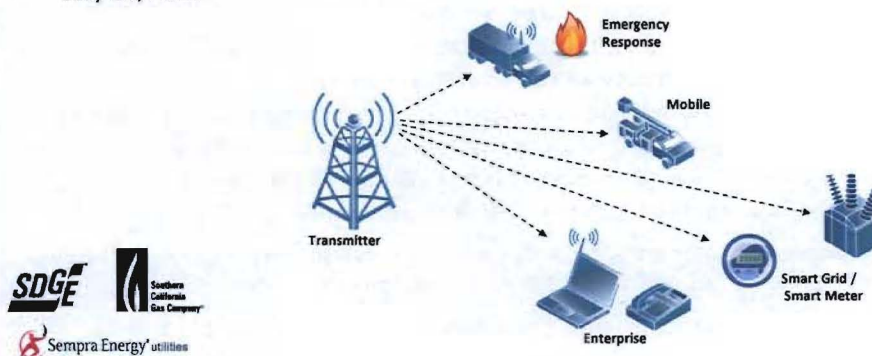


Next-Generation Communications for the Smart Utility

Jeff Nichols, Director of Network & Communication Services
Semptra Energy Utilities
July 13, 2010



Agenda

- Program Overview
 - Details
 - Architecture
 - Program Roadmap
- State and Federal Funding Summary
- Impacts
- What's Next/Potential Challenges
- Discussion
 - What SDG&E would do differently if federal dollars made available in the future
 - What SDG&E would suggest CEC do differently in the future

Program Overview

- **GOAL:** Provide reliable, secure wireless service to utility ops stakeholders
 - Smart Grid & Smart Meter
 - Customer Field Service
 - T&D Operations
 - Emergency Services
- **APPROACH:** Consolidate (integrate) previously dedicated RF systems into a general purpose private wide area wireless system
 - Use the right RF network for each application – (TCO, license, capacity, SLA)
 - **Integrate all RF services via a new Control Services layer**
 - Locate base stations where we have backhaul (not in the model-perfect location)
 - Use low-cost point-point RF to construct new backhaul (\$10-20K/link)
 - Use carrier services where practical in terms of cost and coverage
 - Facilitate integration with future (TBD) Smart Grid devices
- Provide low-to-moderate capacity pervasive wireless service coverage for all business locations, major grid assets and customer locations
- Provide high capacity wireless broadband wireless for selected locations

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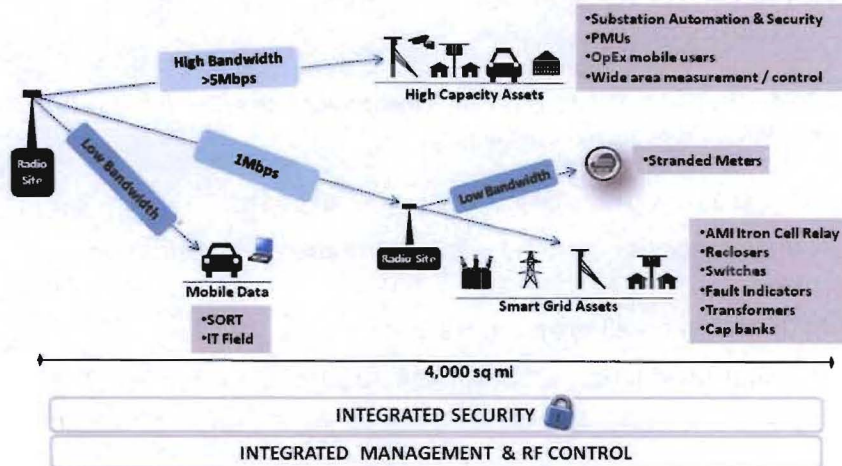
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Program Details

- **Foundation Services supporting fixed & mobile assets**
 - Fixed data service to endpoints or gateways with 900MHz for Smart Meter and Smart Grid devices
 - Mobile data service to radios in field service & emergency service vehicles
- **Broadband Services – 802.11n, 802.16d/e & (maybe) LTE – at major asset sites**
 - Services high-speed needs of mobile users using Wi-Fi, WiMax
 - Provide ~200 sub-stations with 5Mbps private backhaul
- **Control Services**
 - Integrate all radio network layers
 - “Single pane of glass” for configuration, security, audit, capacity/traffic management...
- **Migration Services**
 - Support transition of user base to new services, including endpoint installation

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Program Architecture

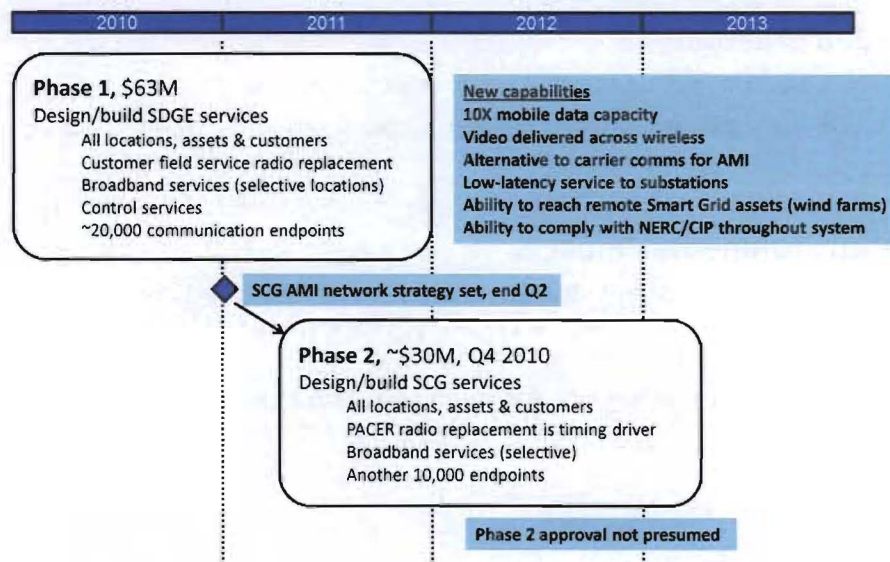


Integrated, consolidated RF system replacing multiple standalone systems

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Program Roadmap



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Sempra Energy utilities

Funding Summary

- 7-year business case approved by Utility Board on 4/20/10 (covers SDGE only)
 - SDGE capital, \$34M approved
 - DOE SGIG \$28M matching grant agreement signed on 4/26/10
 - CEC PIER, \$1M agreement pending
- TOTAL: \$63M 2-year capital program started April 2010
- First major supplier contract signing imminent – Foundation Services
- Work initiated on all program tracks
- Expect first production service in Q4 2010, completion in Q2-Q3 2012

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Sempra Energy utilities

Impacts

- Job Creation
 - 7 full-time positions in the utility reported to date
 - 83 full-time positions (utility and vendors) estimated during 2+ years
- Environmental Impacts
 - SDG&E Grid Communication System is an enabling technology to support multiple Smart Grid solutions for increasing RPS, reliability and new Smart Grid functionality
 - Mobile system features and smart meter backhaul will reduce truck rolls in order to reduce greenhouse gas emissions

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What's Next / Potential Challenges

- Complete program staffing
- Implement DOE oversight & reporting
- Get key suppliers under contract
- Complete engineering on key integration solutions
- Get our users ready for the new system/service
- Build more detailed test/acceptance plan
- Build on the eventual SCG AMI network provider selection and integrate them into the architecture (Control Services)

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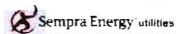
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Discussion

- **Federal Stimulus Program**
 - SDGE would have built a similar smart grid-ready network, but it would have taken more time
 - For future grant opportunities, we would likely create multiple narrowly-focused applications rather than one large smart grid project
- **CEC Matching Grant Program**
 - Recommend in the future CEC adopt a coordinated grant application process in order to sync state submission with federal submission
 - Similarly coordinate reporting requirements on matching grants
 - Reduce paperwork

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Thank You

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