Supply Curve Development

Conservation Resources Advisory Committee
October 3, 2014

Goals for Today

- Review & feedback on
  - Approach to analysis
  - Measure lists
  - Data sources & gaps
  - Emerging issues

1. Issues that cross all sectors
2. Then sector-specific review

Key Changes from Sixth Plan

- New Federal Standards
- Stock Assessments
  - Residential (+Metering)
  - Commercial
  - Industrial
- Updated savings and/or cost data (e.g. RTF UES)
- New/dropped measures
- Tina & Kevin joined Council staff

CROSS-SECTOR ISSUES

Key Questions for CRAC Input Today

- How to account for rapid changes in solid-state lighting?
- How should we account for the 2020 provisions of the EISA general service lighting requirements?
- Which behavior-based measures should go into the supply curve and how to account for persistence?
- How to incorporate consumer electronics?
- How to account for federal tax credits?

Solid-State Lighting

- How should we treat this rapidly changing market in the supply curves?

What Emerging Tech Can Be Included in Power Plan?

- The standard from the Power Act:

  Energy Efficiency resources must be

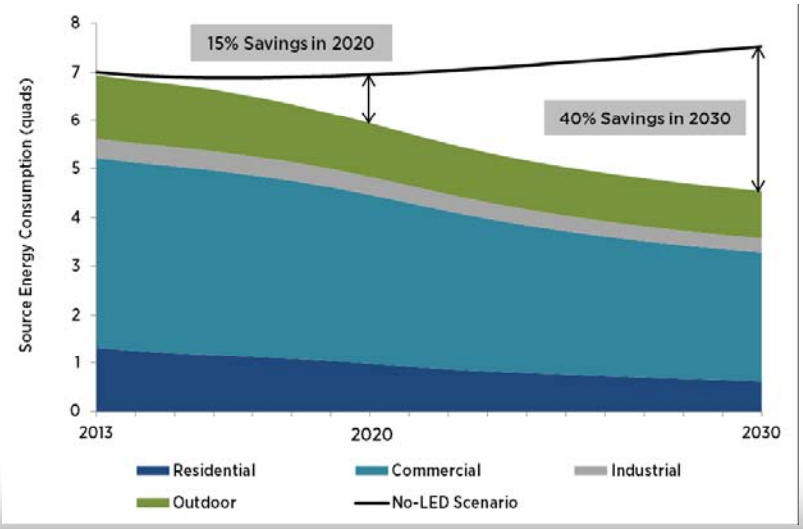
  "... similarly available and reliable"

  as the generation resources in the plan, and

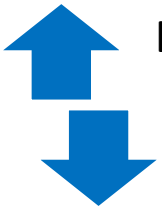
  "... reliable and available within the time it is needed"

- How to interpret and implement?
  - Product or practice is available, safe, persistent and acceptable to end users

Latest DOE Forecast for SSL



Solid-State Lighting



- Council generally assumes frozen efficiency
- But, LEDs have been changing rapidly
- Freezing at current cost & efficacy will overstate cost & understate savings potential – even in the near term
- Freezing penetration at current levels increases potential savings

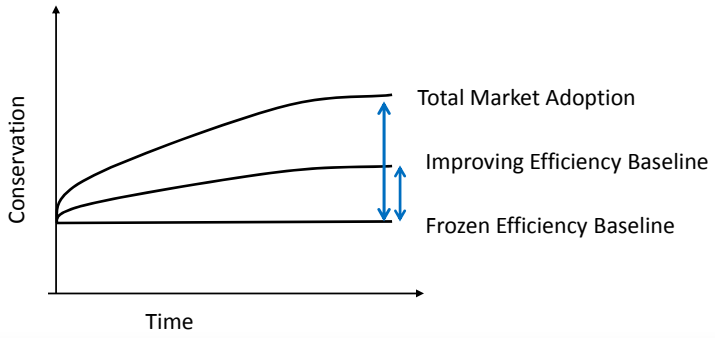
SSL: Proposal

- Cost & Efficacy
  - Forecast cost & efficacy changes to 2017 then freeze
  - Based on PNL analysis (reviewed November CRAC)
  - Use today's costs then use PNL trend forecast
  - By product class and application
- Market Penetration of SSL (options)
  - Freeze at known saturation
    - (CBSA ~2013, RBSA ~2011, DOE ~2013)
  - Freeze at forecast 2015 estimated penetration, or
  - Forecast economic uptake (moving baseline)

Discussion & Issues

- All baseline penetration assumptions are forecasts, whether frozen or changing
- Need to use same baseline penetration forecast in conservation as for forecast load
- Freezing penetration at start of forecast means larger EE potential
- High market uptake outside of programs counts towards EE targets
  - But requires tracking through market research
- Have to measure market uptake either way

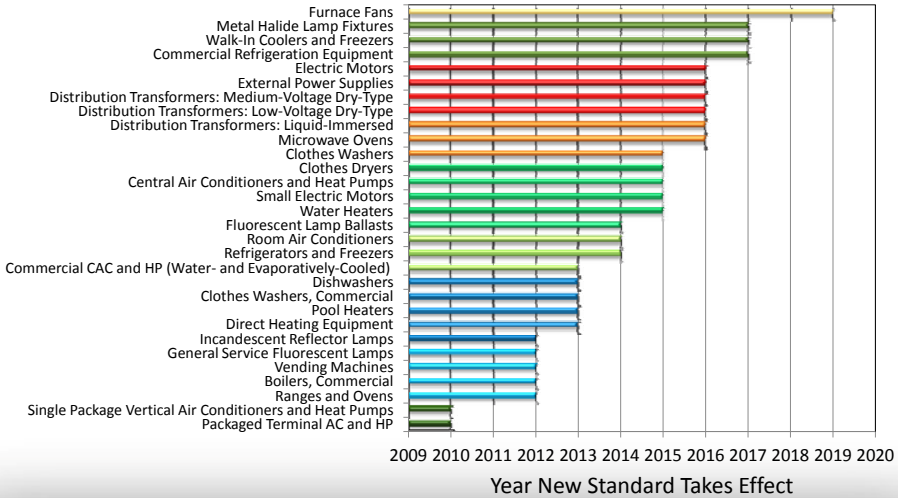
Savings Potential & Baseline



Federal Standards

- What is coming?
- How do we incorporate?
- What about lighting?

30 New Federal Efficiency Standards Take Effect This Decade



How We Account for Standards

- Assume any final enacted standard will occur at stated effective date
- Use National Impact Analysis (NIA) workbooks to:
  - Assess energy savings and costs from standards
  - Determine level of higher efficiency tiers
- Incorporate impact of standards into baseline forecast as well as measure list

Standards Example

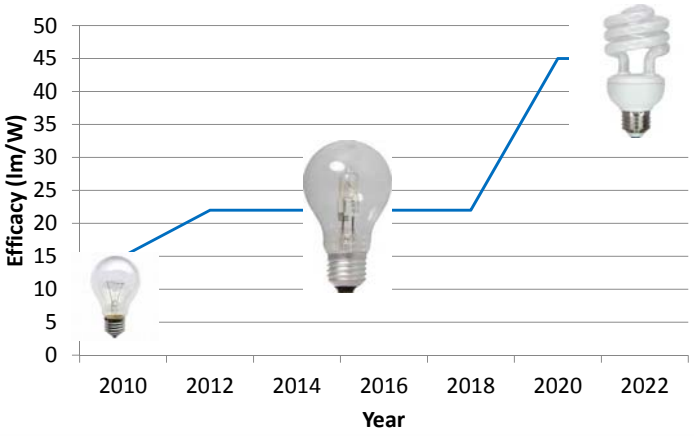
- Microwaves – New standard effective 2016

Level	Standby Power (W)	UEC (kWh)	Installed Price ($)
Baseline	4.00	34.8	$234
1	2.00	17.4	$234
2	1.50	13.0	$234
3	1.00	8.7	$239
4	0.02	0.2	$243

New Standard

New Measure

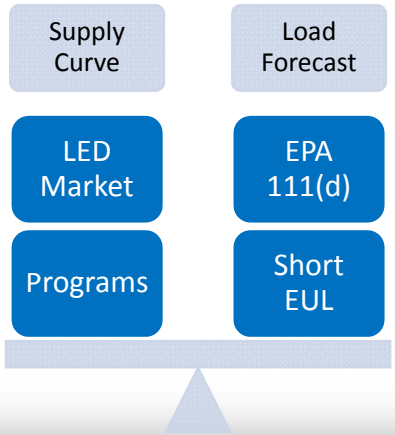
Lighting under EISA 2007



EPA 111(d) – A Complicating Factor

- Proposed state-level carbon dioxide emission guidelines for existing generation units
- Four building blocks to attainment
  - Reducing carbon intensity of generation
  - Increase usage of lower-emitting generation units
  - Increase usage of zero and low carbon generation sources
  - Increase demand-side energy-efficiency
- Compliance begins in 2020

What to do in 2016-2019 for lighting?



Standards: Discussion & Issues

- Relative value of measure as a resource
  - Savings diminish greatly after 2020
  - How to represent that in supply curve?
- Would program dollars be better spent elsewhere if there is high market uptake outside of programs?
- What is the value of regulatory compliance?
- How to quantify value of programs to influence market on product quality or efficiency or program infrastructure?

Behavior-based Programs

- Programs that work to influence the cultural norms
  - Provide information
  - Provide training
  - Provide feedback
  - Provide funds

Behavior Measures for the Seventh Plan

- Agriculture: SIS*
- Industrial: O&M*, Strategic Energy Management*
- Commercial: O&M*, SEM
- Residential: Home Energy Reports, In-Home Devices

*included in Sixth Plan

Behavior: Questions

- Do all of these measures meet the Act requirements?
  - Reliable and available
  - "Conservation means any reduction in electric power consumption as a result of increases in the efficiency of energy use, production or distribution."
- How do we account for the persistence (or lack thereof) of these savings?
- Do we have enough data to quantify the savings?
- Are we missing any?

Behavior: Proposal

- Include measures for which evaluations suggest statistically significant savings
- A viable method to ensure persistence
  - Set measure life conservatively
  - Assume utility reinvestment is required, or
  - Tracking and reporting mechanism

Consumer Electronics

- Sixth Plan included: TVs, Computers, Monitors, Network PC Management, Set-top Boxes
- These technologies change quickly
- Rapid product turnover = short-term savings
- TVs & STBs market has been transformed to efficient option
- Include Computers, Monitors, Network PC Management?

Consumer Electronics: Modeling Approach

- No federal standard, Yes ENERGY STAR
- Baseline forecast accounts for changes in saturation
  - Desktop computers being replaced by laptops and tablets -> less savings potential over time
- Proposed approach:
  - Use ENERGY STAR calculator as estimate of savings for desktops & monitors
  - Use RTF UES for network PC management
  - Freeze savings assumptions

Federal Tax Incentives

- Currently, three "efficiency" measures have federal tax credits: PV, solar water heaters, ground-source heat pumps
  - 30% of cost, expire December 31, 2016
- Should we account for this credit in the cost-effectiveness analysis?

Definition of Cost

- The Council uses the "total resource cost" approach in the power plan to meet the requirements of the Regional Act
  - Includes all direct system costs regardless of who pays
  - Includes system costs: "An estimate of all direct costs of a measure or resource over its effective life..."
  - Is a fair comparison to other resources considered for development
  - Assure economic for the power system and the region as a whole

Tax Incentives: Discussion & Issues

- Consistency with generation resources
  - Investment tax credit – 30% for solar, decreasing
- Federal taxes are not substantively paid for by regional ratepayers
- Proposal: Reduce cost due to federal tax credit for 2016 for applicable measures

Summary of Issues and Data Needs: Cross-Sector

- **SSL**: How to account for rapid changes in price and efficacy?
- **Standards**: What should we do about general service lighting from 2016-2019 given EISA?
- **Behavior**: Which behavior measures should be included and how to account for persistence?
- **Consumer electronics**: Should we include desktop computers, monitors, network PC management using ENERGY STAR/RTF savings?
- **Tax incentives**: Should we discount cost by federal tax incentive on GSHP, PV, SWH in 2016?

End
Cross-Sector Issues