California Public Utilities Commission

Distribution Resources Plan (DRP) Roadmap Straw Proposal

R. 14-08-013

Prepared by Energy Division Staff

November 2, 2015

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1. Introduction

This staff straw proposal for a Distribution Resources Plan (DRP) Proceeding Roadmap is intended to provide input into the Scoping Memo for the DRP proceeding (R. 14-08-013). It is also intended to serve as a starting point for a broader effort to integrate planning efforts in several open proceedings, most notably the Integrated Distributed Energy Resource (IDER) proceeding (R. 14-10-003). Staff suggests that the DRP Roadmap be served on parties to both the DRP and IDER proceedings and that parties to either proceeding may offer feedback regarding the Roadmap during the November 9 workshop.

The purpose of the DRP Roadmap Straw Proposal is to lay out a basic schedule of proposed activities and workshops, potential rulings, and staff recommendations for decisions in the proceeding. Some workshops would lead to workshop reports and some workshop reports would receive party comment. The Roadmap also draws together related processes in other proceedings to aid in coordination. As noted in the DRP Pre-Hearing Conference (PHC) Administrative Law Judge (ALJ) David Gamson asked Energy Division Staff to put out a straw proposal DRP Roadmap that would be the focus of a one-day workshop (scheduled for November 9, 2015). Energy Division staff offer this straw proposal to give parties a draft plan to react to and comment upon. Creating a DRP Roadmap Straw Proposal necessarily involves proposing potential workshops, rulings and decision points. Final decision on the scope, schedule and procedural issues for the DRP will be made in the Scoping Memo.

A number of parties made recommendations for phasing and scheduling of the proceeding. For example, Southern California Edison (SCE) proposed two tracks for this proceeding, one to first consider foundational issues that can be resolved relatively early and are important to move forward expeditiously. The second would consider longer term, more complex issues. Staff finds merit in this approach. Thus this roadmap proposes the following approach toward achieving the goals of the DRP proceeding:

a. Identify foundational issues that must be first considered;

b. Provisionally approve “no regrets” actions or otherwise provide expedited direction, by ruling, on key issues for further development and review in the proceeding;

c. Setting up a track for Decision(s) to resolve more complex issues that might involve recurring filings or coordination with other proceedings such as the General Rate Case (GRC).

2. Summary of Potential DRP Roadmap Decisions

The following is a summary of staff recommendations for timing and scope of potential decisions in the DRP proceeding. This is a starting point and not an exhaustive list of potential scope issues for these decisions. The workshop on the DRP and Roadmap will develop substantial record to inform the Scoping Ruling and the scope of issues.

Table 1. Proposed Decisions, Dates and Potential Scope of Issues

Decision	Date	Potential Outcome and Scope
Decision 1	December 2016	1. Should the Commission authorize IOUs to execute the project design phase of demonstration and deployment projects C, D and E, taking

		into account the record developed in workshop reports 3, 4 and for the demonstration project design workshops? 2. Funding authorization and cost recovery mechanism for design phase of demonstration and deployment project activities; 3. Should the Commission order IOUs to formally characterize DER portfolio optimization techniques for purposes of use in the IDER proceeding? 4. Should the Commission order IOUs to file 2016-17 DRPs based on modifications adopted by Ruling to date? 5. Should the Commission set policy direction and recommendations for using DRP data and results in Rule 21 interconnection streamlining, smart inverter working group (SIWG), and Rule 15 and 16?
Decision 2	May 2017	1. Should the Commission approve finalized designs and project configurations of C, D and E demonstration projects? 2. Should the IOUs be ordered to provide regular public status reports on Demonstration Project activities? 3. Should the Commission authorize funding for procurement of utility assets including online tool development for DER development support? 4. Determination of an "other DRP infrastructure spending request" evaluation if required. This evaluation process provides a means for determining reasonableness of capital expenditures requests that involve specific capabilities related to DER support that are an outcome of the DRP process. A second new process is required for determining whether utility requests for distribution system capital project spending in their GRCs adequately consider DER.
Decision 3	December 2017	1. Should the Commission approve funding required for Demonstration C, D and E implementation? 2. Should the Commission approve updated ICA and LNBA methodologies, along with online presentation of results? 3. Should the Commission establish recurring filing or update of DRPs?

3. DRP Overview

The Assigned Commissioner's Ruling (ACR) on Guidance for Public Utilities Code Section 769 – Distribution Resource Planning (Guidance Ruling or Guidance) sets out the specific requirements for the DRPs. On July 1, 2015, filings were received from all six California Investor-Owned Utilities (IOUs). Only the three major IOUs (PG&E, SCE and SDG&E) responded to the detailed guidance in the ACR that was issued on February 6, 2015.

The three smaller IOUs minimally addressed the requirements in the statute (PU Code Section 769), as they were requested to do in the Guidance Ruling. The applications filed by IOUs were consolidated with the rulemaking and preliminarily re-classified as quasi-legislative.

The utility filings use a common format comprised of nine major sections, as required by the Guidance Ruling. These sections address:

a. **Integration Capacity (ICA) and Locational Net Benefit Analysis (LNBA) and Distributed Energy Resource (DER) Growth Scenarios.** These studies and analysis identify "optimal locations" for DER, the avoided costs of DER deployment, as well as the projected growth of DER throughout the IOU service territories. The IOUs have made the ICA results available on public online maps (*e.g.*, http://on.sce.com/derim.)

b. **Demonstration and Deployment Projects.** These projects demonstrate the use of analytic methodologies and data, described in the previous section, to site, deploy and operate portfolios of DER, including utility, third party and customer-owned resources.

c. **Data Access.** The statistical and operational data required to be shared by the utilities to enable third parties to develop optimal portfolios of DER is described here. Data that might be required of developers or customers in order to safely operate the distribution system is also described.

d. **Tariffs and Contracts.** Existing tariffs applied to DER are described here, as well as recommendations for new tariffs or incentives for DER. Approaches for integrating locational values into existing tariffs and incentive programs are described.

e. **Safety Considerations**. Includes descriptions of how DER can improve safety and reliability in the distribution system. Engagement with local permitting officials to ensure best practices for DER is also described.

f. **Barriers to deployment**. Barriers to higher penetration of DER are identified with recommendations for overcoming them.

g. **Coordination with General Rate Case (GRC).** This section shows how investments related to the DRP will be coordinated with the GRC.

h. **Coordination** with California Energy Commission (CEC) load forecasting, Long Term Procurement Plan (LRPP) and California Independent System Operator (CAISO) Transmission Planning Process (TPP). Describes how DRP results are coordinated with the CEC Integrated Energy Policy Report (IEPR), CPUC LTPP and CAISO TPP.

i. **Phasing** of next steps. Comments on long term implications of DRP and succeeding phases.

4. Key Objectives

Staff recommends the following high-priority, no regrets activities that could be addressed early in the DRP proceeding:

a. Establishing and approving methodologies and frameworks, such as the Integration Capacity Analysis (ICA) and the Locational Net Benefit Analysis (LNBA);

b. Determination of other "no regrets" actions that should be evaluated and approved by the Commission in order to initiate early action such as demonstration projects;

c. Coordination of DRP activities, demonstration projects and other results with the IDER proceeding and properly scoping each proceeding;

d. Coordination with other individual resource proceedings (such as demand response, energy efficiency, storage, electric vehicles, and distributed generation) and related policy proceedings (such as Rule 21 interconnection, net energy metering, etc.);

e. Evaluating barriers enumerated in the DRP applications and determining whether potential solutions can inform other proceedings or activities undertaken jointly with other proceedings;

f. Coordination with GRC proceedings to ensure that DRP findings and results are included in consideration of distribution system capital project requests.

These potential early actions can set the stage for action on some of the more complex issues envisioned in PU Code Section 769 and the Guidance Ruling. These actions might include:

a. Key recommendations for provision of grid services by DER and the associated monetary value;

b. Potential development of an approach to grid planning that utilizes DER to improve the safety and reliability of the grid, rather than simply mitigating its effects ;

c. Potential establishment of processes that utilize optimal location information provided by the LNBA and ICA to specify or define portfolios of DER that are optimized for specific locations;

d. Method for assessing, updating and making public locational avoided cost information that can be used to optimize DER portfolio design and operation;

e. Potential full integration of DER planning across multiple agencies on statewide and regional planning activities such as Long Term Planning and Procurement (LTPP), Renewable Portfolio Standard (RPS), Resource Adequacy (RA), Integrated Energy Resources Plan (IEPR) demand forecast and Transmission Planning Process (TPP);

f. Tee up procedural vehicles to more broadly support grid modernization.

Deliberate collaboration in the execution of this roadmap through this and the IDER proceeding, as well as interagency coordination with CEC and CAISO on related stakeholder initiatives, will advance distributed energy resource technology and planning methods to better enable a more efficient, reliable and greener grid.

5. Advancing Distributed Energy Resources – The Relationship Between Distribution Resources Plans (DRP) and Integrated Distributed Energy Resources (IDER)

The DRP proceeding is primarily concerned with distribution grid planning and identifying enhancements required for optimal placement and operation of distributed energy resources (DER). IDER is focused on DER sourcing, *i.e.*, guiding optimal sets of resources to the appropriate locations on the grid. Both proceedings are directly concerned with meeting the policy objectives expressed in PU Code Section 769 and should be coordinated accordingly.

Section 769 directs the IOUs to submit for Commission DRPs to identify optimal locations for the deployment of DER. The IOUs' Integration Capacity Analysis (ICA) will specify how much DER hosting capacity is available at each node within the distribution network. The Locational Net Benefit Analysis (LNBA) will quantify the net benefits that DER can provide at a given location. Based on this analysis, the IOUs will modify their distribution planning process to implement necessary distribution grid infrastructure upgrades that incorporate DER as a cost-effective alternative to traditional investments. Further, the utilities will identify distribution grid enhancements and tools required to accommodate DER at a lower cost. These enhancements should also enable customer equipment to provide distribution system benefits and be appropriately compensated. As part of the required demonstration and deployment projects the IOUs will recommend modified tariffs to support the optimal deployment of DER.

The IDER rulemaking will determine how the resources needed to fill the required characteristics and deliver locational net benefits determined in the DRP proceeding will be sourced. Decision D.15-09-022 adopted the following goal for the integration of distributed energy resources in the IDER proceeding:

> *To deploy distributed energy resources that provides optimal customer and grid benefits, while enabling California to reach its climate objectives.*[1]

Specifically, the IDER proceeding will focus on implementing two portions of PU Code Section 769:

a. The identification of tariffs, contracts, or other mechanisms for the deployment of cost-effective distributed resources. [Section 769(b)(2)]; and

b. Cost-effective methods of effectively coordinating existing commission-approved programs, incentives, and tariffs to maximize the locational benefits and minimize the incremental costs of distributed resources. [Section 769(b)(3)].

IDER will consider the tariffs, contracts or other mechanisms proposed in DRP, but will also be concerned with implementing Section 769(b)(2) and Section 769(b)(3) as part of "an end-to-end framework from the customer side to the utility side of the system" developed jointly in the DRP and IDER proceedings.[2] IDER may also potentially consider the issue of location-specific or service-specific pricing and how the LNBA and

[1] D.15-09-022, OP4.
[2] D.15-09-022, p. 8.

ICA results or other methods may be used in determining such pricing, as suggested by a number of parties.[3]

The DRP Straw Proposal Roadmap includes activities that require close coordination between DRP and IDER. The DRP Roadmap is not intended to be a roadmap for the entire IDER proceeding, but it does cover the areas of scope where the two proceedings should closely coordinate.

[3] *Ibid. e.g.*, at 22

6. DRP Process Timeline

Table 2. 2015-2016 Gantt Chart

Key															
W- workshop															
R - ruling															
JW - Joint Workshop															
D - decision															
	2015														
	Q4														
DRP	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
ICA		W1		R1	Execute approved ICA update(All IOU)										
LNBA				JW2	R2	Execute LNBA									
demo A		W1		R1		Conduct Dem A									
demo B				JW2	R2	Conduct Dem B									
demo C															
demo D						W5 W6	R3								
Demo E															
Growth Scenarios					W3	R4									
Process Alignment					W4										
Use of DRP in GRC											W7				
Data Access				W2											
Overall DRP		JW1	Scoping Memo								W8	Comment Period	PD	Comment Period	D1
IDER			Scoping Memo?			Decision?	JW3				JW4			JW5	
C-E Ph 1		Improve existing cost-effectiveness framework													
C-E Ph 2		Coordinate with DRP (e.g., incorporate LNBA into cost-effectiveness framework)													
C-E Ph 3			Improved C-E models and methods to more accurately reflect CA policies and goals												
C-E Ph 4				All Source "valuation" framework (akin to supply-side)											
Evaluate All Sourcing Options			Evaluate								Develop New				
SIWG												JW6	JW8		
Interconnection												JW7			
Storage														JW10	
ZNE														JW11	
EV													JW9		

- Conduct Demo A and B
- Use ICA, LNBA and learnings from Demo A and B to conduct design activities for Demo C, D and E
- Workshops to discuss IOU design process (WDEMO)

Table 3. 2017 Gantt Chart

Key
W- workshop
R - ruling
JW - Joint Workshop
D - decision

	2017											
	Q1			Q2			Q3			Q4		
DRP	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
ICA	W9	R5										
LNBA												
demo A												
demo B												
demo C	Demo Project C,D E Design Phase Status report webinars											
demo D												
Demo E												
Growth Scenarios												
Process Alignment												
Use of DRP in GRC												
Data Access	Development of online tools – pilots											
Overall DRP	W10	Comment Period	PD	Comment Period	D2			W11	Comment Period	PD	Comment Period	D3
IDER		Decision ?										

6.1 Process Timeline Monthly Descriptions

For the following descriptions, please refer to the Table 2 Gantt chart above. The proposed DRP process timeline described below covers the period from November 2015 through December 2018. Alpha-numeric identifiers (parenthetically noted in the text below) correspond to specific milestones in the Gantt.

November 2015

This DRP Roadmap will be evaluated in a joint IDER/DRP workshop (JW1).

Staff recommends that a stakeholder process includes a workshop (W1) and a workshop report with stakeholder comment that will provide input for consideration of the ICA methodology and the Demonstration A Project (Demo A). The proposed ICA methodology as described in the DRP Application will be further improved and tested in the Demo A project.[4] Methods for the online presentation of the data will also be considered and improved.

Event (November 2015)	**Purpose**
DRP Roadmap Joint Workshop (JW1)	Joint DRP-IDER workshop to evaluate the proposed DRP roadmap in order to provide input for the Scoping Memo.
ICA Workshop (W1)	ICA result and methodology review, direction, gaps, application in Demo A.

December 2015

Staff recommends a December 2015 target release of the scoping memo, based on the DRP roadmap workshop, public comment in the workshop and all prior record of the proceeding.

Event (December 2015)	**Purpose**
R. 14-08-013 Scoping Memo	Defines scope of the proceeding, sets schedule, and defines the process.

January 2016

A ruling (R1) may be issued in January 2016 that would provisionally approve the ICA methodology (modified, as needed) for the IOUs to use in Demo A. The ruling could also approve (modified, as needed) the Demo A to be conducted by the IOUs, assuming no additional cost recovery authorization is needed to complete Demo A (*i.e.*, IOUs have sufficient funds previously authorized in other proceedings). This ruling would be based on the record created by the workshop report and stakeholder comment.

Staff recommends further improvement, approval and testing of the LNBA and Demonstration Project B (Demo B) proposed by the IOUs be considered in a joint workshop (JW1). This workshop could also result in a workshop report upon which stakeholder comment could be invited. The workshop could additionally cover the creation of integrated map displays of the LNBA results and the ICA results as described above.

[4] For descriptions of the Demonstration Project requirements, see Guidance Ruling Attachment at 6.

Staff recommends that this workshop could be jointly held with the IDER proceeding and activities underway there to "unify cost-effectiveness methods" across DERs. The workshop would discuss what **non-location specific** valuation methods to defer to the IDER proceeding for further review in staff's proposed "phase 1" cost-effectiveness work.[5] The work would also ensure that **location-specific methods** being developed in the DRP proceeding receive input from IDER stakeholders, from the perspective of how these enhanced locational net benefits methods will ultimately feed back into the unified cost-effectiveness framework established in the IDER proceeding (*i.e.*, staff's proposed "phase 2" cost-effectiveness work).[6] This workshop may also refine the phasing concepts put forward by staff in the IDER proceeding, leading to potential refinements in the scopes of each phase.

A workshop (W2) can potentially be held to evaluate, for example, a staff straw proposal or other proposal on data access needs and online tools such as the map displays and other tools needed for DER development. Staff recommends that this workshop discuss potential enhancement of online tools for data presentation and other functions to support the Demonstration Project Design Working Group design activities that begin in May 2016. Potential pilots may also be discussed that may be used to support the C, D and E demo project design process.

Workshop can also cover possible data access issues concerning privacy and system security. This workshop could lead to a workshop report with stakeholder comments.

Event (January 2016)	**Purpose/Outcome**
LNBA Workshop (JW2)	Review of LNBA methodology, alternatives, potential modification, and application in Demo B. Produce workshop report.
Data Access Workshop (W2)	Evaluate staff straw proposal for data access procedures and types. Evaluate online tool needs. Produce workshop report.
Ruling (R1)	1. Potentially direct IOUs to apply ICA methodology as modified per workshop 1 report; 2. May authorize Demo A as modified per workshop report; 3. Potentially direct IOUs to execute Data Access plan per straw proposal and modified per workshop report.

[5] See October 9, 2015 ALJ ruling in IDER Proceeding [R.14-10-003] establishing a working group to develop a proposal to implement staff's proposed "phase 1" cost-effectiveness framework. This ruling follows a July 30, 2015 workshop in which staff presented the results of its cost-effectiveness "mapping project" and proposed a four-phase approach to updating the Commission's cost-effectiveness framework. Phase 1 would "improve the existing cost-effectiveness framework. Staff's IDER cost-effectiveness proposal is available at www.cpuc.ca.gov/PUC/energy/IDSM/workshop.htm.

[6] Per the IDER staff proposal, "phase 2" is to coordinate with the DRP proceeding to improve the relationship between cost-effectiveness and actual system conditions.

February 2016

IOUs will potentially begin to implement the modified ICA, if directed by Ruling R1, with a focus on the Demo A area.

Recommended target is for a ruling (R2) to be issued in February that would provisionally approve the LBNA methodology (modified, as needed, to reflect bifurcated IDER-DRP review) for the IOUs to use in Demo B. The ruling could also approve the proposed Demo B, potentially as modified (again, assuming no additional cost recovery authorization is needed).

A workshop (W3) could evaluate the Growth Scenarios proposed by the IOUs, including the methodology and applicability to other forecasts such as the CEC IEPR demand forecast used in the CPUC LTPP and CAISO TPP. The DER growth scenario methodology and results can be considered and can result in a workshop report on improvements to the growth scenarios proposed by the IOUs. The Growth Scenarios that result from this process should potentially be approved for use in the IEPR and TPP processes. The details of the use of the Growth Scenarios can be considered in the next workshop on process alignment, described below.

The first in a possible series of workshops (W4) can be held to consider process alignment issues among the LTPP, TPP and IEPR, and to identify potential work products needed to support these processes. The IOUs may be asked to review their demand forecasting tools and methods used in distribution planning studies. The workshop could review whether and how to (a) bring transparency to these forecasting methods and processes, (b) provide opportunity for stakeholder comment (if appropriate and feasible), and (c) identify an efficient pathway for regulatory approval. In addition, the workshop should review SCE's request to fund/acquire new demand forecasting tools and processes to improve the geospatial granularity and better interface with the CEC's system-level demand forecast.

Event (February 2016)	**Potential Purpose/Outcome**
Ruling (R2)	1. Potentially direct IOUs to apply modified LNBA methodology as informed by consensus established in workshops; 2. May authorize Demo B, modified (if necessary) based on input from workshop report; 3. Potentially direct IOUs to execute Data Access plan for LNBA/ICA per straw proposal and modified per workshop report.
Growth Scenario Workshop (W3)	Review of Growth Scenarios, receive stakeholder input on needs and potential modifications.
Process Alignment Workshop (W4)	Definition of input and output data required for LTPP, TPP and IEPR from DRP. Identify coordination venue and frequency of meetings.

March 2016

Two workshops (W5-W6) can be held to consider issues related to the proposed C, D and E demonstration projects. Workshop reports may be prepared and submitted for public comment. The C, D and E demonstration projects were required by the Guidance and were defined as:

a. Project C: Demonstrate DER Locational Benefits. This project will "validate the ability of DER to achieve net benefits consistent with the Optimal Location Benefit Analysis." (aka, LNBA)

b. Project D: Demonstrate Distribution Operations at High Penetrations of DERs. This project calls for the utilities to integrate high penetrations of DER into their distribution planning operations. The utilities must: a) assess locational benefits and values of DER at the substation level using ICA and LNBA across multiple circuits; b) demonstrate the operations of multiple DER in concert; c) operational coordination with third parties and customers; d) develop and explain methodology for selection of DER types used in project; e) utilize both third-party owned and utility-owned resources.

c. Project E: Demonstrate a microgrid where DERs (both customer-owned and utility-owned) serve a significant portion of customer load and reliability services. This project will demonstrate the use of a DER management system for controlling the resources. The project will develop, document and implement a methodology for construction and operation/dispatch of the DER portfolio. The project shall include both third-party and utility owned resources.

The workshops can evaluate the utility proposals for these projects and consider project modifications and any necessary enhancements.

The IOUs may begin conducting Demo A and B projects, potentially as modified as directed in Ruling R2. As tools and techniques are developed to apply the full analysis as specified in the Guidance, the results can be applied system-wide. [7]

Event (March 2016)	**Potential Purpose/Outcome**
Demonstration Project C, D and E evaluation workshops (W5-W6)	Discussion and evaluation of C, D and E proposals. Vetting of proposals and alternatives.
Ruling (R4)	Approval of Growth Scenario methodologies and need and frequency of updates. Guidance on how Growth Scenarios are applied to other proceedings

[7] The IOUs were given a stretch goal in the methodology of the ICA and LNBA, *i.e.*, fully dynamic analysis, down to node level, in both the "no reverse power flows across the substation" condition and "with reverse power flow" condition. This is the methodology that can potentially be approved for the Demos A and B. As those projects develop the learning and expertise for applying tools and techniques, there should be no further need for authorization unless it is determined that Commission approval is required.

April 2016

There may be the first of a series of Joint Workshops (JW3-JW5) with the IDER proceeding to examine the approach to sourcing for the C, D and E demonstration projects. The sourcing element of these projects potentially will be included in the activities of the Demonstration Project Design Working Group.

A ruling (R3) can potentially be issued that could use the record developed in the Demonstration Project C, D and E workshop reports and comments that could authorize the IOUs to begin initial design activities for the demonstration projects in a stakeholder working group.

Event (April 2016)	**Potential Purpose/Outcome**
Demonstration Project Sourcing Activities Workshop (JW3)	Consideration of the development and sourcing of optimal portfolios. Discussion of the use of LNBA and ICA results to develop locationally specific resource portfolios and implications for sourcing mechanisms. Discussion of potential sourcing pilot definition to be conducted in conjunction with demonstration projects.
Ruling (R3)	Potentially direct IOUs to begin design activities for Demo Projects C, D and E. Establish a working group process for collaborative initial design and specification of approved Demonstration Projects. Direct working group to base Demo Project on findings from ICA and LNBA.

May- December 2016

Staff recommends that a "Demonstration Project Design Working Group" potentially be established with stakeholders and the IOUs to use the data and learning from the Demo A and B projects to establish a design and sourcing framework for the Demo C, D and E projects. This joint DRP-IDER working group may meet through the end of the year and can be tied with a series of workshops (WDEMO) to discuss the design process for the Demo C, D and E projects. This working group may deal with (but not be limited to) the following topics:

1. Determination of necessary rules and procedures for sharing detailed distribution system data such as powerflow models and distribution system operational parameters to a level that can support third party participation in determination of optimal locations for DER. The Commission should determine the necessary policy support for third party access to utility data sets, as well as access by utilities to third party data. Third party data access rules, already established via the Smart Grid proceeding, would apply.[8] These rules could be reviewed as a starting point.
2. Determination of data communications and other distribution automation infrastructure requirements for support of interconnection of DER. DER support for monitoring and control should include smart inverter standards as well as additional functions as necessary.

A workshop (W7) to consider the use of the DRP for evaluating distribution system capital project requests for their application of "non-wires" DER solutions can be held. This workshop can develop a definition for

[8] R.08-12-009

procedures that may enable distribution system funding requests to be evaluated for their support for and utilization of DER to defer traditional upgrades and realize ratepayer benefits.

At approximately mid-year, a workshop (W8) may be held to discuss cost requirements and targets for the Demonstration C, D and E projects. This workshop, along with the working group report, could inform a potential Decision (D1) to set spending caps and authorize spending. This Decision would probably occur by the end of the year. This Decision may also specify the reporting format for status reporting on the Demo C, D and E projects and will order the reporting schedule. Finally, this Decision can determine the method and frequency for updating the DRPs.

There are three Joint Workshops (JW3-JW5) that may be planned for coordination with the IDER Cost-Effectiveness/Valuation activities. These workshops can coincide with Demo Project Design Working Group activities that involve use of the Locational Net Benefit Analysis to determine DER benefits and services. These activities may inform the design and sourcing activities being developed in the Working Group.

Staff recommends that multiple Joint Workshops (JW6-JW11) be conducted with Interconnection/Smart Inverter Working Group, Storage and Electric Vehicles and the ZNE activities are proposed to clarify how the ICA and LNBA results can best be leveraged in these proceedings.[9]

Event (May-December 2016)	**Potential Purpose/Outcome**
Demonstration Project Sourcing activities workshop (JW3)	Evaluations of methodologies for development and sourcing of optimal portfolios. Use of LNBA and ICA results to develop locationally specific resource portfolios and implications for sourcing mechanisms. Potential sourcing pilot definition to be conducted in conjunction with demonstration projects.
IDER/DRP joint workshops (JW4, JW5)	TBD based on IDER status and needs.
Ruling (R3)	Potentially direct IOUs to begin design activities for Demo Projects C, D and E. Establish a working group process for collaborative initial design and specification of approved Demonstration Projects. May direct working group to base Demo Project on findings from ICA and LNBA.
Demonstration Project Working Group joint workshops (WDEMO)	Presentations from IOUs on learnings from Demo A and Demo B Status reports from IOUs on Demo Project Design Activities Provide information to IDER on learnings related to portfolio development. Provide record on initial expenditures for Demo C, D and E design activities.

[9] Zero Net Energy (ZNE)-related stakeholder initiatives potentially relevant to the DRPs include: (a) the June 2015 New Residential ZNE Action Plan (available at: www.californiaznehomes.com); and (b) the ZNE Project Coordination Group (PCG), a joint ED-IOU technical working group devoted to planning and reviewing ratepayer-funded research studies on topics related to ZNE; brief summary of past, present, and future research can be found in the ZNE chapter of the Commission's Energy Efficiency Evaluation, Measurement, and Verification Plan, Version 5 (available at: www.cpuc.ca.gov/NR/rdonlyres/2B9A7A84-E787-4023-89C3-F376B0CF018B/0/EMVEvaluationPlan20132015.pdf)

Joint Workshops (JW6-JW11) – Rule 21/Interconnection, Smart Inverter working group, Electric Vehicle proceeding, Storage proceeding and Zero Net Energy PCG.	Inform potential recommendations for using ICA, LBNA and Demonstration Project results to streamline interconnection, use smart inverter capabilities to provide grid benefits, fully integrating storage, EVs and ZNE buildings into distribution grid planning and optimization
Workshop (W7) – Distribution Planning Process and Capital Project definition review with definition of use of DRP results and methods in the GRC process	Review of Distribution Planning Process, DRP proposals for incorporating DER into GRC Phase 1. Workshop report.
Workshop (W8) to evaluate total cost and cost recovery for C, E and E projects	Evaluation of costs to implement C, D and E demonstration projects. Workshop report
Decision (D1)	1. Should the Commission authorize IOUs to execute demonstration and deployment project design phase C, D and E as modified by workshop reports 3, 4 and for demo project design workshops? 2. Should the Commission authorize funding for design phase activities? 3. Should the Commission order IOUs to formally characterize portfolio optimization techniques such that they can be used in IDER proceeding? 4. Should the Commission order IOUs to file 2016-17 DRPs based on modifications to date? 5. Should the Commission set policy direction/ recommendations for using DRP results in interconnection streamlining and smart inverter working group?

2017

The DRP filing was not intended to be a "one and done" exercise and most parties have expressed the notion that the DRP or a successor document would become a regular filing. On the other hand, it is an open question as to whether the Commission would require a regularly recurring DRP filing. Therefore, the presumed activities in 2017 and 2018 as shown below do not make any assumption that there would be a new or updated filing. Staff proposes activities that could occur to further develop the DRPs, but stops short of proposing activities associated with a new recurring DRP filing.

The primary focus (absent another DRP filing) in 2017 will be a) the detailed design and specification of the Demonstration C, D and E projects, as well as other activities such as site acquisition, preparation and

permitting; b). The focus during this time will be on determining how to source the various DER, how to engage customers and developing working relationships with third parties and vendors. There are two major Decisions (D2 and D3) that can potentially occur during 2017. Both are preceded by workshops and workshop reports.

The first workshop will evaluate the outcome of the DPDWG and will give parties a final opportunity to weigh in on the Demo C, D and E configurations. Staff recommends Decision (D2) resolve the following questions:

a. Should the Commission approve Final configurations of C, D and E demonstration projects?

b. Should the Commission require regular public status reports on Demonstration Project activities?

c. Should the Commission authorize funding for procurement of utility assets including online tool development for DER support?

d. Should the Commission make a determination of "other DRP infrastructure spending request" evaluations? One type of evaluation process could provide a means for determining reasonableness of capital expenditure requests that involve specific capabilities related to DER support that are an outcome of the DRP process. Another new process may be required for determining whether utility requests for distribution system capital project spending in their GRCs adequately consider DER.

Direct review of SDG&E GRC distribution investments will potentially occur using the criteria outlined in the Decision for evaluation of DRP investment criteria in the SDG&E filing for the 2019 GRC that will occur in September 2017.

The third Decision (D3) is proposed for at or near the end of 2017. This Decision will potentially close the first phase of the rulemaking, and transition to Phase 2. Staff proposes that this Decision be preceded by a workshop that will consider: a) any mid-course corrections to ICA or LNBA methodologies; b) any necessary funding changes for the Demonstration Project implementation; c) general communications and distribution automation infrastructure requirements for DER support; d) online tool support for DER design activities; e) whether and how there should be an update or "refresh" of the DRPs.

Phase 2 – Beginning 2018

During this phase, the ICA and LNBA methodologies defined in Phase 1 will be fully executed. The results will be regularly updated through online tools. The data will be available to support third party and utility deployment of portfolios of distributed resources that provide grid services for the utilities as well as other services for customers.

The Demonstration Projects C, D and E will be rolled out and become operational in 2018-2019 timeframe. Learnings from these projects will be used to further enhance continued development of DER both on the utility side and on the customer side of the meter.

This phase may have the following primary activities:

a. Consider lessons learned in continued development of Demonstration C, D and E. This will move the IOUs and vendors toward developing the capability for simulation of portfolios of DER in optimal locations using data obtained from ICA and LNBA methodologies perfected in Phase 1.

b. Determine requirements for monitoring and control systems using data acquired in Demo C, D and E. This should also include the requirements for communications systems necessary to optimize DER effects on distribution systems.

c. Generate and produce data in online displays that can be used to identify both optimal locations in the IOU systems and combinations of DER that can provide services in those locations throughout the IOU systems.

d. Determine requirements for deployment of distribution system infrastructure needed for DER monitoring and operation, including sensors and communications infrastructure for optimal locations throughout all three IOU systems.

e. Specify tools and process to compare DER as an alternative provider of distribution reliability functions, including voltage regulation (etc.).

This phase can potentially move toward defining "Distributed Energy Resource Development Zones" (could be Distribution Planning Areas) that can be associated with locational values. Per the Guidance Ruling, "In these zones, additional DER portfolios would be defined using the process of value optimization. The value optimization methodology will specify tools and processes to compare DER as an alternative to traditional Distribution infrastructure investments, including both operations and economic factors."[10]

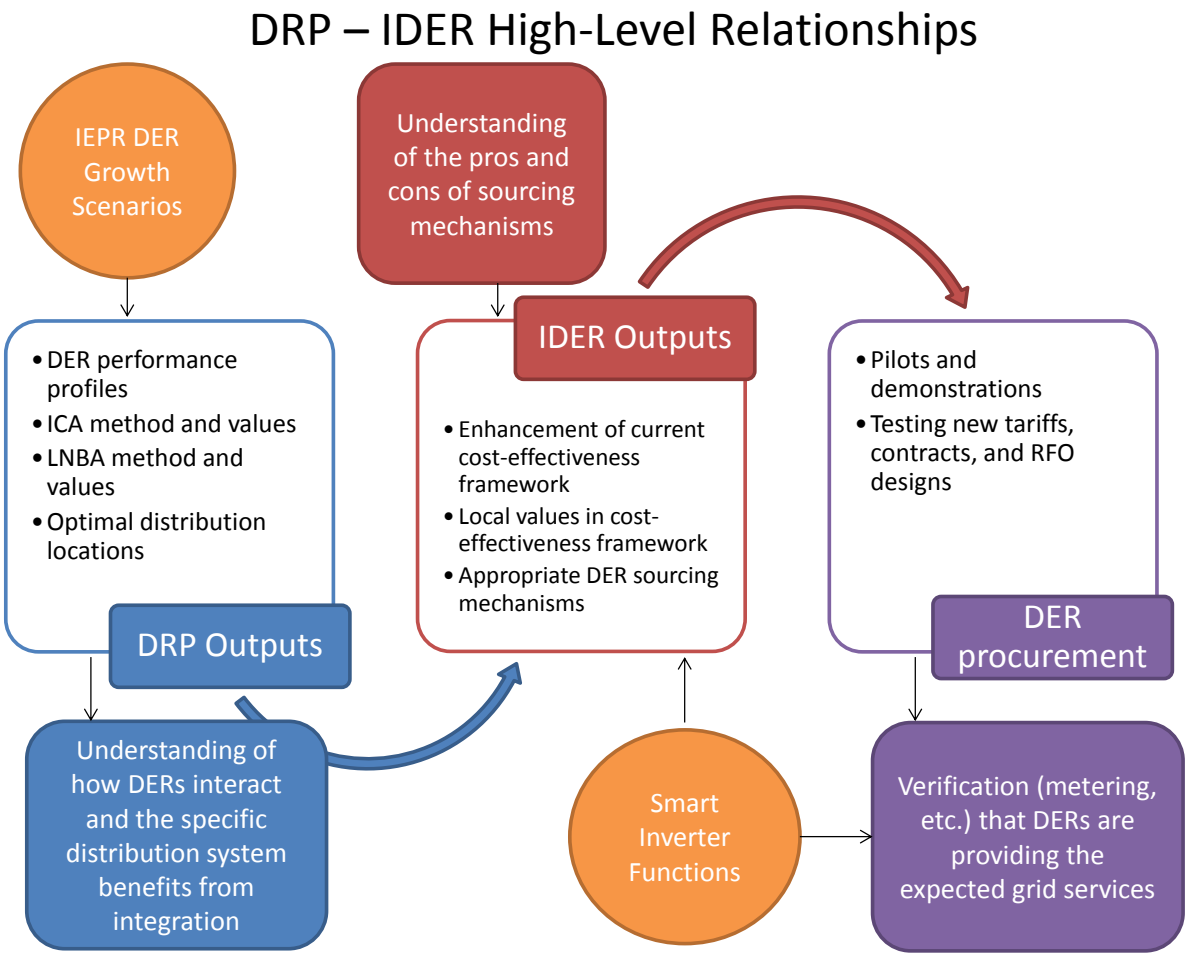
This phase may also consider, in conjunction with the IDER and other proceedings, issues related to "the utility of the future" from the perspective of defining a "grid end state" and the regulatory and economic structures that would support this.

7. Coordination with IDER

The figure shown below illustrates Staff's current conception of the relationship in activities and scope between the IDER proceeding and the DRP proceeding, as well as other activities conducted by the Commission, and other agencies. Inputs to the DRP potentially include the DER growth scenarios in the CEC Integrated Energy Policy Report. Potential outputs from the DRP are shown in the blue box to the left. The inputs to and outputs from the IDER proceeding are shown in the box in the center of the figure. IDER may consider grid services provided by smart inverters. Finally the outcomes of the IDER and DRP activities are shown in the purple box on the right as "DER Procurement."

[10] Assigned Commissioner Guidance Ruling, February 6, 2015, p. 12

This figure is meant to be illustrative of staff proposed scope and activities, and not reflective of any definite procedural or policy direction. The figure is intended to bring focus to the issues involved in properly scoping the IDER and the DRP proceedings, so that they are complementary.



Staff envisions that certain outputs from the DRP proceeding will serve as inputs to the IDER proceeding and vice versa. Outputs from both proceedings would inform DER procurement in either the IDER or the resource-specific proceedings.

Additionally, staff proposes to:

a. Categorizethe LNBA components as either "non-location specific" (*e.g.*, ancillary services, avoided GHG adder, avoided RPS purchases, renewables integration adder, and potentially other bulk power system attributes) or "location-specific" (*e.g.*, line loss factor, avoided transmission, and avoided distribution, voltage support, and power quality) and defer any modifications to non-location-specific components to the IDER proceeding. The DRP proceeding would use the existing methods for non-location-specific components until directed otherwise.

b. Consider how to incorporate any methods to calculate location-specific, distribution level avoided costs (developed in the DRP proceeding) into the CPUC's cost-effectiveness framework in the IDER proceeding. The IDER proceeding would not re-litigate the methods for location-specific avoided costs (or valuation) components adopted in the DRP proceeding.

c. Review existing DER sourcing mechanisms and consider any new sourcing mechanisms needed to effectively achieve the "end-to-end framework" vision set forth in the IDER proceeding. Engage market actors (technology vendors and aggregators, etc.) in a structured dialogue about how best to source DERs in DRP-defined locations.

d. Test new or modified sourcing mechanisms identified in the IDER proceeding in DRP Demonstration Projects C, D and E.

e. Selectively review barriers to DER deployment identified in the IOUs DRPs appropriately addressed in the IDER proceeding, given the link to DER sourcing mechanisms. Safety and operational reliability-related barriers [pursuant to Sec 769(b)(5)] and other technical issues best handled in the DRP proceeding should be addressed there. Staff should conduct a review of remaining DER barriers identified in the IOUs DR, determine whether they are already being addressed in an active proceeding or initiative (*e.g.*, the DR or storage proceeding; or ISO ESDER initiative), and if not, recommend whether to address in the IDER proceeding.

The matrix provided below shows the staff-proposed delineation between the DRP and IDER proceeding scopes in greater detail.

Table 4. Potential DRP and IDER Scope Matrix

Scope Item	DRP		IDER
ICA	IOUs proposals:		1. Whether to direct DER "sourcing" to "no regrets" locations (as determined by ICA), and how to define "no regrets."
	1. ICA method	Complete ICA for all circuits	
	2. ICA pilot (Demo A)	Run ICA pilot	
	Proposed DRP scope: ICA method + ICA pilot		
LNBA	IOUs proposals:		
	3. LNBA method a. *Non*-location specific value components	Defer to IDER Use *existing* methods in LNBA pilot unless / until IDER changes it	2(a). Consider any changes to non-location specific methods (Phase 1 C-E track);
	b. *Location*-specific value components	Test *new* methods in LNBA pilot	2(b). Determine how to incorporate any approved location-specific LNBA methods (Phase 2 C-E track).
	4. LNBA pilot (Demo B)	Run LNBA pilot (modified, as needed)	
	Proposed DRP scope: Location-specific LNBA method + LNBA pilot in scope; **defer to IDER for non-location specific**		
Other Pilots	IOUs proposals:		3. Consider piloting any new sourcing mechanisms, as appropriate, in concert with DRP Demos (rather than waiting until they are complete). This may require modification of the OIR's scoping, which deferred any pilots to "Phase 2" of the OIR.
	5. Demo C 6. Demo D 7. Demo E 8. Demo F (SDG&E)	Defer to IDER	
	Proposed DRP scope: Pilot Demos C, D, E in scope; SDG&E optional pilot **Demo F deferred to IDER**.		
Sourcing mechanisms	IOU proposals / submittals:		4(a). Best sourcing approach (broadly);
	10. "Tariffs + Contracts" (per Sec 769(b)(2)		4(b). Review *existing* methods.

	11. "Cost-effective methods of coordinating existing programs [and deploying DER]" [per Sec 769(b)(3)] Party proposals: *e.g.* DER "loading order," etc.[15] **Proposed DRP scope:** out of scope (per D.15-09-022); **defer to IDER**	4(c). Consider *new* methods, *e.g.*: (i) All-source procurement (lessons learned from SCE LCR RFO + Sec 353.5 RFOs); (ii) DER "loading order";*[11, 12] (iii) TURN's MEETS proposal;*[13] (iv) SDG&E Demo F; (v) Dispatchable grid services compensation ;*[14] (v) Other.
DER barriers	IOU submittal: 12. "Barriers to DER deployment" [per Sec 769(b)(5)] a. Safety or operational reliability-related; b. Other. **Proposed DRP scope:** Code section compliance review (Y/N); address any safety or reliability-related barriers; **defer to IDER for other barriers**	5. Review DER barriers in light of sourcing mechanisms, and address any barriers not already addressed in other proceedings (*e.g.*, DR, Storage, Rule 21, etc.) ☐ Staff product – Review DRP-filed barriers; ID which proceeding is addressing each barrier + any w/o a "home"
DER growth scenarios	IOU proposals: 13(a) Trajectory — Approve (as modified consistent with IEPR?) 13(b) High — Approve as-is? 13(c) Very High — Approve as-is? **Proposed DRP scope:**	Out of scope

[11] Response of EDF to Utilities' Applications for Approval of DRPs, dated August 31, 2015, p. 6.

[12] Joint Protest of Comverge, Inc., CPower, EnergyHub, EnerNoc, Inc., and Johnson Controls, Inc. ("Joint DR Parties") to Consolidated DRP Applications, dated August 31, 2015.

[13] Opening Response of TURN to the April 15, 2015, Joint Assigned Commissioner and Administrative Law Judge's Ruling Requesting Responses to Questions, dated May 15, 2015, pp. 9-11.

[14] Numerous parties, in Comments and Protests on the DRP filings pointed out the need for compensation for grid services: *e.g.*, CESA said, "The DRPs also lack new tariffs designed to leverage and compensate DERs for distribution system functions *(e.g.*, voltage support)" (at p. 3); NRG said, "NRG anticipates that the Commission may eventually elect to compensate DER owners for such things as increased transfer capability, decreased loading, or other attributes that increase total hosting capacity or decrease the need for utility investments in the distribution grid." (p. 10)

[15] Response of SolarCity Corporation and CESA to Utilities' DRPs filed August 31, 2015.

	• Whether to adopt a baseline forecast for DPP, and if so, should that be the Trajectory case? • Whether Trajectory case may depart from IEPR "single forecast"; • How High + Very High case should be used in ICA and LNBA of DPP and/or DRP; • Consider SCE's proposed forecasting tools and funding request.	
Other customer-facing	Out-of-scope.	Other consumer-facing issues that may surface in the IDER that contributes to achieving the "end-to-end DER framework" vision.

8. Detailed 2015 and 2016 Workshop Descriptions

Table 5. DRP-Only Workshops

DRP Only Workshops			
Workshop Number	**Description**	**Outcome**	**Workshop Report?**
W1	ICA result and methodology review, direction, gaps, application in Demo A.	Consensus on ICA methodology and Demo A extent and focus.	Yes
W2	Data Access- Review of online maps, other tools.	Consensus on direction for online tools and maps.	
W3	Review of Growth Scenarios, receive stakeholder input on needs and potential modifications.	Receive stakeholder input on potential modifications to Growth Scenarios and methodologies.	
W4	Process alignment LTPP, TPP, IEPR, DRP, IDER.	Definition of input and output data required from other proceedings from DRP.	Yes
W5	Discussion and evaluation of Demo C, D and E proposals.	Vetting of Demo C, D and E proposals and alternatives	Yes
W6			
Workshop DEMO	Presentations from IOUs on learnings from Demos A and B. Status reports from IOUs on Demo Project Design Activities.	Provide information to IDER on learnings related to portfolio development. Provide record on initial expenditures for Demo C, D and E design activities.	
W7	Review of Distribution Planning Process, DRP proposals for incorporating DER into GRC Phase 1.		Yes
W8	Evaluate results of Demos A and B pilots and consider necessary modifications.	Obtain inputs on finalizing ICA and LNBA methodology and updates.	
W9	Consideration of the cost requirements for the Demo Project Design Phase including new tools and IT technologies.	Determine cost requirements for new tools.	Yes

W10-11	As necessary to build the record for DRP decisions related to pilot projects and father development of the DRP.		

Table 6. Joint Workshops

Workshop Number	Joint Proceedings	Description	Outcome
JW1	IDER	Workshop to evaluate the DRP roadmap to provide a record for the Scoping Memo. Consideration of memo account for demonstration projects.	Record appropriate and comprehensive enough to inform Scoping Memo. Basis for Decision on memo account.
JW2	IDER	Review of LNBA methodology, alternatives, potential modification, application in Demo B.	Consensus on LNBA methodology and Demo B extent and focus.
JW3	IDER	Portfolio Optimization - Use of LNBA and ICA results to develop locationally-specific resource portfolios.	Optimization methodology including valuation assessment for portfolios.
JW4	IDER	Use of LNBA results for development of use in sourcing mechanisms.	Framework for incorporation of locational avoided cost in sourcing mechanisms. Definition of grid service pricing mechanism.
JW5	IDER	Evaluation of proposed sourcing mechanisms and applicability to the C, D and E demonstration projects.	Pilot for sourcing of DER used in demo projects.

JW6 - JW7	Interconnection/SIWG	Use of smart inverter functions and LBNA to inform placement and use of smart inverters in the Demo C, D and E projects Use of ICA to provide interconnection streamlining	
JW8	SIWG	Development of dispatch mechanism for controlling services provided by smart inverters.	Adoption of protocol used for dispatching and controlling smart inverters.
JW9	EV	Integration of EV into optimal portfolio.	Methods for building a portfolio of DER that includes EVs.
JW10	Storage	Integration of storage into optimal portfolio.	Methods for building a DER portfolio that includes storage.
JW11	Zero Net Energy	Integration of ZNE buildings into optimal portfolio.	Methods for building an optimal portfolio with integrated ZNE.

9. Demonstration and Deployment Projects[16]

As the Utilities develop new analytics it is critical that they demonstrate the capabilities of DERs to meet grid planning and operational objectives described in the DRPs. With this in mind, the Utilities are directed to propose DER-focused demonstration and deployment projects. These projects are intended to demonstrate integration of locational benefits analysis into Utility distribution planning and operations. Where feasible, these demonstration projects should be coordinated with on-going efforts associated with each Utility's smart grid deployment plan and EPIC investment plan. The Utilities shall work closely with Load Serving Entities, third-party DER providers and DER technology vendors through the design of these demonstration projects. Through this collaboration, all stakeholders shall pay particular attention to issues related to data exchange. The Utilities shall include any expected cost recovery for these demonstration projects as part of their DRP Applications, including any specific proposals related to minimum cost thresholds requiring Commission approval. To implement this guidance, the Utilities shall include the following in their DRP filings:

a. Demonstrate Dynamic Integrated Capacity Analysis

Develop a specification for a demonstration project where the Utilities' Commission-approved Integration Capacity Analysis methodology is applied to all line sections or nodes within a Distribution Planning Area (DPA). The specification should include a detailed implementation schedule. This demonstration shall utilize fully dynamic modeling techniques for all line sections or nodes within the selected DPA. This demonstration shall consider two scenarios:

1. The DER capacity does not cause power to flow beyond the substation busbar.
2. The DERs technical maximum capacity is considered irrespective of power flow toward the transmission system.

This Demonstration project shall be scoped to commence no later than 6 months after Commission approval of the DRP.

b. Demonstrate the Optimal Location Benefit Analysis Methodology

Develop a specification for a demonstration project where the Utilities' Commission-approved Optimal Location Benefit Analysis methodology is performed for one DPA, including a detailed implementation schedule. In selecting which DPA to study, the Utilities shall, at minimum, evaluate one near term (0-3 year project lead time) and one longer term (3 or more year lead time) distribution infrastructure project for possible deferral. This Demonstration project shall be scoped to commence no later than one year after Commission approval of the DRP.

[16] Attachment, ACR on Guidance for PUC §769 – Distribution Resource Planning, pp. 5-7

c. Demonstrate DER Locational Benefits

Develop a specification for a demonstration project where at least three DER avoided cost categories or services for which only "normative value data" presently exist (*e.g.,* avoided resource adequacy capacity, distribution capacity deferral, voltage/reactive power management) can validate the ability of DER to achieve net benefits consistent with the Optimal Location Benefit Analysis. The specification should include a detailed implementation schedule. Such a DER demonstration project will either displace or operate in concert with existing infrastructure to provide the defined functions. This demonstration shall also explicitly seek to demonstrate the operations of multiple DER types in concert, and shall explain how minimum-cost DER portfolios were constructed using locational factors such as load characteristics, customer mix, building characteristics and the like. This demonstration project shall be scoped to commence no later than one year after Commission approval of the DRP. Use cases shall employ services obtained from customer and/or 3rd party DERs. Each Utility shall specify products and services employed to obtain the avoided costs or net benefits, and shall specify related transaction methods (*e.g.*, contract, tariff, marginal price) by which customer and/or 3rd party DERs will provide services under the demonstrations.

d. Demonstrate Distribution Operations at High Penetrations of DERs

Develop a specification for a demonstration of high DER penetrations that integrates the Utilities' distribution system operations, planning and investment for implementation. This analysis of potential benefits and locational values associated with high-DER penetration should be conducted at the Substation level and involve up to five circuits, and may serve as a prototype model that could be applied on a wider scale upon completion and refinement. This project shall also explicitly seek to demonstrate the operations of multiple DERs in concert, and operational coordination with third-party DER owners/ operators/aggregators and as part of this component of the project shall explain how DER portfolios were constructed. This demonstration shall employ some quantity of third party-owned and -operated DERs, and may include Utility-owned DERs. This demonstration project shall be scoped to commence no later than one year after Commission approval of the DRP.

e. Demonstrate DER Dispatch to Meet Reliability Needs

Develop a specification for a demonstration project where the Utility would serve as a distribution system operator of a microgrid where DERs (both third party- and Utility-owned) serve a significant portion of customer load and reliability services. This project shall also explicitly seek to demonstrate the operations of multiple DERs as managed by a dedicated control system and as part of this component of the project shall explain how DER portfolios were constructed, as well as how they are being dispatched or otherwise managed. This demonstration shall define necessary operational functionalities. This demonstration shall employ some quantity of third party DERs, and may include Utility-owned DERs. This demonstration project shall be scoped to commence no later than one year after Commission approval of the DRP.