



Residential Odds & Ends

**CRAC Meeting
December 17, 2014**

Measures for Today

- **Heat Pump Water Heaters**
- **WIFI Thermostats**
- **Multifamily Weatherization**
- **Electric Vehicle Level II Charger (EVSE)**

Source of Key Parameters

Parameter	Source(s)
Unit Savings at busbar (kWh)	RTF, DOE TSD, secondary sources
Levelized Cost (\$/MWh)	Incremental cost: RTF, DOE TSD, secondary sources
Baseline EE Saturation	RBSA, ENERGY STAR, secondary sources
Number of Units (20 years)	Load forecast, RBSA, ENERGY STAR, secondary sources
Achievable Technical Potential (aMW over 20 years)	Product of # Units * Unit Savings

Heat Pump Water Heater

- Savings based on DHW + heating + cooling
- Driving parameters include:
 - Tank size: Federal standard starting 2015 will require all >55 gal units to be a HPWH
 - **Tier** – Tier 1 versus Tier 2
 - **WH location** – indoor versus buffered
 - **HVAC system** – gas furnace w/ or w/o cooling; FAF, HP, zonal
 - Climate zone

HPWH

Parameter	Sixth Plan	Seventh Plan (draft)
Unit Savings at busbar (kWh)	2180 kWh	~1000 - 1500 kWh
Levelized Cost (\$/MWh)	\$28/MWh	~\$60/MWh (Tier 1) \$>400/MWh (Tier 2)
Baseline EE Saturation	nil	Assume 12% for Tier 1 based on fed standard
Number of Units (20 years)	2.0M	2.4 M
Achievable Technical Potential (aMW over 20 years)	492 aMW	230 aMW

WiFi Thermostats

- Allow remote control (via smart phone) of thermostat
- Thermostat includes occupancy sensor
- Thermostat has been successfully used as an advanced heat pump control (Energy Trust pilot study)

WiFi Tstats

Parameter	Sixth Plan	Seventh Plan (draft)
Unit Savings at busbar (kWh)	Not included	400 - 500 kWh (depends on HZ)
Levelized Cost (\$/MWh)	Not included	~\$30/MWh
Baseline EE Saturation	Not included	<1%
Number of Units (20 years)	Not included	~500,000 (SF electric zonal or HP homes only)
Achievable Technical Potential (aMW over 20 years)	Not included	20 aMW

Multifamily Weatherization

- RTF has been updating savings from shell measures for SF and MH using:
 - Calibration
 - SEEM 96
- Multifamily calibration is stalled because of lack of data
- 7P will update for SEEM 96, but no new calibration

MF Wx

Parameter	Sixth Plan	Seventh Plan (draft)
Unit Savings at busbar (kWh)	38 – 6,658 kWh depending on measure	52 – 3049 kWh depending on measure
Levelized Cost (\$/MWh)	\$18-\$345/MWh depending on measure	\$15-\$450/MWh depending on measure
Baseline EE Saturation	Varies by measure	Varies by measure
Number of Units (20 years)	835k	1M
Achievable Technical Potential (aMW over 20 years)	69 aMW	49 aMW

EVSE

- **Electric vehicle chargers can be Level 1 (120 V) or Level 2 (240 V)**
- **Efficiencies better at Level 2**
 - **Level 1 - ~95% efficient**
 - **Level 2 - ~97.5% efficient**

EVSE

Parameter	Sixth Plan	Seventh Plan (draft)
Unit Savings at busbar (kWh)	Not included	108 kWh
Levelized Cost (\$/MWh)	Not included	>\$300/MWh
Baseline EE Saturation	Not included	<1%
Number of Units (20 years)	Not included	1M
Achievable Technical Potential (aMW over 20 years)	Not included	77 aMW