



Advanced Metering Infrastructure (AMI)

Work Session
November 23, 2020

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Opening Remarks:

Heather Weisband,

Senior Counsel, New Jersey BPU



Education:

Chris Villarreal

Plugged In Strategies

Advanced Metering Infrastructure Work Session

Before the New Jersey Board of Public Utilities

Docket No. EO20110716

Chris Villarreal

Plugged In Strategies

November 23, 2020

Topics for Discussion

- ▶ What is AMI
- ▶ Data Access and Data Privacy
- ▶ U.S. Department of Energy report on AMI

Conversations are occurring across the U.S.

- ▶ On-going proceedings in
 - ▶ Minnesota (AMI and Data)
 - ▶ New Hampshire (Data)
 - ▶ Arkansas (Data)
 - ▶ Michigan (Data)
 - ▶ New York (Data)
 - ▶ Connecticut (AMI and Data)
 - ▶ Maryland (Data)
 - ▶ New Mexico (AMI)
 - ▶ Virginia (AMI)
 - ▶ Hawaii (Data)
- ▶ According to EEI, close to 70% of US customers will have AMI by 2021

AMI

“Advanced metering infrastructure (AMI) is an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers. Customer systems include in-home displays, home area networks, energy management systems, and other customer-side-of-the-meter equipment that enable smart grid functions in residential, commercial, and industrial facilities.”

https://www.smartgrid.gov/recovery_act/deployment_status/sdgp_ami_systems.html

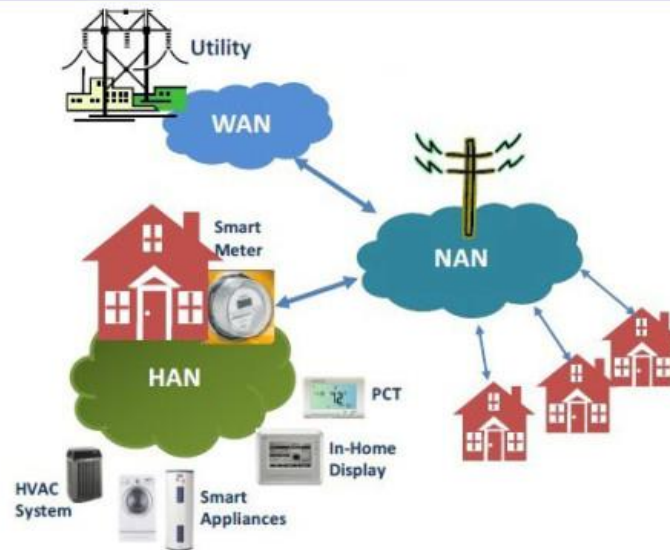


More about the meter

- ▶ Depending on utility needs, digital meter collects and stores kwh readings between 15-60 minutes.
- ▶ Usually transmits the data back to the utility a couple times a day
- ▶ Meter can collect more than just kwh! Meter monitors kw, current, volt, var, to name a few.
- ▶ Access to this information often restricted by the utility for.....
 - ▶ Business reasons
 - ▶ Meter memory and processing
 - ▶ Communication network bandwidth

Even more!

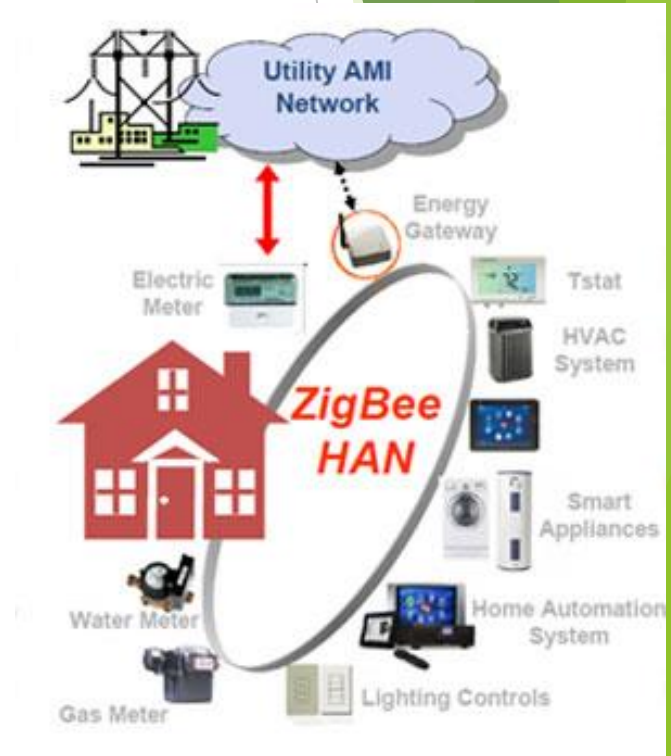
- ▶ Meter usually comes with 2 radios
- ▶ First radio (900 Mhz) is to communicate back to the utility (over a mesh network)
- ▶ Second radio (2.4 Ghz) is to communicate locally into the home

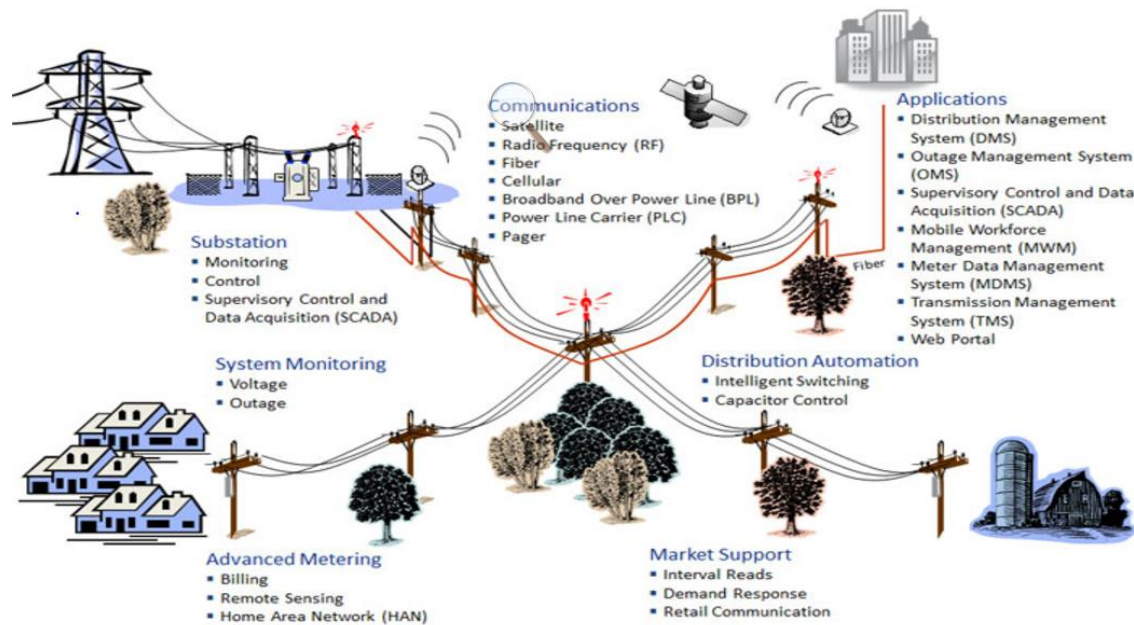


Advanced Metering Infrastructure with Home Area Networking

Home Area Network (HAN)

- ▶ Smart Meters come with two radios
 - ▶ One to send information back to the utility
 - ▶ One to send information into customer premise
- ▶ HAN radio capable of sending information every 7 seconds
 - ▶ Usage
 - ▶ Other meter data
- ▶ Requires Zigbee-certified (IEEE 2030.5) equipment
 - ▶ Router
 - ▶ In home display
- ▶ HAN can provide usage, rate, and cost information received from meter and utility via AMI network





Data Access and Data Privacy

The background of the slide is white with abstract green geometric shapes on the right side. These shapes are composed of overlapping triangles and polygons in various shades of green, ranging from light lime to dark forest green. The shapes are positioned on the right edge, creating a modern, layered effect.

Definitions

- ▶ Customer Energy Usage Data
 - ▶ Customer Energy Usage Data reflects an individual customer's measured energy usage but does not identify the customer.
- ▶ Primary Purpose
 - ▶ The use of Account Data or CEUD that is reasonably expected by the customer: (1) to provide or reliably maintain customer-initiated service; and (2) including compatible uses in features and services to the customer that do not materially change reasonable expectations of customer control and third party data sharing.
- ▶ Secondary Purpose
 - ▶ The use of Account Data and CEUD that is materially different from the Primary Purpose and is not reasonably expected by the customer relative to the transactions or ongoing services provided to the customer by the Service Provider or their contracted agent.
- ▶ Comes from DataGuard documentation

DataGuard

- ▶ Began in 2012
- ▶ Representatives included utilities, state commission staff, third parties, and privacy experts
- ▶ Met several times through 2015
- ▶ Final document released January 2015
- ▶ Resulting document set of voluntary principles
- ▶ High level in nature
- ▶ Provides guidance
- ▶ Applies to utilities and third parties

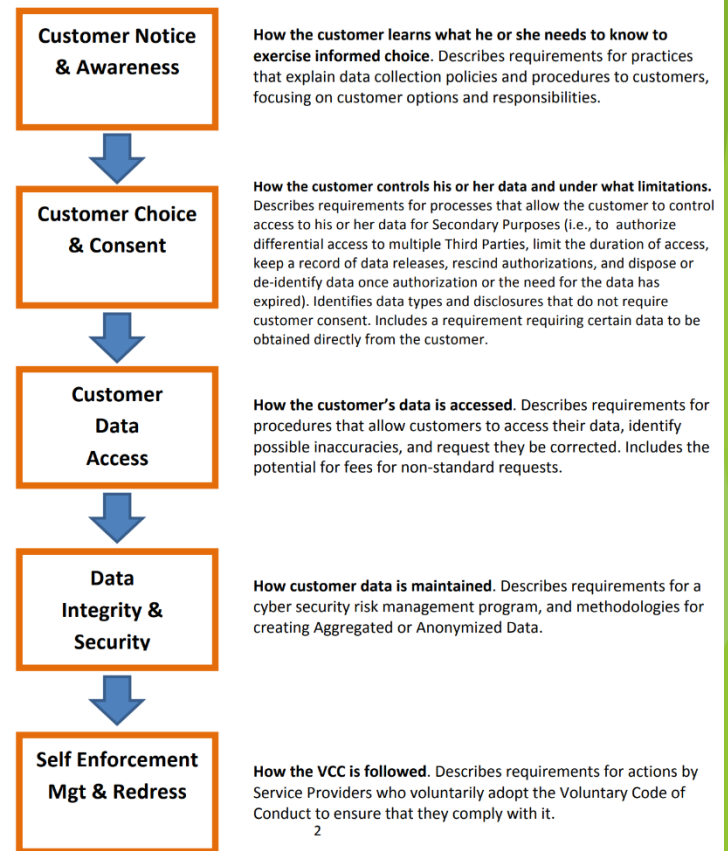


https://www.dataguardprivacyprogram.org/downloads/DataGuard_VCC_Concepts_and_Principles_2015_01_08_FINAL.pdf

Core Principles

- ▶ **Consumer Notice and Awareness:** Customers should be given prior notice about privacy-related policies and practices.
- ▶ **Customer Choice and Consent:** Customers should have a degree of control over access to their own Customer Data.
- ▶ **Customer Data Access and Participation:** Customers should have access to their own Customer Data and should have the ability to participate in its maintenance.
- ▶ **Integrity and Security:** Customer data should be as accurate as reasonably possible and secured against unauthorized access.
- ▶ **Self-Enforcement Management and Redress:** Enforcement mechanisms should be in place to ensure compliance with the foregoing principles.

Overview of the Voluntary Code of Conduct



Framework for Data Privacy

- ▶ All adopted Frameworks have similar requirements
 - ▶ Notice
 - ▶ Purpose Statement
 - ▶ Access and Control
 - ▶ Data Minimization
 - ▶ Use and Disclosure Limitation
 - ▶ Data Quality and Integrity
 - ▶ Data Security (including breach notification)
 - ▶ Accountability and Auditing
- ▶ Many frameworks are organized around the Fair Information Practice Principles, developed by the FTC in the 1970s, and later adopted by DHS.
 - ▶ See- https://www.dhs.gov/xlibrary/assets/privacy/privacy_policyguide_2008-01.pdf
 - ▶ “...this decision adopts the FIP principles as the framework for developing specific regulations to protect consumer privacy...” California PUC, D.11-07-056 (July 2011)
http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/140369.pdf

Data Access

- ▶ Privacy and data access often viewed as in conflict- but it doesn't have to be this way
- ▶ Control in the hands of the customer
- ▶ Utility (or 3rd Party) is custodian
- ▶ Identifiable
 - ▶ Customer Usage
- ▶ Non-Identifiable
 - ▶ Aggregated
 - ▶ Anonymized
- ▶ Process and formats must be consistent across utilities
 - ▶ Standards (NAESB REQ 21/Green Button)
- ▶ Risk based approach
- ▶ Differential aggregation

California Example

▶ California PUC

- ▶ Adopted July 2011 (D.11-07-056)
- ▶ Based on Fair Information Practice Principles
- ▶ Applies to utilities, utility contractors, and third parties that obtain data from the utilities
 - ▶ To be enforced via utility tariffs
- ▶ Goals of rules are both to protect customer privacy, but also enable customers to access usage data and share that data with authorized third parties to promote future conservation and grid management activities
- ▶ Primary Purpose/Secondary Purpose structure
 - ▶ Primary purposes are provision or billing of electricity or gas, provide for system, grid, or operational needs, provide services required by state or federal law or as directed by the CPUC, and “plan, implement, or evaluate” demand response, energy efficiency or energy management programs
 - ▶ Secondary purpose is anything that is not a primary purpose
 - ▶ Primary Purposes do not require customer consent
- ▶ With roll-out of gas AMI, also applies to gas only utility (Southern California Gas)
- ▶ https://www.pge.com/en_US/about-pge/company-information/privacy-policy/energy-usage-information/energy-usage-information.page



California Data Access Requirements

- ▶ All three electric IOUs should make information available to customers in a consistent manner.
- ▶ Provide customers with approximate electricity price, actual usage and bill estimate, updated daily.
- ▶ Also provide bill-to-date, bill forecast data, projected month-end tiered rate, and notification of crossing tiers; all prices should be “all in” price for electricity.
- ▶ Utilities must allow third party access via the utility’s back-haul when authorized by a customer.
- ▶ Directs utilities to develop a process to allow customers to utilize the Home Area Network to access meter data
- ▶ Created process to allow certain groups access to more granular data, such as universities and local governments
- ▶ Tariffs in machine-readable format

Green Button

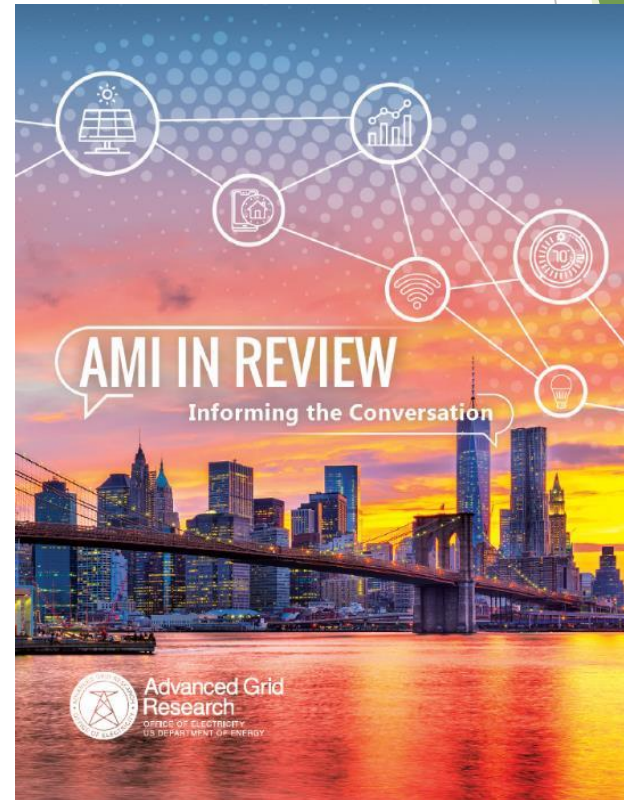
- ▶ Standards-based means of providing usage data to customer authorized third parties
 - ▶ Standard capable of providing wide variety of data, e.g., voltage, billing cycles, gas, water
- ▶ Developed starting in 2011 with California utilities
- ▶ Green Button Download
 - ▶ File format with all metering data
 - ▶ Customer provides file to third party
- ▶ Green Button Connect
 - ▶ Customer authorized third party obtains data directly from utility
- ▶ Based on delivery of AMI data, but can use any level of granularity
- ▶ Note- EDI a separate means of providing data, largely in the retail choice context.
 - ▶ Not a “competitor,” but another standard suited for a different purpose



Aggregation examples

- ▶ For most applications, 15/15 is often designated
 - ▶ Any aggregation must have at least 15 customers and no one customer is more than 15% of the load
 - ▶ Used for residential mostly
- ▶ For industrial, see 4/80
 - ▶ Must have 4 customers and no one customer is more than 80% of the load
- ▶ Aggregation is a function of
 - ▶ time (15 minutes, hourly, daily, monthly, quarterly, annually)
 - ▶ Geography (zip+4, zip, census block, city, county, state)
 - ▶ Groupings (Residential, Commercial, Industrial)
- ▶ Trade off between value and privacy
 - ▶ Annual state data, kind of useful, but privacy protected
 - ▶ Hourly residential on feeder, very useful, but privacy at risk
- ▶ Differential Aggregation
 - ▶ Adds noise to data to limit ability to re-identify a customer

U.S. Department of Energy Report:
AMI In Review: Informing the Conversation



Effort Overview

Objective: *Investigate how investments are being evaluated, determine if there was additional data or information that would be helpful, and explore the impact of new grid modernization technologies on the regulatory process.*

Phased research study with two components

- Analysis of public records: Reviewed more than 100 AMI applications
- Convene stakeholders: Spoke with over 125 individuals from over 50 entities representing commissions, utilities, customer advocates and third parties

Aim of effort

- Provide insights and perspectives on how AMI applications are being developed and evaluated
- NOT seek to offer an opinion on state actions or to advocate for or against any position.

Underlying Goals

1. Create valuable resource for industry
2. Help bridge perspectives
3. Identify opportunities for success
4. Illuminate the evolving nature of regulatory proceedings

Resulting Reports

Main Report

- Captures the collective insights and perspectives of participants
- Organized around five main chapters related to approach, analysis factors, discussion of benefits, collaboration and transparency, and customer interaction with the technology
- Includes helpful resources, list of elements to consider and questions that might be asked when developing or evaluating an investment proposal

Compendium

- Reference materials of 600 filings from over 230 proceedings
- Includes filing document details and entity review notes

A neutral perspective that informs new and experienced practitioners about the vast and complicated questions surrounding an AMI regulatory review

Conversation Findings and Observations

- Increased review scrutiny due to inconsistent implementation results
- Value is being left on the table
- Lack of a sufficient record hampers approval and increases frustration
- AMI is a big project that needs a multidisciplinary team with executive support
- CBA is a decision tool and is not necessarily a means in and of itself
- Pre-application stakeholder processes can be valuable but depends on approach
- AMI Investments funded through ARRA have had mixed results in informing regulatory proceedings

“We had an executive sponsorship that understood the magnitude of changes and made it a business priority. This was critical.”

- Utility

Approaching the Filing

Four major elements that commissions and parties are looking for

The vision

- A well-articulated vision and transparency about future investments can help alleviate concerns
- Raises questions for utilities about the right balance and how much to include

Customers at the forefront

- Make a direct connection to the customer – don't rely on the commission to infer or hear it during exploratory questions

Sufficient detail to support the record

- A proposal needs to stand on its own merits even if the commissions is favorable to the technology

Commitments and accepting risk

- Perspective differs between the various parties
- Well-defined metrics and additional reporting can give commissions and advocates confidence and level-set expectations
- Underscored by the analysis - settlement agreements typically included provisions that bound the utility to specific commitments regarding timelines and AMI functionality

**“A full grid modernization proposal
- the big picture - can be scary.”**

- Utility

Collaboration and Transparency

A collaborative stakeholder process with two-way dialog can increase understanding, bridge perspectives, instill confidence, and foster trust

- Parties increasingly **want more details and a voice in the programs and value streams** a utility might pursue
- **Hearing from engineers** about the technology and potential limitations integrating with legacy systems can be important for understanding utility choices and stakeholder viewpoints
- **Helps think through value from all perspectives**
- **Agreement on all areas is a lofty but unlikely goal**
- **Demeanor matters** – a formal demeanor can stifle impressions of openness and the free-flow of information
- **Who manages the process can make a difference**
- **Mitigate surprises through continued collaboration.** Don't necessarily limit the stakeholder process to pre-approval or an AMI deployment

AMI Analysis

- **Review often includes two components**
 - Specific cost-benefit analysis
 - Technical review
- **A positive cost-benefit analysis is not necessarily enough**
- Commissions and advocates are looking for **details, a timeline for realizing benefits, and what it will take to achieve the benefit**
- Technical **details help** regulators understand the functionality so they can **determine if the investment will perform as described and accomplish utility and state goals**
- Providing **details can address concerns about cost recovery, obsolescence, and useful life** of the asset
- Parties emphasized the importance of achieving benefits for customers sooner rather than later

“I expect to see an AMI application that is as detailed as something a utility manager would provide to the utility’s financial officer.”

– Commission

Presentation of Cost and Benefits

- The **majority of benefits** identified in utility applications **were operational benefits** with no stated connection to the customer – over 70% on average
- Operational benefits may **be easier to quantify**
- **Think about benefits** – even operational benefits - **through the lens of the consumer** (e.g., predictive maintenance can reduce unplanned outages and decrease customer frustration)
- **Intangible benefits** can be a significant factor and **can tip the scale positive**
- **Customers are not homogenous** and will prioritize value differently. Focus groups can help demonstrate an understanding of which programs hold the most value for different customers.
- Some benefits might not be cost effective to achieve
- **Don't forget about benefits that may accrue to the market** (and thus customers) – regulators, advocates and others are interested in these



Interaction Between AMI & the Customer

- AMI is **expanding the commission's and advocates' views of value** to beyond what can be achieved with utility programs
- Assessment weighs the **cost-effectiveness for consumers, whether a utility or a third-party product or service**
- **Four broad classes of issues were most prominent**
 - Can derail utility applications if not addressed.
 - Often require lengthy conversations
 - Increased sensitivities around these topics result because projected savings or benefits often depend on customer programs and participation creating a relationship between the customer and the AMI system
- **Customer education plan is important**
 - In more than 20 settlement agreements, elements of the customer engagement plan were addressed as stipulations within the agreements in nearly every one

Four broad classes of issues:

1. Enabling customer capabilities and technology
2. Customer choice and opt-out
3. Impacts to vulnerable or disadvantaged customers
4. Education and engagement

Moving Forward

“What impact will AMI have on the customer experience?”

- AMI is an early indicator of how the review process is changing
- Customer-centric view of value that is not limited to what utility can provide
- Role of the commission is changing too requiring more knowledge of the technical details
- Commissions must have a record with sufficient detail on which it can issue a decision
- Collaboration is becoming an essential component
- Benefits are being replaced with capabilities

“A bad proposal for a good technology is still a bad proposal.”

-Commission

Thank you!

Chris Villarreal

Plugged In Strategies

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Panel 1:

Ensuring AMI's Ability to Facilitate EMP Goals: An Exploration of Hardware and Software Considerations

Moderator: Paul Flanagan, Executive Director, NJ Board of Public Utilities



Panel 1:

- **Paul Flanagan, Executive Director, New Jersey Board of Public Utilities**
 - › Gregg Edeson, PA Consulting
 - › Robert Gibbs, Centrica
 - › Marissa R. Hummon, Utilidata
 - › Nha Truong, American Water

AMI Use Cases as a basis for achieving EMP Goals

Goals

Customer Benefits

Utility Operations

Social & Environmental Goals

Example Use Cases

- Customer Engagement & Communications
- Customer Energy Efficiency
- Customer DER, EV, PV
- Asset Load Phase Management, Balancing & Power Analysis
- Distribution Technical & Non-Technical Losses
- Innovative Rate Development

Tech. Requirements

Smart Meters

Communication Infrastructure

MDMS

System Integration (OMS, Billing, etc.)

Mobile / Web Customer Portals



Panel 1:

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AMI, TPS, and the EMP: Perfect Together

Rob Gibbs

Centrica

November 23, 2020

Benefits of AMI

- AMI systems and the data retrieved can enable:
 - Improved Grid Operations by providing greater awareness of what’s going on in the distribution system so EDC’s can proactively solve problems
 - This can lead to greater resiliency and outage management
 - Better integration of Distributed Energy Resources (“DER”) through data analytics
 - This means utilizing resources like solar, wind, and battery technologies in the most efficient manner and in a way that protects the reliability of the grid system
 - A growing suite of customer services like online access to energy use information, high usage alerts, power outage alerts, remote connect/disconnect services and many more
 - This provides customers with information that can help them use less energy, save more \$, manage their behaviors that impact energy use, and conduct routine transactions seamlessly
 - Innovative pricing by EDC’s or third party suppliers that rewards customers for voluntarily reducing energy consumption during peak electricity demand thereby protecting the grid system from power outages and other impacts
 - This helps save customers \$ by rewarding customers who make smart energy usage decisions

AMI and TPS

- What AMI with a Data Access Plan (“DAP”) can enable for TPS customers who consent to share their data:
 - **Time of Use offers** - Ability to charge a free or discounted rate at specific times. Examples include: Free Weekends, Free Nights, Free Month, On-peak / Off-peak discounted rates. Customers can select a plan that best fits the needs of their family with these types of offers.
 - **Prepaid** - Similar to cell phone plans, can prepay for electricity. Customers get charged their usage on a daily basis and their balances are refreshed as needed. They receive text messages with their usage so they can adjust their usage patterns as needed. Also, allows customers that don't have sufficient credit to start with a prepaid offer.
 - **Demand Response** - Customers can sign up to received demand response text messages where the TPS advises them to reduce their usage during peak / costly times. If they are able to respond and reduce their usage by x%, they qualify for a bill credit.
 - **Flat Bill** - Product that offers a flat monthly fee unless usage goes over xx kwh. While the ESCO doesn't need smart meter data for this necessarily, it helps with retention product targeting (see below) if the TPS can understand the customer's on peak / off peak usage behavior to determine a flat bill price right for them.
 - **Retention Product Targeting** - Smart meter data allows us to understand customer usage patterns and target them with products that makes sense for them, especially for time of use and flat bill offerings.

AMI and TPS cont.

- **Value add services** - By monitoring smart meter data at potentially the appliance level, the TPS can alert customers of excessive usage or problems with an appliance.
- **Smart alerts** - Many Texas customers receive Smart alert emails – these emails summarize usage halfway through the month and provide an estimated monthly bill for customers so they have advanced idea of their bill size and can adjust their usage behavior if needed.
- **Real-time energy pricing product** - Allows customers to receive wholesale energy pricing at the hourly level with no adders for a monthly fee.

So how does this help NJ's EMP?

- TPS AMI enabled products and services can help NJ achieve almost every Strategy laid out in the EMP:
 - EV TOU rates and charging infrastructure to speed adoption of EV's and electrify the transportation sector (Strategies 1 and 3)
 - Solar and energy storage products for residential/C&I to decarbonize the building sector (Strategies 2 and 4)
 - Empower customers energy management through ownership and control of their data, including sharing with TPS (Strategy 5)
 - An example of that would be customers with EVs and battery storage may be able to optimize their peak and off-peak usage
 - Community Solar and energy aggregation programs for LMI communities (better data allows for better pricing)(Strategy 6)
- **but only if a DAP is in place at the time of smart meter deployment!**

Bottom line...

- There are no justifiable barriers to inclusion of a DAP in any AMI deployment plan.
- Competitive states with AMI have or are rolling out DAPs as part of their AMI deployment (PA, IL, OH, NY)
- New Jersey should not, once again, be at the bottom of the list of states who do not have a DAP in place at the time of AMI deployment.
- New Jersey can borrow from these states' experiences and existing regulations to develop a DAP quickly and with the customer in mind.

For more information

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About Utilidata



We are the market leader in meter-based software with over a decade of experience optimizing the distribution grid.

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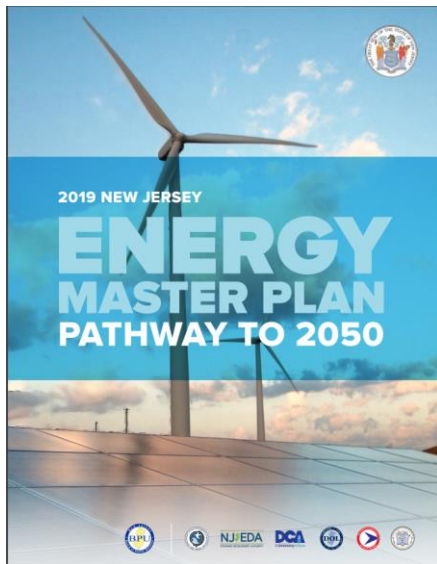
Itron

AMI can provide real-time visibility and control of the grid-edge, if equipped with the right software

New meters should come equipped with basic capabilities:

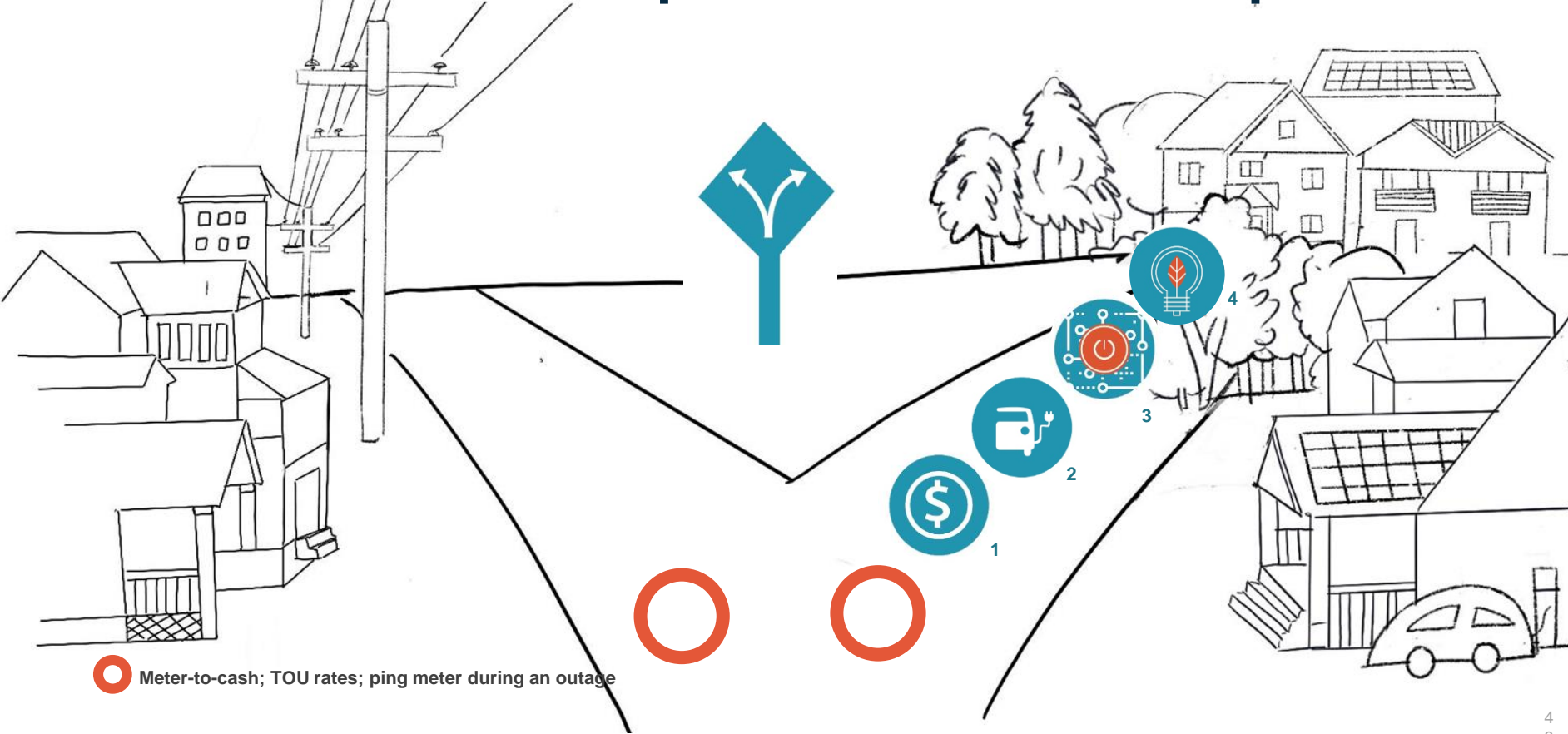
- 1. Real-Time Data Insights:** On-meter computation that distills important information in real-time, like low voltage conditions or changes in power quality
- 2. System Visibility:** Provide real-time power flow modeling all the way to the meter
- 3. Price Signals:** Communicate TOU rates and other price signals to smart devices (e.g., thermostats), service providers and customers
- 4. Local Optimization:** Identify the value of loads, storage and on-site generation and make optimization decisions/recommendations for both the grid and DERs in service of lowest-cost operations and maintaining service in an outage
- 5. Anomaly Detection:** Enable predictive detection of anomalies to prevent outages, fire hazards or security breaches

Meeting the goals of the Energy Master Plan will require real-time visibility and control of the grid-edge



Strategy 1	Reduce energy consumption and emissions from the transportation sector
Strategy 2	Accelerate deployment of renewable energy and distributed energy resources
Strategy 3	Maximize energy efficiency and conservation and reduce peak demand
Strategy 4	Reduce energy consumption and emissions from the building sector
Strategy 5	Decarbonize and modernize New Jersey's energy system
Strategy 6	Support community energy planning and action with an emphasis on encouraging and supporting participation by low- and moderate-income and environmental justice communities
Strategy 7	Expand the clean energy innovation economy

Initial approval is where the path for AMI is set and where outcomes and capabilities should be specified





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Panel 2:

Data Access, Sharing, and Transparency

Moderator: Abraham Silverman, General Counsel, NJ
Board of Public Utilities



Panel 2:

- **Abraham Silverman, General Counsel, New Jersey Board of Public Utilities**
 - › Leah Gibbons, NRG Energy, Inc.
 - › Terrence J. Moran, Public Service Electric and Gas
 - › Michael Murray, Mission:data Coalition
 - › Gary Rahl, Deloitte Consulting, LLP
 - › Chris Villarreal, Plugged In Strategies
 - › Sherri Weigand, Vistra Corp
 - › Luis Ceferino, Princeton University

Data Access: Ensuring Consumers Realize the Full Value of AMI

New Jersey Board of Public Utilities – AMI Work Session
November 23, 2020

Leah Gibbons, NRG Energy, Inc.

Competitive Retail Markets will Deliver Innovation



In a well-structured retail electricity market, **competitive retail suppliers will deliver innovative, value-added products and services** – including time-of-use and demand response products – to consumers **when the barriers** inhibiting the deployment of these products and services **are removed.**

Unlocking the Innovation



- Smart meter/AMI deployment
- Load settled and PLCs calculated based on interval meter data – not load profile
- Supplier access to their customers' bill quality, interval meter data on a near real-time basis (i.e., 48 hours or less) – with customer consent
 - ❖ Customers own their consumption data and should be permitted to grant access to the service provider of their choice
 - ❖ Utilities must provide suppliers with access to their customers' near real-time interval meter data all at one time (i.e., automated), every single day, with Watt level precision
 - ❖ flat file format accessible through a secure portal or website
- Supplier Consolidated Billing

Market Status



Jurisdiction	Smart Meters	Mass Market Load Settlement ¹	"Real Time" Data Access ²
PA	PECO/FE/PPL – Yes	IDR	Yes
MD	BGE/PHI– Yes FE – No	IDR FE - Profile	Yes FE - No
DC	PHI – Yes	IDR	Yes
DE	PHI – Yes	IDR	Yes
NJ	No	Profile	No

Cost recovery in other markets via base rates and/or tariff riders

IDR = Interval Data Recorded Usage; Profile = Rate Class Average Usage; ¹IDR noted if used for PJM Settlement A; ²Real Time = data access within 48 hours or less; ³Unconfirmed; ⁴Under discussion

Delivering Smart Energy Solutions

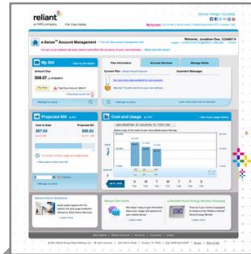


Engage/Educate consumers through information and convenience

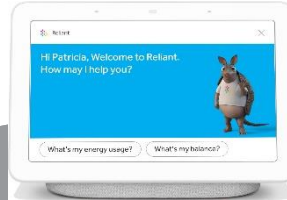
Weekly Email



Web Portal



Google Hub



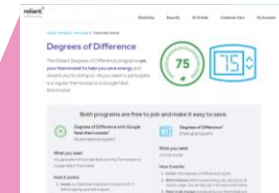
Insight

Mobile/Txt Alerts

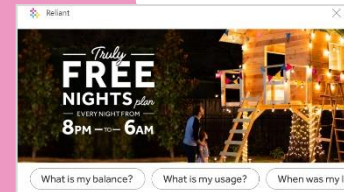


Enable new product choices to empower consumers

Demand Response Plans



Pricing Plans (TOU)



Convenience

Choice

Solar



EV and Fleet Vehicles

Provides platform for new services



Appliances

Automation



Thermostats/Controllers

Partnership Offers



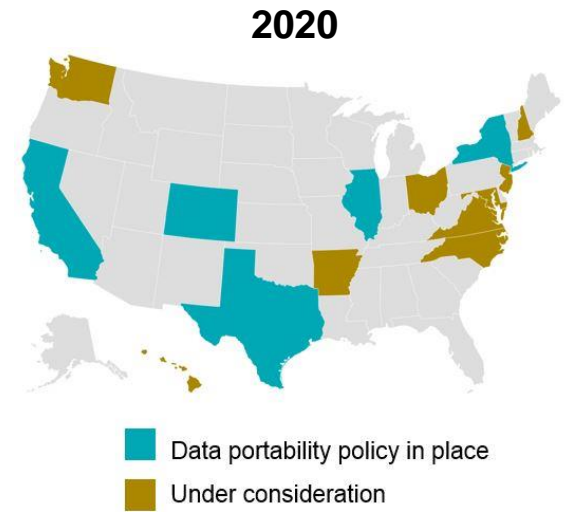
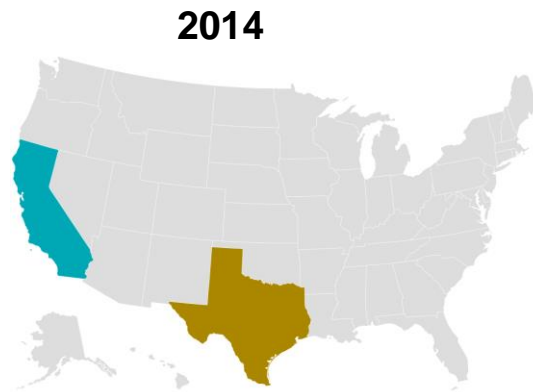


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MISSION DATA

empowering energy savings



36 million meters and growing...

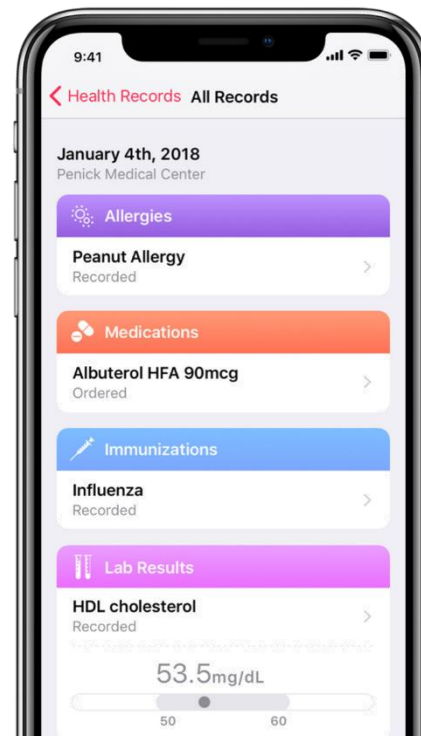


Global movement toward data portability



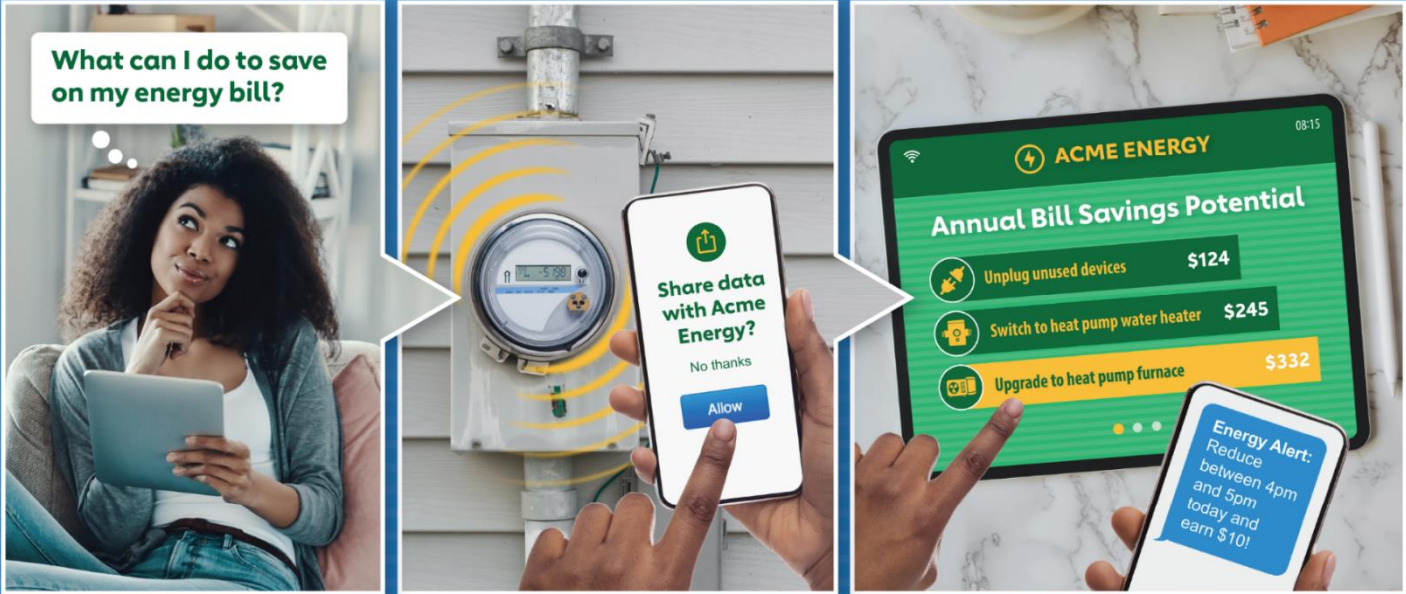
Payment Services Directive (PSD2)

More info: <https://bit.ly/2yVCHPv>



Energy data portability: How would you use it?

How energy data portability benefits consumers

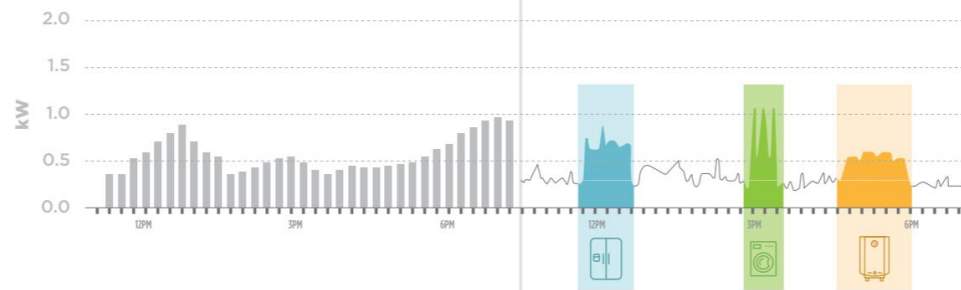



A new generation
of smart meters
has big
potential...

SMART METER



SMART METER + COMPUTER



SAMPLE FREQUENCY	15 minutes	1/10,000th of a second or less
MEASUREMENTS	energy (kWh)	energy (kWh), voltage, current
END-USE IDENTIFICATION ACCURACY	40%-80%	90%+
EXAMPLE RECOMMENDATIONS	<i>"Your heating system needs attention"</i>	<i>"You left the living room lights on"</i>
APPLIANCE LEVEL INSIGHT	Overall heating Overall Cooling Large loads such as EVs	Individual devices/appliances 

...but also significant risks:

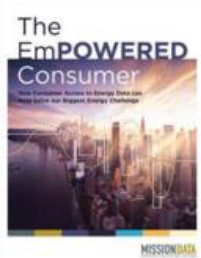
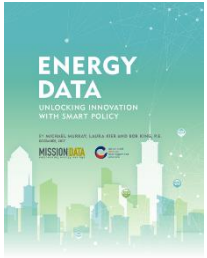
- Utility is gatekeeper of the “app store”
- Utility can capriciously reject apps
- Utility can extract rents
- Utility can set the terms
- Utility can cripple certain features
- Utility can surveil third party apps

Principles of Digital Platform Regulation

1. App Store policies should be Fair, Reasonable and Non-Discriminatory (FRAND)
2. Due process rights for DERs/third parties
3. Fair competition



Thank You



Michael Murray
President
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Panel 2:

- **Abraham Silverman, General Counsel, New Jersey Board of Public Utilities**
 - › Leah Gibbons, NRG Energy, Inc.
 - › Terrence J. Moran, Public Service Electric and Gas
 - › Michael Murray, Mission:data Coalition
 - › Gary Rahl, Deloitte Consulting, LLP
 - › Chris Villarreal, Plugged In Strategies
 - › Sherri Weigand, Vistra Corp
 - › Luis Ceferino, Princeton University



Insights from the 2019 DER Data Initiative for AMI planning and Data Transparency

New Jersey Board of Public Utilities Advanced Metering Infrastructure (AMI) Work Session

Panel Two: Data Access, Sharing and Transparency
November 23, 2020

Gary Rahl
Managing Director, Deloitte Consulting LLP

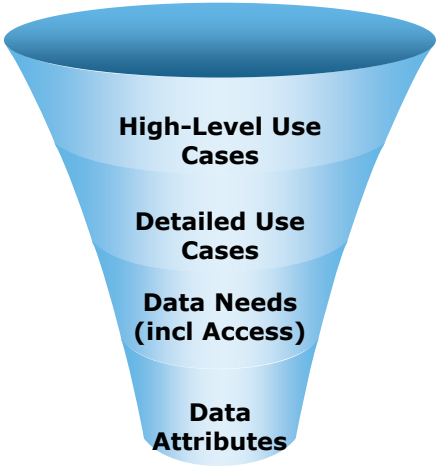
Insights from 2019 DER Data Initiative

Summary

- April to December 2019
- 20+ Distributed Energy Resource companies and analysts
- Developed Use Cases & Data Needs
- Described Data Access Environment needed
- Produced Summary Report



Approach



Insights from 2019 DER Data Initiative

Use Cases Identified (Examples)

Distributed Energy Resources:

- Identifying and engaging potential DER customers;
- Designing, implementing, and operating DERs;
 - o Individually, aggregated (e.g., community), or as part of microgrid

Transportation Electrification:

- Siting EV charging facilities;

Building Electrification:

- Assessing business case for building energy solutions

Interconnection/Hosting Capacity

Regulatory Oversight (rate cases, non-wires alternatives, etc.)

Insights from 2019 DER Data Initiative

Implications for AMI

1) Use cases are almost never supported by a single data type/source (e.g., AMI)

- Customer, system, market, and DER data are most valuable together

2) Data needs for clean energy market growth, grid planning, and grid operations are different in important ways

- AMI plays a role in each, but specific AMI capabilities required for each may vary

3) Data standards are valuable, but haven't shown to be enough by themselves

4) NH, NY are strongly considering data platforms to focus effort, drive impact



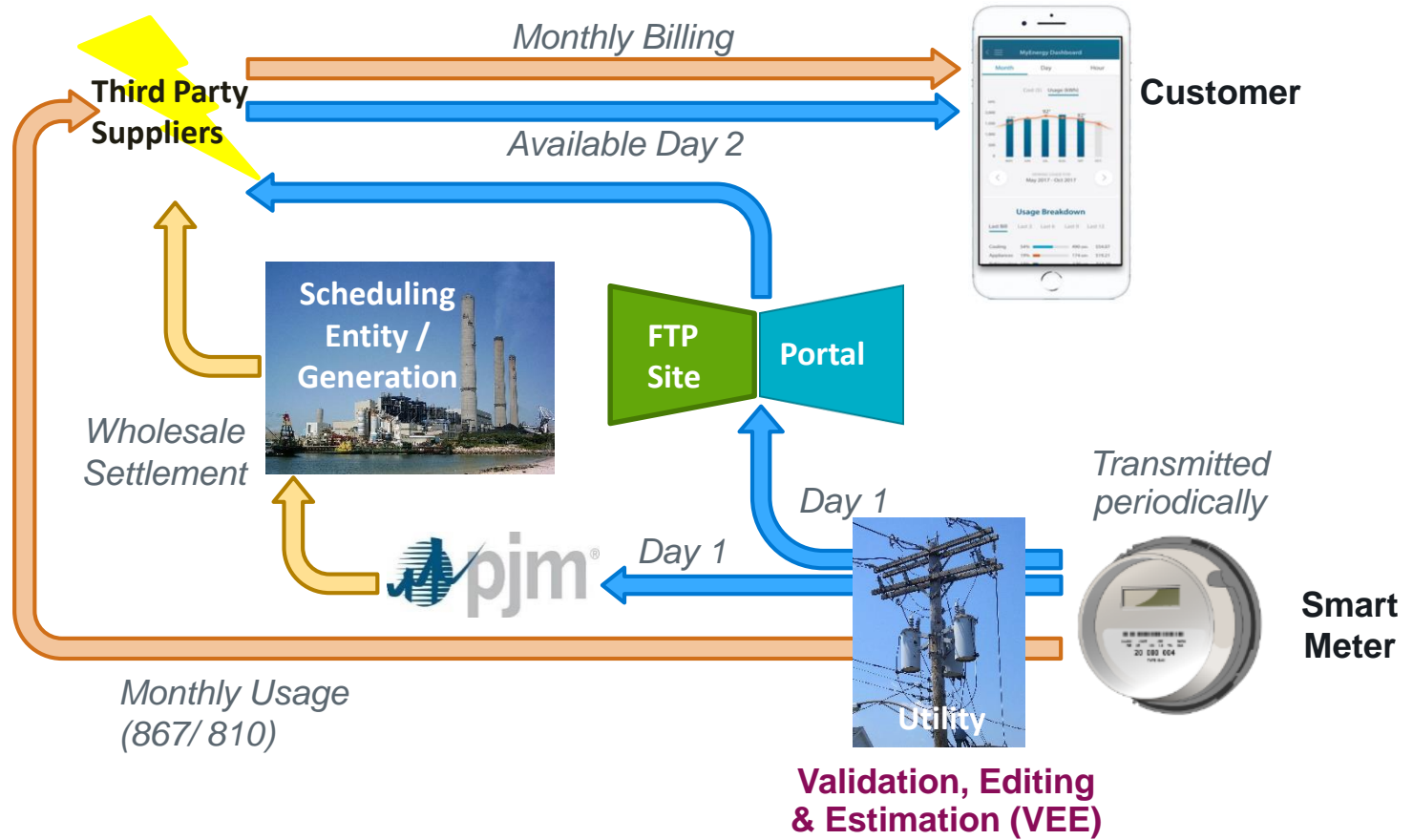
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Access to AMI Data & Impacts on the Market

New Jersey Board of Public Utilities
Advanced Metering Infrastructure Work Session
November 23, 2020

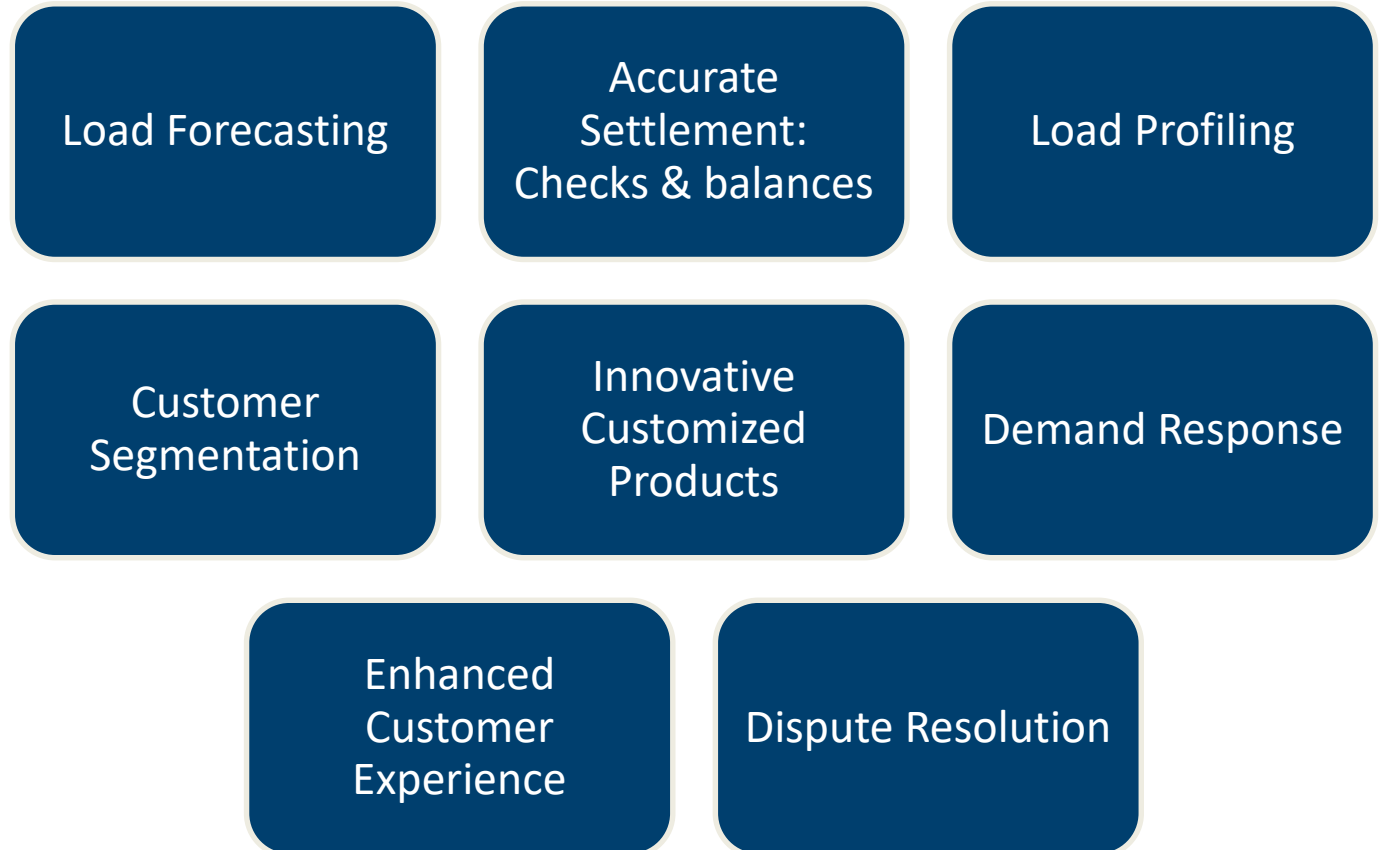
AMI Data Flow Diagram



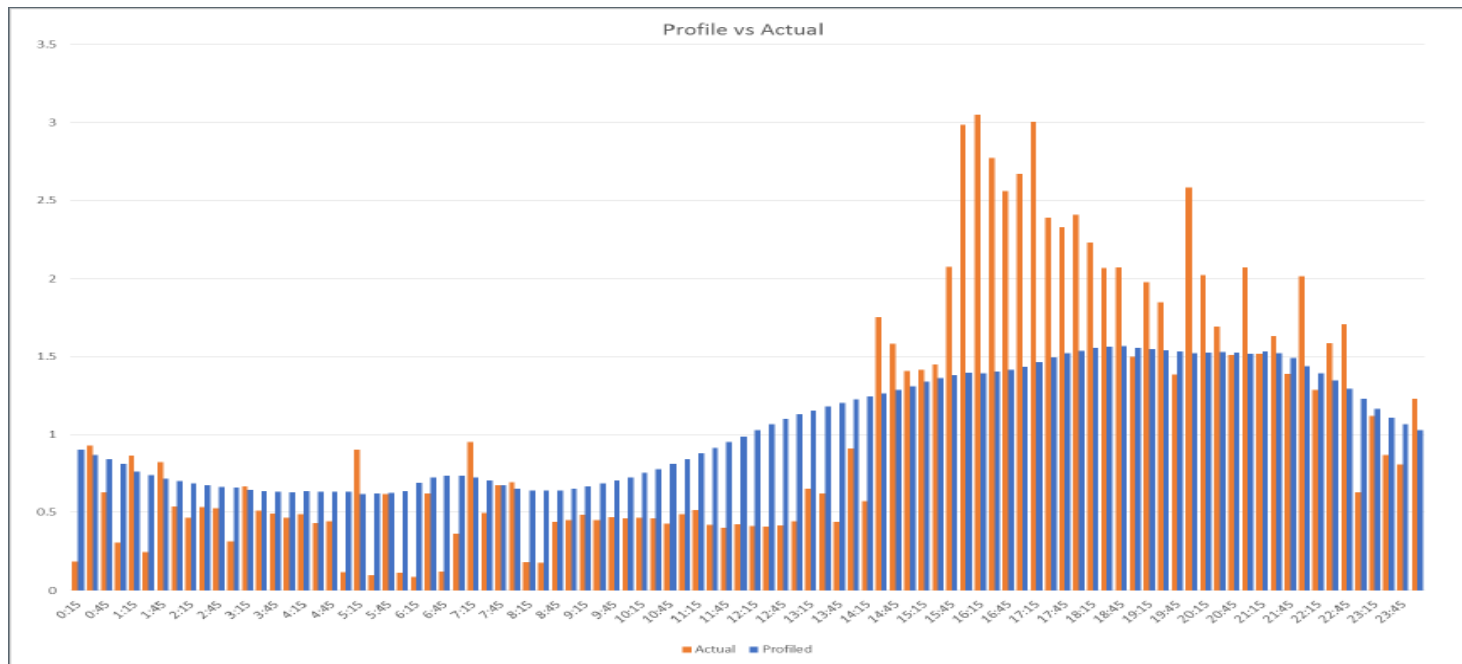
Third Party Supplier Interval Data Uses



TPS access to daily customer interval data allows customers to realize the **full value** of AMI deployment.

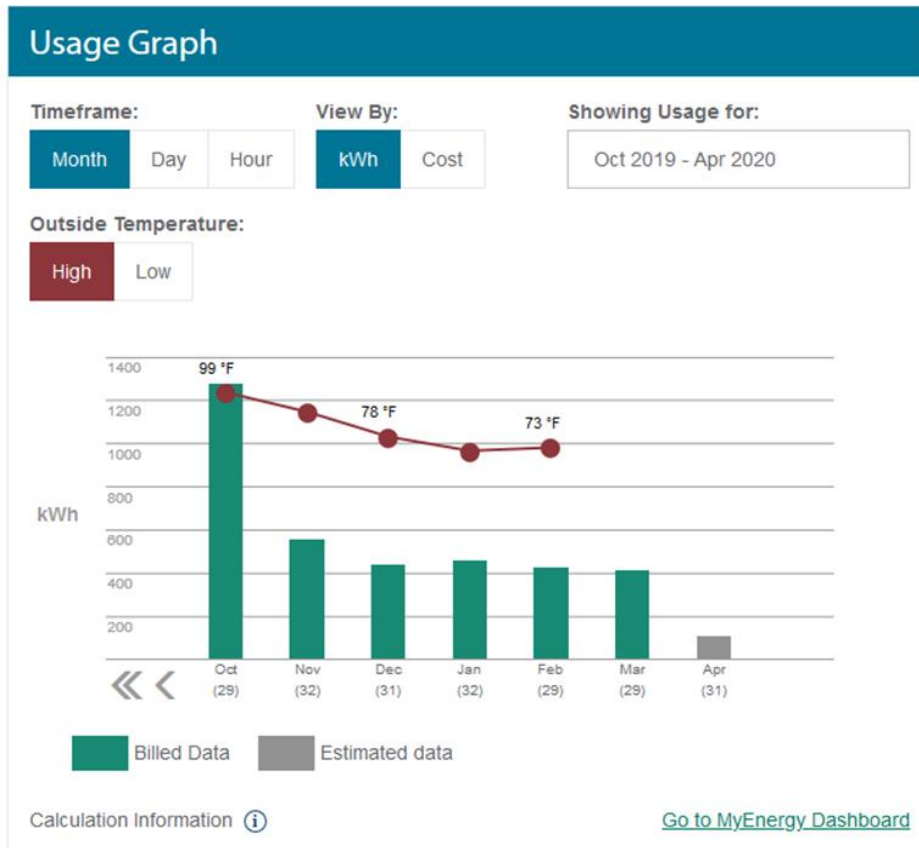


Settlements - Profiled Data Vs Actual Data



Residential consumption can vary greatly from the profiled consumption. If suppliers have access to data, they can develop Time of Use (TOU) products based on the customer's actual usage patterns.

Benefits of Interval Data Access - Enhanced Customer Experience



- ✓ Value Added Services
- ✓ Usage graphs mapped with temperatures
- ✓ Ability to send Budget Alerts

Demand Response Products

- Price-based demand response products give customers time-varying rates that reflect the value and cost of electricity in different time periods.
- Customers enrolled on a demand response product tend to use less electricity at times when electricity prices are high.
- Examples: Time of Use or Indexed Products

Incentive-based Programs

- In some restructured states, retail suppliers who have real-time access to customer usage data pay participating customers to reduce their usage at times requested by the retail supplier, triggered either by a grid reliability problem or high electricity prices.
- Example: Peak Rewards

Market-Wide Financial Benefits

- Demand response averts the need to use the most costly-to-run and inefficient power plants during periods of otherwise high demand, driving production costs and prices down for all wholesale electricity purchasers.

In the TX market, over 1 million premises are enrolled in demand response products.*

* 2019 ERCOT data

Thank you!

For additional questions, please contact Sheri Wiegand.

Sheri.Wiegand@vistracorp.com



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Written Comments

- The Board will be accepting written comments on this matter until 5pm E.S.T. on December 7, 2020.
- Please submit your written comments in PDF or Word format to board.secretary@bpu.nj.gov or see meeting notice for e-filing instructions.
- Please reference Docket No. EO20110716 in the subject line of your comments.



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Thank You!