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OPus One Solutions comment on Modleing Tools to Evalutate DERs and Microgrids

Additional submitted attachment is included below.

Response to Request for Comments

Draft Solicitation on Modeling Tools to Evaluate Distributed Energy Resources (DERs) and Microgrids located behind the meter on California's Modern Distribution Systems

Date: June 21, 2017
To: Jamie Patterson, California Energy Commission
Energy Research and Development Division
From: Mark Hormann, Opus One Solutions

Regarding: Docket # 16-EPIC-01; The Request for Comments on the Draft Solicitation on Modeling Tools to Evaluate Distributed Energy Resources (DERs) and Microgrids located behind the meter on California's Modern Distribution Systems

Background - Opus One Solutions

Opus One Solutions is a software engineering and solutions company founded on the vision of a connected Distributed Energy Network by providing an enhanced system layer to utilities. Through GridOS®, its intelligent energy networking platform, Opus One optimizes complex power flows so that it can deliver real-time distribution system state estimation (DDSE) and energy management to distribution utilities and other managers of distributed energy assets. GridOS is modular, scalable, CIM based and integrates seamlessly with existing data systems to unlock values streams for distributed energy resources.

The SWIG Phase 3 DER Functions Final Report on March 31, 2017 discusses the many services which can be provided by DERs on the network. In-order-to optimize the benefit of these DERs to the grid for customers, DER owners & the utility, a solution will need to be provided which can value DER services on the network at a specific location and during a specific point in time. This all begins with full situational awareness which is then coupled with optimization of DERs.

GridOS's Integrated Distribution Planning application (IDP) aims at merging traditional capacity planning with DER planning. At its core, GridOS IDP offers model-based planning & real time tools by leveraging the underlying physics of the grid through a 3-phase unbalanced model with state estimation and optimal power flow. Using Distribution Locational Marginal Pricing and Locational Net Benefit Analysis methods GridOS IDP can determine value, lowest-cost locations, and configurations & optimizations of DERs and other assets.

Opus One's objective is to provide a holistic approach for utilities to integrate any form of DERs into the distribution grid at optimal efficiency ensuring a reliable and sustainable energy future.

Questions from the CEC:

1. (For all groups) Are the proposed funding amounts identified in this Request for Comments (RFC) appropriate for the work requested? Please explain the rationale behind the recommendations, and if applicable, what the appropriate level of funding should be to develop the products identified in this draft solicitation?

   These comments are specific to Group 2 proposed funding allocation of $1 million.

   It is our opinion that the funding should be increased to a minimum of $3-4 million given the breadth of the Scope of Work as proposed. The proposed scope is seeking interaction across the three investor owned utilities. From our experience, integrating planning tools/models with only one IOU is a major software integration effort.
   We would also suggest that you have the opportunity to point this effort towards developing CIM standards within proven and successful technologies that are currently being deployed by the IOUs such as CYME Power Engineering Software, OpenDSS and Powerfactory Software. This will ensure compatibility and smooth data exchange across these applications.

The following comments are specific to Questions 2 & 3 & 5:

1. Group 1:
   a. Opus One recommends that the tool addresses DERs, Microgrids, and other distributed assets with regard to their importance and role within non-wires alternatives, ancillary services, or other grid or energy related services.
   b. We would be in favor of an open source access to real-time dynamic hosting capacity & calculated value streams available on utility feeders to help DER/microgrid developers with investments in specific locations to quantify benefits.

2) Group 2:
   a. Opus One recommends a CIM 'Network Model Manager', which manages all distribution models and provides the single source of truth for network models. These 'combined' models would be used as inputs for all planning applications moving forward.
   b. In order to perform an initial study across the three investor owned utilities, will you need to obtain cooperation from the utilities or can this work be done separately? If not, this may be a problem for applicants that do not already have a relationship with all of these utilities.

3) Group 3:
   a. Opus One questions the focus on a faster compute time. We believe that a redesigned application would achieve exponential results for less cost. We encourage you to develop a solicitation that allows for both approaches.
   b. Opus One encourages you to explore new mathematical approaches to the grid modeling problem that could provide significant improvements vs simply purchasing more or parallel computing power.

c. We would also like to encourage you to include Design Cyber Security requirements around cloud hosted solutions, such as AWS, to increase computational power dynamically around the requirements, rather than individually on-premise or hosted solutions. This will allow access to more processing power at higher utilization rates reducing the overall cost for all stakeholders.
d. We would like to suggest an open source data exchange and encourage the utilities to host these solutions for their feeder and grid data. That way, industrial solutions can be provided yet everyone else can freely access and manipulate data and simulations to assess their own DER.

4) Group 4:
   a. In our opinion, the opening premise that adoption is hindered due to the command line interface is flawed. GridLab-D is utilized and therefore adopted primarily for heavy lab simulations to model dynamic responses of enclosed systems. There is a very specific narrow application for this technology stack which is systematic of its adoption curve.
   b. We believe that the assumption used is incorrect – "unlike other commercial power flow software, uses an agent-based to simulating smart grid" as there are agent-based approaches currently available on the market. We would, however, encourage that any approach at optimization is agent or micro-service based.
   c. We feel that technology should be open to different vendors who can provide software with a focus on what is trying to be accomplished with the modeling exercise (for example modeling markets, DER optimization, Buildings, etc), not to develop an interface to GridLab-D, as this constraints the solicitation from stakeholders bringing in new and innovative solutions which however might be based on different technology modeling platforms.

Question 4. (For groups 2, 3 and 4) Should it be required that all source code generated as a result of this solicitation be hosted on a public open-source developers site such as GitHub? If not, describe how to ensure distributed version control and source code management functionality while making the open-source code available to the open-source developers' community.

Opus One encourages you to make the information and data open source and have the utilities host the solutions if possible. That way, industrial solutions can be provided yet everyone else can freely access and manipulate data and simulations to assess their own DER.