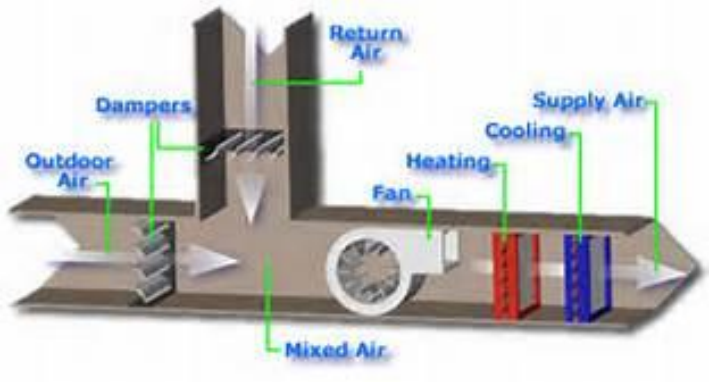
Commercial Building Energy Management

Preliminary Approach For Commercial EM Savings in the Seventh Plan

Conservation Resources Advisory Committee Meeting

December 17, 2014

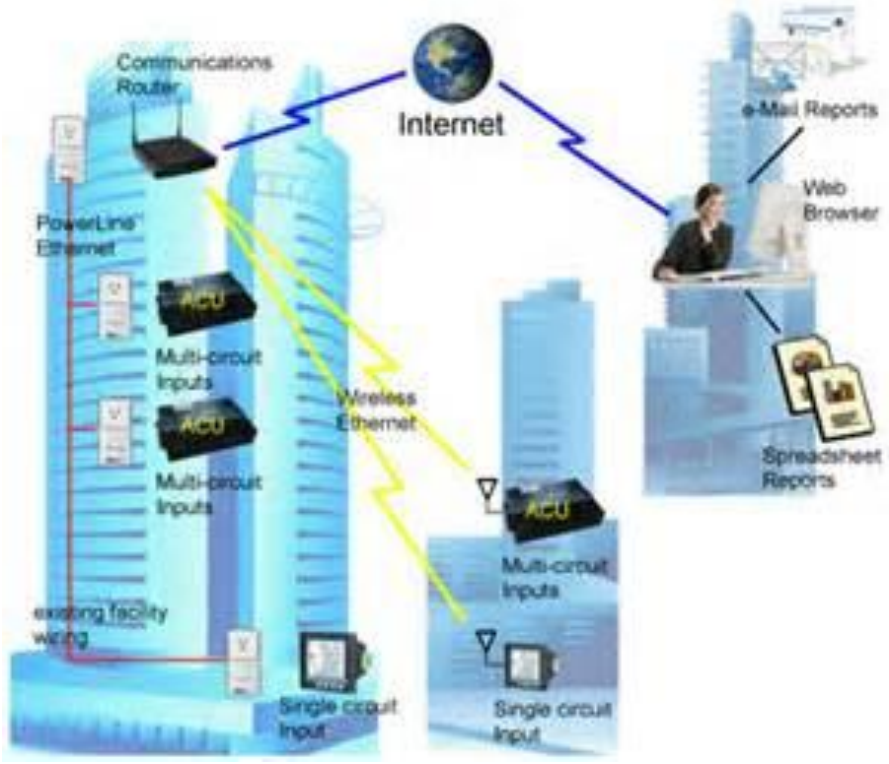


Presentation Outline

- What is Commercial Building Energy Management (CBEM)?
- What we did in the Sixth Plan
- What has happened since the Sixth Plan
- Approach for the Seventh Plan

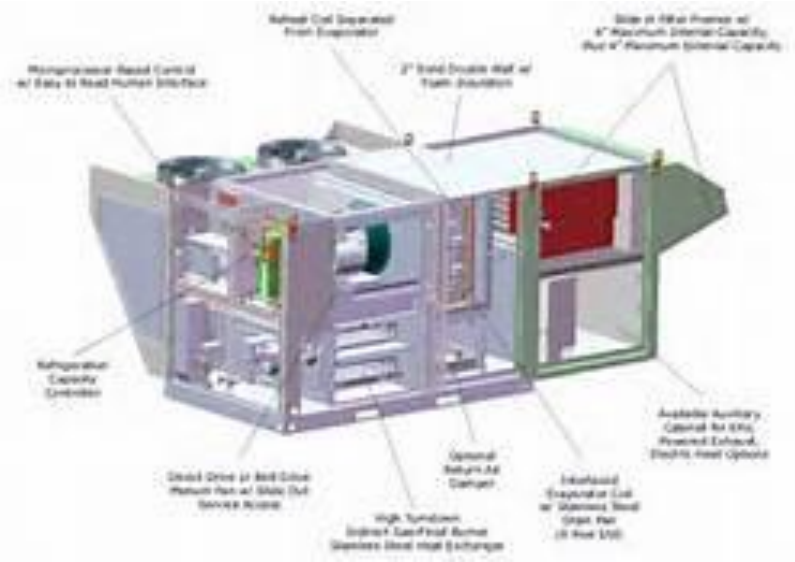
What is CBEM?

- Suite of measures focused on making HVAC systems work better through controls changes
- Includes programs like:
  - Strategic Energy Management (SEM)
  - Retro-commissioning
  - Track and tune
  - Resource Conservation Manager (RCM)
- Mostly for large buildings and complex systems



CBEM in the Sixth Plan

- EM Related Measures in 6P
  - Controls Commissioning Complex HVAC
    - 130 aMW
  - Package Roof Top Optimization and Repair
    - 26 aMW
  - Demand Control Ventilation
    - 25 aMW
- Primary focus on the Controls Commissioning

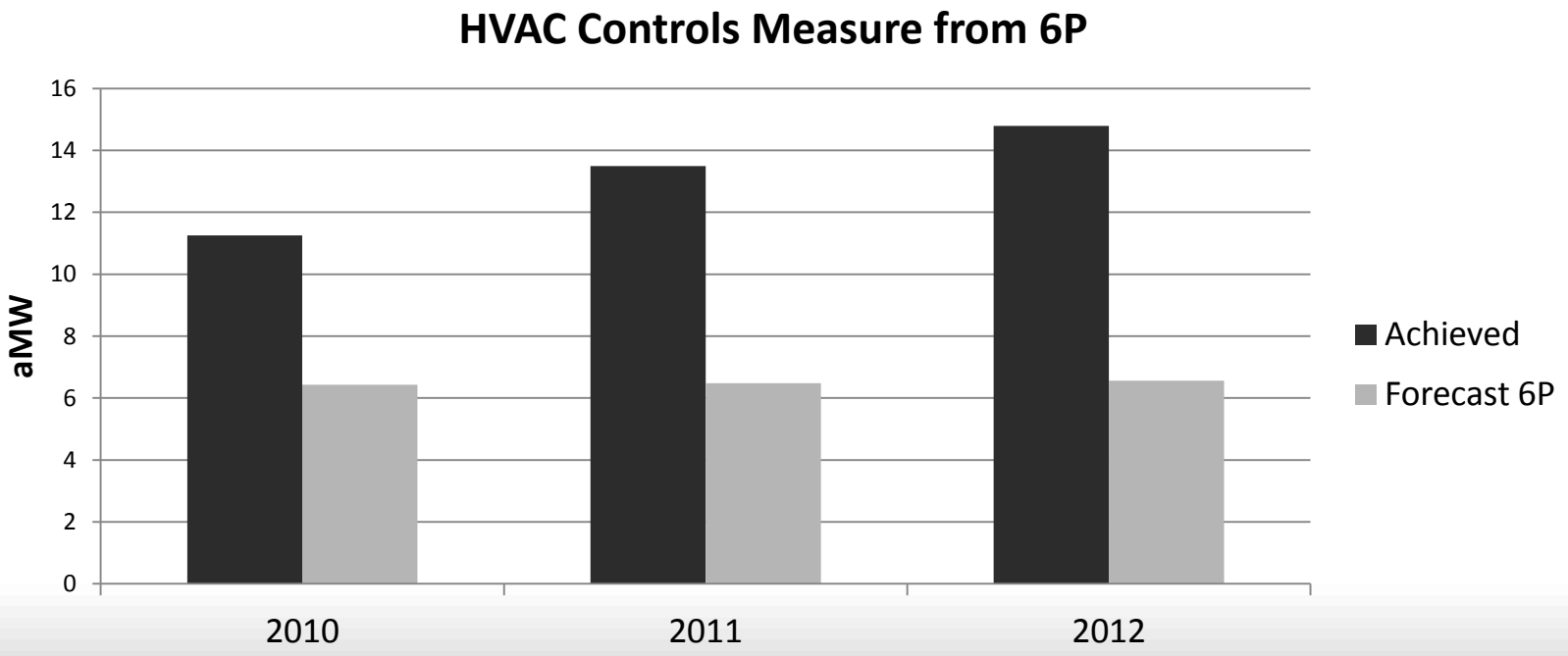


Controls Commissioning Complex HVAC (6P measure)

- Improving the performance of HVAC systems controls changes
- Based primarily program data from LBL, PECI, NEEA, SMUD
- Applies to floor area with Complex (Built-Up) HVAC systems only
- Measure Components:
  - Savings: 1 to 2.2 kWh/sf for retro, 0.5 to 1.2 kWh/sf for new.
  - Cost: $.20 to $1.00 per sf.
  - Life: 7 years

What has Happened Since 6P?

- Development of programs (e.g., SEM) to reach the commissioning/controls potential
- Results have been strong



CBEM Approach for 7P

- For single-zone systems: primarily utilize the ARC measure discussed previously
- For multi-zone systems:
  - Start with the 6P Controls Commissioning measure
  - Update building stock with new CBSA data
  - Use recent project experience to inform/update measure savings, cost and saturations
  - Utilize new research (e.g., Energy Savings Modeling of Standard Commercial Building Re-tuning Measures: Large Office Buildings. PNNL, 2012)
  - Call it “CBEM” or something similar

Discussion/Comments

- Input or revisions to approach?
- Data sources that could help to improve the results?
- Ramp rate too slow?