BEFORE THE PUBLIC UTILITIES COMMISSION OF

THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
And Related Matters.	Application 15-07-002 Application 15-07-003 Application 15-07-006
(NOT CONSOLIDATED)	
In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015)
And Related Matters.	Application 15-07-007 Application 15-07-008

CLEAN COALITION COMMENTS ON ASSIGNED COMMISSIONER'S RULING REQUESTING ANSWERSC TO STAKEHOLDER QUESTIONS SET FORTH IN THE ENERGY DIVISION STAFF WHITE PAPER ON GRID MODERNIZATION

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I. INTRODUCTION

The Clean Coalition appreciates the opportunity to comment on this topic and the work done by the California Public Utilities Commission (Commission) staff on this topic to date. In summary, the Clean Coalition strongly encourages that the Commission's grid modernization efforts accelerate the deployment of distributed energy resources (DER) in order to maximize ratepayer benefits and to accelerate the development of the modern grid.

II. DESCRIPTION OF THE PARTY

The Clean Coalition is a nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise. The Clean Coalition drives policy innovation to remove barriers to procurement and interconnection of distributed energy resources (DER)—such as local renewables, advanced inverters, demand response, and energy storage—and we establish market mechanisms that realize the full potential of integrating these solutions. The Clean Coalition also collaborates with utilities and municipalities to create near-term deployment opportunities that prove the technical and financial viability of local renewables and other DER.

III. GENERAL COMMENTS

Grid Modernization must meet statutory obligations to accelerate DER deployment.

Distributed Resources Planning today must prepare for the energy systems of tomorrow, and the Clean Coalition's comments are squarely guided by the need for future forward planning. That future must include a distribution focused entity, the Distribution System Operator (DSO), to organize and manage the vast array of distribution edge resources coming online. To create these DSOs, California must create a bright line between distribution and transmission operations by having existing utilities shed their transmission assets. The resulting DSO would focus on aggressively innovating new services and markets for distribution areas to foster deployment of new Distributed Energy Resources (DER). The DSO will manage the balancing of each local distribution area: load balancing, dispatch instructions for DER, Demand Response, voltage regulation, and all other services. The DSO will also present the aggregate to the transmission grid as a single point of interface with the ISO at the Transmission-Distribution interface (T-D interface). Furthermore, the DSO will facilitate both distribution level wholesale markets for these services and bid these services into transmission wholesale markets on behalf of DER

owners. This system will create an efficient and streamlined framework for the operation of a more complex grid that will result from successful efforts in this track of the DRP proceeding.

The Clean Coalition emphasizes that the DSO model will help resolve a number of problems that have come to light in this proceeding. Therefore, the approaches adopted in this proceeding should support the implementation of an efficient DSO system. In particular, the Clean Coalition emphasizes:

1) Grid Modernization methodology should explicitly distinguish between and address investments both to accommodate natural growth of DER under existing conditions and policies *and* investments to accelerate the adoption of DER above natural growth. As proposed in the white paper, the Grid Needs Assessment focuses on investments to accommodate only forecasts of natural growth in DER that would occur under existing conditions. However, this may result in underinvestment in enabling technologies that are prerequisite of an acceleration of DER growth above and beyond autonomous growth under existing conditions and policies. This approach is likely to result in underinvestment in control technologies that facilitate critical distribution level markets that will be key to adding to the value stack for DER.
2) A forward-looking Grid Modernization evaluation methodology must include a dynamic planning process that can incorporate changes resulting from new policy developments. Ideally, grid investments would support policy changes to accelerate DER growth and create new market opportunities. For example, while the development of a DER management system (DERMS) is distinct from modernization of the physical grid infrastructure, the ability of a DERMS to effectively leverage DER value is dependent upon compatible infrastructure equipment. Public Utilities Code §769(c) requires reform of utility distribution planning, investment, and operations to "minimize overall system cost and maximize ratepayer benefits from investments in preferred resources," while advancing time- and location-variant pricing and incentives to support distributed energy resources. Grid modernization investment must be responsive to developments on these broader goals, including the Commission's own DER Action Plan, wholesale DER market integration and interconnection, IRP, and inter-agency GHG reduction targets. Thus, grid investment must reflect established DER Action

Plan goals including those related to wholesale DER market integration and interconnection, and associated rates and tariffs, and not just incorporate grid capacity upgrades to accommodate planned projects in the short term only.

3) As a result, the Grid Modernization planning process must include a policy evaluation component to add in the needs of specific policies into any Grid Modernization Plan (GMP). The GMPs must be able to respond within a current cycle to any new policies adopted. For example, GMPs must be able to include the new categories of investments immediately if and when policies are adopted to call for new information and control technologies to allow DSOs to manage Distribution Grids, to provide the ISOs with reliable forecasts and reliable services, and to manage the distribution level markets with the goal of resource optimization. Failure to direct grid modernization investments to address evolving trajectories of DER deployment would be inefficient and not result in the most be cost-effective investment in both infrastructure and resource procurement.
4) In addition to the current conditions natural growth DER deployment forecasts, the GNAs must include also include analyses of market response ("accelerated growth forecast"), based on where additional marginal DER deployment would become viable under market and policy changes. The necessary data could be derived from a combination of LNBA information and developer information regarding where DER would be viable should new value streams become available or new investment makes new locations economically viable. This analysis should identify the location and kinds of grid investments that could stimulate new DER deployment by enabling greater visibility, dispatch, signaling, and compensation opportunities.
5) The Grid Modernization framework should include analysis and use cases reflecting full-scale distribution management by DSOs with a full suite of distribution and transmission wholesale markets to allow DER to capture their full value stacks. This analysis would include consideration of the full set of technologies to support the development of distribution wholesale markets, participation in transmission wholesale markets, integration of signals from both distribution and transmission grid operators at the T-D interface, and advanced management of the distribution grid.

SPECIFIC STAKEHOLDER QUESTION COMMENTS

Section 1: Defining Grid Modernization Stakeholder Questions:

1. Please provide any comment and/or recommended changes to the definition, challenges and opportunities, or objectives of Grid Modernization presented in this section.

The Clean Coalition reiterates its support for requiring evaluation and consideration of new and developing policies under development in other proceedings. The ongoing proceedings, such as IRP and IDER, will generate needs for new functionalities, which in turn will require investments beyond those required for current natural DER growth. The definition of Grid Modernization specifically includes calls for "seamless interconnection" and "fully utilize[ing] the capabilities that these resources offer and enable[ing] distributed energy resources to participate in … emerging markets to more fully realize the value of the resources." We support these aspects of the definition,

The increasing complexity of the electric system recognized by the white paper will ultimately require a distribution level dedicated manager, and the Clean Coalition recommends and expects that this entity will take the form of a DSO. Managing this complexity is itself a critical task in facilitating deployment and the creation of emerging markets. The creation of DSOs to make that happen will require increased investment in telemetry and distribution level forecasting. The opportunities and challenges should expressly recognize that different kinds of investment will be critical to implement distribution grid management, the creation of distribution level wholesale markets, bidding the full suite of energy services market at the transmission level, and providing accurate planning and presentation to the transmission grid at the T-D Interface.

Staff suggest that costs deployment of technologies could outstrip the benefits they provide, but making that comparison requires that the valuation of benefits really include the full set of values. That in turn would require an evaluation of the DER growth inducing impacts (e.g., how much additional DER would these investments stimulate as acceleration in deployment above natural growth) and the full set of benefits and avoided costs resulting from those induced DER. Currently, the framework focuses mostly on investments to support natural growth and makes no express evaluation of whether investments might induce beneficial DER in the future. Without that the methodology would miss a significant fraction of the value of individual investments.

2. Based on the definition above, which investments should be characterized as only supporting safety and reliability, and thus, out of scope of this proceeding?

Staff's language of distinguishing between "investments that are primarily driven by the need to accommodate high penetration of DERs" and non-DER investments suggests that there is some threshold of minimal DER support to qualify, and that a "one electron from DER" rule would be inappropriate. To achieve this, Staff should consider some kind of DER index to rate potential investments. For example, investments should be characterized as supporting DER if they 1) support planned or natural DER growth and/or 2) can be expected to induce accelerated DER growth in the future. Thus, characterizing individual investments should be done based on an "impacts test" that evaluates those two factors as well as the past or forecast load growth supported by or driving the investment. At a simplistic level, a straight or weighted sum of the change in load and the change in DER can be used to give a rough index of how much the investment is driven by DER growth compared to load growth. Staff could either incorporate a straight ratio (*e.g.*, where the increase in DER is greater than 50% of the total), a ranking approach (*e.g.*, the top 30% of DER supporting investments), or both (*e.g.*, all investments with greater than 50% of changes in load/supply attributable to DER or the top 30% of ranked investments, whichever is greater) as appropriate. These approaches might shed light on which investments should qualify as DER grid modernization investments that are "*primarily* driven by the need to accommodate high penetration of the DERs. More complex formulations for a DER index may be better suited to the real-world suite of potential investments and should perhaps be developed.

Section 2: Classification of Grid Modernization Investments to Support DER

3. Does this classification framework, with the 5 sets of categories, accurately frame grid modernization technologies for the purpose of clarification and evaluation of grid needs? If not, how could grid modernization proposals be more effectively framed?

We support the framework for assessment of investment proposals depending on the three key functions grid modernization would support (system planning, grid operations, and market operations). The distinctions related to long-term v. short-term, system-wide v. local, and emerging v. mature technologies seem less useful in determining the relative importance of

investments, particularly if there is an integrative assessment of how much DER and reliability need is supported by each proposal. For example, functions may be served by either mature or emerging technologies, and as long as the needed function is satisfied it isn't clear why the maturity of the technology should be a particular consideration.

Thus, investments would be evaluated for their impacts to the grid on a case by case basis (not a technology by technology basis) and each of the key functions would be assessed to ensure no one function is subject to underinvestment.

Finally, we support the addition of the class of Distribution System Management Activities, since these will be important areas of consideration in future policy discussions. Distribution System Management Activities will be critical for operations of a complex distribution grid by the Distribution System Operator and also to adding to the value stack for DERs and accelerating DER growth.

4. Are the categories of use cases, technologies, functions and other classification accurate and complete? If not, what should be added or modified?

We recommend the methodology consider adding a fourth use case of "accelerated DER adoption" to evaluate acceleration of DER deployment resulting from policy changes as these are developed and adopted. The High DER use case only incorporated forecasted levels of autonomous growth, but under the development of new markets, the range of deployment could be substantially accelerated. As we suggested in our prior comments, this "future forward" use case should include the deployment of a full function Distribution System Operator (DSO), which would operate the distribution grid, manage high penetration of DERs, manage the local energy market, provide reliability and resiliency, and dispatch services.to manage distribution markets, distribution grids, and the transmission-distribution (T-D) interface. Similarly, we recommend that the Grid and DER Services incorporate not just participation in transmission wholesale markets, but also the possibility of distribution level whole sale markets as well (e.g., for generation not subject to transmission access charges, voltage support or even local demand charge or time of use management services)

In addition, the modeling should include the DSO another "technology category." Since the DSO model represents a distribution management system and policy innovation that could specifically

address the High DER Adoption and Grid and DER Services use cases, this model could be considered alongside other technologies to ensure that technology decisions do not inappropriately foreclose a policy option.

Section 3.1: Process to Evaluate DER-Related Grid Modernization Investments

6. Are the proposed steps in the grid modernization planning process reasonable and appropriate? If not, what should be modified?

As suggested above, the development of assumptions and distribution planning would rely on existing interconnection queues, rebates and incentive programs. However, DER deployment may prove highly responsive to changes in market conditions, especially to the development of new markets for services.

In order to be able to include DER accelerating investments along with DER accommodating investments, it is critical to also include an analysis of how much DER could be induced through additional investments. For example, there may be areas of the grid where DER deployment is marginal because of existing grid constraints or lack of key capacities. While that potential would not be captured by looking at rebates, incentives or the interconnection queue, investment to relieve these constraints could spur substantial DER deployment that would not otherwise happen. Thus, a forward-looking, proactive analysis would be a critical addition to the method.

In addition, the output should be designed to allow an integrated comparison of DER investments and reliability investments.

Section 3.2 Identification of Grid Needs

7. What types of information and level of detail should the IOUs include in the GNA?

Given the importance of stakeholder input in this process, the level of specificity should be adequate for stakeholders to have confidence that the methods and results are adequately supportive of DER and DER inducing investments.

As mentioned in our prior comments and suggested above, the GNA process should incorporate a component to evaluate new grid functionalities or investments that would unlock DER deployment in addition of current deployment demand. In particular, the ICA and LNBA can be used in the GNA to evaluate where next best opportunities are likely to occur. Not only would this analysis identify where to invest to induce DER deployment, but it would allow the

GMP process to respond more flexibly to changing conditions by pre-evaluating the areas where incremental or accelerated growth would occur should market conditions improve.

8. Should the Grid Needs Assessment be formally filed, or only made available for informal review? If formally filed, what is the appropriate procedural vehicle? (e.g., Advice Letter, Motion, Application)?

The GNA process should allow for stakeholders to address any deficiencies in the GNA and to ensure that the assessment does not neglect key analyses. Provided that informal comments would be required to be addressed in the resulting GMP, informal submission of the GNAs with formal review of the GMPs could suffice.

9. How can the timing of the GNAs, GMPs, and GRCs be best coordinated? How should the Grid Needs Assessment inform the GMP?

As part of the consideration of how best to respond to changing conditions and near-term changes, the should also consider a hybrid GNA system, with a major three year GMP submitted with each GRC and supplemental GMPs developed each year to feed into the distribution grid planning process that would allow adjustments to address policy or economic developments since the last GRC. The major GMPs in GRC years are likely to serve as three-year planning documents with greater details and analysis. The subsequent two GMPs would feed into the grid planning process and would require less analysis since these could be tiered from the GRC GMP process.

As discussed in the workshop, this structure could accommodate various levels of involvement. DER focused parties could participate in the GRC GMP every three years, while parties interested in the specific investments made each year could participate in the annual distribution planning process, and those with wider interests would participate in the GRC that takes the GMP as an input.

In addition, this could allow the distribution grid planning process to have ready inputs when policy decisions are reached based on the forward-looking analyses in GMPs rather than having to wait for the next GRC cycle to be implemented.

Finally, the planning process should incorporate some common metric of net ratepayer benefit such that DER supportive investments can be compared to reliability investments to determine

which investments should be made. As discussed in the workshop, the output of the GMP process will eventually have to feed into the GRC process. As currently configured, it appears that the GMP would deliver a simple list of investments to be added into the GRC, and presumably the mix of reliability and DER investments would be determined on some ad hoc basis or on some fixed ratio or budget. A common metric of net benefit however, would allow the specific mix of investments to be selected based on net ratepayer benefit such that in any given GRC, investments would be allocated according to where the best opportunities are. However, this metric must be carefully constructed, because a failure to incorporate the value of induced DER into the metric again would result in underinvestment in DER supportive investments.

Section 3.2.2. Prioritization of Proposed Location-Specific investments

10. Is this schema an appropriate method to prioritize locational needs and proposed investments? How should it otherwise be modified, or what would be an alternative approach to identifying locational priorities?

As discussed, there needs to be two distinct DER forecasts. First is the DER growth anticipated under current conditions, based on interconnection queues, rebates and incentives. The second is an assessment of how DER could be stimulated in high potential areas that have barriers to DER project implementation. Thus, the schema should include a column for "High potential acceleration" for areas that are not currently forecasted to have high immediate DER growth during that GMP period, but are close to having accelerated DER penetration with marginally improved economics. This column would differentiate areas with low current DER growth and low projected DER growth from those with low current DER growth, but potentially high medium-term DER growth.

Section 3.3. Grid Modernization Plans

Stakeholder Questions:

11. Should the Grid Modernization Plans include information on both location-specific and systemwide proposed investments or should they focus on system-wide proposals?

Location-specific DER supportive needs can be extremely important to fostering the deployment of DER. Again, Staff should consider approaches to balance these two categories based on the

net value for the current and future deployment of DER. In particular, this would require understanding how localized needs aggregate, and how system-wide needs support and induce growth. Grid modernization needs and value varies by location, and even systemwide investment should reflect locational implementation prioritization.

That said, many of the technologies that would support full DSO operation of the grid and the implementation of a full suite of markets will require system-wide investment. As new functionalities require the implementation new technologies across the grid, these should receive considerable weight. A failure to weight the importance of facilitating new markets to induce new DER divestment may well cause underinvestment in technologies that would be needed to support these quantum steps in deploying new markets.

In addition, the valuation of locational benefits may provide a good entry for incorporating the needs of disadvantaged communities as an explicit factor to weight locational benefits.

12. What additional or different information should the IOUs submit as part of the Grid Modernization Plans?

As discussed above, GNAs include assessments of current needs as well as assessments of the needs for induced DER growth. These latter assessments would give proper weighting to accelerating investments and allow faster responses to new policies and conditions that would direct investment to support additional functionalities.

Grid Modernization Plan Options

13. Which option should be implemented and why? How could these options be modified? Are there other options that should be considered?

As we have stated before, interested parties should have an opportunity to have specific input on GMPs without participation in the full rate case or in every GMP (should annual GMPs on a three-year cycle be adopted.) Of the options, Option 3 presents the best opportunity to take advantage of the participation of special expertise by DER specific stakeholders. However, it is not clear that any "addition" time would be required, since GRC funding will continue on a three-year review process, while the biennial DRP will develop and regularly update the Grid

Mod plans. If the timing of GNA and GMP processes are staged appropriately, and possibly scaled differently depending on the GRC cycle, neither process should be affected. The GRCs will simply translate the most recent technical and value based plan into an anticipated funding request. The GMPs will benefit from the technical expertise and planning in the DRP process in order to maximize the acceleration of DER deployment. Although it would take making evaluation and decisions in the GMP, this would save time making those same evaluations in the context of the GRC. What might slow the GRCs actually would be to add a new planning component that might need to be litigated in that context if not evaluated independently to create a standalone input into the GRC process.

14. If you recommend an option that requires the utilities to file GMPs in advance of their GRC applications, how far in advance should the GMPs be filed to allow for adequate review?

If the Commission were to have a three year GMP process, the GMPs would need to be complete several months in advance of the reliability investment analysis, and the GMPs themselves would need several months for full review. The interim (*e.g.,* year 2 and 3) GMPs, if any, could be developed as a component of the annual distribution grid investment planning process.

15. As an alternative to filing GMPs every three years, should the GMPs provide a more general blueprint of proposed grid investments over a longer timeframe?

Ideally, GMPs should both provide a general blueprint or vision of the overall contours of a longer-term grid investment plan in addition to the three-year cycle. From that strategic plan, the GMP could identify planned investments within the funding authorization period with reasonable specificity reflecting the most recent DRP and possible updates. However, given the pace of technological and policy development, those longer-term visions are likely to change markedly between each GMP cycle.

Section 3.4. Evaluating the Cost Reasonableness of the Grid Modernization Plans

Net Benefits definitions Options

16. Are there any additional approaches to assessing net benefits that should be considered? 17. Which of the above options should be applied and why?

As discussed above, the autonomous growth support approach has a significant drawback in that it will necessarily assign no value to investments that could induce additional DER deployment. Thus, this approach should be augmented to include both net benefits from autonomous growth and any induced growth.

While the accounting for the full cost and benefits of DER growth is theoretically appealing, the key will be to ensure that the alternative options to meeting the state's GHG targets are also subject to a full cost and benefits analysis. In particular, transmission costs extend well beyond the costs of building and maintaining transmission, but include habitat impacts and the costs of distribution grid investments necessitated by alternatives must also be incorporated. Since the accounting of non-DER alternatives is not within the scope of the proceeding, such an approach could only be recommended if a similarly rigorous approach is adopted across the board.

Thus, both options have significant drawbacks as proposed. Cost-effective investment requires that decisions be based on a full and unbiased assessments of value. Therefore, we can and should apply the best measurement methods available at the time while continuing to refine these methods and values to the degree warranted. Costs and benefits transparency is fundamental to reach a rational and objective conclusion. Failure to grasp the net value is fundamentally contrary to the responsibility of the Commission and utilities in evaluating rules and investments. The methodology options should be evaluated in the context of the purposes of the DRP to:

1. Ensure that grid investments are forward looking ("future proofed") and appropriate to meet reasonably anticipated needs rather than having to be replaced or upgraded long before the end of the useful life of the investments,
2. Capture the underutilized capabilities of deployed DER and realize the benefits where cost effective,
3. Identify location specific differentiators for investment need and value.

Of the four options, Staff should consider a hybrid approach that evaluates the tools identified in Options 1 and 2 as inputs to the development modified LCBF methodology. The approach should evaluate the IOU tools described in Option 1, the Commission-developed tools in Option 2, and develop procedures for incorporating new tools as they are developed going forward.

Currently, neither group of methods can completely identify factors that need to be included in the valuation, and some evaluate technologies only in isolation from the location and context. That said, the Commission developed tools represent significant inputs of time and expertise that should not be ignored. Finally, the Least Cost Best Fit (LCBF) analysis is conceptually the most sensible approach, but the existing LCBF is not designed for this application and will need substantial modification. Therefore the methodology should usefully take up how to incorporate the tools from Options 1 and 2 into a modified and improved LCBF framework.

Option 1: Existing IOU methodologies would appear to not capture full value, since the benefits are locational and context dependent, so an analysis at a whole technology level is likely to miss important aspects. The existing methodologies can be a starting point or inputs into a more comprehensive analysis, but they will miss factors that should be included in valuation, or offer initial valuation of those factors in isolation. Furthermore, given IOU ownership of transmission assets, it isn't clear that IOUs will fully value DER since the benefits to ratepayers from DER (with avoided transmission) is higher than it is to IOUs (which recoup transmission charges). Thus, a pure reliance on only IOU methods is unwarranted.

Option 2: The existing and developed Commission methodologies represent a critical source of information as they are derived from a collaborative multi-stakeholder process. These should be employed where available. Ignoring the value of the implicit expertise would also be unwarranted.

Option 3: The statutory and policy guidance to accelerate the deployment of DER suggests that the Grid Modernization Planning process should achieve the most cost-effective approach to high DER penetration. Using the Least Cost Best Fit (LCBF) analysis is conceptually the most sensible approach, but the existing LCBF is not designed for this application and will need substantial modification. For example, LCBF does not adequately capture the avoided transmission investment that DER provide to ratepayers.

Option 4: This option should be considered a factor in the evaluation of net benefits rather than as the final result, especially those related to coordinated control and optimization of DER

portfolios which will contain varying elements and capabilities under differing DER and DERMS scenarios. As noted by staff, there are issues that the methodologies are not necessarily sufficiently forward looking and may not incorporate the full benefits of DER integration.

18. Is the table of costs and benefits in Figure 3 complete and accurate?

How could Figure 3 be modified?

Several benefits should be added to the Grid & DER Services section including the value of optimized operations, such as improved conservation voltage management, and increased operational efficiency and system merit order and marginal cost reduction value of services and capacity, including lower marginal cost of energy.

19. How should the Grid Modernization Guidance inform the SCE GRC?

To the extent possible the requirements of the guidance should be met by SCE in the GRC, in part to ensure that these considerations are appropriately evaluated in that context. Furthermore, working through these issues in that context is likely to provide important insights into how the GMP process should be structured.

The Clean Coalition thanks Staff for the opportunity to participate and for your ongoing work on this effort.

Respectfully submitted,

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