Smart Grid Technical Advisory Project

Chuck Goldman, Project Manager
Electricity Markets and Policy Group
Lawrence Berkeley National Laboratory

Roger Levy, Lead Consultant

Project Objectives

Provide technical assistance, referrals, references, and other information to assist state regulatory commissions and policy makers better understand near-term Smart Grid implementation and policy issues.

- **Clarify subject matter technical issues**
- **Identify implementation alternatives and tradeoffs**
- **Assist staff with the development of workshops, briefings, and other information sessions**

Project Objectives

Provide technical assistance and facilitation services to assist state regulatory commissions and policymakers better understand near-term Smart Grid implementation and policy issues

- ❑ **Analyze and clarify subject matter technical issues**
- ❑ **Identify implementation alternatives and tradeoffs**
- ❑ **Assist PUC staff with the development and/or facilitation of public workshops & briefings**

Project Consulting Team

Team Members	Experience
Roger Levy	❑ Levy Associates, Independent Consultant ❑ BS Management Science, University of Rochester, MBA USC ❑ 30+ years of utility industry experience ❑ Demand response, rates, business systems, marketing, analysis
Ron Hofmann	❑ Independent Consultant ❑ BS ME, UC Berkeley ; Post Grad University of Wisconsin ❑ 40+ years of industry experience ❑ Technology assessment, communications, distribution automation
Steve Hadden	❑ RW Beck, Vice President ❑ BS Engineering Physics, Cornel ❑ 20+ years of utility industry experience ❑ Metering, demand response, home automation, communications
Erich Gunther	❑ EnerNex Corporation, Chairman and CTO ❑ BSEE, Gannon University, ME RPI ❑ 25+ years of utility industry experience ❑ Communications, Networks, Security, Technology assessment
Doug Houseman	❑ EnerNex Corporation, formerly CTO Capgemini Global Energy ❑ BS Engineering , US Naval Academy ❑ 30+ years of utility industry experience ❑ Technology management, information systems, marketing, demand response, advanced metering

Activities to-date

Organizations	Smart Grid Support Activities
Kansas Corporation Commission	▪ Review utility pilots, smart grid status, lessons learned ▪ Arranged Cyber Security speaker for Commission workshop ▪ Information to compare smart grid communication systems ▪ Assistance with review of PON proposals for DR and pricing ▪ Technical assistance and detailed written comments on Smart Grid implementation issues ▪ Written comments on provisions of state metering legislation ▪ Technology presentation ▪ Review of advanced metering business case and technology issues
NYSERDA	
Pennsylvania Public Utilities Commission	
PJM	
Wyoming Public Service Commission	

Activities to-date

Organizations	Smart Grid Workshops
MADRI	▪ Full team participated in one-day smart grid workshop
Ohio Public Utilities Commission	▪ Conducted one-day workshop with Commissioners / staff ▪ Providing special assistance for rates project
Oregon Public Utility Commission	▪ Conducted one-day workshop with Commissioners, staff, utilities and interveners
Utah Public Service Commission	▪ Conducted one-day workshop with Commissioners, staff, utilities and interveners

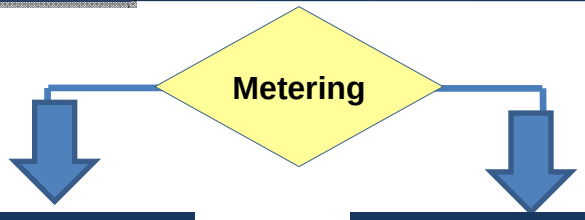
Key Smart Grid Issues

1. Metering
2. Rates
    a) Rate Design
    b) Demand Response
    c) Empowering the Customer
3. Reliability
4. Pilots or Transition Plans
5. Standards

Key Issue - Metering

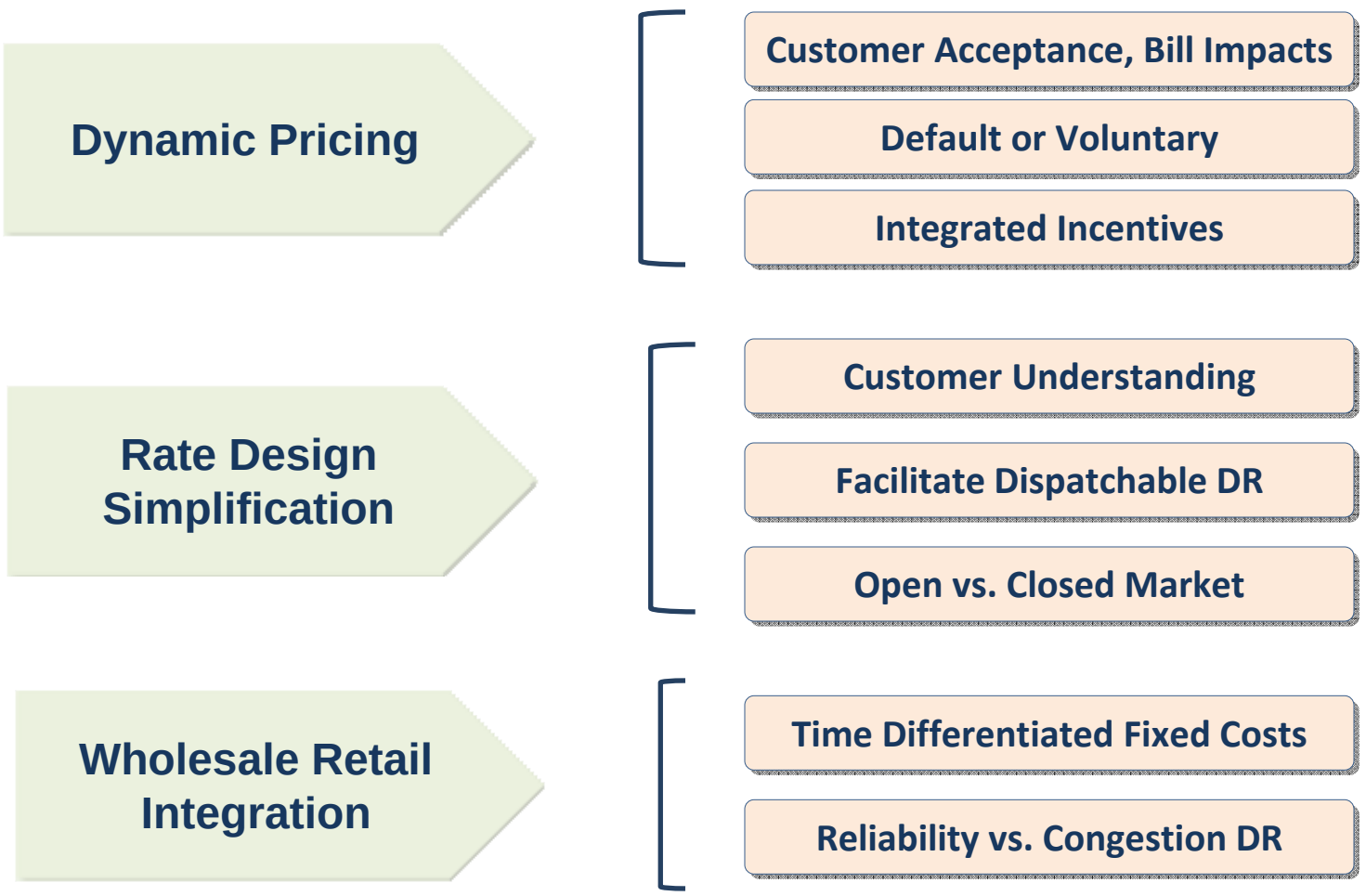
1. System integration vs. hardware integration
    a) Advanced meters vs. Smart meters ?
    b) What is the role of the HAN?
2. Establishing a business case [costs and benefits]
3. Targeted vs. system-wide implementation
4. Security and privacy – who owns the data ?
5. Utility vs. the regulatory / customer use case
    a) utility programs or open markets
    b) Customer vs. utility control strategies
6. Standards – Communication and hardware vs. data models.

Key Issue - Metering



Metering System	Advanced	Smart	Tradeoffs - Issues
Primary Function	Interval Recording	Interval Recording	none
Communications Capability	Network, two-way	Network, two-way into customer premise	•Focus on Meter Network •Reach into customer premise
Remotely Configurable Demand Limit Connect-Disconnect Service Switch	A separate piece of equipment	Integrated	Hardware Integration
Home Area Network Gateway	Separate system or piece of equipment	Partially Integrated	Partial Hardware Integration
Cost Range per Meter [excludes customer devices]	**$70-$150**	**$130-$250**	**Cost, Depreciation, Obsolescence**
Data Collection	Interval kWh	•Interval kWh •Customer device status	•More complex data • Security and Privacy
Rate Forms Supported	Flat, Tiered, TOU, Dynamic	Flat, Tiered, TOU, Dynamic	none
Support for Usage Displays	Remote Access Separate Service	Integrated Plus Separate Service	Thru the Meter
Obsolescence Ranking	Low to Moderate	Moderate to Uncertain	Increased Risk
Support for Market Based Devices and Services	Open	"Gate Keeper" Potential	May Limit Open Market

2. Rates [Pricing] - Issues



Webinar Schedule

December 1, 2009

Overview of the NIST Standards Process

December 16, 2009

Review of the "Top Five" Smart Grid Issues

*** Schedules and access to advanced copies of all materials will be provided in advance by NARUC.**

Contact Information

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