



Smart Grid Pilot Deployment Project

March, 2013

- Smart Grid Pilots Objectives Implementation Approach
- Proposed Pilot Deployment Projects
- Pilot and Potential Full Deployment Benefits
- Post Decision Requirements

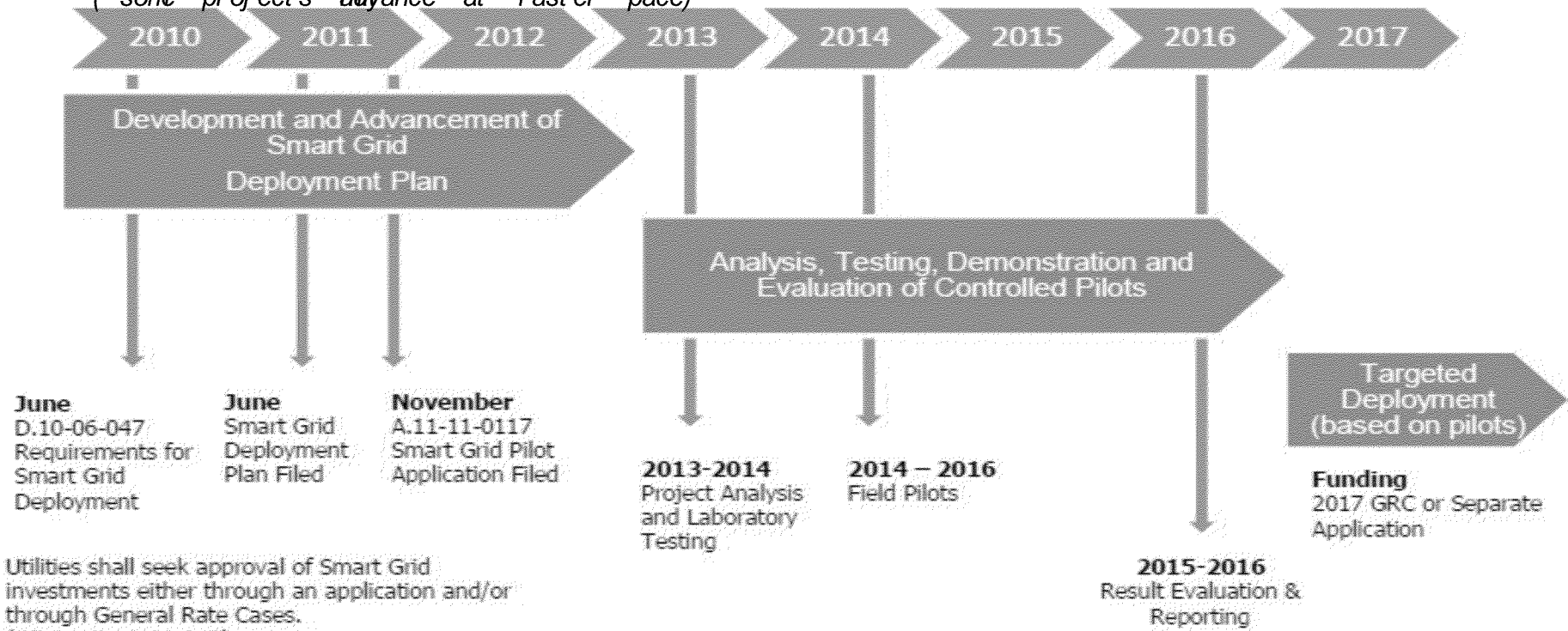
Smart Grid Pilot Deployment Plan Objective and Timeline

Objectives Associated with Proposed Pilots

- Inform “ Full Deployment ” Investment Decisions
- Advance Grid Modernization Efforts as required in SB 17
- Accelerate Achieving California’s Policy Goals

History and Conceptual Timeline Going Forward

(some projects advance at faster pace)



Utilities shall seek approval of Smart Grid investments either through an application and/or through General Rate Cases. (OP 14, D.10-06-047)



Proposed Pilot Deployment Projects

PD Recommended Approval:	Project Cost ¹ (2013 - 2016)	Annual Avg. Req for 2013 - 2016	
1. Smart Grid Line Sensors * PG&E will perform product analysis and field tests of new line sensors to evaluate their performance in reducing outage response time, improving outage location accuracy and providing more granular information on up to 30 distribution circuits.	\$ 16.9 M		
2. Volt/ VAR Optimization * PG&E will test voltage and reactive power (VAR) optimization control systems on up to 12 distribution circuits with high peak demands and high solar photovoltaic generation levels to evaluate the ability of Volt/ VAR to reduce customer energy usage and reduce utility system losses, improve the voltage profile and reliably integrate more distributed solar generation by managing the distribution from the substation to the customer's service point.	\$ 38.8 M	\$ 2.8 M	
3. Detect & Locate Line Faults * PG&E will test decision analysis tools to pinpoint outages and hazardous circuit conditions caused by damaged equipment using input from a variety of data including protective relays, fault current sensors, Smart Meter voltage measurement and Smart Grid line sensors.	\$ 13.0 M		
4. Short- Term Demand Forecasting * PG&E will evaluate if more granular sources of data can be used cost- effectively to improve the accuracy of short- term demand forecasts for PG&E's bundled customers from hourly electricity procurement activities. Examples of more granular sources are smart meters, transmission and distribution network devices and demand response programs.	\$ 14.7 M		\$ 0.4 M
Total	\$ 82.8 M		\$ 3.2 M
PD Recommended Denial:			
5. Technology Evaluation, Standards and Testing * Create Smart Grid technology development capabilities and test new technologies, evaluate and develop standards, and improve understanding of new technology through experiences of others.	\$ 12.5 M		\$ 2.9 M
6. Smart Grid Customer Outreach * Perform outreach pilots to engage them in understanding Smart Grid benefits. Support customers in using Smart Grid enabled tools, making informed energy choices and participating in energy markets.	\$ 13.5 M		\$ 3.4 M
Total	\$ 26 M		\$ 6.3 M

¹ As presented in PD



Smart Grid Pilot Deployment Projects: Pilot and Potential Full Deployment Benefits

Initial evaluation of full deployment identified significant reliability, environment and other non-quantifiable benefits worth further investigations via pilot

Projects	Cost of Pilot/Estimated Cost of Full Deployment	Expected Benefits Obtained From Pilots	Conceptual Benefits at Full Deployment; Pilots Needed to Verify			
			Monetary (in Millions)	Reliability	Climate	Other Non-Quantifiable Benefits
Smart Grid Line Sensors	\$ 16.9 M \$ 98 - \$ 131 M	Information Regarding Monetary, Reliability, Social, Other Non-Quantifiable Benefits 1 M 3 M 6 M 7 M	Avoided Operation and Maintenance \$ 28.7 - \$ 43.1 M	Improved Reliability: 5 - 9 % SAIDI 9 - 16 % CAIDI		<ul style="list-style-type: none"> Improved public/ system safety Customer Satisfaction Improved distributed renewable integration
Detect & Locate Line Faults	\$ 13.0 M \$ 74 - \$ 103 M		Avoided Operation and Maintenance \$ 51.3 - 62.7 M			
Volt/ VAR Optimization	\$ 38.8 M \$ 200 - \$ 276 M		Avoided Energy Procurement \$ 536 - \$ 1,070 M	1.6 to 2.2* of Avoided CO ₂ Future Monetary Value of CO ₂	<ul style="list-style-type: none"> Improved distributed renewable integration Improved power quality Improved notification of equipment malfunctions 	
Short-Term Demand Forecasting	\$ 14.1 M \$ 19 - \$ 27 M		Avoided Energy Procurement \$ 3.2 - \$ 47.6 M			<ul style="list-style-type: none"> Improved ability to forecast at more granular level.

¹ As presented in PD

- Proposed Decision (PD) final number of post decision requirements such as:
 - Meet with staff to discuss EM&V methodologies, costs, benefits, schedules and expectations for phase status reports
 - Submit a Tier 1 advisory letter prior to implementation of its final EM&V metrics and updated project schedules.
 - Submit a status report via a Tier 1 advisory letter within 4 days of each phase.
- Requirements are reasonable provided that they do not delay the start of the approved projects or their continued implementation
 - PG&E will work diligently with staff to fulfill requirements and avoid duplicative post decision reviews