GRIDMOBILITY™

Subject: Comments on UM 1461 Straw Proposal August 25, 2010

Submitted by:
James D. Holbery, Ph.D.
President
GridMobility LLC
PO Box 2066
Kirkland, WA 98083-2066
(425) 250-8204
jdh@gridmobility.com

BACKGROUND

GridMobility LLC, a registered company in WA State, is developing operational strategies to fully integrate intermittent renewable resources into the grid for utilities, balancing authorities, RTOs/ISOs, and consumers of all scale. The GridMobility technology platform allows commercial, industrial and residential consumers to reduce their carbon footprint by actively managing their renewable energy consumption.

GridMobility is pleased to contribute to the Oregon PUC UM 1461 Investigation into Electric Vehicle Charging Rates and Infrastructure docket. It is the firm belief of our company that the adoption curve of EV/PHEVs will exceed conservative projections and will transform the transportation market. Power consumers in the PNW have a history of early adoption of energy efficiency concepts as demonstrated by adoption rates of CFLs relative to other US geographical regions; there is no reason to believe the adoption of EV/PHEVs will be any different.

I. Goals and Objectives

Number 2 in the Goals and Objectives should be expanding to incorporate the need to integrate renewable energy charging as a priority. While off-peak period charging and ancillary services attempts to address this motivation, the technology and market demand exists today to preferentially charge vehicles at the time period that intermittent renewable energy is available on the local or regional grid.

Regulatory policy should be developed that exploits to the fullest extent possible the opportunity to dramatically reduce greenhouse gas generation through the introduction of EV/PHEVs to the market place. From a carbon generation standpoint, the motivation is to utilize renewable energy to fuel EV/PHEVs to the greatest extent possible. Electric vehicles powered by coal-fired electricity generate 323 g CO_2/mile driven [1], while a PHEV running on coal-fired electricity generates 328 g CO_2/mile driven [2] as compared to a PHEV powered by natural-gas fired electricity which is 224 CO_2/mile. For comparison, a conventional gasoline automobile generates 450 g CO_2/mile while a conventional gasoline hybrid generates 288 CO_2/mile [2]. In contrast a renewable-electricity powered PHEV generates 136 CO_2/mile while a renewable-electricity powered EV generates 0 CO_2/mile [2, 3]. GridMobility believes the State of Oregon should consider these facts when structuring the charging infrastructure and associated regulatory policy.

III. Regulatory Policies and Guidelines

A. Policies related to developing public charging infrastructure.

1. Rate Schedules for Publicly Available EVSE Stations

GridMobility agrees with the OPUC Staff assessment of charging rate structure. We stress that real-time information that reports the CO_2 generation of the delivered electricity, or a quantitative real-time mix of sources contributing to the delivered power be made available to the consumer. This information will enable consumers to make informed choices and furthermore, integrate into the charge architecture business logic.

3. Utility Ability to Dispatch EV Charging

This section of the Straw Proposal addresses rate adjustment during peak load periods and suggests the utility have the ability to reduce or interrupt power flow for EV charging. While in principal this is advantageous for utility operation, another variation of this theme is to enable the utility to directly communicate with charge stations to report in real-time the renewable content of the delivered electricity. Control logic within the charge station, or the power-providing venue, would then deliver power preferentially to contribute to balancing installed and future renewable resource installations dedicated to meeting state renewable portfolio standards (RPS).

Integration of renewable energy sources into the future national electric infrastructure faces a significant new challenge – in contrast to power generation facilities such as coal, natural gas, nuclear or hydro-based power generation, renewable energy sources such as wind and solar are both inherently unpredictable and can not be controlled to meet demand. This unpredictability and uncontrollability requires energy generating and aggregating entities to provide significantly larger generation balancing services to make up shortfalls or handle overages. Within its balancing authority area, the BPA is responsible for providing integration services that maintain a constant balance between loads and resources to assure system reliability. Regional utilities face a similar challenge as more renewable resources are added to their power make-up.

The most challenging characteristic of wind energy (and to a lesser extent solar) is the inability of wind energy providers to accurately predict their generating capacity. BPA data shows that deviations between projected and actual production can be as much as 55%, for predictions as short as one hour in advance. Figure 1 shows data from the BPA that highlights how wind power generators are unable to accurately forecast output, even for relatively short periods in advance. Furthermore, the data also shows clearly that this issue is rapidly growing.

Unanticipated swings in loads from one source are balanced in real-time by producing (or not producing) electricity from another source. For the BPA, swings in wind energy are compensated by systems based primarily on hydro power. Other energy producing entities will frequently rely on coal or natural gas as the compensation source, with correspondingly higher carbon footprints. As the proportion of wind power usage in the BPA region increases, the capacity of the compensation systems required also increases. With wind energy approaching 30% of peak load these hydro-based systems are reaching their limits. To give an idea of the magnitude of these swings, in the spring of 2008, wind turbines in BPA's balancing authority produced an unexpected excess of 400MW of generation – in order to maintain grid stability, BPA was forced to reduce hydro generation and spill high levels of water over their dams. According to the BPA, "Given the estimated wind fleet of 4,330 MW in 2011, the amount of needed incremental capacity alone could exceed the capacity of Bonneville Dam" [4].

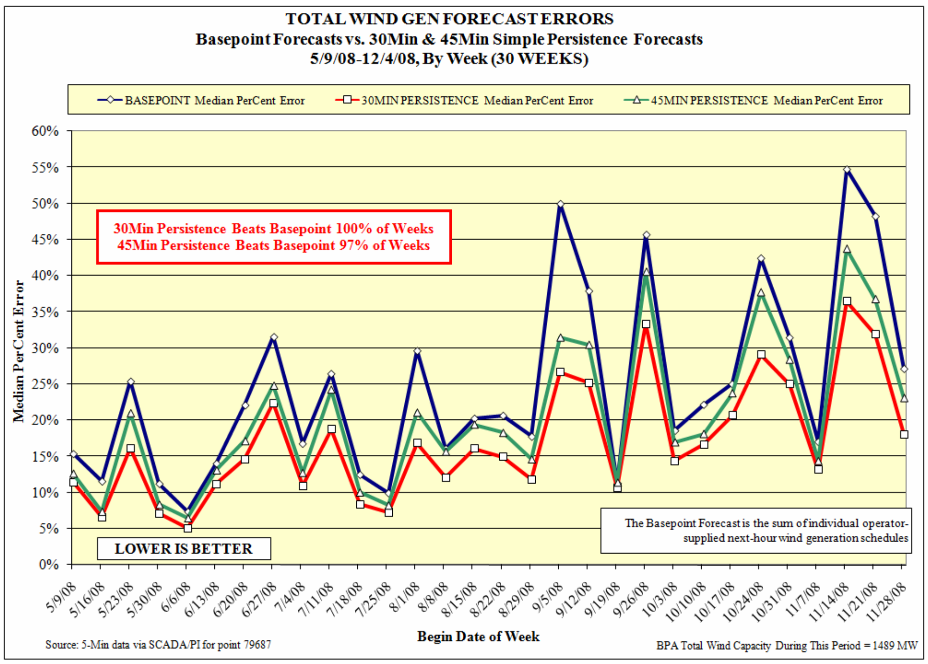

Figure 1: Total wind generation forecast errors. Basepoint forecasts vs. 30min and 45min Simple Persistence Forecasts, May 9 to December 4, 2008. Source: BPA.

In essence, a critical goal necessary for the successful integration of intermittent renewable energy sources such as wind power is that the generation must be carefully matched to the consumption of these resources. Thus, a key component of the solution includes not only energy generation management and increased storage capacity but also renewable-driven consumption and/or storage. This can be achieved inexpensively with today's technology and current commercially available control hardware specific to EV/PHEVs.

Currently, renewable consumption based on a ***real-time electronic renewable energy signal*** is being demonstrated in WA State via a BPA-funded program with Mason County PUD 3 [5]. Providing renewable electricity source information to the EV/PHEV consumer brings the consumer into the overall discussion concerning electricity consumption and renewable energy sources. At the present time, limited real-time information about electricity generation sources is available to consumers from utilities and Transmission and Distribution providers. The Mason County PUD 3 program aims to establish the foundation for aggregating and deploying a real-time ***renewable energy signal*** to the BPA customers by analyzing the effect of varying renewable load elasticity parameters on wind spill, hydro efficiency, power prices, and controllability. **The identical concept can be achieved utilizing EV/PHEVs as a storage resource and could result in lower balance tariffs to utilities, a portion of which can be passed to EV/PHEV consumers.**

4. Information on emissions to consumers.

GridMobility believes that public and private utilities should provide real-time generation resource mix information and CO_2 emission rates to EV/PHEV owners and users. This information can be delivered by a number of technologies and should integrate into the charge infrastructure deployed in the State of Oregon.

B. Policies related to private charging

GridMobility refers to the comments above as they relate to public and private charging infrastructure alike.

C. EV's as a provider of Ancillary Services

GridMobility supports OPUC Staff in their support for a demand forecast in support of flexible capacity, but questions the merit of a similar supply study. There are industry indications that battery manufacturers are years away from warranting their equipment under such a deployment scenario.

REFERENCES

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3. Voelcker, J., IEEE Spectrum, "How Green is My Plug-In", March 2009, http://spectrum.ieee.org/energy/the-smarter-grid/how-green-is-my-plugin.
4. BPA, "Balancing Act: BPA grid responds to huge influx of wind power", November 2008.
5. "Smart grid projects will let wind farms "talk" to appliances", BPA, http://www.bpa.gov/corporate/BPANews/ArticleTemplate.cfm?ArticleId=article-20100812-01.

UM 1461 CERTIFICATE OF SERVICE

I hereby certify that I served the foregoing **Petition to Intervene of GridMobility LLC in docket UM 1461** on the following persons on June 1, 2010 by hand-delivering, e-mailing, or mailing to each a copy thereof, and if mailed, contained in a sealed envelope, with postage paid, addressed to said attorneys at the last known address of each shown below and deposited in the post office on said day at Salem, Oregon.

DATED this 1st day of June, 2010.

By: /s/ James Holbery
James Holbery, Ph.D.
GridMobility LLC
jdh@gridmobility.com
(206) 679-6473

DEPARTMENT OF JUSTICE
JANET L PREWITT ASSISTANT AG
NATURAL RESOURCES SECTION
1162 COURT ST NE
SALEM OR 97301-4096
janet.prewitt@doj.state.or.us

OREGON DEPARTMENT OF ENERGY
VIJAY A SATYAL
SENIOR POLICY ANALYST
625 MARION ST NE
SALEM OR 97301
vijay.a.satyal@state.or.us

CITIZENS' UTILITY BOARD OF OREGON
GORDON FEIGHNER
ENERGY ANALYST
610 SW BROADWAY, SUITE 308
PORTLAND OR 97205
gordon@oregoncub.org

ROBERT JENKS
EXECUTIVE DIRECTOR
610 SW BROADWAY STE 308
PORTLAND OR 97205
bob@oregoncub.org

G. CATRIONA MCCRACKEN
LEGAL COUNSEL/STAFF ATTY
610 SW BROADWAY - STE 308
PORTLAND OR 97205
catriona@oregoncub.org

RAYMOND MYERS
ATTORNEY
610 SW BROADWAY - STE 308
PORTLAND OR 97205
ray@oregoncub.org

KEVIN ELLIOTT PARKS
STAFF ATTORNEY
610 SW BROADWAY STE 308
PORTLAND OR 97205
kevin@oregoncub.org

DEPARTMENT OF JUSTICE
MICHAEL T WEIRICH
ASSISTANT ATTORNEY
GENERALREGULATED UTILITY &
BUSINESS SECTION
1162 COURT ST NE
SALEM OR 97301-4096
michael.weirich@doj.state.or.us

ECOTALITY, INC.
ALANA CHAVEZ-LANGDON
80 E RIO SALADO PKY, SUITE 710
TEMPE AZ 85281
achavez@ecotality.com

ETEC
DAVE MAYFIELD
308 SW FIRST AVE. SUITE 181
PORTLAND OR 97204
dmayfield@etecevs.com

NW Energy Coalition
Steven Weiss
4422 Oregon Trail Ct. NE
Salem, OR 97305
steve@nwenergy.org

OREGON DEPARTMENT OF ENERGY
WALLACE RICK
625 MARION STREET NE
SALEM OR 97301-3737
rick.wallace@state.or.us

ANDREA F SIMMONS
625 MARION ST NE
SALEM OR 97301-3737
andrea.f.simmons@state.or.us

OREGON PUBLIC UTILITY COMMISSION
ED DURRENBERGER
PO BOX 2148
SALEM OR 97308-2148
ed.durrenberger@state.or.us

PACIFICORP
RYAN FLYNN
LEGAL COUNSEL
825 NE MULTNOMAH, SUITE 1800
PORTLAND OR 97232
ryan.flynn@pacificorp.com

PACIFICORP, DBA PACIFIC POWER
OREGON DOCKETS
825 NE MULTNOMAH ST, STE 2000
PORTLAND OR 97232
oregondockets@pacificorp.com

PGE RATES & REGULATORY AFFAIRS
PORTLAND GENERAL ELECTRIC
121 SW SALMON STREET, 1WTC0702
PORTLAND OR 97204
pge.opuc.filings@pgn.com

PORTLAND GENERAL ELECTRIC
RICK DURST
121 SW SALMON ST - 1WTC1711
PORTLAND OR 97204
rick.durst@pgn.com

DOUG KUNS
121 SW SALMON ST
1WTCO702
PORTLAND OR 97204
doug.kuns@pgn.com

PORTLAND GENERAL ELECTRIC COMPANY
J RICHARD GEORGE121 SW SALMON ST 1WTC1301
PORTLAND OR 97204
richard.george@pgn.com