Self-Generation Incentive Program 2009 Market-Focused Process Evaluation

SGIP Working Group

May 17, 2010

Presented by

Navigant Consulting
1722 14th Street, Suite 230
Boulder, CO 80302

phone 720.564.1130
fax 720.564.1145

www.navigantconsulting.com

Submitted by:

Navigant Consulting, Inc.
1722 14th Street, Suite. 230
Boulder, CO 80302
720.564.1130

Prepared by:

Kevin Cooney, Managing Director
720.564.1130
Kevin.Cooney@NavigantConsulting.com

Jennifer Barnes, Associate Director
415.399.2116
Jennifer.Barnes@NavigantConsulting.com

Beth Baker, Managing Consultant
720.564.1130
Beth.Baker@NavigantConsulting.com

Section 1. Acknowledgements

The evaluation team would like to thank Betsy Wilkins, Evaluation Project Manager, as a consultant to PG&E, for the direction she provided to this study. We also wish to thank the CPUC and the SGIP Working Group who contributed their time to this study:

- Molly Sterkel, Sach Constantine, Curtis Seymour, and Neal Reardon of the CPUC;
- Andrew Yip and Matt Heling of PG&E;
- James Stevenson and Pierre Landry of SCE;
- Chris Roberts and Dale Smet of SCG;
- Ryan Amador of CCSE;
- Steve Jaffe and Brenda Gettig of SDG&E; and
- Sandy Miller and James Lee of the CEC's ERP.

We also wish to thank the wind, fuel cell, and CHP project developers and market actors we interviewed who were generous with their time and forthcoming with their insights. The research team contacted 94 SGIP participants and 128 non-participating IOU customers. We appreciate the time they spent with us.

The evaluation team comprises many individuals: Kevin Cooney, who provided the overall direction, and Jennifer Barnes, who managed the evaluation on a day-to-day basis. Beth Baker deserves a special thanks for her creative insights regarding the program data.

Table of Contents

Section 1. Acknowledgements i

Section 2. Report Highlights 1

2.1 Key Findings 1

2.1.1 Program Achievements 1

2.1.2 Program Delivery 2

2.2 Key Recommendations 3

Section 3. Executive Summary 4

3.1 Evaluation Methods 4

3.2 Key Findings 4

3.2.1 Program Achievements 4

3.2.2 Participant Experiences 6

3.2.3 Private versus Public Entities 8

3.3 Lessons Learned 10

3.3.1 Program 10

3.3.2 Marketing 11

3.4 Recommendations 11

Section 4. Introduction 14

4.1 Program Background 14

4.1.1 Program Modifications Over Time 22

4.2 EM&V Background 29

4.3 Research Objectives 30

Section 5. Evaluation Approach 31

5.1 Review of Program Data 31

5.2 Surveys 31

5.2.1 Sampling Plan 32

5.2.2 Survey Pretests 35

5.2.3 Survey Disposition 36

5.2.4 Survey Weighting 39

5.3 In-Depth Interviews 39

5.3.1 Working Group and PA Staff Interviews 39

5.3.2 Participating Host Customers 40

5.3.3 Non-Participating Customers 41

5.3.4 Market Actor Interviews 42

5.3.5 Project Developer Interviews 42

Section 6. Findings 45

6.1 Participation Summary 45

6.2 SGIP Interface with the Market 51

6.2.1 Influential Factors in the Decision to Install On-Site Generation 51

6.2.2 Awareness of the SGIP 53

6.2.3 Market Sector Involvement 54

6.2.4 Customer's Payback Expectations 58

6.3 Stakeholder Experience with the Program 60

6.3.1 The Connection between Host Customers and Project Developers 61

6.3.2 Program Application Materials 64

6.3.3 Program Satisfaction 65

6.3.4 Program Processes Satisfaction 65

6.3.5 Program Timelines 70

6.3.6 Project Delays 71

6.3.7 Program Changes....72

6.3.8 Time to Process Applications 72

6.3.9 Eligibility Issues 78

6.4 The SGIP Process for Public versus Private Entities 78

6.4.1 Process Differences 83

6.4.2 Differences in Program Experiences 84

6.4.3 Barriers to Additional Onsite Generation 89

6.4.4 Reasons for Withdrawing Applications 91

6.4.5 Federal Incentives for SGIP Projects 92

6.5 Social and Economic Factors Related to Program Participation 92

Section 7. Program Lessons Learned 95

Section 8. Assessment of Program Administrator Marketing and Outreach Efforts 97

8.1 PA Marketing 97

8.1.1 IOU Account Representative Training 97

8.1.2 PA Web Sites....97

8.1.3 Conference Attendance and Promotion 98

8.1.4 Technology and Program Education 98

8.1.5 Industry Partnerships....99

8.1.6 Segmentation Strategy 99

8.2 Appropriate Marketing Approaches within the CPUC's Integrated Marketing Vision100

Section 9. Conclusions and Recommendations 102

9.1 Summary of Conclusions....102

9.1.1 SGIP Participation 102

9.1.2 Participant Experiences 103

9.1.3 Private versus Public Entities 104

9.1.4 Lessons Learned 105

9.2 Recommendations 106

Section 10. Appendices 109

10.1 Appendix 1: Survey and Interview Guides 109

10.1.1 Program Administrator Interviews 109

10.1.2 CEC and CPUC Staff Interviews 120

10.1.3 Participant Survey Active 125

10.1.4 Participant Survey Rejected 136

10.1.5 Participant Interview Active 148

10.1.6 Participant Interviews Rejected 156

10.1.7 Non-Participant Survey 165

10.1.8 Non-Participant Interviews 178

10.1.9 Participating Developer 185

10.1.10 Non-Participating Developer Interview Guide 192

10.1.11 Wind Market Actor Interview Guide 198

10.1.12 Fuel Cell and AES Market Actor Interview Guide 202

10.2 Appendix 2: Interview Summaries 208

10.2.1 Participant and Non-Participant Host Customers 208

10.2.2 Findings 208

10.2.3 Participating Developer 212

10.2.4 Wind Developers 212

10.2.5 Fuel Cell Developers....220

10.2.6 Non-Participating Developers....227

10.2.7 Combustion Technology Developers....228

10.2.8 Wind Market Actors....233

10.2.9 Fuel Cell Market Actors....239

10.2.10 Advanced Energy Storage Market Actors....244

Section 2. Report Highlights

The 2009 Self-Generation Incentive Program (SGIP or Program) Market-Focused Process Evaluation (2009 Process Study) reviewed the Program processes from the perspective of the current self-generation market needs. The 2009 Process Study focuses on how various aspects of the market interface with the SGIP, and how Program processes and requirements can be refined or modified to better meet the needs of the diverse market actors while delivering cost effective benefits to California ratepayers.

2.1 Key Findings

2.1.1 Program Achievements

- The SGIP has disbursed over $619 million in incentives that provided for installation of 348 megawatts (MW) of self-generation capacity since program inception in 2001 through December 2009. This represents 1,299 on-site generation projects, as follows:
  - 889 solar photovoltaic (PV) systems;
  - Four wind turbines;
  - 25 fuel cells (seven renewable-fueled and 18 non-renewable-fueled);
  - 234 internal combustion engines (15 renewable-fueled and 219 non-renewable-fueled);
  - 138 microturbines (18 renewable-fueled and 120 non-renewable-fueled); and
  - Ten non-renewable-fueled gas turbines.
- Solar PV systems make up the largest number of completed projects (68 percent) and the largest percentage of incentives paid (74 percent), but represent only 39 percent of installed capacity.
- Non-renewable-fueled internal combustion engines constitute the largest portion of installed system capacity (40 percent) but only 13 percent of incentive dollars requested at project completion.
- Providing tiered incentives for projects sized between 1 and 3 MW beginning in 2008 has led to an increase of the percentage of applications with system sizes greater than 1 MW.
- Host Customers[1] with Active/Completed[2] or Withdrawn[3] projects find three factors most compelling in the decision to participate: concern for the environment, utility bill

[1] Host Customers are investor-owned utility customers who have submitted an application to the SGIP.
[2] Active projects are SGIP projects that are still in the development process and likely to be completed. Completed projects are SGIP projects that have been installed and the SGIP incentive paid.

reduction, and improving their image in the community. However, Host Customers with Active/Completed projects ranked concern for the environment number one, while Host Customers with Withdrawn projects ranked utility bill savings as number one.

» For applications[4] received in 2008 and 2009, residential customers were the dominant market sector with 50 applications (about 46 percent).

» Overall, Program satisfaction is high (83 percent of survey respondents with Active/Completed projects and 39 percent of those with Withdrawn projects were "satisfied" or "very satisfied").

2.1.2 Program Delivery

» A majority of Host Customers with Active/Completed projects found the Program processes for which the Program Administrators (PAs) have a direct influence to be "easy" or "very easy," while processes outside the direct influence of the PAs and which may require approval from local or state agencies or other utility departments were found to be "difficult" and "very difficult."

» Consistent with the results of the 2007 SGIP Market-Focused Process Study,[5] the 2009 Process Study found that 75 percent of Host Customers with an Active/Completed project report that an energy services company is involved with the application process.

» The 2009 Program timelines are not reasonable for the current SGIP-eligible technologies, which have complex and unpredictable project development cycles.

» Project developer attitudes toward Program changes shifted significantly since the 2007 Process Study when both developers and Host Customers indicated that frequent Program changes hampered their ability to move projects forward. In this round of interviews, project developers were generally positive about recent Program changes, specifically mentioning the streamlining of the application process, raising the incentive cap to three MW, and adding advanced energy storage.

» Growing attention to climate change and environmental issues has resulted in modest increases in the influence these issues have on Host Customers. However, economic issues remain a dominant driver across times of economic prosperity and downturn. In the current economic climate, social factors do not override economic realities in a customer's decision to install distributed generation or renewable energy projects.

---

[3] Withdrawn projects are SGIP projects where the applications have been withdrawn from the SGIP by the project applicant.

[4] Applications to the SGIP may not result in Completed projects. Project applications may ultimately be Rejected or Withdrawn.

[5] http://www.pge.com/sgipreports/.

2.2 *Key Recommendations*

- Adjust the Program timelines to make them more appropriate for the project complexities inherent in wind and fuel cell technologies and the changing business practices of private firms.
- Maintain a tiered incentive structure for projects between one and three MWs.
- Monitor the new two-step application process for residential applications to ensure that it meets the needs of the residential customers and project developer and is workable for the Program.
- Consider removing the 30 kW minimum system size for wind and renewable-fueled fuel cells when the California Energy Commission's Emerging Renewables Program ends in 2012.
- Consider requiring monitoring equipment on all projects.
- Assign SGIP staff at each PA to project developers so they have a consistent point of contact.
- Continue refinements to the SGIP application process and annual clarifications to the Program handbook.
- Effectively leverage content on the PA SGIP Web pages as a marketing or decision support resource.
- Maintain a presence at industry conferences, leveraging supplemental opportunities to support participation. Appropriate industry associations for wind and AES should be identified.
- Continue PA participation in industry associations.

Section 3. Executive Summary

The Self-Generation Incentive Program (SGIP or Program) 2009 Market-Focused Process Study (2009 Process Study) is unique in that it not only reviews the Program processes, but also considers the interaction between these processes and the current self-generation market needs. The 2009 Process Study focuses on how various aspects of the market interface with the SGIP, and how Program processes and requirements can be refined or modified to better meet the needs of the diverse market actors while delivering cost effective benefits to California ratepayers.

3.1 Evaluation Methods

The evaluation methods used included the following:

- A review of Program participation records and reports submitted to the California Public Utilities Commission (CPUC) through September 2009 from all program Administrators (PAs);
- In-depth interviews with staff from each PA, with wind, fuel cell, and combustion technology project developers across the state, and with California Energy Commission (CEC) Emerging Renewables Program (ERP) and CPUC staff;
- Surveys of participating Host Customers and non-participating California investor-owned utility (IOU) customers;
- In-depth interviews with participating Host Customers and non-participating IOU customers;
- Interviews with program managers of other, similar programs across the United States;
- Review of applicable literature sources, relevant industry documents, and Internet sources;
- A geographic information system analysis of high potential locations for wind projects; and
- In-depth interviews with other market actors: wind, fuel cell, and advanced energy storage (AES) manufacturers and industry associations.

3.2 Key Findings

3.2.1 Program Achievements

- The SGIP has disbursed over $619 million in incentives that provided for installation of 348 megawatts (MW) of self-generation capacity since program inception in 2001 through December 2009. This represents 1,299 on-site generation projects, as follows:
    - 889 solar photovoltaic (PV) systems;

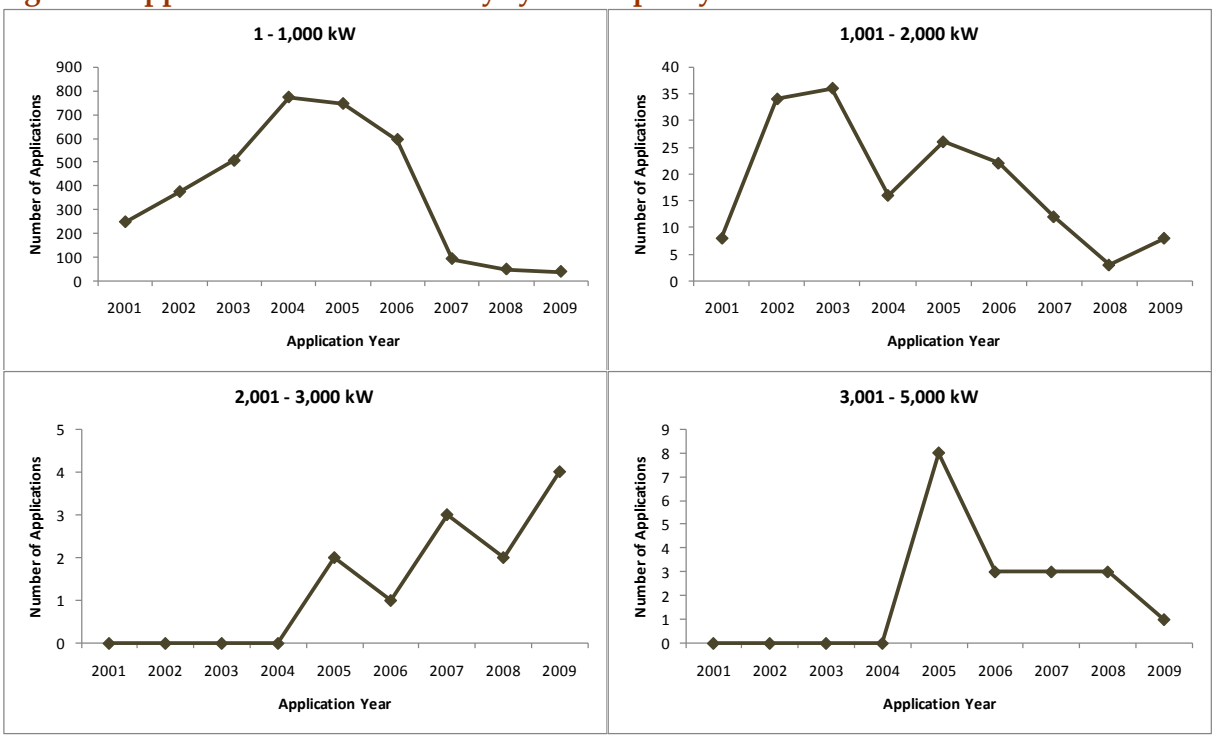
- Four wind turbines;
- 25 fuel cells (seven renewable-fueled and 18 non-renewable-fueled);
- 234 internal combustion (IC) engines (15 renewable-fueled and 219 non-renewable-fueled);
- 138 microturbines (18 renewable-fueled and 120 non-renewable-fueled); and
- Ten non-renewable-fueled gas turbines.

» Solar PV systems make up the largest number of Completed[6] projects (68 percent) and the largest percentage of incentives (74 percent) but only 39 percent of installed capacity.

» Non-renewable-fueled IC engines constitute the largest installed system capacity (40 percent) but only 13 percent of incentives requested at project completion.

» Providing tiered incentives for projects sized between one and three MW beginning in 2008 has led to an increase of the percentage of applications with system sizes greater than one MW (Figure 1).

Figure 1. Applications to the SGIP by system capacity



Source: SGIP Data as of December 2009.
Notes: (1) the y-axis scales are different for each system capacity group so that the trend line can be seen; (2) eleven projects are not included in the figure due to unknown system capacity on the application; (3) projects combined with advanced energy storage are sized based on the fuel cell or wind system size; and (4) represent applications submitted to the SGIP and not completed projects.

[6] Completed projects are SGIP projects that have been installed and the SGIP incentive paid.

- Host Customers with Active/Completed[7] or Withdrawn[8] projects find three factors most compelling in the decision to participate: concern for the environment, utility bill reduction, and improving their image in the community. Specifically, Host Customers with Active/Completed projects ranked concern for the environment number one while Host Customers with Withdrawn projects ranked utility bill savings as number one.
    - This is similar to the 2007 SGIP Market-Focused Process Study[9] (2007 Process Study) which revealed the top three influencing factors for Host Customers to be utility bill reduction, concern for the environment, and improving their image in the community.
- Residential non-participating IOU customers indicated that utility bill reduction would be the most important factor, followed by a concern for the environment and energy supply independence. Non-residential non-participating IOU customers also found utility bill reduction to be the most important influencing factor, but reducing peak demand came in second and a concern for the environment was third.
    - Non-participating IOU customers in the 2007 Process Study also found utility bill reduction and concern for the environment to be the top two influence factors with peak demand reduction and wanting a back up electric supply tied for third. A desire for backup power seems to be falling in influence over time.
- For applications[10] received in 2008 and 2009, residential customers were the dominant market sector with 50 applications (about 46 percent). The top four market sectors, which include public administration (ten applications and nine percent), manufacturing (eight applications and seven percent), water districts/sanitary services (eight applications and seven percent), account for 71 percent of the applications by number received in 2008 and 2009.
    - This is in sharp contrast to the 2007 Process Study when ten market sectors accounted for 78 percent of the applications, with manufacturing dominating.

3.2.2 Participant Experiences

- Overall, Program satisfaction is high (83 percent of survey respondents with Active/Completed projects were "satisfied" or "very satisfied" and 39 percent of Withdrawn projects):

---

[7] Active projects are SGIP project that are still in the development process and likely to be completed. Completed projects are SGIP projects that have been installed and the SGIP incentive paid.
[8] Withdrawn projects are SGIP projects where the applications have been withdrawn from the SGIP by the project applicant. Rejected projects are SGIP projects where applications were rejected by the PA. No surveys were completed with customers with Rejected projects.
[9] http://www.pge.com/sgipreports/.
[10] Applications to the SGIP may not result in Completed projects. Project applications may ultimately be Rejected or Withdrawn.

- Active/Completed Host Customer satisfaction is consistent with the 2007 Process Study which found that 80 percent were "very satisfied" or "satisfied." However, Withdrawn Host Customer satisfaction is dropping. In 2007, 50 percent of survey respondents with Withdrawn projects were "very satisfied" or "satisfied."

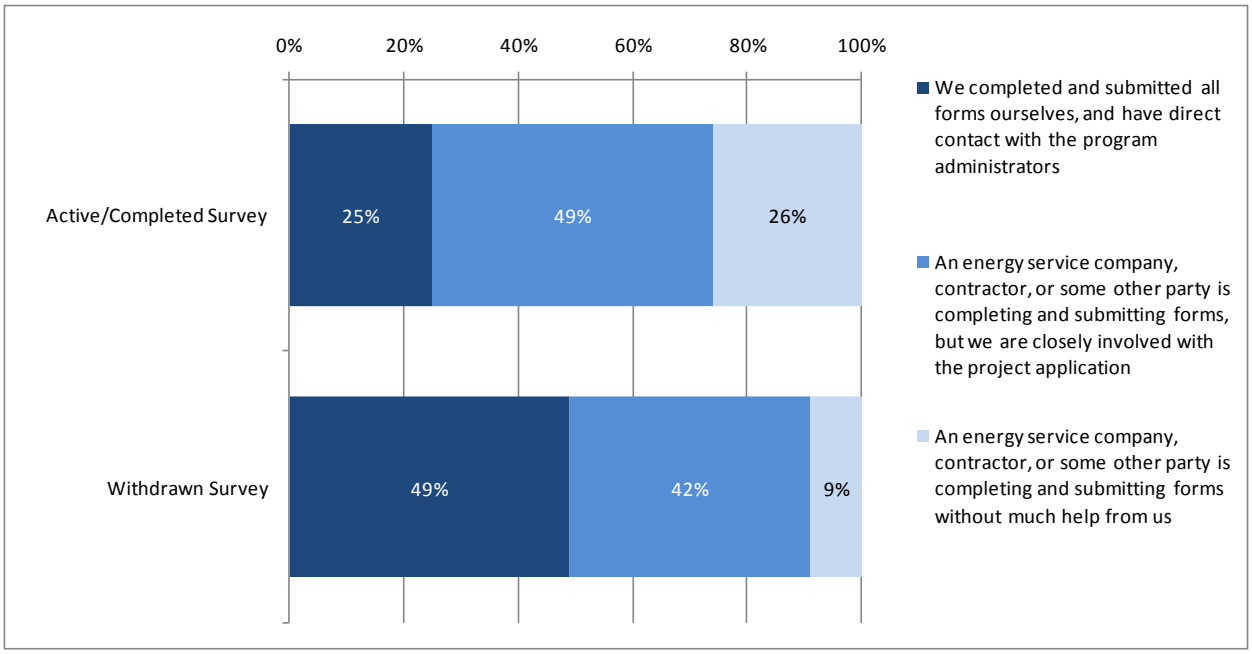
» At least 70 percent of all Host Customers with Active/Completed projects found the Program processes for which the PAs have a direct influence to be "easy" or "very easy."[11] The processes cited as "difficult" and "very difficult" by the Host Customers with Active/Completed projects are those that are outside the direct influence of the PAs and may require approval from local or state agencies or other utility departments.

» Consistent with the results of the 2007 Process Study, the current study found that 75 percent of Host Customers with an Active/Completed project report that an energy services company is involved with the application process (Figure 2). In 2007, this number was 80 percent across all Host Customers:

- However, in the current survey, the 49 percent of Host Customers with Withdrawn applications managed the application process without the assistance of an energy services company, implying that the involvement of an energy services company in the application process may help influence a successful outcome.

[11] Includes only responses that were not "not applicable," "don't know," or "no answer." The program processes for which the Program Administrators have a direct influence are "submitting a reservation application," "submitting proof of project milestone to the program," "submitting a claim incentive payment," "scheduling with the program administrator for the program's on-site inspection," "obtaining approval based on the program's on-site inspection," and "obtaining the incentive payment from the program."

Figure 2. Customer Involvement in the SGIP Application Process



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8. The responses of Host Customers with Withdrawn projects have a confidence level/precision internal of 90/23.
Note: One "don't know" response is not included in this figure.

- The 2009 Program timelines are not reasonable for the current SGIP-eligible technologies, which have complex and unpredictable project development cycles.
- Project developer attitudes toward Program changes have shifted significantly since the 2007 Process Study when both developers and Host Customers indicated that frequent Program changes hampered their ability to move projects forward. In this round of interviews, project developers were generally positive about recent Program changes, specifically mentioning the streamlining of the application process, raising the incentive cap to three MW, and adding advanced energy storage. Host Customers did not mention Program changes as a project barrier.

3.2.3 Private versus Public Entities

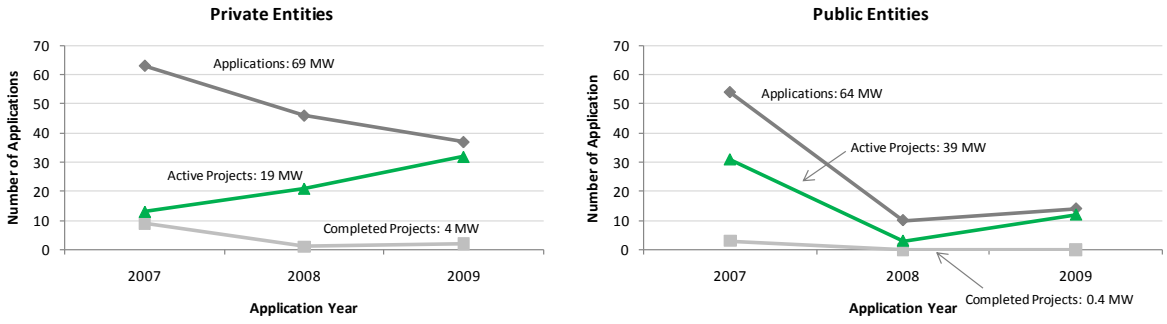
- Public entities (38,608 kW) currently have more capacity in active projects than private entities (19,212 kilowatts (kW)) (see Figure 3).
- Private and public entities had a similar number of applications in 2007 (63 and 54, respectively); however, the number of public entity applications (ten and 14) was greatly reduced in 2008 and 2009 compared to private entity applications (46 and 37) (Figure 3).

» Private entity applications appear to be on a downtrend, where public entity applications reduced in 2008 (from 2007) and then increased slightly in 2009(Figure 3).

  - These trends are slightly different than those in the 2007 Process Study. In 2007, private entity applications seemed to be trending down while the number of public entity applications was increasing every year.

» 15 projects have been completed from applications submitted between 2007 and 2009. Of those Completed projects, three were with public entities (all in the non-profit sector) and 12 were with private entities (Figure 3).

Figure 3. Yearly Private and Public Entity Project Counts and System Sizes



Project Type	Applications		Active Projects		Completed Projects	
	Number	kW	Number	kW	Number	kW
Private Entity	146	69,441	66	19,212	12	3,808
Public Entity	78	63,503	46	38,608	3	405
Federal government	6	8,085	5	6,585	0	0
Local government	50	27,239	31	17,166	0	0
Non-profit	12	8,451	5	2,903	3	405
State government	8	15,294	4	10,054	0	0
Tribal government	2	4,434	1	1,900	0	0

Source: SGIP data as of December 2009.
Note: This data includes eight projects with an "unknown" market sector. The evaluation team made their best estimate for whether these projects were public or private by reviewing the Host Customer name.

» The majority of private (82 percent) and public (83 percent) entities with Active or Completed projects were "satisfied" or "very satisfied" with the SGIP. About two percent of private entities were "dissatisfied" or "very dissatisfied" with the Program compared to six percent of public entities.[12]

[12] The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and is 90/11 for public entity values.

    - This finding is also in contrast with the 2007 Process Report where more than ten percent of private entities were either "dissatisfied" or "very dissatisfied," whereas just one percent of public entities felt that way.

- About 71 percent of private entity Host Customers and 77 percent of public entity Host Customers with Active/Completed projects had some involvement in the application process. However, private entities with Withdrawn projects are twice as likely as public entities to have completed the process on their own.
    - These findings contrast those in the 2007 Process Study where public entities were about twice as likely as private entities to complete the forms themselves, while private entities were about twice as likely to hire an energy services company to manage the application process.
- Between 2007 and 2009, there have been surges of applications in December for both public and private entities as Host Customers reserve Program funds before Program changes take effect in the following year. This is different from prior years when application surges occurred when the Program opened at the beginning of each year when the new Program budgets became available.
- Economic issues remain a dominant driver across times of both economic prosperity and downturn. In the current economic climate, social factors do not override economic realities in a customer's decision to install DG or renewable energy projects. Growing attention to climate change and environmental issues has resulted in modest increases in these issues as an influencing factor for Host Customers.

3.3 Lessons Learned

A review of the SGIP successes and shortcomings identified the following lessons:

3.3.1 Program

- Offering incentives for projects up to three MW has opened up the market to more customers.
- Program milestone requirements that are developed based on the information and documents readily available at each point in a project's development cycle simplify the application process for Host Customers and project developers.
- Providing a meaningful and efficient way for industry stakeholders to participate in the Program's administration can result in innovative Program changes.
- Being responsive to changes in technology and customer type can expand the SGIP's reach into new markets.
- Program requirements applicable to one technology can undermine other technologies if not properly vetted.

3.3.2 Marketing

- PG&E Web-based training for its account representatives was a positive step toward ensuring that IOU customers have a credible resource on SGIP-eligible technologies.
- The SGIP information and materials available on each PA Web site are an important resource for both IOU customers and project developers.
- Effective participation at conferences targeted at industry participants, such as equipment manufacturers and project developers, is an appropriate forum for promoting the SGIP.
- Educational offerings by the PAs were a positive step in educating the market and providing a credible resource on the SGIP technologies in order to overcome barriers of awareness and anxiety over technology performance.
- Participation in industry associations is an important and meaningful way for the PAs to become engaged with the industries that support the SGIP-eligible technologies.
- The PAs should leverage segmentation strategies and utility billing data to target high-potential wind and fuel cell customers.

3.4 Recommendations

- ***Adjust the Program timelines*** to make them more appropriate for the project complexities inherent in wind and fuel cell technologies and the changing business practices of private firms:
  - Wind projects have a much more complex development cycle and can encounter any number of legitimate delays which are difficult to predict. The fuel cleaning equipment for renewable-fueled fuel cell adds an additional layer of complexity to these projects. Both wind and fuel cells require custom built equipment that can take up to a year for delivery.
  - Private firms are more frequently requiring competitive bidding for capital projects to comply with the Sarbanes-Oxley Act of 2002.
- ***Maintain a tiered incentive structure for projects between one and three MWs***. The funding for these incentives should come from the regular Program funds and not be limited to roll-over funding, as this distinction has caused concerns by the project developers about the availability of funding for these projects.
- ***Monitor the new two-step application process for residential applications*** to ensure that it meets the needs of the residential customers and project developer and is workable for the Program.
- ***Consider removing the 30 kW minimum system size for wind and renewable-fueled fuel cells when the CEC's ERP ends in 2012***. Wind and renewable-fueled fuel cells sized under 30 kW are currently only funded through the CEC's ERP. However, the ERP is set

to expire at the end of 2011 and would require a lengthy legislative process to extend. Removing the SGIP's 30 kW minimum for these technologies will provide continuity in incentive funding for small wind and renewable-fueled fuel cells and can be accomplished through a CPUC decision. If the SGIP institutes Program requirements for system monitoring, these requirements should be considered relative to the monitoring costs for these smaller projects.

» ***Consider requiring monitoring equipment on all projects***. Ideally, project monitoring systems have an interface that is easy for the customer to understand, allows them to track system output relative to forecasted output, and includes the capability to alert the customer or other responsible party if the system should fail.

  - The project developers interviewed indicated that most of the current SGIP systems are installed with monitoring equipment already so a new requirement should not result in an increase in system costs over the current costs. However, if the composition of the SGIP shifts to smaller projects, this recommendation might need to be re-evaluated.
  - If system monitoring requirements are added to the SGIP, any requirements to provide data to the Program should be carefully considered. Regular reporting, such as monthly or quarterly, may create a hardship to customers who already have many industry and regulatory reporting requirements. Customers and project developers may also be concerned that their incentives may be in jeopardy based on the reported production. Lastly, the PAs should consider whether and how this information will be used when considering regular reporting of data and be quite clear with project developers and Host Customers.

» ***Assign SGIP staff at each PA to project developers so they have a consistent point of contact,*** in much the same way account representatives work with commercial and industrial IOU customers.

» ***Continue refinements to the SGIP application process and annual clarifications to the Program handbook***:

  - Consider allowing application documents to be submitted electronically;
  - Layer key interconnection steps into SGIP process flow diagrams; and
  - Establish time frames for various milestones, such as responding to inquiries, sending requests for additional information, delivering conditional reservation notice letter, reservation confirmation and incentive claim form, and scheduling field verifications.

» ***Offer training similar to the PG&E's Web-based training for account representatives across PA territories.*** Similar training sessions should be developed for wind and AES.

» ***Effectively leverage content on the PA SGIP Web pages as a marketing or decision support resource:***

  - Additional content could include project success stories and information on the appropriate applications, costs, benefits, and maintenance requirements for each technology; and
  - Expand PA technology and Program educational offerings, with separate offerings developed for customers and project developers with content appropriate to each.

» ***Maintain a presence at industry conferences, leveraging supplemental opportunities to support participation,*** such as placing advertisements in the conference brochure or providing speakers at conference breakout sessions. Similar conferences for wind and AES should be identified.

» ***Continue PA participation in industry associations*** as an important and meaningful way for the PAs to become engaged with the industries that support the SGIP-eligible technologies. Appropriate industry associations for wind and AES should be identified.

» ***Leverage segmentation strategies and utility billing data to target high-potential wind and fuel cell customers.***

» ***Establish a minimum funding level for SGIP marketing and outreach activities.*** Currently, the SGIP has a single budget category and funding level for Program administration, marketing, and outreach.[13] To ensure adequate expenditures for marketing and outreach activities, the CPUC could modify Decision 09-12-047 to create separate funding categories for administration, marketing, and outreach. The specific funding levels for each category should be developed based on administrative funding requirements and informed by similar funding levels in the CSI program.

» ***Leverage the new Smart Energy Living (SEL) brand, marketing campaign, and Web portal by:***

  - Adding links to the PA's SGIP Web sites;
  - Developing information on residential fuel cells; and
  - Utilizing the social media components of the SEL Web portal by:
    - Providing questions for the site's polling feature; and
    - Posting content on the message boards.

[13] CPUC Decision 09-12-047, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/111738.htm.

Section 4. Introduction

The Self-Generation Incentive Program (SGIP or Program) was first launched in March 2001 by the California Public Utilities Commission (CPUC) to provide incentives for the installation of new, customer-sited self-generation equipment. The SGIP operates in the service areas of Pacific Gas and Electric (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), and the San Diego Gas and Electric Company (SDG&E). The SGIP is administered by PG&E, SCE, and SCG in their respective territories. The California Center for Sustainable Energy (CCSE) administers the SGIP in SDG&E's territory.[14]

The SGIP is overseen by a Working Group (WG) consisting of representatives from each of the PAs, as well as representatives from SDG&E, the California Energy Commission (CEC) staff associated with the Emerging Renewables Program (ERP), and the Energy Division of the CPUC. A Measurement and Evaluation subcommittee (M&E subcommittee) works on behalf of the Working Group to oversee the SGIP evaluation activities.

This report presents the findings of the 2009 Market-Focused Process Study (2009 Process Study), which is unique in that it not only reviews the Program processes, but also considers the interaction between these processes and current distributed generation (DG) market needs. The 2009 Process Study focuses on how various aspects of the market interface with the SGIP, and how Program processes or requirements can be refined or modified to better meet the needs of the various market actors. Section 4.3 describes the research objectives in detail.

A combination of primary and secondary research was conducted to inform this study. Surveys and in-depth interviews with California investor-owned utility (IOU) customers participating in the SGIP (Host Customers) and non-participating California IOU customers were conducted. In-depth interviews were also conducted with the SGIP PAs, the CPUC staff overseeing the SGIP, CEC staff involved with the ERP, participating and non-participating project developers, and other market actors. Program records were reviewed as were other sources of publicly available industry reports and market data. Section 5 describes the evaluation approach in detail.

4.1 Program Background

The SGIP was initially approved in Assembly Bill (AB) 970 (Ducheny, 2000)[15], which passed in September 2000 in response to the 2000-2001 energy crisis, and was implemented by CPUC

[14] Together, PG&E, SCE, SCG, and CCSE are referred to as the PAs in this report.
[15] www.leginfo.ca.gov/pub/99-00/bill/asm/ab_0951-1000/ab_970_bill_20000907_chaptered.html

Decision 01-03-073 in March 2001. The Program was reauthorized in AB 1685 (Leno, 2003)[16] and implemented in CPUC Decision 04-12-045[17].

The California Legislature passed AB 970 directing the CPUC to create programs to reduce electricity demand and fend off rolling blackouts. CPUC Decision 01-03-073[18] formally created the SGIP to offer financial incentives to customers who install certain types of DG technologies to meet all or a portion of their energy needs. At that time, the SGIP was designed to complement the CEC's ERP by providing incentive funding to larger renewable-fueled and non-renewable-fueled self-generation units.

In October 2003, AB 1685 extended the SGIP beyond 2004 through 2007. This bill required the CPUC, in consultation with the CEC, to administer the SGIP until January 1, 2008 in largely the same form that existed on January 1, 2004. This decision notwithstanding, a number of program modifications were made during the 2004 and 2007 period. For example, with the establishment of the California Solar Initiative (CSI), the SGIP stopped offering incentives for PV systems after 2006. AB 2778 (Lieber, 2006)[19], approved in September of 2006, continued the SGIP for fuel cells and wind technology until 2012. Other renewable technologies, such as micro-hydropower, were not included, and combustion technologies were eliminated after 2007. However, there are suggestions that allowing combustion technologies in the Program may be revisited. [20] Upon enacting AB 2778, Governor Schwarzenegger encouraged parties to revisit the eligibility of the eliminated technologies in the following signing message:

> *This bill extends the sunset of the Self-Generation Incentive Program to promote distributed generation throughout California. However, the legislation eliminated clean combustion technologies like mircoturbines from the program. I look forward to working with the Legislature to enact legislation that returns the most efficient and cost effective technologies to the program. If clean up legislation is not possible, the California Public Utilities Commission should develop a complimentary program for these technologies.*[21]

On October 11, 2009, Senate (SB) 412 (Kehoe, 2009)[22] was signed into law thereby changing the eligibility of SGIP technologies to those distributed generation technologies that achieve

---

[16] California Assembly Bill 1685, www.leginfo.ca.gov/pub/03-04/bill/asm/ab_1651-1700/ab_1685_bill_20031012_chaptered.html
[17] CPUC Decision 04-120045, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/42455.htm
[18] CPUC Decision 01-03-073, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/6083.htm
[19] California Assembly Bill 2778, hwww.leginfo.ca.gov/pub/05-06/bill/asm/ab_2751-2800/ab_2778_bill_20060929_chaptered.html
[20] Personal Communication SGIP administrator, Nathalie Osborne, SDREO, November 1, 2006.
[21] Governor Schwarzenegger AB 2778 signing message, http://gov.ca.gov/pdf/press/ab_2778_sign.pdf
[22] California Senate Bill 412, www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0401-0450/sb_412_bill_20091011_chaptered.html

greenhouse gas emissions pursuant to the California Global Warming Solutions Act of 2006.[23] SB 412 gives the CPUC (in consultation with the California Air Resources Board (CARB)) the flexibility to add technologies to the SGIP. The bill authorizes the Program to operate through 2016 with ratepayer collections to fund the Program approved through December 31, 2011. The CPUC issued an administrative law judge ruling on November 13, 2009 requesting parties' comments and noticing a public workshop to solicit suggestions on implementing SB 412.[24] The SB 412 implementation planning was still underway at the time this report was published.

The timelines shown in Figure 4 and Figure 5 summarize key decisions related to the SGIP and details additional Program modifications. Following the timeline is a table (Table 1) summarizing the key differences among AB 970, AB 1685, AB 2778, and SB 412.

[23] California Assembly Bill 32, www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf

[24] CPUC, Administrative Law Judge's Ruling Requesting Comments on the Implementation of Senate Bill 412 and Noticing Workshop, November 13, 2009.

Figure 4. SGIP Event Timeline 2000 – 2007

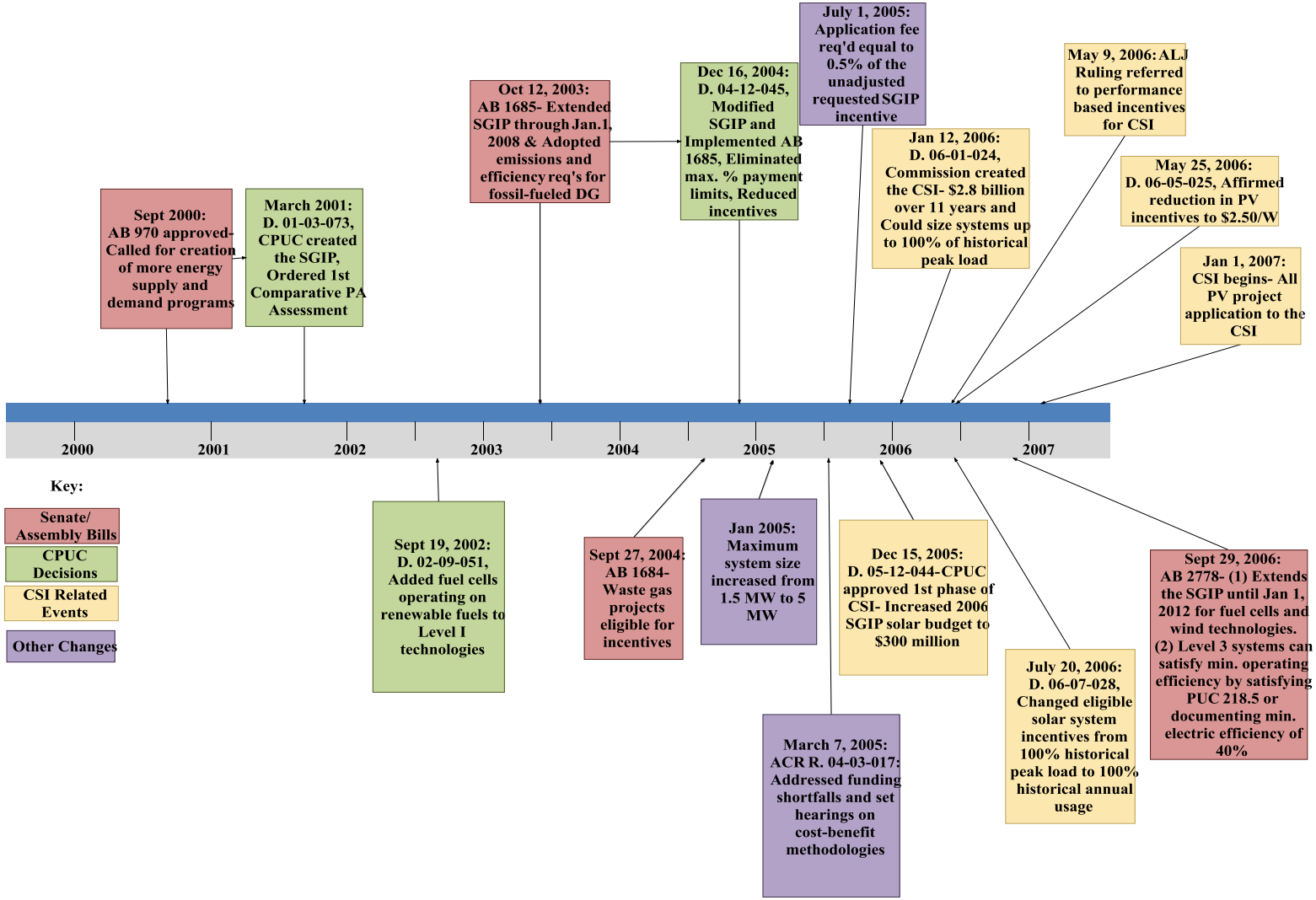


Figure 5. SGIP Event Timeline 2007 - 2009

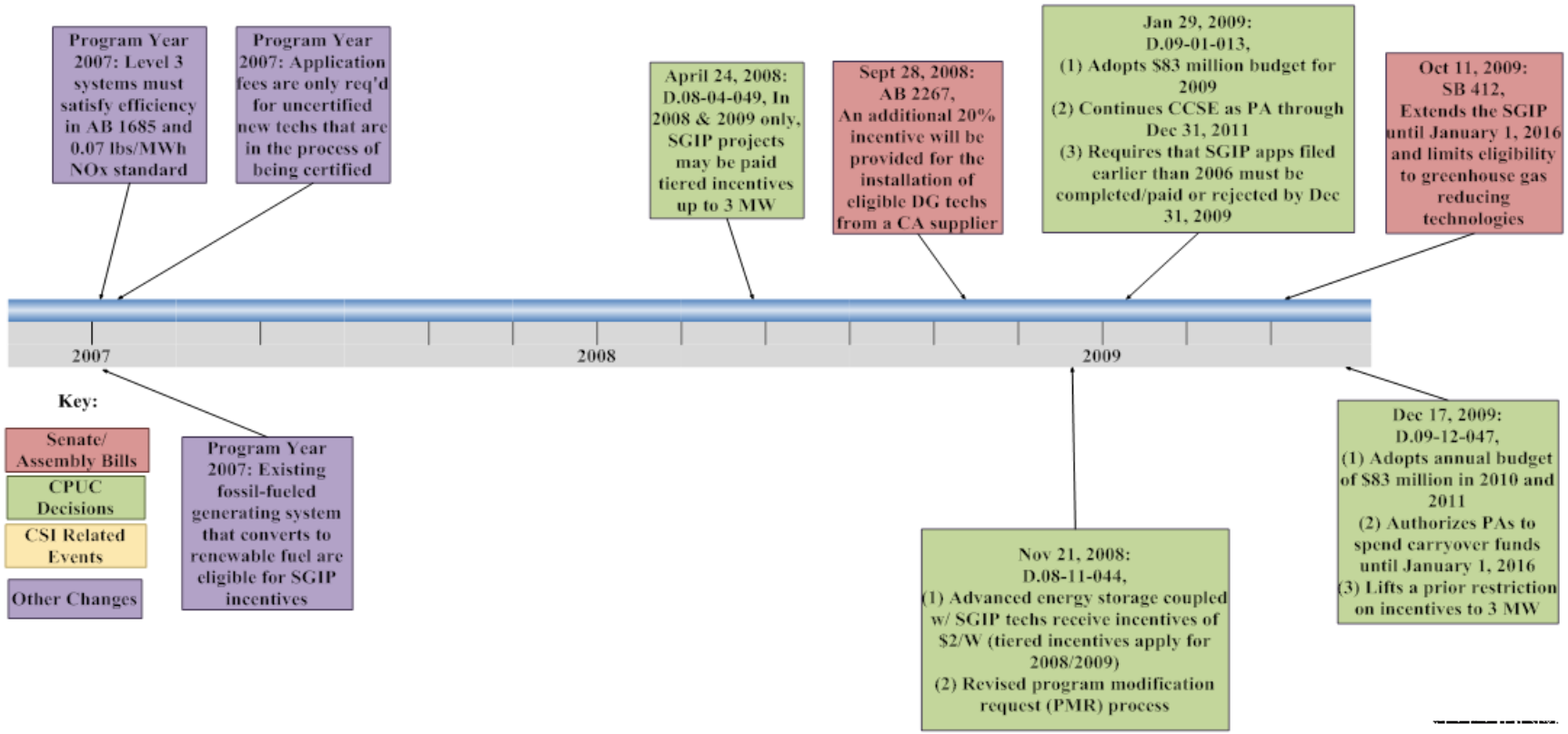


Table 1. Comparison of California AB 970, AB 1685, AB 2778, and SB 412.

Comparison	AB 970: Approved Sept. 6, 2000	AB 1685: Approved Oct. 12, 2003	AB 2778: Approved Sept. 29, 2006	SB 412: Approved October 11, 2009
Bill's self-stated intent and approach	"This bill would require the Public Utilities Commission to identify and undertake certain actions to reduce or remove constraints on the electrical transmission and distribution system, and adopt specified energy conservation initiatives and undertake efforts to revise, mitigate, or eliminate specified policies or actions of the Independent System Operator for which the Public Utilities Commission or Electricity Oversight Board make a specified finding."	"This bill would require the commission, in consultation with the Energy Commission, to administer, until January 1, 2008, a SGIP for distributed generation resources in the same form that exists on January 1, 2004, but would require that combustion-operated distributed generation projects using fossil fuels commencing January 1, 2005, meet a NOx emission standard, and commencing January 1, 2007, meet a more stringent NOx emission standard and a minimum efficiency standard, to be eligible for incentive rebates under the program. The bill would establish a credit for combined heat and power units that meet a certain efficiency standard. The bill would revise the definition of an ultra-clean and low-emission distributed generation to include electric generation technologies that commence operation prior to December 31, 2008."	"This bill would require the commission, in consultation with the Energy Commission, to administer, until January 1, 2012, a SGIP for distributed generation resources. The program in its currently existing form, would be applicable to all eligible technologies, as determined by the commission, until January 1, 2008, except for solar technologies, which the commission would be required to administer separately, after January 1, 2007, pursuant to the California Solar Initiative. The bill, commencing January 1, 2008, until January 1, 2012, would limit eligibility for nonsolar technologies to fuel cells and wind distributed generation technologies that meet or exceed the emissions standards required under the distributed generation certification program adopted by the State Air Resources Board."	"This bill would limit the eligibility for incentives pursuant to the program to distributed energy resources that the commission, in consultation with the state board, determines will achieve reduction of greenhouse gas emissions pursuant to the California Global Warming Solutions Act of 2006."

Comparison	AB 970: Approved Sept. 6, 2000	AB 1685: Approved Oct. 12, 2003	AB 2778: Approved Sept. 29, 2006	SB 412: Approved October 11, 2009
Changing specificity over time	This bill is general in its statements. It calls for "a response to electricity problems facing the state that will result in significant new investments in new, environmentally superior electricity generation, while also making significant new investments in conservation and demand-side management programs in order to meet the energy needs of the state for the next several years."	This bill is specific in requiring an extension for the SGIP. It also adds that "ultra clean and low emission distributed generation" meet: Jan 1, 2003- Dec 31, 2008- Produces 0 emissions or meets 2007 State Air Resources Board emission limits for DG, except technologies operating by combustion must operate in a CHP application with 60% efficiency. SGIP must meet: Commencing Jan 1, 2005: NOx emissions of 0.14 lbs/MWh, and Commencing Jan 1, 2007: NOx emissions of 0.07 lbs/MWh and 60% min. efficiency.	This bill is specific in requiring an extension of the SGIP until 2012, but the eligible technologies for this period (Jan 1, 2008- Jan 1, 2012) are only fuel cells and wind distributed generation technologies. Technologies must meet the same emission and efficiency standards as outlined in AB 1685, unless the technology operates on waste gas and the air quality management district determines that the project will produce a net air emissions benefit.	This bill is broad in that it limits eligible technologies to those that are determined by the CPUC, in consultation with the CARB, as those that reduce greenhouse gas emissions pursuant to the California Global Warming Solutions Act of 2006. The bill includes specific requirements for combustion-operated technologies of NOx emissions of 0.07 lbs/MWh and 60% min. efficiency.

Comparison	AB 970: Approved Sept. 6, 2000	AB 1685: Approved Oct. 12, 2003	AB 2778: Approved Sept. 29, 2006	SB 412: Approved October 11, 2009
Additional areas implicated	Expedited siting of electrical generation. Peak electricity demand programs. Cogeneration. Costs.	Energy conservation demand-side management. Actions to remove constraints from transmission and distribution system. Evaluation of other public policy interests such as rate payers and energy efficiency but also environmental interests.	The commission may adjust the amount of rebates, include other ultraclean and low-emission DG technologies, and evaluate other public policy interests (i.e., ratepayers, energy efficiency, and environmental interests). Costs and benefits.	The commission is authorized to make annual ratepayer collections through December 31, 2011. The administration of the program is extended until January 1, 2016, at which time any unexpended funds collected are to be returned to the ratepayers.

4.1.1 Program Modifications Over Time

Since the creation of the SGIP in March 2001, many changes have shaped the Program. Changes to the incentive level structure, the incentive levels themselves, eligible technologies, and other Program administrative issues are summarized in Table 2, Table 3, and Table 4, respectively, from information compiled from the SGIP Program Handbooks.

The following summary illustrates how the universe of eligible technologies to the Program has changed over time and shows the varying incentive levels and changing requirements for application to the Program. For this study, Navigant Consulting uses technology-based grouping for data collection and analysis, despite the incentive level structure in place over the Program lifetime.

Table 2. SGIP Incentive Level Structure 2004-2009

Incentive Level	Eligible Technologies by Year					
	2004	2005	2006	2007	2008	2009
Level 1	PV Wind turbines Renewable-fueled fuel cells	PV Wind turbines Renewable-fueled fuel cells	PV			
Level 2	Non-renewable-fueled fuel cells	Non-renewable-fueled fuel cells	Wind turbines Renewable-fueled fuel cells Renewable-fueled internal combustion engines and large gas turbines Renewable-fueled microturbines and small gas turbines	Wind turbines Renewable-fueled fuel cells Renewable-fueled microturbines, internal combustion engines, and gas turbines	Wind turbines Renewable-fueled fuel cells	Wind turbines Renewable-fueled fuel cells Advanced energy storage coupled with eligible renewable technologies
Level 3-R	Renewable-fueled Microturbines	Renewable-fueled Microturbines	Non-renewable-fueled fuel cells	Non-renewable-fueled fuel cells	Non-renewable-fueled fuel cells	Non-renewable-fueled fuel cells

Incentive Level	Eligible Technologies by Year					
	2004	2005	2006	2007	2008	2009
	Renewable-fueled Internal-combustion engines Renewable-fueled large gas turbines	Renewable-fueled Internal-combustion engines Renewable-fueled large gas turbines	Non-renewable-fueled and waste gas fuel microturbines and small gas turbines Non-renewable-fueled and waste gas-fueled internal combustion engines and large gas turbines	Non-renewable-fueled and waste gas fuel microturbines, internal combustion engines, and gas turbines		Advanced energy storage coupled with eligible non-renewable-fueled technologies
Level 3-N	Non-renewable-fueled microturbines Non-renewable-fueled internal-combustion engines Non-renewable-fueled small gas turbines	Non-renewable-fueled and waste gas-fueled microturbines Non-renewable-fueled and waste gas-fueled internal combustion engines and large gas turbines				
Notes			Level 1, 2 and 3 only: no R,N	Level 2, and 3 only	Level 2, and 3 only	Level 2, and 3 only

Source: Self-Generation Incentive Program Handbooks.

4.1.1.1 SGIP Incentives Offered

The amount of the incentives offered has changed over time. Table 3 shows the incentives offered between 2004 and 2009. Incentives are shown as "not applicable" for technologies in some years due to varying Program eligibility. Wind turbine incentives fell between 2004 and 2005, but they have stayed constant at $1.50 per watt since 2005. Incentives for renewable-fueled fuel cells and non-renewable-fueled fuel cells have stayed constant since 2004 at $4.50per watt and $2.50 per watt, respectively. Advanced energy storage, coupled with eligible technologies, was added to the SGIP in 2009 at $2.00 per watt. Also in 2009, an additional incentive of 20 percent was provided for projects using a technology manufactured by a California supplier. In 2008 and 2009, tiered incentives are offered to projects up to three MW, as compared to the previous one megawatt (MW) limit.

Table 3. SGIP Incentives Offered 2004-2009

Eligible Technology	Incentive Offered ($/Watt)					
	2004[1]	2005	2006	2007	2008	2009
PV	$4.50	$3.50	$2.50	N/A	N/A	N/A
Wind turbines	$4.50	$1.50	$1.50	$1.50	$1.50	$1.50
Renewable-fueled fuel cells	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50
Non-renewable-fueled fuel cells	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
Renewable-fueled microturbines/small gas turbines	$1.50	$1.30	$1.30	$1.30	N/A	N/A
Renewable-fueled internal-combustion engines	$1.50	$1.00	$1.00	$1.00	N/A	N/A
Renewable-fueled large gas turbines	N/A	$1.00	$1.00	$1.00	N/A	N/A
Non-renewable-fueled microturbines[2]	$1.00	$0.80	$0.80	$0.80	N/A	N/A
Non-renewable-fueled internal-combustion engines[2]	$1.00	$0.60	$0.60	$0.60	N/A	N/A
Non-renewable-fueled small gas turbines[2]	$1.00	$0.80	$0.80	$0.80	N/A	N/A
Non-renewable-fueled large gas turbines[2]	N/A	$0.60	$0.60	$0.60	N/A	N/A
Advanced Energy Storage[3]	N/A	N/A	N/A	N/A	N/A	$2.00

[1] The maximum incentive offered was 50%, 40% and 30% of the total project cost for Level 1, Level 2 and 3-R, and Level 3-N projects, respectively.
[2] Approval of waste gas as a non-renewable fuel was grated at the end of 2004.
3 Coupled with eligible self-generation technology and four hour discharge period at rated capacity.
N/A= Not Applicable

4.1.1.2 SGIP Minimum and Maximum Sizing

The minimum size for PV, wind turbines, and renewable-fueled fuel cells is 30 kilowatt (kW). There is no minimum size for non-renewable-fueled eligible technologies. The maximum size for all technologies was 1.5 MW in 2004, increasing to five MW in 2005, where it has remained.

Table 4. SGIP Minimum and Maximum Sizing 2004-2009

Eligible Technology	Minimum Size						Maximum Size[1]					
	2004	2005	2006	2007	2008	2009	2004	2005	2006	2007	2008	2009
PV	30 kW	30 kW	30 kW	N/A	N/A	N/A	1.5 MW	5 MW	5 MW	N/A	N/A	N/A
Wind turbines	"	"	"	30 kW	30 kW	30 kW	"	"	"	5 MW	5 MW	5 MW
Renewable-fueled fuel cells	"	"	"	"	"	"	"	"	"	"	"	"
Non-renewable-fueled fuel cells	None	None	None	None	None	None	"	"	"	"	"	"
Renewable-fueled fuel microturbines	"	"	"	"	N/A	N/A	"	"	"	"	N/A	N/A
Renewable-fueled internal-combustion engines	"	"	"	"	″	″	"	"	"	"	″	″
Renewable-fueled large gas turbines	"	"	"	"	″	″	"	"	"	"	″	″
Non-renewable-fueled microturbines	"	"	"	"	″	″	"	"	"	"	″	″
Non-renewable-fueled internal-combustion engines	"	"	"	"	″	″	"	"	"	"	″	″
Non-renewable-fueled small gas turbines	"	"	"	"	″	″	"	"	"	"	″	″
Non-renewable-fueled large gas turbines	"	"	"	"	″	″	"	"	"	"	″	″

N/A= Not Applicable
" = Same as above
[1]The maximum incentive payout is capped at one MW for 2004-2007; there is a tiered incentive structure for 2008 and 2009 as a pilot
Source: Self-Generation Incentive Program Handbooks.

4.1.1.3 Project Sizing

Sizing eligibility has changed over time. Initially, PV and wind turbines could be sized up to 200 percent greater than the customer site's annual peak demand. As a result of CPUC Decision 06-01-024[25], solar facilities could only size their systems up to 100 percent of the historical peak load, beginning with applications submitted after January 12, 2006. Since this change resulted in reduction of net metering credits for some solar sites, the ruling was changed in Decision 06-07-028[26] to allow solar sizing up to 100 percent of the historical annual electricity usage.[27] Fuel cell projects may be sized up to the Host Customer's previous 12-month annual peak demand and wind turbine projects may be sized up to 200 percent of the Host Customer's previous 12-month annual peak demand. Fuel cells less than five kW are exempt from the sizing requirements. Advanced energy storage projects may be sized no larger than the SGIP technology with which they are coupled.

4.1.1.4 Percentage of Project Cost

Before 2005, the SGIP paid a maximum percentage of the project cost determined by one of three levels the project qualifies for. Level 1 projects were paid a maximum of 50 percent, Level 2 and Level 3-R projects were paid a maximum of 40 percent, and Level 3-N projects were paid a maximum of 30 percent of total project cost. However, the SGIP did not limit payment to a maximum percentage of project cost after 2005.[28]

4.1.1.5 Application Fee

At the start of the SGIP, no application fee was required. As a consequence, there were many "phantom projects," or projects that would enter the queue but not complete the application process, reserving funds that could have been used for viable projects. To address this problem, an application fee was required for all SGIP reservations received as of July 1, 2005. The application fee was equal to 0.5 percent of the unadjusted requested SGIP incentive.[29] However, the PAs changed the application fee requirement in 2007. Beginning in Program year 2007, application fees are only required for uncertified new technologies that are in the process of being certified by a nationally recognized testing laboratory.[30]

---

[25] CPUC Decision 06-01-024, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/52898.htm
[26] CPUC Decision 06-07-028, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/58274.htm
[27] CPUC Decision 06-078-028, http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/58274.htm.
[28] SCE, SGIP Brochure/Fact Sheet for 2004-2006, www.sce.com/RebatesandSavings/SelfGenerationIncentiveProgram/.
[29] SCE, Selfgen Application Fee Implementation Notice, www.sce.com/RebatesandSavings/SelfGenerationIncentiveProgram/SGIPModificationsfor20052.htm.
[30] SGIP Handbook. January 1, 2007- Rev.0. It should be noted that one reason the application fee requirement was removed in 2007 when PV systems transferred to the CSI was that these phantom projects were typically PV and were longer included in the SGIP.

4.2 EM&V Background

Decision 01-03-073, which established the SGIP, ordered the PAs to outsource Program evaluation to independent consultants and directed the Administrative Law Judge to establish a schedule for the filing of the required evaluation reports (Ordering paragraph 13). Two additional rounds of evaluation studies have been proposed by the PAs and approved by the CPUC. On May 18, 2006, ruling in Rulemaking 06-03-004, the predecessor rulemaking to the original SGIP proceeding, the administrative law judge approved an M&E plan for the SGIP for 2006 and 2007. On December 4, 2008, PG&E, on behalf of the PAs, filed a motion with the CPUC proposing a schedule of measurement and evaluation reports for Program years 2009-2011, including this 2009 Process Study. On February 3, 2009, the CPUC approved the PA's request with minor modifications to the impact studies.

Since the SGIP's inception, the following measurement and evaluation reports have been prepared:[31]

- Impact evaluations have been conducted annually since 2001;
- Renewable fuel use reports, which report on the compliance of SGIP projects using renewable fuels with the renewable fuel use provisions, have been prepared and filed with the CPUC every six months. The first renewable fuel use report was issued for the six-month period ending December 31, 2002;
- A cost-effectiveness framework was published in March 2005, with subsequent cost effectiveness reports published in September 2005 and February 2007;
- Two PA comparative assessments have been conducted, the first was published in September 2003 and the second in April 2007;
- A market characterization study was published in August 2007 with a revised edition issued in November 2007. A second market characterization study was published in February 2010 with a revision in March 2010;
- Five process evaluations have been prepared; the first two were traditional process evaluations while the third, published in August 2007, was a market-focused process evaluation. Two targeted investigations were conducted of the reasons behind observed PV and combined heat and power (CHP) performance degradation and were published in March and April 2010, respectively;
- A retention study was published in December 2007; and
- An In-Depth Analysis of Useful Waste Heat Recovery and Level 3/3N Performance was published in February 2007.

[31] SGIP evaluation reports (with the exception of RFURs) are available on the CPUC Web site at: www.cpuc.ca.gov/PUC/energy/DistGen/sgip/sgipreports.htm. All reports are posted at www.pge.com/sgipreports

4.3 Research Objectives

The purpose of this Process Study is to review the Program delivery processes and interaction between these PA processes and current DG market needs. The Process Study focuses on how Program processes and requirements can be refined or modified to better stimulate the private sector market for DG that delivers good value for California ratepayers who fund the SGIP.

The following ***research objectives*** were developed based on the December 4, 2008 motion, filed jointly by the PAs, and input from the SGIP Working Group and the M&E subcommittee:

- Update research conducted through Program year 2006 to confirm or correct trends reported in the 2007 Market-Focused Process Study[32];
- Document and capture process "learnings" from the SGIP for future Program design. This objective will address technologies that have been a part of the SGIP but are not currently as well as those currently included;
- Update and document the social and economic factors relating to Program participation. The interest in distributed generation solutions will be placed in the context of the increasing awareness of greenhouse gas issues as well as the reduction in available capital for investment in distributed generation solutions; and
- Review the PAs' marketing efforts to understand and document success stories and potentially missed opportunities. This objective will explore the appropriate marketing approaches for the SGIP in the context of the CPUC's integrated marketing vision.

[32] http://www.pge.com/sgipreports/.

Section 5. Evaluation Approach

This section describes the data collection methodologies used to gather information for this report. The data collected through these efforts were also used to inform the 2009 SGIP Market Characterization Report (2009 Market Study) which was published in February 2010[33]. The evaluation approach included both primary and secondary data collection and largely followed the evaluation approach used for the 2007 Process Study and the 2007 Market Characterization Study[34] (2007 Market Study).

5.1 Review of Program Data

SGIP Program records, provided by each PA, were the source for information on Program participation, including technology type and size, application dates, and project location. These records are prepared by each PA on a monthly basis and include the following two reports:

- The ***Project List*** includes a list of projects by year and a list of cumulative projects to date. For each project, the Project List shows, among other items, the project identification number, incentive level received, system type, and fuel type; and
- The ***Budget Status Report*** contains Program data on budget allocations, reallocations, Program expenditures, Program definitions, and rebate amounts. A summary of application statistics by year and incentive level is also included in the Budget Status Reports.

For the purposes of developing the participant and developer sample frames, Program records through June 2009 were used. For the purposes of the data analysis for this report, Program records through December 2009 were used.

The PAs also provided additional internal Program records, where available, on outreach activities, public presentations, and attendance lists. Publicly available Program information, including the SGIP Handbook and information on the PAs' Web sites, was also reviewed and referenced.

Several existing reports and other sources of market data were consulted to inform the 2009 Market Study. These sources are listed in a bibliography found in Appendix 1.

5.2 Surveys

Surveys were conducted with both participant Host Customers and non-participating IOU customers. Surveys were conducted by Ward Research of Honolulu, Hawaii. Supervisor-level surveyors were used for these surveys. In an attempt to reach as many different sites as

---

[33] http://www.pge.com/sgipreports/.
[34] Ibid.

possible, call attempts were scheduled at a variety of different times during the day. The Ward Research team conformed to Pacific Daylight Time during the survey period.

5.2.1 Sampling Plan

Unique sampling plans were developed for participant Host Customers and non-participating IOU customers.

5.2.1.1 Participant Host Customers

Projects whose applications were received through 2006 comprised the population for the 2007 Process Study and the 2007 Market Study. The population for the 2009 Process Study and 2009 Market Study are project applications received in 2007, 2008, and 2009. The cutoff date for Program data that comprised the sample frame for surveys was June 2009. One of the objectives for the 2009 Process Study was to update the trends identified in the 2007 Process Study, many of which were driven by PV participation. Therefore, PV projects with an "active" status prior to 2007 and completed in 2007 were included in the survey population. If a participant was surveyed or interviewed for the 2007 studies, their record was removed from the sample frame.

In several instances the same Host Customer had several unique project sites. In some instances, the customer contact was the same for all sites and for others each site had a separate contact. In order not to over represent these customers who, arguably, are operating under the same or similar budget and decision-making structures, we developed the sample frame by unique Host Customer rather than unique site. In the case where there are different contacts for the sites, the contact at the site with the largest capacity project was contacted.

Table 5, Table 6, and Table 7 below present the population data stratified by technology type, PA, and project status. The sample sizes presented are those required to reach 90/10 confident level (+/- ten percentage points at the 90 percent confidence interval).

The possible project status categories are:

- Active – projects that are still in progress within the SGIP;
- Completed – projects that have been completed and the rebates sent to the Host Customer;
- Withdrawn – project applications that have been withdrawn from the SGIP by the Host Customer; and
- Rejected – project applications that have been rejected by the PA and are no longer active within the SGIP.

For the purposes of developing the sampling plan and reporting the survey and interview results, the four project status categories have been grouped into two categories of Active/Completed and Withdrawn/Rejected projects.

Table 5. Population Stratified by Technology Type

Technology	Project Population by Site	Number of Unique Host Customers	Sample Size*
Wind Turbines	16	15	12
Fuel Cells (Non-Renewable-Fueled)	49	44	27
Fuel Cells (Renewable-Fueled)	33	27	20
MT, Gas Turbine, IC Engine (Non-Renewable-Fueled)	77	62	33
MT, IC Engine (Renewable-Fueled)	17	17	14
Solar PV Population for 2009 Data Collection	227	151	47
Total	**419**	**316**	**153**

*Note- three fuel cell projects list "Unknown" as fuel type. One project has an unknown technology type.

Table 6. Population Stratified by Program Administrator

Program Administrator	Project Population by Site	Number of Unique Host Customers	Sample Size*
PG&E	221	159	48
SCE	90	65	33
SCG	87	73	35
CCSE	25	20	16
Total	**423**	**317**	**132**

* Four non-solar Host Customers have applied or have projects in two PA territories. One solar Host Customer has applied or has projects in two PA territories.

Table 7. Population Stratified by Project Status

Project Status	Population by Site	Number of Unique Host Customers	Sample Size*
Active/Completed	319	255	54
Withdrawn/Rejected	104	67	34
Total	**423**	**322**	**88**

* Seven Host Customers have projects in both Active/Completed and Withdrawn/Rejected categories. One Host Customer has a project with unknown status.

In order to prepare meaningful results at the finest level of detail, the evaluation team attempted to complete 153 surveys of participating Host Customers.

5.2.1.2 Non-Participant

In addition to the participant surveys, the evaluation team sought to conduct approximately 150 telephone surveys of eligible end-users who had not participated in the SGIP process. The non-participating IOU customers include both residential and non-residential customers and were stratified by customer type and PA as illustrated in Table 8.

Residential participants made up only 23 percent of the non-PV projects entering the SGIP since 2007. However, in order to improve the precision levels for the residential sample, the non-participant sample included equal proportions of residential and non-residential customers.

The non-participant sample was split evenly among each PA with a target of 50 non-participating IOU customers surveyed from each PA territory. Because the territories for SCE and SCG overlap and because non-participating IOU customers provided non-PA specific input, the SCE and SCG samples were combined.

Table 8. Non-Participant Sample Sizes and Precision Levels

	PA/Territory		
Sector	**PG&E**	**SCE/SCG**	**SDG&E**
Residential	25 (90/17)	25 (90/17)	25 (90/17)
Non-residential	25 (90/17)	25 (90/17)	25 (90/17)

5.2.1.2.1 Non-Residential Non-Participant

The specific industry segments targeted by the non-residential non-participant surveys were selected based on an analysis of the demographics of each PA territory and Program participants and described in Table 9. The sample frame was purchased from Dunn & Bradstreet's commercially available database.

Table 9. Non-Residential Non-Participant Sample Parameters

Variable	SGIP Non-Residential Non-Participant Sample Frame
Industry Segment:	» Industry segments that are well represented among Program participants; and » Any additional large/growing industry segments with the technical capacity to adopt self-generation technologies.
Business Size:	Greater than 10,000 feet.
Geography:	Counties with the greatest population density for each PA.

5.2.1.2.2 Residential Non-Participant

Residential non-participating IOU customers were selected into the sample based on geography, household income, and housing type. The sample frame was purchased from Survey Sampling International's commercially available database.

Residential customers applying to the SGIP are considering installing 5kW-10kW fuel cell installations. These units typically cost in excess of $60,000 so it is reasonable to assume that the target market for this technology is affluent. As fuel cells are not portable structures, it is also reasonable to assume that a consumer would not make an investment in a fuel cell unless they own their home. Therefore, the residential non-participant sample was selected according to the parameters listed in Table 10.

Table 10. Residential Non-Participant Sample Frame Parameters

Variable	SGIP Residential Non-Participant Sample Frame
Geography:	30 California counties representing the top 60% of counties based on median household income:[35] The 38 residential SGIP applications are located within these 30 counties.
Income:	Household income $250K and above.
Household Type:	Homeowners in single family homes.

5.2.2 Survey Pretests

Surveys were pretested prior to the main data collection effort. The surveyors were briefed on the SGIP nomenclature and survey goals prior to making any calls. After approximately five surveys, each instrument was reviewed by Ward Research and the evaluation team to identify issues and implement improvements.

[35] Determined from 2005-2007 U.S. Census Bureau, American Community Survey.

Only one substantive change was made to the participating Host Customer surveys, both Active/Completed, and Withdrawn/Rejected. An option for "project financing or cost" was added as a barrier to installing additional on-site power generation. Minor grammatical changes were made to the introductions of all surveys.

During the full-scale survey deployment, several other issues were identified and the following changes made to the non-participant survey:

- A question regarding the respondent's income was moved from the screening questions to the end of the non-participant survey. Some interviewees became suspicious when this question was asked in the early part of the survey;
- A definition of price signals was added; and
- Non-residential respondents were asked if their company had ever participated in the SGIP during the screening. The survey was terminated if the respondent indicated that they had.

5.2.3 Survey Disposition

All survey calls were tracked, and refusals or incomplete responses were recorded. Results of the completed surveys were entered into an electronic database. The data were reviewed by Navigant Consulting's principal analyst to ensure quality control. At the end of this data collection task, a survey disposition report was prepared to document the outcome of each contact attempt.

5.2.3.1 Participant Survey Disposition

The evaluation team completed 94 surveys of Host Customers that participated in the Program in some form. After data cleaning, 91 surveys were included in the final results. The three complete surveys not included in the final results were removed for the following reasons: one project went through the California Solar Initiative (CSI), one project was completed in 2006, and one project was rejected. None of these project types were included in the original sample. Therefore, the evaluation team completed 80 surveys of Host Customers with Active/Completed projects and 11 surveys of Host Customers that had Withdrawn projects. No surveys were completed by customers with Rejected projects. Table 11, Table 12, and Table 13 indicate the confidence and precision levels reached by technology, PA, and project status, respectively.[36]

[36] For example, a confidence/precision level of 90/10 means that we are 90% confident that the true value is within ±10% of the estimate.

Table 11. Confidence and precision levels by technology

Technology	Sample Size	Survey Completes (not including removals)	Survey Completes (including removals)	Confidence/ Precision Levels
Wind Turbines	12	4	4	90/37
Fuel Cells (Non-Renewable-Fueled)	27	8	8	90/27
Fuel Cells (Renewable-Fueled)	18	8	8	90/25
MT,Gas Turbine, IC Engine (Non-Renewable-Fueled)	32	18	17	90/17
MT, Gas Turbine, IC Engine (Renewable-Fueled)	14	7	7	90/25
Solar PV Population for 2009 Data Collection#	46	49	47	90/10
Total	**149**	**94**	**91**	**90/7**

Note that all non-solar PV projects applied in 2007, 2008, or 2009, all solar PV projects completed in 2007, 2008, or 2009.
Confidence/precision levels assume proportional sampling, two-tailed test, and a finite population correction.

Table 12. Confidence and precision levels by PA

Program Administrator	Sample Size	Survey Completes	Confidence/ Precision Levels
PG&E	48	56	90/9
SCE	31	18	90/16
SCG	35	14	90/20
CCSE	14	3	90/45
Total	**128**	91	90/7

Note that all non-solar PV projects applied in 2007, 2008, or 2009, all solar PV projects completed in 2007, 2008, or 2009.
Confidence/precision levels assume proportional sampling, two-tailed test, and a finite population correction.

Table 13. Confidence and precision levels by project status

Project Status*	Sample Size	Survey Completes	Confidence/ Precision Levels
Active/Completed	53	80	90/8
Withdrawn/Rejected	34	11[37]	90/23
Total	**87**	91	90/7

* Seven Host Customers have project in both the Active/Completed and Withdrawn/Rejected categories.
Note that all non-solar PV projects applied in 2007, 2008, or 2009, all solar PV projects completed in 2007, 2008, or 2009.
Confidence/precision levels assume proportional sampling, two-tailed test, and a finite population correction.

Because of the wide confidence intervals, care must be taken when interpreting the survey results. For instance, in the case of survey results for Withdrawn projects, the actual value may vary from the survey response by +/-23 percent. To improve the precision of the technology-level results, the evaluation team combined the renewable-fueled and non-renewable-fueled fuel categories for both the fuel cell category and microturbine, IC engine, and gas turbine category, as described in Table 14. As a result, any differences between the survey results for renewable-fueled and non-renewable-fueled projects will be lost, but the evaluation team believes that the gains in precision levels outweigh any loss of resolution.

Table 14. Confidence and precision levels with combined renewable-fueled and non-renewable-fueled sites

Technology	Number of Unique Host Customers	Sample Size*	Survey Completes	Confidence/ Precision Levels
Wind	15	12	4	90/37
Fuel Cell	69	35	16	90/18
Microturbine, IC Engine, Gas Turbine	78	37	24	90/14
Solar PV	141	46	47	90/10
Total	303	56	91	90/7

[37] This value only applies to customers with Withdrawn projects. No surveys were completed by customers with Rejected projects.

5.2.3.2 Non-Participant Survey Disposition

The evaluation team completed 128 surveys of non-participating IOU customers: 75 surveys of residential non-participating IOU customers and 53 surveys of non-residential non-participating IOU customers, as illustrated in Table 15.

Table 15. Non-Participant confidence and precision levels

Sector	PA/Territory			Total
	PG&E	SCE/SCG	CCSE	
Residential	37 (90/14)	28 (90/16)	10 (90/26)	75 (90/10)
Non-residential	17 (90/20)	32 (90/15)	4 (90/41)	53 (90/11)

5.2.4 Survey Weighting

Because the survey did not reach every Host Customer within each specified stratification variable, simply reporting the unweighted survey responses would give a misleading picture of the views of host customers as a whole. To correct for this, the evaluation team applied survey weights to the data before reporting the results. The weight for each Host Customer was based on their technology because the team felt that survey responses were most likely to vary by technology type. For each technology, the percent of the population and the percent of completed surveys was calculated (e.g., if the population of Host Customers was 50 and the number of Host Customers with fuel cell projects was 25, then the percent of the population would be 50%; if the number of completed surveys was 25 and the number of completed surveys with fuel cell projects was 5, then the percent of completes would be 20%.) The weight applied to the survey was the percent of the population divided by the percent of the completed survey (which would be 2.5 in the example above). This weighting strategy maintains the survey number. When weighted in this fashion, the survey results provide an accurate representation of the likely responses of all SGIP host customers, had it been feasible to survey them all.

5.3 In-Depth Interviews

A variety of qualitative, in-depth interviews as well as shorter, targeted interviews were conducted to capture data for this study. In-depth interviews were conducted with staff from each PA, project developers, CEC and CPUC staff, Host Customers, non-participating customers, and market actors.

5.3.1 Working Group and PA Staff Interviews

Navigant Consulting conducted interviews with each PA between July 21 and 24, 2009. These interviews were conducted at each PA's office. During these same visits, Navigant Consulting was able to interview a number of non-SGIP utility staff, including interconnection and marketing department staff and account representatives. In some cases, the non-SGIP utility

staff was not available at the time of the PA interviews or not in the same location as the SGIP staff. These interviews were then conducted via telephone subsequent to the PA interviews.

An interview with the CPUC staff was conducted at the CPUC offices in San Francisco. An interview with the CEC staff involved with the ERP was conducted via telephone. Both of these interviews were conducted in early August 2009.

The interview guides for these interviews can be found in Appendix 1.

5.3.2 Participating Host Customers

Navigant Consulting conducted 24 in-depth interviews with participating Host Customers. These interviews were conducted as follow-up discussions with participants who completed a survey. These in-depth, follow-up interviews were conducted by senior-level evaluation team staff and allowed us to probe much more deeply into the role that specific factors played in leading to successful or less successful installations than was possible in the more structured telephone survey. Each follow-up interview focused on the factors identified in the initial telephone survey as most important to the specific installation in question.

Respondents for the follow-up interviews were recruited at the time of the initial telephone survey and were limited to non-PV participants. Each respondent who completed a follow-up interview received $100 in compensation for their time. If the interviewee was not able to accept cash compensation, $100 was donated to the charity of their choice.

The breakdown of the participating Host Customer interviews by technology, PA, and project status is described below in Table 16, Table 17, and Table 18, respectively. None of the interviews conducted were with host customers with Rejected projects.

Table 16. Completed participating Host Customer interviews by technology

Technology	Interviews Completed
Wind Turbines	3
Fuel Cells (Non-Renewable-Fueled)	3
Fuel Cells (Renewable-Fueled)	5
MT,Gas Turbine, IC Engine (Non-Renewable-Fueled)	9
MT, Gas Turbine, IC Engine (Renewable-Fueled)	4
Total	**24**

Table 17. Completed participating Host Customer interviews by PA

Program Administrator	Interviews Competed
PG&E	9
SCE	7
SCG	6
CCSE	2
Total	**24**

Table 18. Completed participating Host Customer interviews by project status

Project Status	Interviews Completed
Active/Completed	18
Withdrawn	6
Total	**24**

5.3.3 Non-Participating Customers

The evaluation team attempted to conduct 15 in-depth interviews with non-participant utility customers. These interviews were conducted as follow-up discussions with non-participating IOU customers who completed a survey. These in-depth, follow-up interviews were conducted by senior-level evaluation team staff and allowed us to probe much more deeply into why customers have not pursued self-generation opportunities. Through these interviews, we hoped to understand whether there are some sites or business types for which self-generation is simply not a workable option, or if some non-participating IOU customers had considered the SGIP but failed to apply and why. Each follow-up interview was tailored to focus on the factors identified in the initial telephone survey.

Respondents were recruited at the time of the initial telephone survey, as part of the closing. Each respondent who completed a follow-up interview received $100 in compensation for their time. If the interviewee wasn't able to accept cash compensation, $100 was donated to the charity of their choice.

Unfortunately, only five interviews with non-participating IOU customers were able to be recruited and completed.

5.3.4 Market Actor Interviews

To better understand and assess the market for wind, fuel cells, and advanced energy storage, the evaluation team interviewed 17 different individuals in these industries. The number of interviews with each market actor is presented in Table 19.

Table 19. Market Actor Interviews Completed

Market Actor Type	Number of Interviews Conducted
Wind Association	2
Wind Manufacturer	4
Wind Industry Expert	1
FC Associations	3
FC Manufacturers	3
AES Industry Associations	1
AES Manufacturers	3
Total	17

Interview guides for these interviews can be found in Appendix 1. Summaries of these interviews can be found in Appendix 2.

Navigant Consulting also conducted shorter, informal interviews with members of permitting agencies and legislative analysts in order to clarify questions or gain insights into issues.

5.3.5 Project Developer Interviews

The evaluation team conducted in-depth interviews with non-PV SGIP-eligible technology project developers. In order to gain a broad range of perspectives, these developers included those that have participated in the SGIP and those who have not.

5.3.5.1 Participating Developers

Through June 2009, there were 49 different non-PV project developers, representing 89 Active/Completed non-PV projects and 35 Withdrawn/Rejected non-PV projects, identified in the SGIP Program database. Many of these project developers worked with both renewable-fueled and non-renewable-fueled fuel cell and micro-turbine, gas turbine, and IC engine technologies. Participating wind developers were involved with wind technologies exclusively. Because PV is no longer included in the SGIP, PV developers were not interviewed.

The goal when developing the participating developer sample was to include both project developers who had worked on projects through the SGIP Program many times as well as project developers who had less experience with the Program and whose perspectives are newer. It was also desirable to interview project developers across all of the non-PV SGIP technologies with an emphasis on wind and fuel cell developers.

When scheduling the participating developer interviews, the evaluation team's goal was to reach:

- The five developers who completed the greatest number of non-PV projects which would have captured developers who represent both renewable-fueled and non-renewable-fueled fuel cell and micro-turbine, gas turbine, and IC engine technologies;
- Two additional fuel cell developers with only one Active or Completed SGIP project – one renewable-fueled and one non-renewable-fueled project;
- A census of the only four wind developers with an Active or Completed project; and
- One additional wind developer with a Withdrawn or Rejected project.

The evaluation team was successful at conducting interviews with 11 participating non-PV developers. These developers represented:

- Four of the five developers who submitted the greatest number of non-PV project applications. In total, these developers represented 59 total non-PV projects across renewable-fueled and non-renewable-fueled fuel cell and renewable-fueled and non-renewable-fueled combustion technologies. Of these projects, 44 were still Active and two were Completed;
- Two additional fuel cell developers, one with an Active renewable-fueled project and one with an Active non-renewable-fueled project;
- Four wind developers with Active projects;[38] and

[38] One developer was originally contacted as a non-participating developer. However, the firm was the developer on an active project submitted under the Host Customer's name in the SGIP database. The developer was interviewed as a participating developer.

» One wind developer with a Rejected project.

Interview guides for these interviews can be found in Appendix 1. Summaries of these interviews can be found in Appendix 2.

5.3.5.2 Non-Participating Developers

The evaluation team was only able to complete one interview with a non-participating wind developer. Non-participating developer names were solicited from a variety of sources, including the market actors that were interviewed. However, when these developers were called upon, we found that they were or had participated in the SGIP for projects that were listed under the Host Customer's name, or they were developers of utility-scale projects. One of the developers interviewed as a participating developer was originally approached as a non-participant.

One possible explanation for the difficulty in finding non-participating developers of projects in the size range of the SGIP is that these projects are dependent on the SGIP incentive to make them financially feasible.

The guides used for this interview can be found in Appendix 1. A summary of this interview can be found in Appendix 2.

Section 6. Findings

This section presents the evaluation findings and updates the prior research conducted through the 2007 Process Study. The section begins with a summary of Program participation across time, technology, and system capacity. Findings on the Program's interface with the market are presented next, including influence factors, Program awareness, and customer expectations of project payback.

Survey and in-depth interview findings are the summarized from various market perspectives and key Program indices are discussed. The section concludes with a synopsis of public, private, and non-profit perspectives.

6.1 Participation Summary

As of December 2009, participating Host Customers in the SGIP have:

- Completed 1,299 on-site generation projects,[39] as follows:
  - 889 solar photovoltaic (PV) systems;
  - 4 wind turbines;
  - 25 fuel cells (7 renewable-fueled and 18 non-renewable-fueled);
  - 234 IC engines (15 renewable-fueled and 219 non-renewable-fueled);
  - 138 microturbines (18 renewable-fueled and 120 non-renewable-fueled); and
  - 10 non-renewable-fueled gas turbines.
- Developed about 348 MW of expected distributed capacity for California.
- Received over $619 M in incentives.

Table 20 presents a summary of the SGIP to-date, and includes the total Completed projects under the SGIP, installed system capacity, and incentives requested. Solar PV makes up the largest percentage of completions by count (about 68 percent). However, non-renewable-fueled IC engines constitute the largest installed system capacity (about 40 percent), with solar PV closely following at about 39 percent of total installed system capacity. Furthermore, the highest percentage of incentives requested was for solar PV projects (about 74 percent). Because solar PV projects have not been eligible in the SGIP since 2007, the mix of completed projects in the future will look very different than the mix of completed projects during the 2001-2009 timeframe.

[39] Thirty-one completed projects were funded through the California Solar Initiative and are not included in this count.

Table 20. Projects by Completion Count, Installed System Capacity, and Reserved Incentives for Projects Completed from 2001-2009

Technology	Projects by Completion Count	Projects by Installed System Capacity	Projects by Reserved Incentives
Solar Photovoltaic	68%	39%	74%
Internal Combustion Engine (Non-Renewable-Fueled)	17%	40%	13%
Microturbine (Non-Renewable-Fueled)	9%	6%	2.6%
Fuel Cell (Non-Renewable-Fueled)	1.4%	3%	4%
Microturbine (Renewable-Fueled)	1.4%	0.9%	0.6%
Internal Combustion Engine (Renewable-Fueled)	1.2%	2%	1.3%
Gas Turbine (Non-Renewable-Fueled)	0.8%	8%	1.1%
Fuel Cell (Renewable-Fueled)	0.5%	1.4%	3.5%
Wind Turbine	0.3%	0.5%	0.4%
Total	100%	100%	100%

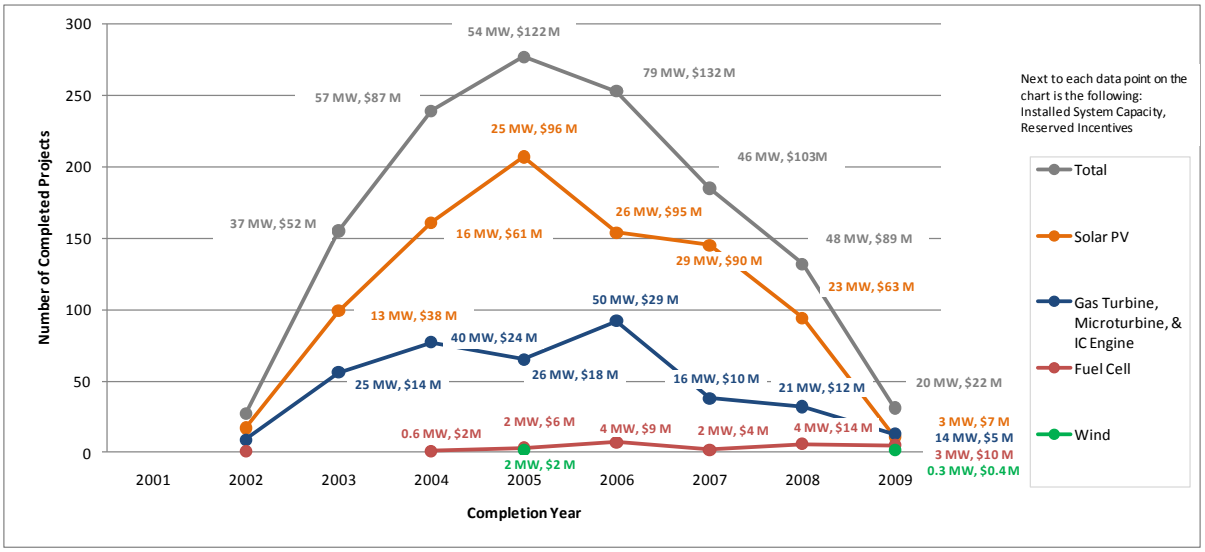
Source: SGIP Data as of December 2009.

Figure 6 presents an annual summary of projects Completed as of December 2009. It should be noted that though the SGIP began in 2001, no projects completed the process until 2002. The number of Completed projects steadily increased from 2002 to 2005. However, the number of Completed projects per year has been declining since 2005. This decline in project completions is can be attributed to two main reasons:

1. Solar PV was not eligible for incentives to the Program after December 31, 2006 due to the advent of the CSI on January 1, 2007. Solar PV has historically been the technology with the greatest number of Completed projects through the SGIP; and
2. Gas turbines, microturbines, and IC engines were no longer eligible for incentives after December 31, 2007. These technologies also had a large number of Completed projects through the Program.

Fuel cells, wind turbines, and advanced energy storage combined with a fuel cell or wind turbine are currently the only technologies eligible for incentives under the SGIP. In the Program's history, these wind and fuel cells have relatively lower number of Completed projects. As of December 2009, no advanced energy storage projects had been completed under the SGIP.

Figure 6. Summary of Completed Projects by Completion Year

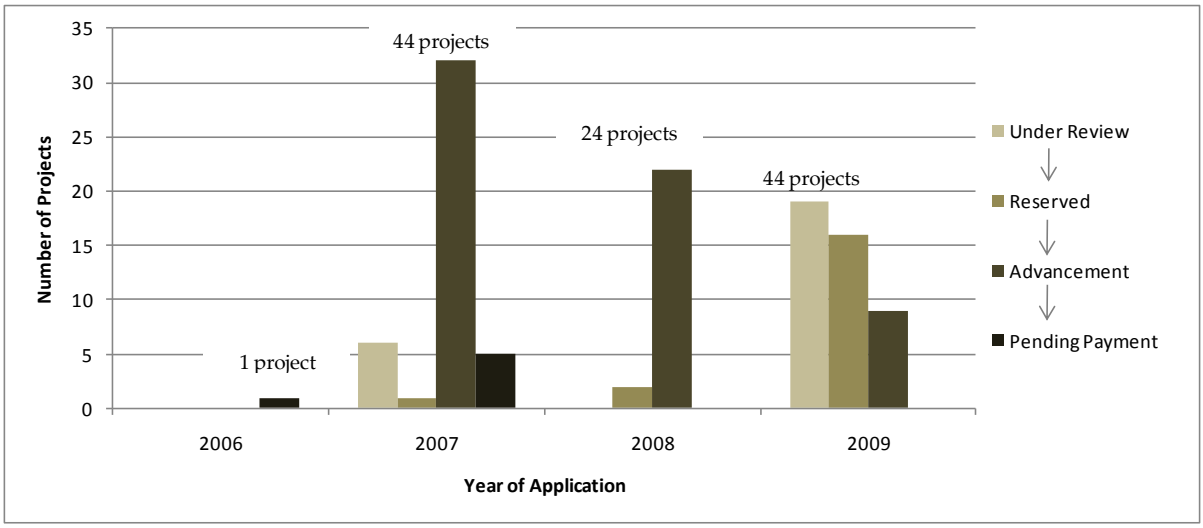


Source: SGIP Data as of December 2009
Notes: One solar PV project has a status of "Completed" with no completion date; therefore, this project is not included in the figure. "IC Engine" stands for "Internal Combustion Engine." A single combined solar PV/wind project is included in both the count of solar PV projects and wind projects. The installed system capacity and reserved incentives are split between the two technologies.

As of December 2009, there were 113 Active projects in the SGIP with reserved incentives of about $109 million. The stage of these Active projects varies and is shown in Figure 7. Projects are assigned a status depending on the stage of the application process that they have completed. Active projects move through the process from "Under Review" to "Reserved" to "Advancement" and to "Pending Payment." Once payment has been sent to the customer, the project has reached the Completed stage. The low number of Active projects compared to Completed projects (113 projects to 1,299, respectively) is partly due to the reduced number of technologies eligible in the SGIP. In addition, 15 percent of the Active projects are greater than one MW (see Figure 8 for more information on system capacities). On April 24, 2008, the California Public Utilities Commission authorized tiered incentives for wind turbines and fuel cells up to three MW in capacity (in D.08-04-049). Prior to this authorization, incentives were capped at one MW, though systems could be sized up to 5MW.

As would be expected, the majority of the projects that applied in 2009 are "Under Review" or "Reserved," the first two stages of the SGIP process (see Figure 7). Surprisingly, many projects (73 percent) that applied in 2007 are still in the "Advancement" stage.

Figure 7. Summary of Active Projects by Status, Year of Application and Number of Projects



Source: SGIP Data as of December 2009
Note: The number of projects above the bars for each year of applications is the total number of Active projects from that application year.

Table 21 details the projects that are in Active stages in the SGIP process. The 113 Active projects are shown by application year, application status, and technology. The evaluation team has included information on the number of projects, the system capacity, and the reserved incentive amount in each table cell. Forty-two gas turbine, microturbine, and internal combustion engine projects are Active, though as of January 2008, they were no longer eligible to participate in the Program. Four Active projects include advanced energy storage: one project is for only advanced energy storage, one project is for a fuel cell and advanced energy storage, and two projects are for wind and advanced energy storage.

Table 21. Summary of Active Projects by Application Year, Status and Technology (Number of Projects, System Capacity (kW), and Reserved Incentives ($, millions))

Year of Application	Status	Fuel Cell	Gas Turbine, Microturbine, & IC Engine	Wind	Advanced Energy Storage	Fuel Cell with Advanced Energy Storage	Wind with Advanced Energy Storage
2006	Advancement	0	0	0	0	0	0
	Pending Payment	0	1 p; 820 kW; $0.5 M	0	0	0	0
2007	Under Review	0	6 p; 5,278 kW; $2.5 M	0	0	0	0
	Reserved	0	1 p; 50 kW; $0.03 M	0	0	0	0
	Advancement	1 p; 750 kW; $3.4 M	30 p; 19,915 kW; $10.7 M	1 p; 1,500 kW; $1.5 M	0	0	0
	Pending Payment	1 p, 1,200 kW; $5.0 M	4 p; 967 kW; $0.6 M	0	0	0	0
2008	Reserved	0	0	2 p; 4,744 kW; $2.9 M	0	0	0
	Advancement	22 p; 115 kW; $0.3 M	0	0	0	0	0
2009	Under Review	18 p; 4,055 kW; $15.8 M	0	0	0	1 p; 2,000 kW; $6.5 M	0
	Reserved	12 p; 6,105 kW; $21.2 M	0	2 p; 2,541 kW; $2.5 M	0	0	2 p; 10,500 kW; $9.4 M
	Advancement	7 p; 6,100 kW; $22.2 M	0	1 p; 1,500 kW; $2.3 M	1 p; 1,000 kW; $2.0 M	0	0
All Years	All Active Projects	61 p; 18,325 kW; $67.9 M	42 p; 27,030 kW; $14.3 M	6 p; 10,285 kW; $9.2 M	1 p; 1,000 kW; $2.0 M	1 p; 2,000 kW; $6.5 M	2 p; 10,500 kW; $9.4 M

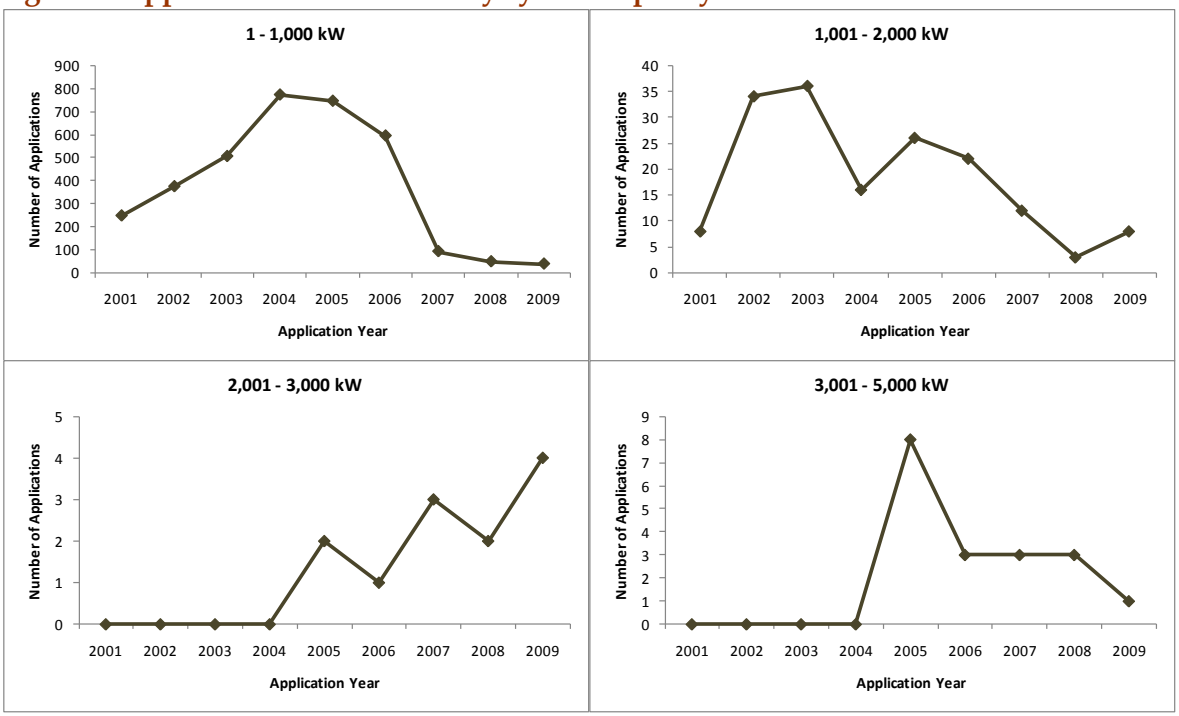
Source: SGIP Data as of December 2009

Notes: Each square in the table contains three data points in the following order: number of projects (p); system capacity (kW); and reserved incentives ($, millions). "IC Engine" stands for "Internal Combustion Engine."

Figure 8 shows the number of applications[40] over time by the size of the system the applicant was intending to install. While the majority of applications over time have been within the one - 1,000 kW size range, the trend line shows that the number of applications with this size of system have been decreasing since 2004. A Program change in 2008 allowed tiered incentives for capacity above 1,000 kW and equal to or less than 3,000 kW (>1,000 kW to 2,000 kW receive 50 percent of the incentive and >2,000 kW to 3,000 kW receive 25 percent of the incentive for that portion of the project). This change has led to an increase of the percentage of applications with system sizes greater than 1,000 kW. For example, in 2009, 25 percent of the applications were for systems greater than 1,000 kW (16 percent of the applications were for systems between 1,001 kW and 2,000 kW, eight percent for systems between 2,001 and 3,000 kW, and two percent for systems between 3,001 and 5,000 kW).

Providing tiered incentives for projects sized between one and three MWs beginning in 2008 has led to an increase in the percentage of applications with systems sized greater than one MW.

Figure 8. Applications to the SGIP by system capacity



Source: SGIP Data as of December 2009.

Notes: (1) the y-axis scales are different for each system capacity group so that the trend line can be seen; (2) eleven projects are not included in the figure due to unknown system capacity on the application; (3) projects combined with advanced energy storage are sized based on the fuel cell or wind system size; and (4) represent applications submitted to the SGIP and not completed projects.

[40] Applications to the SGIP may not result in Completed projects. Project applications may ultimately be Rejected or Withdrawn.

6.2 SGIP Interface with the Market

The evaluation team conducted telephone surveys with Host Customer and non-participating IOU customers, along with follow-up interviews with some respondents of both these surveys and with project developers, as described in Section 5. This information was utilized to provide the following overview of how the SGIP interacts with the existing market for on-site generation.

6.2.1 Influential Factors in the Decision to Install On-Site Generation

The Host customer surveys asked respondents to indicate how various factors influenced their decision to purchase and use their on-site generation. Similarly, non-participating IOU customers were asked to rate the influence of various factors in a decision to purchase and install on-site generation in the future. The results are presented in Table 22 below.

Table 22. Influential Factors in Decision to Install On-Site Generation (% of survey respondents who cited factor as "influential" or "very influential")

Influential Factors	Host Customers: Active/Completed	Host Customers: Withdrawn	Non-Participants: Non-Residential	Non-Participants: Residential
Concern for the environment	84%	81%	55%	62%
Wanted to reduce utility bills	81%	84%	76%	82%
Improve our image in the community- green marketing	73%	82%	55%	24%
Concern about climate change	64%	53%	47%	51%
Wanted to reduce our peak demand	61%	68%	62%	47%
Energy supply independence	49%	56%	40%	60%
Provide technical demonstration	40%	47%	22%	18%
Wanted a backup system to improve the overall reliability of our electricity supply	21%	29%	36%	23%
Confidence level/precision interval	90/8	90/23	90/11	90/10

Source: Navigant surveys of Host Customers and non-participating IOU customers.
Note: "influential" and "very influential" from a scale of one to five, with five being "very influential" and one being "not influential at all."
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.2.1.1 Host Customers

Two dominant factors in considering on-site generation installation for Host Customers with Active/Completed projects are a concern for the environment (84 percent stated this as "influential" or "very influential") and a desire to reduce utility bills (81 percent stated this as "influential" or "very influential") (see Table 22 for comparisons). The follow-up interviews confirmed this finding that a concern for the environment (e.g., a sustainability initiative, a push from the company leadership to be environmentally minded) was a leading factor to going forward with the project; however, the respondents indicated that the project also had to make economic sense.

6.2.1.2 Non-Participating IOU Customers

In comparison to the Host Customers, most of the respondents in the non-participant survey (non-residential: 76 percent and residential: 82 percent) indicated that utility bill reduction would be "influential" or "very influential" in a decision to install on-site generation. However only 55 percent of non-residential non-participating IOU customers and 62 percent of residential non-participating IOU customers would find concern for the environment "influential" or "very influential." In addition, reducing peak demand is more influential for non-residential non-participating IOU customers (62 percent found it to be "influential" or "very influential") than for residential non-participating IOU customers (47 percent found it to be "influential" or "very influential"). This difference between non-residential and residential respondents is likely due to a demand charge on many non-residential bills which is not included on residential customers' bills.

6.2.1.3 Comparison of Key Influence Factors

Though concern for the environment was a leading influential factor for Host Customers (with Active, Completed, and Withdrawn projects), concern about climate change does not appear to be as large an influence (64 percent of Host Customers with Active/Completed projects and 53 percent of Host Customers with Withdrawn projects cited this as "influential" or "very influential").

Environmental reasons were a varying dominant factor for Host Customers with different technologies. The influential factors can also be compared by the technology the respondents have installed or plan to install.[41] Concern for the environment was cited by 90 percent of the Host Customers with Active/Completed fuel cells projects as "influential" or "very influential" (compared to 87 percent of Host Customers with Completed solar PV projects, 67 percent of Host Customers with Active wind projects, and 68 percent of Host Customers with

[41] Reviewing the survey with Host Customers with Active/Completed projects by technology increases the precision interval. The following confidence level/precision intervals can be used by technology: solar PV: 90/10, wind turbines: 90/37, fuel cells: 90/18, and microturbines, gas turbines, and internal combustion engines: 90/14.

Active/Completed microturbine, gas turbine, and internal combustion engine projects). Concern about climate change was also highest for Host Customers with Active/Completed fuel cell projects (80 percent cited this as "influential" or "very influential") compared to the Host Customers with Active/Completed projects with the following technology: solar PV (68 percent), microturbine, gas turbine, and internal combustion engine (37 percent) and wind turbines (33 percent).

Other decision making factors greatly varied between Host Customers and non-participating IOU customers. Improving the image in the community/ green marketing was reported to be more influential to Host Customers (73 percent of Host Customers with Active/Completed projects cited this as "influential" or "very influential" and 82 percent of Host Customers with Withdrawn projects cited this as "influential" or "very influential") than to non-participating IOU customers (55 percent of non-residential and 24 percent of residential non-participating IOU customers cited this as "influential" or "very influential"). Section 6.4 discusses these decision-making factors for Host Customers in greater depth by comparing private and public entity decision making factors.

6.2.1.4 Trends Over Time

Comparing the results from the 2009 Process Study to the results from the 2007 Process Study reveal similarities and differences. In 2007, Host Customers' top influential factors in their decision to install on-site generation were a desire to reduce utility bills (87 percent) and concern for the environment (75 percent), similar to the 2009 survey. However, for Host Customers with Active/Completed projects in 2009, a concern for the environment was a slightly higher influence than reducing utility bills. In addition, the top influential factor for non-participating IOU customers from both surveys is a desire to reduce utility bills. One difference between the surveys is the non-participant's views on the influence of wanting a backup system to improve the overall reliability of the electric supply. In the 2007 survey, 52 percent cited this as an influential factor compared to 36 percent of non-residential non-participating IOU customers and 23 percent of residential non-participating IOU customers in the 2009 survey.

6.2.2 Awareness of the SGIP

Across all market segments surveyed, approximately 25 percent of non-residential non-participating IOU customers and 23 percent of residential non-participating IOU customers reported having heard of the SGIP.[42] Previous evaluations also revealed non-participating IOU customers' awareness of the SGIP. The 2007 Market Study indicated that 26 percent of non-

[42] The non-residential value has a confidence level/precision interval of 90/11. The residential value has a confidence level/precision interval of 90/10.

participating IOU customers had heard of the Program, while a 2003 study indicated that 15 percent of non-participating IOU customers were aware of the SGIP.[43]

Most of the non-residential non-participating IOU customers had heard of the Program from a utility representative (31 percent), a government agency (e.g., CPUC, CEC, DOE), or an "other" response such as the LA County Fair or a seminar (15 percent). Most of the residential non-participating IOU customers had heard of the Program from a magazine or newspaper article (35 percent) or an equipment/system dealer or vendor (24 percent). The segments with the greatest familiarity (within their segment) include lodging, elementary/secondary schools, and manufacturing. The segments with the least familiarity with the Program include office buildings.[44] Not surprisingly, the office buildings sector has not contributed to SGIP application numbers significantly in the past few years. Historically, manufacturing and elementary/secondary schools have had a high number of applications to the SGIP.

6.2.3 Market Sector Involvement

Figure 9 shows the market sectors and their involvement in the SGIP over time. The top of the figure also indicates which technologies have been eligible to participate in the SGIP over time. The residential sector is a growing market sector in the SGIP and totaled 47 percent of the applications to the SGIP in 2008 and 2009. This sharp increase in residential applications is the result of the introduction of a five kW fuel cell into the market and the aggressive marketing and outreach by the manufacturer. Some sectors like retail stores and elementary/secondary schools had a large interest in the SGIP when solar PV was an eligible technology; however, they no longer factor significantly in SGIP application counts.

For applications received in 2008 and 2009, residential customers were the dominant market sector with 50 applications (about 46 percent).

[43] RER. "Self-Generation Incentive Program, Second Year Process Evaluation." April 25, 2003. http://www.pge.com/sgipreports/

[44] Sample sizes within segments are very small, therefore, no percentages are given to support this text.

Figure 9. Market Sectors and the SGIP: Involvement over Time

	2001—2006	2007	2008—2009
Eligible Technologies	Solar PV Conventional CHP Renewable-fueled microturbine, internal combustion engine & gas turbine Fuel cells Wind systems	Conventional CHP Renewable-fueled microturbine, internal combustion engine & gas turbine Fuel cells Wind systems	Fuel cells Wind systems Advanced energy storage (combined w/ wind or a fuel cell)

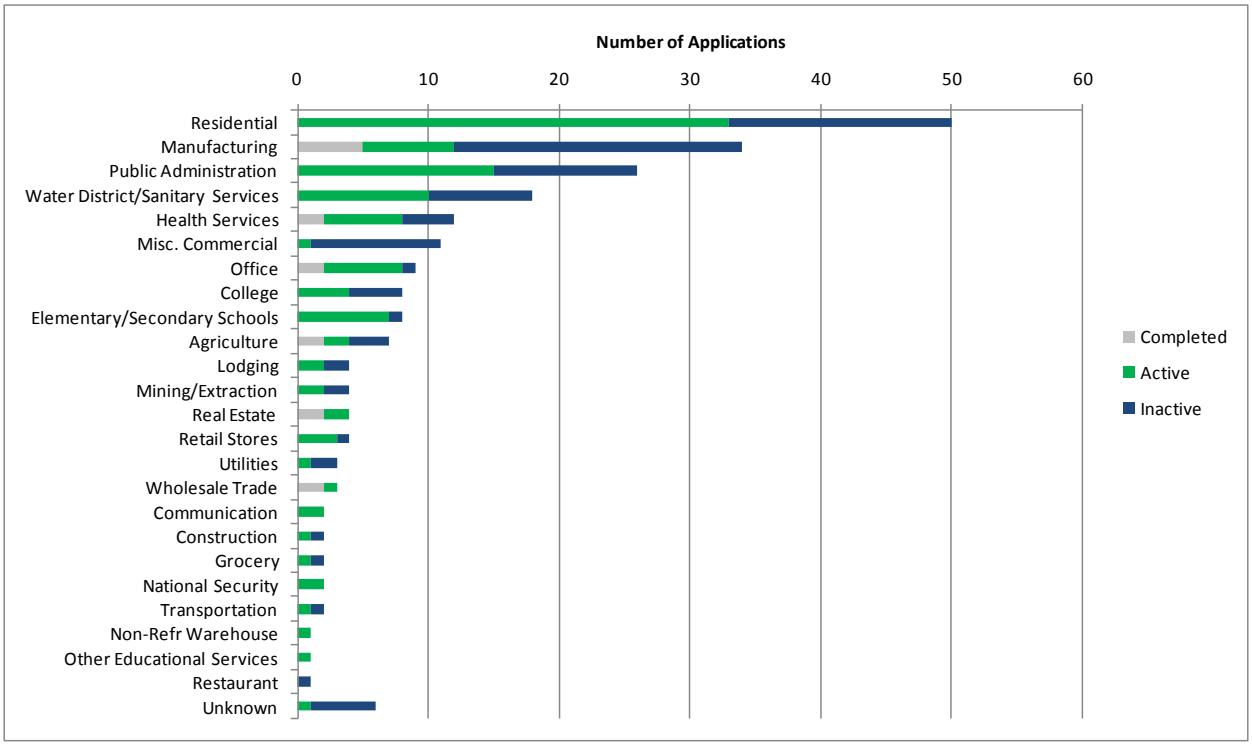
Market Sector	# of Applications	Market Sector	# of Applications	Market Sector	# of Applications
Manufacturing	**555**	**Manufacturing**	**26**	**Residential**	**50**
Retail Stores	**372**	**Public Administration**	**16**	**Public Administration**	**10**
Public Administration	**356**	**Health Services**	**10**	**Manufacturing**	**8**
Elementary/Secondary Schools	**323**	**Water District/Sanitary Services**	**10**	**Water District/Sanitary Services**	**8**
Real Estate	264	Misc. Commercial	8	Office	4
Office	242	Elementary/Secondary Schools	7	Misc. Commercial	3
Misc. Commercial	213	College	6	Retail Stores	3
College	153	Agriculture	5	Agriculture	2
Utilities (Includes Sanitary Services)	150	Office	5	College	2
Health Services	104	Lodging	4	Communication	2
Lodging	98	Mining/Extraction	3	Health Services	2
Agriculture	86	Real Estate	3	Construction	1
Wholesale Trade	71	Utilities	2	Elementary/Secondary Schools	1
Non-Refr Warehouse	57	Wholesale Trade	2	Grocery	1
Grocery	55	Construction	1	Mining/Extraction	1
Transportation	45	Grocery	1	National Security	1
Construction	28	National Security	1	Non-Refr Warehouse	1
National Security	24	Restaurant	1	Real Estate	1
Mining/Extraction	23	Retail Stores	1	Transportation	1
Communication	21	Transportation	1	Utilities	1
U.S. Postal Service	17	Other Educational Services	1	Wholesale Trade	1
Restaurant	13	Unknown	3	Unknown	3
Other Educational Services	12	*Grand Total*	*117*	*Grand Total*	*107*
Residential	9				
Refr Warehouse	8				
Unknown	131				
Grand Total	*3430*				

Note: Red text is for the top four market sectors in 2001-2006; green text is for new top market sectors in 2007, blue text is for new top market sectors in 2008 – 2009. Also, this table includes all applications to the SGIP over these time periods, including those projects that were ultimately funded through the California Solar Initiative.

Source: SGIP data as of December 2009. Note that this figure has been updated from the version in the 2009 Market Study.

A brief review of SGIP participation data by market segment and technology is presented next to provide market context for the process study findings. Figure 10 shows the applications by market sector (from 2007 - 2009). The figure covers Program years 2007 through 2009 for two reasons: (1) the prior Process Study completed in 2007 covered Program data through December 2006 and (2) the Program today has had many changes since its inception in 2001, especially regarding eligible technologies, thus attracting different market sectors over time. Generally, the top nine sectors applying to the Program account for 80 percent of Program applications.[45] Of these sectors, residential applications far exceed other segments in terms of number of applications, with 22 percent of the total number of Program applications. The figure includes both Active and Completed projects.

Figure 10. Applications by Sector and Status (Applications from 2007 – 2009)[46]



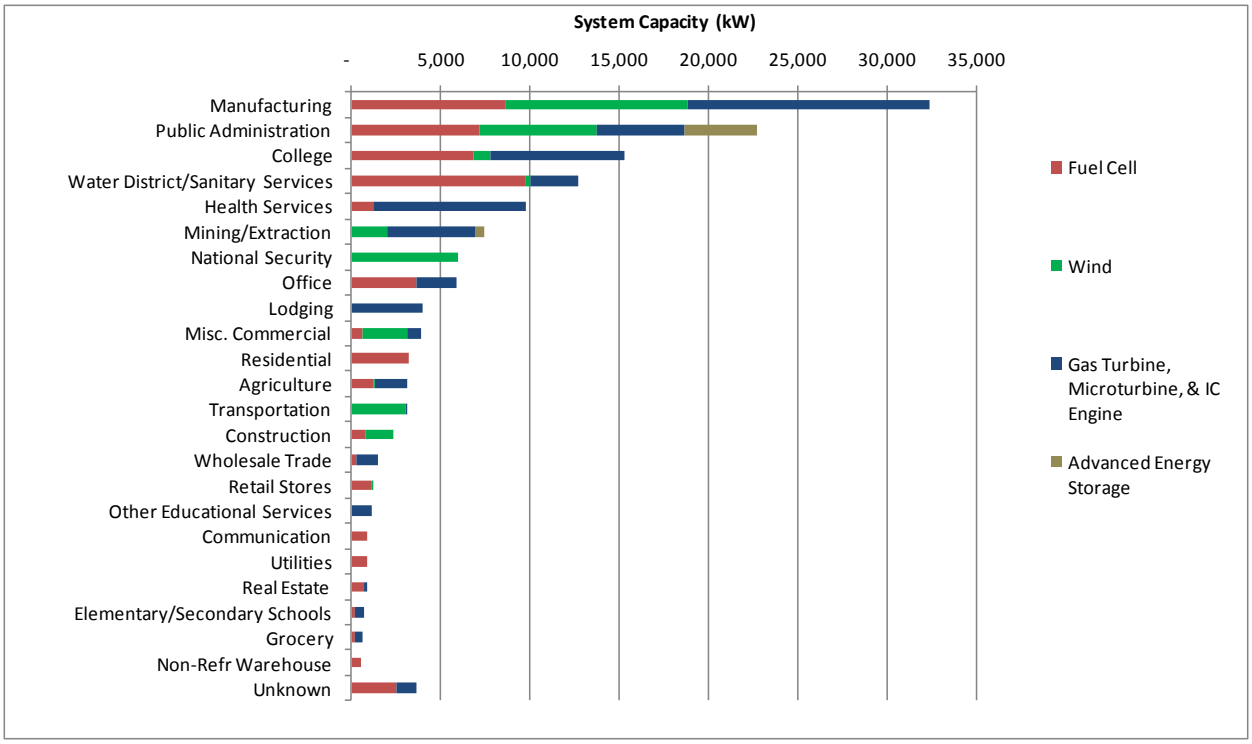
Source: SGIP Data as of December 2009
Note: "Inactive" projects have been Withdrawn or Rejected from the Program.

A slightly different picture emerges when looking at applications by the proposed project system capacity. Figure 11 shows project applications by market sector, technology and proposed system capacity in kW. Eight sectors make up 80 percent of the total applications by system capacity.[47] To date, the public administration, mining/extraction, and office buildings

[45] The top nine sectors are residential, manufacturing, public administration, water district/sanitary services, health services, misc. commercial, office, elementary/secondary schools, and college.

sectors have submitted applications with advanced energy storage components.[48] In addition, between 2007 and 2009 the residential sector has submitted only fuel cell projects while the manufacturing sector has completed fuel cell, wind, and gas turbine, microturbine, and internal combustion engine projects.

Figure 11. Applications by Market Sector, Technology, and System Capacity (Applications from 2007 – 2009) [49]



Source: SGIP Data as of December 2009
Note: One fuel cell project in the office buildings sector contains an advanced energy storage component; however, the data does not explicitly differentiate between the fuel cell and the advanced energy storage system size. "IC Engine" stands for "Internal Combustion Engine." One project in the restaurant sector is not included because the project size is unknown.

---

[46] The real estate sector includes operators of non-residential and apartment buildings, operators of other dwellings, lessors of real property, real estate agents and managers, and land sub-dividers and developers.
[47] These eight sectors are manufacturing, public administration, college, water district/sanitary services, health services, mining/extraction, national security, and office.
[48] One fuel cell project in the office sector contains an advanced energy storage component; however, the data does not explicitly differentiate between the fuel cell and the advanced energy storage system size. Therefore, the advanced energy storage component is not shown on the figure.
[49] The real estate sector is includes operators of non-residential and apartment buildings, operators of other dwellings, lessors of real property, real estate agents and managers, and land sub-dividers and developers.

6.2.4 Customer's Payback Expectations[50]

The technologies currently in the SGIP, wind and fuel cells, require a significant capital expenditure. Responses from the participant surveys of Active/Completed projects appear to indicate that they expect and accept a longer payback period than non-participating IOU customers (see Table 23). The surveys reveal that nearly one third of participants with Active/Completed projects expect a payback period of 11 or more years. Nearly one third of participants with Active/Completed projects expect a payback period of six to ten years. Participants with Withdrawn projects also expect long payback periods. Sixty-three percent of these participants were expecting a payback period of six to ten years.

Three of the Active/Completed participants surveyed were residential. These residential respondents had differing expectations for system payback: three years, four years, and don't know/refused. All of the Withdrawn surveys were with non-residential participants.

The picture is much different for non-participating IOU customers. Non-participant responses ranged from willingness to accept a payback of six months or less to 11 or more years. Both the non-residential and residential non-participant responses are grouped around a one to three year payback acceptance (45 percent for non-residential respondents and 39 percent for residential respondents) and a five to ten year payback acceptance (42 percent for non-residential respondents and 41 percent for residential respondents). Therefore, there are a group of non-participating IOU customers that are willing to accept the payback periods required for investment in SGIP-incented technologies.

[50] The questions about payback times were asked in terms of how long the respondent expects the system to pay for itself for Host Customers. Section 6.4 includes additional data from Host Customers with Withdrawn/Rejected projects on the longest payback they would accept. The question was asked of non-participating IOU customers in terms of the longest payback period the respondent would be willing to accept.

Table 23. Longest payback period participants expect, and non-participating IOU customers are willing to accept

Time	Host Customers: Active/ Completed	Host Customers: Withdrawn	Non-Participants: Non-Residential	Non-Participants: Residential
6 months or less	0%	0%	6%	8%
1 year	0%	0%	9%	16%
2 years	0%	18%	21%	12%
3 years	6%	10%	15%	11%
4 years	6%	0%	2%	4%
5 years	12%	0%	23%	24%
6-10 years	31%	63%	19%	17%
11+ years	31%	0%	2%	5%
Don't know/Refused	14%	8%	4%	3%
Precision level/confidence interval	90/8	90/23	90/11	90/10

Source: Navigant Consulting surveys of SGIP participants and non-participating IOU customers.
Note: The column totals may not add to 100% due to rounding.
Note: three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

Table 24 disaggregates the participant responses by technology type. However, care must be taken when interpreting these responses because the small number of surveys within each technology type results in a wide confidence interval.

Participants with solar PV applications are willing to accept long paybacks (five years or longer). Most participants with microturbines, gas turbines or internal combustion engines are willing to accept a payback of five to ten years. Responses of participants with fuel cells ranged from three to ten years.

Table 24. Longest payback period participants are willing to accept - by technology type

Time	Host Customers: Active/Completed				Host Customers: Withdrawn		
	PV	Wind	Fuel cell	Microturbine, internal combustion engine, gas turbine	Wind	Fuel cell	Microturbine, internal combustion engine, gas turbine
6 months or less	0%	0%	0%	0%	0%	0%	0%
1 year	0%	0%	0%	0%	0%	0%	0%
2 years	0%	0%	0%	0%	0%	20%	20%
3 years	2%	0%	27%	0%	0%	0%	20%
4 years	2%	0%	18%	11%	0%	0%	0%
5 years	9%	33%	9%	32%	0%	0%	0%
6-10 years	32%	0%	27%	37%	100%	60%	60%
11+ years	43%	67%	0%	0%	0%	0%	0%
Don't know/Refused	11%	0%	18%	21%	0%	20%	0%
Precision level/ confidence interval	90/10	90/42	90/22	90/15	90/83	90/34	90/35
Number of surveys	47	3	11	19	1	5	5

Source: Navigant Consulting surveys of SGIP Host Customers and non-participating IOU customers.
Note: The column totals may not add to 100% due to rounding.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.3 Stakeholder Experience with the Program

Host Customers experienced the Program both directly through the PA and indirectly through project developers. Their views on their experiences are presented in this section, including interaction with developers, the Program's various administrative processes, the Program's marketing and outreach efforts, eligibility and, for those who had projects withdrawn, what were reasons for the withdrawals.

6.3.1 The Connection between Host Customers and Project Developers

Overall, Host Customers rely heavily on the energy services industry to aid them in the application process. Survey data, presented in Figure 12, show that nearly half of the Host Customers with Active/Completed projects (49 percent) were closely involved with the project application, but an energy services company, contractor, or some other party is completing and submitting the application forms. An additional 26 percent of Host Customers had an energy services company, contractor, or some other party complete and submit the forms without their help. Therefore, indications are that the energy services industry was involved in a significant fashion in about 75 percent of Host Customer applications to SGIP. On the other hand, 25 percent of Host Customers with Active/Completed projects completed and submitted all forms on their own and had direct contact with the PA.[51] The Host Customer interviews revealed that Host Customers who worked with a developer that had experience with the SGIP increased the likelihood that they would have positive experience with the Program. In some cases, Host Customers now specify that vendors have prior experience and success working with the SGIP as a prequalification to bidding on a construction contract.

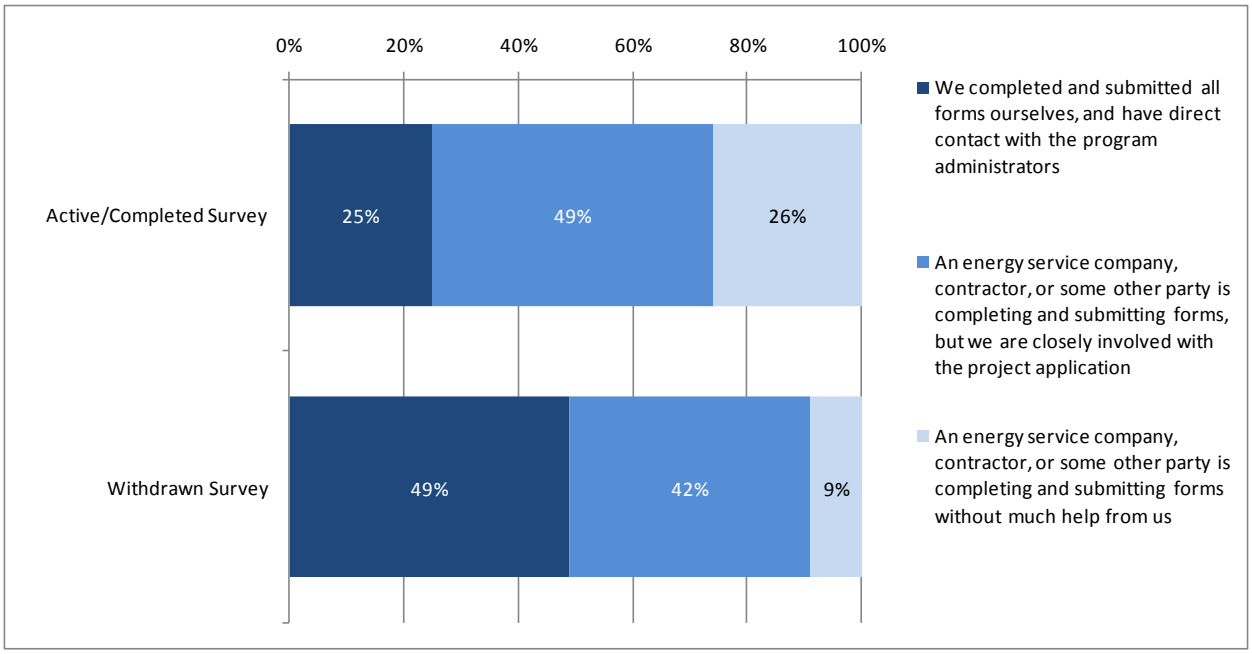
In contrast, nearly half of Host Customers with Withdrawn projects (45 percent) completed and submitted the application forms on their own and have direct contact with the PAs. Forty-seven percent of Host Customers with Withdrawn projects had significant help from an energy services company, contractor, or some other party in completing and submitting the forms and eight percent of Host Customers with Withdrawn projects did not know their involvement.[52] Though precision of these values should be taken into account, it appears that Host Customers with Active/Completed projects involve an energy services company, contractor, or some other party in the application process more than Host Customers with Withdrawn projects.

It appears that Host Customers with Active/Completed projects involve an energy services company, contractor, or some other party in the application process more than Host Customers with Withdrawn/Rejected projects.

[51] The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8.

[52] The responses of Host Customers with Withdrawn/Rejected projects have a confidence level/precision internal of 90/23.

Figure 12. Customer Involvement in the SGIP Application Process



Source: Navigant Consulting surveys of SGIP Host Customers
Note: The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8. The responses of Host Customers with Withdrawn projects have a confidence level/precision internal of 90/23.
Note: One "don't know" response is not included in this figure.

6.3.1.1 Project Developer Perspective

The survey findings are consistent with the feedback received from participating project developers. All of the project developers interviewed indicated that they handled the SGIP application process for their customers but with varying degrees of customer involvement. In some cases, the developer completes the paperwork, only coordinating with the customer for signatures. Another developer indicates that they work "hand in hand" with their customers but that they drive the process while the customer reviews and approves the documents. Only one developer indicated that about half of their customers choose to manage the application process but even in these instances, the developer assists them through the process. These findings are not unexpected given that the developers interviewed were selected because they were indicated as the project developer in the SGIP project file.

In some cases, participants now specify that vendors have experience and success working with the SGIP as a prequalification to bidding on a construction contract.

The follow-up interviews with Host Customers also inform the relationship between Host Customers and distributed generation contractors. Host Customers noted that having a contractor with prior experience with the SGIP is helpful to having a successful experience. In some cases, participants

now specify that vendors have experience and success working with the SGIP as a prequalification to bidding on a construction contract.

6.3.1.2 Trends over Time

Comparing these results to the 2007 Process Study reveals that the energy services and contractor sectors have had similar involvement in the SGIP process during the last few years as they had during years prior. In the 2007 Study, 80 percent of the Host Customer applications to the SGIP had significant involvement by an energy services company or contractor. However, fewer Host Customers with Active/Completed projects noted that an energy services company, contractor or some other third party completed and submitted the forms without much help from them during the 2009 survey than the 2007 survey (26 percent compared to 40 percent, respectively).

6.3.1.3 Program Data Insights

Similar results are also shown in the Program data. About 87 percent of all projects in the database have a developer or installer listed and about 77 percent of projects received in 2007, 2008, and 2009 have a developer or installer listed. In addition, about 82 percent of all projects in the database and 81 percent of projects received in 2007, 2008, and 2009 show different entities for applicant and Host Customer. It should be noted that even for projects where there is no developer indicated in the SGIP records, there may be an Active project developer. Two of the participating project developers interviewed indicated that they'd been involved with other SGIP projects where the Host Customer was the actual applicant but that they'd been heavily involved in the projects. One developer who was contacted to be interviewed as a non-participating developer was in fact an Active developer on a project applied for under the customer's name.

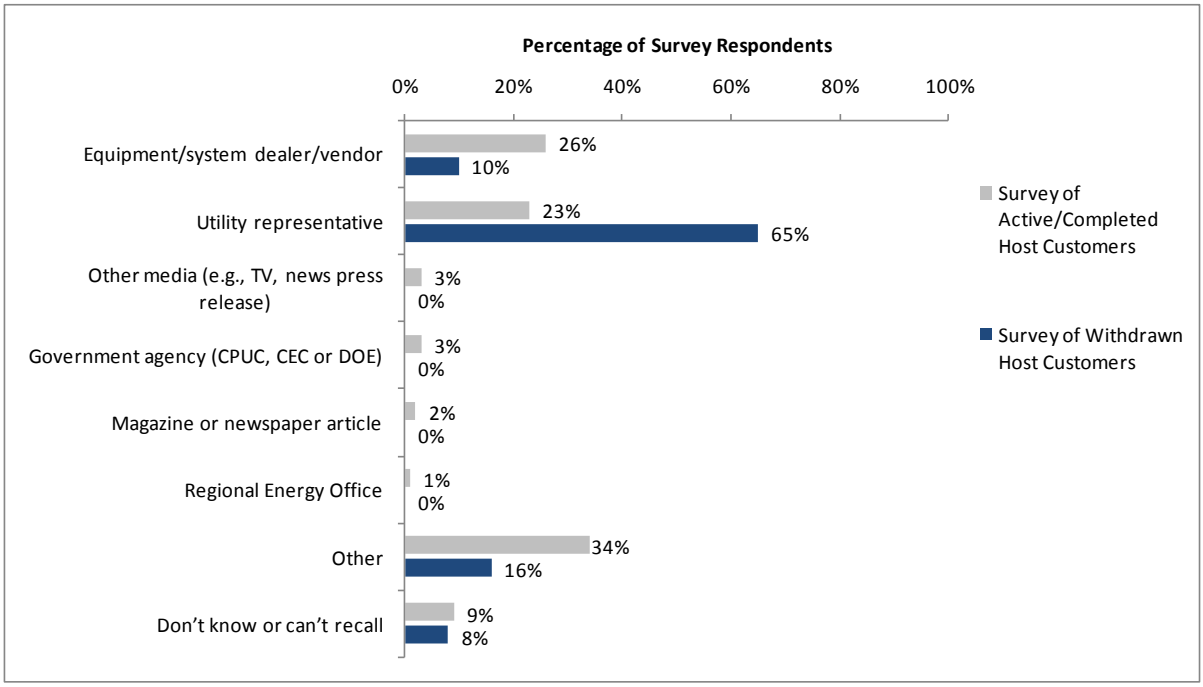
It appears that more Host Customers are learning about the program from a utility representative than in past years; however, many of these projects are not completing the process.

6.3.1.4 Program Introduction

Working closely with a third-party supplier or services company is consistent with the ways Host Customers with Active/Completed projects learned about the Program. About 26 percent of Host Customers with Active/Completed projects learned about the Program from an equipment/system dealer or vendor compared to ten percent of Host Customers with Withdrawn projects learning about the Program through this channel. The majority of Host Customers with Withdrawn projects (65 percent) learned about the SGIP through a utility representative (Figure 13). These results vary greatly from the 2007 survey. In 2007, the majority of Host Customers with Active/Completed and Withdrawn/Rejected projects learned about the Program foremost through an equipment/system dealer or vendor. The utility representative was a secondary source. Therefore, it appears that more Host Customers are learning about the

Program from a utility representative than in past years; however, many of these projects are not completing the process.

Figure 13. How Program Host Customers Learned about the Program



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: Other includes specific developers' names, SGIP on the internet, and word of mouth. The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8. The responses of Host Customers with Withdrawn projects have a confidence level/precision internal of 90/23.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.3.2 Program Application Materials

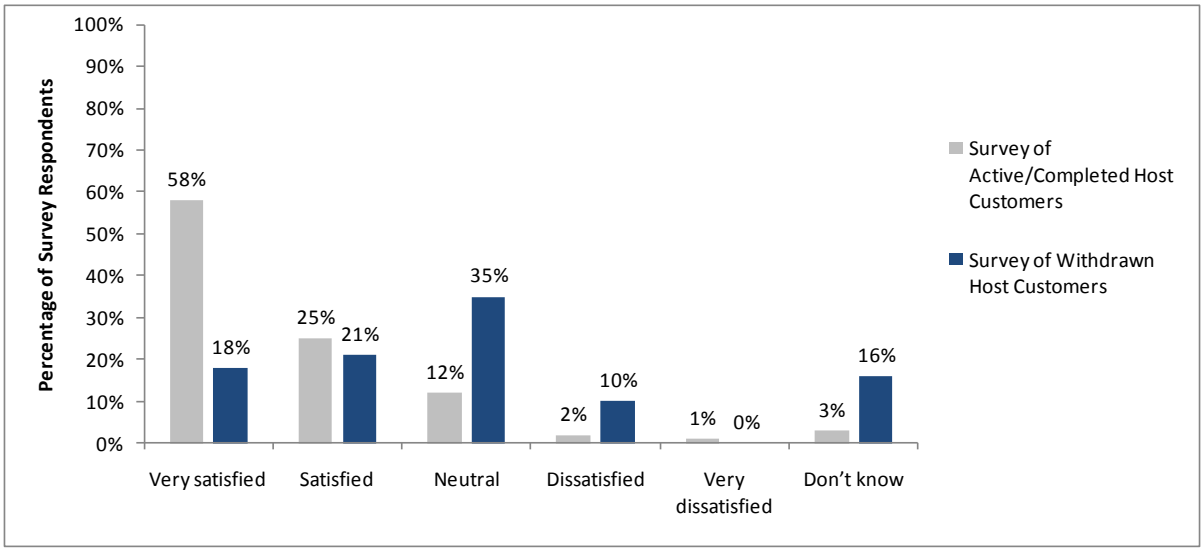
When asked about the clarity of the Program application materials, project developer comments ranged from "they're fine" to "I've read the handbook so many times that I'm very familiar with it." Almost all of the developers interviewed indicated that they've had to contact one of the PAs for clarification on certain Program requirements. The majority of Host Customers interviewed had no comments on the application materials. Many of them had a developer or contractor complete the materials or had help from an outside party. Some Host Customers that were involved in the process felt that the materials required a duplication of information, the materials were confusing about the definition of "renewable fuel," and the volume of forms was overwhelming. These responses are similar to the results presented in the 2007 Process Study. As mentioned in the 2007 evaluation, these complaints should be taken in context, in that, very large incentives are being offered under the SGIP. While it shouldn't be unnecessarily difficult to apply to the SGIP, a threshold level of business and electrical sophistication could rightfully be expected from applicants.

6.3.3 Program Satisfaction

Overall, program satisfaction is high (83 percent of survey respondents with Active/Completed projects were "satisfied" or "very satisfied" and 39 percent of Withdrawn/Rejected projects).

The Host Customers with Active/Completed projects had a high overall satisfaction with the Program, as is shown in Figure 14. Not surprisingly, a higher percentage of Host Customers with Active/Completed projects were "very satisfied" or "satisfied" with the Program (about 83 percent) than those Host Customers with Withdrawn projects (about 39 percent). The percentage of Host Customers with Withdrawn projects that were "very satisfied" or "satisfied" with the Program has decreased since the 2007 Process Study (50 percent in the 2007 survey compared to 39 percent in the 2009 survey). Satisfaction among Host Customers with Active/Completed projects has remained consistent between the evaluations (80 percent in the 2007 survey compared to 83 percent in the 2009 survey).

Figure 14. Host Customers' Overall Satisfaction with the SGIP



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8. The responses of Host Customers with Withdrawn projects have a confidence level/precision internal of 90/23.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.3.4 Program Processes Satisfaction

6.3.4.1 Project Developer Perspective

The majority of project developers believe that the SGIP application process is "fairly straightforward" and in line with other, similar rebate programs. However, the following specific issues were raised:

- One developer commented on the number of steps in the process. This developer has indicated that it's already "difficult" to coordinate the timing of the various milestones for the several dozen projects they currently have in various stages of development and is concerned that it will become unmanageable with additional projects;
- The length of time it takes to receive the incentive check was a concern for one developer. He indicated that the SGIP Handbook indicates 30 days but his experience has been closer to 90 days. This is problem because the customers need to use that money to pay off their construction loans and get the final financing in place and the delay in receiving the rebate check delays this process. They speculated that the delays were caused by the third-party verification inspectors;
- The amount of time it takes to receive a response from the PAs after the Program forms are submitted is an issue for another developer. The customers want to know that their incentive is guaranteed before they agree to proceed with the projects. The developer notes that the handbook gives specific time limits for the various stages but does not impose time limits on the PAs themselves;
- One developer would like to be able to submit the Program documents electronically and another would like the option to hand deliver the documents. The current requirement that materials be mailed reduces the time to comply by several days;
- Another developer suggested that each PA assign a point person for each developer. This person would know the history of each project and how the developer's systems operate so they wouldn't have to re-explain it every time they contact the PA; and
- Other developers felt that the sequencing of the various project milestones results in a chicken and egg situation with the financing agents. The contracts with the manufacturer and the customer (a requirement of the Proof of Project Milestone (PPM)) can't be executed until the financing is finalized. However, some financing agents aren't comfortable approving project financing with a conditional reservation and require the reservation confirmation. Two developers pointed out that, for wind projects, which tend to be complicated; the rebate application process is "the least of their problems."

6.3.4.2 Host Customer Perspective

The results from the Host Customer survey regarding the application process are shown in Figure 15 and Figure 16. Figure 15 shows the responses of Host Customers with Active/Completed projects while Figure 16 shows the responses of Host Customers with Withdrawn projects. Note that the number of application steps for the Host Customers with Withdrawn projects is smaller than those for Host Customers with Active/Completed projects.

6.3.4.2.1 Active/Completed Projects

At least 70 percent of all Host Customers with Active/Completed projects found the Program processes for which the PAs have a direct influence to be "easy" or "very easy."[53] The processes cited as "difficult" and "very difficult" by the Host Customers with Active/Completed projects are those that are outside the direct influence of the PAs and may require approval from local or state agencies or other utility departments. These processes included "obtaining any necessary air quality permits" (28 percent cited this "difficult" or "very difficult"), "obtaining any necessary building or siting permits" (17 percent), and "working with the electric utility to connect your unit to the utility grid" (15 percent). Air quality permits were cited as difficult due to having to work with an Air Quality Management District, the amount of paperwork required, and slow response times, while obtaining building or siting permits were perceived as difficult because of planning review cycles, open interpretation of rules, and that they are "just difficult to get." Connecting the unit to the grid was difficult because interconnection departments are regional, decision times are slow and specific equipment requirements can be onerous.

In addition, Host Customers with Active/Completed projects had internal process difficulties including "meeting the waste heat requirements for the project" (27 percent cited this "difficult" or "very difficult") and "financing the project" (21 percent).

At least 70 percent of all Host Customers with Active/Completed projects found the program processes for which the PAs have a direct influence to be "easy" or "very easy."[29]

Processes cited as difficult are also interesting to compare by technology installed or to be installed.[54] "Financing the project" was cited as "difficult" or "very difficult" by 33 percent of Host Customers with Active/Completed fuel cell projects, 22 percent of Host Customers with Active/Completed microturbine, internal combustion engine, or gas turbine projects, and 18 percent of Host Customers with Completed solar PV projects. No Host Customers with Active wind projects cited "financing the project" as "difficult" or "very difficult."[55] Interviews with market actors in the fuel cell market also cited finding outside financing as a barrier to the installation of fuel cells because of the perceived investment risk

[53] Includes only responses that were not "not applicable," "don't know," or "no answer." The program processes for which the Program Administrators have a direct influence are "submitting a reservation application," "submitting proof of project milestone to the program," "submitting a claim incentive payment," "scheduling with the program administrator for the program's on-site inspection," "obtaining approval based on the program's on-site inspection," and "obtaining the incentive payment from the program."

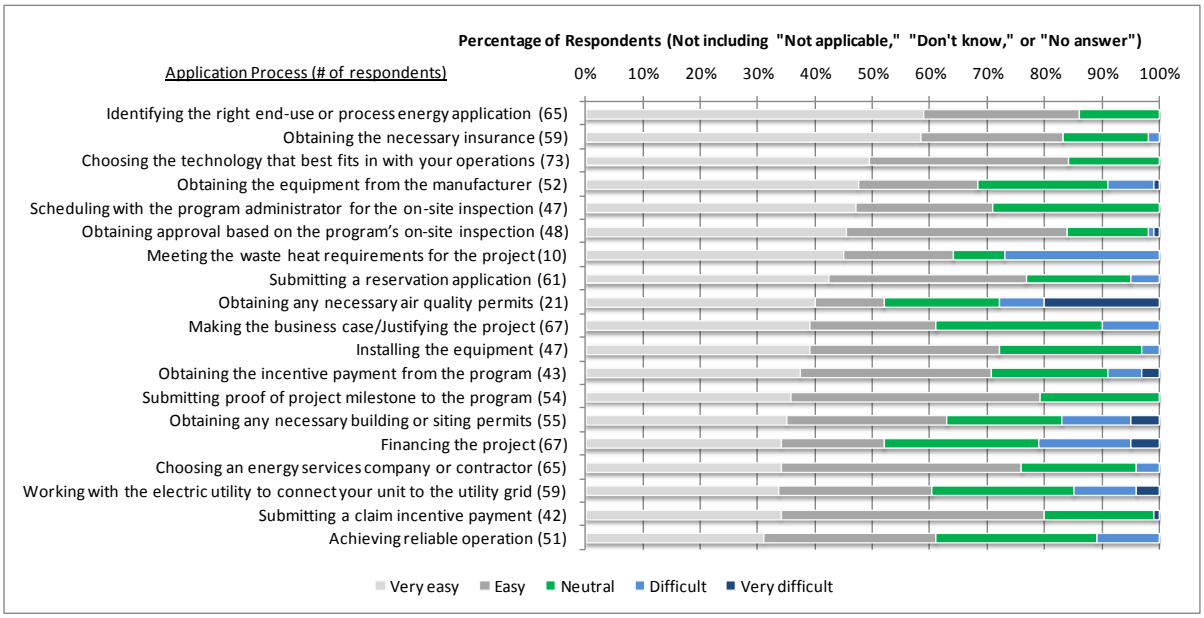
[54] The precision level/confidence interval for the Host Customer surveys of Active/Completed projects by technology is as follows: solar PV (90/10), wind (90/42), fuel cells (90/22), and microturbine, internal combustion engine or gas turbine (90/15).

[55] Note that two of the three respondents with active wind projects were government agencies. Their experiences with the project financing may be different than those of private companies.

attached to a fuel cell system.

Nearly one third of Host Customers with Active/Completed microturbine, internal combustion engine, or gas turbine projects cited "obtaining any necessary building or siting permits" as "difficult" or "very difficult," while 16 percent of Host Customers with Completed solar PV projects and 13 percent of Host Customers with Active/Completed fuel cell projects agreed. No Host Customers with Active wind projects cited "obtaining any necessary building or siting permits" as "difficult" or "very difficult."[56] However, interviews with market actors in the small wind arena noted that obtaining permits for wind turbines is the number one barrier to small wind in California.

Figure 15. Ease of Application Process from Host Customers with Active/Completed Projects



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: These responses do not include a "not applicable," "don't know," or "no answer" response. Only respondents that answered the question are included in the 100% count. The responses of Host Customers with Active/Completed projects have a confidence level/precision interval of 90/8.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

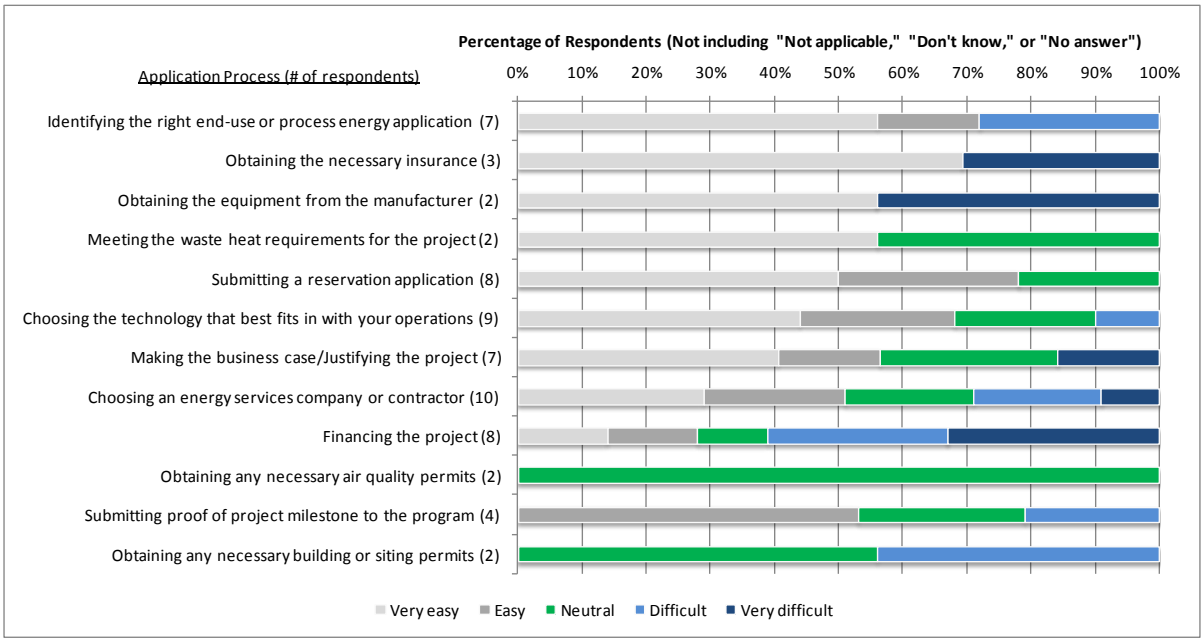
6.3.4.2.2 Withdrawn Projects

The majority of Host Customers with Withdrawn projects found "financing the project" to be "difficult" or "very difficult" (61 percent). Financing the project was cited as difficult because of the expensive equipment and the current economic environment which creates a reluctant

[56] Note that two of the three respondents with active wind projects were government agencies. Their experiences with obtaining building or siting permits will be different than those of private companies; because projects are government land do not have to obtain local permits.

lending climate. Host Customers with a Withdrawn project also had difficulty "identifying the right end-use or process energy application for onsite power generation at the facility," (28 percent cited this as "difficult" or "very difficult"), "choosing an energy services company or contractor" (29 percent), and "making the business case/justifying the project" (16 percent). Host Customers with a Withdrawn project found "choosing an energy services company or contractor" to be more difficult in the 2009 survey than the 2007 survey. Reasons given for this difficulty included that most companies or contractors had limited experience, a contractor sought to get an unsolicited proposal through a public agency process, and the Host Customer needed specialized equipment.[57]

Figure 16. Ease of Application Process from Host Customers with Withdrawn Projects



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: These responses do not include a "not applicable," "don't know," or "no answer" response. Only respondents that answered the question are included in the 100% count. The responses of Host Customers with Withdrawn projects have a confidence level/precision internal of 90/23.

6.3.4.2.3 Trends over Time

Host Customer experiences with the application process are similar to those in the 2007 Process Study, in which respondents found the application process to not be too difficult. In the 2007 survey, "obtaining the necessary insurance" was the easiest stage gate for Host Customers with Active/Completed projects. The 2009 survey also revealed that "obtaining the necessary insurance" was an easy process (70 percent of Host Customers with Active/Completed projects cited this as "very easy"). As in the 2007 survey, "working with the electric utility to connect

[57] Note that only those processes with more than two respondents are cited in the text.

your unit to the utility grid" was perceived to be relatively difficult—55 percent of Host Customer with Active/Completed microturbine, internal combustion engine, or gas turbine projects cited this as "difficult" or "very difficult." "Financing the project" was also perceived as a difficult process in both the 2007 and 2009 survey.

6.3.5 Program Timelines

6.3.5.1 Project Developers

All participating wind developers interviewed agree that the Program timelines are not appropriate for wind projects. Specifically, the 60 day limit for private entities to demonstrate PPM is inadequate for wind projects that have complex and unpredictable project development cycles. Some projects require wind studies and performance modeling. Depending on the specific location, environmental studies may need to be conducted, with negotiations on environmental mitigation often being required, as well. If a county building department determines that the project requires a special use permit, then public hearings and community approval may be required. Both Host Customers and project developers need assurances that their incentive funding will be available if they spend the significant time and resources required to work through these issues. However, neither party can be expected to enter into an agreement for project installation (a requirement of the PPM) until these types of issues are resolved.

Some developers believe that the 18 months allowed for public entities to complete their projects should be extended to all applicants, regardless of business type. More private companies are requiring all capital projects to be put through a solicitation process in order to comply with the Sarbanes-Oxley Act of 2002.

Project developers also commented that renewable-fueled fuel cell projects have a longer project cycle that those using non-renewable fuels. This is because they require more extensive design at the front end and the commissioning process takes longer on the back end because the two systems need to be tested and tuned, which is a complex and iterative process. Project developers also indicated that fuel cells and wind turbines must be custom-ordered and take from six months to a year to be built and delivered.

6.3.5.2 Host Customer

During the in-depth interviews, Host Customers also noted that the time frames allotted to develop and complete projects appear to be aggressive. Those with fuel cell projects, due to equipment delay, and internal combustion projects, due to air permitting, reported the most

difficulty with the time frames.[58] Particularly where equipment must be ordered from outside the US, there is some concern about timing to procure and install the equipment within the SGIP timeframes. Interestingly, some Host Customers report that the recession has led to increasing job responsibilities and thus relative overburden and delay on the part of on-site personnel, while others, particularly public entities, indicate that during a recession, construction is relatively more affordable and responsive, as vendors and suppliers are relatively less constrained. Host Customers also noted that as these are very high capital projects, they require significant planning, thus requiring a good amount of time.

The 2009 Program timelines are not reasonable for the current SGIP-eligible technologies, which have complex and unpredictable project development cycles.

6.3.6 Project Delays

Twenty-one percent of Host Customers with Active/Completed projects felt that there were unnecessary delays in the onsite generation project or the Program application process. Those citing delays noted that they occurred at the top four following stages (with the percent citing this process as a delay): working with the electric utility to connect your unit to the grid (30 percent), financing the project (27 percent), obtaining approval based on the Program's on-site inspection (20 percent), and installing the equipment (20 percent). In the Host Customer's view, the person or organization primarily responsible for the delay was as follows, in order of percentage of respondents that cited the person or organization:

- Working with the utility to connect your unit to the grid:
  - Energy services company or contractor,
  - The PA,
  - The utility's interconnection department, and
  - Their own firm or organization;
- Financing the project-> energy services company or contractor, their own firm or organization, and the state of California;
- Obtaining approval based on the Program's on-site inspection-> energy services company or contractor, the PA, the permitting agencies, and the design-build contractor; and
- Installing the equipment-> the permitting agencies, their own firm or organization, and the design-build contractor.

[58] It is important to note that the team completed three interviews with Host Customers with wind projects, eight interviews with Host Customers with fuel cell projects, two interviews with Host Customers with microturbine projects, and twelve interviews with Host Customers with internal combustion engine projects.

Only one Host Customer with a Withdrawn project felt that there were unnecessary delays in the on-site generation project or the Program application process. This respondent felt that the delays occurred when financing the project (the delay caused by the bank), submitting a reservation application, and submitting PPM (the delays caused by the PA).

6.3.7 Program Changes

Project developer attitudes toward Program changes shifted significantly since the 2007 Process Study when developers complained generally about the frequent changes to the Program. In this round of interviews, project developers were generally positive about recent Program changes, mentioning the following changes specifically:

- Removing requirements like site maps and customer taxpayer IDs at early stages of the project has streamlined the reservation process significantly;
- Adding advanced energy storage broadens the options that they can evaluate for their clients;
- Raising the incentive cap from one MW to three MW made larger projects financially feasible. This is especially important as fuel cell manufacturers offer better prices for larger systems; and
- Adding the ability to qualify for renewable-fueled incentives using directed biogas.

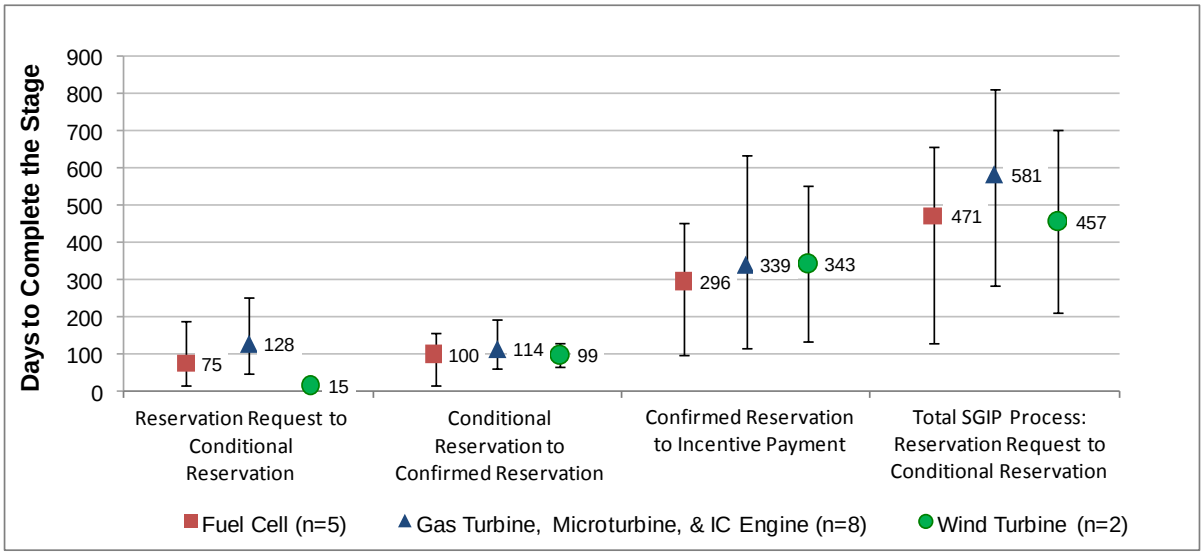
Project developers were generally positive about recent program changes.

However, one developer complained that Program changes are not always communicated to all of the PA in a timely manner.

6.3.8 Time to Process Applications

Figure 17 shows the days elapsed to reach process milestones. Single data points represent the mean, and the range is shown with minimum and maximum bars. For the rest of this section, the minimum, maximum, and mean (or average) days are discussed for each process stage.

Figure 17. Days to Reach Process Milestones (Projects that applied between 2007 and 2009 and are complete)



Source: SGIP data as of December 2009.
Note: 15 Completed projects are represented in figure 15. The number of Completed projects by technology is shown after the "n=" in the legend. For example, "Fuel Cell (n=5)" means that there are five Completed fuel cell projects. The bar indicates the minimum (lowest bracket), maximum (highest bracket) and the mean (numeric value indicated by the symbol) days to complete each stage.

6.3.8.1 Application Date to Conditional Reservation

The average days an applicant waited to receive a conditional reservation after submitting a reservation request varied, depending on the technology type. The conditional reservation notice letter is sent to the potential Host Customer once the PA has reviewed the application and determines that it qualifies for the Program and is complete. Projects that applied in 2007, 2008 or 2009 and that are complete took between 15 and 128 days to complete this process, on average. This spread is smaller than that for projects that completed the process between 2001 and 2006—these projects took between six and 235 days to complete this process.

6.3.8.2 Conditional Reservation to Confirmed Reservation

Once an applicant has received a conditional reservation, he must provide proof of project milestone documents, and an RFP or executed agreement (if public entity) by a specified time period to remain in the Program and receive his confirmed reservation. The SGIP Program Handbook outlines the time periods in Table 25 for confirmed reservation to conditional reservation.

Table 25. Conditional Reservation to Confirmed Reservation Time Periods

Program Year[59]	Conditional Reservation to Confirmed Reservation Time Period Allotment	Average Time to Complete
2001-2004	90 days	160 days
2005	60 days	106 days
2006	60 days (private firms) 240 days (public entities, effective 7/1/06)	108 days (private firms) 182 days (public entities)
2007-2009	60 days (private firms) 240 days (public entities)	110 days (private firms) 211 days (public entities)

Source: SGIP Handbook and SGIP Data as of December 2009

The Program data shows that, despite the limitations to receive a confirmed reservation, on average the private projects were exceeding this time frame. However, public entity projects were under the limitation. For projects that applied between 2007 and 2009, across all technologies, private projects took 95 days to complete this stage, while public entity projects took 154 days to complete this stage, on average. Across both public and private entities, most projects were taking around 100 days, on average, to complete this stage.

6.3.8.3 Confirmed Reservation to Incentive Payment

The number of days from the confirmed reservation to the incentive payment varied slightly, depending on the technology. Across technologies, the time to receive the incentive payment varied from 296 days to 343 days, with wind turbine projects taking the longest amount of time. Per the SGIP Handbook, the reservation expiration date may be extended for up to 180 days. Therefore, the days to receive the incentive payment from the confirmed reservation in Figure 17 may include any extensions given to projects.

The amount of time that projects take to complete this process is highly variable, more so than for the other processes. Over all technologies, the average time from confirmed reservation to incentive payment is 325 days, with a minimum of 98 days and a maximum of 635 days. Materials that are required to be submitted with the incentive claim include proof of authorization to interconnect, final building permit inspection report, and final air permit documentation. As discussed in the "Program Processes Satisfaction" section, among the processes cited as most difficult were "obtaining any necessary air quality permits," "obtaining any necessary building or siting permits," and "working with the electric utility to connect your unit to the utility grid." The delays from these difficulties are reflected in the variability and the time to complete this stage.

[59] Program Years 2001-2006 are shown for comparison only.

Some Host Customers noted that they received an extension and were aware that extensions were available. This is a change from the 2007 Process Study where the granting of extensions was not generally understood among those in the applicant pool. Drop-Out Rates

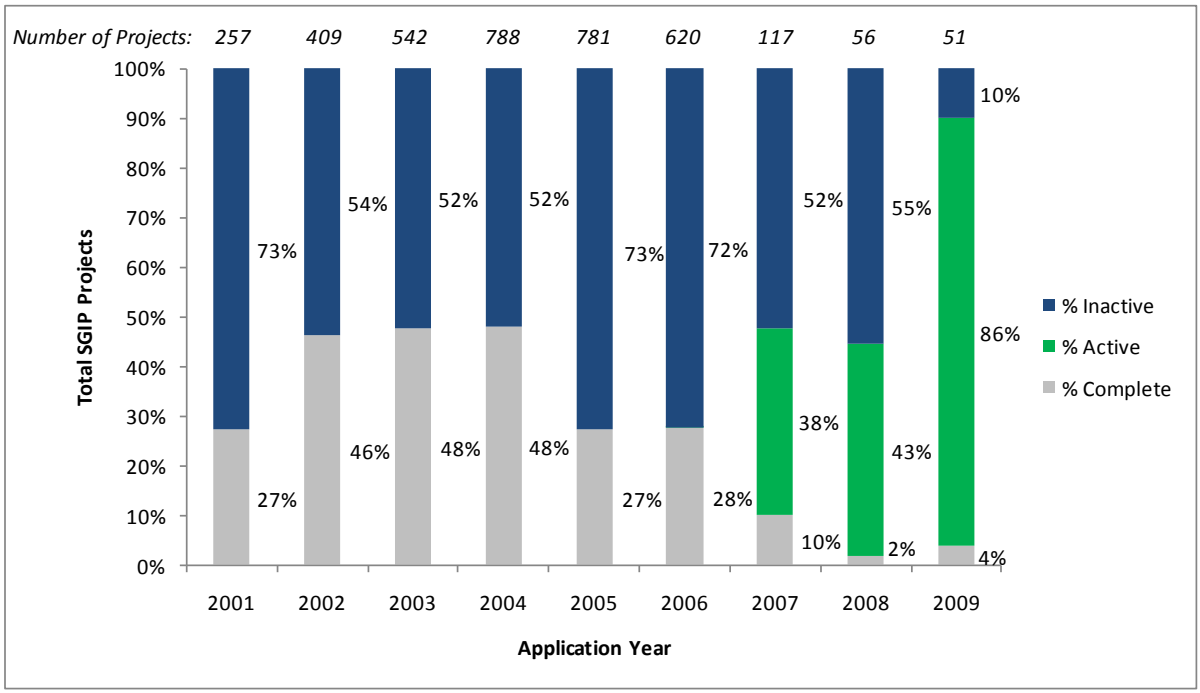
Over the lifetime of the SGIP, project withdrawal rates have been over 50 percent (Figure 18).[60] The drop-out rates for projects that applied in 2001, 2005, and 2006 are relatively higher than for projects that applied in 2002, 2003, and 2004. For 2002-2004, the drop-out rate remained relatively constant at about 50 percent. The drop-out rate increased to just over 70 percent for projects that applied in 2005 and 2006. The higher 2005 drop-out rate may also be a reflection of the surge of applications in 2005 that occurred most likely in an effort to avoid the application fee (which was instituted in July of 2005), as well as concern over declining solar rebates.

Solar PV projects were the major contributors to the high drop-out rate in 2006 (72 percent of the applications did not complete the Program). The majority of projects that applied to the Program in 2006 (75 percent) did so in two separate months—February 2006 and December 2006. These two months correspond to the Program opening in 2006 (February 2006) and the last month that solar PV applications were allowed in the SGIP (December 2006). The drop-out rate for solar PV projects that applied in December 2006 is 93 percent-- many projects likely submitted an application to reserve funds before they were no longer available and transferred the project to the California Solar Initiative or did not go through with the solar installation.

It is difficult to know the true drop-out rate for projects that applied in 2007, 2008, and 2009. However, the drop-out rates for 2007 and 2008 are already greater than 50 percent. Eighty-six percent of the total projects that applied in 2009 are still Active as of December 2009; therefore, it is difficult to estimate the 2009 drop-out rate

[60] Note that it is too early to tell what the withdrawal rate for 2009 will be because projects have not had a sufficient amount of time to complete the process.

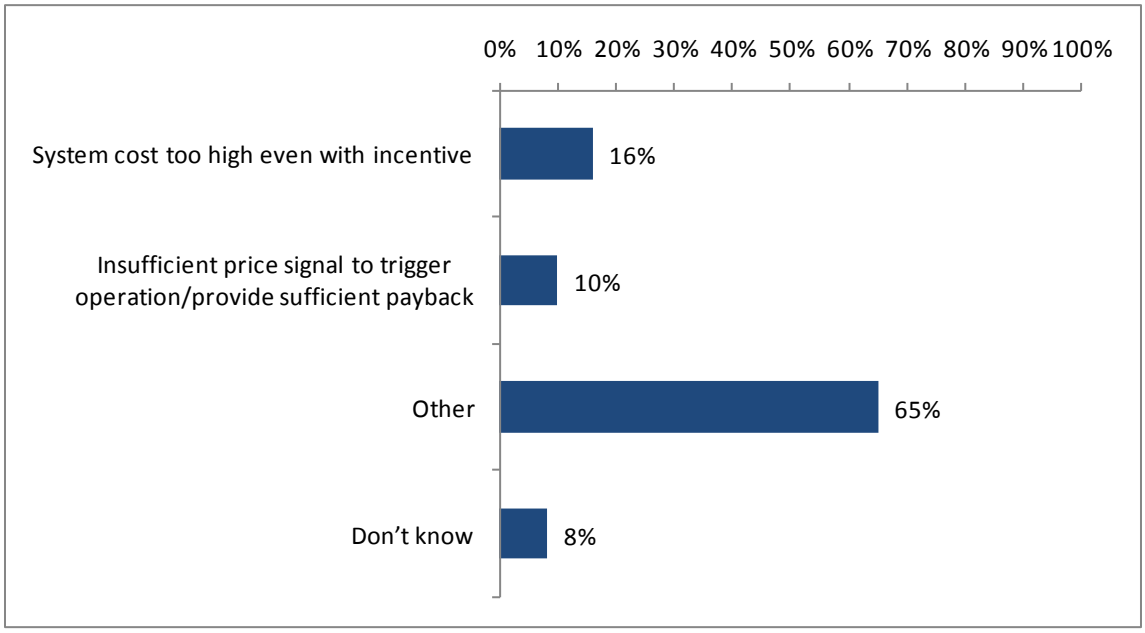
Figure 18. Withdrawal Rates Over SGIP Project Years



Source: SGIP data as of December 2009.

Figure 19 presents the reasons Host Customers withdrew applications. The primary reason specified by Host Customers for drop out (second to "other") was that the system costs were too high even with the incentive (16 percent cited this reason). This was also the main reasons Host Customer withdrew applications based on the 2007 Process Study. However, the majority of those who withdrew from the Program had their own specific reasons for doing so (65 percent chose "other" as a reason for withdrawing from the Program and then provided a clarifying response). These reasons ranged from air emissions issues to equipment availability to a change in strategy. This large percentage of Host Customers having "other" reasons of withdrawing their application shows that Host Customers going through the Program have very specific issues or barriers and may need extra support for their individual circumstances.

Figure 19. Reasons for Withdrawn Applications



Source: Navigant Consulting surveys of SGIP Host Customers.
Note: Other includes: the equipment we were going to purchase did not pass air emissions for the county and the supplier couldn't guarantee it; we are waiting for the engineering to come so we can present it to funding; equipment was no longer available from the manufacturer; we are going to change strategy; we were not able to meet the emissions requirements; we couldn't decide to go forward with the Program or not- we took too much time and missed the Program by 6-9 months; and the contractor refused to complete the project.

Despite withdrawing from the Program, some projects were planned to be completed anyway. Of the surveyed Host Customers that withdrew from the Program, nearly one-third (29 percent) indicated that they planned to install the system anyway. In addition, of those Host Customers that planned to install the system after withdrawing from the Program, 100 percent felt that is was "likely" or "very likely" that the project would be completed.[61] It should be noted that many of these projects would not have been initiated without the potential of receiving funding through SGIP. About 71 percent of Host Customers with Withdrawn projects ranked the availability of rebates from the Program in their initial decision to go forward with this project as "important" or "very important."[62] The availability of funding appears, then, to be crucial for the initiations of many

Of the surveyed Host Customers that withdrew from the program, nearly one-third (29 percent) indicated that they planned to install the system anyway.

[61] The responses of Host Customers with Withdrawn/Rejected projects have a confidence level/precision internal of 90/23.
[62] On a scale of one to five, with five meaning "Very important," one meaning "Not at all important," and three meaning "Neutral."

on-site generation projects.

6.3.9 Eligibility Issues

For the most part, developers, and Host Customers did not cite eligibility issues as a reason that projects do not complete the SGIP. The majority of the Host Customers interviewed had no eligibility issues, though during the in-depth interviews a few cited concerns about being eligible for the Program because they were a non-profit organization or a residential customer. However, once the Host Customers looked into the issue it was clear that they were eligible. In addition, there were a few specific instances in which Host Customers had issues with eligibility due to the equipment at the site. One site also exported generation and another site had combined meters, both of these cases led to some eligibility issues. For the second issue, the Host Customer noted that the project would not have continued through the Program without the help and knowledge of the contractor.

For the most part, developers, and Host Customers did not cite eligibility issues as a reason that projects do not complete the SGIP.

Project developers generally understand the Program's eligibility requirements but would like to see a few specific requirements loosened to allow more customers to be eligible. Allowing grid-tied projects to receive incentives and lifting the restriction that system size be limited by the site's demand were all mentioned as desirable changes. Several developers mentioned that the net energy metering limit of one MW should be raised to allow larger systems to participate.

One developer of renewable-fueled fuel cell systems was initially confused about renewable system eligibility believing that each system was allowed to have a renewable and non-renewable component and that the incentive would be prorated accordingly. They now understand that each system has to meet the 75 percent renewable-fuel threshold in order to qualify but explained that this sometimes restricts the customer to purchasing two smaller units when a single larger unit would provide better project economics.

6.4 The SGIP Process for Public versus Private Entities

The Program has modified its processes to better accommodate public entity participation in the Program. Elements of particular interest in achieving an increased number of participating public entities include educating customers, application assistance and, critically, adequate lead times for key Program milestones. This section examines whether there have been notable differences between public and private entities participating in the Program along these and related lines of interest between 2007 and 2009. For this evaluation, the CPUC requested that the evaluation team further break out the public projects into federal government, state government, local government, and non-profit.

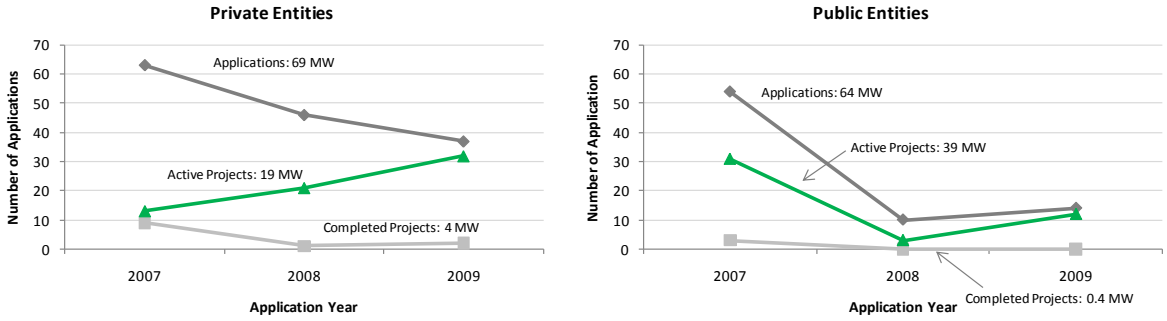
Private firms were more active in the SGIP than public entities by number of applications and only slightly more active by proposed system capacity (kW) (Figure 20). However, public entities (38,608 kW) currently have more capacity in Active projects than private entities (19,212 kW). Private and public entities had a similar number of applications in 2007 (63 and 54, respectively); however, the number of public entity applications (10 and 14) was greatly reduced in 2008 and 2009 compared to private entity applications (46 and 37). The most active sub-group in the public sector by application count and proposed system size is local government, with 64 percent of the total number of applications and 43 percent of the total proposed kW during the 2007 – 2009 timeframe.

In addition, private entity applications appear to be on a downtrend, where public entity applications reduced in 2008 (from 2007) and then increased slightly in 2009. These trends are slightly different than those in the 2007 Process Study. In 2007, private entity applications seemed to be trending down while the number of public entity applications was increasing every year.

Public entities currently have more MWs in active projects than private entities.

Fifteen projects have been completed from applications submitted between 2007 and 2009. No projects have completed in CCSE's territory that applied in 2007, 2008, or 2009. Of those Completed projects, three were with public entities (all in the non-profit sector) and 12 were with private entities. The three non-profit Completed projects were non-renewable-fueled internal combustion engines. The Completed projects with private entities were for a range of technologies including renewable-fueled and non-renewable-fueled fuel cells, renewable-fueled and non-renewable-fueled internal combustion engines, non-renewable-fueled microturbines, and wind turbines. All of the non-profit projects were completed through PG&E, while the private sector projects were completed through PG&E, SCE and SCG.

Figure 20. Yearly Private and Public Entity Project Counts and System Sizes



Project Type	Applications		Active Projects		Completed Projects	
	Number	kW	Number	kW	Number	kW
Private Entity	146	69,441	66	19,212	12	3,808
Public Entity	78	63,503	46	38,608	3	405
Federal government	6	8,085	5	6,585	0	0
Local government	50	27,239	31	17,166	0	0
Non-profit	12	8,451	5	2,903	3	405
State government	8	15,294	4	10,054	0	0
Tribal government	2	4,434	1	1,900	0	0

Source: SGIP data as of December 2009.
Note: This data includes eight projects with an "unknown" market sector. The evaluation team made their best estimate for which bucket these projects fell into- public or private.

Motivations of Host Customers with Active/Completed projects for purchasing and using on-site generation technology is shown in Table 26. The top motivation for both private and public entities is a desire to reduce utility bills. While 52 percent of public entities from the 2007 survey purchased and used on-site generation technology for this reason, 83 percent of public entities from the 2009 survey cited it. This increase may be due to the fact that public entities are looking for ways to reduce their operating costs more. Concern for the environment was cited by more private entities (70 percent) than public entities (59 percent); however, more public entities wanted to reduce their peak demand than private entities (63 percent and 48 percent, respectively). The 2007 survey also revealed that 43 percent public entities wanted to provide a technical demonstration, compared to 24 percent of public entities in the 2009 survey.

Table 26. Reasons for Purchasing and Using On-Site Generation Technology by Private and Public Entities and Study

Reasons for Purchasing and Using On-Site Generation Technology that were "Very influential"*	2009 Process Study		2007 Process Study	
	Private Entity	Public Entity	Private Entity	Public Entity
Wanted to reduce utility bills	77%	83%	74%	52%
Concern for the environment	70%	59%	56%	55%
Concern about climate change	55%	43%	N/A	N/A
Improve our image in the community- green marketing	52%	51%	40%	55%
Wanted to reduce our peak demand	48%	63%	43%	34%
Energy supply independence	36%	35%	18%	29%
Provide technical demonstration	27%	24%	19%	43%
Wanted a backup system to improve the overall reliability of our electricity supply	17%	17%	N.A	N.A

*Asked on a scale from "very uninfluential" to "very influential." The responses reported here are only the "very influential" responses.
Source: Navigant Consulting surveys of SGIP Host Customers.
Note: These responses are from the survey of Host Customers with Active/Completed projects. The confidence level/precision interval is 90/10 for private entity values and 90/11 for public entity values.
Note: three private entity Host Customers were residential Host Customers.
N/A – The climate change question was not asked for the 2007 Process Study.
N.A. – "Very influential" responses are not available for this question.

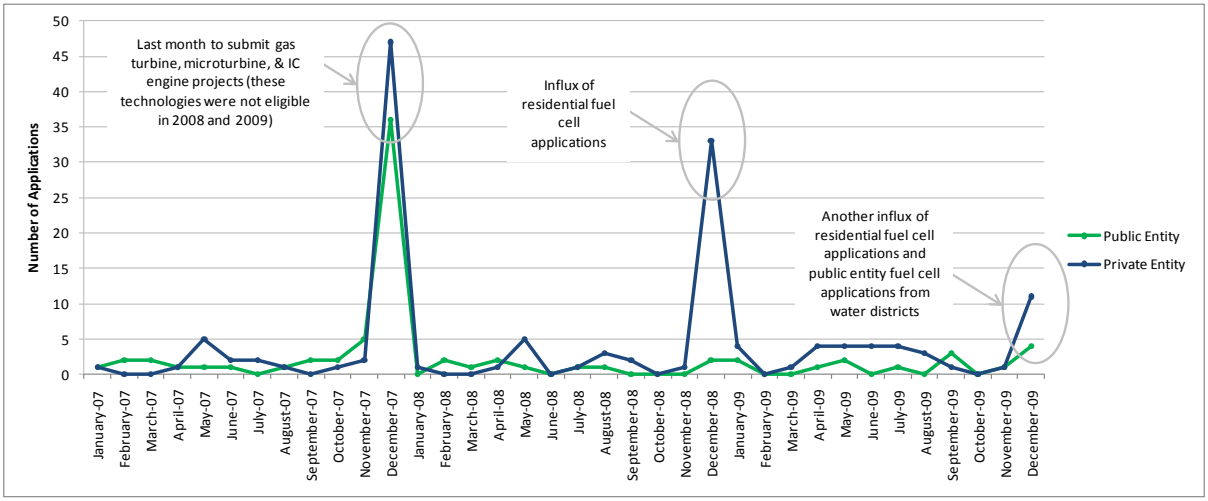
Between 2007 and 2009, there have been three periods with a large number of applications from both public and private entities, all in the months of December. December 2007 was the last month that gas turbines, microturbines and internal combustion engines were eligible for the Program. Therefore, many applicants submitted applications for these technologies in December in order to receive incentives before they were eliminated. Ninety-one percent of the public entity applications and 89 percent of the private entity applications in December 2007 were for these technologies. Of public entities, 32 percent of the December 2007 applications were from the public

Between 2007 and 2009, there have been surges of applications in December for both public and private entities. This is different from prior years when application surges occurred when the program opened at the beginning of each year.

administration sector and 23 percent were from the health services sector. Forty-three percent of private entity applications in December 2007 were from the manufacturing sector.

Another surge of private entity applications came in December 2008. One hundred percent of the private entity applications in this month were for residential fuel cells and 94 percent of them were from a single developer.[63] Lastly, December 2009 saw a smaller peak of applications. This peak was due to another influx of residential fuel cell applications and a few fuel cell applications from water districts (75 percent of the public entity applications in December 2009 were from water districts for fuel cells). This trend of applications at the close of each year is somewhat different from prior program years. Previously, application surges occurred at the open of the Program in the beginning of each year, except for a peak in December 2006 from solar PV applications hoping to secure funding before solar PV was transferred to the CSI.

Figure 21. SGIP Applications Between 2007 and 2009 (by Public and Private Entity)



Source: SGIP data as of December 2009.

[63] The other 6% of private entity applications in December 2008 do not have a project developer name listed.

6.4.1 Process Differences

Public and private entities are treated similarly in the SGIP application process in terms of what technologies are eligible, size requirements for eligible projects, the incentive levels paid per technology type, application fees, and waste heat and system efficiencies required. They are treated differently, however, in terms of the amount of time provided to meet application milestones and complete projects and in terms of certain paperwork requirements. A number of project developers commented that the project cycle process is much more difficult with public entities than private firms because of significant additional bureaucracy related to approvals, boards and multiple stakeholders involved. Because of the additional administrative burdens inherent in public management, public entities were provided with extended time periods for meeting various requirements. However, some developers believe that the additional time given to public entities should be extended to all applicants, regardless of ownership. More private companies are requiring all capital projects to be competitively bid in order to comply with the Sarbanes-Oxley Act of 2002. This extends project timelines considerably.

The current process differences between public and private entities are presented in Table 27, below. It is difficult to compare the completion rate for public and private entity projects that applied in 2007, 2008, and 2009 and have completed due to the small number of completes (15). Of those projects that applied in 2007, 2008, or 2009, 59 percent of the public entity projects and 46 percent of the private entity projects are Active as of December 2009. The higher percentage of Active public entity projects may be due in part to the longer amount of time they are given to complete the process. In addition, four percent of the public entity projects and nine percent of the private entity projects that applied in 2007, 2008, or 2009 have completed the process. Of these completed projects, it has taken public entities 579 days and private entities 515 days to complete the process, on average. Therefore, on average, public entities are exceeding their reservation period by about 31 days (one month) and private entities are exceeding their reservation period by about 150 days (5 months).

More private companies are requiring all capital projects to be competitively bid in order to comply with the Sarbanes-Oxley Act of 2002.

Table 27. Process Timelines for Private and Public Entities

Milestone in Process	Private Entity	Public Entity
Reservation Period	12 Months[64]	18 months
Proof of Project Milestone	Required within 60 days after Conditional Reservation Notice is issued	Required within 240 days after Conditional Reservation Notice is issued
Request for Proposal for Purchase or Installation of Generating System	Not required	Required within 60 days after Conditional Reservation Notice

Source: SGIP Program Handbook.

6.4.2 Differences in Program Experiences

A similar percentage of private and public entities learned about the Program from an equipment or system dealer/vendor (30 percent and 29 percent, respectively). This percentage has increased for public entities and decreased for private entities since the 2007 Process Study. The findings from that report show that 43 percent of private entities and 17 percent of public entities learned about the Program from an equipment or system dealer/vendor. Public entities were somewhat more likely to learn about incentives through their utility account representatives than private firms (Table 28). This finding is the same as that in the 2007 Process Study.

[64] In 2010, the PAs extended the reservation period for private entities to 18 months.

Table 28. Learning about the SGIP, by Private and Public Entities*

Source of Initial Program Information	Private Entity Responses	Public Entity Responses
Active/Completed Projects		
Equipment/system dealer/vendor	30%	29%
Utility representative	23%	32%
Magazine or newspaper article	2%	0%
Other media (e.g., TV, news press releases)	2%	4%
Government agency (CPUC, CEC, or DOE)	2%	4%
Regional Energy Office	0%	4%
Other[65]	41%	29%
Withdrawn Projects		
Utility representative	71%	67%
Equipment/system dealer/vendor	0%	33%
Other[66]	29%	0%

Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and 90/11 for public entity values. The confidence level/precision interval for the survey of Host Customers with Withdrawn projects is 90/29 for private entity values and 90/37 for public entity values.

*Note: These responses are the first responses given during the survey. Other ways that Host Customers learned about the Program include other users of on-site generation systems (private entity response in Active/Completed survey), internet search/website (private entity response in Active/Completed and Withdrawn survey).
Note: three private entity Host Customers were residential Host Customers.

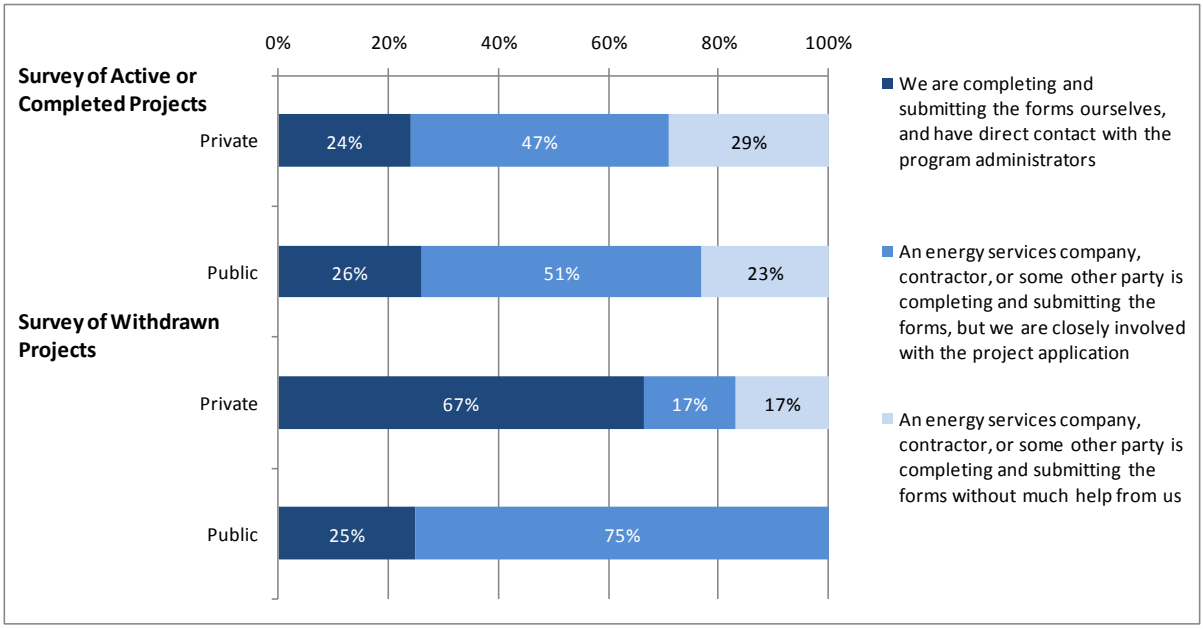
Overall, the rebates played a similarly important role for both private and public entities with Active/Completed projects when deciding about the project. One hundred percent of private entities and 97 percent of public entities claimed that the availability of the rebate was important or very important in their decision to install onsite generation. In slight contrast, 83 percent of private entities with Withdrawn projects claimed that the availability of the rebate was important or very important in their decision to install onsite generation and 75 percent of public entities with Withdrawn projects made this claim.[67]

[65] Other includes specific developers' names (private and public entity response), SGIP on the internet (private entity response), and word of mouth (private entity response).
[66] Other includes specific developers' names (private entity response) and SGIP on the internet (private entity response).
[67] The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and is 90/11 for public entity values. The confidence level/precision interval for the survey of

With regards to involvement in the process, public entities and private entities with Active/Completed projects have similar involvement. About 71 percent of private entity Host Customers and 77 percent of public entity Host Customers with Active/Completed projects have some involvement in the application process. However, private entities with Withdrawn projects are more than twice as likely as public entities to complete the process on their own. The majority of public entities with Withdrawn projects (74 percent) were closely involved with the project application. (See Figure 22).

These findings contrast those from the 2007 Process Study. From the 2007 survey, public entities were about twice as likely as private entities to complete all the forms themselves, while private entities were about twice as likely to hire energy service companies (ESCOs) to manage the application and Program paperwork. The difference was due to a greater percentage of private-entity projects being of a turnkey nature. This was true for both Active/Completed projects as well as Withdrawn projects.

Figure 22. Completing Application Forms by Public-Private and Active/Completed-Withdrawn

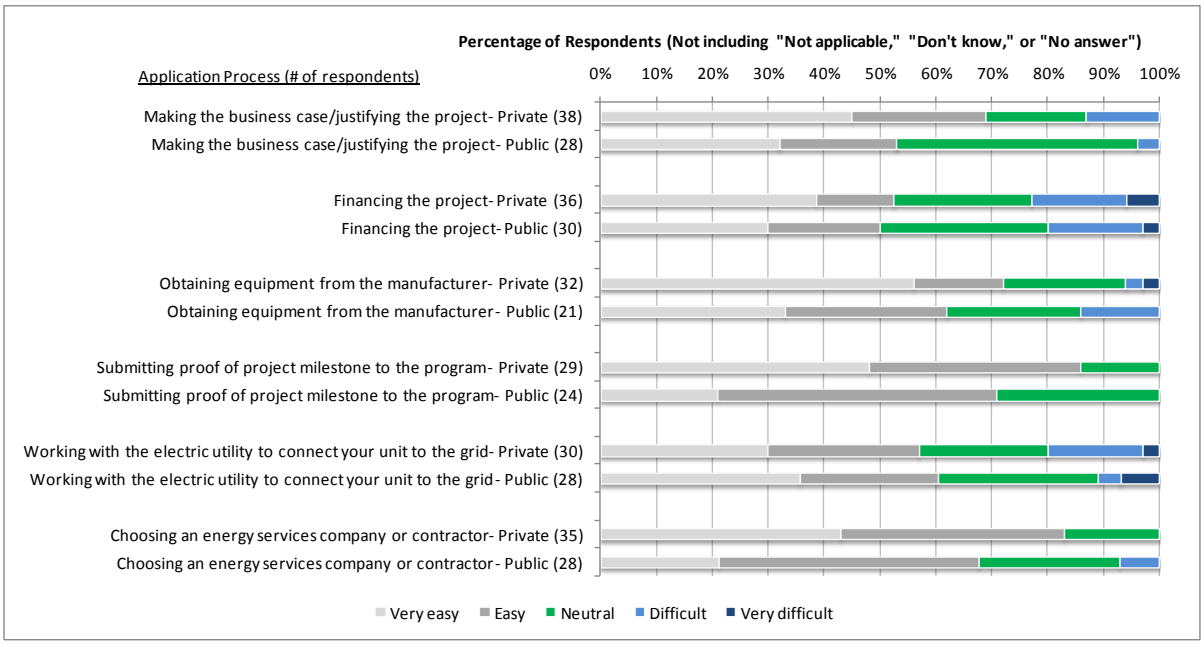


Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and 90/11 for public entity values. The confidence level/precision interval for the survey of Host Customers with Withdrawn projects is 90/29 for private entity values and 90/37 for public entity values.
Note: Rows may not add to 100% due to rounding.
Note: three private entity Host Customers were residential Host Customers.

Host Customers with Withdrawn/Rejected projects is 90/29 for private entity values and is 90/37 for public entity values.

Except for a few small differences, private and public entities appear to have similar eases and difficulties with regard to the SGIP processes (Figure 23). More private entities found it easier to make the business case for on-site generation than public entities (69 percent to 53 percent, respectively). About 20 percent of both private and public entities found obtaining project financing to be difficult or very difficult. In contrast to the results from the 2007 Process Study, neither groups cited proof of project advancement as difficult or very difficult. In the 2007 report, proof of project advancement was harder to achieve for public entities (38 percent found it difficult or very difficult, compared to 17 percent of private entities).

Figure 23. Differences in Program Experiences- Private vs. Public Entities



Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and 90/11 for public entity values.
Note: This data is for Host Customer with Active/Completed projects only.
Note: Three private entity Host Customers were residential Host Customers.

In addition, the majority of private (82 percent) and public (83 percent) entities with Active/Completed projects were "satisfied" or "very satisfied" with the SGIP. About two percent of private entities were "dissatisfied" or "very dissatisfied" with the Program compared to six percent of public entities.[68] This finding is also in contrast with the 2007 Process Study where more than ten percent of private entities were either "dissatisfied" or "very dissatisfied," whereas just one percent of public entities felt that way.

[68] The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and is 90/11 for public entity values.

Eighty percent of private and 77 percent of public entities own or will own the equipment. Yet, public entities are more likely to keep maintenance and repair duties in-house rather than outsource them (36 percent of public entities handle maintenance and repair of equipment in-house, compared to 19 percent of private entities).[69] These findings are similar to those in the 2007 Process Study.

Similar to the findings in the 2007 Process Study, private firms expect shorter payback periods from on-site generation projects than public entities.

Similar to the findings in the 2007 Process Study, private firms expect shorter payback periods from on-site generation projects than public entities. Forty percent of public entities with Active/Completed projects can tolerate payback periods greater than ten years, compared to 25 percent of private entities with Active/Completed projects. Similarly, public entity applicants who withdrew from the Program can stand longer payback periods than private entities. One hundred percent of public entities with Withdrawn projects expected a payback of six to ten years compared to 43 percent of private entities with Withdrawn projects. (See Table 29.)

In addition to asking about payback period expectations, the Host Customers with Withdrawn projects were also asked about the longest payback period they would be willing to accept. Public entities are more willing to accept longer payback periods: 75 percent would accept a six to ten year payback and 25 percent would accept a payback greater than ten years. In comparison, 17 percent of private entities would accept a payback of six to ten years and none would accept a payback of greater than ten years.

[69] The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and is 90/11 for public entity values.

Table 29. Payback Period Expectations by Private and Public Entities

Payback Period Expectations	Private Entities		Public Entities	
	Host Customers with Active/Completed projects	Host Customers with Withdrawn projects	Host Customers with Active/Completed projects	Host Customers with Withdrawn projects
6 months or less	0%	0%	0%	0%
1 year	0%	0%	0%	0%
2 years	0%	29%	0%	0%
3 years	9%	14%	0%	0%
4 years	9%	0%	3%	0%
5 years	16%	0%	6%	0%
6 – 10 years	30%	43%	34%	100%
More than 10 years	25%	0%	40%	0%
Don't know/Refused	11%	14%	17%	0%

Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and 90/11 for public entity values. The confidence level/precision interval for the survey of Host Customers with Withdrawn projects is 90/29 for private entity values and 90/37 for public entity values.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.4.3 Barriers to Additional Onsite Generation

Overall, about half of Host Customers with Withdrawn projects are likely or very likely to install on-site power generation equipment for their facility in the next five years. Fifty percent of private entities noted that they are very likely to install on-site generation, while 33 percent of public entities thought they were in a similar situation.[70] These estimates are much higher and different than those from the 2007 Process Study. In the 2007 survey, public entities were twice as likely to install on-site power generation in the next five years: almost 25 percent claimed

Barriers to installing additional on-site generation by customers with Active/Completed projects include: no more space/room for generation, no additional loads to be served, and equipment prices.

[70] The confidence level/precision interval for the survey of Host Customers with Withdrawn/Rejected projects is 90/29 for private entity values and is 90/37 for public entity values.

they are very likely to install additional generation in the next five years, compared to 12 percent of private firms.

Table 30 lists the barrier to installing additional on-site power generation grouped by private and public Host Customers and by Host Customers with Active/Completed projects and Withdrawn projects. The most significant barriers to installing additional on-site generation for private entities with Active/Completed projects are the following: no more space/room for generation, no additional loads to be served, and equipment prices. These reasons are similar for public entities, who also mention financing costs as a barrier. Host Customers with Withdrawn projects cited different reasons due to the fact that many have not yet installed on-site generation. The top reasons for private entities are equipment prices and difficulty in working with the utility. The top reasons for public entities are equipment prices, natural gas prices, and no additional loads to be served.

Table 30. Barriers to Installing Additional On-Site Power Generation[71]

Barrier	Private Entities		Public Entities	
	Host Customers with Active/ Completed projects	Host Customers with Withdrawn projects	Host Customers with Active/ Completed projects	Host Customers with Withdrawn projects
No more space/room for generation	30%	0%	17%	0%
No additional loads to be served	18%	0%	14%	25%
Equipment prices	16%	40%	19%	25%
Difficulty in working with the utility	7%	40%	3%	0%
Financing/Money/ Cost	5%	0%	17%	0%
Natural gas prices	2%	0%	6%	25%
Experience with the current system	0%	20%	8%	0%
Environmental concerns	0%	0%	3%	0%
Other	9%	0%	8%	25%
Don't know	11%	0%	6%	0%
Refused	2%	0%	0%	0%

Other: (Active/Completed) include cost/financing (private and public entities) and difficulty in working with AQMD (private entity); (Withdrawn) include experience with equipment (private entity), regulatory issues (private entity) and cost/financing (private and public entities).
Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Active/Completed projects is 90/10 for private entity values and 90/11 for public entity values. The confidence level/precision interval for the survey of Host Customers with Withdrawn projects is 90/29 for private entity values and 90/37 for public entity values.
Note: Three surveys of Host Customers with Active/Completed projects were with residential Host Customers.

6.4.4 Reasons for Withdrawing Applications

The majority of both private and public entities cited their own reasons for withdrawing their applications. Both private and public entities also withdrew because the system cost was too

[71] First response listed only.

high, even with incentives. See Table 31 for a complete listing of withdrawal reasons for private and public entities.

The high system cost was the number one reasons cited by both private and public entities in the 2007 Process Study. However, Host Customers with Withdrawn projects also cited other reasons for their withdrawal including problems in obtaining project financing (private entities), problems with the application process (private and public entities), and the internal priorities of the organization have changed (public entities).

Table 31. Reasons for Withdrawn Applications by Private and Public Entity

Private Entity	Public Entity
Other (71%)	Other (50%)
System cost too high, even with incentive (14%)	System cost too high, even with incentive (25%)
Don't know (14%)	Insufficient price signal to trigger operation or provide sufficient payback (25%)

Other: the equipment we were going to purchase did not pass air emissions for the county and the supplier couldn't guarantee it; we are waiting for the engineering to come so we can present it to funding; equipment was no longer available from the manufacturer; we were not able to meet the emissions requirements; we couldn't decide to go forward with the Program or not- we took too much time and missed the Program by 6-9 months.
Other: we are going to change strategy and the contractor refused to complete the project.
Source: Navigant Consulting surveys of SGIP Host Customers. The confidence level/precision interval for the survey of Host Customers with Withdrawn projects is 90/29 for private entity values and is 90/37 for public entity values.

6.4.5 Federal Incentives for SGIP Projects

In addition to the SGIP incentive, projects are eligible for additional incentives including those from the federal government. Private entity projects may be eligible for the investment tax credit (ITC), production tax credit (PTC), and the modified accelerated cost-recovery system (MACRS). Public entity projects may be eligible for tribal energy program grants and renewable energy production incentives (REPI). More information about these federal incentives and other state incentives is available in the 2009 Market Study.[72]

6.5 Social and Economic Factors Related to Program Participation

This section discusses the social and economic factors relating to Program participation and how these factors have evolved since the last evaluation. The recent Host Customer survey and interview findings are considered in the context of growing public concern for and acceptance of environmental issues as well as the current economic climate. Conventional wisdom would

[72] Cooney, Kevin, Jennifer Barnes and Beth Baker. "Self-Generation Incentive Program Final Market Characterization Report." Summit Blue Consulting: A part of Navigant Consulting. February 16, 2010.

lead one to believe that a concern for the environment and climate change would motivate firms to spend resources on projects that reduce environmental impacts and greenhouse gases when they otherwise would not. Conversely, a slow economy generally causes firms to reduce spending on projects other than those that are essential.

Table 32 presents the survey findings from Host Customers with Active/Completed projects from both the 2007 Process Study and from the current survey. The responses are further disaggregated by public and private entities.

Reducing utility bills is the most influential factor in purchasing and using on-site generation for both private and public entities in the current survey. However, this wasn't the case for public entities in the 2007 survey where they were split between a concern for the environment and improving their image as their primary motivator. This sharp increase in utility bill reduction as a motivator (31 percent) may be the result of budget constraints in the public sector. Public entity survey responses also indicate a significant increase (29 percent) in the influence of peak demand reduction as an influencing factor. This is consistent with a strong desire to reduce utility bills as most medium- to large-sized facilities have an electric rate structure that includes a demand charge.

These results aren't surprising in light of interview results from Host Customers. Host Customer interviews revealed that although corporate sustainability initiatives often provided the momentum to drive a project to completion, the projects were also required to be cost-effective.

Table 32. Reasons for Purchasing and Using On-Site Generation Technology by Private and Public Entities

Reasons for Purchasing and Using On-Site Generation Technology that were "Very influential"*	Current Survey Responses		2007 Survey Responses	
	Private Entity	Public Entity	Private Entity	Public Entity
Wanted to reduce utility bills	77%	83%	74%	52%
Concern for the environment	70%	59%	56%	55%
Concern about climate change	55%	43%	N/A	N/A
Improve our image in the community- green marketing	52%	51%	40%	55%
Wanted to reduce our peak demand	48%	63%	43%	34%
Energy supply independence	36%	35%	18%	29%

*Asked on a scale from "very uninfluential" to "very influential." The responses reported here are only the "very influential" responses.
Source: Navigant Consulting surveys of SGIP Host Customers
Note: These responses are from the survey of Host Customers with Active/Completed projects. The confidence level/precision interval is 90/10 for private entity values and 90/11 for public entity values.
Note: three private entity Host Customers were residential Host Customers
N/A – the climate change question was not asked in the 2007 Survey

Although private firms report reducing utility bills is their primary influencing factor, consistent in rank and percent with the 2007 survey, the role of the environment is growing. In the current survey, a concern for the environment was second to utility bill reduction by only seven percent and a jump or 14 percent over the previous survey. Similarly, wanting to improve their image in the community/green marketing saw an increase of 12 percent. Based on the survey results, energy supply independence is arguably a social factor closely tied to environmental concern. Its importance as an influencing factor has doubled with private firms.

Despite the growing attention climate change and distributed generation as a means to energy independence has received in the media, renewable energy projects can still encounter strong public opposition. Public opposition was cited by project developers as a primary barrier to the development of wind turbine projects. Opposition voiced by neighbors frequently requires the local land use commission to hold public hearing to review wind projects. Concerns expressed by the neighboring land owners include noise, safety, avian mortality, and even visual impacts.

Economic issues remain a dominant driver across times of both economic prosperity and downturn. In the current economic climate, social factors do not override economic realities in a customer's decision to install DG or renewable energy projects. Growing attention to climate change and environmental issues has resulted in modest increases in these issues as an influencing factor for Host Customers.

Section 7. Program Lessons Learned

This intent of this section is to document lessons learned from the SGIP administration and design that can be leveraged for future program design. This review applies to technologies beyond wind, fuel cells, and advanced energy storage that have been eligible for the SGIP in the past but are not currently eligible.

Offering incentives for projects up to three MW has opened up the market to more customers. In 2008, the SGIP began offering incentives for projects over one MW and up to three MW through a tiered incentive structure. Several of the project developers interviewed expressed their satisfaction with this Program change and indicated that the additional incentive has driven down the project payback period or allowed them to propose larger projects (which are often more cost-effective) to their customers. In the case of fuel cells, one developer explained that the change opens up the Program to customers with larger loads and that the fuel cell manufacturers have been offering larger systems that are better priced.

The SGIP data for 2008 and 2009 supports this finding. The number of applications for systems between one and three MWs has increased from 2008 to 2009, while the number of applications for systems under one MW and over three MWs has fallen or stayed the same (see Figure 8).

Program milestone requirements that follow the information available at each point in a project's development cycle simplify the application process for Host Customers and project developers. The SGIP application process was streamlined in 2008, with several requirements moved from the proof of project milestone to the incentive request, with some requirements removed all together. Several project developers noted that these changes have been positive and that it is now easier to submit a reservation request. However, issues still persist with the timing of required documents relative to the stages of project development. Wind projects can encounter significant and unpredictable delays if a project requires public hearings or environmental impact reports. Host Customers and project developers can't enter into an installation contract until they are resolved, but don't want to spend significant resources resolving these issues unless their incentive request is assured.

Providing a meaningful and efficient way for industry stakeholders to participate in the Program's administration can result in innovative Program changes. One of the findings of the 2007 Process Study was that stakeholders were not confident in the Program Modification Guidelines process because none of the technology applications submitted resulted in a Program modification. The SGIP Program Modification Guidelines (PMG) were developed to provide a more effective process for stakeholders to propose new technologies and Program rule changes than the petition for modification procedures. Since the release of the PMG, a request for a change to the Program guidelines was successfully submitted by a project developer. This Program change allowed projects to use directed biogas as a renewable fuel and has the potential to significantly advance the market for renewable fuels. As it currently stands, the PMG process is successful in that it provides the SGIP stakeholders with a clear and reasonable process for meaningful participation in the SGIP's administration.

Being responsive to changes in technology and customer type can expand the SGIP's reach into new markets. Historically, SGIP participants have been almost exclusively non-residential. However, the introduction of a new 5kW fuel cell into the market expands potential Program participants into the residential sector. The characteristic of these projects in terms of cost, complexity, and project timeframe make these projects inherently different than those participating in the SGIP in the past. In response, the 2010 SGIP Handbook introduced a new two-step application process for residential customers. This simplified process and streamlined requirements are more appropriate for a residential-scale project than the traditional SGIP process and requirements. In addition to providing the appropriate level of effort for residential Host Customers, the reduced number of forms and milestones will be more manageable for project developers should the technology gain mass market appeal.

Program requirements that are focused on a specific technology can undermine other technologies if not properly vetted. AES was introduced into the SGIP in May 2009 with the requirement that qualifying systems have the ability to handle hundreds of partial discharge cycles each day. However, a subsequent petition for modification filed by CCSE and the California Energy Storage Alliance claimed that this requirement was unnecessarily restrictive, especially for fuel cells. The original requirement was developed around wind technologies, which are inherently intermittent; however, it failed to consider the steady state operating characteristics of fuel cells. Left unchanged, the requirement could have disadvantaged certain advanced energy storage manufacturers.

Section 8. Assessment of Program Administrator Marketing and Outreach Efforts

This section presents an assessment of the PA's marketing and outreach efforts. The purpose is to understand and document marketing success stories and identify potentially missed opportunities. The section also explores appropriate marketing approached for the SGIP within the context of the CPUC's integrated marketing vision.

8.1 PA Marketing

The SGIP PAs conducted minimal Program marketing in 2008 and 2009. However, the activities they did conduct involved elements of success and had opportunities for enhancement. The 2009 Market Report found that project activity is driven by the industry and not by Program marketing. The 2009 Market Report also found a lack of awareness of the value and performance of fuel cells and AES. With this context in mind, the following sections examine the PA's marketing success stories and missed opportunities.

8.1.1 IOU Account Representative Training

Although project activity is driven by the wind, fuel cell, and AES industries, IOU account representatives are still an important source of information about the SGIP, with 23% of host customers with Active/Completed projects and 65% of host customers with Withdrawn applications first learning of the Program through an IOU account representative. Therefore, it is important that the IOU account representatives are familiar with the SGIP requirements, eligibility, and application process, as well as related areas like utility interconnection and net energy metering. The IOU account representatives should also be familiar with the basic site and customer characteristics associated with successful and unsuccessful project installations so they can advise their customers as they consider distributed generation options.

In 2009, PG&E offered a Web-based training to its account representatives on PV and fuel cell technologies, which was a positive step toward ensuring that IOU customers have a credible resource on SGIP-eligible technologies. The presentation included a basic introduction to each technology, the benefits to the customer, a description of the available products, and appropriate applications. Information on net energy metering was also provided. However, the training could have been enhanced by providing information and tools for identifying good customer candidates for each technology. Information on the utility interconnection process and requirements would have enhanced the training as well. Lastly, the training should include a section on the SGIP, covering Program eligibility (both technology and customer), incentive levels and calculations, and the application process and requirements.

8.1.2 PA Web Sites

Although only 10% of customers with Active/Completed projects indicate that they first heard about the SGIP through a Web search, many of the project developers indicate that the PA Web

sites are their first stop when they have questions about the SGIP. All PAs have a Web page dedicated to SGIP that can be easily located and accessed from the PA's main page. The CCSE site is the most accessible and can be reached directly off the main page.

The SGIP information and materials available on each PA Web site are an important resource for both IOU customers and project developers. However, none of the PAs effectively leverage their SGIP Web pages as a marketing or decision support resource.

The PAs should add content to their Web sites beyond Program application materials. Project success stories, such as those on the CCSE site, should be developed for the existing SGIP-eligible technologies and kept current. Other information to provide support to the customers as they determine whether or not to pursue distributed generation should also be provided. This could include technology-specific information on the basic operation of SGIP technologies, the appropriate and inappropriate applications for each technology, and realistic information on the costs, benefits, and maintenance requirements.

8.1.3 Conference Attendance and Promotion

In 2009, SCE sponsored a booth at the 2009 Fuel Cell Seminar and Exposition (FCS&E) to promote the SGIP. To support their conference attendance, SCE placed a full page advertisement in the conference brochure. The advertisement served two important purposes. The first was to drive foot traffic to the SGIP booth where conference participants could talk with the SCE representatives about the SGIP and pick up Program brochures and other information. The second purpose was to provide a resource in the conference materials (in this case, a Web address) where attendees could find more information on the SGIP in the event that they did not have an opportunity to visit the SCE SGIP booth. The SCE representatives reported a high number of visitors to the SGIP booth, many visitors mentioning that they'd seen the advertisement in the conference brochure. SCE also received many inquiries from participants subsequent to the conference, supporting the notion that the advertisement is an effective take-away.

Effective participation at conferences targeted at industry participants, such as equipment manufacturers and project developers, is an appropriate forum for promoting the SGIP. Industry conferences are attended by an important target audience for the SGIP and the conference format allows a dialogue between Program representatives and the industry where information can be shared. The PAs should maintain a presence at the FCS&E, or a similar conference venue in years when the FCS&E is held outside of California, leveraging supplemental opportunities to support participation, such as placing advertisements in the conference brochure or providing speakers at conference breakout sessions. Similar conferences for wind and AES should be identified.

8.1.4 Technology and Program Education

The lack of awareness of the advantages of SGIP-eligible technologies is a major barrier to project activity but provides a unique opportunity for the PAs to leverage their position as an

energy resource by providing technology and Program education. PG&E regularly offers an internet-based course on the SGIP, which includes eligible technologies, the application process, and other helpful resources. PG&E has also offered a day-long, in-person training on fuel cells. However, this training was designed as a comprehensive review of fuel cell technologies and applications with the result being that the early content was appropriate for the host customers in attendance but too simplistic for project developer participants, while the content presented later in the session was too complex for the customers but appropriate for the project developers.

Educational offerings by the PAs were a positive step in educating the market and providing a credible resource on the SGIP technologies and should be expanded in order to provide a credible resource on the SGIP technologies which will help overcome barriers of awareness and performance anxiety. Workshops or classes on all of the SGIP technologies, including wind and AES, should be offered. Separate classes should be offered for interested customers and the general public, and project developers, engineers, or architects, with the content of each tailored to each groups technical understanding and the type of information and support needed.

8.1.5 Industry Partnerships

In 2009, PG&E became a member of the California Stationary Fuel Cell Collaborative (CSFCC). The CSFCC is a public-private partnership working to advance the deployment of stationary fuel cells for distributed generation and other applications. ***Participation in industry associations like the CSFCC is an important and meaningful way for the PAs to become engaged with the industries that support the SGIP-eligible technologies***. Active participation facilitates an understanding of the issues facing the industry which will allow the SGIP to adapt to meet the industry's needs. Industry associations similar to the CSFCC should be identified for wind and AES.

8.1.6 Segmentation Strategy

The PAs have realized that the IOU customers with the potential to support wind, fuel cells, and AES are very site-specific and limited in number. Therefore, they have not pursued mass market outreach approaches for the SGIP. However, an opportunity exists to leverage IOU records to conduct targeted outreach to high-potential market segments. ***The PAs should leverage segmentation strategies and utility billing data to target high-potential wind and fuel cell customers.*** For instance, potential wind customers are usually located away from urban centers and wildlife habitats and have electric consumption high enough to support a medium-sized turbine, waste water treatment plants are good candidates for renewable-fueled fuel cells, and residential IOU customers with high electric usage are good candidates for non-renewable-fueled fuel cells.[73] Once high-potential customers are identified, targeted information on the Program or educational opportunities can be delivered. IOU account representatives can also

[73] The 2009 Market Report provides additional detail on customer characteristics.

make these customers aware of the opportunities for distributed generation and SGIP incentives.

8.2 Appropriate Marketing Approaches within the CPUC's Integrated Marketing Vision

The California Long-Term Energy Efficiency Strategic Plan[74] (Strategic Plan), adopted by the CPUC in September 2008,[75]"sets forth a roadmap for energy efficiency in California through the year 2020 and beyond."[76] Within the Strategic Plan, there is a vision for marketing, education, and outreach, (ME&O) that states that "Californians will be engaged as partners in the state's energy efficiency, demand-side management and clean energy efforts by becoming fully informed of the importance of energy efficiency and their opportunities to act."[77] In support of this vision, the CPUC is in the process of developing a California statewide ME&O brand and marketing plan. The foundation of the marketing plan is the Smart Energy Living (SEL) brand.

The ME&O marketing plan development began by developing a market segmentation strategy that identified five unique consumer segments. The segmentation strategy was conducted based on energy efficiency attitudes and behaviors within the residential and small commercial markets, so its applicability to the SGIP is limited. However, one possible opportunity exists to promote residential fuel cells within the "Leading Achievers" segment. Leading Achievers have several attributes that align with the characteristics of residential fuel cell adopters. Leading Achievers "are generally willing to reduce their energy use and are resource-minded, recycle regularly, and index highly compared to other segments on energy-related altruism."[78] In addition, 85 percent own their own homes and 16 percent have an annual household income of $150,000 or greater, though only five percent have an annual household income of $250,000 or greater. Leading Achievers are more likely to take action to adopt energy efficiency than the other four market sectors, but they already feel that they are "doing enough" to conserve energy. These factors present a unique opportunity to move this segment from energy efficiency to distributed generation.

The statewide ME&O program will span a three-year time horizon, from 2010 to 2012, and will feature the new brand energy efficiency brand and SEL marketing plan. The increasing popularity of self-generating renewables is one of five key elements predicted to act as potent catalysts in driving consumers to active involvement with their energy consumption and energy

---

[74] "California Long-Term Energy Efficiency Strategic Plan" California Public Utilities Commission. September 2008. http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf.
[75] CPUC Decision 08-09-040, September 18, 2008. http://docs.cpuc.ca.gov/published/FINAL_DECISION/91068.htm.
[76] Strategic Plan, page 1.
[77] Strategic Plan, page 80.
[78] Opinion Dynamics Corporation "Market Segmentation Findings" Memorandum to the CPUC. December 10, 2009. http://www.cpuc.ca.gov/NR/rdonlyres/9A3B6444-96AD-4A6D-A392-7588761C3A9D/0/OpinionDynamicsFinalSegmentationReport.pdf.

management. To support the ME&E campaign, an SEL Web portal (SEL Web Portal) will be developed. The SEL Web Portal will be designed to educate and inspire IOU customers to adopt Smart Energy Living through "information sharing and social networking around energy efficiency issues and practices."[79]

Several opportunities exist for the PAs to leverage the CPUC's ME&O plan to promote the adoption of residential fuel cells. Links to each PA SGIP Web site should be included on the SEL Web Portal along with a brief but compelling description of the SGIP. Content on residential fuel cells should be developed by the SGIP for placement on the SEL Web Portal. This content should include a description of the fuel cell technology, presented in non-technical terms, appropriate applications for residential customers, first and life-cycle cost information, maintenance requirements, and tips for a finding a project developer. The PAs can also utilize the social media components of the SEL Web Portal by providing questions for the site's polling feature and posting content on the message boards.

[79] "California Statewide Marketing, Education and Outreach Plan" PowerPoint presentation January 18, 2010.

Section 9. Conclusions and Recommendations

9.1 *Summary of Conclusions*

9.1.1 SGIP Participation

- Achievements of the SGIP include disbursing over $619 million in incentives for 348 MW of capacity since its inception in 2001 through December 2009. This represents 1,299 on-site generation projects, as follows:
  - 889 solar photovoltaic;
  - Four wind turbines;
  - 25 fuel cells (seven renewable-fueled and 18 non-renewable-fueled);
  - 234 IC engines (15 renewable-fueled and 219 non-renewable-fueled);
  - 138 microturbines (18 renewable-fueled and 120 non-renewable-fueled); and
  - Ten non-renewable-fueled gas turbines.
- Solar PV make up the largest number of Completed projects (68 percent) and the largest percentage of incentives (74 percent), but only 39 percent of installed capacity.
- Non-renewable-fueled IC engines constitute the largest installed system capacity (40 percent), but only 13 percent of requested incentives.
- Providing tiered incentives for projects sized between one and three MWs beginning in 2008 has led to an increase in the percentage of applications with system sizes greater than one MW.
- Host Customers, those with Active/Completed or Withdrawn projects, find three factors most compelling in the decision to participate: concern for the environment, utility bill reduction, and improving their image in the community. Specifically, Host Customers with Active/Completed projects ranked concern for the environment number one while Host Customers with Withdrawn projects ranked utility bill savings as number one.
  - This is similar to the 2007 survey which revealed the top three influencing factors for Host Customers to be utility bill reduction, concern for the environment, and improving their image in the community.
- Residential non-participating IOU customers indicated that utility bill reduction would be the most important factor, followed by a concern for the environment and energy supply independence. Non-residential non-participating IOU customers also found utility bill reduction to be the most important influencing factor, but reducing peak demand came in second and a concern for the environment was third.
  - Non-participating IOU customers in the 2007 Process Study also found utility bill reduction and a concern for the environment to be the top two influence factors

with peak demand reduction and wanting a backup electric supply tied for third. A desire for backup power seems to be falling in influence over time.

» For applications received in 2008 and 2009, residential customers were the dominant market sector with 50 applications (about 46 percent). The top four market sectors, which include public administration (ten applications and nine percent), manufacturing (eight applications and seven percent), water districts/sanitary services (eight applications and seven percent), account for 71 percent of the applications by number received in 2008 and 2009:

  - This is in sharp contrast to the 2007 Process Study when ten market sectors accounted for 78 percent of the applications, with manufacturing dominating.

9.1.2 Participant Experiences

» Overall, Program satisfaction is high (83 percent of survey respondents with Active/Completed projects were "satisfied" or "very satisfied" and 39 percent of Withdrawn projects).

  - Active/Completed Host Customer satisfaction is consistent with the 2007 Process Study, which found that 80 percent were "very satisfied" or "satisfied." However, Withdrawn Host Customer satisfaction is dropping. In 2007, 50 percent of survey respondents with Withdrawn/Rejected projects were "very satisfied" or "satisfied."

» At least 70 percent of all Host Customers with Active/Completed projects found the Program processes for which the Program Administrators have a direct influence to be "easy" or "very easy."[80] The processes cited as "difficult" and "very difficult" by the Host Customers with Active/Completed projects are those that are outside the direct influence of the Program Administrators and may require approval from local or state agencies or other utility departments.

» Consistent with the results of the 2007 Process Study, the current study found that 75 percent of Host Customers with an Active/Completed project report that an energy services company is involved with the application process. In 2007, this number was 80 percent across all Host Customers.

  - However, in the current survey, the 49 percent of Host Customers with Withdrawn applications managed the application process without the assistance of an energy services company, implying that the involvement of an energy

[80] Includes only responses that were not "not applicable," "don't know," or "no answer." The program processes for which the Program Administrators have a direct influence are "submitting a reservation application," "submitting proof of project milestone to the program," "submitting a claim incentive payment," "scheduling with the program administrator for the program's on-site inspection," "obtaining approval based on the program's on-site inspection," and "obtaining the incentive payment from the program."

services company in the application process may help influence a successful outcome.

» The 2009 Program timelines are not reasonable for the current SGIP-eligible technologies, which have complex and unpredictable project development cycles.

» Project developer attitudes toward Program changes shifted significantly since the 2007 Process Study when both developers and Host Customers indicated that frequent Program changes hampered their ability to move projects forward. In this round of interviews, project developers were generally positive about recent Program changes, specifically mentioning the streamlining of the application process, raising the incentive cap to three MW, and adding advanced energy storage. Host Customers did not mention Program changes as a project barrier.

9.1.3 Private versus Public Entities

» Public entities (38,608 MW) currently have more capacity in Active projects than private entities (19,212 MW). Private and public entities had a similar number of applications in 2007 (63 and 54, respectively); however, the number of public entity applications (ten and 14) was greatly reduced in 2008 and 2009 compared to private entity applications (46 and 37):

  - These trends are slightly different than those in the 2007 Process Study. In 2007, private entity applications seemed to be trending down while the number of public entity applications was increasing every year.

» Fifteen projects have been completed from applications submitted between 2007 and 2009. Of those Completed projects, three were with public entities (all in the non-profit sector) and 12 were with private entities.

» The majority of private (82 percent) and public (83 percent) entities with Active/Completed projects were "satisfied" or "very satisfied" with the SGIP. About two percent of private entities were "dissatisfied" or "very dissatisfied" with the Program compared to six percent of public entities:[81]

  - This finding is also in contrast with the 2007 Process Report where more than ten percent of private entities were either "dissatisfied" or "very dissatisfied," whereas just one percent of public entities felt that way.

» About 71 percent of private entity Host Customers and 77 percent of public entity Host Customers with Active/Completed projects have some involvement in the application process. However, private entities with Withdrawn projects are twice as likely as public entities to complete the process on their own.

[81] The confidence level/precision interval for the survey of Host Customers with active or completed Active/Completed projects is 90/10 for private entity values and is 90/11 for public entity values.

- These findings contrast those in the 2007 Process Study, where public entities were about twice as likely as private entities to complete the forms themselves, while private entities were about twice as likely to hire an energy services company to manage the application process.

» Between 2007 and 2009, there have been surges of applications in December for both public and private entities as Host Customers reserve Program funds before Program changes take effect in the following year. This is different from prior years when application surges occurred when the Program opened at the beginning of each year when the new Program budgets became available.

» Economic issues remain a dominant driver across times of both economic prosperity and downturn. In the current economic climate, social factors do not override economic realities in a customer's decision to install DG or renewable energy projects. Growing attention to climate change and environmental issues has resulted in modest increases in these issues as an influencing factor for Host Customers.

9.1.4 Lessons Learned

A review of the SGIP successes and shortcomings identified the following lessons:

9.1.4.1 Program

» Offering incentives for projects up to three MW has opened up the market to more customers.

» Program milestone requirements that are developed based on the information and documents readily available at each point in a project's development cycle simplify the application process for Host Customers and project developers.

» Providing a meaningful and efficient way for industry stakeholders to participate in the Program's administration can result in innovative Program changes.

» Being responsive to changes in technology and customer type can expand the SGIP's reach into new markets.

» Program requirements applicable to one technology can undermine other technologies if not properly vetted.

9.1.4.2 Marketing

» PG&E Web-based training for its account representatives was a positive step toward ensuring that IOU customers have a credible resource on SGIP-eligible technologies.

» The SGIP information and materials available on each PA Web site are an important resource for both IOU customers and project developers.

- Effective participation at conferences targeted at industry participants, such as equipment manufacturers and project developers, is an appropriate forum for promoting the SGIP.
- Educational offerings by the PAs were a positive step in educating the market and providing a credible resource on the SGIP technologies in order to overcome barriers of awareness and anxiety over technology performance.
- Participation in industry associations is an important and meaningful way for the PAs to become engaged with the industries that support the SGIP-eligible technologies.
- The PAs should leverage segmentation strategies and utility billing data to target high-potential wind and fuel cell customers.

9.2 Recommendations

- ***Adjust the Program timelines*** to make them more appropriate for the project complexities inherent in wind and fuel cell technologies and the changing business practices of private firms.
    - Wind projects have a much more complex development cycle and can encounter any number of legitimate delays which are difficult to predict. The fuel cleaning equipment for renewable-fueled fuel cell adds an additional layer of complexity to these projects. Both wind and fuel cells require custom built equipment that can take up to a year for delivery.
    - Private firms are more frequently requiring competitive bidding for capital projects to comply with the Sarbanes-Oxley Act of 2002.
- ***Maintain a tiered incentive structure for projects between one and three MWs***. The funding for these incentives should come from the regular Program funds and not be limited to roll-over funding, as this distinction has caused concerns by the project developers about the availability of funding for these projects.
- ***Monitor the new two-step application process for residential applications*** to ensure that it meets the needs of the residential customers and project developer and is workable for the Program.
- ***Consider removing the 30 kW minimum system size for wind and renewable-fueled fuel cells when the CEC's ERP ends in 2012***. Wind and renewable-fueled fuel cells sized under 30 kW are currently only funded through the CEC's ERP. However, the ERP is set to expire at the end of 2011 and would require a lengthy legislative process to extend. Removing the SGIP's 30 kW minimum for these technologies will provide continuity in incentive funding for small wind and renewable-fueled fuel cells and can be accomplished through a CPUC decision. If the SGIP institutes Program requirements for system monitoring, these requirements should be considered relative to the monitoring costs for these smaller projects.

- ***Consider requiring monitoring equipment on all projects***. Ideally, project monitoring systems have an interface that is easy for the customer to understand, allows them to track system output relative to forecasted output, and includes the capability to alert the customer or other responsible party if the system should fail.
    - The project developers interviewed indicated that most of the current SGIP systems are installed with monitoring equipment already so a new requirement should not result in an increase in system costs over the current costs. However, if the composition of the SGIP shifts to smaller projects, this recommendation might need to be re-evaluated.
    - If system monitoring requirements are added to the SGIP, any requirements to provide data to the Program should be carefully considered. Regular reporting, such as monthly or quarterly, may create a hardship to customers who already have many industry and regulatory reporting requirements. Customers and project developers may also be concerned that their incentives may be in jeopardy based on the reported production. Lastly, the PAs should consider whether and how this information will be used when considering regular reporting of data and be quite clear with project developers and Host Customers.
- ***Assign SGIP staff at each PA to project developers so they have a consistent point of contact,*** in much the same way account representatives work with commercial and industrial IOU customers.
- ***Continue refinements to the SGIP application process and annual clarifications to the Program handbook***:
    - Consider allowing application documents to be submitted electronically;
    - Layer key interconnection steps into SGIP process flow diagrams; and
    - Establish time frames for various milestones such as responding to inquiries, sending requests for additional information, delivering conditional reservation notice letter, reservation confirmation, and incentive claim form, and scheduling field verifications.
- ***Offer training similar to the PG&E's Web-based training for account representatives across PA territories.*** Similar training sessions should be developed for wind and AES.
- ***Effectively leverage content on the PA SGIP Web pages as a marketing or decision support resource:***
    - Additional content could include project success stories and information on the appropriate applications, costs, benefits, and maintenance requirements for each technology;
    - Expand PA technology and Program educational offerings, with separate offerings developed for customers and project developers with content appropriate to each.

- ***Maintain a presence at industry conferences, leveraging supplemental opportunities to support participation,*** such as placing advertisements in the conference brochure or providing speakers at conference breakout sessions. Similar conferences for wind and AES should be identified.
- ***Continue PA participation in industry associations*** as an important and meaningful way for the PAs to become engaged with the industries that support the SGIP-eligible technologies. Appropriate industry associations for wind and AES should be identified.
- ***Leverage segmentation strategies and utility billing data to target high-potential wind and fuel cell customers.***
- ***Establish a minimum funding level for SGIP marketing and outreach activities.*** Currently, the SGIP has a single budget category and funding level for Program administration, marketing, and outreach,[82] To ensure adequate expenditures for marketing and outreach activities, the CPUC could modify Decision 09-12-047 to create separate funding categories for administration, marketing, and outreach. The specific funding levels for each category should be developed based on administrative funding requirements and informed by similar funding levels in the CSI program.
- ***Leverage the new Smart Energy Living (SEL) brand, marketing campaign, and Web portal by:***
    - Adding links to the PA's SGIP Web sites;
    - Developing information on residential fuel cells; and
    - Utilizing the social media components of the SEL Web portal by:
        - Providing questions for the site's polling feature; and
        - Posting content on the message boards.

[82] CPUC Decision 09-12-047, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/111738.htm.

Section 10. Appendices

10.1 Appendix 1: Survey and Interview Guides

10.1.1 Program Administrator Interviews

SGIP Program M&E

Program Administrator Interviews

Interview Guide (FINAL 7/20/09)

Interview Date:

10.1.1.1 General introductory script

Acknowledge past evaluation interviews and related interactions/information provisioning. State that this interview will focus on issues associated with fulfilling the following key research objectives and prospective program improvements related to them:

1. Update the 2007 process evaluation and market characterization work, focusing on market barriers and PA program marketing;
2. Document factors associated with program and project successes and failures and how to address those to improve program and project success in the future; and
3. Identify potential new technologies to add to the program and how they could support the SGIP.

10.1.1.2 A. Background and Program Experience Since 2007 (previous evaluation)

1. What is your own history with the SGIP effort – please describe your role, tenure, and location.

Interviewee Name:

Interviewee Title:

Interviewee Organization and Dept.:

Interviewee's primary program role:

Interviewee's start date with SGIP PA office/length of tenure in SGIP PA role:

(If interview done with other staff):

Other Interviewee Name/Title/Role/Tenure:

Other Interviewee Name/Title/Role/Tenure:

Other Interviewee Name/Title/Role/Tenure:

2. Is there anyone else who supports the program who is not here? Include marketing department and account executives? Where are they located?

3. Since 2007, briefly summarize how your organization and its approach to the SGIP has evolved in relation to the changes in the program and general market conditions?
4. The SGIP's technology eligibility changes have been a critical factor affecting SGIP's operation. Aside from that and considering the markets and technologies currently eligible for SGIP, briefly summarize in your view what have been the key market, technology and programmatic issues (including changes) in the last two years that most strongly affect SGIP's performance?
   a. Markets:
      1) Host Customers
      2) Self-gen trades
      3) Technology
   b. Program:
      1) Program structure/design
      2) PA organization/management
      3) Administration
      4) Regulatory/legislative oversight

10.1.1.3 B. Program Design

Eligibility

5. What has the change in technology eligibility meant to your organization as a PA, in particular your effectiveness in meeting program goals? *[Re: cogeneration and non-renewable techs not being eligible after 2007, and the advent of the CSI]*
6. Are there other eligibility requirements that cause concerns or constrain the potential within the market, and, if so, what are those concerns?

CSI

7. What effect has the CSI had on the SGIP relative to the following…
   a. Your organization and staffing?
   b. Program budgets and goals?
   c. Program operations?
   d. What about the longer term, beyond next year?
8. Are people more aware of the SGIP because the CSI is so "publicized"? Or has it overshadowed the SGIP?
9. Landfill gas – is lack of on-site load still a problem preventing such projects?

10. What other technologies should be included in SGIP either currently available or on the horizon?
    a. Would the program rules or requirements need to change to accommodate them? (size restrictions, warranty requirements, etc.)

Incentive Structure

11. What has been the effect of the increased size cap for incentives (from one MW to three MW) on the number of SGIP projects?
    a. The type of project?
    b. The number of projects?
    c. The average size of project?
    d. Are you aware of projects initiated or built in 2008-09 that, because of the previous incentive cap, would not have otherwise?
    e. Do you think reducing the current three MW incentive cap back to one MW in 2010 will limit applications in the future? To what extent?
    f. What other issues related to size and change in the incentive's size cap are important to understand?
12. Aside from the increased size cap, have $ levels for currently eligible technologies been high enough?
    a. Do they need to be increased? e.g., higher % of first cost covered by incentives.
    b. How would an increase change the number and kW size of projects participating in the program?
13. Have you received or paid an application that included an additional 20% incentive because the technology was from a California supplier?
    a. How many?
    b. Did you have trouble determining the eligibility of the technology?
    c. Are there other problems with this additional incentive?
    d. What's the purpose? Reward the existing CA manufacturers or draw manufacturers into CA?
14. [ASK SCE & PG&E] Do you interact with your tariffs department:
    a. To develop or modify tariffs to better support the SGIP?
    b. To advise on the best, DG-friendly tariff for program participants?
    c. To provide advice to SGIP applicants as to tariff options that could support SGIP project development?
15. [ASK CCES & So Cal Gas] Do you interact with the utility tariffs department:

a. To develop or modify tariffs to better support the SGIP?

b. To advise on the best, DG-friendly tariff for program participants?

c. To provide advice to SGIP applicants as to tariff options that could support SGIP project development?

16. What pros and cons do you see for up-front, sized-based incentives versus some form of downstream performance-based incentive?

    a. Please discuss for wind and fuel cells.

    b. Are developers and Host Customers warming to the concept of performance-based incentives? [Is the market of self-generation providers becoming less dependent on incentives?] Why or why not?

17. What other concerns or successes have there been regarding incentives, including disbursement and related administration processes?

Application process, including fees

18. Has the application process been a significant barrier to participation and, if so, how?

19. Have you had the need for a waiting list (recently/since PV went to CSI)?

    a. Are there concerns regarding the wait list process?

20. Have you had any projects that needed an application fee (since the change was made/since PV went to CSI)?

    a. Do you think it's been effective at achieving its purpose?

21. Has there been any integration of the program application process with the interconnection application process?

22. Are there other important issues concerning the application process that your organization has encountered?

    a. How have you handled those?

    b. Are these unique to your situation or have you seen them crop up with other PAs?

23. For solar, cogeneration and non-renewable tech projects started prior to CSI and SGIP eligibility changes (solar to CSI, cogeneration and non-renewable techs disqualified), have there been notable problems in getting those projects completed? What have those been?

Project verification and quality assurance process

24. Is there anything unique about your verification requirements that has helped your process be particularly efficient?

25. What percent of projects don't pass the verification on the first inspection?

    a. For which reasons?

    b. What usually is needed to remedy?

26. What other verification or quality assurance process issues have you encountered?
    a. Are these unique to your PA situation and market?
    b. How have you addressed those issues?
27. What could be done to improve the verification process?

Grid interconnection

28. What technical requirements have been problematic? How has your organization handled those problems? Any change in the last two years (for better or worse)?
29. Have you assisted applicants in meeting IC requirements? If so, how would you rate these efforts? Successful, partially successful, unsuccessful? *[Ask for specifics of what they have done, if anything.]*
30. What concerns do you have regarding overlapping interconnection verification requirements with other project verification requirements?
    a. How has your organization handled those concerns?
    b. Any change in the last two years (for better or worse)?
31. What other grid-related issues have been problematic? How have those been resolved by your organization? Any change in the last two years (for better or worse)? *Probe per last evaluation:*
    a. Interconnection process: consistency, gaps and overlaps (e.g., inspection overlaps)
    b. Disconnect switch confusion/redundancy
    c. Inter- and intra company coordination
    d. Sufficient budget for IC process
    e. IC agreements
32. *[ASK PG&E & SCE]* What interactions have you had with your internal interconnection department in resolving SGIP applicant interconnection issues in the last two years? How has this relationship evolved over the last two years? *[Ask for specifics of what they have done.]*
33. *[ASK CCSE & SoCalGas]* How have you worked with the local electric utility's interconnection office to resolve interconnection issues for SGIP applicants? How has this relationship evolved over the last two years? *[Ask for specifics of what they have done.]*

System Performance

34. Let's discuss system performance, including failures and removals. What factors do you see affecting system capacity factor performance?
    a. What are the primary reasons for systems failing?
    b. What are the primary factors affecting systems' capacity factors? (Pertains to evidence that capacity factors are declining)

c. Are you aware of specific sites where systems are known to have been removed or the system shut down? What are the primary reasons for removals or shutdowns? What might be done to reduce those instances?

35. Do you think metering or monitoring should be required on any/all projects? Which ones?
    a. What would the requirement be? What access would the program have to the output?
    b. What do you think the additional cost would be?
    c. What would the benefits be? To whom?
36. Are there any other changes to the overall program design that are planned for the future years of the program that you think need to be considered?

10.1.1.4 C. Organization, Cost Drivers and Management

Staffing

37. Has there been a change in program staffing? Did previous SGIP staff migrate to the CSI? Were they replaced?
38. Do you have enough people to effectively administer the program? Why not?
39. Are there functions/departments where closer coordination would be helpful (e.g., legal, interconnection)?

Budget

40. We've noticed a difference in the way administrative and marketing costs are allocated in your budget.
    a. What prompted this change?
    b. Are more changes/flexibility needed?
41. How do you allocate your budget amongst labor, marketing and outreach, and administration?
42. What would you do with the money if the budget were to <u>increase</u>? Where would you take it from if the budget were <u>decreased</u>?
43. *[For SDG&E and CCSE…]* How do you split the SGIP budget between SDG&E and CCSE?
    a. To what extent has there been budget duplication to handle overlapping program functions (i.e., project reviews, field support) between CCSE and SDG&E?
    b. How have you coordinated with [SDG&E, CCSE] to minimize your combined costs?
    c. What concerns do you have regarding any duplication of functions and costs between the two organizations?

Cost Drivers

44. What factors make program costs most volatile, that most affect administrative cost/project or cost/kW?
45. How does your organization manage controllable cost drivers to ensure you stay within the program budget?

10.1.1.5 D. Program Operations

Marketing and Outreach

46. Review materials and plans provided and discuss for each:
    a. Do you think they've been effective/successful?
    b. Are these strategies unique to your organization?
47. Are there marketing and outreach strategies or tactics you would like to use, but have not used to promote the program?
    a. Why have you not yet tried those strategies or tactics?
    b. What other resources would you need to implement these?
48. How has your organization used electric utility account representatives or others in any of the utilities to market/promote the SGIP program? *[Request details on what was done and what worked/didn't work if preceding question is answered positively.]*
49. *[If not mentioned yet]* In what ways do you target particular market segments of project developers, Host Customers or others in your marketing and outreach efforts?
    a. How successful has this been?
    b. Which market segments have been most responsive? Least responsive?
    c. Areas for improvement?
50. In what ways do you target particular technologies in your marketing efforts?
    a. How successful has this been?
    b. Areas for improvement?
51. Are you aware of the CPUC's integrated marketing vision?
    a. Does your current marketing strategy support this vision?
    b. What changes could you make to support this vision?

Technical and Program Support

52. What support do you provide to help projects through the program process? (Technical, application process, or training?)
    a. To customers?

b. To developers?

53. What problems have arisen in your organization's efforts in providing technical or program support to developers and Host Customers?

    a. How has your organization handled those problems?

    b. Are there particular successes your organization has had in overcoming technical support problems?

Project Developers and Installers

54. What are the most important characteristics of good project developers/installers? What are the most important characteristics of poor developers/installers?

55. What are the key lessons you have learned in dealing with developers and installers?

Administrative Operations

56. What changes have been made to the project advancement requirements or milestones in the last two years?

    a. Why were these changes made?

    b. Have the changes been successful?

57. What current issues do you see concerning project advancement requirements?

    a. Do you see any differences by customer type? State or local government, non-profit, private?

58. Roughly, what fraction of project applications in the last two years have not been completed within their required advancement requirements?

    a. What fraction of those incomplete projects were Withdrawn/Rejected but then re-started as "new" projects subsequently? Why are those being withdrawn?

    b. What fraction have been suspended while various requirements are being satisfied? Why are those being suspended?

    c. Of the projects being rejected, what are the reasons for their being rejected?

    d. *[If not already mentioned]* Are requests for extensions to advancement requirements increasing or decreasing, and to what do you attribute that trend?

        1) *[If increasing numbers of extensions]* What concerns do you have about this trend, and what actions is your organization taking to address the situation?

59. What unique approaches does your organization employ to minimize projects being withdrawn, suspended or rejected? What makes those approaches effective?

60. For projects in your PA territory, what project milestones have been the most problematic for developers and Host Customers to meet?

a. In what ways has your organization worked to successfully overcome those milestone difficulties?

b. Are there intractable difficulties in the project development process that have prevented timely completion of projects? What are those and why do they seem intractable?

61. What difficulties have you had with the incentive disbursement process?

a. What has your organization done, that's unique, to improve the incentive disbursement process? Why has that been more effective than other solutions?

62. What concerns have you had to address regarding program participation tracking and reporting (including Statewide Program Compliance database to avoid inter-program/utility incentive overlapping, and actions to prevent incentive overlaps)?

a. What has your organization done, that's unique, to improve the tracking and reporting process?

b. Why has that been more effective than other solutions?

Program Modification Guidelines

63. How many program modification requests have you received since the most recent changes? From whom and for what? What was the outcome?

a. Does the process work well for the PAs? (either the old or new)

b. What are the shortcomings?

c. What works well?

d. What can be improved?

64. How has the PMG process worked for the various market actors, in your opinion? (either the old or new)

a. Are most aware of the opportunity/process?

65. Has the current definition of Advanced Energy Storage prevented other vendor systems besides VRB from qualifying for the program?

a. What aspects of the definition are problematic?

b. What manufacturer(s)?

10.1.1.6 E. Regulatory and Legislative Oversight

Let's discuss federal, state, and local policies that could affect the market for and availability and acceptance of any of the SGIP technologies in CA.

Feed-inTariffs

66. How are the two feed-in-tariffs (at PG&E it's schedule E-PWF for W&WW facilities and e-SRG for small generators) effecting the SGIP participation:

a. Are you aware that customers are opting for these FiTs rather than the SGIP?

b. How many/often? Specific customers?

Permitting and Siting

67. Are you aware of any city and county zoning ordinances or building construction regulations (building codes, construction and operating permits, etc.) within CA that make projects difficult to install?

    a. How many/often? What circumstance?

    b. What jurisdictions?

    c. Were these barriers overcome? How?

    d. Did the PAs have a role in the solution? What can the PAs do in the future to overcome?

    e. Have you heard about solutions outside of your territory or CA?

68. Are you aware of any homeowner association CC&Rs within CA that make projects difficult to install?

    a. How many/often? What circumstances?

    b. Where?

    c. Were these barriers overcome? How?

    d. Did the PAs have a role in the solution? What can the PAs do in the future to overcome?

    e. Have you heard about solutions outside of your territory or CA?

Emissions (Fuel Cell and CHP only)

69. Do fuel cells have to meet local permitting requirements or do you have to use CARB-certified fuel cells?

70. Are you aware of issues that applicants have had applicants in meeting local air quality regulations?

    a. How many/how often? What circumstances?

    b. What regulations?

    c. Were these barriers overcome? How?

    d. Did the PAs have a role in the solution? What can the PAs do in the future to overcome?

    e. Have you heard about solutions outside of your territory or CA?

71. Do you have any particular concerns regarding various aspects of CPUC oversight in terms of program design or rule changes [Per last evaluation, CPUC oversight/decision process seen as being a constraint on market and program dynamics (e.g., calendar-year cycle stacks

program changes with many other year-end regulatory requirements, yet project schedules don't run on a calendar-year basis.]

Other Functions

72. Do you have any comments on other program functions we haven't discussed that you'd like to offer? (Such as project tracking requirements and how this function has evolved over time.)

10.1.1.7 F. Other Issues

73. What have you seen as being the most significant barriers to technology adoption?
74. What are the most significant barriers to program participation? (If different than above)

Program Goals

75. Should the SGIP have annual goals or targets?
    a. If so, what would the structure be? Capacity? # of applicants?
    b. One what would the goals be based?
    c. Who should be responsible for setting these goals?
76. What technology trends – costs and availability, including sales and service – do you see over the next several years that could significantly affect the SGIP as it is currently designed and for the technologies it addresses?

[Ask CCSE] – Follow-up to the last evaluation's finding that the organization's identity was being misperceived] In the last two years, how has the perception of the CCSE evolved – are there still misperceptions regarding association with SGG&E or a government agency? Other identity concerns?

77. Are you aware of other similar programs for wind and fuel cells outside of CA? Which ones?

10.1.1.8 G. Lessons Learned & Conclusion

78. What is your view of whether the SGIP has significantly transformed the energy services market for wind and fuel cells?
    a. For example, has the number and capabilities of energy services companies increased, and are energy service companies who develop SGIP-types of projects becoming less reliant on the program for such projects?
79. In closing, what are the key lessons learned for your in the program, that you think ought to be considered in future program developments?
    a. In particular, are there aspects of your organization and its approach to administering the program that you feel have been uniquely effective in influencing program awareness and participation, and also cost-effectiveness?

b. Are there particular barriers to applying on a statewide basis any such unique approaches to program administration your organization has employed?

80. Any other last thoughts?

10.1.2 CEC and CPUC Staff Interviews

SGIP Program M&E

CEC/CPUC Staff Interviews

Interview Guide (8/6/2009 FINAL)

Interview Date:

Primary Interviewee Name:

Primary Interviewee Title:

Primary Interviewee Organization and Dept.:

Primary Interviewee's primary program role:

Other CEC or CPUC staff:

Other Interviewee Name/Title/Role:

Other Interviewee Name/Title/Role:

Other Interviewee Name/Title/Role:

10.1.2.1 Introduction/Background

The interview will take 30 minutes to one hour.

The purpose of this interview is to identify the issues, concerns and opportunities CEC/CPUC staff think are important for the SGIP, particularly since 2007. From their perspective as regulatory staff, what has been effective about the program and what hasn't been effective, considering all the dimensions of the program including the various markets the program is trying to influence, the program's design, its operation by the various PAs, how well the regulatory process has worked in overseeing the program and other matters that CEC/CPUC staff think are important to address as the program evolves in relation to other DSM program developments in California. [Note: if same staff interviewed in 2007 evaluation, review the notes from that interview prior to the current interview. Acknowledge previous interview and advise the interviewee to focus on program issues from the regulatory perspective that have been most important in the last two years.]

1. Please describe your history as CEC/CPUC staff with the SGIP:

a. How long have you been assigned to handle it?

b. What's been your role on the Working Group?

c.What has been your level of participation with the Working Group?

d. How well did you develop your knowledge of the program and all the market actors involved, such that you can do your oversight job effectively? (on a 1-5 scale, 1=Not well at all…5=Extremely well)

[CEC only] What is your involvement with the ERP?

How is it going? What has been the volume of applications?

2. Are there any tools or additional information that would help you as a regulator involved with the program?

3. Program Design and PA's Program Planning. In light of your experience with the SGIP, please provide your perspective on the following aspects of the program's design and the various PA's planning to implement it. Specifically consider what strengths and weaknesses do you see that are critical to the program's success or failure, and also, what you think would be appropriate changes that would either improve the program itself in various ways, or improve your effectiveness as regulatory staff?

3.a. Eligibility

What effects has the CSI had on SGIP, aside from the obvious shift of PV technology to CSI? Will there be further changes to the CSI in the next two years, and what will those do to the SGIP?

What strengths, weaknesses and potentially positive changes in eligibility rules have you seen in the last two years?

a) What do you see going forward?

Are there particular eligibility rules that currently are of concern to you as a regulatory staff person, such as project sizing constraints, technology categorizations, etc? What are those and why are they a concern? What resolution do you see that would mitigate the concern?

Are you aware of other technologies that should be included in the SGIP?

3.b. Incentive Structure

In what ways do you think the incentive structure of the program has affected the program's achievements, either positively or negatively, and why do you think that?

Specifically, please discuss your thoughts on the effect of the increased size cap on system rebates, including the partial incentive structure after one MW?

Are there any aspects about the program's incentive structure that present problems or have been particularly successful?

What incentive developments would make for more efficient regulatory oversight?

Do you think the SGIP should move to a performance-based incentive structure?

Why or why not?

Would this result in changes to the type or number of projects applying to the program?

On a related matter, do you have a sense as to how has project financing being available (or not) affected SGIP participation?

3.c. Application Process

What, if any, difficulties with the program's application process have you noted from your perspective as a regulatory staff person – does the application process present any major barriers to prospective project developers and customers?

Have you had to deal much with the application process of any of the PAs, in terms of handling complaints or procedural problems that get escalated to the CPUC? If so, has handling those situations been a major or a minor regulatory concern?

3.d. Verification and Quality Assurance

What, if any, difficulties with the program's verification process have you noted from your perspective as a regulatory staff person – does the verification process present any major barriers to project developers and customers?

Has the CPUC had to become involved with any particularly difficult cases where verification was problematic and customers, developers or PAs were at significant odds regarding the procedures or outcome of the verification process? If so, what resolution was achieved and what insights for the future might be gained from the experience?

3.e. Grid Interconnection

What grid interconnection issues have you had to deal with for SGIP projects, and how have those been addressed?

What outstanding interconnection issues are there that still need to be addressed from your regulatory perspective in order to further streamline the program or otherwise help it be more successful?

Are there regulatory overlaps regarding interconnection that you think need to be addressed and, if so, where do those exist and what do you think should be done to address them?

3.f. Developer and Host Customer Relations

As regulatory staff, are you noting any particular PA, developer or Host Customer relations issues that need to be addressed? What are those and what thoughts do you have about resolving those?

From a regulatory perspective, what are the traits of the better PAs? And those of the better developers and installers?

3.h. PA Staffing

Do you think PAs have staffed the program effectively, or are there areas where you think any of them could improve their staffing – whether organizationally or in professional and technical skills?

3 i. Program Goals

What are the program goals of the SGIP?

Do you think these need to be changed? What should they be?

Should the PAs be given a performance goal for the SGIP?

How would this be structured?

What should be the implications of meeting or not meeting the goal?

4. Program Implementation. Next, let's discuss the program's implementation: PA's marketing and outreach efforts, and their administration of the program. Again in light of your experience with the SGIP, please provide your perspective on those aspects of the program. As with the design and planning discussion, tell me two things about your perspective on the program's implementation: first, what strengths and weaknesses do you see that are critical to the program's success or failure, and second, what you think would be appropriate changes that would either improve the program itself in various ways, or improve your effectiveness as regulatory staff overseeing the program's implementation?

4.a. PA Marketing and Outreach

Do you think the PAs are effectively marketing the SGIP?

Do you think it's the PA's role to actively market the SGIP?

What marketing and outreach strategies either are not being utilized that should be, or are being used that should be changed or stopped? Why is that?

How might PAs better intervene in the market to facilitate project developments?

5. Regulatory Issues Considering the discussion so far, I'd like to explore the key regulatory issues associated with the program, whether at the legislative level, the CEC/CPUC level or other regulatory contexts such as emissions regulations and project permitting.

What regulatory issues have had the greatest impact on the program historically?

What regulatory issues do you see being critical to the program's success or failure in the future, and why do you think those are critical?

How has the CSI affected regulatory oversight of SGIP?

What do you see the direction of future legislative and regulatory directives, including continuation of the CSI, being such that SGIP would be significantly affected?

What are the key national, regional or local regulatory issues you see that have impeded the SGIP in the past or could do so in the future?

Probe specifically on: CA feed-in tariffs, latest CARB, AB32 and REC developments.

How do you think they have affected SGIP in the last two years?

How do you see them affecting SGIP in the next two years?

[If not yet mentioned] What about emissions regulations and permitting: what issues in the past two years have arisen, and how resolved? Issues seen for the next two years?

[If not yet mentioned] And for self-generation construction and operational permitting: what issues in the past two years have arisen, and how resolved? Issues seen for the next two years?

[If not yet mentioned] Reliability compliance requirements (CHP projects in particular): what issues in the past two years have arisen, and how resolved? Issues seen for the next two years?

Please describe your thoughts regarding the Program Modification Guideline process: has it worked as intended?

What aspects of the PMG process work well, and how is they work well?

What aspects of the PMG process need improvement, and in what ways might they best be improved?

What about PMG accommodation for innovative technologies such as advanced energy storage – what are your thoughts on how the PMG should evolve to address future technical and market developments?

What changes ought to be made to improve the regulatory process for programs like SGIP?

Has SGIP required a relatively greater or lesser effort from you as a regulatory staffer than other programs, considering the programs' size, budget, etc?

How has the CSI affected your organization in relation to SGIP, and has that changed significantly since 2007?

What do you see as being the key regulatory lessons learned from oversight of the SGIP?

6. General Market Developments. Stepping back from the program's implementation and regulatory perspective, let's talk about general market developments – the broader context within which the program has operated and which affects the program in various ways, and how the market should be characterized.

SGIP to some customers may seem like going into the utility business, which they don't see being appropriate to their business. Thus, they may have an aversion to the program from that perspective: "It's not my business to produce electricity; that's what utilities are for." Do you see this issue being a significant barrier to program participation? In

what ways do you think so, or not, and what importance do you think this issue has for the program's future market potential?

Is the self-generation market transforming yet, such that manufacturers, equipment suppliers and contractors, energy service companies and Host Customers are beginning to understand and participate in the self-generation market without the sort of program SGIP has been historically?

If not, where do you see the market at this point with regard to its transformation to support a self-generation industry?

Are there geographic or other regional differences that affect SGIP that should be addressed but are not being adequately addressed at this time?

What are those and how should such differences be addressed in the program's regulatory oversight?

Are there any other general market developments (barriers or opportunities) you see affecting SGIP's program structure or participation (vs. program-specific developments)?

What are those and from a regulatory perspective, how might the barriers be minimized and opportunities be exploited?

[Probe: technical including installation barriers, economic barriers, business/risk barriers]

7. Other Issues/Close

What are your expectations for SGIP's future?

Are you aware of other programs in other jurisdictions that are similar to the SGIP?

Do you have any closing thoughts on issues we haven't discussed here?

10.1.3 Participant Survey Active

PG&E SGIP Program M&E

Host Customer Survey (Active/Completed Projects)

Survey Guide (08/29/2009)

SGIP ID:

a. Respondent's name

b. Respondent's title (if a business)

c. Firm/Organization name (if a business)

d. Phone No.

	Date	Time	Contacted			Comments
1						
2						
3						
4						
5						
6						
7						

Num of Calls _____Num of Contacts: _____

*Comments:*_____
_____
_____
_____

INTRODUCTION

Hello, this is _____ and I'm calling from **[Name of Survey Firm]**. We are have been hired to help evaluate California's Self-Generation Incentive Program. We understand you submitted an application to this program, and we would like to ask you some questions about your participation. May I please speak with **___[CONTACT NAME]_____**?

If [CONTACT NAME] no longer works for the organization *[if residential,* no longer lives there*]* or will not be available during the survey period:

Could I please speak with a person such as the facility manager, building manager, operations manager or chief engineer ***[if residential,*** the person***]*** who would be knowledgeable about your ***[if a business,*** organization's***]*** participation in the Self-Generation Incentive Program?

Once contact is on the phone:

S1. **Repeat Intro (above)**

Are you the person most familiar with your ***[if a business***, organization's***]*** participation in the program? I'd like to obtain your views on the Program based on your experience to date. This survey is for research purposes only, and will not affect your application status in the program or the incentive you will receive.

Yes _____ **(CONTINUE)**

No _____ **(ASK FOR APPROPRIATE PERSON; RECORD NAME, TITLE, AND PHONE NUMBER; AND REPEAT S1)**

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:

Dale Smet

dsmet@semprautilities.com

213-244-3777

PG&E:

Matt Heling

Mgh9@pge.com

415-973-6996

SCE:

Jim Stevenson

James.stevenson@sce.com

626-633-4888

CCSE:

Ryan Amador

Ryan.amador@energycenter.org

858-244-7283

S2. **[IF RESPONDENT STILL REFUSES SURVEY, ASK IF YOU MAY HAVE THE REASON FOR REFUSAL – TO DOCUMENT NON-RESPONSE BIAS, THANK AND TERMINATE]**

_____

Background

Q1. First, I'd like to confirm some basic information regarding your application. **[Pre-fill fields from project database wherever possible and then confirm.]**

a. Respondent's name_____

b.Respondent's title [if a business]

_____

c. Firm/Organization name [if a business]

_____

d. Physical address where project is located_____

e.Primary business activity at this site [if a business]

_____

f. Technology employed___ [1. PV, 2. wind, 3. fuel cell, 4. microturbine, 5. reciprocating or internal combustion engine, 6. gas turbine, 7. advanced energy storage]

g. Does the system use ___ renewable or ___ nonrenewable fuel?

h. Applicant (if different than Host Customer)

i. Electric utility _____

j. Natural gas utility _____

k. Program administrator _____

l. Zip code where project is located: _____

Note that all references to the Program in this survey refer to the Self-Generation Incentive Program.

Q2. Is your self-generation program administrator and your electric supplier one and the same?

Yes 1

No 2

Don't know 3

Program Awareness, Satisfaction, and Process

Q3. How did you first learn about the incentives that were available to you through the program? (ASK OPEN ENDED; PROMPT WITH LIST IF NECESSARY; RECORD ALL THAT APPLY)

a. Utility representative 1

b. Regional Energy Office 2

c. Equipment/system dealer/vendor 3

d. Other users of on-site generation systems 4

e. Magazine or newspaper article 5

f. Other media (e.g., TV, news press releases) 6

g. Professional publications 7

h. Government agency (CPUC, CEC, or DOE) 8

i. Internet search/web site 9

(Specify:_____)

j. E-mail notice or advertisement 10

(Specify:_____)

k. Other 11

(Specify:_____)

Don't Know or Can't Recall/Refused 88/99

Q4. On a scale of one to five, with five meaning "Very important," one meaning "Not at all important," and three meaning "Neutral," how important was the availability of rebates from the program in deciding whether to go forward with this project?

Not at all Important			Very Important	
1	2	3	4	5

Q6. Which of the following three scenarios best describes your involvement in the project?

We complete and submitted all forms ourselves, and have direct contact with the program administrators 1

An energy service company, contractor, or some other party is completing and submitting forms, but we are closely involved with the project application 2

An energy service company, contractor, or some other party is completing and submitting forms without much help from us 3

Q7. Please rate your overall satisfaction with the program on a scale of one to five, with five being "very satisfied," and one being "very dissatisfied."

Very Dissatisfied		Very Neutral		Satisfied
1	2	3	4	5

Q8. For the next couple of questions we would like to learn more about the level of ease associated with the application process and the on-site generation project itself. Please rate each aspect where "5" means "Very Easy" and "1" means "Very Difficult." If you cannot rate an aspect, either because you have not reached that stage of the project yet or because a contractor or 3rd party handled that aspect for you, please say "Not Applicable." **[ASK a-q FOR ALL TECHNOLOGIES. ASK (r) for all projects EXCEPT PV. ASK (s) for ONLY non-renewable fueled technologies.**

START RATING

a. Identifying the right end-use or process energy application for on-site power generation at your facility (e.g., have process heat requirements or want to reduce billing demand with on-site self-generation)..... ....._____ N/A

b. [If business] Making the business case/[If residential] Justifying the project....._____ N/A

c. Choosing the technology that best fits in with your facility [if residential, your home's] operations (e.g., waste heat utilization from cogeneration, or using PV to offset purchased utility power) _____ N/A

d. Choosing an energy services company or contractor ....._____ N/A

e. Financing the project....._____ N/A

f. Submitting a reservation application....._____ N/A

g. Obtaining the equipment from the manufacturer....._____ N/A

h. Submitting proof of project milestone to the program....._____ N/A

i. Obtaining any necessary building or siting permits....._____ N/A

j. Obtaining the necessary insurance ....._____ N/A

k. Installing the equipment ....._____ N/A

l. Achieving reliable operation ....._____ N/A

m. Working with the electric utility to connect your unit to the utility grid ....._____ N/A

n. Submitting a claim incentive payment ....._____ N/A

o. Scheduling with the program administrator for the program's on-site inspection _____ N/A

p. Obtaining approval based on the program's on-site inspection....._____ N/A

q. Obtaining the incentive payment from the program....._____ N/A

ASK (r) for all projects EXCEPT PV

r. Obtaining any necessary air quality permits....._____ N/A

ASK (s) for ONLY non-renewable fueled technologies

s. Meeting the waste heat requirements for the project....._____ N/A

Ask Q9 for anything rated one or two on Q8

Q9a to Q9s. What made **[INSERT APPROPRIATE a-s ITEM FROM Q8]** difficult?

_____

_____

_____

_____

Q10. Were there any unnecessary delays in the on-site generation project or the program application process?

Yes1

No 2 **SKIP TO Q13**

Q11. At what part of the process did this delay occur? Any other parts of the process? **[Prompt with stages from Q8 as necessary. Record all that apply.]**

Ask Q12 for delays identified in Q11

Q12a to Q12s. In your view, who was primarily responsible for this delay (these delays)? **[DO NOT READ LIST; probe for each process delay cited]**

The program administrator.....1

Your energy services company or contractor2

Your firm or organization.....3

The equipment manufacturer 4

The electric utility's interconnection department 5

The permitting agencies (air, building, etc.)6

Other 7

(Specify:_____)

Don't Know/Refused.....88/99

Economics, Status, Performance, and Success of Self-Gen Project

READ: Throughout the remainder of the interview, any reference to "the equipment" refers to the on-site generation equipment installed (or being installed) under the program.

Q13. Who owns the equipment or will own it once/(now that) it is operational?

Self/Customer 1

Installation contractor / ESCO / maintenance firm..... 2

Other..... 3

Vendor until system is paid off..... 4

(Specify:_____)

Q14. Who will handle maintenance and repair for the equipment once it's completed (or who DOES handle it, for completed projects)?

Self/Customer 1

Installation contractor..... 2

Maintenance firm 3

Other..... 4

(Specify:_____)

Q15. How long do you expect it to take this system to pay for itself?

6 months or less..... 1

1 year 2

2 years 3

3 years 4

4 years 5

5 years 6

6 – 10 years 7

More than 10 years..... 8

Don't Know/Refused 88/99

Q16. Has the on-site generation unit for which you applied to the program begun operating?

Yes 1

No 2 **SKIP TO Q19**

Q17. Has it operated reliably?

Yes 1

No..... 2

(1) **[If NO]** What problems have arisen?_____)

Q18. How has the output of the unit, in kWh per month, compared to your initial expectations for the system?

Below expectations..... 1

Meets expectations..... 2

Above expectations..... 3

Don't know..... 4

Q19. How has the amount of time actually spent on operations and maintenance of the equipment compared to your initial expectations for the system?

Below expectations..... 1

Meets expectations..... 2

Above expectations..... 3

Don't know..... 4

Q20. Did you experience any unexpected problems upon system start-up?

Yes 1

(Specify:_____)

No 2

Q21. Have you experienced any unexpected maintenance problems with this system?

Yes 1

(Specify:_____)

No 2

Q22. How frequently is (or will be) routine maintenance conducted on this system?

Weekly.....1

Monthly.....2

Bi-monthly.....3

Semi-annually.....4

Annually.....5

Other.....6

(Specify:) _____

Drivers and Barriers to Self-Generation

Q23. Please indicate on a scale of one to five, where five is very influential, how much each of the following factors influenced your decision to purchase and use the on-site generation technology you chose. **(Rotate response options. Record one response for each factor)**

Factor	Rating				
a. Wanted to reduce utility bills	1	2	3	4	5
b. Wanted to reduce our peak demand	1	2	3	4	5
c. Wanted a backup system to improve the overall reliability of our electricity supply	1	2	3	4	5
d. Concern for the environment **[ask d.1) immediately after d]**	1	2	3	4	5
1) And more specifically, concern about **climate change**	1	2	3	4	5
e. Energy supply independence	1	2	3	4	5
f. Improve our image in the community— green marketing	1	2	3	4	5
g. Provide technical demonstration	1	2	3	4	5

Q24. **[Ask only for PV projects]** In 2007 and beyond PV systems over 30kW have been funded through the California Solar Initiative (CSI). Based on what you have heard about the CSI, do you think the CSI program will be an improvement on the prior program for PV?

a. Yes…..
……..1

(1) Why do you think so?) _____

b. No.....2

(Why do you think not?) _____

c. Don't know.....3

Q25. **[Ask only for PV projects]** Why did you not shift your project to the CSI?

_____

Q26. Which of the following would be significant barriers to your organization installing additional on-site power generation? **(Read list; choose all that apply)**

No additional loads to be served 1

Natural gas prices 2

Equipment prices 3

Experience with the current system 4

No more space/room for generation 5

Environmental concerns.....6

Difficulty in working with utility 7

Other 8

(Specify :_____)

[ONLY RECRUIT NON-PV PARTICIPANTS FOR IN-DEPTH INTERVIEWS]

This concludes all the questions that I have we want to thank you for your time and consideration. We would like to invite you to participate in a more in-depth, follow-up interview that would be more like a conversation than a formal survey. This interview would last about 25 minutes and it will be conducted by an analyst with Navigant Consulting, one of the firms participating in this research. It would be conducted in the next few weeks at your convenience. In recognition of the additional time commitment, we'd provide $100 in compensation once the interview is complete. [If they indicate that they are not able to take

monetary compensation, indicate that we would provide a $100 donation to the charity of your choice.]

May we schedule you for this follow-on interview?

Yes 1

No 2 **Thank and terminate**

Yes, but I can't commit to day & time 3

THANK RESPONDENT FOR THEIR TIME TODAY AND THEIR AGREEMENT TO DO AN IN-DEPTH INTERVIEW

Schedule appointment for interview. Verify:

Date and time (PDT),_____ Phone No._____ & Email address_____

10.1.4 Participant Survey Rejected

PG&E SGIP Program M&E

Host Customer Survey (Withdrawn/Rejected Projects)

Survey Guide (08/29/2009)

SGIP ID:

a. Respondent's name

b. Respondent's title (if a business)

c. Firm/Organization name (if a business)

d. Phone No.

	Date	Time	Contacted			Comments
1						
2						
3						
4						
5						
6						
7						

Num of Calls _____Num of Contacts: _____

*Comments:*_____
_____
_____
_____

Introduction

Hello, this is _____ and I'm calling from [Name of Survey Firm]. We are have been hired to help evaluate California's Self-Generation Incentive Program. We understand you began to participate in this program but that the project submitted was either Withdrawn/Rejected. We would like to ask some questions about your participation. May I please speak with **___[CONTACT NAME]_____**, the person we show as being the contact for the program and your project?

If [CONTACT NAME] no longer works for the organization [if residential, no longer lives there] or will not be available during the survey period:

Could I please speak with a person such as the facility manager, building manager, operations manager or chief engineer ***[if residential,*** the person***]*** who would be knowledgeable about your ***[if a business,*** organization's***]***participation in the Self-Generation Incentive Program?

Once contact is on the phone:

S1. **Repeat Intro (above)**
Are you the person most familiar with your ***[if a business,*** organization's***]*** participation in the program? I'd like to obtain your views on the Program based on your experience to date. This survey is for research purposes only, and will not affect your status in the program.

Yes _____ **(CONTINUE)**

No _____ **(ASK FOR APPROPRIATE PERSON; RECORD NAME, TITLE, AND PHONE NUMBER; AND REPEAT S1)**

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:
Dale Smet
dsmet@semprautilities.com
213-244-3777

PG&E:
Matt Heling
Mgh9@pge.com
415-973-6996

SCE:
Jim Stevenson
James.stevenson@sce.com
626-633-4888

CCSE:
Ryan Amador
Ryan.amador@energycenter.org
858-244-7283

S2. **[IF RESPONDENT STILL REFUSES SURVEY, ASK IF YOU MAY HAVE THE REASON FOR REFUSAL – TO DOCUMENT NON-RESPONSE BIAS, THANK AND TERMINATE]** _____

Background and Nature of Withdrawal/Rejection

Q1. First, I'd like to confirm some basic information regarding your application. **[Pre-fill fields from project database wherever possible and then confirm.]**

a. Respondent's name [if a business]

_____

b. Respondent's title [if a business]

_____

c. Firm/Organization name [if a business]

_____

d. Physical address where project is located_____

e. Primary business activity at this site [if a business]

_____

f. Technology employed___[1. PV, 2. wind, 3. fuel cell, 4. microturbine, 5. reciprocating or internal combustion engine, 6. gas turbine, 7. advanced energy storage]

g. Does the system use 1)___ renewable or 2)___ nonrenewable fuel?

h. Applicant (if different than Host Customer)_____

i. Electric utility_____

j. Natural gas utility_____

k. Program administrator_____

l. Zip code where project is located:

_____

Note that all references to the Program in this survey refer to the Self-Generation Incentive Program.

Q2. Were the program administrator and your electric utility one and the same?

Yes 1
No 2
Don't know 3

Q3. Our records indicate that [you withdrew from the program / your application was rejected]. Is this correct?

Yes 1
No **(Clarify which category they believe they fall into, and ask remaining questions based on that)** 2

Q4. What parts of the application process did you complete before the *[withdrawal/rejection]*? Did you…?

a. Submit a Reservation Request (but didn't receive confirmation of reservation) 1
b. Receive a Conditional Reservation Notice Letter from Administrator 2
c. Submit Proof of Project Milestone (but was not approved by Administrator) 3
d. Submit Proof of Project Milestone (which was approved by Administrator) 4

e. Submit claim for incentive payment; were awaiting on-site verification..... 5
f. On-site inspection/verification was conducted 6
g. Other 7
(Specify:_____)
h. Don't Know/Refused 88/99

Q5. **[WITHDRAWALS ONLY]** Why did you withdraw your application? **(Ask open-ended; record all that apply)**

a. System cost too high, even with incentive..... 1
b. Permitting issues 2
(Specify:_____)
c. Problems in obtaining or installing equipment..... 3
(Specify:_____)
d. Problems in obtaining project financing..... 4
e. Problems with the application process 5
(Specify:_____)
f. Changes in the program..... 6
(Specify:_____)
g. My system did not qualify for the program..... 7
(1) Why not?_____)
h. My system was only for emergency backup generation 8
i. The internal priorities of my organization [if residential, our household] changed 9
j. To avoid the hassle of owning, operating, or maintaining the DG system..... 10
k. We were wait listed and ultimately concluded funding would not be available..... 11
l. Increased uncertainty of the investment 12
(1) What changed to increase the uncertainty?_____)
m. Insufficient price signal to trigger operation or provide sufficient payback..... 13
n. Other 14
(1) specify:_____)
o. Don't Know/Refused 88/99

Q6. **[WITHDRAWALS ONLY – Ask if multiple responses to Q5]** What was the **primary** reason that you withdrew? **(Read options chosen in Q5; record one best response)**

Q7. **[REJECTIONS ONLY]** Our records show that your application was rejected. What reason did the program administrator give you for the rejection? (Ask open-ended; record all that apply)

a. System size was too large for the program..... 1
b. System size was too small for the program 2
c. Couldn't obtain permits 3
(Which?:_____)

d. Couldn't meet waste heat standards (Non-renewable fuels only) 4
e. System was to be used solely for backup generation 5
f. Missed deadlines (Which?_____) 6
g. Other 7
(Specify:_____)
h. Don't Know/Refused 88/99

Q8. Are you still planning on installing the system anyway, despite the fact that your application has been *[withdrawn/rejected]*?
Yes 1
No 2
Don't know 3

Q9. **[If "yes" on Q8]** Please rate the likelihood that your project will be completed on a scale of one to five, with five meaning "Very likely to be completed" and one meaning "Very unlikely to be completed." **(If already installed, enter "6.")**

Very Unlikely					Very Likely	Already Installed
1	2	3	4	5		6

Program Awareness, Satisfaction, and Process

Q10. How did you first learn about the incentives that were available to you through the program? **(Ask open ended; prompt with list if necessary; record all that apply)**

a. Utility representative 1
b. Regional Energy Office 2
c. Equipment/system dealer/vendor 3
d. Other users of on-site generation systems 4
e. Magazine or newspaper article 5
f. Other media (e.g., TV, news press releases) 6
g. Professional publications 7
h. Government agency (CPUC, CEC, or DOE) 8
i. Internet search/web site 9
(Specify:_____)
j. E-mail notice or advertisement 10
(Specify:_____)
k. Other 11
(Specify:_____)
Don't Know or Can't Recall/Refused 88/99

Q11. On a scale of one to five, with five meaning "Very important," one meaning "Not at all important," and three meaning "Neutral," how important was the availability of rebates from the program in your initial decision to go forward with this project?

Not at all Important				Very Important
1	2	3	4	5

Q12. Please tell me which of the following three scenarios most closely describes your [if business, your organization's] involvement in the application process:

We are completing and submitting all the application forms ourselves, and have direct contact with the program administrators..... …1
An energy service company, contractor, or some other party is completing and submitting the application forms, but we are closely involved with the project application..... 2
An energy service company, contractor, or some other party is completing and submitting the application forms without much help from us 3

Q13. Please rate your overall satisfaction with the program on a scale of one to five, with five being "very satisfied," and one being "very dissatisfied."

Very Dissatisfied				Very Satisfied
1	2	3	4	5

Q14. For the next couple of questions we would like to learn more about the level of ease associated with the application process and the on-site generation project itself. Please rate each aspect where "5" means "Very Easy" and "1" means "Very Difficult." If you cannot rate an aspect, either because you have not reached that stage of the project yet or because a contractor or 3rd party handled that aspect for you, please say "Not Applicable." **[ASK a-q FOR ALL TECHNOLOGIES. ASK (r) for all projects EXCEPT PV. ASK (s) for ONLY non-renewable fueled technologies.**

START RATING

a. Identifying the right end-use or process energy application for on-site power generation at your facility (e.g., have process heat requirements or want to reduce billing demand with on-site self-generation)....._____ N/A

b. [If business] Making the business case/[If residential] Justifying the project....._____ N/A

c. Choosing the technology that best fits in with your facility [if residential, your home's] operations (e.g., waste heat utilization from cogeneration, or using PV to offset purchased utility power) _____ N/A

d. Choosing an energy services company or contractor ....._____ N/A
e. Financing the project....._____ N/A
f. Submitting a reservation application..... _____ N/A
g. Obtaining the equipment from the manufacturer....._____ N/A
h. Submitting proof of project milestone to the program....._____ N/A
i. Obtaining any necessary building or siting permits....._____ N/A
j. Obtaining the necessary insurance ....._____ N/A
k. Installing the equipment ....._____ N/A
l. Achieving reliable operation ....._____ N/A
m. Working with the electric utility to connect your unit to the utility grid....._____ N/A
n. Submitting a claim incentive payment ....._____ N/A
o. Scheduling with the program administrator for the program's on-site inspection _____ N/A
p. Obtaining approval based on the program's on-site inspection....._____ N/A
q. Obtaining the incentive payment from the program....._____ N/A
ASK (r) for all projects EXCEPT PV
r. Obtaining any necessary air quality permits....._____ N/A
ASK (s) for ONLY non-renewable fueled technologies
s. Meeting the waste heat requirements for the project....._____ N/A

Ask Q15a-s for anything rated one or two on Q14
Q15a to Q15s. What made **[INSERT APPROPRIATE a-s ITEM FROM Q14]** difficult?

_____
_____
_____
_____

Q16. Were there any unnecessary delays in the on-site generation project or the program application process?

Yes1
No 2 **SKIP TO Q19**

Q17. At what part of the process did this delay occur? Any other parts of the process? **[Prompt with stages from Q14 as necessary. Record all that apply.]**

Ask Q18 for any delays identified in Q17

Q18a to Q18s. In your view, who was primarily responsible for this delay (these delays)? **[DO NOT READ LIST; probe for each process delay cited]**

The program administrator 1
Your energy services company or contractor2
Your firm or organization.....3

The equipment manufacturer 4
The electric utility's interconnection department ...5
The permitting agencies (air, building, etc.)6
Other 7
(Specify:_____)
Don't Know/Refused.....88/99

Economics and Success of Self-Gen Project

READ: Throughout the remainder of the interview, any reference to "this on-site generation equipment" refers to the equipment that was to have been installed under the program.

Q19. Who would have owned this on-site generation equipment once it was operational?

Self/Customer 1
Installation contractor / ESCO / maintenance firm .2
Other 3
(Specify:_____)

Q20. Who would have handled maintenance and repair for your system, once it was completed?

Self/Customer 1
Installation contractor.....2
Maintenance firm 3
Other 4 .....
(Specify:_____)

Q21. How long did you originally expect it to take this system to pay for itself? (Read list; record one response. If respondent cannot answer the payback question, try to get them to answer Q21a.)

6 months or less.....1
1 year.....2
2 years.....3
3 years.....4
4 years.....5
5 years.....6
6 – 10 years.....7
More than 10 years.....8

AskQ21a only if no response to Q21

Q21a. What percentage of your electric bill did you originally expect to be offset by this on-site generation system in a typical month? (Approximations are fine.)

_____ % or 88 (Don't Know) or 99 (Refused)

Drivers and Barriers to Self-Generation

Q22. Please indicate on a scale of one to five, where five is very influential, how much each of the following factors influenced your decision to purchase and use the on-site generation technology you chose. **(Rotate response options. Record one response for each factor)**

Factor	Rating				
a. Wanted to reduce utility bills	1	2	3	4	5
b. Wanted to reduce our peak demand	1	2	3	4	5
c. Wanted a backup system to improve the overall reliability of our electricity supply	1	2	3	4	5
d. Concern for the environment **[ask d.1) immediately after d]**	1	2	3	4	5
1) And more specifically, concern about **climate change**	1	2	3	4	5
e. Energy supply independence	1	2	3	4	5
f. Improve our image in the community— green marketing	1	2	3	4	5
g. Provide technical demonstration	1	2	3	4	5

Q23. **[Ask only for PV projects]** In 2007 and beyond PV systems over 30kW have been funded through the California Solar Initiative (CSI). Based on what you have heard about the CSI, do you think the CSI program will be an improvement on the prior program for PV?

a. Yes.....1

(1) Why do you think so?) _____

b. No 2

(1) Why do you think not?) _____

c. Don't know.....3

Q24. **[Ask only for PV projects]** Did you shift your project to the CSI?

a. Yes

b. No

(1) Why not?) _____

Q25. On a scale of one to five, where five means "Very likely to install" and one means "Not at all likely to install," how likely is it that your organization will install other on-site power generation equipment for this facility in the next five years? Please do not count generation equipment that would be used solely for backup or emergency power.

Very Likely to Install..... 5

4 4

3 3

2 2
Not At All Likely to Install..... 1

Q26. If you were to install additional on-site power generation (other than backup or emergency generation) in the next five years, how influential would each of the following factors be in making that decision? Please rate the influence of each factor on a scale of one to five, with five being "very influential," and one being "not influential at all." **(Record one response for each factor – NOTE that this question is the same as Q22 above, but is to be asked PROSPECTIVELY, about FUTURE installations)**

Factor			Rating		
a. Want to reduce utility bills	1	2	3	4	5
b. Want to reduce our peak demand	1	2	3	4	5
c. Want a backup system to improve the overall reliability of our electricity supply	1	2	3	4	5
d. Concern for the environment/ [PROBE:] And more specifically, concern about global climate change?	1/ 1	2/ 2	3/ 3	4/ 4	5/ 5
e. Energy supply independence	1	2	3	4	5
f. Improve our image in the community— green marketing	1	2	3	4	5
g. Provide technical demonstration	1	2	3	4	5
h. Other: (Specify:) _____	1	2	3	4	5

Q27. If you were to install additional on-site power generation (other than backup or emergency generation) in the next five years, what is the longest payback period you would be willing to accept? **(READ LIST – RECORD ONE RESPONSE)**

6 months or less 1

1 year 2

2 years 3

3 years 4

4 years 5

5 years 6

6 – 10 years 7

More than 10 years 8

Don't Know/Refused 88/99

Q28. Which of the following would be significant barriers to your organization installing additional on-site power generation? **(Read list; choose all that apply)**

No additional loads to be served 1

Natural gas prices 2

Equipment prices 3

Experience with the prior project/application 4

No more space/room for generation 5

Environmental concerns 6

Difficulty in working with utility 7

Other 8

(Specify:_____)

Q29. **[Ask if multiple answers on Q28]** For those barriers you have previously mentioned, which barrier would be **the most** significant? **(If necessary, read options chosen in Q28; choose one)**

No additional loads to be served 1

Natural gas prices 2

Equipment prices 3

Experience with the prior project/application 4

No more space/room for generation 5

Environmental concerns 6

Difficulty in working with utility 7

Other (specify:_____) 8

Q30. How important would the availability of rebates such as the one you are receiving under the program be in deciding whether to install additional on-site generation in the future? Rating on a scale of one to five, where five is very important.

Not at all Important				Very Important
1	2	3	4	5

[ONLY RECRUIT NON-PV PARTICIPANTS FOR IN-DEPTH INTERVIEWS]

We appreciate your time and cooperation today. Because understanding the role that various factors play in making on-site generation projects successful is so important, we invite you to participate in a more in-depth, follow-up interview to be scheduled in the next few weeks. This interview would last between 20 and 30 minutes. It will be conducted by a senior analyst with Navigant Consulting, one of the firms participating in this research. It would be structured less like a formal survey and more like a conversation about your experiences with the program. In recognition of the additional time commitment, we'd provide $100 in compensation once the interview is complete. [If they indicate that they are not able to take monetary compensation, indicate that we would provide a $100 donation to the charity of your choice]

May we schedule you for this follow-on interview?

Yes1

No 2 **Thank and terminate**

Schedule appointment for interview. Verify:

» Date and time (PDT)

» Phone number to call

» Email address (for reminder email the day before the interview)

THANK RESPONDENT FOR THEIR TIME TODAY AND THEIR AGREEMENT TO DO AN IN-DEPTH INTERVIEW.

10.1.5 Participant Interview Active

PG&E SGIP Program M&E

Host Customer Interview (Active/Completed)

Interview Guide (8/29/2009)

SGIP Project number: _____

Respondent name: _____

Respondent title [if a business]: _____

Company name [if a business]: _____

Date and time of interview: _____

Interviewer: _____

Technology: _____

Taped? (circle one) **YES** **NO**

10.1.5.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 30-minute in-depth interview (IDI). As you know, the qualitative research process is about *discovery*, not coverage. As such, we expect you to cover all areas of investigation, but, if necessary, to focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; based on your experience in qualitative interviewing, allow the flow of the conversation to dictate the order in which you ask them.

10.1.5.2 Background

Navigant Consulting is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group (consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC) is charged with the evaluation of the program through their M&E subcommittee led by PG&E.

10.1.5.3 Interview Recording

If you record the interview, you must obtain explicit permission from the respondent.

10.1.5.4 Confidentiality

If respondents ask, tell them yes, their answers will remain confidential.

10.1.5.5 Introduction

[NOTE: The survey house will have already qualified the respondent for this IDI prior to this point. Please have those survey responses in front of the interviewer so that we can simply confirm and probe for more detail. Many of these questions are addressed in the survey.]

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting interviews to follow up on some of the issues raised in the survey on the Self-Generation Incentive Program you recently completed. This interview is for research purposes, and will not affect the application status of the project(s) you are involved with.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:

Dale Smet

dsmet@semprautilities.com

213-244-3777

PG&E:

Matt Heling

Mgh9@pge.com

415-973-6996

SCE:

Jim Stevenson

James.stevenson@sce.com

626-633-4888

CCSE:

Ryan Amador

Ryan.amador@energycenter.org

858-244-7283

10.1.5.6 Interview Recording (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the recording for anything other than note taking and analysis. *(NOTE TO INTERVIEWER: Recording is optional, but you must obtain consent before doing so.)*

10.1.5.7 I. Process Questions

First I would like to discuss the process of the Self-Generation Incentive Program.

ELIGIBILITY

1. When considering whether to participate in SGIP, did anyone at your business [if residential, in your household] have initial concerns about eligibility for the program?

   1.1 **[If yes]** What were those concerns?

   1.2 How were those concerns addressed?

2. Are there other technologies that you think would make a good fit for the SGIP that are not currently eligible?

3. **[Ask for any aspects of the project that they rated as one or two (very difficult or difficult) on survey Q8 – also note and probe on any comments made in survey Q9. Probe further in questions below regarding various aspects of the program process]**

   1.1 What made this difficult?

   1.2 What would have helped or made it easier?

   1.3 Are there things the Program Administrator could have done to make this easier?

4. **[Ask for any unnecessary delays the respondent attributed to the PA on survey Q10 and Q11]**

   2.1 Tell me more about this (these) delay(s). What happened?

   2.2 What could have been done to avoid the delay(s) or resolve it/them sooner?

5. In your case, do you think the initial (60, 90 or 240-day, depending on PY and public entity) deadline provided sufficient time for providing proof of project milestone?

6. Which requirement(s) of the proof of project milestone made it difficult to meet the deadline? **[SELECT ALL THAT APPLY; DO NOT READ OPTIONS]**

   - ☐ Submitting an air pollution permit application
   - ☐ Submitting an electrical interconnection application
   - ☐ Ordering the generating equipment
   - ☐ Obtaining proof of insurance
   - ☐ Providing waste heat recovery calculations

- ☐ Providing project cost breakdown
- ☐ Other: (specify) _____

7. Do you think the 1-year (or 18 months, depending on PY and public entity) deadline is sufficient for completing the installation of your system or a system similar to yours?

   7.1 **[If no]** Why was the deadline hard to meet? **[SELECT ALL THAT APPLY; DO NOT READ OPTIONS]**

- ☐ Takes long time for manufacturer to ship equipment
- ☐ Type of equipment impacted by long lead times
- ☐ Installation delays by the contractor
- ☐ Air pollution permitting issues
- ☐ Other local permit issues (Conditional Use Permit, Negative Declaration, etc.)
- ☐ Building Permit issues
- ☐ Meeting waste heat requirements
- ☐ Interconnection with utility
- ☐ Financing the purchase/installation of equipment
- ☐ Other (specify) _____

8. **[If public entity]** Did you find the process too complex for a public entity?

   8.1 **[If yes]** What part of the process was/has been the most difficult?

9. **[If private entity]** Did you find the process too complex for a businesses like yours?

   9.1 **[If yes]** What part of the process was/has been the most difficult?

APPLICATION FEE

10. **[If participant applied after July 2005 and before December 31, 2006]** Do you have any issues with the application fee?

11. Do you think the application fee stops others from applying for funding through the SGIP?

COGEN **[Ask of participants that installed a cogen system (any non-renewable system)]**

12. Did natural gas prices affect your decision to apply to the program?

13. Do natural gas prices today affect the operating hours of your system and, if so, in what ways?

14. When applying to the program, did you encounter difficulty in meeting the waste heat and/or overall system efficiency requirements?

    14.1 Do you currently have any (or have you previously had any) problems with waste heat utilization after the system became operational?

14.1a **[If yes]** Please elaborate.

15. Have you had any heat exchanger failures?

16. Would any current market factors affect your decision to install a cogen system? How about other people's decision to install a cogen system?

PRICE SIGNALS [Ask of PV and Renewable Fuel Systems]

17. In the survey you recently completed for us, you mentioned that reducing utility bills was [**INSERT ANSWER FROM Q23**] in your decision to purchase use the on-site generation technology. Do you operate your system to respond to utility rates or other price signals? Please elaborate. [**Probe for price structure – how prices are designed, as well as price level – to what extent are price signals high enough]**

PERFORMANCE BASED INCENTIVES/RENEWABLE ENERGY CREDITS

18. Imagine that, instead of a set incentive amount provided up front, you were offered an incentive based on the performance of your system that would be greater than the current up-front incentives (assuming the project performed as expected), but that you would not receive the incentive until after the project was installed and operating. Would you prefer that greater performance incentive rather than an up-front dollar-per-watt-installed incentive? Why or why not?

    18.1 How might such a performance-based incentive change how you operate the system, and the resulting performance of the system?

19. Did you include the potential value of renewable energy credits (also called green tags) associated with your SGIP project(s) in your contracts or negotiations with any parties involved?

    19.1 **[If yes]** Did you keep the RECs or did you sign them over to your developer?

    19.2 **[If they kept the RECs]** Do you plan to participate in WREGIS (Western Renewable Energy Generation Information System launched in June 2007)?

20. Which tax credits, if any, did you receive for the project?

ECONOMIC FACTORS: INCENTIVE LEVELS AND EQUIPMENT COSTS

21. In the survey you recently completed for us, you mentioned that it would likely take **[INSERT ANSWER FROM SURVEY Q15]** for your system to pay for itself. Do you feel that the current incentive levels adequately cover enough of the equipment costs in order for the pay back period to be reasonable for your company/organization/household]?

22. Do you feel like equipment cost is increasing or decreasing over time, and to the extent you see that change in cost, how do you see it affecting customers like you adding self-generation equipment?

23. Would a declining incentive amount over the next several years for all the technologies in the program affect your participation in future projects? In what way? (e.g., deciding

to not participate; accelerating projects to get a better incentive; increasing the size of the project to maximize the incentive.)

24. How has the recent economic recession affected your completion and (if operational) initial operation of your self-generation system?

25. Do you know where the SGIP incentive funds come from? [If don't know, indicate source as being part of the overall funding for energy efficiency and renewable energy programs that customers like them fund through a nominal charge on their monthly bills. Then ask 25.1 below.]

    25.1 Do you think such incentives are a wise way to spend customers' program funding dollars, and why/why not?

    25.2 Knowing the incentives are funded by customers through their monthly bills, how does that affect the future likelihood of your company/organization/household participating in the Self-Generation Incentive Program?

APPLICATION MATERIALS AND OTHER

26. If you reviewed the program application materials, were these materials and instructions clear?

    26.1 Please explain anything that wasn't clear to you.

    26.2 Do you have any suggestions for making them better?

27. Have you looked at the Program Handbook?

    27.1 **[If yes]** Was it helpful?

    27.2 Please explain anything that wasn't clear to you.

    27.3 Do you have any suggestions for making it better?

28. Did you experience any delays with the utility interconnection process?

    28.1 **[If yes]** please describe.

29. **[For all project types EXCEPT PV and wind]** Were you aware that your system might be assessed nonbypassable charges for departing load?

[*Nonbypassable charges involve costs that have historically been included in bundled service bills but are now separately listed as line items, and include charges for items such as public purpose programs. A customer's date of departure and the size and type of technology installed determine whether or not the customer will be exempt from nonbypassable charges.*]

    29.1 **[If yes]** Have you received your first bill?

        29.1a **[If yes]** Is it what you expected?

        [If no] Please describe the difference.

10.1.5.8 II. Market Study Questions

Now I would like to focus on your reasons for installing an on-site generation project and the overall market for on-site generation.

30. What prompted you to first consider this on-site generation project?

31. What were the primary drivers for this project (refer back to survey answers in Q23 as needed, but try to capture in their own words).

    31.1. Why did you choose this particular technology?

    31.2 Did the specific application in some sense dictate the technology? How or why?

    31.3 Please describe your thoughts about how environmental considerations – climate change in particular – influenced the project decision. **[Probe for how those considerations compare to economic and other considerations.]**

32. In the survey you completed for us, you indicated that the amount of time actually spent on operations and maintenance of the equipment, compared to your initial expectations for the system, was ____ ***[insert response from Q19 of the survey: Below/Meets/Above Expectations or DK]***. About how many hours per month did your organization [if residential, your household] expect to spend on O&M when you decided to install the system, and how many hours per month have you actually spent since the system went into operation?

33. Do you think this project has been successful? Cost-effective?

34. If so, what made it succeed or be cost-effective? What factors did you have going in your favor on this project? If not, what prevented it from succeeding or being cost-effective?

35. Has your experience with this project made you more or less likely to do additional on-site generation projects? Why?

36. What would you do differently next time (or if you had the chance to do this project over from the beginning)?

    36.1. Would your expectations be different next time? How so?

37. What advice would you have for a business like yours that was considering on-site power generation?

[Ask Q38 if respondent has completed or attempted projects at different sites in California.]

    38.1 If you have completed or tried to complete more than one project, are there any regional issues that affected these project in different ways? (e.g., air emissions regulations, labor or materials costs, availability of knowledgeable contracting help.)

    38.2 How did these regional issues affect the project? [e.g., project costs, timing, etc.]

39. Lastly, are you the person who initiated or championed the system and participating in the program?

    39.1 [If that person] What was it like being the one to champion the system and participating in the program?

    39.2 [If NOT that person] How has the transition from another person to you being the leader affected the project's planning and installation, and also system operations and performance?

10.1.5.9 Closing

Thank you very much for your time today. As the survey interviewer mentioned when they asked if you would be willing to do this follow up interview, we would send you $100 as a token of our appreciation for your help with this research. To whom should we make out the check? [NOTE THAT THEY MAY DESIGNATE A CHARITY IF THEY ARE NOT ABLE TO ACCEPT THE $100 THEMSELVES]

Make check to: _____

Address:_____

City/State/Zip:_____

Finally, If I have a clarification question as I'm reviewing my notes, is it alright to call you back or email you?

- Yes
- No

Thanks again, and have a great day.

10.1.6 Participant Interviews Rejected

PG&E SGIP Program M&E

Host Customer Interviews (Withdrawn/Rejected)

Interview Guide (8/29/2009)

SGIP Project number: _____

Respondent name: _____

Respondent title [if a business]: _____

Company name [if a business]: _____

Date and time of interview: _____

	_____
Interviewer:	_____
Technology:	_____
Taped? (circle one)	**YES** **NO**

10.1.6.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 30-minute in-depth interview (IDI). As you know, the qualitative research process is about *discovery*, not coverage. As such, we expect you to cover all areas of investigation, but, if necessary, to focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; based on your experience in qualitative interviewing, allow the flow of the conversation to dictate the order in which you ask them.

10.1.6.2 Background

The Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems initially applied for but then either Withdrawn/Rejected under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group (consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC) is charged with the evaluation of the program through their M&E subcommittee led by PG&E.

10.1.6.3 Interview Recording

If you record the interview, you must obtain explicit permission from the respondent.

10.1.6.4 Confidentiality

If respondents ask, tell them yes, their answers will remain confidential.

10.1.6.5 Introduction

[NOTE: The survey house will have already qualified the respondent for this IDI prior to this point. Please have those survey responses in front of the interviewer so that we can simply confirm and probe for more detail. Many of these questions are addressed in the survey.]

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting interviews to follow up on some of the issues raised in the survey on the Self-Generation Incentive Program you recently completed. This interview is for research purposes, and will not affect the application status of any project(s) you may still be involved with.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:

dsmet@semprautilities.com

213-244-3777

PG&E:

TBD

SCE:

TBD

CCSE:

TBD

10.1.6.6 Interview Recording (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the recording for anything other than note taking and analysis. **(NOTE TO INTERVIEWER: Recording is optional, but you must obtain consent before doing so.)**

10.1.6.7 I. Confirm Project Status

Before beginning, make sure you understand the reason the project was Withdrawn/Rejected; and whether or not the customer continued with the project without SGIP funding. Summarize your understanding from their survey responses, and give them a chance to verify, correct, or comment.

10.1.6.8 II. Process Questions

Next I would like to discuss the process of the Self-Generation Incentive Program.

ELIGIBILITY

1. When considering whether to participate in SGIP, did anyone at your business [if residential, in your household] have initial concerns about eligibility for the program?

   1.1 **[If yes]** What were those concerns?

1.2 How were those concerns addressed?

2. Are there other technologies that you think would make a good fit for the SGIP that are not currently eligible?

3. **[Ask for any aspects of the project that they rated as one or two (very difficult or difficult) on survey Q14 - also note and probe on any comments made in survey Q15. Probe further in questions below regarding various aspects of the program process]**

   3.1 What made this difficult?

   3.2 What would have helped or made it easier?

   3.3 Are there things the Program Administrator could have done to make this easier?

4. **[Ask about any unnecessary delays the respondent attributed to the PA on survey Q17 and Q18]**

   4.1 Tell me more about this (these) delay(s). What happened?

   4.2 What could have been done to avoid the delay(s) or resolve it/them sooner?

[For the remaining questions in this section, determine what stage of the application or project they achieved before withdrawal/suspension/rejection (based on survey responses) and only ask the questions relevant to that or earlier stages]

5. In your case, do you think the initial (60, 90 or 240-day, depending on PY and if respondent is a public entity) deadline provided sufficient time for providing proof of project milestone?

6. Which requirement(s) of the proof of project milestone made it difficult to meet the deadline? **[SELECT ALL THAT APPLY; DO NOT READ OPTIONS]**

   - ☐ Submitting an air pollution permit application
   - ☐ Submitting an electrical interconnection application
   - ☐ Ordering the generating equipment
   - ☐ Obtaining proof of insurance
   - ☐ Providing waste heat recovery calculations
   - ☐ Providing project cost breakdown
   - ☐ Other

7. Do you think the 1-year (or 18 months, depending on PY and public entity) deadline is sufficient for completing the installation of your system or a system similar to yours?

   7.1 [If no] Why was the deadline hard to meet? **[SELECT ALL THAT APPLY; DO NOT READ OPTIONS]**

- ☐ Takes long time for manufacturer to ship equipment
- ☐ Type of equipment impacted by long lead times
- ☐ Installation delays by the contractor
- ☐ Air pollution permitting issues
- ☐ Other local permit issues (Conditional Use Permit, Negative Declaration, etc.)
- ☐ Building Permit issues
- ☐ Meeting waste heat requirements
- ☐ Interconnection with utility
- ☐ Financing the purchase/installation of equipment
- ☐ Other (specify) _____

8. **[If public entity or residence]** Did you find the process too complex for a public entity/residence?

   8.1 **[If yes]** What part of the process was the most difficult?

9. **[If private entity]** Did you find the process too complex for a businesses like yours?

   9.1 **[If yes]** What part of the process was the most difficult?

APPLICATION FEE

10. **[If participant applied after July 2005 and before December 31, 2006]** Do you have any issues with the application fee?

11. Do you think the application fee stops others from applying for funding through the SGIP?

COGEN **[Ask of participants that would have installed a cogen system (any non-renewable system)]**

12. Did natural gas prices affect your decision to apply to the program?

13. Do natural gas prices today affect the operating hours that would have been expected of your system and, if so, in what ways?

14. When applying to the program, did you encounter difficulty in meeting the waste heat and/or overall system efficiency requirements?

    14.1 Do you currently have any (or have you previously had any) problems with waste heat utilization once the system would have become operational?

    14.1a **[If yes]** Please elaborate.

15. Did any current market factors affect your company's/household's decision to install a cogen system? How about other people's decision to install a cogen system?

    15.1 **[If project was withdrawn]** Did any current market factors lead directly to you withdrawing your application? Please describe.

PRICE SIGNALS [Ask of PV and Renewable Fuel Systems]

16. In the survey you recently completed for us, you mentioned that reducing utility bills was [**INSERT ANSWER FROM Q22.a**] in your decision to purchase use the on-site generation technology. Do you operate your system to respond to utility rates or other price signals? Please elaborate. [**Probe for price structure – how prices are designed, as well as price level – to what extent are price signals high enough]**

PERFORMANCE BASED INCENTIVES/RENEWABLE ENERGY CREDITS

17. Imagine that, instead of a set incentive amount provided up front, you were offered an incentive based on the performance of your system that would be greater than the current up-front incentives (assuming the project performed as expected), but that you would not receive the incentive until after the project was installed and operating. Would you prefer that greater performance incentive rather than an up-front dollar-per-watt-installed incentive? Why or why not?

    17.1. **[If project was withdrawn]** Would a performance-based incentive being available kept you from withdrawing the project?17.2. How might such a performance-based incentive change how you would have operated the system, and the resulting performance of the system, were you to have gone ahead with the project?

18. Did you include the potential value of renewable energy credits (also called green tags) associated with your SGIP project(s) in your contracts or negotiations with any parties involved?

19. Which tax credits, if any, did you apply for on the project?

ECONOMIC FACTORS: INCENTIVE LEVELS AND EQUIPMENT COSTS

20. In the survey you recently completed for us, you mentioned that it would likely take **[INSERT ANSWER FROM SURVEY Q21]** for your system to pay for itself. Do you feel that the current incentive levels adequately cover enough of the equipment costs in order for the pay back period to be reasonable for your company/organization/household? **[If Q21a asked instead of Q21 in survey, base discussion on Q21a response]**

21. Do you feel like equipment cost is increasing or decreasing over time, and to the extent you see that change in cost, how do you see it affecting you adding self-generation equipment in the future?

    21.1 **[If project withdrawn]** How did your view of such cost changes affect your withdrawing the project?

22. Would a declining incentive amount over the next several years for all the technologies in the program affect your participation in future projects? In what way? (e.g., deciding to not participate; accelerating projects to get a better incentive; increasing the size of the project to maximize the incentive.)

23. How has the recent economic recession affected the status of your self-generation system?

24. Do you know where the SGIP incentive funds for the program come from? [If don't know, indicate source as being part of the overall funding for energy efficiency and renewable energy programs that customers like them fund through a nominal charge on their monthly bills. Then ask 24.1 below.]

    24.1 Do you think such incentives are a wise way to spend customers' program funding dollars, and why/why not?

    24.2 Knowing the incentives are funded by customers through their monthly bills, how does that affect the future likelihood of your company/organization/household] participating in the Self-Generation Incentive Program?

APPLICATION MATERIALS AND OTHER

25. If you reviewed the program application materials, were these materials and instructions clear?

    25.1 Please explain anything that wasn't clear to you.

    25.2 Do you have any suggestions for making them better?

26. Have you looked at the Program Handbook?

    26.1 **[If yes]** Was it helpful?

    26.2 Please explain anything that wasn't clear to you.

    26.3 Do you have any suggestions for making it better?

27. Did you experience any delays with the utility interconnection process?

    27.1 **[If yes]** please describe.

10.1.6.9 III. Market Study Questions

Now I would like to focus on your reasons for installing an on-site generation project and the overall market for on-site generation.

28. What prompted you to first consider this on-site generation project?

29. What were the primary drivers for this project **(refer back to survey answers in Q22 as needed, but try to capture in their own words)**.

    29.1. Why did you choose this particular technology?

    29.2 Did the specific application in some sense dictate the technology? How or why?

    29.3 Please describe your thoughts about how environmental considerations – climate change in particular – influenced the project decision. **[Probe for how those considerations compare to economic and other considerations.]**

30. Do you think this project has been successful? Cost-effective?

31. If so, what made it succeed or be cost-effective? What factors did you have going in your favor on this project? If not, what prevented it from succeeding or being cost-effective?

32. Has your experience with this project made you more or less likely to do additional on-site generation projects? Why?

    32.1. What would you do differently next time (or if you had the chance to do this project over from the beginning)?

    32.2. Would your expectations be different next time? How so?

33. What advice would you have for a business/home like yours that was considering on-site power generation?

[Ask Q34 if respondent has completed or attempted projects at different sites in California.]

34.1 If you have completed or tried to complete more than one project, are there any regional issues that affected these project in different ways? (e.g., air emissions regulations, labor or materials costs, availability of knowledgeable contracting help.)

34.2 How did these regional issues affect the project? [e.g., project costs, timing, etc.]

35. Lastly, are you the person who initiated or championed the system and participating in the program?

    35.1 [If that person] What was it like being the one to champion the system and participating in the program?

    35.2 [If NOT that person] How has the transition from another person to you being the leader affected the status of the project, in particular regarding the decision to withdraw the system [if project was withdrawn] or it being rejected [if project was rejected]?

10.1.6.10 Closing

Thank you very much for your time today. As the survey interviewer mentioned when they asked if you would be willing to do this follow up interview, we would like to send you $100 as a token of our appreciation for your help with this research. To whom should we make out the check? [NOTE THAT THEY MAY DESIGNATE A CHARITY IF THEY ARE NOT ABLE TO ACCEPT THE $100 THEMSELVES]

Make check to: _____

Address:_____

City/State/Zip:_____

Finally, If I have a clarification question as I'm reviewing my notes, is it alright to call you back or email you?

- Yes
- No

Thanks again, and have a great day.

10.1.7 Non-Participant Survey

PG&E SGIP Program M&E

Non-Participant Survey

Survey Guide (/08/29/2009)

NOTE: Non-participating IOU customers defined as customers who have not been contacted by the SGIP program, so no prior awareness or knowledge of SGIP is to be assumed.

SGIP ID:

a. Respondent's name

b. Respondent's title (if a business)

c. Firm/Organization name (if a business)

d. Phone No.

	Date	Time	Contacted			Comments
1						
2						
3						
4						
5						
6						
7						

Num of Calls _____Num of Contacts: _____

*Comments:*_____

_____

INTRODUCTION

S1. Hello, this is _____ and I'm calling from [CALL CENTER NAME], a national survey research center. We are conducting a study sponsored by the California Public Utilities Commission. Have I reached [CONTACT NAME] [***if business:***] at [BUSINESS NAME]?

1 YES (*CONTINUE*)

2 NO _____ (*CLARIFY BUSINESS NAME OR ADDRESS FOR RESIDENTIAL AND CONTINUE*)

RESPONDENT SCREENING

S2. Are you knowledgeable about the day-to-day operations and energy requirements for your business facility/home located at [*ADDRESS*]?

Yes _____ (*CONTINUE*)

No _____ (*ASK FOR APPROPRIATE PERSON AND REPEAT S2*)

S3. Would you be involved in significant energy equipment and energy purchasing decisions?

Yes _____ (*CONTINUE*)

No _____ (*ASK FOR APPROPRIATE PERSON AND BEGIN SCREENING WITH S3*)

[**If asked about the purpose of the call:** We are conducting a survey of California businesses/homes concerning their energy use and familiarity with on-site power generation technologies. We are seeking only the opinions of selected professionals/homeowners and all individual responses will be kept confidential.]

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:

Dale Smet

dsmet@semprautilities.com

213-244-3777

PG&E:

Matt Heling

Mgh9@pge.com

415-973-6996

SCE:

Jim Stevenson

James.stevenson@sce.com

626-633-4888

CCSE:

Ryan Amador

Ryan.amador@energycenter.org

858-244-7283

S4. **[IF RESPONDENT STILL REFUSES SURVEY, ASK IF YOU MAY HAVE THE REASON FOR REFUSAL – TO DOCUMENT NON-RESPONSE BIAS, THANK AND TERMINATE]** _____

FACILITY SCREENING

S5. Our firm is conducting a study to help utility companies and energy service providers develop energy-related products and services that better meet your needs. I'd like to ask a few questions about your business/home. Please answer for the facility/residence located at [*ADDRESS*]. Does your business own or lease this facility [if residential, do you own this residence]?

Own 1

Lease/rent ..... 2 *(TERMINATE)*

S6. [If business] According to the information I have, your business is primarily involved in [SIC description] at this location. Is this correct?

Yes1 (SKIP TO S7)

No 2 (PROCEED TO S6.1)

S6.1. [If business] How would you describe your business? **(Make sure that they respond for the LOCATION. Wait for respondent to answer. If necessary,**

prompt with the following list of choices, then select appropriate category. Verify category or read list of choices if necessary.)

Agriculture, Forestry, & Fishing 1

Mining 2

Construction 3

Manufacturing – Primary Metals 4

Manufacturing – Stone/Clay/Glass products 5

Manufacturing – Lumber products 6

Manufacturing – Petroleum Refining 7

Manufacturing – Chemicals or Pharmaceuticals 8

Manufacturing – Paper products 9

Manufacturing – Food products 10

Manufacturing – Industrial Machinery 11

Manufacturing – Electronics 12

Manufacturing – Transportation Equipment 13

Manufacturing – Other 14

Transportation or Communications 15

Water or wastewater treatment plant 16

Wholesale Trade/Warehouse 17

Restaurants, eating and drinking establishments 18

Grocery stores/supermarkets 19

Retail Trade (excludes groceries, eating & drinking establishments) 20

Hospital/nursing home 21

Hotel/motel 22

Office building (includes banks, doctor's office, professional services, etc.) 23

Schools, colleges or universities 24

Other Private Sector Services (non-manufacturing) 25

Public Administration/Government 26

Non-Profit Organization 27

Other (specify): _____ 28

(Re-classify into one of the categories above if possible.)

S7. [If business] Approximately how many full-time employees or full-time equivalent positions are there who work for your company **at this location**?

_____ **Thank and terminate if < 10 for manufacturing (IF Q6.1=4-14) or < 25 for non-manufacturing (If q6.1=1-3,15-27)**

S8. [If residential] In which of the following categories is your annual household income? [Reassure that this information will be kept strictly confidential]

Under $60,000	1
$60,000 to $99,999	2
$100,000 to $249,999	3
$250,000 to $499,999	4
$500,000 or above	5
Don't know	88
Refused	99

S9. And to confirm, is your electric utility [INSERT SCE, SDG&E, OR PG&E BASED ON ZIP CODE]?

Yes1

No 2

S10. Do you have natural gas service at this address?

Yes1

No 2 **(SKIP S11)**

S11. Is your natural gas utility [INSERT SCG, SDG&E, OR PG&E BASED ON ZIP CODE]?

Yes1

No 2

If NEITHER S9 NOR S10 = 1, OR if S9 = 2 AND S10 = 1 AND S11 = 2, thank and terminate.

Read: For the remainder of the survey, I'll be referring to "on-site generation." On-site generation refers to any of the following technologies:

[If residential, read:] Residential list: Photovoltaic, wind turbines, or fuel cells

[If business, read:] Commercial list: Photovoltaic, wind turbines, fuel cells, microturbines, internal combustion engines, gas turbines, reciprocating engines

(UNLESS OTHERWISE SPECIFIED RECORD ALL DON'T KNOW's AS 88 AND REFUSED AS 99)

Q1. Does your company/household have either of the following two types of on-site power systems installed at this facility/home? **(READ LIST. RECORD ALL THAT APPLY)**

An on-site power system that is used *only* during blackouts (emergency, standby, or back up generators) 1

An on-site power system that *regularly* generates power at your facility (not just during outages or blackouts).....2

Neither of the above ..... 3 **(SKIP TO Q5)**

Don't Know/Refused..... 88/99 **(SKIP TO Q5)**

Q2. **[If Q1 = 1 or 2]** Approximately what percentage of your facility's/home's total electrical load is currently covered by . . .? **(READ EACH ITEM AND RECORD PERCENTAGE)**

Percent of Load Covered

[Only ask if Q1 = 1]

3a. A standby or backup generator _____ %

[Only ask if Q1 = 2]

3b. An on-site power system that regularly generates power at your facility/home _____ %

[IF Q1 = 1 and 2] Read: For the rest of the questions in this survey, "on-site generation" refers only to systems that regularly generate power. Please do not include systems that only provide backup power for outages in your responses.

Q3. Which of the following on-site generation technologies do you have installed at this facility/home? **(Read list; record all that apply)**

3.a. Reciprocating or internal combustion engine 1

3.a.1. What Fuel is used?

Natural gas.....1

Other 2

(specify): _____)

3.b. Microturbine.....2

3.b.1. What Fuel is used?

Natural gas.....1

Other 2

(specify): _____)

3.c. Turbine.....3

3.c.1. What Fuel is used?

Natural gas.....1

Other 2

(specify): _____)

3.d. Fuel cell 4

3.d.1. What Fuel is used?

Natural gas.....1

Other 2

(specify): _____)

3.e. Wind turbine.....5

3.f. Photovoltaic cells 6

3.g. Other (specify): _____) 7

3.g.1. What Fuel is used?

Natural gas.....1

Other 2

(specify): _____)

Q4. In what year was the on-site generation system at this facility/home installed? If you have more than one system, please answer for the one most recently installed.

_____

Q5. Before today, had you heard of the California Self-Generation Incentive Program?

Yes1

No 2 **(SKIP to Q7)**

Don't know/not sure.....3**(SKIP to Q7)**

Q6. How did you first learn about the incentives that were available to you through the program? **(Ask open ended; prompt with list if necessary; record all that apply)**

a. Utility representative 1

b. Regional Energy Office 2

c. Equipment/system dealer/vendor 3

d. Other users of on-site generation systems 4

e. Magazine or newspaper article 5

f. Other media (e.g., TV, news press releases) 6

g. Professional publications 7

h. Government agency (CPUC, CEC, or DOE) 8

i. Internet search/web site 9

(Specify: _____)

j. E-mail notice or advertisement 10

(Specify: _____)

k. Other 11

(Specify:_____)

l. Don't Know or Can't Recall/Refused 88/99

6a. What do you recall specifically that was appealing about the program when you first heard about it or thoughts since then? Anything else? **(ASK OPEN ENDED, PROMPT FOR ADDITIONAL REASONS & RECORD UNAIDED RESPONSES PER LIST BELOW; RECORD ALL THAT APPLY)**

Don't recall specific information – just a general recollection.....1

Financial incentives available to defray system cost…….……....2

Opportunity to become more energy self-reliant……..……3

Opportunity to contribute to environmental protection. 4

Opportunity to show alternative energy technology leadership in the community 5

Reduce energy costs……..6

Other #1 (specify:_____).....7

Other #2 (specify:_____).....8

Nothing I heard about or have thought of appealed to me about the program – my focus is on other issues, not generating power 9

[Skip to Q8]

Q7. Are you aware of any programs in California that provide financial incentives or rebates to businesses/households for installing on-site power generation systems?

Yes1

No 2

Q8. On a scale of one to ten, where ten means "Very likely to install" and one means "Not at all likely to install," how likely is it that your organization/household will install [**if Q1 = 2, add "additional"]** on-site power generation equipment for this facility/home **in the next five years**? **Please do not count generation equipment that would be used solely for backup or emergency power**.

Very Likely to Install.....10 **(SKIP TO Q9)**

9 9 **(SKIP TO Q9)**

8 8 **(SKIP TO Q9)**

7 7

6 6

5 5

4 4

3 3

2 2

Not At All Likely to Install..... 1

8a. (If Q8 response = seven or less) What concerns do you have that would prevent you installing on-site generation other than an emergency backup system? **(ASK OPEN ENDED, PROMPT FOR ADDITIONAL REASONS & RECORD UNAIDED RESPONSES PER LIST BELOW; RECORD ALL THAT APPLY)**

Don't have specific concerns – just a general feeling that it's not a good idea for us..... 1

It's the utility industry's job to provide power – it's not our business (if a business)/not my responsibility (if residential or institutional) 2

Our priorities are on our business and doing a good job with that, not running a generating system 3

We're interested but don't know anything about the technologies available and/or how they might apply to our situation 4

We don't have time/resources to investigate self-generation 5

We're concerned about having to operate and maintain a self-generation system – no technical ability…..... 6

We don't know if a self-generation system would make economic sense (to reduce energy bills)……..... 7

Other #1 (Specify: _____) 8

Other #2 (Specify: _____)… 9

8b. What information, resources or other factors would help overcome the concerns you just told me about? **(Revisit each concern stated in Q8a and probe for factors that would help overcome each stated concern. Record all factors stated.)**

Nothing – it's not my business/responsibility to be generating power 1

More information about available technologies – how they work, costs, etc 2

More information about how on-site generation would make us more energy self-reliant and/or reduce environmental impacts 3

Technical assistance to identify and design an on-site generation system that works best for us..... 4

Technical assistance to operate and maintain a system (third party operator/maintenance services)..... 5

Financial or economic analysis assistance to determine if a system would provide a reasonable return on the investment 6

Financial incentives to make a system economically viable 7

Other #1 (Specify: _____)..... 8

Other #2 (Specify: _____)..... 9

Q9. **If you were** to install additional on-site power generation (other than backup or emergency generation) in the next five years, how influential would each of the following factors be in making that decision? Please rate the influence of each factor on a scale of one to five,

with five being "very influential," and one being "not influential at all." **(Record one response for each factor)**

Factor			Rating		
a. Want to reduce utility bills	1	2	3	4	5
b. Want to reduce our peak demand	1	2	3	4	5
c. Want a backup system to improve the overall reliability of our electricity supply	1	2	3	4	5
d. Concern for the environment **[ask d.1) immediately after d]**	1	2	3	4	5
d.1. And more specifically, concern about **climate change**	1	2	3	4	5
e. Energy supply independence	1	2	3	4	5
f. Improve our image in the community — green marketing	1	2	3	4	5
g. Provide technical demonstration	1	2	3	4	5
h. Other:_____	1	2	3	4	5

Q10. **If you were** to install additional on-site power generation (other than backup or emergency generation) in the next five years, what is the longest payback period you would be willing to accept? **(READ LIST – RECORD ONE RESPONSE)**

6 months or less.....1

1 year.....2

2 years.....3

3 years.....4

4 years.....5

5 years 6

6 – 10 years 7

More than 10 years 8

Read: Next, I'm going to ask several questions about factors that may influence whether to install on-site generation or not. Please rate each factor on a scale of one to five, where five is very important and one is not at all important.

Q11. How important would the availability of rebates be in deciding whether to install on-site generation in the future? Please rate on a scale of one to five, where five is very important and one is not at all important.

Not at all Important				Very Important
1	2	3	4	5

11a. How important would it be in deciding whether to install on-site generation to have the system have a basic payback of less than five years? Again, please rate on a scale of one to five where five is very important and one is not at all important.

Not at all Important				Very Important
1	2	3	4	5

11b. How important would technical assistance to identify and design an on-site generation system be in deciding whether to install on-site generation in the future? [Prompt again as needed: Please rate on a scale of one to five where five is very important and one is not at all important.]

Not at all Important				Very Important
1	2	3	4	5

11c. How important would it be in deciding whether to install on-site generation to have a trustworthy provider of operation and maintenance services? [Prompt again as needed: Please rate on a scale of one to five where five is very important and one is not at all important.]

Not at all Very

Important Important

1 2 3 4 5

11d. How important would it be in deciding whether to install on-site generation to have the system's operation not be noticeable to you? [Prompt again as needed: Please rate on a scale of one to five where five is very important and one is not at all important.]

Not at all Very

Important Important

1 2 3 4 5

Q12. Finally, on a scale of one to five, with five meaning "Very important," one meaning "Not at all important," and three meaning "Neutral," how important would having a reasonable or sufficient price signal for operating the system be in deciding whether to install a self-generation system?

Not at all Very

Important Important

1 2 3 4 5

Q13. **[ONLY RECRUIT FOR AN INTERVIEW IF THEIR RESPONSE TO Q1 WAS A 1 OR 2]** We appreciate your time and cooperation today. Because understanding the role that various factors play in making on-site generation projects successful is so important, we invite you to participate in a more in-depth, follow-up interview to be scheduled in the next few weeks. This interview would last about 20 to 30 minutes. It will be conducted by a senior analyst with Navigant Consulting, one of the firms participating in this research. It would be structured less like a formal survey and more like a conversation. In recognition of the additional time commitment, we'd provide $100 in compensation once the interview is complete. [If they indicate that they are not able to take monetary compensation, indicate that we would provide a $100 donation to the charity of your choice]

May we schedule you for this follow-on interview?

Yes1

No 2 **Thank and terminate**

Schedule appointment for interview. Verify:

Date and time (PDT)

Phone number to call

Email address (for reminder email the day before the interview)

THANK RESPONDENT FOR THEIR TIME TODAY AND THEIR AGREEMENT TO DO AN IN-DEPTH INTERVIEW

10.1.8 Non-Participant Interviews

PG&E SGIP Program M&E

Non-Participant Interviews

Interview Guide (08/29/2009)

Respondent name:	_____
Respondent title [if a business]:	_____
Company name [if a business]:	_____
Date and time of interview:	_____
Interviewer:	_____
Taped? (circle one)	**YES** **NO**

10.1.8.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 30-minute in-depth interview (IDI). As you know, the qualitative research process is about *discovery*, not coverage. As such, we expect you to cover all areas of investigation, but, if necessary, to focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; based on your experience in qualitative interviewing, allow the flow of the conversation to dictate the order in which you ask them.

10.1.8.2 Background

The Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group (consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC) is charged with the evaluation of the program through their M&E subcommittee led by PG&E.

10.1.8.3 Interview Recording

If you record the interview, you must obtain explicit permission from the respondent.

10.1.8.4 Confidentiality

If respondents ask, tell them yes, their answers will remain confidential, and we will not reveal identities to anyone outside our research team, including utility company employees

10.1.8.5 Introduction

[NOTE: The survey house will have already qualified the respondent for this IDI prior to this point. Please have those survey responses in front of the interviewer so that we can simply confirm and probe for more detail. Many of these questions are addressed in the survey.]

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting interviews to follow up on some of the issues raised in the survey on on-site power generation that you recently completed. This interview is for research purposes, and your participation will not result in marketing or sales calls.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE PROGRAM ADMINISTRATOR'S EMAIL ADDRESS. ALSO SEND THE PROGRAM ADMINISTRATOR AN EMAIL WITH THE NAME AND ORGANIZATION OF THE PERSON WHO MAY BE CONTACTING THEM.

SCG:

Dale Smet

dsmet@semprautilities.com

213-244-3777

PG&E:

Matt Heling

Mgh9@pge.com

415-973-6996

SCE:

Jim Stevenson

James.stevenson@sce.com

626-633-4888

CCSE:

Ryan Amador

Ryan.amador@energycenter.org

858-244-7283

10.1.8.6 Interview Recording (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the recording for anything other than note taking and analysis. *(NOTE TO INTERVIEWER: Recording is optional, but you must obtain consent before doing so.)*

10.1.8.7 I. Confirm On-Site Generation Status and Awareness of SGIP

Before beginning, make sure you understand whether the respondent has installed on-site generation (other than standby), what technologies they have installed, when they were installed, and whether the respondent was familiar with SGIP, before proceeding with the interview. Summarize your understanding from their survey responses, and give them a chance to verify, correct, or comment.

10.1.8.8 II. Reasons for not Applying to SGIP

Q1. **[Ask Q1 only of those who installed on-site generation (other than standby) since 2000]** Our records indicate that you did not apply for funding through the Self-Generation Incentive Program for the on-site generation system you installed in **[insert year from survey Q4]**. Why not? **Probe for:**

Unaware of the program at the time

Believed our project would not qualify (why not?)

Had heard negative things about the program (what? From whom?)

Other (specify)?

Q2. If you were to install additional on-site generation in the future, would you be likely to apply to SGIP? Why or why not?

Q3. Are there other technologies that you think would make a good fit for the SGIP that are not currently eligible?

10.1.8.9 III. Market Study Questions [Ask only of those who installed on-site generation (other than standby generation) since 2000]

You indicated that you've installed a [**Note their response from survey Q3**]. Now I would like to focus on your reasons for installing an on-site generation project and the overall market for on-site generation.

Q4. What prompted you to first consider this on-site generation project?

Q5. What were the primary drivers for this project (refer back to survey Q8a answers as needed and as they apply to the current on-site system, but try to capture in their own words).

5.1. Why did you choose this particular technology?

5.2 Did the specific application in some sense dictate the technology? How or why?

Q6. Do you think this project has been successful? Cost-effective?

Q7. If so, what made it succeed or be cost-effective? What factors did you have going in your favor on this project? If not, what prevented it from succeeding or being cost-effective?

Q8. Has your experience with this project made you more or less likely to do additional on-site generation projects? Why? [Review response to survey Q8 and 8a for perspective, refer to survey responses to help probe]

8.1. What would you do differently next time (or if you had the chance to do this project over from the beginning)?

8.2. Would your expectations be different next time? How so?

Q9. What advice would you have for a business/household like yours that was considering on-site power generation?

[Ask Q10 and 10.1 if respondent has completed or attempted projects at different sites in California.]

Q10. If you have completed or tried to complete more than one project, are there any regional issues that affected these project in different ways? (e.g., air emissions regulations, labor or materials costs, availability of knowledgeable contracting help.)

10.1 How did these regional issues affect the project? [e.g., project costs, timing, etc.]

10.1.8.10 IV. Program Features

PERFORMANCE BASED INCENTIVES/RENEWABLE ENERGY CREDITS

Q11. The SGIP provides an up-front financial incentive, with the amount based on the size of the system (i.e., $/watt). Imagine that, instead, you were offered an incentive based on the performance of your system that would be greater than the current up-front incentives (assuming the project performed as expected), but that you would not receive the incentive until after the project was installed and operating. Would you prefer that greater performance incentive rather than an up-front dollar-per-watt-installed incentive? Why?

INCENTIVE LEVELS AND EQUIPMENT COSTS

Q12. In the previous survey, you mentioned that if you were to install on-site generation in the future, it would need to pay for itself within _[Insert answer from survey Q10]_____ years. Do you feel that the current incentive levels adequately cover enough of the equipment costs in order for the pay back period to be reasonable for your company/organization?

Q13. Do you feel like equipment cost is increasing or decreasing over time?

Q14. Would a declining incentive amount over the next several years for all the technologies in the program affect your participation in future projects? In what way? (e.g., deciding to not participate; accelerating projects to get a better incentive; increasing the size of the project to maximize the incentive.)

10.1.8.11 V. Increasing Awareness and Education (SGIP and on-site generation)

Q15. If the CPUC wants to increase awareness and knowledge of the SGIP among businesses/household such as yours, how would you suggest they go about doing that? What would be the most effective ways to reach businesses such as yours? **Probe for:**

Equipment suppliers/project developers as channels, versus utilities

Utilities as channels, versus equipment suppliers/project developers

Utility bill inserts versus direct mail

Specific professional publications or professional associations

Mass media campaigns (print versus radio versus television)

Non-profit environmental or energy organizations

Other (specify)

Q16. On a scale from one to five, where five means "very interested" and one means "not at all interested," how interested are you in learning more about on-site generation and the financial incentives available to support such projects?

Not at all interested				Very interested
1	2	3	4	5

Q17. Information about on-site generation technologies, available incentives, and overall project economics could come from a variety of sources such as equipment manufacturers, project developers, electric or gas utilities, non-profit environmental or energy organizations, or state agencies such as the CPUC or CEC. What sources would you find most (or least) credible for information on:

17.1 On-site generation technologies

17.2 Available incentives

17.3 Overall project economics

10.1.8.12 VI. Closing

Thank you very much for your time today. As the survey interviewer mentioned when they asked if you would be willing to do this follow up interview, we would like to send you $100 as a token of our appreciation for your help with this research. To whom should we make out the check? [NOTE THAT THEY MAY DESIGNATE A CHARITY IF THEY ARE NOT ABLE TO ACCEPT THE $100 THEMSELVES]

Make check to: _____

Address:_____

City/State/Zip:_____

Finally, if I have a clarification question as I'm reviewing my notes, is it alright to call you back or email you?

- Yes
- No

Thanks again, and have a great day!

10.1.9 Participating Developer

SGIP Program M&E

Participating Project Developer Interviews

Interview Guide (10/24/2009 FINAL)

Respondent identification _____

Respondent name: _____

Respondent title: _____

Company name: _____

Date and time of interview: _____

Interviewer: _____

Type of Developer: _____

Primary Technology _____

Taped? (circle one) **YES** **NO**

10.1.9.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 30-40 minute interview. Remember, the qualitative research process is about discovery, not coverage. As such, try to cover all areas of investigation but, if necessary, focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; allow the flow of the conversation to dictate the order in which you ask them.

10.1.9.2 Background

Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC is charged with the evaluation of the program through their M&E subcommittee led by Betsy Wilkins, a consultant to PG&E.

10.1.9.3 Taping

If you tape the interview, you must obtain explicit permission from the respondent.

10.1.9.4 Confidentiality

If respondents ask, tell them yes, their answers will remain anonymous.

10.1.9.5 Introduction

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting an evaluation of the state of California's Self-Generation Incentive Program, and we are aware that your company has been involved as a project developer with at least one project that has applied for funding through this Program. We're conducting a survey to obtain your views on the Program, based on your experience to date. This survey is for research purposes, and will not affect the application status of the project(s) you are involved with.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE BETSY'S CONTACT INFORMATION:

Betsy Wilkins

Consultant to Pacific Gas & Electric Company

bawilkins@sbcglobal.com

Taping (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the tapes for anything other than note taking and analysis. (NOTE TO INTERVIEWER: Taping is optional, but you must obtain consent before doing so.)

10.1.9.6 I. Background

First, I'd like to get some background information about yourself and your company, just to provide some context for our discussion.

1.1 How long has your company been in business? Within California?

_____ Number of years in business

_____ Number of years in business in California

1.2 In what year were your [PRIMARY TECHNOLOGY] systems first installed for customers in California?

1.3 Outside of the SGIP, have you received, or are you receiving additional financial assistance or funding of any kind for any of the SGIP projects you've installed (e.g., grants, tax credits, or buydowns/rebates)?

IF YES → What percent of your projects in the last two years have received additional funding?

From what types of financial sources?

1.4 What percent (or total kW) of all of your self-generation projects in California in the last two years went through the SGIP process?

1.5 In the last two years, were there any self-generation projects that you tried to get through SGIP but weren't eligible?

IF YES → Why weren't they eligible?

1.6 Have you ever seen a self-generation project that would have been eligible for SGIP go forward without applying for the SGIP?

IF YES → Do you know why the project(s) did not go through the SGIP? How often have you seen this happen? Even though such projects didn't go through the program, did the program have any influence on the project, such as educating the Host Customer on self-generation or some other influence?

IF YES → Please describe the program influence you noticed on those projects.

1.7 What % of your SGIP projects would have been completed even without the SGIP's incentive?

1.8 Do you ever maintain ownership of the SGIP-funded equipment?

IF YES → What percent of your projects do you maintain ownership for? Do these installations experience any different operational experiences (e.g., reliability, lifetime, etc.)?

10.1.9.7 II. SGIP Process Experiences

[NOTE TO INTERVIEWERS: The purpose of this section is to find out the respondent's role in the application process, their opinions on program design issues, how the administrator(s) handled the application(s), and their knowledge of other programs that may overlap or dovetail with the SGIP.]

[NOTE: IF the company is also the Host Customer, SKIP TO 2.2.]

In order to provide suggestions on how to improve the SGIP process, I'd like your feedback on your experiences in dealing with each of the Program Administrator(s). But first I'd like to know how involved your Host Customer(s) are in the application process.

2.1 Please tell me which of these two scenarios most closely describes your Host Customer's involvement in the application process:

a. The Host Customer is actively involved in each stage of the application process and reviews all application materials before they're sent out.

b. The Host Customer essentially takes a hands-off approach to the application process, leaving your company to make most of the decisions.

2.2 Okay, now let's talk about the SGIP process, and in particular, any issues or problems that may have come up along the way. [NOTE: Probe on any of the following mentioned below.] What about…

a. the clarity of the Program application materials and instructions?

b. the responsiveness of the Program Administrator (e.g., did they contact you enough)? [NOTE: If the respondent dealt with more than one Program Administrator, probe for differences among them.]

c. the 90-day deadline for Proof of Project Advancement? [NOTE: If there were issues, probe on issues such as the air pollution permit application submission, the electrical interconnection application submission, ordering the generating equipment, obtaining proof of insurance, providing waste heat recovery calculations, providing project cost breakdowns, etc. Inquire how/if the Program Administrator assisted them in any way in overcoming these issues.]

d. the 1-year deadline for completing the installation? (NOTE: If there were issues, probe on issues such as air pollution permitting, local permitting, meeting waste heat recovery requirements, utility interconnection, financing, etc. Inquire how/if the Program Administrator assisted them in any way in overcoming these issues.]

2.3 What is the primary source of SGIP program information for you? How do you get clarification of information when you need help?

2.5 Have you developed SGIP projects for both public and private entity customers? If YES → What percent have been for public entities?

2.4 [ASK OF RESPONDENTS WHO DEALT WITH BOTH PUBLIC AND PRIVATE ENTITIES.] For you as a developer, what are the key differences between public and private entities in developing and building self-generation projects?

a. How does the process differ for these two groups?

b. What does it take to successfully engage with a public entity on an SGIP project?

c. In what ways has the SGIP been able to effectively attract and build self-generation projects given those differences? Are there areas where the program has not adequately addressed these key differences, such that projects have been hindered in some way?

2.5 [ASK OF RESPONDENTS WHO DEALT WITH PUBLIC ENTITIES – (refer to data sheet)]

a. What about the extended amount of time now allowed for public entities to complete projects? Has this been beneficial for the public entity organizations, or is more a case of "if you provide more time, they'll take more time"?

2.6 What percent of Host Customers with whom you have helped developed projects already knew about SGIP before you became involved with them (the customer)?

2.7 Do you find that prospective Host Customers understand the SGIP eligibility requirements? Does this differ by segment (e.g., public vs. private, commercial, industrial, size, etc.)?

2.8 Have you experienced any unnecessary project delays caused by Host Customers? IF YES → What were they?

10.1.9.8 III. Marketing and Outreach

3.1 Are you aware of any SGIP marketing or outreach activities? Which ones? Are they effective?

3.2 What market activities could the PA conduct that would be most effective?

3.3 Has your organization incorporated information with reference to the SGIP into any of their marketing and promotional materials? IF YES → How? (For example, as part of presenting case studies to trade groups such as BOMA or other industry associations, etc.)

10.1.9.9 IV. Program Changes

4.1 Since January 2007, what program changes – incentives, program processes, eligibility requirements or performance requirements including emissions – have had the most significant impact on your role as a project developer?

PROBE ON:

Renewable CHP, fossil-fuel based DG NOx emissions standard of 0.14 lbs/MWH that was effective in January 2005, and NOx emissions of 0.07 lbs/MWh and 60% minimum efficiency beginning January 1, 2007,

Increase of the incentive cap from 1MW to 3MW

4.2 Should the incentive cap increase be made permanent?

4.3 How much of an impact did each change have on project timelines? The number of projects applying and the number of projects completed? [NOTE: Probe for any other impact these changes might have had.]

4.5 Are you aware of the 20% additional incentive available for CA suppliers? Are you a CA supplier? Is this bonus sufficient to motivate you to open CA operations?

4.6 What would be the effect of a performance-based incentive structure on SGIP participation? Would you continue to pursue projects under a PBI structure?

4.7 Do you have any other issues or concerns with the incentive structure?

10.1.9.10 V. System Performance

5.1 In general, do your customer's systems meet their system performance and reliability expectations? Why or why not?

5.2 What factors do you see affecting a system's performance and reliability? What could be done to improve? What could the SGIP do to support?

5.3 What steps does your company take to ensure the reliability and continued availability of the self-generation equipment after it's installed?

5.4 What effect(s) would it have on your projects if the SGIP required monitoring and reporting on all systems? How much would it increase the costs?

10.1.9.11 VI. Market Dynamics

[NOTE TO INTERVIEWERS: This section will focus on the technologies themselves and the respondent's views of the current and future markets for each technology.]

6.1 What are the most significant barriers to the adoption of small wind/fuel cell? [PROBE FOR: Customer barriers, technology barriers, regulations.

6.2 What needs to happen before these barriers can be overcome?

6.3 What market trends to you see in the next 2-4 years? [PROBE FOR: technology advancements, changes in price]

6.4 Have you tailored your approach for the different California markets you work in? [NOTE: "Different markets" could mean different Program Administrator territories, different geographies and associated environmental and other market constraints, different technologies, etc.] If YES → How? What challenges does this present?

10.1.9.12 VII. Project Development Process

7.1 In your opinion, what are the most important factors that lead to successful SGIP projects? That is, how do you define a successful project? Does that vary when working on public vs. private entities? Is continued operation of the installation an element of success?

7.2 What factors regularly undermine projects?

7.3 What about leased systems? Are there unique problems/issues with developing leased systems through the current SGIP? IF YES → What types of problems/issues?

7.4 On a scale of one to five please rate the impact of the Program on the market development needs of the energy services industry, where one means no impact and five means a significant impact.

1 2 3 4 5

7.5 In your opinion, has the Program provided support for the energy services industry to market the Program? IF YES → How has this support been provided?

7.6 In your opinion, has the Program made a contribution to Host Customer education with respect to self-generation technology? IF YES → How?

7.7 Have you experienced any difficulties with… (Circle all that apply) [NOTE: probe if yes to any of the below.]

1 connecting distributed generation system projects to the grid?

2 [For Wind] obtaining information about net metering? Installing and managing net metering equipment?

3 the inspection and approval of your system by the utility?

4 receiving adequate Local Building Department support/information regarding the installation of distributed energy systems? [NOTE: probe on issues like permitting/building code requirements and safety inspection/approval.]

IF YES → What type(s) of difficulties did you have?

7.8 In the absence of the SGIP, would the current development of the energy services industry in California be any different than what it is today? IF YES → How so?

7.9 Please rate your overall satisfaction of the SGIP on a scale of one to five, with one being "very dissatisfied" and five being "very satisfied."

1 2 3 4 5

7.10 Is there any support/information you need from the SGIP or its Program Administrators, that you don't already receive, that would help to overcome customer barriers to [PRIMARY TECHOLOGY] adoption? IF YES → Please describe.

7.11 What other technologies should be eligible under the SGIP? What program rules or requirements would need to be changed to accommodate them?

7.12 Have you installed any projects outside of California? IF YES → Is it easier or harder to install projects outside of California? What are the major differences?

7.13 Have you or your customers participated in other programs to incent or support wind or fuel cells besides the SGIP? IF YES → Who is the program administrator? What features of these programs are more effective than the SGIP?

VIII. Program Modifications Guidelines

8.1 Are you aware of the SGIP program modifications guidelines? IF YES → Are the guidelines clear and reasonable?

8.2 Have you requested a program modification in the last year? IF YES →Was the process reasonable? Was the desired outcome achieved? What changes should be made to improve?

10.1.9.13 IX. Conclusion

I've got just one more question, and then we'll wrap things up.

9.1 What was your approximate sales volume in California in each of the past two years, in terms of the number of [TECHNOLOGY TYPE] units (modules/wind turbines/fuel cells/small or micro-gas turbines/IC engines) and total kW (or total $, if available)?

_____ Total number of units in 2007 _____ kW sold in 2007

_____ Total number of units in 2008 _____ kW sold in 2008

9.2 Is there anything I haven't asked you about on which you'd like to comment? Any other Program changes/things that worked well that we didn't cover?

I want to thank you again for your participation in this SGIP evaluation. We really appreciate it.

10.1.10 Non-Participating Developer Interview Guide

FINAL

Respondent name: _____

Respondent title: _____

Company name: _____

Date and time of interview: _____

Interviewer: _____

Type of Market Actor: _____

Primary Technology: _____

Taped? (circle one) **YES** **NO**

10.1.10.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 20 minute interview. Remember, the qualitative research process is about discovery, not coverage. As such, try to cover all areas of investigation but, if necessary, focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; allow the flow of the conversation to dictate the order in which you ask them.

10.1.10.2 Background

A Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC is charged with the evaluation of the program through their M&E subcommittee led by Betsy Wilkins, a consultant to PG&E.

(NOTE TO INTERVIEWER: the CCSE administers the program in SDG&E territory)

10.1.10.3 Taping

If you tape the interview, you must obtain explicit permission from the respondent.

10.1.10.4 Confidentiality

If respondents ask, tell them yes, their answers will remain anonymous.

10.1.10.5 Introduction

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting an evaluation of the state of California's Self-Generation Incentive Program, and we are conducting a survey to obtain your views on the wind/fuel cell industry. This survey is for research purposes only.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE BETSY'S CONTACT INFORMATION:

Betsy Wilkins

Consultant to Pacific Gas & Electric Company

bawilkins@sbcglobal.com

Taping (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the tapes for anything other than note taking and analysis. (NOTE TO INTERVIEWER: Taping is optional, but you must obtain consent before doing so.)

10.1.10.6 Background

1. How are you/is your organization involved with wind/fuel cell technology?
2. What is your role/title within your organization?
3. How long have you been with your organization?
4. How long has your organization been in business/existence?

_____ Number of years in business

_____ Number of years in business in California

5. In what year were your [PRIMARY TECHNOLOGY] systems first installed for customers in California?
6. In the last two years, were there any [PRIMARY TECHOLOGY] projects that you tried to get through SGIP but weren't eligible?

IF YES → Why weren't they eligible?

10.1.10.7 Marketing and Outreach

7. Are you aware of any SGIP marketing or outreach activities? Which ones? Are they effective?
8. What market activities could the Program Administrators conduct that would be most effective?

10.1.10.8 Market Barriers

9. What are the most significant barriers to the adoption of [PRIMARY TECHNOLOGY]? Probe for:

   Customer barriers

   Technology barriers

   Regulations

10. For each barrier:

    What needs to happen before these barriers can be overcome?

    Who is the appropriate party to address this?

Barrier	What can be done to overcome this barrier?	Who should take action?

11. Have you tailored your approach for the different California markets you work in? [NOTE: "Different markets" could mean different utility service territories, different geographies and associated environmental and other market constraints, different technologies, etc.]

    If YES → How? What challenges does this present?

12. Have you installed any projects outside of California?

    If YES →Is it easier or harder to install projects outside of California? What are the major differences?

10.1.10.9 Permitting and Siting (Wind Developers only)

12. Were there city or county zoning ordinances or building codes within CA that make projects difficult to install the project(s)?
    - ***a.*** Describe the circumstances. What city/county?
    - ***b.*** What were your strategies for overcoming these obstacles? How effective were they?
    - ***c.*** Have you heard of other solutions, even outside of CA, to this type of obstacle?
    - ***d.*** What could be done to permanently remove these obstacles in the California market?

10.1.10.10 Emissions (Fuel Cell Developers only)

12. Have you had trouble meeting local air board emissions requirements for fuel cells?
    - ***a.*** Describe the circumstances? What regulation was involved?
    - ***b.*** How were the barriers overcome?
    - ***c.*** Have you heard of other solutions to these obstacles, even outside of CA?

10.1.10.11 Project Characteristics

13. Are there key characteristics or circumstances that typically result in a successful project installation?
    - ***a.*** What are they?
14. What are the factors that typically undermine a project?
15. Are there particular industries or customer types better suited to [PRIMARY TECHOLOGY] projects?
    - ***a.*** Please describe.

16. IF NOT ALREADY ADDRESSED:
    Are there internal infrastructure or attributes that a customer needs to have to support a wind/fuel cell project?
17. Have you experienced any difficulties with… (Circle all that apply) [NOTE: probe if yes to any of the below.]
    - ***a.*** connecting distributed generation system projects to the grid?
    - ***b.*** [For Wind] obtaining information about net metering? Installing and managing net metering equipment?
    - ***c.*** the inspection and approval of your system by the utility?
    - ***d.*** receiving adequate Local Building Department support/information regarding the installation of distributed energy systems? [NOTE: probe on issues like permitting/building code requirements and safety inspection/approval.]

IF YES → What type(s) of difficulties did you have?

System Performance

18. In general, do your customer's systems meet their system performance and reliability expectations? Why or why not?
19. What factors do you see affecting a system's performance and reliability? What could be done to improve?
20. What steps does your company take to ensure the reliability and continued availability of the self-generation equipment after it's installed?

10.1.10.12 Other Programs

21. Are you aware of any programs that incent or support the installation of customer sited wind/fuel cells?
    [NOTE TO INTERVIEWER: This doesn't have to be an incentive program; it could be a loan, grant, or information program.]

IF YES:

22. What features of the program make it most effective at promoting wind technology?

IF SGIP AND ANOTHER PROGRAM ARE MENTIONED, ASK:

23. Which program do you think is most effective at supporting the installation of wind projects?

24. What features make it/them more effective than the SGIP? (or SGIP more effective than it/them)

10.1.10.13 Industry Structure

25. Does your company offer financing for these projects?
26. Do you partner with other entities (e.g., banks) that do provide financing for these projects?
27. Have you seen any innovations in financing these types of projects?
28. In your opinion, has the SGIP provided support for the energy services industry to market the Program?

IF YES → How has this support been provided?

29. In your opinion, has the SGIP made a contribution to Host Customer education with respect to self-generation technology?

IF YES → How?

30. In the absence of the SGIP, would the current energy services industry in California be any different than what it is today?

IF YES → How so?

10.1.10.14 Market Trends

31. What market trends to you see in the next 2-4 years?
    Probe for:
    Technology advancements or changes
    Trends in equipment, component, or installation price
    Equipment or component availability

10.1.11 Wind Market Actor Interview Guide

FINAL

Respondent name: _____

Respondent title: _____

Company name: _____

Date and time of interview: _____

Interviewer: _____

Type of Market Actor: _____

Taped? (circle one) **YES** **NO**

10.1.11.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 20 minute interview. Remember, the qualitative research process is about discovery, not coverage. As such, try to cover all areas of investigation but, if necessary, focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; allow the flow of the conversation to dictate the order in which you ask them.

10.1.11.2 Background

A Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC is charged with the evaluation of the program through their M&E subcommittee led by Betsy Wilkins, a consultant to PG&E.

(NOTE TO INTERVIEWER: the CCSE administers the program in SDG&E territory)

10.1.11.3 Taping

If you tape the interview, you must obtain explicit permission from the respondent.

10.1.11.4 Confidentiality

If respondents ask, tell them yes, their answers will remain anonymous.

10.1.11.5 Introduction

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting an evaluation of the state of California's Self-Generation Incentive Program, and we are conducting a survey to obtain your views on the wind industry. This survey is for research purposes only.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE BETSY'S CONTACT INFORMATION:

Betsy Wilkins

Consultant to Pacific Gas & Electric Company

bawilkins@sbcglobal.com

10.1.11.6 Taping (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the tapes for anything other than note taking and analysis. (NOTE TO INTERVIEWER: Taping is optional, but you must obtain consent before doing so.)

10.1.11.7 Background

13. How is your organization involved with wind technology?
    [Interviewer will answer this question in advance of the interview and confirm with respondent that this is the entire breadth of their involvement in the industry.]
14. How long has your organization been in business/existence?
    [Interviewer will answer this question in advance of the interview and confirm with respondent that this is the entire breadth of their involvement in the industry.]
15. What is your role/title within your organization?
16. How long have you been with your organization?

10.1.11.8 Market Barriers

17. What are the most significant barriers to the adoption of small wind?
    [NOTE TO INTERVIEWER: Define wind as systems sized 30kW to 5MW]

    Probe for:

    Customer barriers

    Technology barriers

    Regulations
18. For each barrier:

What needs to happen before these barriers can be overcome?

Who is the appropriate party to address this?

Barrier	What can be done to overcome this barrier?	Who should take action?

10.1.11.9 Permitting and Siting (Associations and Industry Experts only)

19. Have you been involved with any projects installed in California?

IF YES:

20. Were there city or county zoning ordinances or building codes within CA that make projects difficult to install the project(s)?
    - ***a.*** Describe the circumstances. What city/county?
    - ***b.*** What were your strategies for overcoming these obstacles? How effective were they?
    - ***c.*** Have you heard of other solutions, even outside of CA, to this type of obstacle?
    - ***d.*** What could be done to permanently remove these obstacles in the California market?

IF NO:

21. Are you aware/have you encountered any city or county ordinances or building codes in other areas that made it difficult to install small wind projects anywhere in the US?
    - ***a.*** Describe the circumstances. What city/county?
    - ***b.*** Were you effective in overcoming these obstacles? How?
    - ***c.*** Have you heard of other solutions, even outside of CA, to this type of obstacle?
    - ***d.*** What could be done to permanently remove these obstacles?

10.1.11.10 Project Characteristics (Industry Experts only)

22. Are there key characteristics or circumstances that typically result in a successful project installation?
    - ***a.*** What are they?
23. What are the factors that typically undermine a project?
24. Are there particular industries or customer types better suited to wind projects?
    - ***a.*** Please describe.
25. IF NOT ALREADY ADDRESSED:
    Are there internal infrastructure or attributes that a customer needs to have to support a wind or fuel cell project?

10.1.11.11 Other Programs (Associations and Industry Experts only)

26. Are you aware of any programs that incent or support the installation of customer sited wind?
    [NOTE TO INTERVIEWER: This doesn't have to be an incentive program; it could be a loan, grant, or information program.]

IF YES:

27. What features of the program make it most effective at promoting wind technology?

IF SGIP AND ANOTHER PROGRAM ARE MENTIONED, ASK:

28. Which program do you think is most effective at supporting the installation of wind projects?
29. What features make it/them more effective than the SGIP? (or SGIP more effective than it/them)

10.1.11.12 Industry Structure

30. Does your company offer financing for these projects?
31. Do you partner with other entities (e.g., banks) that do provide financing for these projects?
32. Have you seen any innovations in financing these types of projects?
33. Do you partner with any other entities to promote your product?

34. What channels do you use to distribute your technology?

10.1.11.13 Market Trends

35. What market trends to you see in the next 2-4 years?
    Probe for:
    Technology advancements or changes
    Trends in equipment, component, or installation price
    Equipment or component availability
36. Do you foresee your costs increasing or decreasing over time?
    - ***a.*** What are the key drivers of cost?
37. Do you see your market-facing prices increasing over time?
    - ***b.*** What are the key drivers of market-facing price?
38. Do you have plans to scale up your manufacturing operations?
    - ***c.*** How much?
    - ***d.*** When?
    - ***e.*** Where?

10.1.12 Fuel Cell and AES Market Actor Interview Guide

FINAL

Respondent name: _____

Respondent title: _____

Company name: _____

Date and time of interview: _____

Interviewer: _____

Type of Market Actor: _____

Taped? (circle one) **YES** **NO**

10.1.12.1 Notes to interviewers

This topic guide is designed to help you to complete an approximately 20 minute interview. Remember, the qualitative research process is about discovery, not coverage. As such, try to

cover all areas of investigation but, if necessary, focus on those questions that seem most relevant to each respondent or those that develop new and/or useful information. Additionally, you are not required to ask questions in the order they are given herein; allow the flow of the conversation to dictate the order in which you ask them.

10.1.12.2 Background

Navigant Consulting team is evaluating the California SGIP. The evaluation is focused on systems installed under the SGIP in the service areas of PG&E, SCE, SCG, and SDG&E. A Working Group consisting of representatives from the Program Administrators, SDG&E, and the CEC staff associated with the Emerging Renewable Program, and the Energy Division of the CPUC is charged with the evaluation of the program through their M&E subcommittee led by Betsy Wilkins, a consultant to PG&E.

(NOTE TO INTERVIEWER: the CCSE administers the program in SDG&E territory)

10.1.12.3 Taping

If you tape the interview, you must obtain explicit permission from the respondent.

10.1.12.4 Confidentiality

If respondents ask, tell them yes, their answers will remain anonymous.

10.1.12.5 Introduction

Hello, my name is _____ and I work for Navigant Consulting. I am calling on behalf of the California Public Utilities Commission. We are conducting an evaluation of the state of California's Self-Generation Incentive Program, and we are conducting a survey to obtain your views on the wind industry. This survey is for research purposes only.

NOTE: IF RESPONDENT QUESTIONS THE LEGITIMACY OF THE SURVEY, YOU MAY GIVE THEM THE BETSY'S CONTACT INFORMATION:

Betsy Wilkins

Consultant to Pacific Gas & Electric Company

bawilkins@sbcglobal.com

10.1.12.6 Taping (optional)

With your permission, I'll record the interview to avoid slowing down our conversation by taking all written notes. I will not use the tapes for anything other than note taking and analysis. (NOTE TO INTERVIEWER: Taping is optional, but you must obtain consent before doing so.)

10.1.12.7 Background

1. How is your organization involved with fuel cell/AES technology?

   [Interviewer will answer this question in advance of the interview and confirm with respondent that this is the entire breadth of their involvement in the industry.]

2. How long has your organization been in business/existence?

   [Interviewer will answer this question in advance of the interview and confirm with respondent that this is the entire breadth of their involvement in the industry.]

3. What is your role/title within your organization?
4. How long have you been with your organization?

10.1.12.8 Market Barriers

5. What are the most significant barriers to the adoption of fuel cells/AEC?

   (NOTE TO INTERVIEWER: Define systems sized 30kW to 5MW)

   Probe for:

   Customer barriers

   Technology barriers

   Regulations

For each barrier ask:

a. What needs to happen before these barriers can be overcome?

b. Who is the appropriate party to address this?

Barrier	What can be done to overcome this barrier?	Who should take action?

10.1.12.9 Emissions (Associations and Industry Experts only)

6. Have you been involved with any projects installed in California?

IF YES:

7. Have you had trouble meeting local air board emissions requirements for fuel cells?
    - ***a.*** Describe the circumstances? What regulation was involved?
    - ***b.*** How were the barriers overcome?
    - ***c.*** Have you heard of other solutions to these obstacles, even outside of CA?

IF NO:

8. Are you aware of/have you encountered trouble meeting local air board emissions requirements for fuel cells?
    - ***a.*** Describe the circumstances? What regulation was involved?
    - ***b.*** How were the barriers overcome?
    - ***c.*** Have you heard of other solutions to these obstacles?

10.1.12.10 Project Characteristics (Industry Experts only)

9. Are there key characteristics or circumstances that typically result in a successful project installation?
    - ***a.*** What are they?

10. What are the factors that typically undermine a project?

11. Are there particular industries or customer types better suited to a fuel cell/AES project?

a. Please describe.

IF NOT ALREADY ADDRESSED:

12. Are there internal infrastructure or attributes that a customer needs to have to support a fuel cell/AES project?

10.1.12.11 Other Programs (Associations or Industry Experts only)

13. Are you aware of any programs to incent or support the installation of customer sited fuel cells?

(NOTE TO INTERVIEWER: This doesn't have to be an incentive program; it could be a loan, grant, or information program.)

IF YES:

14. What features of the program make it most effective at promoting fuel cell/AES technology?

IF SGIP AND ANOTHER PROGRAM ARE MENTIONED, ASK:

15. Which program do you think is most effective at supporting the installation of fuel cell/AES projects?
16. What features make it/them more effective than the SGIP? (or SGIP more effective than it/them)

10.1.12.12 Market Trends

17. What market trends to you see in the next 2-4 years?

    Probe for:

    Technology advancements or changes

    Trends in equipment, component, or installation price

    Equipment or component availability
18. Do you foresee your costs increasing or decreasing over time?

    f. What are the key drivers of cost?
19. Do you see your market-facing prices increasing over time?

g. What are the key drivers of market-facing price?

20. Do you have plans to scale up your manufacturing operations?

h. How much?

i. When?

j. Where?

10.1.12.13 Program Modification Guidelines

21. Are you aware of the SGIP program modifications guidelines?

IF YES:

22. Are the guidelines clear and reasonable?

23. Have you requested a program modification or participating in the PMG process in the last year? [NOTE: submitting comments qualifies as participating in the PMG process]

IF YES:

24. Was the process reasonable?

a. Was the desired outcome achieved?

b. What changes should be made to improve?

10.2 Appendix 2: Interview Summaries

10.2.1 Participant and Non-Participant Host Customers

The Navigant Consulting team interviewed a total of 29 SGIP participants and nonparticipants in the fall of 2009. Interview candidates were identified, recruited and scheduled through a separately administered survey. Interviews were conducted by telephone using senior staff that had reviewed the interview subjects' survey responses. The interviewers used an interview guide developed by Navigant Consulting and approved by the SGIP M&E subcommittee. While attempts were made to achieve a good distribution of SGIP technology types and PAs, the relatively small number participants and survey completions for some technology types and the greater willingness of some public entity participants did create some skew in respondent types. For instance, a relatively high number (n=5) of interviews were conducted with municipal customers. Also it was relatively difficult to locate and recruit non-participating IOU customers. In the future, calling energy service companies or technology vendors may be a better channel for locating those, apparently few, market actors that install projects of this scale without SGIP incentives.

Table 33. Number of Interviews by Technology and SGIP Status

Technology	Internal Combustion Engine (ICE)	Micro-turbine	Fuel Cell	Wind	Total Completed
Participant – Active/Completed	10	2	5	2	19
Participant - Withdrawn/Rejected	2	0	3	1	6
Non-Participant	N/A	N/A	N/A	N/A	5

10.2.2 Findings

The results from the interviews are summarized below. In general the SGIP is a mature program that appears to be running well. A few areas for improvement are noted, but most of these relate to the current difficult economy or frustrations held by those that proposed relatively complex projects.

10.2.2.1.1 Economics

- Unsurprisingly, the state of the economy was top of mind for many participants as well as Withdrawn/Rejected customers.
- Multiple iterations, particularly in design build-contracts appeared to drive participation costs up for several respondents.

- Some of these iterations could have been avoided through better upfront technology selection[83]
- Iterations were also driven by lack of knowledge about "moving regulatory targets" under CARB 2007 and in which jurisdictions these regulations apply.

» Several interviews yielded comments about funding barriers.

- Some reported that investors expressed concern about California's fiscal difficulties indicating confusion about the commitment and availability of ratepayer funds as opposed to taxpayer funded activities.
- Installations were seen by some as a zero-sum game. If one piece of the project failed to come together, all of the risk rests with either the developer or site owner. While this risk has existed in prior years, in the current economy only the most bankable projects move forward, potentially at the cost of innovative new projects.
- Making bridge monies or feasibility study funds available was seen as a viable backstop by some.

10.2.2.1.2 Technology Related Observations

» For cogeneration projects: sites with their own distribution and transfer switch report that they are good candidates. They have no election to net energy meter and have sufficient demand to utilize all generation.

» Several of the internal combustion engine projects reported delays (due to local permitting moratoriums – the apparent result of a pending litigation in Los Angeles) and "just getting in" under the wire of local air board rule changes.

» Interviewees who had installed microturbines were surprised to find out that they were responsible for paying departing load charges, more so than those who had installed other technologies. However given the relatively few microturbine interviews it is difficult to know what significance to attach to this observation.

» Fuel cell projects:

- Report needing to educate local officials (building, fire) about safety records of fuel cells.
  In smaller scale fuel cells, e.g., those in the high-end residential market; some report contracting around the "spec" risk, e.g., if a customer does not want the fuel cell, the vendor agrees to take it back;

[83] For example a shift in technology preference from original bid (whether due to qualified bidders or shifting regulatory constraints on emissions) can change the design parameters of a project. A project may have begun with little demand for excess heat, but over the projects iterations, and technology change outs the heat demand for optimal design may shift.

- Appear to have more difficulty with delay and lead time for equipment; and
- Have concerns about incentive break points not matching the typical sizing that systems are delivered in, e.g., systems are available at 300, 1400, 2800 kW, while incentives are capped at one MW,[84] as well as sufficiency of overall incentive amounts.

10.2.2.1.3 Program Experiences

» With a few notable exceptions, experiences with PAs are positive.

» Larger projects can still experience delays with interconnection, where reported, attributed to slow dialog with interconnection and SGIP group.

» One participant reported recruiting a utility customer care representative to be an ombudsman to "own the process." This person recruited all utility stakeholders to a face-to-face meeting that assisted in resolving a stalemate over interconnection. It may be advisable to require "sit downs" of this sort to avoid negative surprise about process needs, timing, etc., particularly for relatively large or complex projects.

» There is broad but not uniform support for using ratepayer monies for this program.

» It appears that less fully commercialized technologies (fuel cells) or those new to this scale (wind), or used in newer configurations (waste streams as fuel) may need more support. The program works best with "plug and play" installations as it is not an R&D program. However, the market is working on taking advantage of innovative configurations e.g., using waste streams as renewable fuel. As a result a number of participants expressed concern about funding feasibility studies and the zero sum aspect mentioned above of risk allocation in developing an SGIP project.

» Experience with the SGIP and appropriate sizing and specification of distributed systems is helpful to having a successful experience. In some cases, participants now specify that vendors have experience and success working with the SGIP as a prequalification to bidding on a construction contract. Similarly, those who had not gone through SGIP had slightly more difficulty specifying technology and managing the process and suggested that an available "roaming" engineer or online tutorial could have provided supporting direction.

» The time frames allotted to develop and complete projects appear to be aggressive, with fuel cell projects (due to equipment delay) and internal combustion projects (due to air permitting) reporting the most difficulty. Particularly where equipment must be ordered from outside the US, there is some concern about timing to procure, and install consistent with the SGIP timeframes. Interestingly some report that the recession has led to increasing job responsibilities and thus relative overburden and delay on the part of

[84] Incentives are now capped at 3MW with a declining incentive between 1MW and 3MW.

on-site personnel, while others (particularly public entities) indicate that during a recession, construction is relatively more affordable and responsive, as vendors and suppliers are relatively less constrained.

10.2.2.1.4 Market Insights and Shifts from Prior Process Research

- Compared to previous years, there appeared to be a "back to basics" mentality in approaching due diligence, with more support for "tried and true" technologies, such as internal combustion engines, run in a cogen configuration using renewable fuel. Several participants called prior participants to check on appropriate configurations asking, "will this technology stand up to my specific needs?" as well as to obtain reports on potential vendors and partners. These participants were connected with the prior participants through word of mouth within industries, bulletins circulated via industry or sustainability e-mail lists, and through their developers. Road shows were employed by several vendors to leverage installations in other areas, and "make it real" to applicants. Word-of-mouth was still a significant channel for project inception and promotion. Several participants, notably in the waste water treatment customer segment expressed business drivers that included sentiments of thrift (e.g., why throw away or flare a resource that could provide a fuel for electricity and generate heat as well).
- Many did not support shifting to a performance based business model arguing that the upfront cash incentive was critical in this economy, particularly to smaller boutique installer/vendors that could be driven out of business by larger firms with better access to capital. Those who were more favorable to the concept, believed that creating a performance based incentive model would create strong drivers for vendors to keep systems running particularly where projects are structured as power purchase agreements. Some suggested a hybrid system of support for some upfront costs with payouts overtime for performance.
- Few participants appear to be interested in holding the renewable energy credits generated by the projects. Though awareness of the financial value appears to be growing it remains relatively unsophisticated. For projects owned by a federal entity there are reports of being unable to sell the RECs due to federal status.
- Despite the increasing focus on peak pricing in California, few participants or non-participating IOU customers were willing to consider running in a peaking configuration. Reasons given for this were technology based. Fuel cells are designed to run continuously and wind turbines operate when the wind resource is available. There is also a concern that one outage on a critical day might set their demand ratchet (their peak demand for the year) and negate all prior savings.
- A significant value was attributed to being able to reduce air board regulatory burden (e.g., if a waste could be utilized as fuel, this would have the effect of reducing discharge and therefore regulatory burden from the air board).

- Selling distributed generation is becoming more sophisticated, and increasingly involves the executive team in addition to the energy manager or facilities director. Where firms are international in footprint, this can have the effect of providing direction and support for sustainability initiatives. Similarly several interview subjects reported corporate goals for green power or sustainability initiatives as a key business driver, while others were very clear that money and then environment was the order of priority for their business.
- Surprisingly, none of the respondents expressed much concern about the future price of natural gas. Many appear to have longer term contracts for gas and are thus somewhat insulated from variations.

10.2.3 Participating Developer

The team completed interviews with project developers who have had projects in the SGIP. The goal of these interviews was to obtain the developer's views on the SGIP, the PAs, barriers to project development, and their respective markets.

The interviews addressed the following topic areas:

- SGIP Process
- SGIP Incentives
- SGIP Marketing and Outreach
- Project Development Process
- System Performance
- Project Characteristics
- Market Barriers
- Market Trends

Because of time constraints, not all of the developers were asked every question. Also, some developers opted not to comment on certain questions.

10.2.4 Wind Developers

10.2.4.1 Background on Interviewees

The developers of five SGIP wind projects were interviewed in November and December of 2009. Three of the developers have been involved with completed SGIP wind projects, although two of them were with different firms when they worked on those projects. Four of the developers have SGIP projects that are still in development. All of the interviewees are project developers only and not involved with wind turbine manufacturing. Three of the developers have also been involved with other technologies such as solar and microhydro.

10.2.4.2 SGIP Process

10.2.4.2.1 Application Process

The majority of wind developers believe that the SGIP application process is "fairly straightforward" and in line with other, similar rebate programs. However, one developer noted that it takes a "rocket scientist to get anything through" the process. Two developers pointed out that, for wind projects, which tend to be complicated; the rebate application process is "the least of their problems."

The wind developers generally viewed the Program Administrators favorably, calling them "accessible and helpful" and "very responsive." One PG&E SGIP staff member was mentioned by name as someone who worked "diligently" and sends reminders when the various project milestones are approaching.

All wind project developers handle the SGIP application process for their customers. One indicates that their customers typically review and approve the various program documents, while the remaining developers say their customers take a hands-off approach. While the application process was reasonable for the project developers to navigate, one developer commented that they "couldn't imagine an owner trying to get through."

10.2.4.2.2 Program Timelines

All developers agree that the program timelines are not appropriate for wind projects. Specifically, the 60 day limit for private entities to demonstrate Proof of Project Milestone (PPM) is inadequate for wind projects that have complex project development cycles. Some projects require wind studies and performance modeling. Depending on the specific location, environmental studies may need to be conducted, with negotiations on environmental mitigation often being required, as well. If a county building department determines that the project requires a special use permit, then public hearings and community approval may be required. One developer believes that the timeframe to demonstrate proof of project advancement should be *at least* six months and another suggested a year.

Other developers felt that the sequencing of the various milestones results in a chicken and egg situation with the financing agents. The contracts with the manufacturer and the customer (a requirement of the PPM) can't be executed until the financing is finalized. However, some financing agents aren't comfortable approving project financing with a conditional reservation and require the reservation confirmation.

One developer commented that the SGIP timelines were developed around solar projects when these were the dominant technology in the program and do not take into consideration the project development process for wind projects. Wind projects are very site-specific and may require extensive wind studies and modeling to forecast the system performance. Solar projects are more plug-and-play in contrast and don't require the same level of planning or modeling as a wind project.

Some developers believe that the 18 months allowed for public entities to complete their projects should be extended to all applicants, regardless of business type. More private companies are requiring all capital projects to be put through a solicitation process in order to comply with the Sarbanes-Oxley Act of 2002. Most wind turbines are custom-ordered and take six months to a year to be built and delivered. One developer had a situation where the negotiations with the county zoning department required that the size of the turbine be reduced, which meant that they had to renegotiate their contract with the turbine manufacturer, further delaying the project installation.

10.2.4.2.3 Program Eligibility

Most developers did not express any concern over the program eligibility. However, one developer believes that certain aspects of program eligibility should be modified. This developer expressed the desire that the program be expanded to customers who have contracts for distributed generation services as these customers are typically larger and better candidates for wind turbine projects. They also feel that the requirement to exclude portions of a customer's curtailable load is a complex and unreasonable burden.

Although not related to program eligibility, one developer believes that net metering for wind should be open to projects up to three MW because standard turbine sizing is in the 1.5 MW to two MW range.

10.2.4.2.4 Program Materials

Even developers who found the SGIP application process straightforward admitted to having to call their Program Administrator for clarification on certain program requirements.

One developer made several specific suggestions to the program rules and handbook:

- The applicants should be able to hand-deliver their program materials to the Program Administrator. The requirement that they be mailed reduces each deadline by several days;
- The SGIP handbook should indicate what, if any, information submitted in the program applications will remain confidential. This developer has a proprietary project strategy and would like assurances that their application materials will remain confidential;
- The handbook should be clear on what documentation is required to receive incentives for technologies from a California supplier. This developer developed a package of materials that they thought was appropriate. The application was approved, but they may have put more time into the effort than was necessary; and
- Be specific about what documents are acceptable to satisfy the requirements and where they are available. For instance, a customer tried to provide an internal utility cost tracking spreadsheet as the 12-month load documentation.

10.2.4.3 SGIP Incentives

Project developers indicate that their wind projects require either the SGIP or CEC Emerging Renewables Program (ERP) incentives to make them financially feasible. In addition, all developers with active SGIP wind projects indicate that their projects with private entity customers are taking advantage of the federal ITC as well, one indicating that their customer will likely take the grant in lieu of the tax credit. Another developer opined that customer-sited wind projects were not financially viable until the Emergency Economic Stabilization Act extended the ITC to wind projects. They also pointed out that it will be some time before the benefits of the ITC are fully realized because it wasn't enacted until February of 2009 and the project developers have limited time to market with it.

Only one developer indicated that they have had four or five projects that did not go through the SGIP or CEC ERP programs because the projects were designed to be off grid and therefore did not qualify for these incentives.

Only two developers commented on the SGIP incentive levels. One developer indicated that the current levels are adequate but that the diminishing incentives for larger projects should be remedied because there is not economy of scale as project size increases. The second would like to see the incentives levels increased. This developer feels that non-capital costs, such as securing permits, complying with interconnection requirements, and conducting various studies should be factored when setting incentive levels.

One developer indicated that they take advantage of the CEC's ERP for their smaller wind projects and another developer is aware of the availability of grants from the U.S. Department of Agriculture for wind turbines in agricultural applications.

The following incentive programs outside of California were mentioned by the developers:

Hawaii has a state ITC on top of the Federal ITC;

Ohio is believed to have a program with very attractive wind incentives; and

Oregon has the Business Energy Tax Credit.

10.2.4.3.1 Performance-Based Incentives

All but one wind developer was asked what effect changing to a performance-based incentive (PBI) structure would have on SGIP participation. The general consensus was that it would have a dampening effect on participation but the reasons given had nuanced differences. One was concerned that the uncertainty in the incentive amount and timing under a PBI structure would make it difficult to secure project financing. Another expressed that a PBI structure would undermine smaller projects because in order to secure financing under a PBI structure, extensive modeling would need to be performed to estimate the system performance to the satisfaction of the financing agents. Small projects are not able to carry these additional costs

and remain financially feasible. The remaining two indicate that the incentive needs to be paid up front in order to sell the projects.

One developer specifically stated that the incentive structure should not be based on the project cost or payback. This was tried in the program in the past and was problematic because of disagreements over eligible costs.

10.2.4.4 SGIP Marketing and Outreach

Four of the five wind developers commented on the SGIP marketing. None were aware of any efforts by the Program Administrators to market the SGIP. One developer believes that it's the project developers' role to market the program and educate the customers and does not want program funds spent on marketing and advertising. Another feels that the Program Administrators should market the program so that interested parties are aware of the incentives available. Educational efforts targeted toward the agricultural sector to clear up misconceptions about the limitations of wind applications were suggested by one developer. Specifically, this developer indicated that the farming community believes that wind turbines need to be sited on top of a pass to be feasible. Lastly, one developer feels that the utilities could better support the wind industry by not undermining distributed generation, in general, through adverse policies (such as limitations on NEM and standby charges).

10.2.4.5 Project Development Process

The developers were asked to describe the project development process. Although they expressed that each project is unique, three developers described the following major milestones in the project development process:

Permitting and environmental studies – A review of the local building codes should be conducted early on to determine the land use requirements. If the county determines the project is a special use, lengthy council or public hearings may be required. An environmental impact report may also be required which is lengthy and costly.

Engineering/Site Analysis – This process can take up to a year and involves geotechnical studies and determining where the turbine will be interconnected.

Construction – The construction must be carefully planned. Building the foundation is one of the first steps and should not begin until the building permit is received. After it is poured, the foundation takes a month to dry.

Commissioning – The true commissioning happens after the first major wind event.

One developer stated that making the ITC available for wind projects shortened the project timeline by eliminating the need to conduct a lengthy wind study. This is because the ITC is granted based on the project cost rather than the system's production.

Two developers regularly propose their wind projects as power purchase agreements and are basing their business models on this approach. However, their current SGIP projects have not used this approach.

One developer pointed out that projects installed on government property, like a school, need to go through the Department of State Architect and those developed on the coast need to involve the Coastal Commission. Under both circumstances, the local ordinances also apply. Similarly, projects on tribal lands avoid local building department involvement, but working with the Tribal Council can present its own set of challenges.

10.2.4.6 System Performance

The feedback on system performance was limited because only two of the developers' SGIP wind projects have been completed. A third developer has had completed wind projects through the CEC's ERP.

In the opinion of one developer, forecasting the system performance is a function of the amount of modeling that is done during project development. Careful modeling results in accurate estimates and realistic customer expectations on performance. This developer also points out that thorough modeling is only feasible for larger projects as small systems can't carry the cost of modeling and remain cost-effective.

A second developer is careful to be very clear in their materials about the amount of load that the project will offset and never makes any estimates before seeing the client's energy bills. Some customers are quick to believe that a wind turbine will satisfy all of their energy needs and are disappointed when they still have utility energy use.

Regular maintenance is viewed by one developer as the key to maintaining turbine performance, who recommends servicing them one to two times per year. Maintenance contracts are common for medium to large projects, but can be cost prohibitive for smaller systems where the cost of a maintenance contract is significant relative to the turbine cost. Another developer points out that the CEC ERP requires annual maintenance as a program requirement.

10.2.4.7 Project Characteristics

Four of the developers described key project characteristics that can support or undermine a successful project:

Wind resource. Residential projects that can take advantage of NEM on retail residential rates, need an average annual wind speed of at least ten miles per hour. Commercial projects need an average annual wind speed of at least 14 miles per hour.

Neighborhood or community support. Gaining the support of neighbors early on can help facilitate a project's development. Public hearings can be triggered by the county land use requirements or by complaints from nearby neighbors.

Project financing. Customers with small projects have to have access to financing. Medium to large projects are candidates for a PPA. Developers sponsoring PPAs have to conduct significant site analysis to determine the project output. The lower costs of small turbine projects don't support this level of modeling.

Sufficient electric load. Customers must have sufficient load that will be offset by the wind turbine. One developer looks for customers with annual consumption greater than 200,000 kWh per year.

Project champion. Successful projects usually involve a project champion within the customer organization. This individual takes a personal interest in moving the project to completion.

Site characteristics. Individual sites need adequate acreage to be feasible. It is recommended that the project site be three acres or more. Close proximity to trees and buildings can create turbulence and shading.

Geography. Most developers agree that rural locations, away from residential developments are better candidates for medium- to large-sized project. Projects near airports or military bases may interfere with radar systems.

10.2.4.8 Market Barriers

The developers mentioned a number of barriers to developing wind projects. These are described in the sections below.

10.2.4.8.1 Cost

All developers indicated that cost, in one form or another, was a major obstacle to the development of wind projects. Project economics are usually tight and cannot accommodate additional or unexpected costs. The developers mentioned the following costs as high or uncertain:

- Turbines: The wind turbines are generally the most costly component of a project.
- Interconnection: The cost of the switch gear itself is a barrier as well as the time necessary to work through the interconnection process itself.
- Permitting fees: Permitting fees in some jurisdictions can be as high as $10,000. A special use permit, if required, can add to this cost.
- Environmental studies: A Negative Declaration Study generally cost about $25,000 while a full Environmental Impact Statement, if needed, can cost up to $100,000.

» Project modeling and wind studies: Engineering resources for wind studies and project performance modeling can be significant.

10.2.4.8.2 Lack of Sufficient Wind Resource

California has a limited number of areas with high wind resource (usually noted as NREL wind power class of five or better). The availability of incentives also improves project economics if the wind resource isn't sufficient on its own.

10.2.4.8.3 Project Siting

The developers indicated that they've encountered the following site-specific issues:

Noise levels: Turbine noise must not exceed allowable levels.

FAA restrictions: Projects close to airports may be restricted or require FAA approval.

Wildlife habitats: Monterey County, one of the areas in the state with better wind resource, is essentially shut down to wind development because the region is a condor habitat. Projects near wetlands are seen as a threat to the habitat.

10.2.4.8.4 Permitting

Developers noted several barriers in the permitting process. These include high fees, inconsistent regulations, and uncertain or long permit processing times.

10.2.4.8.5 Environmental Studies

If an environmental impact report is required, it can take up to a year to complete and cost up to $100,000. In addition, projects may be required to implement mitigation strategies. These negotiations can further delay a project.

10.2.4.8.6 Interconnection

Interconnection is still viewed as a significant challenge by all the developers interviewed. Generally, the issues fall into two categories:

Cost of compliance: The cost of the switch gear can be high; costs from $25,000 to $200K were given, depending on the requirements. Another developer indicated that they had to hire a consultant to help them interpret the Rule 21 requirements which added $25,000 to the project cost.

The interconnection process: One developer suggests that wind project schedules should allow a year to get through the interconnection process. Another developer's project required ten to 15 meetings with PG&E's interconnection department in order to determine what was required. As the timing of these meetings was determined by PG&E, the developer felt that the process

was drawn out longer than necessary. A required change in the design of the switch gear triggered a second, lengthy design review by the Program Administrator in one project.

10.2.4.8.7 Tariff and Regulatory Limitations

The one MW limit on the ability to net energy meter is a barrier when there is the potential to install a larger turbine. Developers also mentioned frustration over the restriction on participating in both the SGIP and the feed-in tariff.

10.2.4.9 Market Trends

Because of time constraints, only three wind developers were asked to comment on future market trends. One does not expect the next four years to be any different than the last four years unless fundamental issues regarding NEM limits are addressed. Another sees the interest in medium-sized wind projects for community power increasing. The last looks to the American Wind Energy Association forecasts that there will be a growth in the small wind industry in the coming years.

10.2.5 Fuel Cell Developers

10.2.5.1 Background on Interviewees

Five developers of SGIP fuel cell projects were interviewed in November of 2009. Two of the developers are also manufacturers of fuel cells while two are project developers who worked with technologies other than fuel cells. The fifth firm's main business is constructing cold storage units. They began offering fuel cells as an option to their clients because it is a good fit with refrigeration systems. All of the developers but one has worked exclusively with commercial, industrial, or municipal customers.

The developers represented have worked with both renewable and non-renewable fuel projects.

10.2.5.2 SGIP Process

10.2.5.2.1 Application Process

The developers concurred that navigating the SGIP process is driven by the vendors.

Most of the developers indicated that the SGIP "process is all right", all of the developers noted areas where they felt the process should be improved:

One developer commented on the number of steps in the process. This developer has indicated that it's already "difficult" to coordinate the timing of the various milestones for the several dozen projects they currently have in various stages of development and is concerned that it will become unmanageable with additional projects.

One developer mentioned concerns over their understanding that the carry over funds are only available for projects over one MW.

The length of time it takes to receive the incentive check was a concern for one developer. They indicated that the SGIP Handbook indicates 30 days but their experience has been closer to 90 days. This is problem because the customers need to use that money to pay off their construction loans and get the final financing in place and the delay in receiving the rebate check delays this process. They speculated that the delays were caused by the third-party verification inspectors.

The amount of time it takes to receive a response from the PAs after the program forms are submitted is an issue for another developer. The customers want to know that their incentive is guaranteed before they agree to proceed with the projects. The developer notes that the handbook gives specific time limits for the various stages but does not impose time limits on the PAs themselves.

Another developer commented that the interconnection requirements that the disconnect switch be visible was not necessary because, for the new fuel cells, when the grid shuts down, the fuel cell also shuts down. This developer also noted that the support from the PG&E customer account manager was "fantastic" and that they appreciated his efforts to facilitate the interconnection process.

One developer would like to be able to submit the program documents electronically.

The majority of the fuel cell developers indicated that the PAs were "terrific" and "responsive." However, one developer mentioned that sometimes the PAs are responsive and sometimes "they're fighting you the whole way." It was also noted that PA staff turnover is an issue. It takes each new person time to come up to speed on the program and during that time it's difficult to get questions answered.

Another interviewee would like for each PA to assign a point person for each developer. This person would know the history of each project and how the developer's systems operate so they wouldn't have to re-explain it every time they contact the PA.

Several recent program changes were mentioned by the developers as being particularly beneficial:

Streamlining the reservation requirements by removing requirements like site maps and taxpayer IDs at early stages of the project;

Removing the requirement for tax ID numbers for the contractors;

Adding advanced energy storage broadens the options that they can evaluate for their clients;

Raising the incentive cap from one MW to three MW made larger projects financially feasible. This is especially important as fuel cell manufacturers offer better prices for larger systems; and

Adding the ability to qualify for renewable fueled incentives using directed biogas.

Only one developer had experience with both public and private entities. They noted that projects at waste-water treatment plants have a number of factors that cause for a long project cycle:

1. They're all renewable fuel projects which take longer because of the fuel cleaning systems;
2. They're public entities which usually have to go out to bid; and
3. The projects need to be approved by the water board.

They also noted that projects at water- and waste-water treatment faculties are usually initiated by the engineering firm that works with the plant on an ongoing basis.

10.2.5.2.2 Program Timelines

Two developers indicated that the program timelines worked fine for them. Another indicated that the 240 day milestone for public agencies to demonstrate proof of project milestones was difficult because most agencies are reluctant to sign a contract until they get grant funding and board approval, two processes that can take significant time.

Another developer would like the time allowed to submit the incentive claim form to be 18 months for both public and private entities. They explained that renewable fuel projects are really like two projects, one for the fuel cell and one for the fuel cleaning system. There are two aspects of the fuel cleaning system that cause delays. They require more extensive design at the front end because you have to test the gas, determine if you'll be able to clean it to the fuel cell specifications, then find the right cleaning equipment. The commissioning process takes longer on the back end because the two systems need to be tested and tuned, which is a complex and iterative process.

10.2.5.2.3 Program Eligibility

Most developers did not express concerns over the program's eligibility with the following exceptions:

One developer believes that non-grid tied projects should be eligible for the SGIP; and

Another would like the restriction that system size be limited to a site's maximum demand be removed. The SGIP incentive should be capped at the site's maximum demand and the remaining capacity put back into the grid through a feed-in-tariff.

10.2.5.2.4 Program Materials

Comments about the clarity of the program materials ranged from "they're fine" to "I've read the handbook so many times that I'm very familiar with it." Only one developer gave specific feedback over their initial confusion over hybrid systems that use both renewable and non-renewable fuel. This confusion has since been resolved but they point out that the amount of renewable fuel available for use dictates the size of the fuel cell that you can install and still meet the 75% renewable fuel use requirement but that sometimes it's more economical for a customer to buy a larger fuel cell.

10.2.5.3 SGIP Incentives

Four of the five fuel cell developers indicated that all of their fuel cell projects have gone through, or will go through, the SGIP. The fifth developer indicated that all of their projects, except for one field trial and a possible off-grid project, have received SGIP incentives. The developers speculated on whether their customers would have installed the fuel cells without the SGIP incentive. Two gave a definitive "no" while the others said that it would be highly unlikely.

All of developers indicated that their SGIP projects also applied for the ITC, although one developer said that their future projects will opt for the grant instead of the tax credit. This same developer has had fuel cell projects that received grant money from the Department of Defense. Another developer has had a public project, that couldn't receive the ITC, apply for American Recovery and Reinvestment Act funding.

The developers expressed a range of opinions about the current incentive rate and structure. One developer felt that the tiered incentives are appropriate while another expressed frustration over the diminishing incentives for larger projects. Two developers had no specific concerns but one of them stated that the market for fuel cells in California wouldn't exist without the SGIP incentives. Lastly, one developer would like the rebates classified as grants. For tax purposes, rebates are considered income, and are therefore taxable. Some grants are not taxable which would raise the value of them by the customer's tax rate.

10.2.5.3.1 Performance-Based Incentives

The fuel cell developers also expressed a range of opinions about a performance-based incentive structure. One indicated that the number of projects would definitely be reduced because it would be harder to get financing without the payment up front. Another expressed that residential customers would require a clear and definite plan for their payments. One developer felt that performance-based incentives would work fine under a PPA but customers need the upfront payment when they own the equipment. Lastly, one developer believes that the success of a performance-based incentive structure depends on what the performance parameters are and where the bar is set.

10.2.5.4 SGIP Marketing and Outreach

The majority of the developers were not aware of any marketing or outreach activities conducted by the PAs. One has been to classes at PG&E's Pacific Energy Center where information about the SGIP was presented. Another mentioned workshops and Web tools sponsored by CCSE, and the PAs participation at a solar convention.

The developers gave the following mixed responses when asked what activities the PAs should be conducting:

Marketing activities should be conducted by the project developers and not by the PAs;

Targeting marketing activities to end use customers and city building departments would help to educate them on the fuel cells and legitimize the technology;

Marketing activities should be targeted to large customers in the appropriate industries, like waste water treatment plants, dairies, hotels, cold storage, and food processing; and

The PA energy centers should have fuel cell demonstration displays and conduct seminars and training sessions for building officials, architects, and end use customers to educate them on fuel cells.

10.2.5.5 Project Development Process

The developers were asked to describe the project development process. Although they expressed that each project is unique, some of the major milestones in the project development process are:

Project planning – Engaging building departments, utility interconnection departments, and regulatory agencies, if appropriate, should begin early in the process.

Project financing – Securing the SGIP incentive is usually necessary before the financing agents will approve financing.

Order equipment - The equipment is generally ordered once it is certain that the project is going forward. Larger units take eight to 12 months to manufacture and deliver.

Construction – Laying foundations and hooking up gas lines can occur prior to the delivery of the fuel cells.

Commissioning – Can take 4-6 weeks to test and tune the equipment, more for renewable fuel projects.

None of the developers indicated that they've needed to get air permits for their projects. This is because all of the technologies installed have been CARB-certified and are therefore exempt from air permitting.

All but one developer have had projects that required building permits. Most indicated that the building departments weren't familiar with the fuel cell technology initially; one encountered a building inspector who believed it to be a hydrogen bomb after an internet search. However, all the developers felt that educating the building departments was a realistic aspect of the project development process and didn't express any major concerns.

Two developers indicated that some air districts require that the gas treatment systems be included on the customers overall air permit. Sometimes this can require a little extra effort but that it wasn't a real issue.

A situation unique to the residential sector is that the households who install fuel cells often employ personal assistants who make it difficult to reach the homeowner to secure signatures and utility information. In these circumstances, it would be beneficial to have a process in place where the customer could sign a release so the developer could secure this information directly.

Interconnection also poses unique challenges in the residential sector because the interconnection forms used for residential projects are the same as those used for commercial and industrial projects. They are overly complex for a residential project and require unnecessary and expensive engineering resources to complete.

None of the developers maintained ownership of the SGIP fuel cells. One developer indicated that they are developing a few projects currently under ownership of the units. Another developer indicated that PPAs for fuel cells are trickier that for other technologies because the financing agents feel that fuel cells are riskier than wind or solar.

10.2.5.6 System Performance

Only three developers worked with systems that have been installed for any length of time (the rest have projects that are still in the construction or commissioning phase). These developers indicate that their customers are pleased with the performance. Some of their comments were:

The systems are monitored over the internet. Disruptions to the internet impede their ability to monitor the systems;

Disturbances to the electrical grid can trip a fuel cell system off line; and

Maintenance contracts are effective at ensuring that the systems run reliably. Customers should negotiate a restack as part of their maintenance contract.

One developer indicated that renewable projects are inherently less reliable than non-renewable systems because the gas treatment system adds another variable to the project. It's important for them to be properly maintained to be reliable and that they're seeing higher system availability as the gas treatment systems are improving. One developer indicates that it's common for customers to have service contracts for the gas treatment systems. This is especially important for the first year of operation.

All of the developers indicated that their fuel cells already include monitoring equipment and don't have concerns over making it a program requirement. However, two expressed concerns: the first indicates that many customers, such as water treatment plans, already have many burdensome reporting requirements; and the second believes that customers would be concerned that their rebate could be at risk.

10.2.5.7 Project Characteristics

Several developers indicated that certain customer characteristics are the most important aspect of a successful project. These include:

Customers with the ability to purchase or finance the fuel cells;

Early adopters or those whose culture supports change and advancement;

A project champion who takes a personal interest in seeing the project succeed; and

Customers who stay engaged and communicate regularly.

Several facility-related characteristics were also mentioned:

Around the clock and around the year operations;

A base load demand of 250 kW to three MW;

A use for the waste heat; and

A medium pressure natural gas connection, water, and electrical grid connection.

10.2.5.8 Market Barriers

By far the biggest barrier cited by the developers is the cost of the fuel cells. Two developers also mention that some customers are cautious because the fuel cell technology is perceived to be new and uncertain. A third points out that organizations always put capital improvement projects over projects such as fuel cells.

10.2.5.9 Market Trends

All developers gave predictions for future market trends. They were:

Costs will drop from some combination of increased volumes and technology advances;

They are going to become more scalable; and

The ability to nominate directed biogas to qualify as a renewable fueled project will have a significant impact on the market.

10.2.6 Non-Participating Developers

The team completed an interview with a wind project developer who has not participated in the SGIP. The goal of this interview was to obtain the developer's views on their perception of the SGIP, barriers to project development, and the wind market.

Because of time constraints, the interview only addressed the following topic areas:

- SGIP Marketing and Outreach
- Market Barriers
- Permitting and Siting
- Project Characteristics

10.2.6.1 Background

The non-participating developer interviewed is a project developer of both wind and hydro projects. They installed their first wind system in California about five years ago and have installed 15-20 since then. They've installed approximately 45 additional nation-wide.

The developer indicated that they do not participate in the SGIP because it can't be used with a feed-in-tariff. This developer has not worked through the CEC's Emerging Renewables Program either. Some of their past projects have been net metered and some power purchase agreements with the utilities.

10.2.6.2 SGIP Marketing and Outreach

The developer indicates that they have tried to take advantage of some of the utilities SGIP workshops but felt that they did not provide much substance. They are a minority business and would like for the program to require that a certain percentage of projects be developed by minority or small businesses.

10.2.6.3 Market Barriers

The environmental barrier is the biggest barrier to wind projects, especially the area along the coast between Half Moon Bay and Santa Barbara. Radar constraints (from Travis Air Force Base) in the San Francisco Bay delta are also a barrier. The second biggest barrier is transmission line constraints and the ability to more electricity from the areas of wind resource to areas where it can be used.

This developer feels that nothing can be done about the environmental barriers but that the CPUC should require the utilities to upgrade their transmission lines to resolve the transmission constraints.

The developer also notes that different utilities have different interconnection requirements but that this is true across the United States and not particularly problematic in California.

10.2.6.4 Permitting and Siting

The area from the San Francisco bay area to Santa Barbara has zoning ordinances that make it difficult to install wind projects. These are mostly environmental or visual impact issues. The biggest challenge isn't the particular requirements but that the requirements are different each time you work in a different jurisdiction.

10.2.6.5 Project Characteristics

Projects on federal lands have much red tape to overcome. Projects on Tribal lands bypass the federal and local requirements but that dealing with the Tribal laws presents its own set of challenges. The developer also points out that it's not possible to finance projects on Tribal lands because you can't lien the equipment. However, many of these projects are self-financed by the Tribe or use Bureau of Indian Affairs monies.

Another project characteristic is that the customer has to have the ability to accept the substantial capacity generated by the turbine.

The site terrain often undermines projects and intermittent load problems are also common.

10.2.7 Combustion Technology Developers

The team completed interviews with project developers of combustion technologies. The goal of these interviews was to obtain the developer's views on the SGIP, the PAs, barriers to project development, and their respective markets.

The interviews addressed the following topic areas:

- SGIP Process
- SGIP Incentives
- SGIP Marketing and Outreach
- Project Development Process
- System Performance
- Project Characteristics
- Market Barriers
- Market Trends

However, because combustion technologies are not currently in the program, not all of the developers were able to address program-specific questions. Also, because of time constraints,

not all of the developers were asked every question. Lastly, some developers opted not to comment on certain questions.

10.2.7.1 Background on Interviewees

Interviews were conducted with four project developers who work with combustion technologies. The developers work with internal combustion (IC) engines and microturbines. One of the developer's firms is also a manufacturer. Another developer also works with fuel cell technologies.

10.2.7.2 SGIP Process

For the most part, the developers handle the SGIP application process for their customers.

Public entity customers are usually aware of the SGIP prior to working with the project developers because these customers talk with their peers, some of whom have already completed similar projects. This is particularly true of schools, cities and counties.

10.2.7.2.1 Application Process

One developer experienced some delays on their first renewable-fueled project. They had several rounds of back and forth with the third-party reviewer but eventually worked through the issues. The situation delayed the process and was frustrating, but now they have a better idea as to what documentation is required so they can provide a complete package to begin with.

10.2.7.2.2 Program Timelines

For combustion technologies, the 90 day deadline for demonstrating project advancement was reasonable. One developer indicated that it is useful to instill a sense of urgency in the customer to move them forward and the program deadlines support this. However, one indicated that demonstrating a future council meeting date was problematic.

Issues with air quality boards or utility interconnection has caused some projects to require an extension for completing their projects. One developer indicated that it is reasonable to allow 18 months for public entities because things move more slowly in these organizations.

One developer suggests a different SGIP process for hospitals. Hospitals experience significant delays because the projects must be approved by the Office of Statewide Health Planning and Development. This process can delay a project by six months. Schools experience similar delays because they have to be approved by the Division of the State Architect.

10.2.7.2.3 Program Eligibility

The developers agreed on several points about cogeneration's eligibility in the SGIP:

- The technology was removed from the program because of a lack of understanding about the benefits of combined heat and power (CHP). Legislative staff favor renewable technologies over those that burn fossil fuels.
- Efficient CHP systems are cleaner that grid-supplied power;
- CHP has a better green-house gas profile that wind or solar because it can supply power 24/7 while wind and solar provide renewable power for only part of the day then revert back to grid power the rest of the time.
- A good match between the electrical and thermal load is the key to an efficient CHP system.

One developer points out the change in emissions requirements in the last year that combustion technologies were allowed in the program. These changes made several of the typical equipment manufacturers' products ineligible.

One developer requested that, at a minimum, the SGIP should allow combustion technologies operating on renewable fuels to be added back to the program.

10.2.7.2.4 Program Materials

Generally, the program materials are clear. One developer acknowledges that it's not realistic to anticipate every possible scenario. When an interpretation is required, they contact the program administrator.

10.2.7.3 SGIP Incentives

One developer currently has a project under consideration that will not receive an SGIP incentive if approved.

One developer commented on the program increasing the incentive cap from one MW to three MW. They indicated that this change did not affect them because they do not have systems in this size range.

10.2.7.3.1 Performance-Based Incentives

Because of the amount of tuning required during the initial stages of project commissioning, the combustion technologies would not provided a good return for the first year under a performance-based incentive structure.

10.2.7.4 SGIP Marketing and Outreach

The developers weren't aware of SGIP marketing and outreach efforts. They recommend that the SGIP target end users that are good candidates for combustion technologies. An office building with no heat load wouldn't be a good candidate but customers with year-round heat

requirements, such as hospitals, juvenile halls, and high schools and colleges with swimming pools, are good candidates.

They also recommend marketing to the associations and organizations that candidate customers are involved with, such as the Society of Healthcare Engineers. They also recommend that the SGIP partner with the developers when making presentations to these organizations.

The developers incorporate the SGIP incentive into the financial analysis in their proposals to customers and mention the SGIP when making presentations to their customers and other organizations.

10.2.7.5 Project Development Process

All of the developers report being impacted by the removal of combustion technologies from the SGIP. Most are pursuing new projects but find that it is very difficult to make a good business case for them. Many customers are small, nursing homes, high schools, YMCAs, and apartment buildings, and don't have large budgets. One developer indicated that without the SGIP incentive, paybacks average around six years which is unacceptable to most customers. The SGIP incentive brought the paybacks closer to four years which is much more reasonable.

One developer has had no new projects but is working to complete the projects that were applied for prior to the removal. Another developer is focusing on developing projects with other technologies. A third is also a large maintenance provider in California but is focusing new installations on the east coast.

One developer pointed out that many projects were installed in the 1980s without any incentive but that the project costs were much lower so they could offer paybacks down to four years without any incentive. Since that time, interconnection costs, permitting (mostly air but sometimes building), and installation costs have all gotten more expensive. The unit used to make up about half of the total installed costs, but now it's closer to a third of the total cost.

10.2.7.6 System Performance

The developers indicate that, for the most part, their systems meet the customers' performance expectations. When the project is first installed, they have to work out some of the "tweaks" so there is more downtime in the beginning. If the system is commissioned properly and monitored over the first year, it usually runs well after that.

However, one developer believes that some customers have an expectation that IC engines are plug and play and, therefore, don't always know what to do when something goes wrong. One described a situation where there was an issue with the unit and a communication breakdown within the organization so the information didn't reach the proper person to be fixed.

Some energy services companies offer performance guarantees based on production or up time. The performance guarantees are like insurance policies and some customers feel that they don't need it. Some customers have staff that can perform the necessary maintenance.

One developer indicates that they put monitoring equipment on all of their systems. If the system shuts down, there is a paging system that notifies the individuals responsible for maintenance. Production and status can also be viewed over the internet. This developer feels that this is a good practice.

10.2.7.7 Project Characteristics

Constant, year round heat load and spark spread are the key success factors indicated. In house maintenance staff isn't a requirement because this function can easily be outsourced.

Many projects are public entities are currently on hold because of budget cuts and staff layoffs.

10.2.7.8 Market Barriers

Lack of SGIP incentives was the primary market barrier described by all the developers. CHP project compete against other capital projects for funding. When dealing with a school or government, these projects are often viewed as competing for funding for teacher and staff salaries.

One developer described the barriers to CHP as "death by duck bites" because there isn't a single major barrier. Interconnection requirements, departing load charges, standby charges, and unfavorable NEM terms for CHP were examples given.

The stringent requirements of the Air Quality Management Districts in southern California make developing new projects there unfeasible but the other air districts in California are most others are more reasonable and consistent.

Lack of sufficient heat load at the customer site is another significant barriers to the adoption of combustion technologies.

Low off peak utility rates make it more advantageous to use grid power during the off peak times, undermining the project economics of CHP systems.

10.2.7.9 Market Trends

One developer opined about market trends but didn't have any insights on combustion technologies. They did indicate that the time span between fuel cell restacks is expected to extend to ten years from the current three to five.

10.2.8 Wind Market Actors

The team completed interviews with market actors in the small wind space. The goal of these interviews was to obtain the market's views on the small wind industries.

The team discusses the market through seven topic areas:

- Background on interviewees
- Market barriers
- Emissions issues/Permitting issues
- Project characteristics
- Other programs
- Market trends
- Program modification guidelines

10.2.8.1 Background on Interviewees

The team completed seven interviews with market actors in the small wind industry. The team interviewed staff at four manufacturing companies, at two small wind associations; in addition, one industry expert participated. The staff held positions with the following titles: director, partner, vice president, and sales director.

10.2.8.2 Market Barriers

Market barriers are broken into three main categories for the small wind industry: customer barriers, technology barriers, and other barriers. This section outlines the issues within each of these three categories.

10.2.8.2.1 Customer Barriers

High up-front cost, long payback periods. The up-front cost for a small wind system is substantial, even after all of the government and utility incentives that encourage the installation and use of these systems. Consequently, the payback periods are also longer than the three- to four-year payback periods that most consumers and financiers are seeking. As a result, these systems are still viewed as a purchase for the conscience rather than a smart business decision.

Lack of expertise. Most organizations that could develop small wind projects lack the internal expertise to navigate the development and permitting processes, arrange financing, and maintain the system once it is in operation. Renewable energy development is not the core business of the organizations that have a large enough load to support the system sizes encompassed in SGIP. As a result, the person leading the process is required to learn all of the nuances of the process for the first time; there are rarely follow-on opportunities to leverage the previous experience. In addition, these staff are often doing it on their own time

Lack of third-party providers. Very few third-party providers of development and maintenance services offer packages for small wind projects. As seen with solar development, third-party providers could alleviate the up-front cost and expertise barriers discussed earlier, but very few third-party providers have entered this space at all; AWEA predicted that more entities would fill this role during calendar year 2009, but that has not occurred, likely due to capital constraints.

10.2.8.2.2 Technology Barriers

Lack of manufacturers and turbines in the 50 kW to one MW range. This is an issue of a chicken and an egg. The chicken: the market for these mid-size turbines. The egg: manufacturers of the mid-size turbines. There is a question of whether the manufacturers will drive the market forward or whether the market demand will create the need for more manufacturers. Before the wind boom of the first decade of twenty first century, large manufacturers of wind turbines (e.g., Vestas, Siemens) were involved in the production of mid-size turbines. As larger turbines became available, however, these larger manufacturers stopped producing mid-size turbines; it is unlikely that they will manufacture these again in the future. Few new market entrants have filled this void. It is possible that this issue will self-correct as the market demand increases, but it has not been sufficient to do so in the recent past.

There are some Chinese manufacturers producing turbines in this size range, but they are not widely used in the U.S. The market has been reticent to adopt Chinese equipment, and Chinese manufacturers have not made the effort to gain a foothold in the U.S. market.

Relatively high maintenance costs. It is not cost-effective to maintain a small number of turbines larger than 200 kW. There is a high fixed cost associated with such maintenance and a lower variable cost (cost per turbine). For customers that install a single or a couple of mid-size turbines, the maintenance costs can challenge the financial viability of the project. Specialized labor is needed to maintain turbines of this size; higher densities of distributed projects would need to be created in order to make the cost of such services more reasonable. If a large wind facility is located near to a distributed project, it may be possible to leverage that labor base, but the larger facility would receive priority.

Difficult to secure towers. Manufacturers of wind towers focus their efforts on the large-scale towers. Many turbine manufacturers have frame agreements (i.e., long-term supply agreements) with large-scale wind turbine manufacturers and focus their efforts on producing

turbines for those customers. These are turbines produced in the hundreds and thousands per year. A request for a single tower at a smaller scale does not make economic sense to these manufacturers; it produces neither the profit margin nor the opportunity for additional business that the large-scale towers do. As a result, it is difficult to obtain traditional towers for these mid-scale projects.

10.2.8.2.3 Regulation/Program/Other Barriers

Insufficient customer load. SGIP's project sizing requirement limits the pool of potential projects. Few customers have a load[85] large enough to support a small wind project that is larger than 100 kW under current SGIP rules, and those that do are not always located in areas with appropriate permitting requirements. If projects were allowed to have a capacity larger than the current limitation, the pool of potential projects would increase. Projects larger than 100 kW start to achieve economies of scale.

Incentive focuses on capacity factor more than actual energy production. SGIP awards incentives based on installed capacity rather than on the actual energy produced by the system. The actual capacity factor of a given system is dependent on many factors, including the siting of the facility. As a result, several projects with the same installed capacity may produce very different amounts of energy, though they are all incented at the same level. This arrangement does not do enough to promote optimal siting of the facility.

Manufacturers are confused about program requirements for certifying small wind technologies. Manufacturers believe that any technologies used under the SGIP must be certified by the CEC, just as those technologies used under the ERP are. They believe that t will take six to 12 months and cost tens of thousands of dollars when they include the cost of labor. The only firms willing to bear the cost of this process are those that believe that the access to California's market will enhance their business proposition substantially. This confusion inhibits organic growth into the California market and is especially problematic for manufacturers located outside of the U.S., which is the origin of most of the mid-size equipment. Better communication about the requirements for certifying small wind technology is needed.

Fractured certification process. The CEC certification process fails to recognize certification processes that other government entities have put in place. Manufacturers that are certified by other agencies (e.g., U.S. Department of Agriculture or New York State Energy Research and Development Authority) have to repeat the process in California. Some see this as another Professional Engineer approving equipment that has already been approved by one or more other Professional Engineers.

---

[85] The relevant load qualification for SGIP is that the project be sized no larger than 200% of the Host Customer's previous 12-month annual peak demand.

Small wind is not on the same regulatory footing as solar. The combined set of government incentives for solar tends to be more attractive than that for wind, given the relative energy output of the two technologies.

10.2.8.3 Emissions Issues/Permitting Issues

"Permitting, permitting, permitting. That is *the* barrier for small wind."

Permitting is the prime barrier to development of small wind in California. AB 45 made initial steps to address some of these issues, but it did not go far enough, according to the interview subjects. The primary issues highlighted are as follows:

Inconsistent permitting rules. Every county in California has jurisdiction over permitting small wind projects, and each county has a slightly different approach to permitting. As a result, developers must adjust their development model, equipment, and paperwork for each county in which they do business.

Non-existent permitting guidance. In some counties, small wind permitting guidelines do not even exist. Some counties wait until a developer proposes a project to develop the permitting guidance. This adds a significant element of uncertainty to the development timeline and budget, deterring developers from being "the first" in that county. AB45 took the first steps needed to address this issue for projects smaller than 50 kW, but it will not impact most projects that fall under SGIP.

Uncertain timeline for completing the permitting process. The permitting process can go on indefinitely because there is no limitation on the amount of time that a county can take to reach a decision. It has taken longer than a year for some projects to receive approval, which is a substantial amount of time in the development cycle of a small wind project; compare this with a total development timeline of about a month for the average distributed solar project. This poses a unique challenge for developers, which must finance this process; the delays hurt the project economics substantially.

Public perception challenges. In many cases, the public perceives small and large wind projects as one and the same. The impact of projects at either end of the size continuum is significantly different, and the market actors believe that the regulations put in place to manage those impacts should be the same. For example, a 50 kW turbine will not have the same type of avian impacts as a two MW turbine; some members of the public are not aware of these differences.

Some interviewees cited these specific hurdles created by permitting laws:

Hub height allowed is too short; hub heights need to rise above local structures to avoid turbulence, which impedes production of high quality power.

Full Environmental Impact Statement (EIS) required; these are unnecessary for most small wind systems and add significant cost to projects that are already challenged from a cost-effectiveness standpoint;

Required setbacks are too large; in most cases, one turbine length in each direction from the tower is sufficient.

The respondents did not discuss any emissions issues.

10.2.8.4 Project Characteristics

There are six main project features that must co-exist to produce successful small wind projects:

1. Adequate wind resource: Certain parts of California have robust wind resources; these locations improve the economics of projects substantially.
2. Reasonable and certain permitting requirements: Permitting requirements that facilitate small wind development and that provide clear guidance on the expected timeline for review reduce uncertainty in the development process.
3. Eligibility for SGIP incentives: Parts of California are not eligible for SGIP incentives; this essentially kills those projects.
4. Distance from Urban/Suburban areas: Urban and suburban areas tend to have lower quality wind resources and higher levels of public opposition; few projects succeed in those areas.
5. Site with sufficient load to sustain the project: SGIP requires that the energy produced by its projects serve the on-site load; finding customers with load sufficient to support the project is critical.
6. Project champion: An internal stakeholder at the customer site must believe in the project and be willing to secure support for it.

Projects with these six characteristics have a significantly higher likelihood of success than those that lack even one of them.

10.2.8.5 Other Programs

Due to limited interview time, this question was not asked of all respondents. One respondent listed several different rebate or production-based incentive programs of which he was aware, including Massachusetts, New Jersey, Maryland, New York, Ohio, Wisconsin, Washington, and Oregon. Specific advantages of each program were not mentioned.

Generally speaking, however, the following criteria were identified as relevant to a program's ability to create small wind development:

Rebates and grants rather than tax credits

Allows systems of at least 100 kW

Application process minimizes red tape

Incentives cover at least 30% of project cost

Incentives create a level playing field for small wind and distributed solar.

Two other types of incentive programs were cited:

The City of Berkeley's Berkeley FIRST program allows residents to finance solar projects on the property tax bill. This program could be expanded to include small wind.

Marin County's Community Choice Aggregation pilot allows municipalities and the county to join together to issue bonds, which could be used to finance small wind according to this person. The cost of capital through this program is as low as 4-5%.

10.2.8.6 Market Trends

The interviews indicate a high level of interest in small wind investment coupled with a certain level of reticence.

Cost: The success of small wind is dependent on the industry's ability to bring down the cost of the technology.

Game-changing technologies, such as Pax Streamline's blown wing technology, would revolutionize the design of turbines and the associated cost. By making the turbines smaller and easier to manage, the technology would also enable the turbines to be placed in locations that are currently unavailable to large turbines.

Small wind projects developed in connection with storage or other hybrid approaches would help address the intermittency issues with wind while increasing the project economics by enabling peak demand reduction.

Several respondents indicated that they expected to see an increase in production of turbines in the 200 kW to 500 kW range. These mid-sized turbines address the municipal, school, and agriculture markets, which several respondents see as major growth areas for small wind. These respondents anticipate that this gap will be filled by new market entrants rather than by existing players in the large wind manufacturing space.

Technology: In addition to Pax Streamline's blown wing technology, a variety of changes to *existing* technologies are possible, including the following:

Increasing reliability (and reducing maintenance costs);

Making the turbines more "appliance-like" and easier for on-site staff to manage;

Reducing the cost of towers and foundations through the use of advanced materials;

Improving wind resource assessment technologies.

The innovation of advanced materials is a critical component to the manufacturers' ability to deliver on these cost reductions.

Manufacturing Operations: Two of the three manufacturers that were interviewed have plans to scale up their production of wind turbines in the size range that would be applicable for SGIP. One of the two is run by a team of executives with experience building companies from the ground up to millions of dollars in sales. The other manufacturer is a smaller shop.

10.2.8.7 Program Modification Guidelines

This was not discussed during the interviews with the small wind market actors because the market actors are not familiar with the SGIP program modification process.

10.2.9 Fuel Cell Market Actors

The team completed interviews with market actors in the fuel cell space. The goal of these interviews was to obtain the market's views on the fuel cell industry.

The team discusses the market through seven topic areas:

- Background on interviewees
- Market barriers
- Emissions issues/Permitting issues
- Project characteristics
- Other programs
- Market trends
- Program modification guidelines

10.2.9.1 Background on Interviewees

The team completed four formal interviews and one informal interview with market actors in the fuel cell industry. The team interviewed staff at two manufacturing companies, two fuel cell associations, and one university research center. The staff held positions with the following titles: senior policy advisor, business development and sales director, director of governmental affairs, director/co-chair and manager of external relations.

10.2.9.2 Market Barriers

10.2.9.2.1 Customer Barriers

Lack of recognition of the value and performance of fuel cells: Multiple respondents noted that there is a lack of recognition of the value and performance of fuel cells. The market is currently not at the point where customers ask for and insist on fuel cells. With more installations, customers

are beginning to learn more about the market. One respondent felt that the market needs to surpass a certain point for the industry to be sustainable—there are currently about 28 MW deployed commercially in California. The respondents also noted that the SGIP has been a critical force in allowing the market to be where it is today.

Importance of integrating fuel cells into the built environment: Fuel cells require integration on a case-by-case basis to ensure efficient use of the electrical and thermal products. Respondents mentioned that if successful integration does not occur, it is more likely that the customer will not be satisfied with the fuel cell. Integration is such an important factor in the success of project, that one manufacturer will not allow installers to install their product unless the manufacturer is involved in the integration. One respondent noted that this integration can be more difficult in a retrofit situation.

Lack of education and ownership from architects and developers: There is still a need for educating the market on fuel cells and their advantages. Many architects and developers are not familiar with the technology, and thus are hesitant to use it. The industry needs more architectural and developer firms to become involved with fuel cells. For example, LPA advertises themselves as being one of the leading sustainable design firms in the nation. Firms leading the way on fuel cell development are also needed.

Difficulty in finding outside financing: One respondent noted that the financing sector is not experienced with fuel cells, and thus is hesitant to finance systems. This perceived risk attached to a fuel cell system has limited the amount of financing available and made it difficult to obtain financing.

Cost of fuel cells: Two respondents noted that the cost of fuel cells is a barrier. One felt that it is not the top barrier and another felt that the cost is coming down.

10.2.9.2.2 Technology Barriers

Lack of volume production: Respondents noted the need for an increase in volume of production in order to drive the price down through cheaper manufacturing operations. One respondent noted that the industry is looking for a $2,000/kW installed cost for successful fuel cell implementation.

Use of waste gas requires pre-cleaning before it enters the fuel cell: One respondent noted that for most fuel cells a gas conditioning unit is required for waste gas. The gas conditioning unit cleans the gas before it enters the fuel cell. Fuel cells have exemptions from some air quality management districts, like the South Coast Air Quality Management District; however, air districts require permitting for the gas conditioning unit. One respondent noted that air districts are unclear on how to issue a permit for these systems. Another respondent noted that this issue had been addressed in the South Coast Air Quality Management District in the past year.

Lifetime of the fuel cell: One respondent discussed misconceptions about the lifetime of the fuel cell. Fuel cell technology has improved in this area and will continue to improve.

Little competition: A few respondents noted that there are currently two large stationary fuel cell players in the California market—Fuel Cell Energy and UTC Power. Therefore, there is little competition, but more market players will increase competition.

10.2.9.2.3 Regulation/Program/Other Barriers

Utility opposition: Some respondents felt that the utilities in California do not advocate an increased fuel cell market. Because fuel cells have a narrower application than other distributed generation technologies, like solar, it appears easier for the utilities to fight market entry of fuel cells.

Net metering limit of one MW: One respondent noted two points with regard to the net metering limit of one MW. First, companies are starting to pursue fuel cell projects greater than one MW, and thus would not be eligible for net-energy metering. Second, under net-energy metering for fuel cells, the utility cannot charge some of the additional fees that could be placed on customer-generators like demand charges, standby charges, minimum monthly charges, if the charges go beyond other customer's charges in their rate class. This waiver is not in place for fuel cells larger than one MW. Account managers tell customers that these fees will add a significant cost to the project, thus deterring project completion.

Ability to participate in both SGIP and net-metering: This issue will likely arise in the future and is a potential barrier. Some customer segments may want to receive SGIP funds for a portion of the system and a feed-in tariff for another.

10.2.9.3 Emissions Issues/Permitting Issues

Respondents noted that some air quality management districts, such as the South Coast Air Quality Management District (SCAQMD), provide exemptions for air permits for fuel cells (Rule 219 in SCAQMD). In addition, technologies that are exempt must certify their technologies to specific emission standards under the CARB distributed generation certification program.[86]

Another permitting issue cited by participants is with building departments in cities, specifically the fire marshals. The California Stationary Fuel Cell Collaborative has been working with the state fire marshal office to educate the office on fuel cells and alleviate any issues with permitting. However, one respondent noted that there have still been some issues with local fire departments.

[86] http://www.arb.ca.gov/energy/dg/dg.htm.

10.2.9.4 Project Characteristics

Respondents noted a few project characteristics of successful fuel cell installations:

1. There must be some economic benefit associated with the fuel cell installation. For example, the fuel cell could use on-site waste as fuel and reduce the cost of disposing the waste.
2. There must be a need for the thermal energy.
3. There must be a need for energy and heat 24x7 or the project needs to utilize a feed-in tariff program.
4. The Host Customer needs to be enthusiastic about the deployment of a fuel cell at their site.
5. The installer/manufacturer/contractor takes ownership in the success of the project.
6. The design of the installation is well thought out to ensure high operational efficiency throughout the life of the project.

Some target markets listed include

- Agribusiness community (high target with a lot of promise)
- Wastewater treatment plants
- College campuses
- Food industry (grocery stores, breweries)
- Hotels
- Home use
- Big box stores
- Data centers

It is also becoming popular to use fuel cells to power forklifts.

10.2.9.5 Other Programs

Respondents noted that the SGIP program is the leading fuel cell incentive program—other states look to the SGIP to see its progress. One respondent noted that Texas, New York and Ohio have had programs for fuel cells in the past, though is not aware of the current status of those programs.

10.2.9.6 Market Trends

Markets

Using biogas as a fuel for fuel cells is successfully taking off in the market specifically with wastewater treatment plants. Other biogas applications that could enter the market include biogas operations in the San Joaquin Valley with dairies installing digesters and using the biogas as a fuel for fuel cells. Food processing plants may also be a market sector that begins to install fuel cells. Another biogas application is the gasification of biomass in the San Joaquin Valley. This application will likely receive more attention under AB 32. Lastly, the operation of a fuel cell from landfill gas could increase in the future.

Another respondent also felt that use of renewable fuel will increase with fuel cells.

The market for natural gas fueled fuel cells has begun to reach penetration levels in hotels, hospitals, office buildings, and institutions (prisons and universities), and has started to climb the curve to being able to stand on its own.

Technology

An emerging technology is the stationary fuel cell/gas turbine hybrid power generation. This technology has electrical efficiencies that far exceed the simple sum of either technology—the fuel to electrical efficiencies are approaching 70-80%. The hybrid technology allows a gas turbine to exceed the Carnot efficiency limit. Many universities are exploring this technology including University of California-Irvine and Georgia Institute of Technology. Manufacturing companies that are involved include Fuel Cell Energy and Rolls Royce.

One respondent believes that the technology's lifetime will increase in the future.

Cost

All respondents indicated that prices will decrease in the next few years. Another respondent noted that prices are reducing about 25% per year. Drivers for cost reduction include volume, the competition in the market, and technological developments.

Manufacturing Operations

Both respondents with manufacturing operations indicated that their companies do have plans to scale up their manufacturing operations, but that volume is needed to support an increase. Both respondents noted that their current manufacturing needs are not meeting the maximum capacity of their manufacturing operations—One respondent noted that their current operations can accommodate about 100MW a year and they are producing about 25MW a year. Another respondent noted that the current operations can produce a few thousand units a year and they are producing a few hundred units per year. In addition, an assembly plant in California would reduce costs because shipping costs are high.

10.2.9.7 Program Modification Guidelines

One respondent noted that the program modification process is well defined, but the CPUC can still get held up the requests. However, it seems like the CPUC has been trying to rectify that issue.

10.2.10 Advanced Energy Storage Market Actors

The team completed interviews with market actors in the advanced energy storage space. The goal of these interviews was to obtain the market's views on the advanced energy storage industry.

The team discusses the market through seven topic areas:

- Background on interviewees
- Market barriers
- Emissions issues/Permitting issues
- Project characteristics
- Other programs
- Market trends
- Program modification guidelines

10.2.10.1 Background on Interviewees

The team completed four interviews with market actors in the advanced energy storage industry. The team interviewed staff at three manufacturing companies and one advanced energy storage association. The staff held positions with the following titles: sales, founder, and director.

10.2.10.2 Market Barriers

10.2.10.2.1 Customer Barriers

Unfamiliarity of energy storage: The main customer barrier cited by respondents is unfamiliarity of energy storage. Energy storage as a grid connected application is new and thus there are few success stories to share with customers. A few respondents noted the importance of having history and successful project stories for customers to be willing to adopt the technology. In addition, there is not a ready-made channel of installers who are familiar with the technology. This unfamiliarity can lead to customers assigning a high risk to the technology.

Difficulty in placing technology if customer leases the building space: One respondent noted that many businesses do not own the property where their business is located.

No federal incentive: Though there are high federal incentives for customers to install renewable energy technologies (30% federal tax credit), there are no such incentives for energy storage. Therefore, the financial case is more difficult for energy storage than for renewable technologies. This barrier can also be classified as a regulatory barrier.

Good modeling tools for energy storage do not exist: The industry recognizes the need for good modeling tools to model storage into systems and to model the true value of storage. Models should take into account energy pricing including time of use rates, demand charges, and the locational energy mix on the grid including the amount of renewable technologies feeding the grid. Such modeling tools could allow customers and utilities to better understand the value of the storage system.

High capital cost: One respondent noted that the current return on investment of a 20kWh system could be 5-6 years, and most businesses require a 2-3 year payback.

General economic situation: The current economic situation makes businesses risk adverse. One respondent felt that the situation was starting to get better in California.

10.2.10.2.2 Technology Barriers

Few technologies available to handle large-scale needs: One manufacturing company feels that flow batteries are the best to handle large scale energy storage needs. There are currently four companies in the flow battery space: ZBB Energy Corporation, Prudent Power, Premium Power, and NGK (from Japan).

Need ability to use energy storage as a system, rather than just a battery: Another barrier cited was the ability to use energy storage in a system, rather than just a battery. The respondents states three reasons for the need of energy storage technology to act like a system: (1) combining renewables and energy storage will go smoother if the storage can act like a system and require only one bi-directional inverter for both the renewable technology and storage technology, (2) an energy storage system could allow the customer to continue to receive energy when the grid is down (conventional inverters for PV and other systems shut down when the grid is down) (3) the ability to reserve power and have a continuous stream of energy.

10.2.10.2.3 Regulation/Program/Other Barriers

Regulatory structure does not compensate storage for its true value: The current regulatory environment does not compensate storage for its true value. For example, storage could play a role in frequency regulation. Under one independent system operator, conventional generation is compensated for providing frequency regulation via an opportunity cost. However, energy storage projects are not currently eligible to for frequency regulation compensation in California.

Energy storage must be combined with a wind system or fuel cell to receive the SGIP incentive: Most interviewees noted that in order to receive the SGIP incentive for energy storage technology, the

storage must be combined with a wind system or fuel cell. This requirement is limiting on the technology and the market for the technology.

No strong financial incentive from time of day tariff differences in the U.S.: Two respondents noted that energy storage for commercial customers for time of day arbitrage does not make financial sense in California. The current tariff differences between peak and off-peak are not large enough to make an up-front investment in energy storage are viable option. In addition, one respondent noted that these tariffs could change in the future, so there is no guarantee of what the difference will be in the future. Another respondent thought that the only location energy storage for time of day arbitrage makes financial sense is in São Paulo, Brazil because there is a large enough differential between the peak and off peak energy prices.

Uncertainty in the amount/availability of future SGIP or other program incentives: One respondent felt that a carve-out for energy storage would help demonstrate the advantages of storage.

Unclear interconnection requirements: A few respondents noted that it is unclear if interconnection is required for energy storage under Rule 21, because storage is not a generating technology, for a stand- alone configuration that is not back feeding into the grid.

High interconnection fees: Respondents mentioned that the high interconnection fees can be a large barrier to projects, especially smaller projects. One respondent noted that the fees in PG&E's territory include an $800 application fee and a $600 interconnection fee. This equates to about 15% of the cost of one manufacturer's system.

Potential siting and permitting barrier: One respondent noted that there are not that many projects that have gone through the siting and permitting process. Issues may be uncovered as more projects go through the permitting process.

10.2.10.3 Emissions Issues/Permitting Issues

The respondents did not discuss any emissions issues. Respondents noted that there are not many projects that have gone through the permitting process. Issues may be uncovered as more projects request permits.

10.2.10.4 Project Characteristics

Respondents have seen interest in advanced energy storage from many different market sectors including universities, wineries, military bases and manufacturing plants. A few specific project characteristics that lead to successful installations of energy storage are listed below:

1. Customer has demand charges on their electric bill: storage is currently not cost effective in a load shifting environment due to lack of large enough differential between on-peak and off-peak energy rates.
2. Need a high degree of volatility in the load on the customer premise.

3. Load with high peak demand during the day and low demand at night.
4. Under current rules, customer needs to own the property.
5. A customer with renewable energy or interest in installing renewable energy.

10.2.10.5 Other Programs

Due to limited interview time, this question was not asked of all respondents. One respondent noted that they were not aware of other programs to incent or support the installation of customer sited energy storage, except for a CEC PIER grant under the emerging technologies group.

10.2.10.6 Market Trends

The interviews revealed that there is currently a huge amount of investment in energy storage.

Technology: One respondent noted that there would likely be some performance increases with existing systems and technology in the next 2-4 years. In addition, the stimulus bill investment will probably aid in demonstration sites for new chemistries; however, the respondent did not think that there would be any new breakthroughs in chemistries in the next 2-4 years. The stimulus bill investment will also provide for some reasonably sized storage systems over the next few years. These systems could generate more interest and successful project data to the consumers, thus accelerating the adoption of storage technologies. In addition, one respondent thinks that in 2-4 years, there will be different configurations of the currently available technologies.

Cost: One respondent felt that there would be a significant drop in price because there are a lot of new players and a lot of stimulus money going toward the technology. In addition, the use of lithium ion batteries in vehicles will likely force the price of that technology down. Another respondent felt that the cost of some energy storage technologies will remain stable for the next few years. In four years, one respondent thinks that there will be a sharp acceleration in the adoption of storage with declines in pricing.

Manufacturing Operations: Two manufacturers have plans to scale up their manufacturing operations. An increase in sales will lead to an increase in both the scale and method of manufacturing operations. Both companies anticipate that 2010 will be a positive year for energy storage.

10.2.10.7 Program Modification Guidelines

One respondent has been through the program modification process a few times. The respondent noted that they have been simplified somewhat and cited no further issues with the process.