December 17, 2010

Attention: Filing Center
Public Utility Commission of Oregon
550 Capitol Street NE, #215
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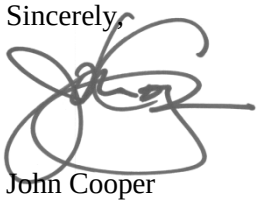
Re: *In the Matter of PUBLIC UTILITY COMMISSION OF OREGON Staff Recommendation to Use Oregon Electricity Regulators Assistance Project Funds from the American Recovery and Reinvestment Act of 2009 to Develop Commission Smart Grid Objectives for 2010-2014*
PUC Docket No.: UM 1460
DOJ File No.: 330-030-GN0389-10

Enclosed are the Closing Comments of Grid Net in the above-captioned matter for filing with the PUC for today.

Sincerely,



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BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1460

In the Matter of the PUBLIC UTILITY COMMISSION OF OREGON Staff Recommendation to Use Oregon Electricity Regulators Assistance Project Funds from the American Recovery and Reinvestment Act of 2009 to Develop Commission Smart Grid Objectives for 2010-2014	))))))))))	CLOSING COMMENTS

Introduction

Grid Net (www.grid-net.com) supports the efforts of the Oregon PUC and PUC staff to provide a diligent and thorough process to evaluate and plan for smart grid deployments in Oregon. As a global leading provider of real-time, all-IP Smart Grid and Smart Home software platforms for any device and any broadband technology, Grid Net has gained the experience to understand the complexities of adapting the fundamental electricity infrastructure to the new realities of the 21st century. The Grid Net software platform PolicyNet™ is designed to integrate substation automation, distribution automation, smart meters, demand response, and load management with electric vehicles, buildings, and homes to increase grid reliability, energy efficiency, renewable energy use, and customer satisfaction while reducing capital and operating costs.

Currently, Grid Net software is powering GE and Landis + Gyr smart meters that are being deployed in two projects in Australia, at SP AusNet and at Energy Australia, leading utilities providing services in Victoria and New South Wales. These projects, which will include nearly three million devices when fully deployed, provide global leadership and highly relevant experience to the issues under consideration in this inquiry. The Energy Australia Smart Grid Smart City project in particular will

integrate multiple technologies in a holistic smart grid ecosystem and provide valuable lessons, similar to DOE ARRA projects in the US. Grid Net is actively developing opportunities in the North American market with a family of partners and has a unique vision of smart grid based on first-hand experience with pioneer smart grid projects.

Recognizing the vital role that regulation plays in the future of the electric industry and smart grid in particular, Grid Net formed an Industry Advisory Board in summer 2010, comprised of members of the US regulatory community. Paul Afonso is a past chairman of the Massachusetts Department of Public Utilities. Paul Hudson is a past chairman of the Texas Public Utility Commission. Laura Chappelle is past chairman of the Michigan Public Service Commission. These advisors provide unique perspectives to the Grid Net executive management team as it works to form its strategies and develops its leading smart grid vision. Grid Net believes that attention to regulatory policy is vital to help shape the emerging smart grid and applauds the Oregon Public Utility Commission for its deliberate and thoughtful approach to the smart grid as reflected in this inquiry. Grid Net welcomes dialogue with the Oregon PSC in this and other forums.

The most vital aspect of the Grid Net smart grid perspective, a thread that runs through these Closing Comments, is two-fold. First, the smart grid must be viewed as *a redesigned, comprehensive value chain* that leverages all the knowledge, lessons learned and benefits that derive from the 21st century digital economy and the two decades of innovation and transformation unleashed by the evolving internet and world wide web. Second, the benefits available from *grid optimization* (e.g., reductions in line losses) alone deserve a broader view and increased attention in smart grid planning. As important and vital are the changes that derive from a digital meter transition, the potential of grid optimization includes not only the terminal point of the distribution grid but every nook and cranny of a holistic energy ecosystem, from centralized generation facilities to end-use electric appliances. These two key considerations - an expansive view of the smart grid and a focus on optimization - combine to highlight the potential in a smart grid transformation and underscore the importance of the questions asked in this well designed inquiry. As an interested party active in the commercialization and deployment of software

to operate the smart grid, Grid Net has selectively responded to particular questions where it has complete expertise.

I. Goals and Guidelines for all Smart Grid Plans

A. Goal and Sub-Goals for This Docket

Grid Net agrees with the primary goal to develop a framework to guide a utility in the development of its Smart Grid Plan (SGP). As noted below in comments regarding the long-term vision and the expanding energy ecosystem, Grid Net recommends an additional goal for these proceedings: the Oregon PUC should consider an expanded long-term vision that includes integration of utility planning with non-utility stakeholders, perhaps in a joint industry long-term planning collaborative.

B. Guidelines for Issues Common to All SGPs

1. *Access, Control, and Use of Customer Information*

Grid Net concurs with Staff comments that the SGP should accommodate evolving federal, state, or other data privacy standards and indicate where the utility plans a different approach than any of the available standards. Grid Net stresses that a principal difference between the current grid and the evolving smart grid will be the dramatic increase in the amount of data collected and stored, which if managed properly will become a tremendous asset for the utility, energy consumers, and society, but if mismanaged will become a new, huge liability. Consequently, the protection of customer data is a vital issue, and data protection begins with an end-to-end security capability that provides the assurance that the network does not become an access point for uncontrolled or unplanned disclosure of customer data. Thus, Grid Net concurs with utility comments that data privacy should be an integral part of smart grid planning and deployment, making the *smart* grid also the *secure* grid at each step of its deployment. Without the assurance of complete security, smart grid projects should not be allowed to be deployed, given the vital role the electric grid plays in our economy and our society.

3. Treatment of Obsolescence Risk

Grid Net concurs with Staff's proposal that the SGP should identify and discuss obsolescence risks that may arise from actions in the SGP, including the degree and quantity of obsolescence risk, as well as a discussion of mitigation measures. Grid Net concurs with PGE comments that obsolescence risk is directly tied to depreciation of assets, and recommends that the Oregon PUC address the increasing penetration of information technology assets in the utility portfolio and the disparity between current depreciation schedules more oriented towards industrial equipment and the much shorter lifecycles of information technology-based assets.

II. SGP Structure and Content

B. Timeframes for the SGP

Grid Net acknowledges the challenges highlighted in Opening Comments by responding utilities regarding planning horizons beyond ten years in a highly dynamic technology environment. Nevertheless, it is vital that the Oregon electricity industry contemplate a future world beyond 2020, one that will be characterized by less emphasis on centralized utility resources and a growing emphasis on distributed energy resources replete with millions of devices and an expanding community of electricity stakeholders, from individual prosumers of energy to third party energy service providers.

Smart meters are merely the beginning of a wave of intelligent devices that will be deployed throughout electric utility grids. In very short order, all devices connected onto the grid - from RTUsto capacitor banks, to reclosers - will begin to acquire intelligence and the ability to communicate with network management systems and the utility managers responsible for grid operations. And beyond the current family of connected devices, a new class of distributed energy resources equipped with smart inverters is emerging, including distributed generation (e.g., solar PV panel systems), electric vehicles (EV) and charging systems, and distributed energy storage systems. To manage the tens of millions of electric devices that will ultimately populate a smart grid, smart grid systems should be able to scale dramatically. The Oregon PUC must require *massive scalability* in the systems it approves, and guard

against investments in smart grid systems that are limited in capability or scalability and that will become outpaced by the proliferation of smart connected devices.

Therefore, it is appropriate that utilities plan beyond the foreseeable horizon of five-year action plans and ten-year extensions, to take a long view that considers new electricity production and distribution paradigms, even new regulatory paradigms, as highlighted in Smart Grid Oregon comments.

C. SGP Estimated Benefits and Costs

Grid Net concurs with Staff and other commenters on the importance of detailed information about potential benefits and costs of actions as part of a robust SGP. Grid Net stresses that options in smart grid planning, especially benefits and costs, should be assessed on a level playing field, in apples-to-apples comparisons, on a lowest Total Cost of Ownership (TCO) basis. Given that investment in a smart grid systems as a new transforming infrastructure is historically significant, it is vital that benefit and cost assessments of smart grid projects be based on a comprehensive total cost of ownership (TCO) and benefit evaluation, one that looks not only at the longer term (10-20 years of project life costs), but also at a broad interpretation of smart grid costs (including back office support system costs, system integration costs, training costs, project management costs, redundant network implications, etc.), and associated benefits. The Oregon PUC must consider the costs of developing and implementing specialized networks based on single applications and functions, for instance, and compare those costs with the costs of an integrated, single network implementation that anticipates supporting multiple applications and functions, in a changing future environment. Finally, the long-term implications of short-term cost management must be considered and balanced against a rapidly changing technology landscape overlaid on an industrial system accustomed to much longer equipment life, as discussed elsewhere in these comments.

G. Communications and IT Infrastructure

Grid Net concurs with Staff that the SGP should include sufficient detail (including cost) to allow the Commission to determine the adequacy of the utility's communications and IT planning to support smart grid actions. In fact, Grid Net underscores that smart grid planning should begin with an assessment

of communications and IT infrastructure needs over the long term and an evaluation of current resources in order to assess gaps and needed upgrades.

With regard to standards, Grid Net stresses the need for open standards-based interoperability. The 21st century technology world benefits from lessons learned regarding open standards and any smart grid plan must leverage those lessons and embrace open standards-based interoperability. The NIST Smart Grid Interoperability Panel is developing guidelines that should be studied and embraced by the Oregon PUC and the utilities in its regulatory purview. Smart grid communication systems and IT infrastructure must be capable of supporting multiple, heterogeneous devices *(*e.g. transformers, fault monitors, switches, volt/VAR controllers, meters, inverters, etc.) from multiple vendors. Anything less than full interoperability will dramatically inhibit the potential of the smart grid and be a poor use of ratepayer funds. The Oregon PUC should require *open standards-based interoperability* in smart grid projects and smart grid technologies.

Grid Net believes that it is vital for communications and IT plans to address the growing need for real-time capabilities. The internet operates in real-time, with information travelling along fiber lines at the speed of light. Similarly, the smart grid must operate at real-time speeds (<100 milliseconds) and support 100% Internet Protocol (IP) functionality. The smart grid should be viewed as a transforming overlay of internet standards onto the electric utility grid to create a radically transformed capability. The smart grid should not be allowed to develop as a slow cousin to the internet, but should be required to have similar or better standards of real-time functionality. The Oregon PUC should require *instant communication* for projects going forward, and should not allow systems to be deployed under the mantle of smart grid that do not embrace real or near real-time functionality.

Finally, Grid Net concurs with PGE in reflecting that a smart grid transformation is as much about organizational impacts and process changes as it is about technology integration. Grid Net stresses the importance of network management in a smart grid as a tool to help manage such a complex transformation. No less than telecom providers do today, electric utilities need a Network Management System to connect their back office operations with their field operations and end devices and manage

increasing complexity that moves beyond human capacity and manual processes. All utilities must plan for the emerging, highly complex field environment that will overwhelm the ability of human beings to integrate disparate systems and make decisions on the fly, as they have traditionally done. In the very near future, utilities will need to have automated systems that they can rely on to provide them a unified vision of their grid devices and operations, and an intelligent control system to execute grid management policies. The Oregon PUC must ensure that utilities provide for *universal management* of their grid operations and do not become encumbered by systems that provide anything less than full visibility and control.

H. Cyber and Physical Security

Grid Net concurs with Staff recommendations that the utility should identify the steps it is taking to ensure that smart grid actions maintain adequate levels of security. Grid Net stresses the importance of end-to-end security, from the utility NOC out to the smart devices at the edge, and the critical requirement that security measures be compliant with *all* US NIST, NERC CIP, and FIPS requirements and standards. The Oregon PUC must make *complete security* an essential element of any smart grid system that is approved for deployment and interconnection with existing electric utility systems.

Grid Net recommends these four provisions be made mandatory for smart grids in Oregon. First, *Security begins with the "edge" device* – standards-based hardware and software should be required to be embedded in every network device to prevent penetration attacks from beyond a device into the network. Second, *Only standards-based security should be used* – only standards-based security leverages the collective best efforts of the community to provide faster, simpler upgrades and the "future proofing" needed to stay ahead of hackers. Third, *Pervasive and granular security architecture should be required in solution offerings* – all levels of the grid should be integrated in the security architecture, from devices to the distribution network to embedded applications to network infrastructure to the stored and transmitted data to the utility NOC to utility enterprise systems. And finally, *Automatic security updates and adjustments should be required* – utilities must make a commitment to ongoing investments in

security oversight, critical software patches, software upgrades, and process improvements to stay ahead of threats.

Conclusion

In conclusion, Grid Net reiterates the two key points made in the Introduction - the smart grid must be viewed as *a redesigned, comprehensive value chain* based on internet and world wide web principles and lessons learned; and the benefits available from *grid optimization* provide a focal point for incremental improvements and deserve increased attention in smart grid planning. In summary, Grid Net stresses *six key considerations* that should be emphasized in any SGP: 1) *Universal Management* – electric utilities need a Network Management System to connect their back office operations with their field operations and end devices and to provide full visibility and management of utility operations at the control center level; 2) *Massive Scalability* – an SGP must provide for a dramatic increase in current and future intelligent devices connected to the grid that are capable of two-way communications with network management systems and the utility managers responsible for grid operations; 3) *Complete Security* – end-to-end security that is compliant with US NIST, NERC CIP, and FIPS requirements and standards must become the standard for smart grid design; 4) *Instant Communication* – the smart grid must operate at real-time speeds (<100 milliseconds) and support 100% Internet Protocol (IP) functionality; 5) *Open Standards-based Interoperability* – the smart grid must embrace open standards-based interoperability, ideally mapping to guidelines from the NIST Smart Grid Interoperability Panel; and 6) *Lowest Total Cost of Ownership* – SGPs must demonstrate *lowest total cost of ownership* for smart grid projects.

Grid Net appreciates the opportunity to comment in this proceeding and looks forward to continuing dialogue with the Oregon PUC.

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused **Closing Comments of Grid Net** to be served by electronic mail to those parties whose email addresses appear on the attached service list, and by First Class US Mail, postage prepaid and properly addressed, to those parties on the attached service list who have not waived paper service from OPUC Docket No. UM 1460.

Dated at Austin, Texas, this 17th day of December, 2010.

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