PG&E'sDemandResponse Technology Initiatives

Roadmapand Opportunities

April 11, 2014





Agenda

- Demonstrate ED and PG&Epriorities alignment
- Discuss customer-centric end-use automation and PG&E's DRroadmap
- Discuss 3^d Party DR



PG&E is:

- Expanding residential/SMB participation in Demand Response(DR)
- 2. Expanding the portfolio of DR resources to provide wholesale market capacity
- 3. Allowing garties to becomemore involved in addressing residential
- 4. Utilizing AMI technology in the DRspace



Customer-centric end-use automation

Opencommunication standards





- Enable cost-effective integration with broader range of customer devices
- Customers can choose devices that they find valuable and appealing

Newchannels to reach customers



- Retailers and service providers engaging customers where they live and shop
- Customer acquisition fulfillment costs shared with other markets

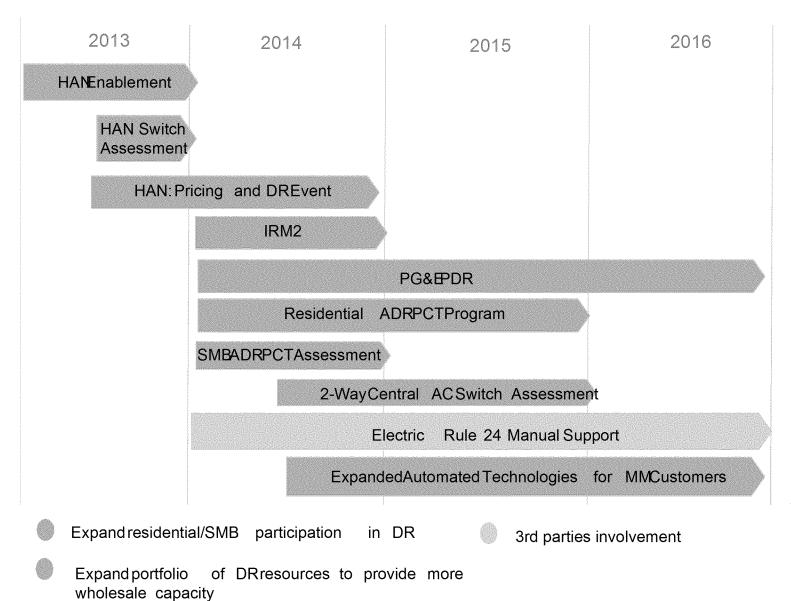
Enables us to reach a broader audience of custom



PG&E's current DR options

	Information Enablement	Automated Response	Automated DLC
Description	their energy usage and the pride of energy in order to support		participation through the installation of a load contrin the customer premise that automatically responds to a
Current Activities	 Phone, Fax, Email, Text HAN- Pricing Information & Event Signal HAN Real Time Energy Usage Customer Data Access Enablement 	 HANSMB- Price Information ADRfor Residential and SMB Event Signal ADRfor C&I - Event Signal 	 ACCycling – DLCSignal One and Two-way communications (e.g., AMI/HAN) Direct installation by controlling entity

Initiatives for 2014 -16



SB GT&S 0641991

Leveraging the AMI Network

What's available now?

- Real time energy usage
- Ability to join HANdevices to a SmartMeter[™] via MyEnergy

What's being delivered in 2014?

- DRevent notifications
- Customer pricing information

What are we looking at in 2015 and beyond?

- DLCover HAN
- Next generation Smart AC
- Third Party opportunities

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PG&Es committed to supporting the thirdparty DRaggregation market:

- Intermittent RenewablesManagemen2 (IRM2) pilot is currently underway in the PG&Eservice territory to provide nonutility entities training and experience with registering with the CAISO,
- Voluntarily led the PFMto modify current AMPcontracts in support of third-parties
- Meter data for direct CAISObidding will be available via Rule
 24 implementation
- Proposing to support residential aggregation (as part of Supply-Side Pilot) in 2015-16



Howare we doing it?

- PG&Es building an open-standard platform to enable behind-themeter DRsolutions
 - PG&Es implementing AMI/HANand AutoDRusing leading industry standards (SEP 1.x, OpenADR0)
 - Customers adopting these standards-based solutions should be able to leverage them with any utility or third-party DR programs
 - PG&E is working with a third-party certification facility (NTS) to enable any manufacturer to validate HANdevice interoperability with PG&E's network
- Third-party DRaggregators do not currently have the ability to leverage PG&E'sAMI network to notify/dispatch customer loads
 - Investigating if/how third-parties can use AMI network for DRevent notifications or direct load control.



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