SMUD's Data Analytics Initiatives

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Agenda

- Introduction
- Background and Drivers
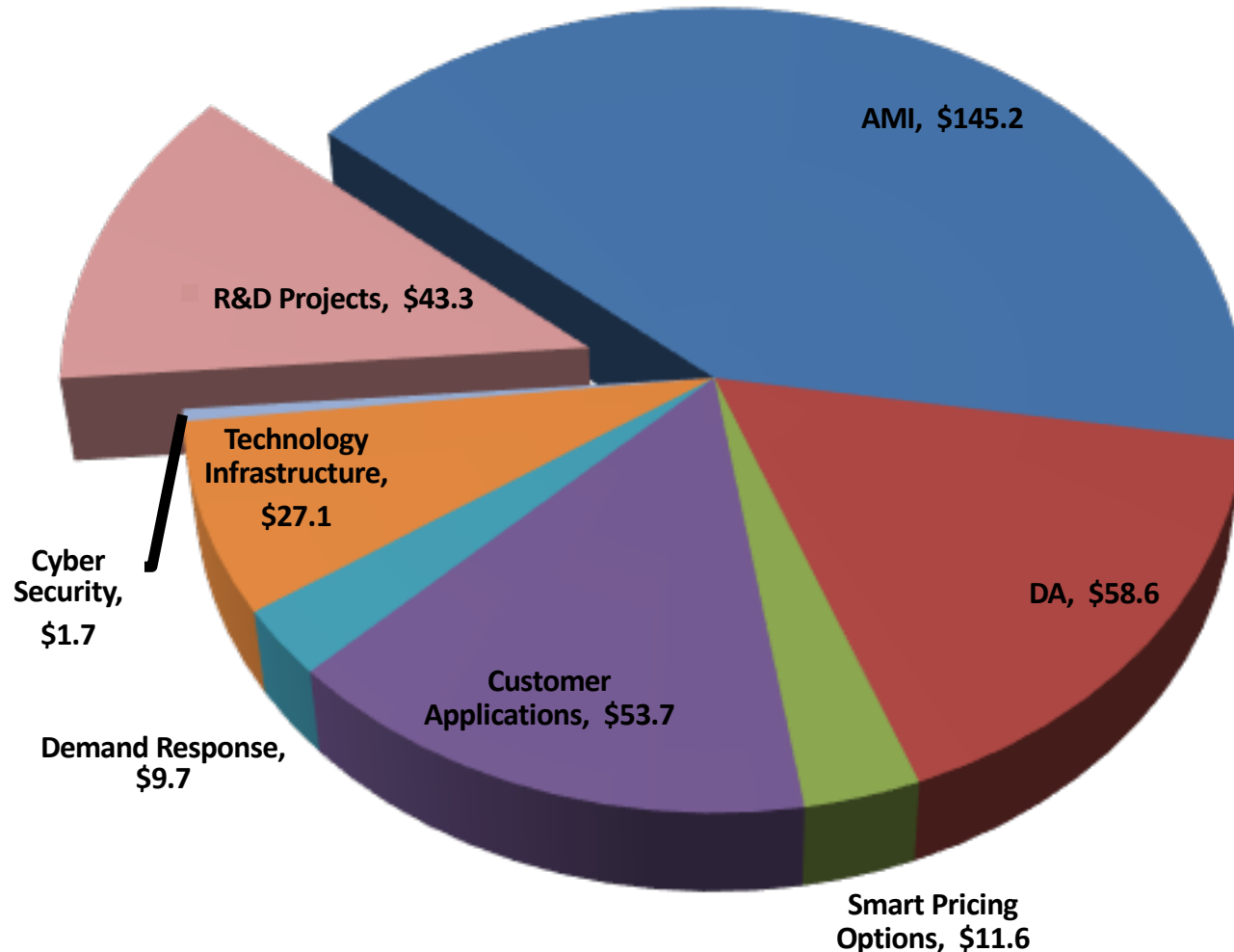- SmartSacramento® Projects
- Customer Data Analytics

About SMUD

- 626,000 meters
- 1.5 million population
- $1.5 billion in revenues
- 900 mi^2, 2304 km^2 service territory
- 7 member, elected Board of Directors

- Not-for-Profit Utility
- 2nd largest muni in California, 6th largest in the US
- 3299 MW peak load (2006)
- 2219 employees

Background - SmartSacramento

Smart Grid Budget $351M ($307.7M SGIG + $43.3M R&D)

AMI, $145.2

R&D Projects, $43.3

DA, $58.6

Technology Infrastructure, $27.1

Cyber Security, $1.7

Customer Applications, $53.7

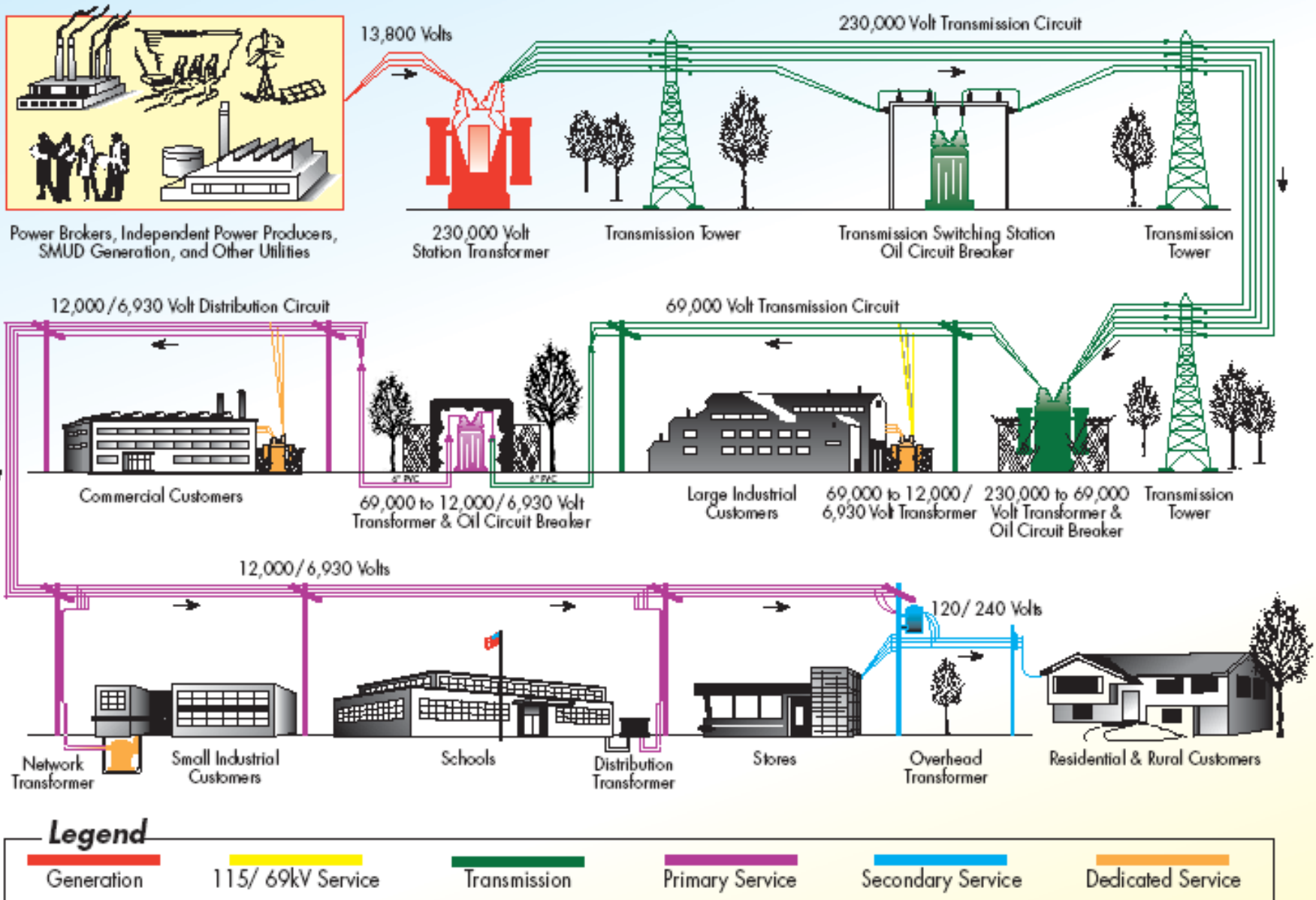Demand Response, $9.7
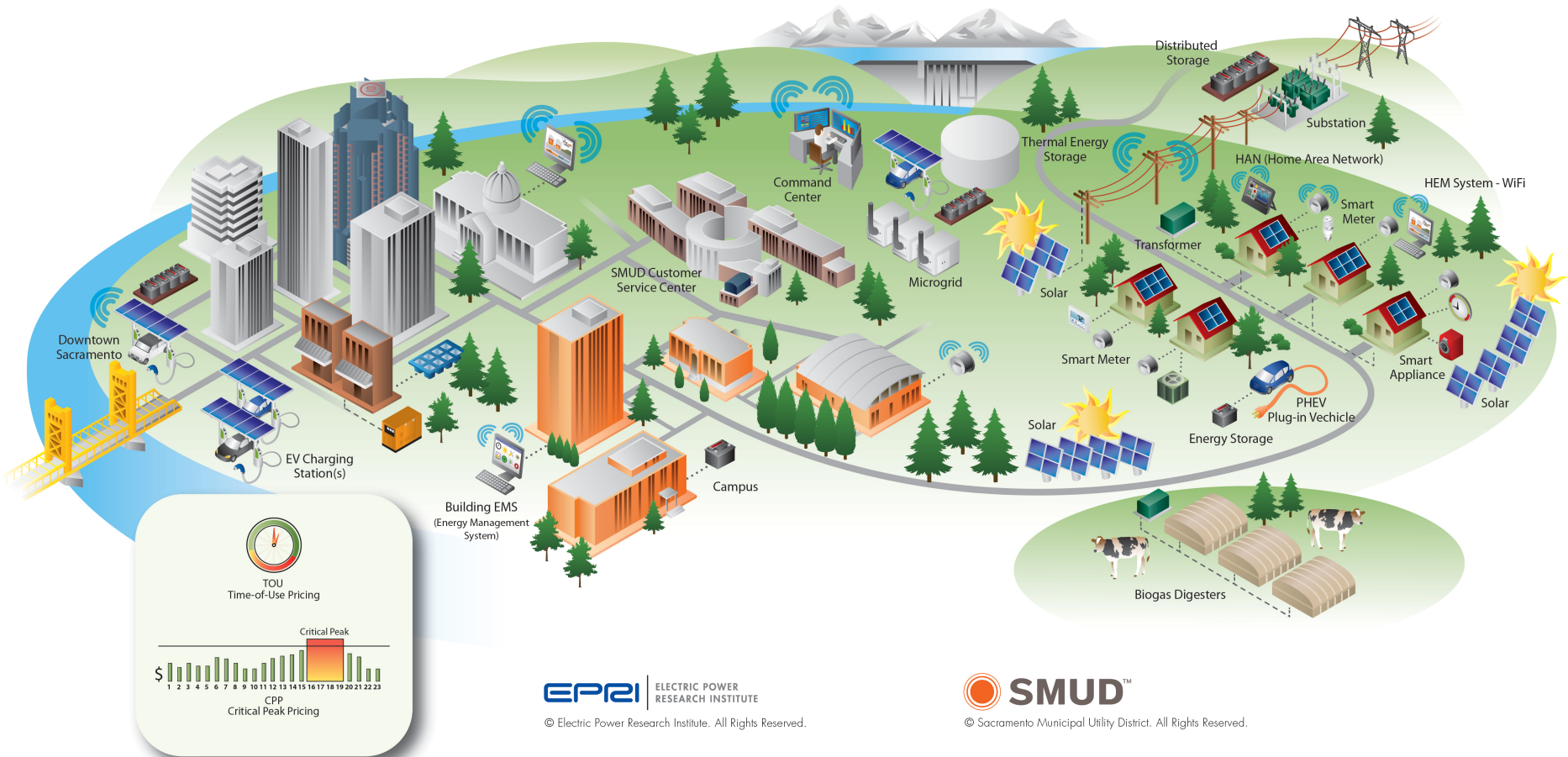
Smart Pricing Options, $11.6

New Data Sources

- AMI Residential—720x increase when moving from monthly reads to hourly reads

- Voltage—hourly voltage reads add new data and increase storage needs

- TOU creates new data

- Increasing SCADA

- Outage management improvements

- New devices in the field—switches, sensors, etc.

Typical Grid—Central Station to Customer

Power Brokers, Independent Power Producers, SMUD Generation, and Other Utilities

13,800 Volts

230,000 Volt Transmission Circuit

230,000 Volt Station Transformer

Transmission Tower

Transmission Switching Station Oil Circuit Breaker

Transmission Tower

12,000/6,930 Volt Distribution Circuit

69,000 Volt Transmission Circuit

Commercial Customers

69,000 to 12,000/6,930 Volt Transformer & Oil Circuit Breaker

6" PVC

6" PVC

Large Industrial Customers

69,000 to 12,000/ 6,930 Volt Transformer

230,000 to 69,000 Volt Transformer & Oil Circuit Breaker

Transmission Tower

12,000/6,930 Volts

120/240 Volts

Network Transformer

Small Industrial Customers

Schools

Distribution Transformer

Stores

Overhead Transformer

Residential & Rural Customers

Legend

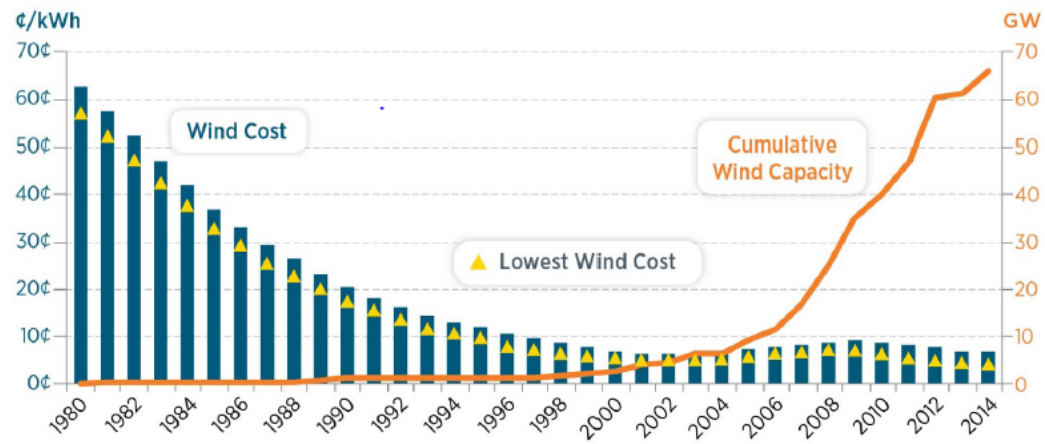| Generation	115/69kV Service	Transmission	Primary Service	Secondary Service	Dedicated Service

0769-06

Vision for the Future
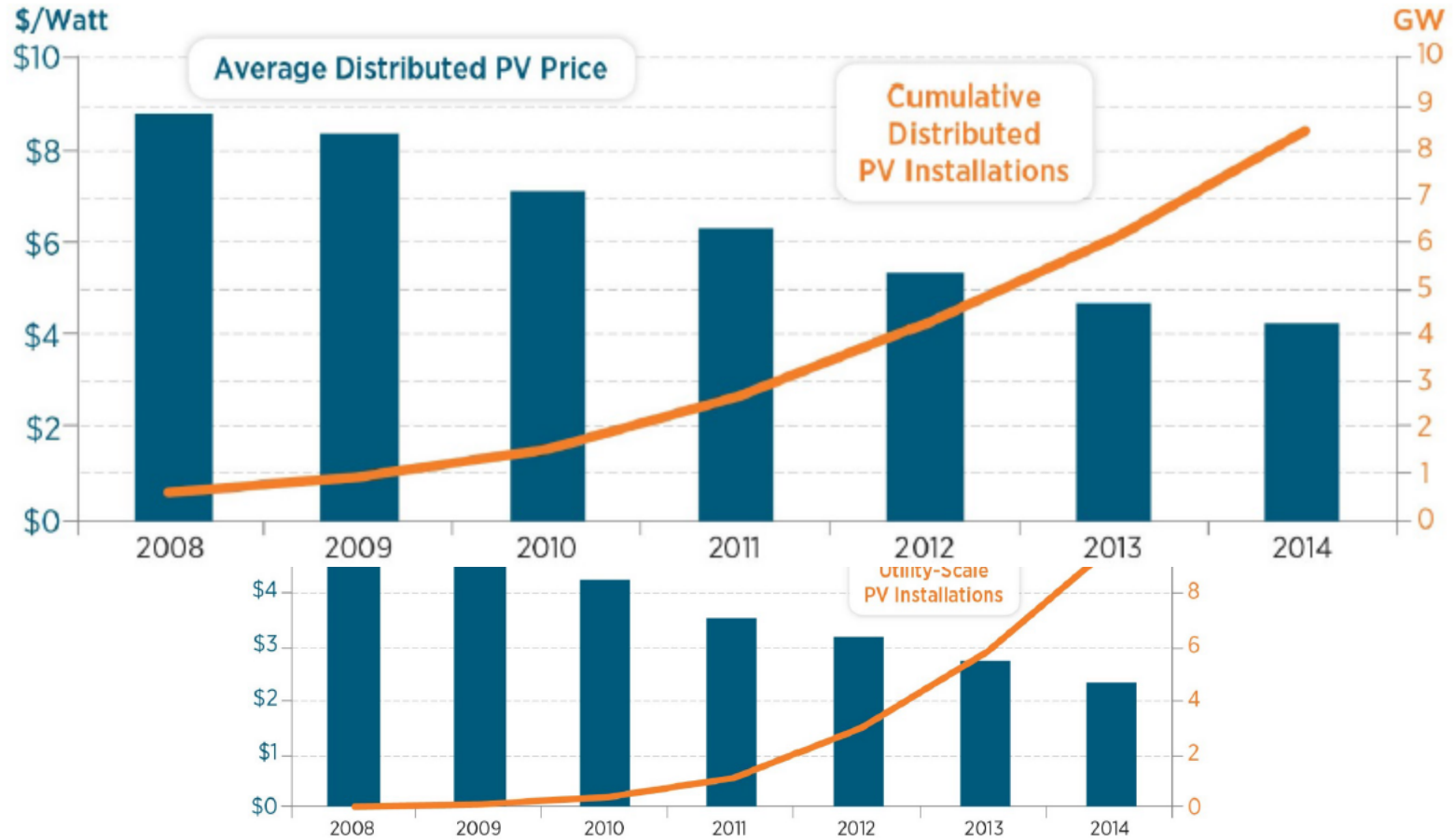
Drivers for Better Data Analytics

Increasing Distributed Energy Resources, DERs

- Renewables

- Energy Storage

- Electric Vehicles

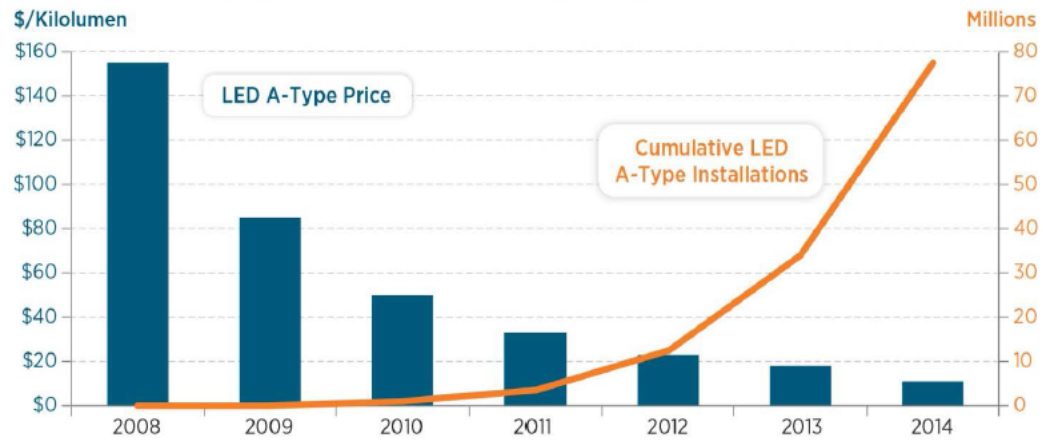- Demand Response

- Energy Efficiency
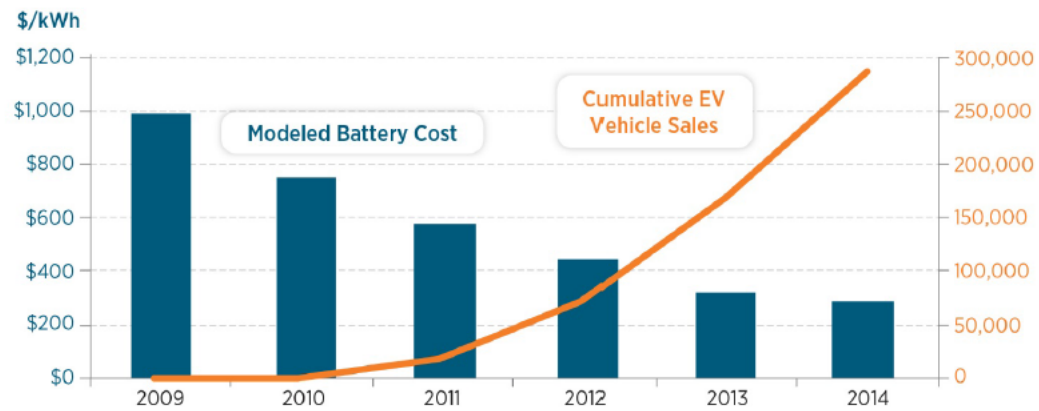
- DG/Microgrids

Land-Based Wind Power

Land-Based Wind Power chart showing Wind Cost (¢/kWh), Lowest Wind Cost, and Cumulative Wind Capacity (GW) from 1980 to 2014.

Solar PV: Distributed Generation

$/Watt — GW

Average Distributed PV Price

Cumulative Distributed PV Installations

Utility-Scale PV Installations

LED Lighting

Electric Vehicles

$/kWh

Chart showing Modeled Battery Cost (bars, left axis) and Cumulative EV Vehicle Sales (orange line, right axis) from 2009 to 2014.

DER Price Trajectory

Cost Reductions Since 2008

Land Based Wind (-41%)
Distributed PV (-54%)
Utility-Scale PV (-64%)
Modeled Battery Costs (-73%)
LED Bulbs (-94%)
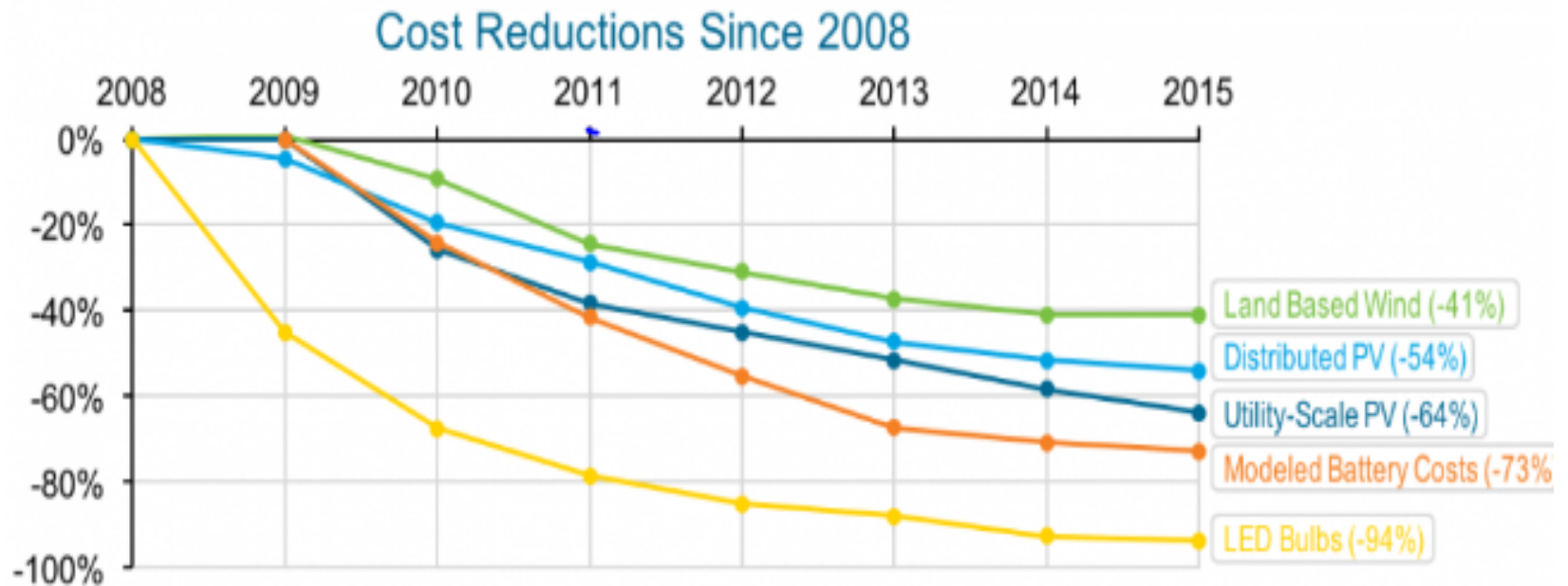
From Revolution…Now - DOE

Drivers--Regulation/Legislation

Transformation of Distribution Planning Process	• AB 327: Distribution Resource Plans	Transparent, competitive procurement
CAISO Expansion and integration of DERs into wholesale markets	• DER Aggregation & access to markets to drive efficiency	Easier DER market access
Support for new energy technology innovation = jobs	• Regulators favoring opening access to third parties in order to spur innovation and jobs	Opportunity for local community
New mandates – DR, Storage, EE, Renewables	• EE: SB 350 (doubling EE by 2030), AB 802 (Real-time M&V) • Storage: AB 2514 • DR: AB 1330: IOUs 10% of peak from DR by 2025	Accelerated DER growth
Continued focus on carbon – CARB and transportation	• ZEV mandate: 2.3M vehicles by 2030, • ↑LCF trajectory • Governor: ↓40% GHG by 2030, ↓80% by 2050 • SB 350: 50% RPS by 2030	Increased focus on transportation

Potential Disrupters for the Utility Industry

- Self generation

- Net energy metering

- Two-way power flows on the dist system

- Legislative or regulatory requirements to do things that are not cost-effective

- Community Choice Aggregation

- Energy efficiency

- Low income credits

=Minimal, stagnant or declining loads and revenues

Data Analytics 3.0

1.0 Traditional Analytics
- Primarily descriptive analytics and reporting
- Internally sourced, relatively small, structured data
- "Back room" teams of analysts
- Internal decision support

2.0 Big Data
- Complex, large, unstructured data sources
- New analytical and computational capabilities
- "Data Scientists" emerge
- Online firms create data-based products and services

3.0 Rapid Insights Providing Business Impact
- Analytics integral to running the business; strategic asset
- Rapid and agile insight delivery
- Analytical tools available at point of decision
- Cultural evolution embeds analytics into decision and operational processes
- All businesses can create data based products and services

Source: The international Institute for Analytics

Enterprise Analytics

Data governance structure

Data warehouse

Data ownership

Developing rate structures

Business intelligence
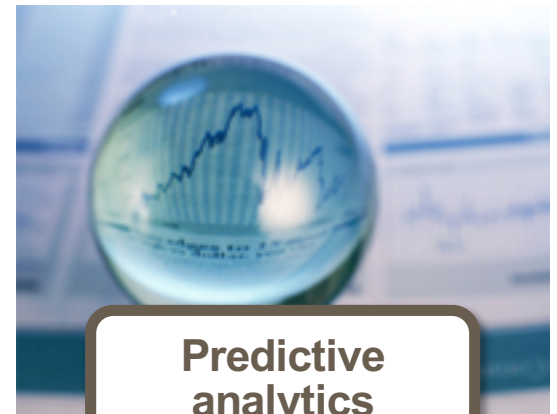
Predictive analytics

Some of Our Analytics Projects

Smart grid set foundation

Outage **management & communications**
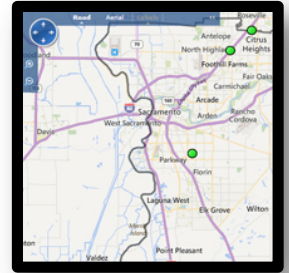
Workforce & asset management

Operational **Efficiencies**

Energy Theft

Distributed energy resource management

Improved Outage Mgmt System

Outage Management System

- Focused on "Change Management" to realize the full benefits of new software by
  - Enhancing internal processes and systems which feed information to OMS
  - Address line automation maintenance procedures which hindered use of SCADA indications
  - Enable text notification and address any integration issues in enabling AMI and SCADA
  - Continue to adapt processes to benefit from electronic wall map

SAVI
Situational Awareness and Visual Intelligence

OVERVIEW
- Electronic maps and data integration provide in-depth view of the distribution system by
  overlaying information from many sources on a digital map.

DATA INTEGRATION
- GIS, Pi, LDAP/Active Directory
- Third-party services such as NOAA, Oracle Locator; ESB, SQL Server, SAP, MS Access and Excel.

CUSTOMER BENEFITS
- Faster response time to outages
- Ability to react to system needs remotely and immediately
- Fewer interruptions in service.

UTILITY BENEFITS
- Provide greater access and ability to synthesize information and visualize data in a timely manner
- Observe trends over time
- Better insight and more efficient planning capabilities.
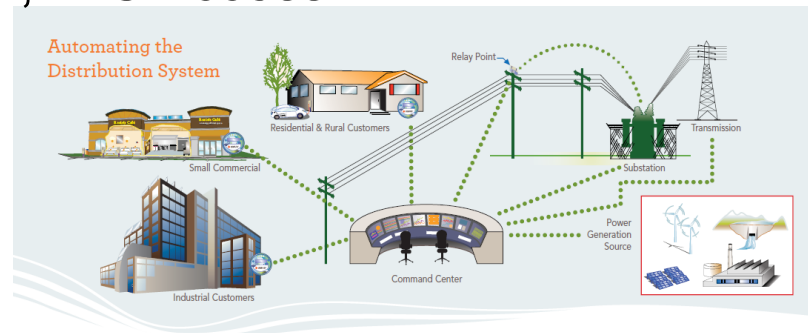
Automating the Distribution System

MEADOWVIEW-MACK ● POCKET
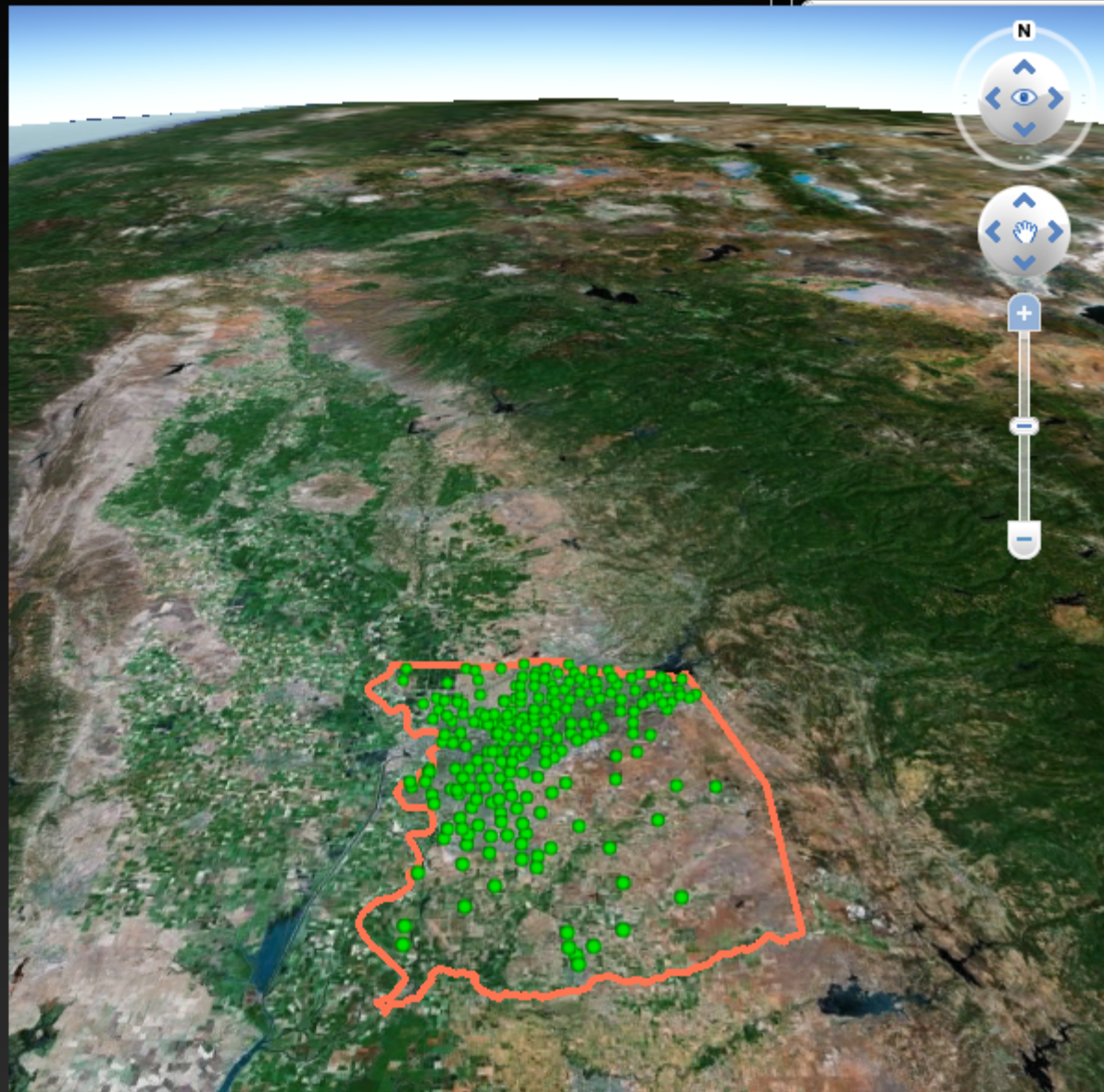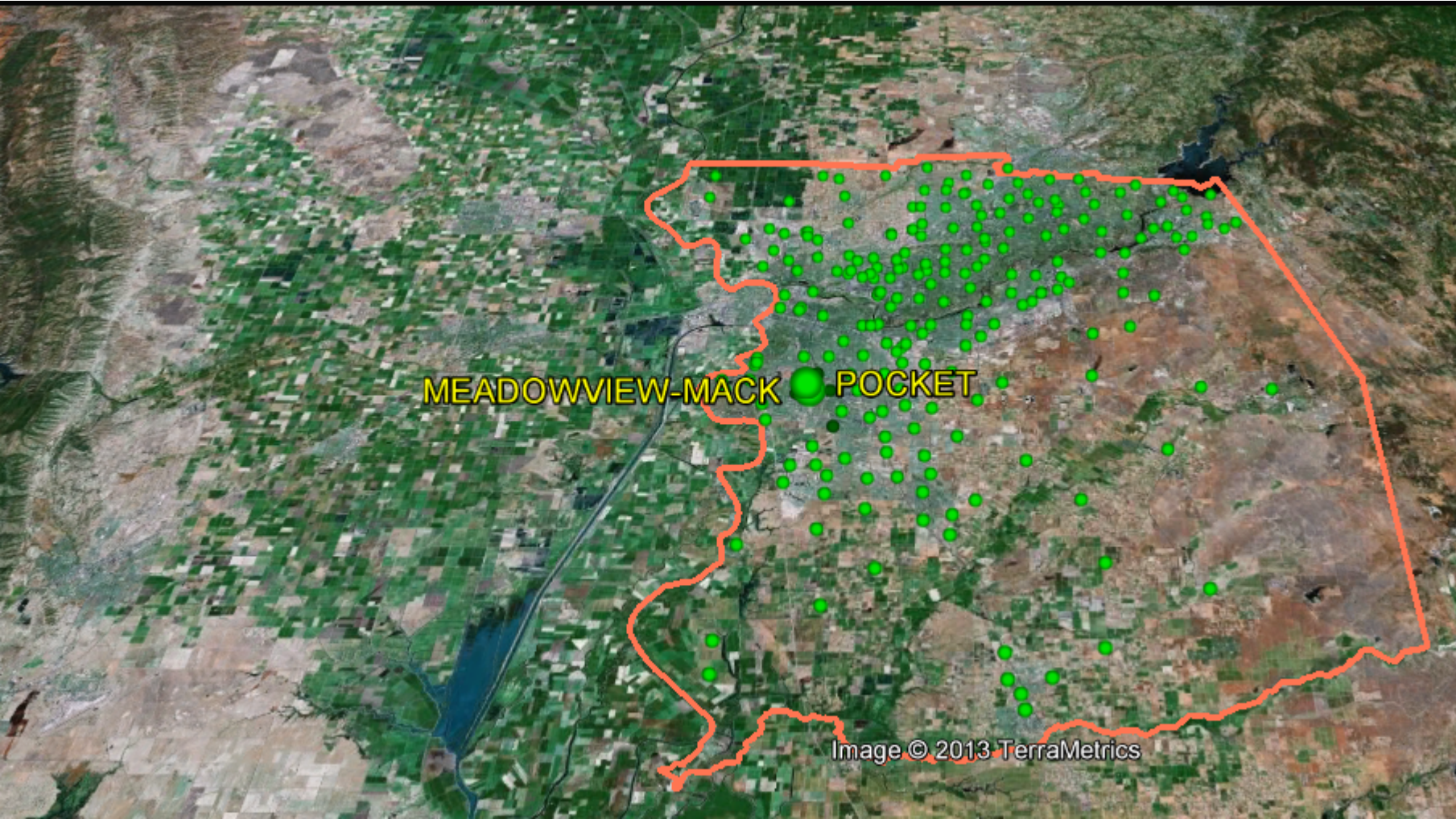
Image © 2013 TerraMetrics

1262

1-KMP-2

224 MVA

224 MVA

6919

6916

224 MVA

6915

4-K
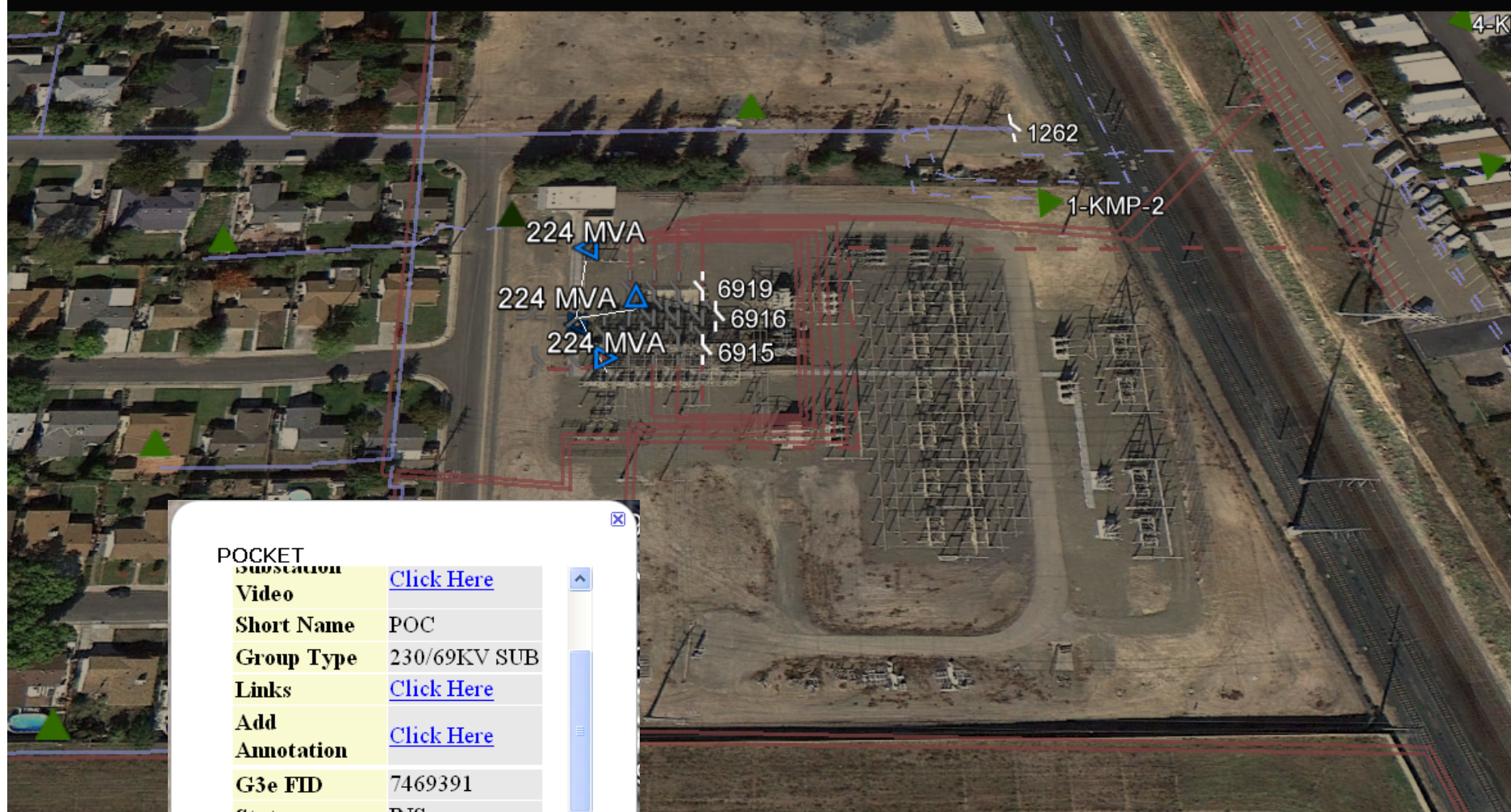
POCKET	
Substation Video	Click Here
Short Name	POC
Group Type	230/69KV SUB
Links	Click Here
Add Annotation	Click Here
G3e FID	7469391
Status	INS
Load	Load

SAVI: Photovoltaic Monitoring
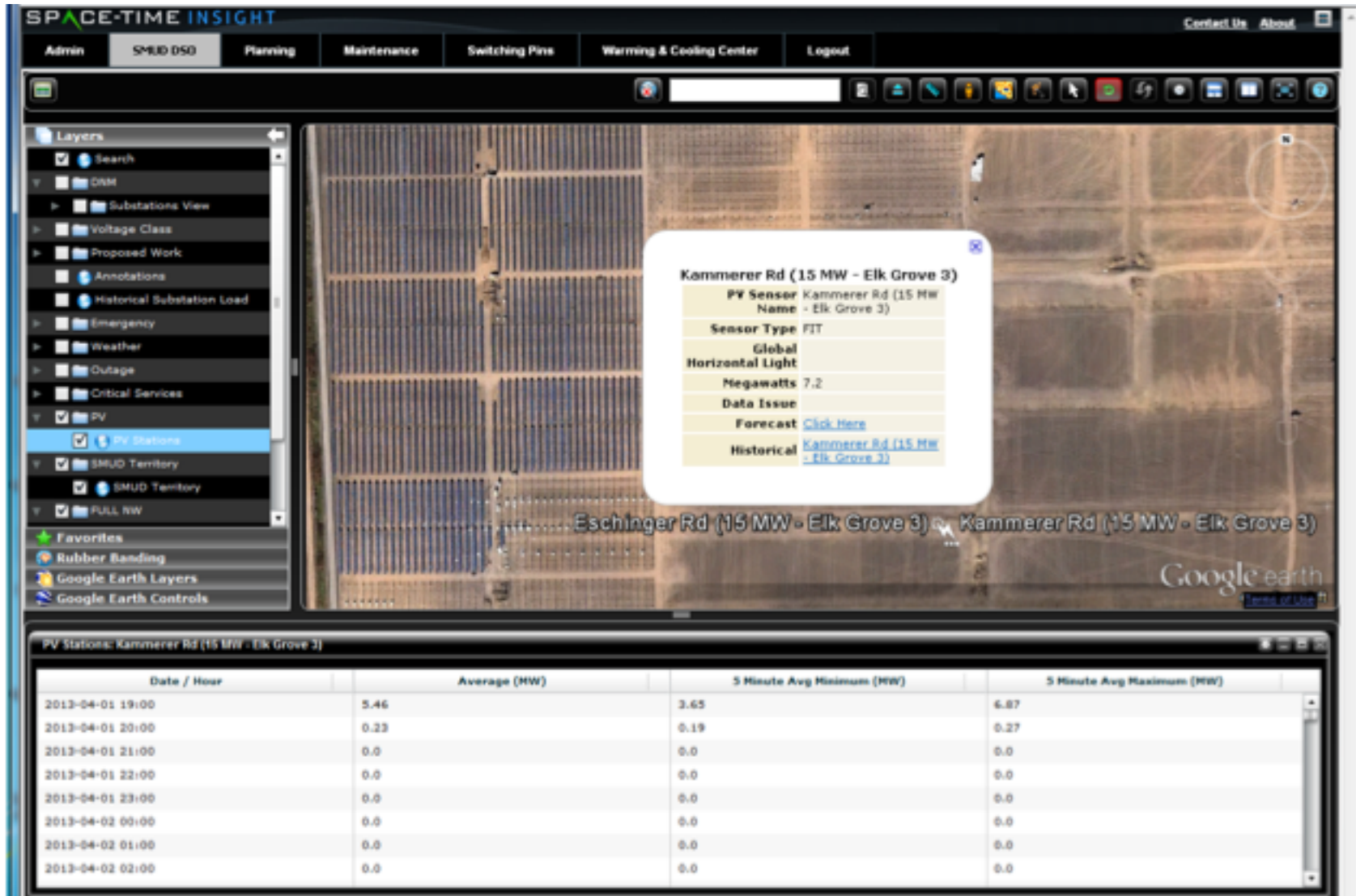
SAVI: Outage Information

Theft Detection and Recovery
Detectent

OVERVIEW
- Software identifies and prioritizes the most probable theft cases by combing smart meter and legacy system data and using analytics to rank accounts that have the highest risk scores to flag for investigation.

DATA INTEGRATION
- *Smart meters*
- *SAP/CIS*: customer, premise, billing, service notifications, GIS
- *Third party*: County assessor (parcel, square footage), weather, business listing

CUSTOMER BENEFITS
- Improves customer safety reducing risk of shock, fire, or property damage.
- Reduces occurrences transformer overload.
- Reduces revenue loss which impacts rates.
- Detects some malfunctioning meters.

UTILITY BENEFITS
- Improves overall safety
- Focus on highest value cases.
- More efficient resource utilization
- Reduces investigation costs and revenue loss.
- Moves utility to being proactive rather than reactive.

One of the Reasons for Reduced Revenue…

Has Become a Reason for Revenue Growth…

What's Happening

- City of Sacramento approved guidelines for indoor grows

- Normal warehouses generally range from 1-5 watts/sf, depending on use

- Grow facilities average 60–80 watts/sf

- Our substations and infrastructure were not designed for these loads and we need some expensive upgrades

VVO and CVR
Reducing Line Losses and Boosting Efficiency on the Distribution System

OVERVIEW:
- Model-based conservation voltage reduction (CVR) and a volt/var optimization (VVO)

  strategy to reduce line losses and boost the efficiency of the distribution system

DATA INTEGRATION
- Uses automated line capacitor banks and the communication network installed under line automation and updated substation equipment in SCADA

  retrofit..

CUSTOMER BENEFITS
- Increased energy and bill savings without disruption of service, quality, or behavior.

UTILITY BENEFITS
- Improved system efficiency
- Increased energy savings
- Reduced line losses
- Increased efficiency of distribution system

VVO / CVR

Substation

Voltage reduced at substation

126 V

Voltage

Voltage Profile - LTC & Capacitors

Voltage Profile - LTC control only

End customers continue to see acceptable voltage

Voltage Profile - LTC control and VVO/CVR

114 V

Increasing Distance from Substation
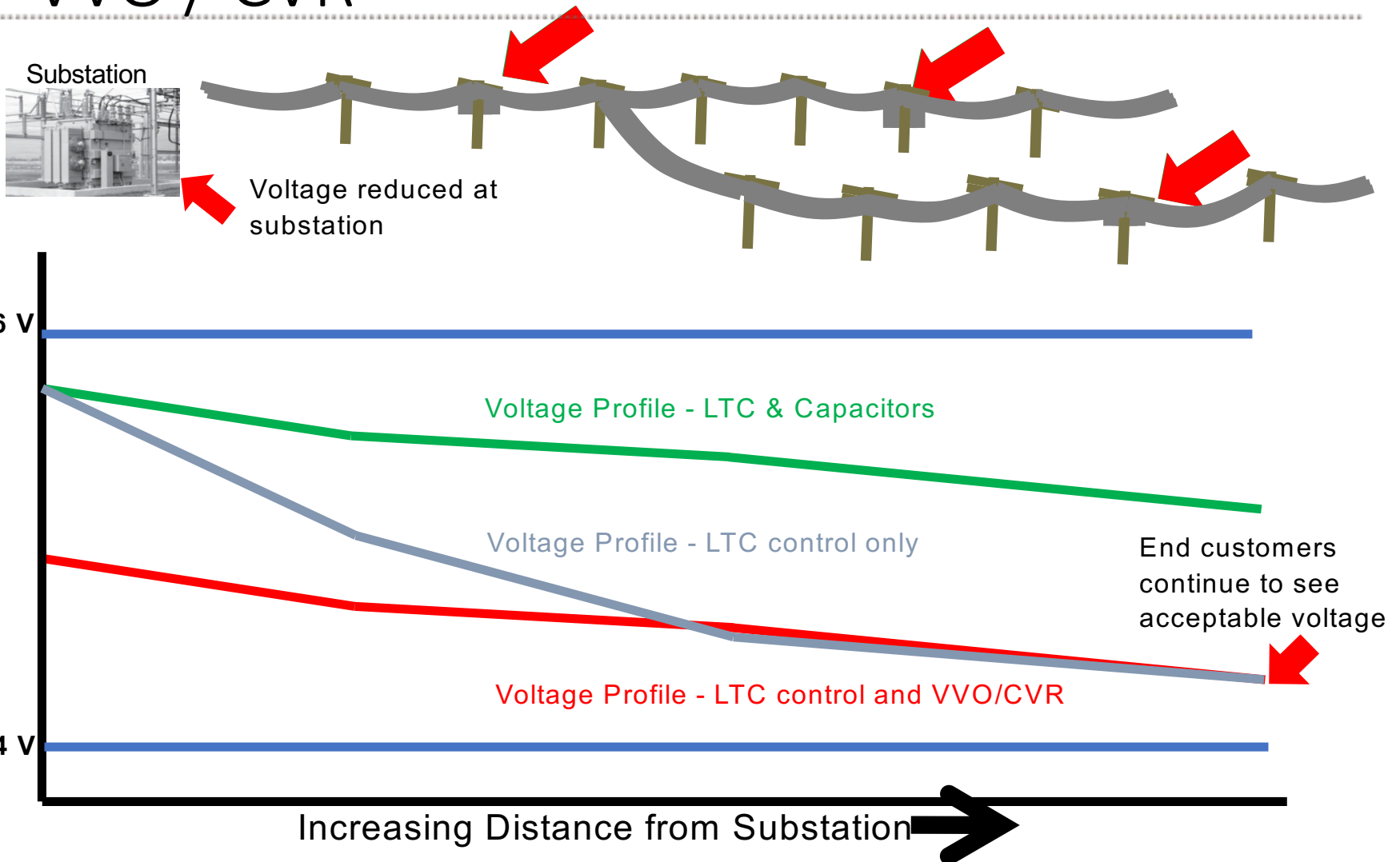
2011 Pilot Deployment - CVR Results

Myrtle-Date 2% CVR Analysis
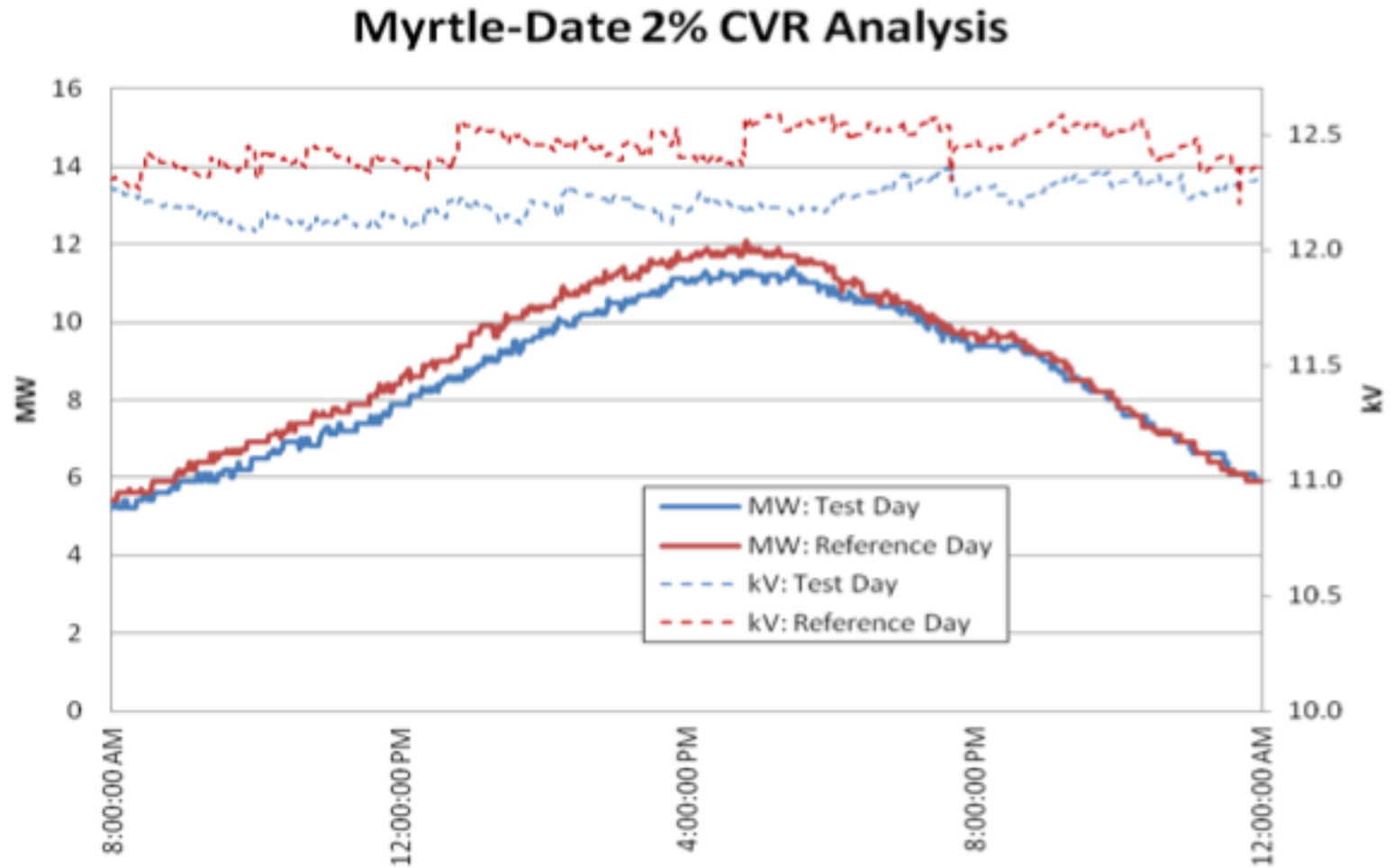
Project Successes – 2013 Analysis

Estimated Substation Average Weekday CVRf (OLS) and Approximate 90% Confidence Intervals
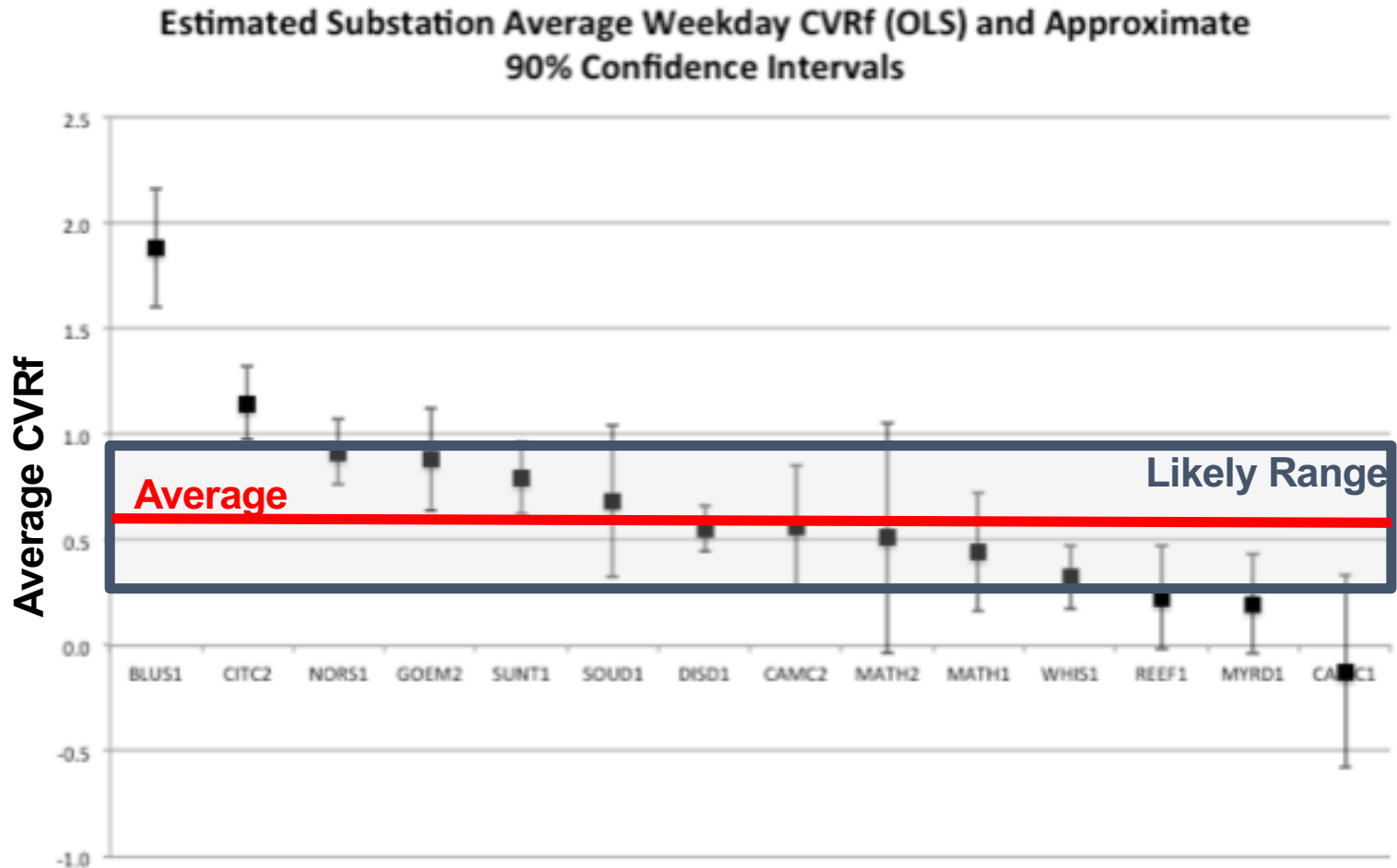
Next Steps with CVR

- Modeling shows too many voltage violations with existing system and capacitor location

- Studying the possibility of relocating capacitors to improve CVR capability

Photovoltaic Integration, Monitoring and Forecasting

OVERVIEW

- Residential Inverter Control Demonstration tested control and communication with residential inverter using AMI.
- Solar Irradiance Monitoring and Forecasting looks at predictability and consistency of solar monitoring and forecasting.

DATA INTEGRATION

- Demonstration of smart-meter-to-inverter wireless communications and end-to-end demonstration
- Collection of solar data such as Global Horizontal Irradiance (GHI) and Direct Normal Irradiance (DNI) to characterize solar resources and variability.

CUSTOMER BENEFITS

- Advancement of PV technology and integration options for future programs and utility efficiencies.

UTILITY BENEFITS

- Supports federal and state distributed renewable energy goals
- Understand opportunities challenges for integrating inverters with AMI
- Evaluate impacts on transmission system under different scenarios
- Better understand forecast accuracy and resolution. Evaluate and improve forecasting by Sandia National Labs and to craft recommendations for weather researchers.

SmartPricing Options

| Standard Residential CBS Rate | On-Peak Prices Weekdays: 4-7 PM | | Off-Peak Prices (All Other Hours) | | Monthly Service Charge |
	Peak Price	Critical Peak Price	Tier 1	Tier 2	
Time-Of-Use Peak Rate	$0.27	$0.00	$0.0846	$0.1660	$10.00
Time-Of-Use with Critical Peak Pricing	$0.27	**$0.75**	**$0.072**	$0.1411	$10.00
Critical Peak Pricing (Stand-Alone)	$0.00	**$0.75**	$0.0851	$0.1665	$10.00

| Low Income Residential CBS Rate | On-Peak Prices Weekdays: 4-7 PM | | Off-Peak Prices (All Other Hours) | | | Monthly Service Charge |
	Peak Price	Critical Peak Price	Tier 1	Tier 2	Tier 3	
Time-Of-Use Peak Rate	$0.20	$0.00	$0.0550	$0.1162	$0.1660	$3.50
Time-Of-Use with Critical Peak Pricing	$0.20	$0.50	$0.0468	$0.0987	$0.1411	$3.50
Critical Peak Pricing (Stand-Alone)	$0.00	$0.50	$0.0553	$0.1165	$0.1665	$3.50

Impacts For Opt-In TOU
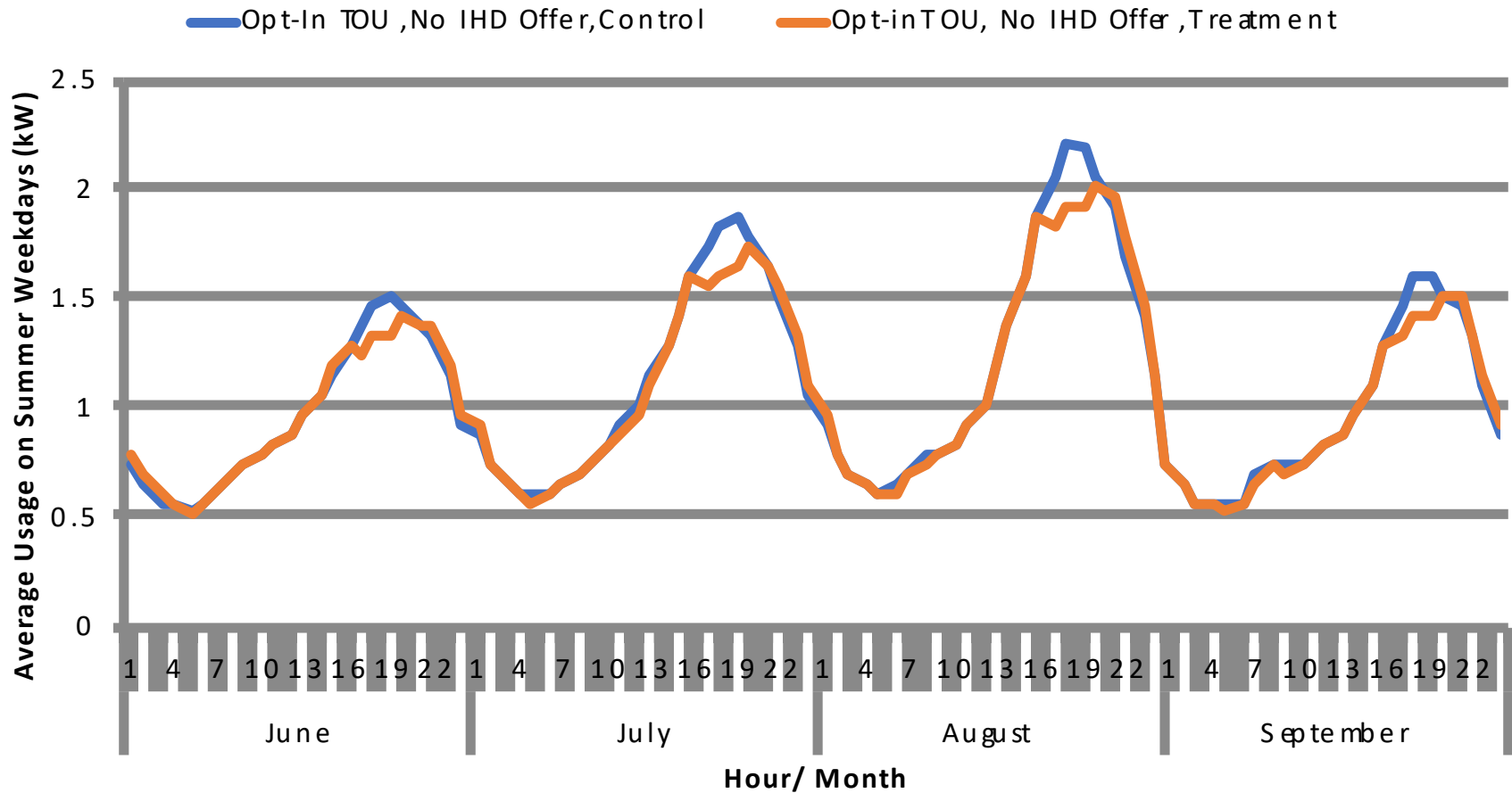
*Results are quite similar for TOU with IHD offer treatment group

Proposed 2018-19 TOU Summer Rate

Summer – Residential Time-of-Day rate (5 – 8 p.m. Peak)
June 1 – September 30

$0.2835 kWh
Peak
Mon. – Fri. only
5 p.m – 8 p.m.

$0.1611 kWh
Mid-Peak
Mon. – Fri. only
noon – 5 p.m.

$0.1611 kWh
Mid-Peak
Mon. – Fri. only
8 p.m. – midnight

$0.1166 kWh
Off-Peak
Mon. – Fri.
midnight – noon
All hours on weekends and holidays

$0.1016 kWh for all use for electric vehicle owners

$/per kWh

12 noon   5 pm   8 pm   12 midnight   6 am   12 noon
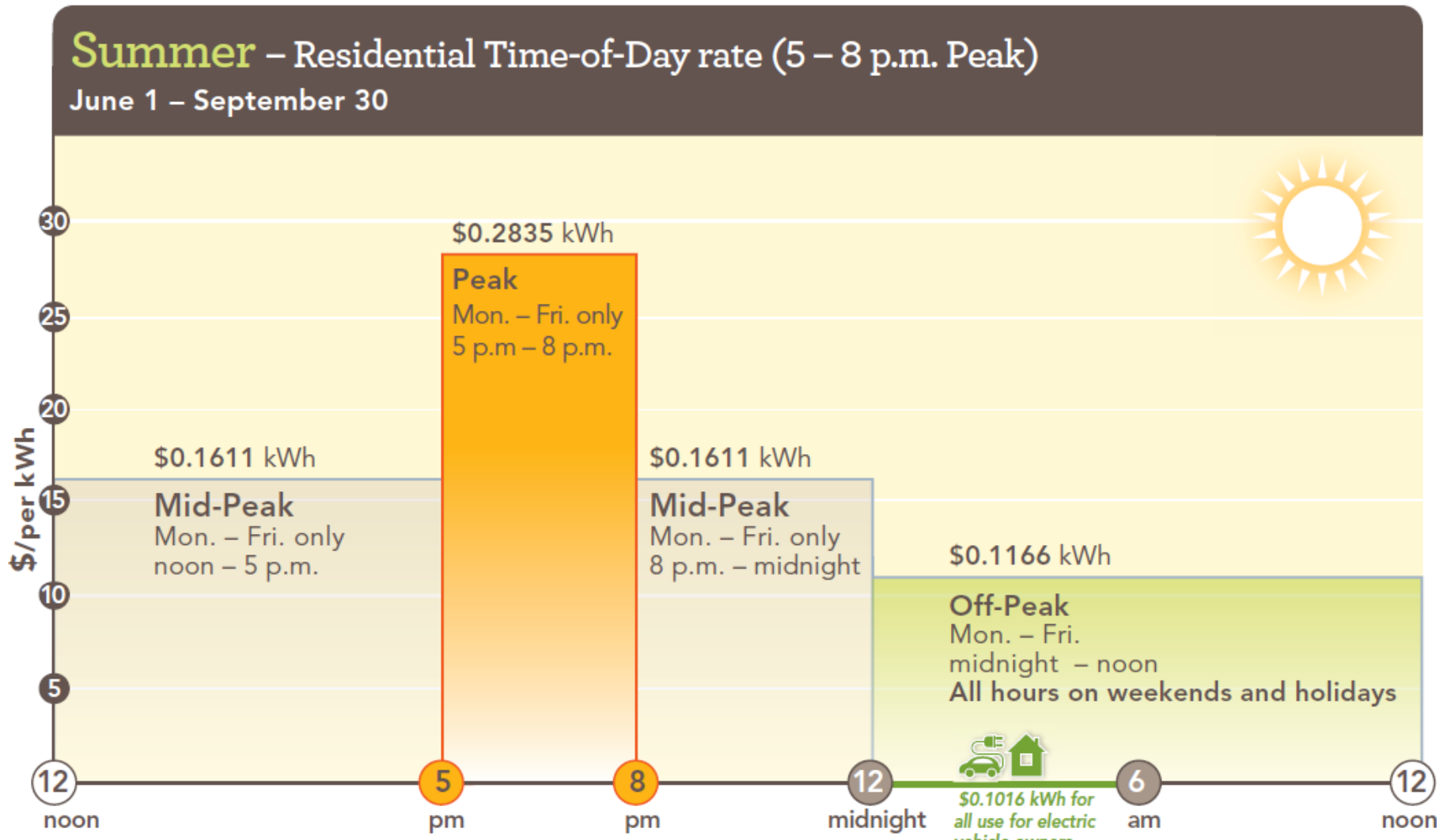
Current Project: Advanced Distribution Management System (ADMS)

ADMS

- Implement DMS
  - Phase 1: Base DSCADA and DMS system with a solid GIS model for modernized subs and feeders
  - Phase 2: Enable DER capabilities and refine processes in areas of highest DER penetration
  - Phase 3: Enhance feeder automation & grow appropriately depending on DER growth

- Correct GIS data issues

- Coordinate with substation and line automation and with communications upgrades

DERMS

- 5-year plan to develop DERMS in coordination with DMS vendor

Another Project--Communications

- Investing in a communication network which at a minimum addresses the following aspects:
  - Distribution substation & DA technology to meet performance requirements
  - Network routers and edge equipment for security, redundancy and management
  - Field Network Operations Center (FNOC) for monitoring and maintaining communications

- These communication components will be integrated with the whole OT network including transmission communications and network infrastructure

- Improved communications brings in new data and new opportunities to improve control and performance

What the Future Holds

- *Installation* of grid modernization infrastructure is not merely a technology project.

- *Creating* a smart network and becoming a more dynamic utility is an integrated, ongoing enterprise effort.

- *Realizing* the benefits of grid mod takes considerable coordination, ingenuity, and commitment.

- We will continue using data from many sources to optimize grid operations and performance, and improve customer service.

What's Happening in SMUD Customer Analytics
- From Self-Service to Data Product

Self-service Analytics

Load Disaggregation

Customer Experience Excellence

Social Media Analytics
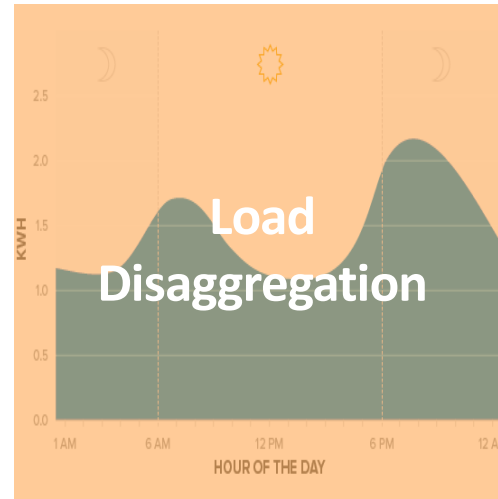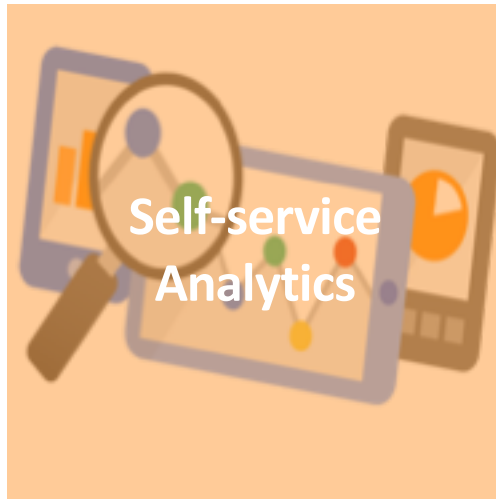
Self-Service Analytics

Self-Service Analytics

Why are self-service analytics important to SMUD?

- Data governance

- Agility

- Operational efficiency

Self Service Analytics
- Example: Program Report

Program	Ward 1 - Rose		Ward 2 - Bui-Thompson		Ward 3 - Fishman		Ward 4 - Shiroma		Ward 5 - Kerth		Ward 6 - Tamayo		Ward 7 - Slaton		Ward Unidentified		Total Customer Participants	Customer Participants Notes
	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants	Customer Participants	% of Total Participants		
ACLM (Air Conditioner Load Mgmt)	13,799	15.6%	13,827	15.6%	13,035	14.7%	17,269	19.5%	7,595	8.6%	10,611	12.0%	12,395	14.0%	7	0.0%	88,538	Contracts
Appliance Efficiency - General **	260	16.5%	258	16.4%	246	15.6%	286	18.1%	216	13.7%	162	10.3%	141	8.9%	7	0.4%	1,576	Contracts
Appliance Efficiency - Pool Pumps **	514	25.1%	453	22.2%	290	14.2%	365	17.8%	89	4.4%	29	1.4%	301	14.7%	4	0.2%	2,045	Contracts
Budget Billing	3,671	19.1%	2,680	13.9%	2,892	15.1%	3,003	15.7%	1,745	9.1%	2,199	11.5%	3,002	15.7%	4	0.0%	19,176	Contract Accounts
Campus Billed Accounts	11	7.3%	16	10.6%	34	22.5%	20	13.2%	48	31.8%	9	6.0%	12	7.9%	1	0.7%	151	Contract Accounts billed on a Campus Bill
Collective Billed Accounts	1,217	13.0%	1,382	14.8%	1,312	14.0%	1,246	13.3%	1,130	12.1%	629	6.7%	1,138	12.2%	1,299	13.9%	9,353	Contract Accounts billed on a Collective
Community Solar (Contributors)	184	10.8%	161	9.4%	263	15.4%	230	13.5%	370	21.7%	278	16.3%	218	12.8%	2	0.1%	1,706	Contributors - Contracts
Complete Energy Solutions **	9	9.3%	16	16.5%	16	16.5%	15	15.5%	15	15.5%	13	13.4%	11	11.3%	2	2.1%	97	Contracts (no new projects in 2016 to-date)
Custom Due Date	485	12.1%	527	13.2%	676	16.9%	695	17.4%	775	19.4%	355	8.9%	483	12.1%	6	0.1%	4,002	Contract Accounts
Custom Efficiency Incentives *	14	9.9%	28	19.7%	19	13.4%	9	6.3%	48	33.8%	9	6.3%	12	8.5%	3	2.1%	142	Contracts
Drive Electric	325	15.4%	462	21.9%	340	16.1%	473	22.4%	210	10.0%	76	3.6%	220	10.4%	3	0.1%	2,109	Contracts
EAPR Subsidy	9,816	10.7%	8,535	9.3%	13,610	14.8%	9,131	9.9%	16,270	17.7%	19,684	21.4%	14,734	16.0%	125	0.1%	91,905	Contracts
Energy Profiler Online	7	4.6%	23	15.1%	22	14.5%	13	8.6%	52	34.2%	19	12.5%	15	9.9%	1	0.7%	152	Contracts
EnergyHelp Bill Assistance (Contributors)	2,554	18.5%	1,869	13.6%	2,471	17.9%	2,299	16.7%	1,343	9.7%	1,325	9.6%	1,906	13.8%	11	0.1%	13,778	Contributors - Contract Accts
Equipment Efficiency *	1,166	19.2%	1,080	17.8%	906	14.9%	1,146	18.8%	546	9.0%	393	6.5%	845	13.9%	2	0.0%	6,084	Contracts
Express Energy Solutions *	108	11.6%	163	17.5%	164	17.6%	66	7.1%	201	21.6%	105	11.3%	118	12.7%	5	0.5%	930	Contracts
Greenergy - Commercial	201	10.9%	247	13.4%	280	15.2%	152	8.3%	542	29.5%	211	11.5%	200	10.9%	6	0.3%	1,839	Contracts
Greenergy - Residential	9,772	14.9%	7,846	12.0%	10,415	15.9%	9,819	15.0%	10,964	16.8%	7,929	12.1%	8,492	13.0%	168	0.3%	65,405	Contracts
Home Power	4,699	16.1%	3,689	12.6%	4,307	14.7%	4,422	15.1%	2,960	10.1%	4,863	16.6%	4,294	14.7%	17	0.1%	29,251	Contract Accounts
ISA (Contracted Premises)	12,768	14.6%	9,339	10.7%	14,638	16.7%	10,234	11.7%	19,642	22.5%	7,595	8.7%	13,156	15.1%	32	0.0%	87,404	Premises covered by an ISA Contract
Legitimation Codes	7	8.8%	8	10.0%	13	16.3%	14	17.5%	16	20.0%	12	15.0%	10	12.5%	0	0.0%	80	Business Partners
Loans Opened **	161	22.9%	95	13.5%	105	14.9%	117	16.6%	50	7.1%	59	8.4%	114	16.2%	2	0.3%	703	Contracts
Low Income Weatherization *	252	12.0%	239	11.4%	237	11.3%	172	8.2%	317	15.1%	570	27.1%	317	15.1%	1	0.0%	2,105	Contracts
MEDRate Subsidy	1,435	15.7%	1,134	12.4%	1,177	12.9%	1,079	11.8%	1,378	15.1%	1,460	16.0%	1,468	16.1%	9	0.1%	9,140	Contracts
My Account User (since 1/1/2015)	42,689	14.5%	42,966	14.6%	43,516	14.8%	43,018	14.6%	50,547	17.2%	31,228	10.6%	37,810	12.9%	2,434	0.8%	294,208	Contract Accounts; Users active 1/1/15+ reauthenticated
Paperless Billing	34,121	14.6%	33,751	14.4%	35,298	15.1%	35,532	15.2%	40,639	17.4%	24,000	10.3%	29,453	12.6%	1,233	0.5%	234,027	Contract Accounts
Power Protection	802	17.4%	702	15.2%	805	17.4%	730	15.8%	367	7.9%	527	11.4%	689	14.9%	0	0.0%	4,622	Contracts
PV - Commercial Retrofit	30	9.5%	36	11.4%	57	18.1%	49	15.6%	63	20.0%	39	12.4%	41	13.0%	0	0.0%	315	Contracts
PV - Residential Retrofit	1,682	14.7%	2,689	23.5%	1,389	12.1%	2,058	18.0%	1,407	12.3%	820	7.2%	1,398	12.2%	0	0.0%	11,443	Contracts
PV - SMART Home	174	7.4%	1,292	54.8%	562	23.8%	134	5.7%	132	5.6%	63	2.7%	0	0.0%	0	0.0%	2,357	Contracts
Refrigerator Recycling **	941	16.5%	842	14.7%	807	14.1%	915	16.0%	619	10.8%	745	13.0%	839	14.7%	7	0.1%	5,715	Contracts (data acquisition from new vendor in development)
Savings by Design *	1	4.5%	5	22.7%	6	27.3%	1	4.5%	5	22.7%	1	4.5%	2	9.1%	1	4.5%	22	Contracts
Smart Pricing Options	476	10.2%	933	20.0%	557	11.9%	1,376	29.4%	791	16.9%	539	11.5%	0	0.0%	1	0.0%	4,673	Contracts
Solar Shares	97	14.2%	107	15.6%	133	19.4%	137	20.0%	81	11.8%	53	7.7%	77	11.2%	0	0.0%	685	Contracts
Third-Party/Senior ID Billing	57	14.8%	23	6.0%	71	18.4%	64	16.6%	41	10.6%	75	19.5%	54	14.0%	0	0.0%	385	Contract Accounts

Program Enrollment as of End of June 2017 — Count of Customer by Active Contracts, Contract Accounts, or Business Partners (see notes)
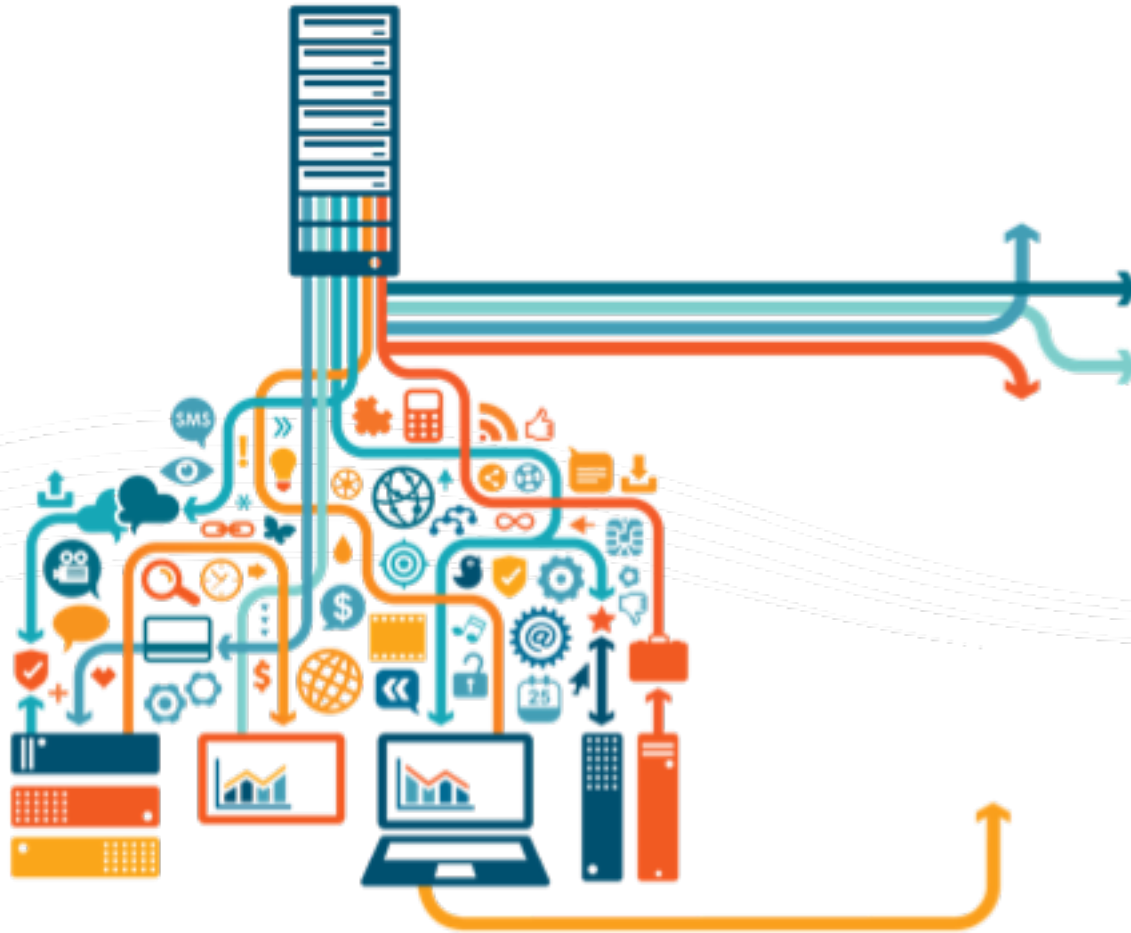
Self-Service Analytics
- Program by Ward Dashboard

[Program Enrollment Example](#)

Algorithm Powered Data Products

Algorithm Powered Data Products
- Low-income Customer Energy Efficiency Program Matching
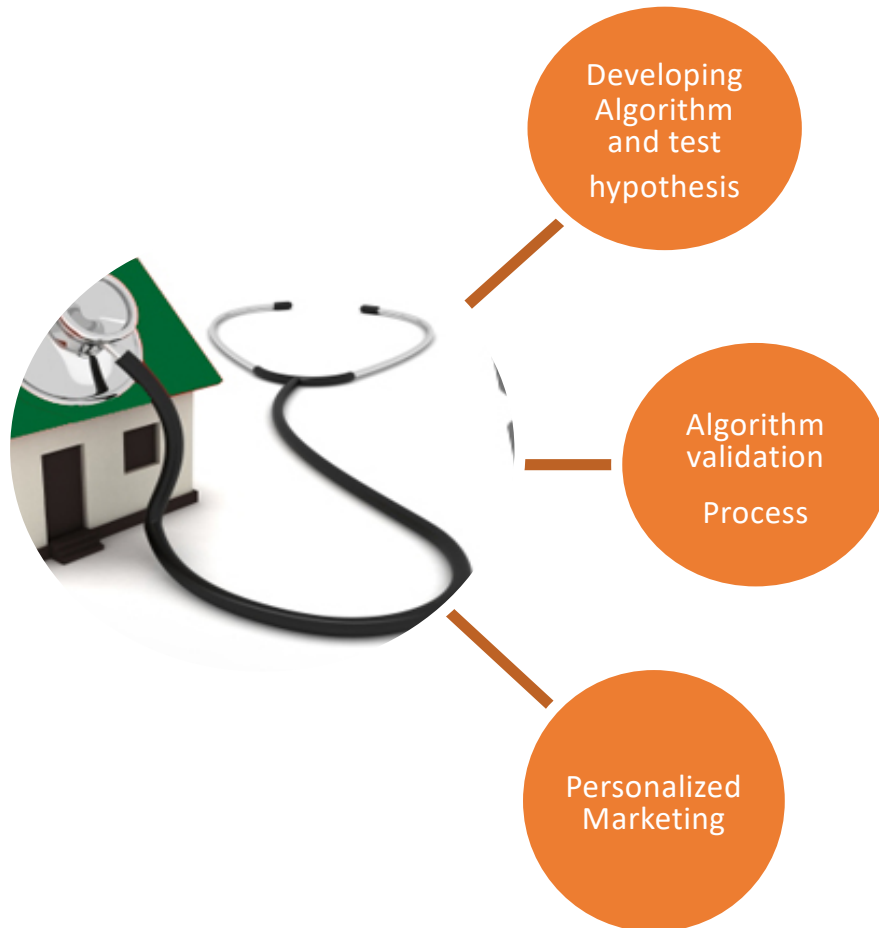
Data Products

Developing Algorithm and test hypothesis

Algorithm validation Process

Personalized Marketing

[Customer Name]
[Address]
[City, State, Zip]

Dear [Customer Name]:

SMUD is giving away free air conditioning, refrigerators, and more to help reduce bills of customers with higher than normal energy use. Schedule a FREE professional on-site energy check-up to verify your eligibility today!

Why You?
Your air conditioner usage is *[Insert X] times* more than the average SMUD customer and your overnight energy usage is *[Insert Y] times* more. You're already saving on your monthly electric bill with SMUD's low-income discount – the Energy Assistance Program Rate (EAPR). Now, you may be able to save even more!

Disaggregation Methodology

Data:

- 2015-2016 hourly smart meter data from low-income customers
- Weather data from NOAA
- Billing data
- Demographic data
- Computed 162 features

Tools:

- Open source tool VISDOM
- R

Disaggregation:

- Identified 3 biggest load groups: base-load, HVAC, and occupant driven-load
- Customers with high base load and high HVAC are in priority group

Algorithm Powered Data Products
- Prototype for Energy Auditor App

Phase I

Phase II

Algorithm Powered Data Products
- Recruitment Letter Sample

[Customer Name]
[Address]
[City, State, Zip]

Dear [Customer Name]:

SMUD is giving away free air conditioning, refrigerators, and more to help reduce bills of customers with higher than normal energy use. Schedule a FREE professional on-site energy check-up to verify your eligibility today!

Why You?
Your air conditioner usage is *[Insert X] times* more than the average SMUD customer and your overnight energy usage is *[Insert Y] times* more. You're already saving on your monthly electric bill with SMUD's low-income discount – the Energy Assistance Program Rate (EAPR). Now, you may be able to save even more!

What can you do?
All you need to do is schedule an appointment and a SMUD representative will come to your home to conduct an energy assessment to see what free improvements we can make to reduce your home's energy use.

Why now?
For a limited time, we're offering special energy-saving services, called the Deep Home Energy Saver, to qualified customers receiving our EAPR discount.

What can I expect?
The program has helped thousands of customers reduce their bills while staying comfortable. You may be surprised at how convenient our free on-site professional assistance is.

These free services could include attic insulation, weather-stripping, even repairing or replacing your heating and cooling system*. Plus, if you have a refrigerator ten years or older, we'll replace it with a new energy-efficient one for free.

The best part is that there is no cost to you! And you'll save on your electric bill for years to come by making your home more energy-efficient.

Don't wait to get started. The sooner you make an appointment, the sooner you can start saving. Schedule an appointment today at **smud.org/HomeSaver** or by calling **(916) 732-7328.**

Solution Design - Data Integration

Data Category	Source	Frequency	Transfer Method	Comments
Customer records	SAP	Daily	ETL (flat file)	
Meter records	SAP	Daily	ETL (flat file)	
Billed consumption	SAP	Daily	ETL (flat file)	For adjustments, billed amount, etc..
Service orders	SAP	Daily	ETL (flat file)	Used in algorithms and for analysis
Meter values	Itron IEE	Daily	ETL (flat file)	Registers and intervals; DNP drives daily
Meter events	UIQ	Daily	ETL (flat file)	Tamper events
Device location notes	RPDS/Customer IP	On Demand	ESB	Account activity
Past investigations	SMUD RP database	One time	Access Database	Create investigation history.

Thank You!
Discussion and Q&A

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