Assessing Demand Response Potential To Provide Renewable Integration Services

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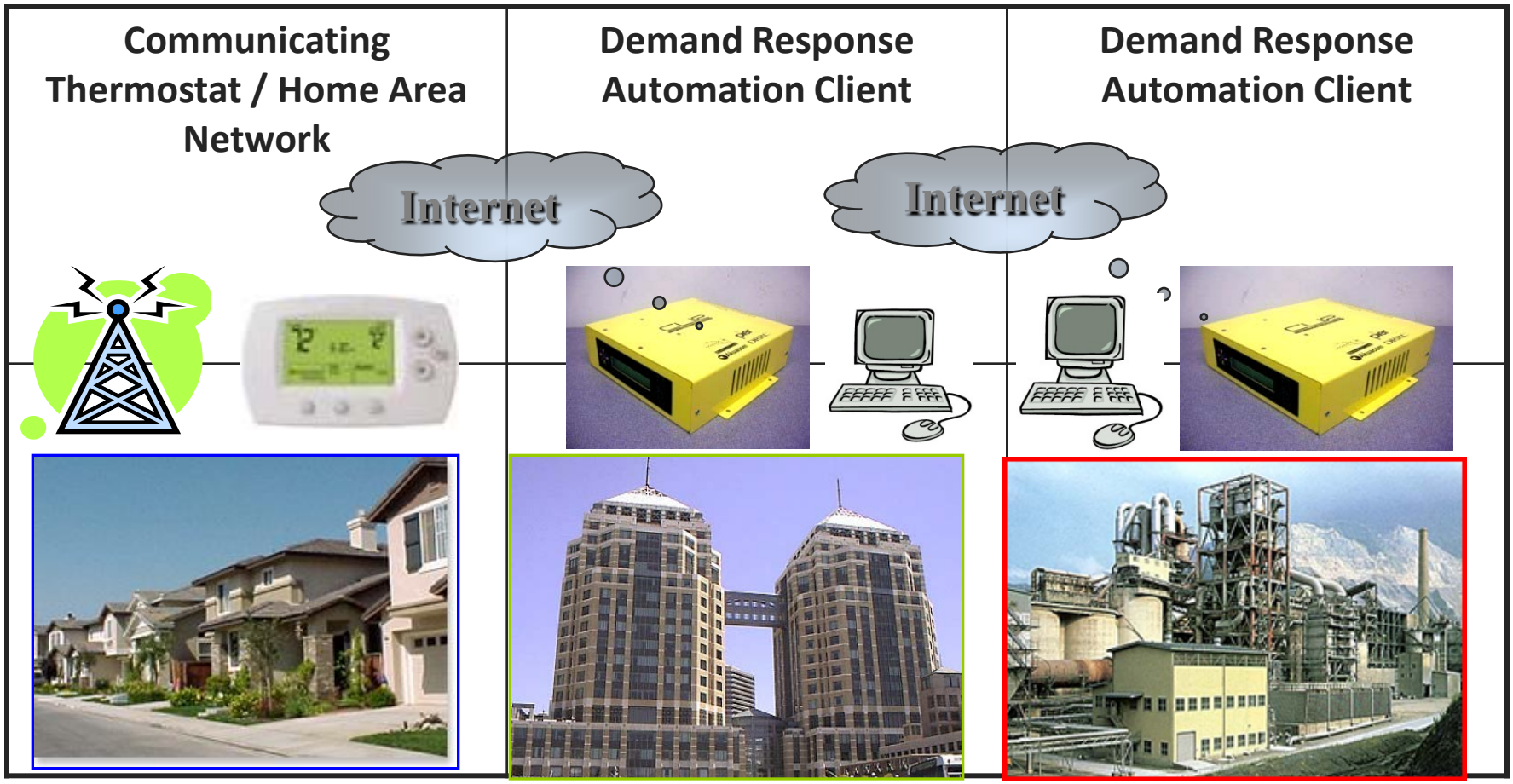
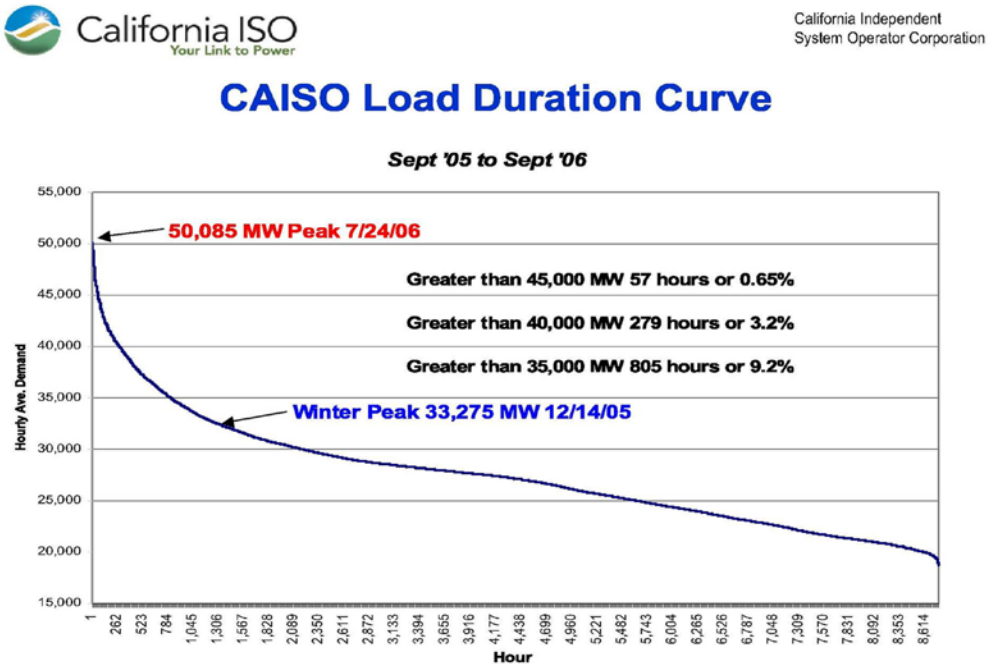
Demand Response Automation by Sector



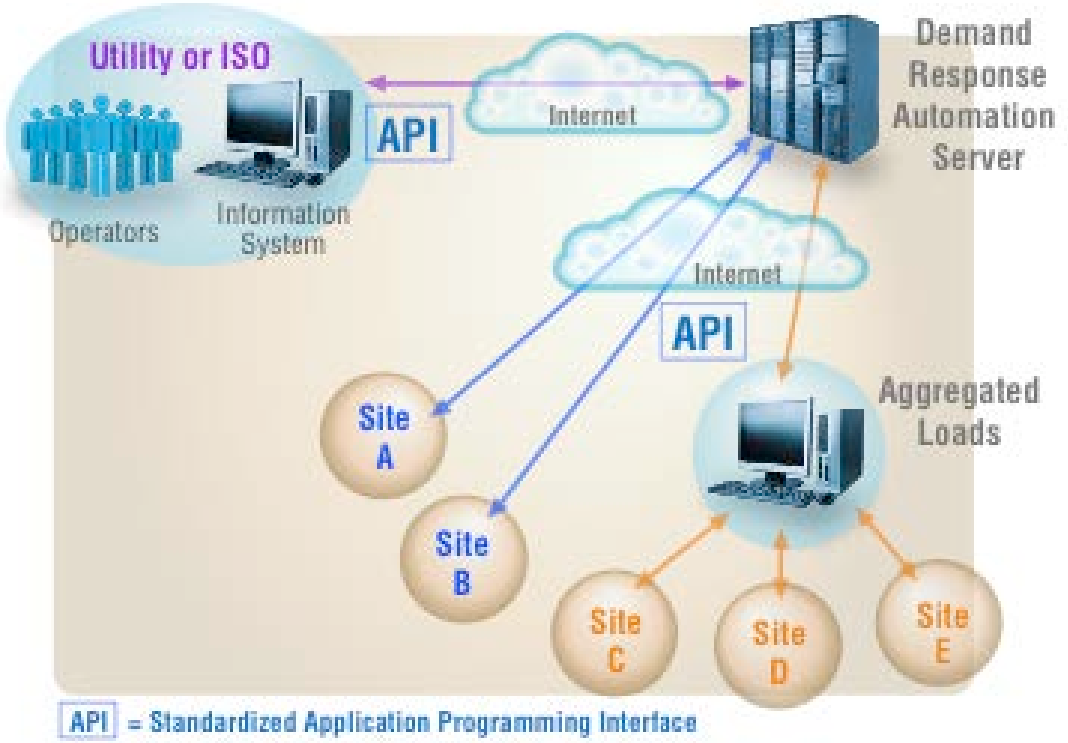
Open Automated Demand Response Communications (OpenADR)

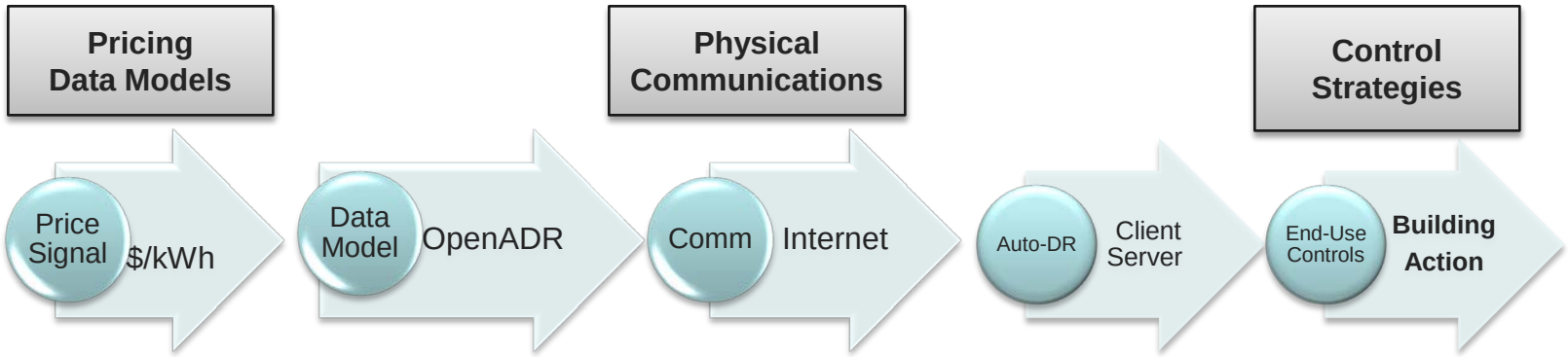
- **Development began in 2002 to meet automation goals**
  - **Cost** - Develop low-cost, automation infrastructure
  - **Technology** – Evaluate reliability & readiness for common signals
  - **Capability** - Evaluate control strategies to modify electric loads
- **OpenADR - open standard for electricity price, DR mode, and reliability signals**
- **OpenADR is used for utility and ISO Automated DR programs**



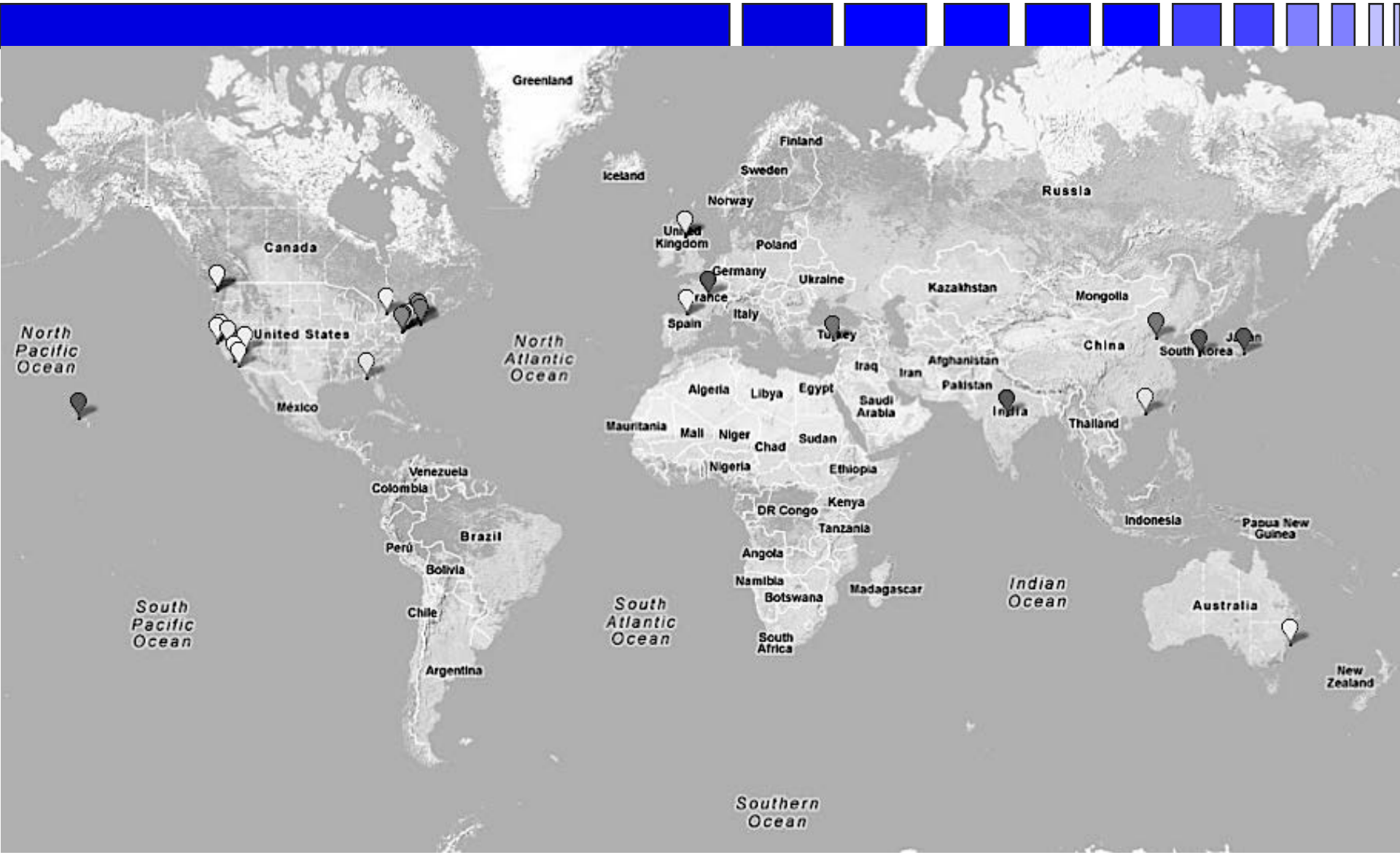
OpenADR Fundamentals

- Provides non-proprietary, open standardized DR interface
- Allows electricity providers to communicate DR signals directly to existing customers
- Uses a common XML language and existing communications such as the Internet





OpenADR Deployed in > 20 Locations Around Globe



* Source: http://drrc.lbl.gov/openadr/map

Today's Panel

- **Scott Baker,** Business Solutions Analyst, PJM
- **Andy Satchwell,** Scientific Engineer Associate, Lawrence Berkeley National Laboratory
- **John Hernandez,** Sr. Product Manager, Customer Energy Solutions Emerging Market, PG&E
- **Anthony MacDonald,** Demand Management Team Lead, Target
- **Ron Dizy,** President and CEO, Enbala
- **Rick Counihan,** Vice President Government Affairs, EnerNOC
- **Stephen Keehn,** Smart Grid Technologies and Strategy, California ISO

Today's Questions for the Panel

1. DR has traditionally provided a variety of services through a variety of programs. What will be needed in a DR program to provide fast-response ancillary services to support renewable, and which of these ancillary services can DR provide?
2. What are the biggest obstacles to implementing DR as a service to support renewable integration?
3. Assuming Automated DR (Open ADR) will be necessary for DR to assist in the integration of renewables in California, what are the technical challenges to open ADR?
4. What are the telemetry, control or performance reporting needs for DR for it to be used by the CAISO or utilities to integrate renewables?
5. As part of the Summer of 2012 efforts by the CEC, CPUC, and CAISO, it was determined that while there was hundreds of MWs of DR potential in the required locations, only a small portion of DR programs could respond within 15 minutes. How do we increase the amount of fast-response DR to thousands of MWs within the next 5 and 10 years?