Staff Proposal for Incorporating Energy Efficiency into the SB 350 Integrated Resource Planning Process

An Energy Division Staff Proposal

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I. Introduction and Background

Senate Bill (SB) 350 requires the CPUC to adopt an integrated resource planning (IRP) process to meet the greenhouse gas reducing targets set by the California Air Resources Board to achieve economy-wide greenhouse gas (GHG) reductions of 40% below 1990 levels, including a mechanism for load serving entities (LSEs) to file integrated resource plans that achieve these objectives.

In 2016, the CPUC opened a rulemaking proceeding to implement the IRP requirements of SB 350. In the rulemaking's Scoping Memo, the CPUC acknowledged that "[t]hese sections of law introduce two important new elements in California's long-term resource planning activity: portfolio optimization and steadily decreasing GHG emissions in the electric sector from now through 2030. These elements create the opportunity to modify our resource planning so that portfolios of resources that achieve optimization and greenhouse gas emissions reductions can be presented to the CPUC for decision-making." [1] This is in addition to existing overall planning concerns, including "long-term system, flexible, and local reliability needs".[2] Therefore, in broad terms, the main objectives of the IRP are:

- GHG emissions reductions to achieve adopted electric system emissions targets.
- Resource portfolio optimization to achieve overall system reliability.
- Cost minimization.

Throughout 2017, with a robust stakeholder engagement effort, the CPUC developed an IRP modeling approach and a Reference System Plan (RSP) in the IRP proceeding. The modeling approach compares alternative resources and optimizes the resource portfolio, selecting a group of resources that achieve GHG emissions targets and system reliability standards at the lowest cost. Integrating demand side resources is complex, and some resources, such as energy efficiency, are traditionally included as a reduction to the demand forecast and are not modeled individually as part of the optimization.

In February 2018, the CPUC adopted a decision describing how LSEs are to develop and file their plans (hereafter referred to as the "February 2018 IRP decision").[3] In response to comments on the lack of optimization of distributed energy resources (DERs), the decision also directed staff to make modeling and data improvements in how DERs – including energy efficiency – are optimized in the IRP model.

This white paper is intended to begin the process of determining how best to incorporate energy efficiency into the IRP optimization process, with a focus on exploring the feasibility of optimizing energy efficiency measures as candidate resources. The paper is organized into four sections. Section II describes the various statutory, policy, and technical challenges associated with incorporating energy efficiency into the IRP resource optimization process, offering staff

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[1] Joint Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge (05/26/2016), pp. 6-7 available at http://docs.Commission.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=162358082

[2] Ibid, p.12

[3] Decision Setting Requirements for Load Serving Entities Filing Integrated Resource Plans (D.18-02-018), available at http://docs.Commission.ca.gov/PublishedDocs/Published/G000/M209/K771/209771632.PDF.

insights and/or recommendations regarding how each challenge might best be addressed. Section III provides results of staff's initial technical analysis of how to incorporate EE resource into the IRP optimization model. Section IV proposes next steps for coordination between the Energy Efficiency and Integrated Resource Planning proceedings to implement staff's recommendations, were they to be adopted.

Appendices I and II provide the results of two reports that support the technical analysis presented in Section II: a Navigant Report can be found in Appendix I and an Energy and Environmental Economics (E3) Report in Appendix II. Appendix III provides details on the step-by- step performance of various tasks between the two proceedings and how these processes would align based on each processes schedule. Finally, Appendix IV presents the scenario for a more limited integration of the two planning processes if optimization of energy efficiency is not an objective to be pursued, essentially reflecting the status quo.

II. EE-IRP Integration Challenges

Incorporating energy efficiency into IRP is expected to be particularly challenging, relative to other DERs. One reason for this is the sheer size and complexity of California's energy efficiency efforts. The CPUC authorizes approximately $1.3 Billion in annual energy efficiency and low-income energy efficiency portfolio expenditures, and the portfolios are comprised of many dozens of programs that incentivize thousands of individual energy efficiency measures. Many statutory energy efficiency mandates must be considered when creating energy efficiency portfolios. The fact that energy efficiency is achieved through a number of different mechanisms outside of the CPUC's authority creates further complications (the California Energy Commission adopts California's Codes and Standards; Federal regulations address many appliances, pre-empting California's authority; a variety of private and public entities implement energy efficiency financing programs; etc.).

A. SB 350 Goal of Doubling Energy Efficiency by 2030

SB 350 requires the California Energy Commission (CEC), in collaboration with the CPUC and local publicly owned electric utilities, to establish targets to achieve a cumulative doubling of energy efficiency savings in electricity and natural gas by January 1, 2030, as compared with the mid-case estimate of "additional achievable energy efficiency" included in the CEC's 2015-2025 demand forecast. The statute acknowledges that California must leverage a variety of programs to achieve the doubling objective. Accounting for all these different savings streams may be challenging. As explained in more detail in Chapter III, some energy efficiency savings can be optimized with other resources through the IRP process, but others cannot. Savings streams not suitable for optimization should continue to be procured to reduce the load and be included in the demand forecast. .

A number of the programs identified in SB 350 (e.g. appliance and building standards, PACE financing and Greenhouse Gas Reduction Fund programs) would not likely be delivered through CPUC-regulated utilities (or other LSEs). Since these savings could not be procured by LSEs, they represent "load modifying" energy efficiency for which the demand forecast must be adjusted downward, so that the IRP process optimizes for the remaining load. While the CPUC authorizes the utilities to develop programs that support the development of appliance and building standards, most of the resulting savings are not procured through a CPUC program. [4]

In addition, the aggressiveness of the code adoption of various appliance and building standards has a direct impact on the energy efficiency savings opportunities of ratepayer-funded energy efficiency programs, since incentives are typically not needed to encourage adoption of code-minimum equipment. This interaction between savings obtained through codes and standards and savings available for LSE procurement must be well understood in order to properly modify the demand forecast and to calibrate the energy efficiency savings potential available for the EE portfolio and/or LSE procurement.

[4] However, the CPUC can authorize programs targeting below-code savings opportunities as well as programs targeting code compliance improvement.

SB 350 directs the CPUC to authorize new market transformation programs, and this statutory requirement is scoped into the current phase of the CPUC's EE proceeding. Market transformation programs typically have different cost-effectiveness methodologies, savings estimation approaches, and time horizons than traditional energy efficiency "resource acquisition" programs, and it is unclear at this time whether market transformation programs authorized by the CPUC in response to SB 350 will be load modifiers or can be incorporated into the IRP optimization framework.

Conservation voltage reduction is another source of energy efficiency identified in SB 350. In the past, conservation voltage regulation efforts have been funded through utility general rate cases and not identified as energy efficiency resources per se, but this energy efficiency resource should be considered for inclusion as a candidate resource in the IRP optimization model.

Staff Recommendations: CPUC staff should collaborate with stakeholders and the CEC through the Demand Analysis Working Group (DAWG) to define energy efficiency savings streams that are suitable for optimization or should remain as load modifiers. Of particular importance:

- The interaction between aggressive code adoption efforts and the resulting availability of ratepayer-funded energy efficiency procurement opportunities, and
- The distinction between ratepayer-funded energy efficiency that can be optimized in the IRP model versus any energy efficiency that must be taken as an "input" in the model by embedding it in the demand forecast, which includes both ratepayer-funded energy efficiency that does not lend itself to IRP modeling (e.g., SB 350-required market transformation programs) and non-ratepayer funded energy efficiency that is outside of CPUC and LSE control.

Ideally, this process will minimize the risk of double-counting of any energy efficiency savings (by both including it in the forecast and the IRP optimization model) nor excluding any savings.

B. CPUC's Portfolio Approach to Energy Efficiency Cost-Effectiveness

The CPUC sets savings goals and associated budgets for obtaining all cost-effective energy efficiency for the overall portfolio, not for individual programs. The CPUC has determined a showing of cost-effectiveness based on a benefit-to-cost ratio for the entire portfolio of ratepayer-funded energy efficiency activities and programs to be a threshold condition for eligibility for ratepayer funds.[5] This portfolio approach provides Program Administrators with significant latitude to implement a variety of programs with different policy objectives while meeting their savings goals. For example, the current energy efficiency portfolios include, in some cases by direction of the CPUC:

- Programs for 'hard-to-reach' markets that may not be accessible cost-effectively;
- Emerging Technology Programs that seed future energy efficiency opportunities for

[5] Interim Opinion: Updated Policy Rules for Post-2005 Energy Efficiency and
Threshold Issues Related to Evaluation, Measurement and Verification of Energy Efficiency Programs (D.05-04-051), p.22 available at: http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/45783.PDF

measures that are currently not cost effective;

- Programs that support the development of Codes and Standards at the CEC, which do not count towards the utilities' savings goals; and
- Other so-called "non-resource programs" such as Workforce Education and Training and Marketing Education and Outreach programs that provide indirect, but non-measurable, support for the delivery of savings through the other energy efficiency programs in the portfolios.

Since the combined portfolio must pass the cost effectiveness test, the portfolio is cost-effective overall. However, some of the individual measures are not cost effective on their own and are included for other reasons such as those described above. The Program Administrator must evaluate the contributions, and cost, of each program' to the overall portfolio and select a mix of programs that achieve the overall energy reduction goals and other objectives.

IRP modeling does not use a portfolio benefit-to-cost ratio. Demand and supply side resources compete on cost, GHG reduction and contribution to reliability. As described in more detail in Chapter III, energy efficiency savings streams could be bundled into resources, each with its own cost and benefits, and compete with other demand and supply side resources. Staff proposes this type of analysis provides a better procurement signal than portfolio-based cost effectiveness. However, as discussed in more detail in the following two subsections, costs and benefits of load modifiers or other activities without easily quantifiable savings are not accounted for in the optimization. Therefore, while optimization may be able to assess the cost-effectiveness of resource acquisition energy efficiency, it is not capable of assessing all costs and all benefits and other non-economic aspects of programs in the entire energy efficiency portfolio.

Staff Recommendations: Staff recommends that the CPUC not replace its portfolio approach to assessing energy efficiency cost-effectiveness with exclusively IRP optimization at this time.

Instead, staff recommends that results of IRP optimization be used in the energy efficiency program goal setting process to inform portfolio development and as an indicator of the influence of specific energy efficiency resources on GHG targets, ongoing changes to system load profiles and system reliability needs.

Information gleaned from tighter coordination of these two processes can be used to improve the IRP process by including increasingly larger amounts of energy efficiency in the optimization model as candidate resources to be optimized, rather than as fixed inputs.

The energy efficiency portfolio will benefit from insights that IRP optimization can provide into which energy efficiency measures and programs will be of most value as the state continues its shift towards an increasingly low-GHG electricity grid and economy. For instance, a future with high penetration of electric vehicles that charge during the day may result in more mid-day load reduction benefits throughout the year than current estimated, or significant increases in building electrification may increase the benefits of early evening load reduction in the winter months compared with currently estimated benefits.

These types of insights into future grid needs will be critically important in shaping the energy efficiency portfolio over time, especially given the long lead times associated with creating and implementing programs that rely on widespread customer adoption of specific measures or technologies (this issue is discussed further in Subsection D below). IRP modeling information may also be useful to the CPUC, Program Administrators, and stakeholders for considering whether and when to discontinue resource and/or non-resource energy efficiency programs. Implementation of this recommendation is explained in more detail in Chapter III.

C. DER Market Adoption Time Horizons

A challenge facing adoption of DERs in general and energy efficiency in particular is the need to develop markets for specific energy efficiency products and ramp up adoption over time. Unlike many supply side resources that can be planned to come online at a certain time, DERs require widespread customer adoption by seeding and nurturing markets for broad societal uptake of these resources. This dynamic not only has implications for resource planning but also in the development of price signals to ensure adoption over time.

The CPUC recognized this challenge and its impact on GHG abatement planning in the February 2018 IRP decision. In that decision, the CPUC identified a "hockey stick" shaped marginal cost of GHG abatement curve for the Reference System Plan's 42 MMT of GHG emissions scenario. This GHG abatement cost path, represented by the solid line in Figure 1, remains in the $20-$25/MMT range until 2026 then increases to $150/MMT in 2030. Recognizing the time needed to develop many DER markets, the decision adopted a GHG "Planning Price" for DERs represented by a straight-line curve from the current GHG abatement maximum price containment cost of $65/MMT to the $150/MMT cost in 2030.

As explained in the February 2018 IRP decision, the CPUC's rationale for adopting this DER GHG Planning Price, represented by dotted line in Figure 1, is that "…mobilizing millions of individual actions in the DER space is inherently more difficult, all other things being equal, than conducting supply solicitations."[6] The CPUC also indicates in the IRP decision that it expects these two curves to converge over time.[7]

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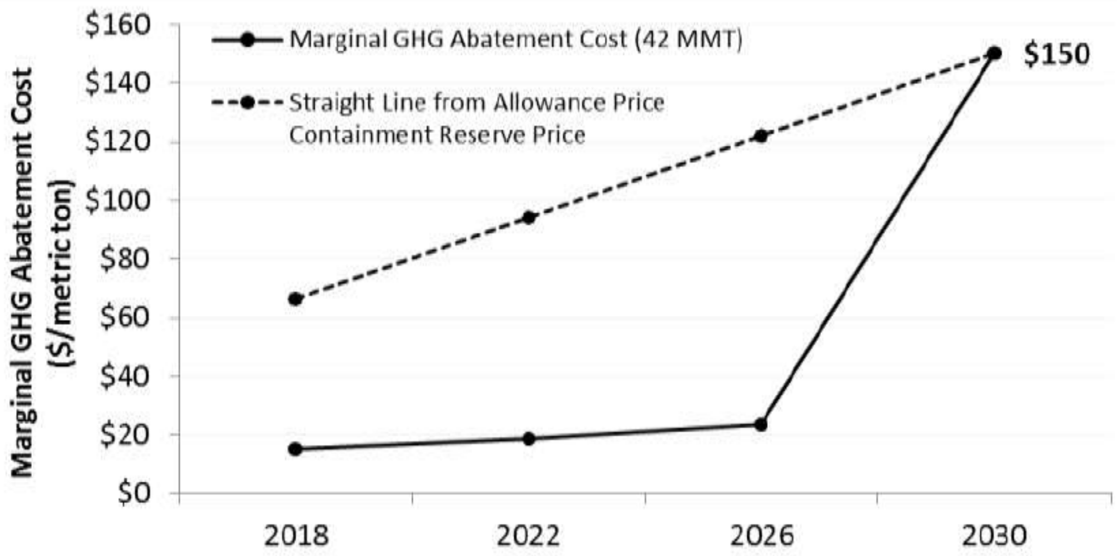
[6] D.18-02-018, P. 118.

[7] Ibid, p. 119

Figure 1 - GHG Planning Price



Source: D.18-02-018, p.106

Staff Recommendations: The market development and customer uptake of many DER resources suggest that great care must be taken by the CPUC before making any significant changes to the current approaches to procuring DERs that require multiple transactions (such as energy efficiency). The CPUC should continue to develop mechanisms to help bridge the different resource characteristics in the IRP.

D. Statutory Requirement to Procure "All Cost-Effective" Energy Efficiency

P.U. Code sections 454.55(a)(i) and 454.56(a) require the CPUC, in consultation with the CEC, to identify all potentially achievable cost-effective energy efficiency savings and establish utility energy efficiency targets based on this assessment.

The CPUC has further established that based on the resource procurement policies articulated in statute, the Energy Action Plan I and II and by the CPUC "cost-effective conservation and energy efficiency are *first* in the IOUs resource loading order—that is, energy efficiency is evaluated for cost-effectiveness and procured *before* supply-side resources are to be factored into the procurement plan" (emphasis original).[8] Therefore, procurement redundancies should be avoided by <u>first</u> procuring energy efficiency and <u>only after</u> procuring other resources as established in the EAP's loading order.[9]

To meet these statutory requirements, the Commission has been assessing achievable cost-effective electric and gas efficiency potential and adopting goals for the EE Portfolios based on that estimated potential since 2004. Benefit-cost analysis is used to determine the amount of

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[8] Interim Opinion: Energy Savings Goals for Program Year 2006 and Beyond, (D.04-09-060) p. 35. http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/40212.PDF (emphasis in the original)
[9] Ibid, pp. 34-35

efficiency potential, and the “benefit” component of this analysis is the estimated cost of generating and delivering the energy that is avoided as a result of adopting efficiency measures.

Optimization of some or all energy efficiency programs in IRP does not conflict with statutory obligations and should assist the CPUC in identifying cost effective energy efficiency. The CPUC policy objectives of first meeting unmet needs with demand reductions via cost-effective, reliable and feasible demand reduction resources should also be supported by IRP optimization. In IRP, energy efficiency could continue to be given procurement priority if deemed the most cost-effective resource to meet the system unmet need at a particular time and location given other resource alternatives.

Optimization also addresses the intent to avoid redundancies in procurement by assessing system needs and available resources holistically. Absent portfolio optimization, there must be a choice between resource procurement targets established via separate processes – energy efficiency goals and bundled procurement plans – where priority should be given to energy efficiency goals. However, if energy efficiency procurement goals are established as a result of integrated planning, the modeling approach should resolve for redundancies in a way that only needed resources must be procured.

Staff Recommendations: The CPUC should consider optimization of energy efficiency resources as the ultimate objective of integration of energy efficiency into the IRP. However, as discussed in the three previous subsections, at this time optimization alone does not fully meet portfolio approval needs. Not all energy efficiency benefits can be easily quantified to be optimized in IRP modeling at this time, resulting in some savings streams needing to continue as load modifiers.

Staff believes that an IRP optimization approach, when implemented, would continue to meet statutory requirement to procure all cost-effective energy efficiency. While this is staff’s assessment, staff also firmly believes that this question is worthy of stakeholder input and formal consideration by the CPUC.

E. Coordination of Energy Efficiency Procurement in an IRP Framework

Staff identifies two challenges associated with the coordination of energy efficiency procurement in an IRP framework.

One challenge is that the LSEs that are required to comply with the IRP framework include IOUs, Customer Choice Aggregators (CCAs), and Energy Service Providers (ESPs); however, ratepayer-funded energy efficiency programs are currently administered primarily by IOUs. Only a few CCAs are administering energy efficiency programs, and of these some elect to serve only their customers while others implement programs that serve all customers in their territory, regardless of whether or not the CCA is their energy provider. No ESPs administer ratepayer-funded energy efficiency programs for their customers, nor is there a mechanism currently in place that would allow them to do so. On the other hand, some energy efficiency programs are currently being administered by entities not required to develop and submit IRPs, including the Regional Energy Networks (REN) and DDB, the contractor currently implementing the Energy Upgrade California Marketing Education and Outreach program. Further complicating this challenge, the Regional Energy Networks and DDB programs target customers in both CCA and bundled IOU service territories.

Given that some entities responsible for developing and implementing IRPs do not administer energy efficiency programs and that some entities who currently implement energy efficiency programs are not required to develop or implement IRPs while others are, further guidance and rule development would be necessary to ensure that cost-effective energy efficiency identified through an IRP optimization process would in fact be procured. .

A second challenge associated with the coordination of energy efficiency in an IRP framework is that there are multiple mechanisms through which energy efficiency is currently procured and will (or could be) procured in the future.

For instance, one example of energy efficiency procurement that has occurred outside of the energy efficiency portfolios is CPUC-directed local capacity requirement procurement. This type of energy efficiency procurement has resulted from “all-source” solicitations by SDG&E and SCE to meet identified local area needs in general, as well as additional needs resulting from the unanticipated closure of the San Onofre Nuclear Generation Station.

In addition, there is coordinated work taking place in the Distributed Resource Plan (DRP) and Integrated Distributed Energy Resource (IDER) proceedings to procure DERs, including energy efficiency, that will defer or avoid distribution upgrades. The IOUs serve as Local Distribution Companies for all LSEs and are best suited to identify opportunities to use DERs to defer distribution system upgrades, and presumably they are also best positioned to structure and evaluate solicitations to meet the identified needs. Similarly, in their role as the Local Distribution Companies, the IOUs are best positioned to procure the Conservation Voltage Reduction efficiency identified in SB 350, which represents another potential source of efficiency procurement outside of the efficiency portfolio.

Staff Recommendations: Additional analysis, policy decisions, and rule development are needed to determine how and by whom IRP-optimized energy efficiency resources might be procured within or outside of current approaches, and the manner in which that procurement would be factored into LSE IRP plans. Staff notes that a number of recent and ongoing changes in how the efficiency portfolio is authorized, how changes to the portfolio can be made by Program Administrators, and how energy efficiency programs are administered require additional analysis before transitioning to a more IRP-optimized procurement approach.

For instance, the overarching shift from authorizing 3-year portfolios with minimal ability to reshape programs mid-course to a “Rolling Portfolio Cycle” with long-term funding authorization and periodic “bus stops” in which key decisions can be made allows for a more nimble, evolvable portfolio makeup. In addition, the shift to standardized, statewide implementation of some programs and the requirement that an increasing portion of the portfolio be implemented by third-parties selected through competitive solicitations may both facilitate any future transitions to more IRP-optimized procurement (e.g., the third party solicitations themselves could be structured as “candidate efficiency resource bundles described in Section III) and possibly hinder consideration of locational impacts of specific programs.

Further, given the breadth and depth of the energy efficiency portfolio activities, to avoid creating arbitrage opportunities that burden ratepayers with undue costs, staff recommends that care be taken to specify the types of energy efficiency programs that would be considered incremental to the portfolio if and when the CPUC authorizes all-source procurement through any future IRP-directed procurement (or for that matter, future authorization of any energy efficiency procurement outside of – and considered 'incremental to' – the energy efficiency portfolio).

Finally, staff defers on providing any specific recommendations regarding procurement that defers or avoids distribution system updates, but analytical approaches to incorporate locational valuation in the IRP be available in the 2019 IRP Cycle.

F. Gas Energy Efficiency

IRP focuses on GHG reductions in the electricity sector, while the energy efficiency portfolio addresses both gas and electricity efficiency. While gas and electricity efficiency savings and implementation programs can theoretically largely be developed separately from one another, there are a number of areas in which the two overlap:

- First, some energy efficiency measures are "dual fuel" (i.e., they provide both gas and electric savings, such as insulation or integrated heating and air conditioning systems).
- Second, a number of single fuel energy efficiency measures have "interactive effects" with the other fuel. For instance, efficient lights or motors generate less heat, which results in higher gas consumption in cold weather in buildings that heat with gas. This relationship is lost when assessing energy efficiency potential for electricity and gas separately.[10]
- Third, building electrification is a potential future source of GHG reductions, and the fuel substitution programs that support building electrification will necessarily involve assessment of measures both within and between each fuel type, the tracking of the appliance stock at each efficiency level, and the dynamic shift of building stock between measures for each fuel depending on consumer choice.[11]

Staff Recommendations: Staff proposes a few possible alternatives for handling these challenges. However, each will demand a full feasibility assessment prior to pursuing optimization.

- Calculation of interactive effects can be done separately as part of the potential and goals study. The potential and goals study would calculate interactive effects for the entire set of technical achievable potential and manually adjust bundled potential prior to optimization. Energy efficiency resulting from the optimization can further adjust final gas market potential.
- Fuel substitution potential can also be assessed in a separate component as part of the potential and goals study to determine potential for building electrification where electric and gas measures can compete. The result of this analysis could be presented as one or more dedicated building electrification bundles.

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[10] Navigant Report, Appendix I.

[11] Ibid.

G. Modeling a Resource Made Up of Many Different Measures

Appropriate characterization of resource attributes such as costs, benefits, performance and persistence is an inherent challenge of integrated planning, especially given the need to model resources with very different characteristics on a comparable basis, so no resource has an unfair advantage.

This challenge is compounded in the case of energy efficiency. While other more homogeneous resources (central station solar, gas turbines) may display some variation in the attributes to be modeled, energy efficiency proves challenging because it is formed by a collection of individual measures all with different costs, load shapes, useful life, persistence and adoption rate.

In addition, modeling hundreds of individual measures in an IRP could prove difficult. Therefore, it is necessary to find an adequate level of aggregation for energy efficiency measures so they can be more manageable in the optimization exercise.

Energy Division staff and our consultants have made an initial attempt to address technical challenges related to optimizing energy efficiency, and the results of this initial work are provided in Section III.

(See Section III for staff recommendations on next steps for incorporating energy efficiency into the IRP optimization model.)

Summary of Challenges and Recommendations

Given the many statutory and policy challenges associated with optimizing ratepayer-funded energy efficiency procurement within the IRP framework, staff recommends that the CPUC not replace its portfolio approach to implementing energy efficiency with a IRP optimization at this time.

Instead, work should focus on how to better coordinate, and where appropriate integrate, the two processes, as staff believes that improved coordination and integration will benefit both efforts – and this work will also lay the groundwork for bringing energy efficiency procurement planning more fully into the IRP optimization framework in the future, were the CPUC to decide to do so.

Staff's recommendations on how to better coordinate the two processes and the components of each process that staff believes should be fully integrated are provided in Section IV, following a technical analysis in Section III of how a resource made up of so many different measures could be incorporated into the IRP optimization model.

III. Optimizing Energy Efficiency in IRP

Optimization of resources in the IRP process requires arranging candidate supply- and demand-side resources on a supply curve and determining the most cost-effective procurement portfolio that will meet forecast load under a specific GHG constraint. This section focuses on the technical challenge of including a resource that comes in as many "shapes and sizes" as does energy efficiency in the IRP optimization model.

To investigate the technical feasibility of energy efficiency optimization in the IRP process, CPUC staff engaged its consultants, Navigant Consulting Inc. (Navigant) and Energy and Environmental Economics (E3), to perform a technical analysis to test optimization of energy efficiency. Navigant explored energy efficiency technical issues, referred to in this document as the *Navigant Report*, and E3 examined optimization issues, referred to as the *E3 Report*. The complete Navigant and E3 reports are available in Appendices I and II of this document, respectively.

The work consisted of:

- Producing energy efficiency resources to be optimized using the IRP capacity expansion modeling capabilities. The groups of energy efficiency resources, called bundles, were built using the 2018 P&G Study[12] data;
- Optimizing energy efficiency alongside other supply side resources for the three scenarios explored in the 2017 integrated resource planning: Default (or 50% RPS, 51 MMT), 42 MMtons GHG, 30 MMtons GHG;
- Reporting results for 2018, 2022, 2026 and 2030 as in the 2017 Reference System Plan and translating the results to annual savings targets for comparison with 2018 P&G Results;
- Documenting findings and lessons learned to inform the analysis, recommendations and next steps in this staff proposal.

A. Adding Candidate Energy Efficiency Resource Bundles

There are thousands of different individual energy efficiency measures. IRP modeling must make simplifications to optimize over a diverse set of technologies and resources, and is therefore not able to model each individual energy efficiency measure in detail. To allow energy efficiency to be optimized in the IRP model, the first step was to create "bundles" of similar energy efficiency measures that could be modeled as candidate resources. Creating these bundles consisted of first determining the technical achievable potential (TAP) energy efficiency, and then grouping this TAP into bundles of measures according to certain attributes, such as cost, load profile, end-use and sector.[13]

A few different bundling approaches were considered to capture cost and a representative hourly load profile – sector (such as residential or commercial), end use (such as lighting or HVAC), combined sector and end use, or combined sector, end use, and cost. Table 1 describes the different bundling approaches and identifies the amount of bundles resulting from each approach.

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[12] Energy Efficiency Potential and Goals Study for 2018 and Beyond, Navigant Consulting, Inc, September 25, 2017. Available at: http://www.cpuc.ca.gov/General.aspx?id=6442452619

[13] TAP is the technical potential adjusted by market adoption parameters, policies and programmatic tools that determine maximum adoption by the market but not constrained by cost-effectiveness assessment. To create TAP using the 2018 P&G Study, Navigant leveraged the technical and market potential analysis methods and removed the economic potential screen. Future studies could be designed with the objective of creating the technical achievable potential, which would be a more direct and accurate way to estimate TAP than the approach used in this analysis.

Table 1 - Bundling Approaches

Bundling Approach	Bundle Description[a]	Number of Bundles
Sector Level	Measures grouped into bundles according to associated sector	6
End Use Level	Measures grouped into bundles according to associated end-use	13
Sector | End Use Level	Measures grouped hierarchically based first upon sector and second upon end use	26
Sector | End Use | Cost Level	Measures grouped hierarchically based first upon sector, second upon end use, and third upon levelized cost	26[b]

a. Each bundle has an associated weighted cost, market potential, and 8760 load profile
b. Some professional judgment is employed to limit bundle count

Source: Appendix I, Navigant Report

Staff and consultants chose to model the supply curve based on sector, end-use, and cost level, as this approach produces the greatest number of discrete bundles of the approaches considered and provides for more cost-differentiation between the bundles.

The energy efficiency measures were organized into 26 distinct bundles of energy efficiency resources, each of which had an associated estimated savings, levelized cost, load shape profile and annual potential market uptake.[14] Navigant developed supply curves for the bundles and provided them to E3 for the optimization, using the same scenarios analyzed in the 2017 RSP.

The next step in the process was to incorporate the energy efficiency bundles into the IRP capacity expansion model, RESOLVE, which "co-optimizes investment and dispatch for a selected set of days over a multi-year horizon in order to identify a least-cost portfolio for meeting renewable energy targets and other system goals".[15]

RESOLVE identified a preferred combination of energy efficiency resources and other supply side resources for each modeled year and scenario, forming the optimal system. Finally, the energy efficiency results were translated into resources to come online every year, or annual savings targets for the entire period.

B. Comparison of IRP Optimization Results with EE Portfolio Goals[16]

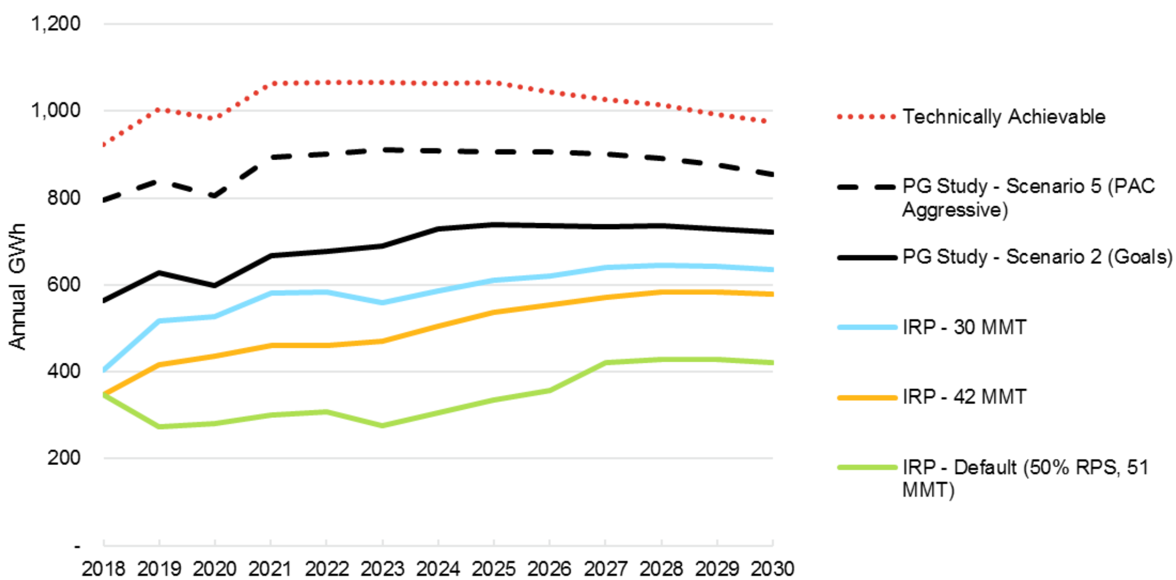
RESOLVE provides annual savings that combine savings for newly installed measures ("first-year" savings) with cumulative savings from measures installed in the previous years that are still within their effective useful lives. However, the EE Portfolio goals are based on first year

[14] During the project planning stages, to reduce processing time and given this was a proof-pf-concept, the team limited the resources to a maximum of 30 bundles. After initial tests, it became clear that RESOLVE could handle more bundles.
[15] E3 Report, Appendix II, p. 6
[16] As the 2017 Reference System Plan did not use the same data as the one used in this analysis, this document will not elaborate on how the technical analysis results compare with the 2017 Reference System Plan. For a high-level comparison with the 2017 Reference System Plan, please see the *E3 Report* in Appendix II. Instead, the focus will be on the comparison between optimization and the 2018 P&G Study.

savings only, not cumulative savings. Consequently, to compare RESOLVE model outputs with the 2018-2030 adopted EE Portfolio goals, CPUC staff and Navigant translated the RESOLVE outputs into annual first year savings.

Figure 2 shows the results of the optimization on an incremental first-year savings basis for the three integrated resource planning cases compared to two 2018 P&G Study scenarios: Scenario 2 that informed the adopted goals and Scenario 5, which was designed in the P&G Study as one of the more aggressive scenarios.[17] These two scenarios establish a lower bound (Scenario 2) and an upper bound (Scenario 5) to the P&G Study analysis.

Figure 2 - Energy Efficiency Savings Optimization Comparison with 2018 P&G Results



Source: Navigant Report

The dotted red line represents the technical achievable potential, the upper limit of savings potential from the measures modeled in the P&G Study.

The two cost-effectiveness approaches, resource optimization and portfolio based on an avoided cost, produce different results, with the RESOLVE model consistently selecting lower quantities of energy efficiency than the current energy efficiency portfolio goals. Staff is uncertain whether this difference is due to limitations of the approach used to develop candidate energy efficiency bundles, which are summarized below and described in greater detail in Appendices I and II, or whether the "direct" determination of all cost-effective energy

[17] The 2018 P&G Study developed 5 scenarios to inform goals adoption. These scenarios varied by different cost-effectiveness tests and by inputs in the ACC. The Navigant Report in Appendix I details all scenarios. For further detail see: Energy Efficiency Potential and Goals Study for 2018 and Beyond, available at ftp://ftp.Commission.ca.gov/gopher-data/energy_division/EnergyEfficiency/DAWG/2018_Potential%20and%20Goals%20Study%20Final%20Report_092517.pdf

efficiency – in which it is optimized with all other available supply- and demand-side resources – will inherently result in lower amounts of cost-effective energy efficiency than the P&G Study's benefit-cost analysis approach, in which:

- Energy efficiency only "competes" against avoided supply-side resources, exclusive of other demand-side resources, and
- A number of favorable cost assumptions are made for the energy efficiency resource (for instance, the P&G Study assumes all non-emerging technologies with a TRC test threshold of 0.85, emerging technologies are included if they meet a TRC test threshold of 0.5 in a given year and are assumed to achieve a TRC test equivalent to the 0.85 threshold for non-emerging technologies within ten years of market introduction.).[18]

This distinction is further illustrated by comparing the mix of measures screened in the P&G Study and in the optimization. Figure 3 below shows that the P&G study included a much greater variety of end uses (and thus measures) in comparison to the optimization results for the year 2018. By 2030 (Figure 4), the resource savings become less diverse overall, still with greater variety in the P&G Study. It is unclear at this time if this is primarily a result of the optimization or an indication that improved cost and load impact data is required.

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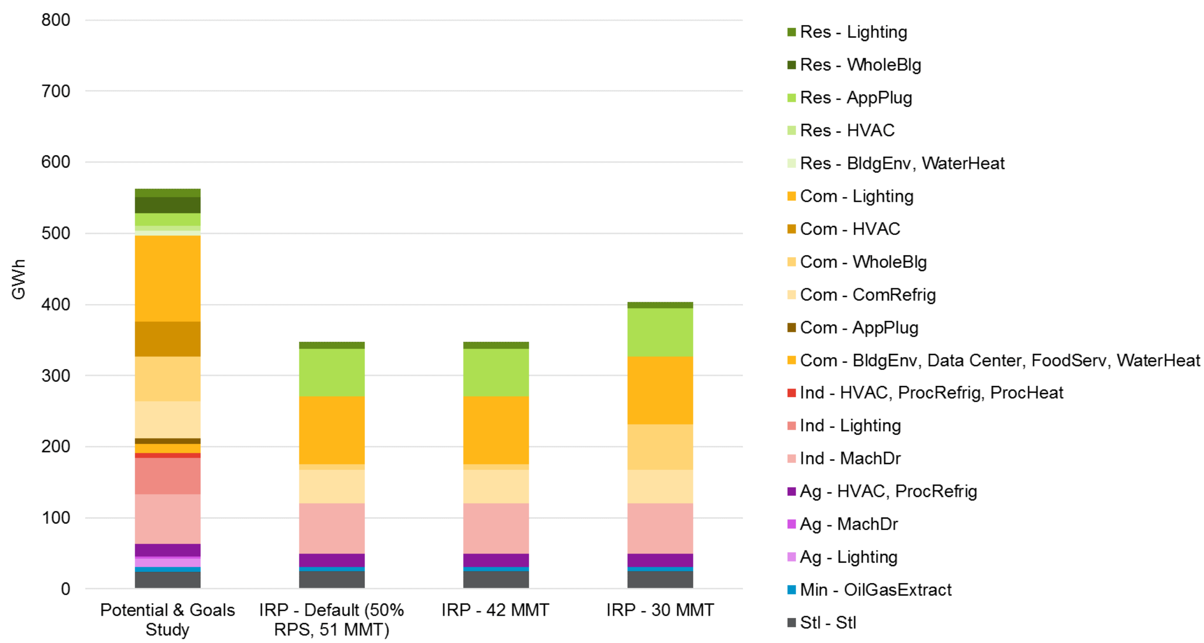
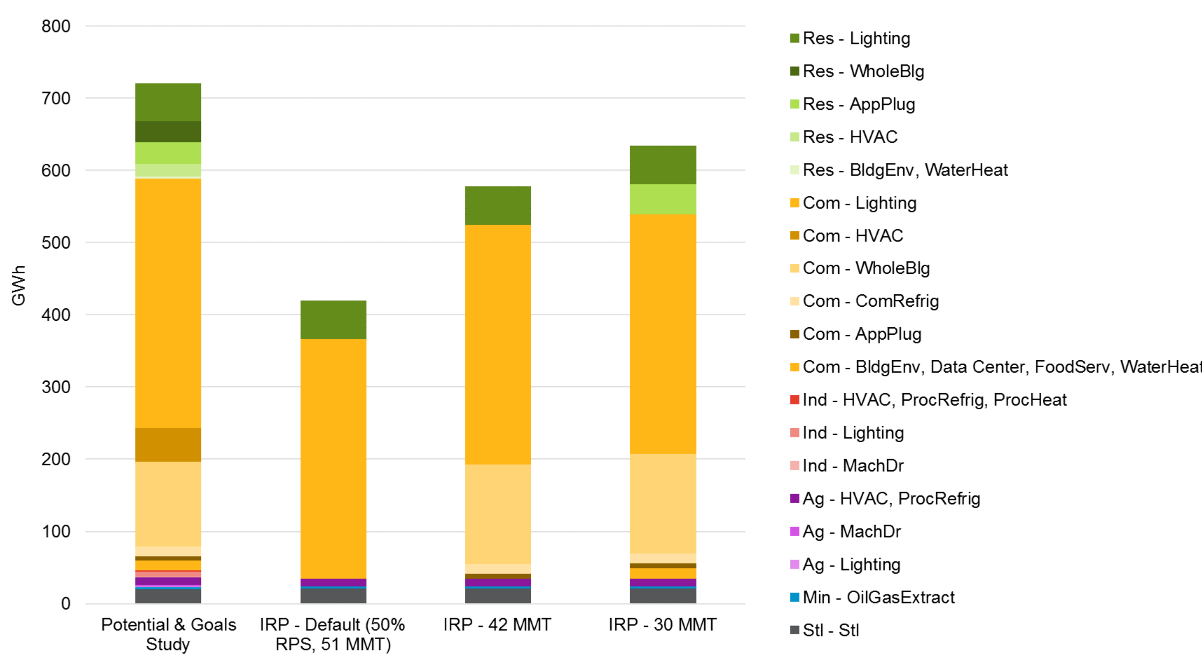
[18]Energy Efficiency Potential and Goals Study for 2018 and Beyond, footnote 4, available at ftp://ftp.cpuc.ca.gov/gopher-data/energy_division/EnergyEfficiency/DAWG/2018_Potential%20and%20Goals%20Study%20Final%20Report_092517.pdf

Figure 3 -2018 Annual Savings Comparison by Sector and End Use



Source: Navigant Report, Appendix I

Figure 4 - 2030 Annual Savings Comparison by Sector and End Use



Source: Navigant Report, Appendix I

The results are still preliminary, but the important takeaway from this finding is that the IRP optimization approach may result in different measures being included in the determination of potential, perhaps signaling more homogeneous portfolios. IRP optimization may also provide insights into the P&G Study analysis, identifying opportunities to focus the energy efficiency portfolio's efforts more strategically.

C. Staff Recommendations

The technical analysis raised an array of technical, modeling, and data questions that need further investigation. Additional analysis that would improve the results of including energy efficiency in the IRP optimization process are summarized below and discussed in more detail in Appendices I and II.

- **Additional refinement to measure bundling**. The bundling developed to inform this proposal had the objective to test modeling capability and shortcomings; therefore, this approach may not represent the most adequate bundling structure. Bundling, while allowing for simplification, may reduce resolution of resources and system benefits.
- **Optimization model should be improved to capture energy efficiency characteristics**. The modeling tool must be able to handle energy efficiency resource decay, and program re-participation. This adjustment should be made with the same rigor as done with other resources. Energy efficiency decay relates to a portion of measures installed reaching the end of their effective useful life, with a portion of those re-participating in programs. Other resources also suffer decay, for instance solar installations eventually experience failed panels and other equipment. Decay modeling assumptions should approximate industry practices irrespective of resources.
- **Increase the focus and efforts in producing up-to-date and measure specific savings load shapes for energy efficiency**. The determination of hourly impacts for energy efficiency measure savings is of critical importance for the optimization. The development of load shapes should be included in the scope of future energy efficiency research activities.
- **Further research to improve the definition of energy efficiency levelized value inputs**. Improved valuation of avoided T&D, including locational values, capacity and others due to energy efficiency will improve valuation of DER resources, in general.
- **Alignment of costs amongst resources**. The levelized cost of energy efficiency resources was based on all cost components included in the TRC test, such as non-resource portfolio delivery costs. It is unclear if these costs categories are analogous to cost categories for other supply and demand side resources.

IV. Next Steps for Coordination of EE Portfolio Goal Setting and IRP

In Section II, staff recommended that EE Portfolio planning not be folded into the IRP optimization framework at this time, given the wide range of statutory, policy, and procurement coordination challenges that need to be resolved prior to such a change.

This recommendation was reinforced by the technical analysis of including energy efficiency in IRP performed by staff and consultants, summarized in Section III. While this analysis indicated that candidate energy efficiency resources could be designed and specified in a manner that would allow energy efficiency to be optimized in the IRP model, additional work is needed to refine and improve upon these initial efforts.

Instead, staff proposes that steps be taken to more tightly coordinate energy efficiency portfolio goal setting and IRP modeling, in order to:

- Provide opportunities for analysis developed in each process to inform and improve upon the other,
- Integrate components of each process that can be integrated and for which there are natural synergies between the two efforts, and
- Begin “beta-testing” the full integration of energy efficiency goal setting and measure/program selection into IRP to prepare for that potentiality, in the event that the various challenges identified in this paper are resolved and the CPUC elects to fully integrate the energy efficiency goal setting and resource selection into the IRP framework in the future.

This section identifies the steps that staff believes should be taken to implement its recommendation.

A. Load Modifiers

As noted earlier, it will not make sense to include all energy efficiency measures and programs in the IRP optimization model for various technical or policy-related reasons. In these cases, the resulting energy efficiency can be reflected as fixed inputs to the optimization process via modifications to the load forecast (i.e., lowering the forecast to reflect less demand resulting from these energy efficiency efforts, before optimizing across all resources). For the purposes of IRP optimization of energy efficiency, staff defines load modifiers as:

- Savings streams not within CPUC jurisdictional control (e.g., codes and standards, PACE-financed energy efficiency);
- Fixed statutory mandates that are not optimized for cost-effectiveness (e.g., low income energy efficiency programs);
- Measures characterized by high uncertainty in cost and/or savings (e.g., market transformation programs); or
- Measures that cannot be easily optimized (e.g., industrial programs with unspecified savings potential that were modeled in the P&G Study as a reduction in consumption as opposed to bottom up measure-level savings).

Staff believes that some of these measures and programs can be included in the optimization model through methodological improvements, but in the meantime energy efficiency savings from these types of programs need to be incorporated into the optimization model as modifiers of the baseline forecast rather than optimized within the model.

The suitability of energy efficiency measures and programs for inclusion as candidate resources or load modifiers (or not at all) should be determined in the P&G Study – initially in the 2019 trial run, but also on an ongoing basis in future EE goal setting / IRP optimization cycles. Ideally, these determinations will be made in collaboration with the CEC, and stakeholders as part of the DAWG. Some load modifiers are developed as part of the P&G Study, such as low income, codes and standards not yet adopted and possible market transformation. Others are developed as part of CEC led processes, such as the SB 350 targets (PACE) and baseline forecast.

B. IRP-EE Coordination Beginning with the 2021 P&G Study

Beginning with the 2021 P&G Study, staff's vision of tightened coordination between the IRP optimization and EE goal setting and portfolio planning consists of utilizing the P&G Study to develop energy savings inputs for the IRP, optimizing energy efficiency alongside other resources in the IRP model, and including these results, in addition to other information developed in the P&G Study, in the EE goal setting and portfolio planning process. This subsection provides an overview of the envisioned coordination.

No changes would be needed in the interagency "single planning demand forecast" process between the CPUC, the CEC and the CAISO. The energy efficiency portfolio proceeding would continue to adopt energy efficiency goals that the CEC uses to develop the baseline forecast (which accounts for committed energy efficiency savings and is a required input to the IRP process) and the managed forecast (which includes additional achievable energy efficiency savings scenarios that are less certain but still "reasonably expected to occur").

Close collaboration between the Energy Division staff and consultants supporting the two proceedings, as well as the Assigned ALJs, would be essential. The proposed steps and handoffs are summarized below. Appendix III provides additional details on what procedural actions will need to occur in each proceeding to effectuate this coordination and integration, as well as the schedule adjustments that may be needed to ensure that the timing of the recurring processes in the two proceedings align.

i. Develop Candidate Bundles and Identify Load-Modifying EE in the P&G Study Analysis

The P&G Study would remain under the purview of energy efficiency staff, since the development of energy efficiency TAP and supply curves – including the development and vetting of bundling strategies, load modifiers and gas savings interactions – requires energy efficiency expertise. However, the IRP optimization inputs would be developed in close collaboration with IRP staff.

To facilitate this work, the scope of the P&G Study would need to be modified to include the determination of the TAP, development of candidate energy efficiency resource bundles and supply curves (with input from IRP staff and consultants for use in IRP modeling), and identification of load-modifying savings streams for measures and programs that are expected to be procured but are not suitable for the IRP optimization model (these savings streams are discussed in more detail in the following subsection).

The P&G Study analysis would continue to determine the technical, economic and market potential analysis to support gas energy efficiency targets, and this work would also support estimates for interactive effects and building electrification potential to adjust resource bundle supply curves as necessary. Stakeholder vetting of all of this work would continue to take place within the CEC-led Demand Analysis Working Group (DAWG).

ii. Run Optimization Model, Including Load Modifying EE and Candidate EE Resource Bundles

The IRP optimization model incorporating all load-modifying energy efficiency and candidate energy efficiency resource bundles identified in the P&G Study will be run to identify which EE resource bundles are selected when optimizing all resources to meet GHG goals at least cost.

iii. Use Optimization Model Results in EE Goal Setting and Portfolio Planning

Starting in the 2021 update, the optimization results will be made available to the EE proceeding to inform the composition of the energy efficiency portfolio to inform adoption in the Energy Efficiency proceeding. Since the EE portfolio is required to adopt all cost-effective EE, by definition the measures and programs included in the bundles selected through the IRP optimization process would never exceed the amount of resources adopted in the EE Portfolio goal-setting process (i.e., all of the load modifying EE included as an input into the IRP optimization model and all of the candidate EE resource bundles selected in the optimization will be adopted in the EE portfolio).

On the other hand, staff anticipates that the EE portfolio goals may exceed the combination of resource bundles and load-modifying energy efficiency identified through IRP optimization for a variety of reasons discussed in Section II. Nonetheless, staff also expects that IRP optimization outputs could assist the CPUC and EE Program Administrators (and other energy efficiency proceeding stakeholders) in considering and evaluating whether to discontinue any resource and/or non-resource energy efficiency programs that are the model identifies as exhibiting net costs – and increasingly so – in a decreasing GHG grid and economy.

Finally, IRP optimization outputs could also be used in the EE proceeding to make further adjustments to gas energy efficiency resource potential based on electricity optimization results associated with interactive effects and/or fuel substitution.

iv. Adopt the Preferred Resource Plan that Includes all EE Portfolio Procurement

In the IRP proceeding, the CPUC directs LSEs to procure the most effective resources within each resource group, and energy efficiency is identified as one of the resource categories.[19] Therefore, the Preferred Resource Plan adopted in the IRP proceeding is the best vehicle to reconcile procurement authorized in the EE proceeding with the IRP. Staff recommends that LSEs responsible for EE procurement (IOUs and CCAs) should be directed to reflect all EE procurement authorized in the EE Portfolio in the LSE IRP plans that the CPUC will use to develop the Preferred Resource Plan. In the event that to accommodate the goals adopted in the EE proceeding, LSE IRP Plans reflect higher levels of energy efficiency than were originally identified in the IRP Reference System Plan – which in turn would presumably result in lower

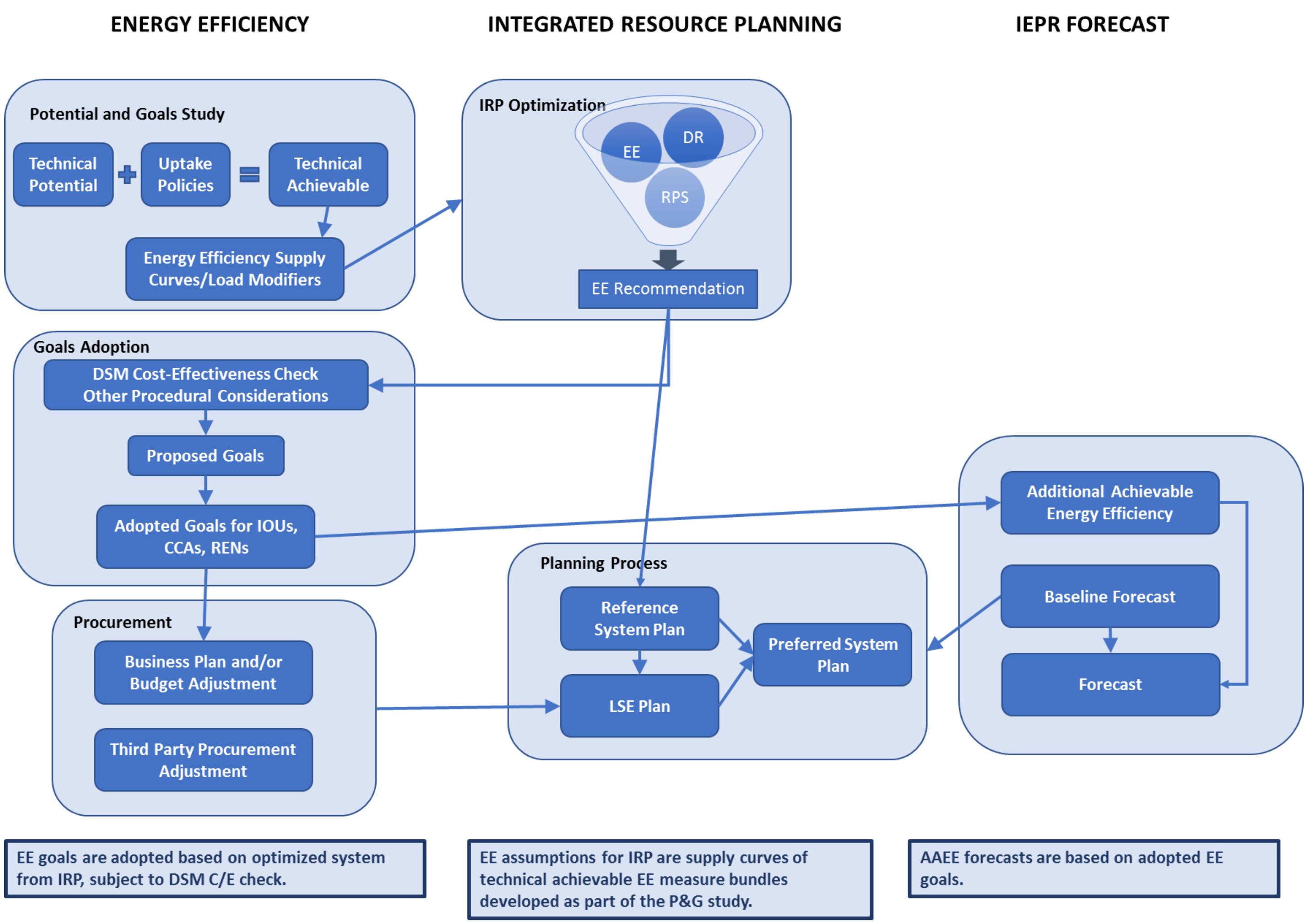
[19] The February 2018 IRP decision identifies four major resource groups for procurement of incremental capacity (to 2017) in 2030: customer solar PV, supply-side renewables, energy efficiency, battery storage. (pp. 89-90, Table 4) It is possible that these categories may change in future IRP updates, however the concept of resource groups should remain.

procurement of other resources identified in the Reference System Plan – the LSE IRP Plans should explain these adjustments in their compliance filings.

It is important to note that the decision adopting the Preferred Resource Plan (which will be made up of all LSE IRP Plans adjusted as needed to be RSP-compliant) would not supersede the EE Portfolio procurement direction or ABAL procurement authorization (i.e., the decision adopting the Preferred Resource Plan should not authorize less EE procurement than approved in the EE portfolio decision). Instead, the Preferred Resource Plan should verify that the adopted LSE IRP Plans conform with these regulatory vehicles.

Figure 5 depicts the proposed coordination of IRP Optimization and EE goal setting and portfolio planning.

Figure 5 Coordination of IRP Optimization and EE Goal Setting / Portfolio Planning



C. Status Quo Option

As a final note, it is important to note that if the CPUC declines to adopt staff's proposal to more tightly coordinate the two processes, another alternative is to continue with the status quo. That is, continue to incorporate EE into IRP through the demand forecast as a load modifier, as was done in the 2017 IRP. This alternative is described in Appendix IV.

Appendix I – Navigant Technical Analysis

Appendix II – E3 Technical Analysis

Appendix III – Process Alignment Details for Coordination of IRP Optimization and EE Goal Setting / Portfolio Planning

This appendix provides implementation details regarding the proposed alignment between the planning and procurement oversight functions and guidance adopted in IRP and in Energy Efficiency.

D. Summary of Sequential Tasks and 'Hand-Offs' Between the Proceedings

Staff recommends a multi-step process that combines IRP and Energy Efficiency proceedings tasks in order to plan for needs, establish goals and oversee compliance with procurement goals as described below and illustrated in Figure AIII-1.

- **Step 1: EE Portfolio/System Planning**
    - The CPUC considers the assessment of potential resulting from the P&G Study and IRP optimization – including portfolio cost-effectiveness results, alignment of short and long-term needs, and other policy objectives – in the Energy Efficiency proceeding. The result of this combined analysis is an assessment of annual and cumulative savings potential over the Energy Efficiency Portfolio planning period (roles and responsibilities of each analytical task are discussed in the following Process Alignment subsection).
    - The IRP optimization results will <u>also</u> inform the amount and types of energy efficiency included in the RSP.

- **Step 2: EE Portfolio Procurement Authorization**
    - The CPUC adopts EE Portfolio goals in the Energy Efficiency proceeding, including procurement directives informed by the IRP optimization. The goals decision should constitute the main vehicle for procurement direction.[20]
    - The Procurement authorization is granted via the Tier 2 Annual Budget Advice Letter (ABAL) filed every September 1 in the Energy Efficiency proceeding that comply with adopted goals and compliance directives, which results in "spending authorization (for all types of PAs) and revenue requirement for rate recovery purposes (for the IOU subset of PAs)."[21]
    - The adoption of EE Portfolio goals and procurement directives may also trigger updates to Business Plans as per D.15-10-028 if those constitute a significant change from existing Business Plans.[22]

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[20] D.15-10-028 also directs a staff white paper to inform a guidance document for Business Plans. This mechanism can complement but should not replace the EE Portfolio goals decision as establishing procurement direction.

[21] Decision Re Energy Efficiency Goals for 2016 And Beyond and Energy Efficiency Rolling Portfolio Mechanics (D.15-10-028) available at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M155/K511/155511942.pdf, p. 62

[22] Ibid, pp.56-57. The triggers for Business Plan refiling are:
"1. A PA is unable to adjust its portfolio in response to goal, parameter, or other updates to:

- **Step 3: EE Portfolio Procurement Compliance**
    - The EE PAs design programs to achieve the adopted goals, taking into consideration the results of IRP optimization and any CPUC adopted procurement directives.
    - For PA procurement, compliance is established via Implementation Plans that detail programs/implementation strategies. Implementation Plans are posted for informational purposes.[23]
    - PAs will implement some programs in their own territories, CPUC-specified PAs will implement statewide programs, and third parties will design and implement an increasing portion of the portfolio as a result of PA-led solicitations. Results of optimization can be used to inform each of these EE procurement paths. Solicitation plans for the third party programs are to be vetted through a stakeholder process, with CPUC approval via Advice Letter (required for contracts above $5 million or longer than three years).[24]

- **Step 4: IRP Compliance**
    - The PAs who are also LSEs (IOUs and CCAs) are required to file RSP-compliant plans in IRP proceeding. As directed by either the EE or IRP proceeding,[25] these plans will need to demonstrate compliance with the goals and procurement directives adopted in the EE proceeding, justifying any deviations from the RSP necessary to comply with adopted energy efficiency goals. [26]
    - As a default, IOUs will roll up REN goals into their Plans, though this may change over time (this issue is identified in the body of the document as one of the challenges that needs to be resolved going forward).
    - The CPUC adopts the Preferred System Plan (PSP) made up of all LSE RSP-compliant plans with any CPUC-required adjustments. The PSP includes all EE Portfolio procurement.

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a. meet savings goals,
b. stay within the budget parameters of the last-approved business plan, or
c. meet the Commission-established cost effectiveness (excluding Codes and Standards and spillover adjustments)"
2. The Commission calls for a new application as a result of a decision in the policy track of the proceeding (or for any other reason);"
PAs may elect to re-file Business Plans at any time.

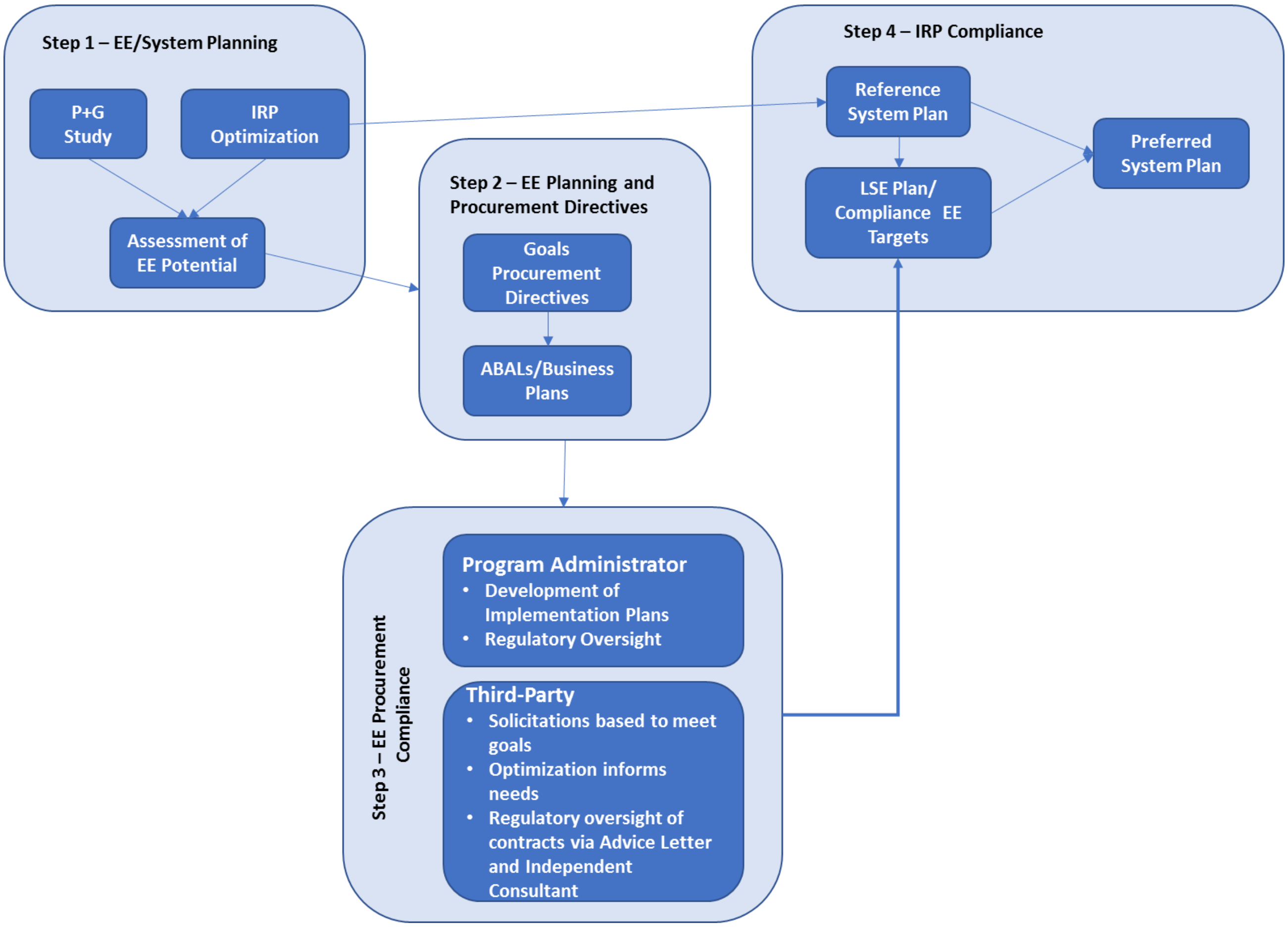
[23] Decision Re Energy Efficiency Goals for 2016 And Beyond and Energy Efficiency Rolling Portfolio Mechanics (D.15-10-028) available at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M155/K511/155511942.pdf and affirmed by Proposed Decision Addressing Energy Efficiency Business Plans, available at: http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M212/K763/212763072.PDF

[24] Decision Addressing Third Party Solicitation Process for Energy Efficiency Programs (D.18-01-004) available at http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M205/K560/205560586.PDF

[25] TBD. As noted in the body of the proposal, the EE proceeding may be the easier/preferable proceeding to make this requirement.

26 In the February 2018 IRP decision, the CPUC directed that LSEs must meet resource specific statutory and/or regulatory requirements as the RSP or the need to meet GHG targets do not relieve LSEs of those obligations.

Figure AIII-1: EE and IRP Procurement Compliance Procedural Alignment



E. Process Alignment

In principle the milestones for EE Portfolio planning in the EE proceeding and IRP have the potential to align well, as each cycle should be completed in two years. In addition, the majority of planning activities relevant to integration and the major proceeding milestones happen in the same year.

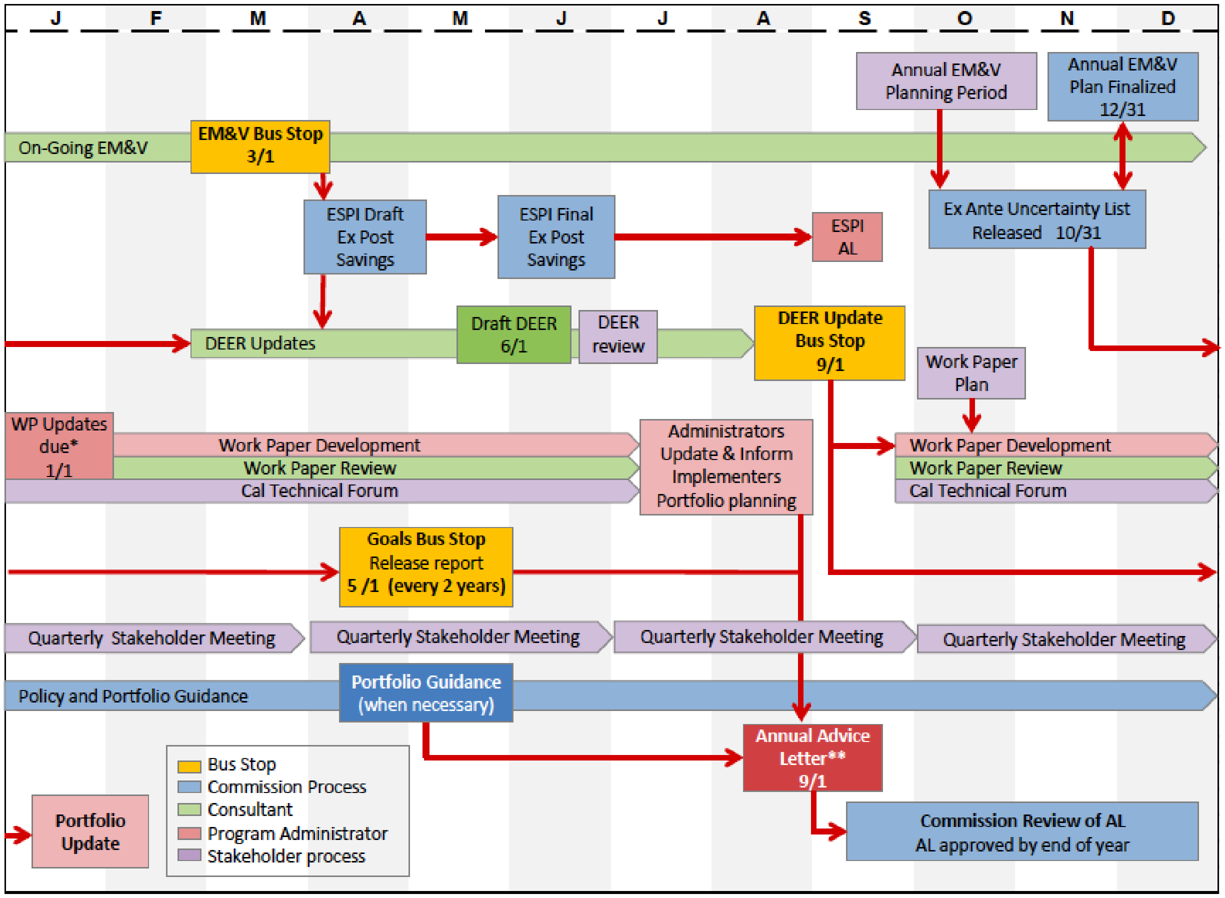
The adopted IRP planning framework includes three major milestones over the two-year planning process:

- Odd years: CPUC staff developing a Reference System Plan, in compliance with Pub. Util. Code §454.51, to be adopted by December 31.
- Even years: LSEs submit their own plans to demonstrate compliance with the reference system plan by May 1.
- The CPUC approves or modifies the LSE Plans by December 31 and adopts a Preferred System Plan (PSP).

The CPUC adopted a funding authorization schedule of ten years for the EE Portfolio starting in 2015. D.15-10-028 adopted a schedule framework of based on “bus stops” [27] for major activities for implementation of EE Portfolio.

[27] “The joint parties prepared a proposed proceeding schedule that was defined by firm “bus stops,” or deadlines for the critical steps in the portfolio updates. The value in the bus stop concept is that it sets a reliable, regular schedule for future updates, so that any new information that “misses a bus” can get on board when the bus rolls around to the stop again the following year.” Decision re Energy Efficiency Goals for 2016 and Beyond and Energy Efficiency Rolling Portfolio Mechanics. (D.15-10-028), p.81 available at http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M155/K511/155511942.pdf

Figure AIII-2: Energy Efficiency Rolling Portfolio Schedule



*Work papers for existing measures that are impacted by DEER updates shall be submitted by 1/1, to provide sufficient time for review
**In years that business plan is filed, advice letter filing should be filed concurrently for budget review. Portfolio guidance and business plans are not defined by a set schedule

Source: D.15-10-028, Appendix 6

The "bus stop" most relevant to the EE Portfolio and IRP integration is the "goals bus stop" that determines the release of the draft P&G Study. CPUC adoption of EE Portfolio goals is scheduled to occur by an August meeting in order to feed into the CEC Integrated Energy Policy Report (IEPR) demand forecast process.

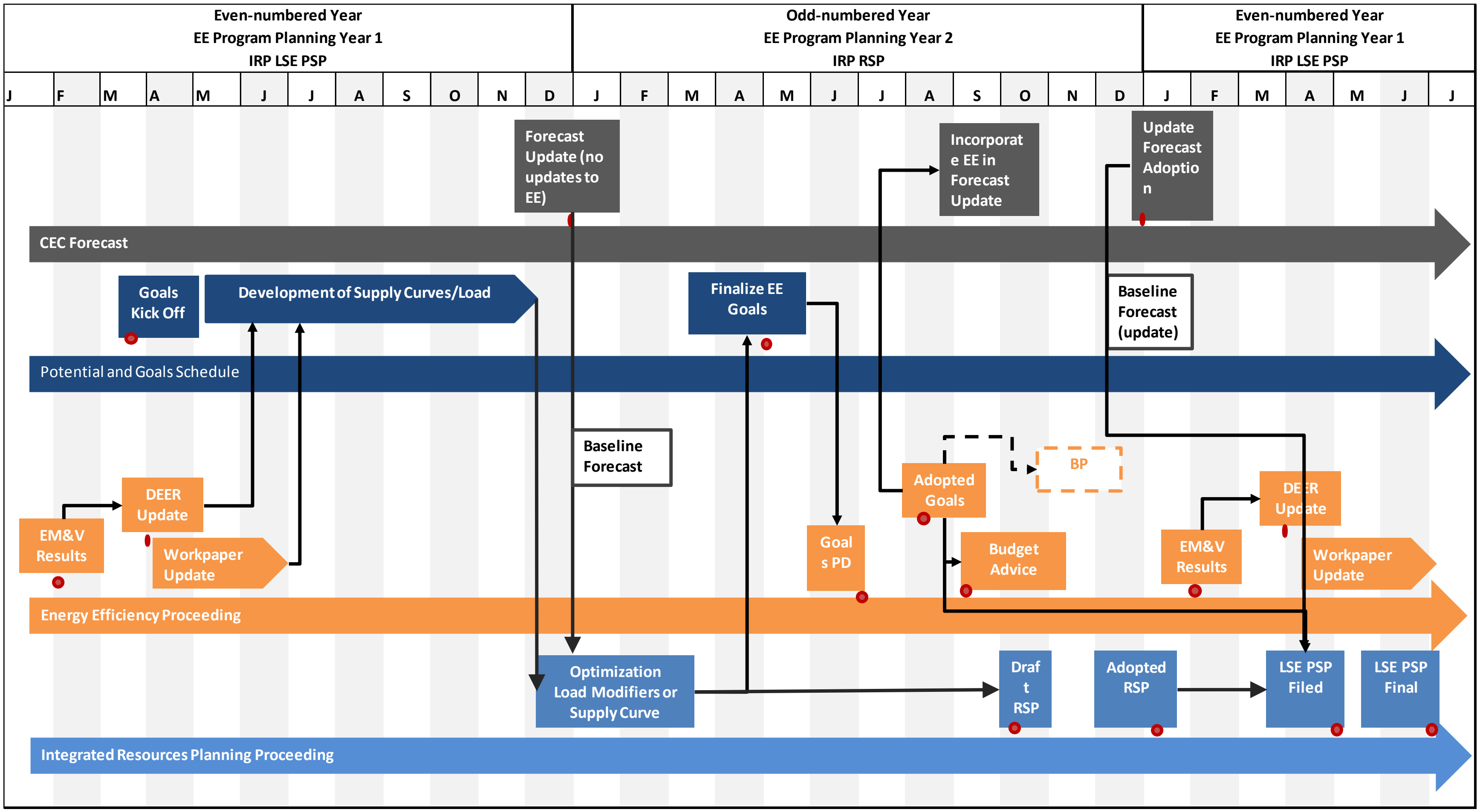
Other relevant "bus stops" are the "DEER update" and "workpaper plan" related to determination of prospective savings values, and the "EM&V Results" for the publishing of results of program evaluation. These processes are important to keep EE Portfolio planning relevant and based on the "best available data" as ordered by the CPUC.[28]

The main inter-proceeding milestones that must coordinate are the P&G Study, optimization activities, the adoption of the RSP and the LSE Plans that meet the adopted EE portfolio goals.

[28] Decision Adopting Interim Energy Efficiency Savings Goals for 2012 Through 2020, and Defining Energy Efficiency Savings Goals for 2009 Through 2011, (D.08-07-047) pp. 18-19 available at: http://docs.cpuc.ca.gov/PublishedDocs/PUBLISHED/FINAL_DECISION/85995.htm

In order to effectuate, optimization of energy efficiency, the P&G Study must be initiated earlier to allow more time for the analysis. This is feasible, but it means that key P&G Study inputs – including updates to savings parameters from EM&V, the Database for Energy Efficient Resources (DEER), and non-DEER workpaper updates – will not be available on the original bus stop timeline. Assuming the IRP schedule is fixed and the supply curve analysis must be initiated earlier than current goals schedule, the only alternatives are to live with stale data or modify the EM&V and DEER adoption "bus stops" and the updates to non-DEER workpapers, if feasible. Staff offers an alternative to address this issue in Figure AIII-3 below.

Figure AIII-3: Conceptual EE Portfolio Planning and IRP Reference System Plan Procedural Alignment



Note: Straight lines represent established processes, dotted lines represent conditional processes; red dots represent expected product public release.

The proposed procedural schedule alignment would require three changes to the EE Rolling Portfolio Schedule. The changes may impact the update of savings parameters and program evaluation which depend on evaluation study tasks and other analytical updates. Any necessary changes to accommodate IRP integration would need to be vetted through the energy efficiency proceeding:

- **Start the potential and goals study no later than March of even-numbered year**. This should allow enough time for the study to develop the necessary inputs for integrated resource planning optimization.
- **Adopt DEER final resolution by April 1st**. One of the policy objectives of EE planning is that it incorporates the best available information. One of the main sources of technical savings information is DEER. DEER is updated annually via staff resolution. D.15-10-028 adopted a September "bus stop" for this update. This will also allow the updates of non-DEER workpapers to start in April.
- **Anticipate releasing EM&V Draft Results by January 1st**. To accommodate an earlier start for the P&G Study, DEER adoption must be accelerated to April 1st and EM&V draft results should be released by January 1st.

DEER update tasks are dependent on EM&V results and codes and standards updates. Non-DEER workpaper updates are triggered by DEER and EM&V updates not incorporated in DEER. This staff proposal would involve shortening the timing to complete these activities. Staff believes that PAs and consultants may be able to streamline this process by improving coordination.

The main bottleneck in this proposal is the release of EM&V results, which needs further consideration. It is possible that changes in the way results are released may allow for shorter lead time between end of field research and results reporting such as the replacement of extensive reports with more dynamic electronic display of results and simplified methods and recommendation reporting.

Staff recognizes that this proposal has unknowns requiring further consideration. In addition, the IRP schedule itself may change as planning processes for other resources (e.g. demand response) must also be coordinated as part of a broad multi-resource procedural integration. Therefore, staff offers this recommendation as an initial conceptual illustration that will require further review alongside other dimensions of potential energy efficiency optimization in 2021.

Appendix IV – Status Quo: Energy Efficiency as a Fixed Input to IRP

In the absence of optimization or any integration of EE Planning and IRP analytical tasks, energy efficiency becomes a fixed input in the IRP process via the demand forecast. As discussed in Section IV, the adopted EE Portfolio goals are transmitted to the CEC as part of the preparation of the IEPR demand forecast. As was done in the 2017 IRP, the IRP uses the full demand forecast as a fixed input to the system optimization that reduces the load to be served. This approach does not allow for the optimization of EE as a candidate resource as goals would have been adopted prior to transmission to the CEC which are the input of the IRP.

In addition, due to the way the full IEPR demand forecast adoption and the IRP are scheduled, the RSP would always be based on the previous cycle demand forecast, as the RSP is developed and adopted on odd-numbered years in conjunction with the full demand forecast update with both adoptions happening at the end of the year. LSE Plans could reflect the latest update of the IEPR forecast as they are developed and adopted the year following the adoption of the full IEPR demand forecast update. Figure AIV-1 illustrates this process.

Figure AIV-1: EE-IRP Integration Absent Optimization Objective