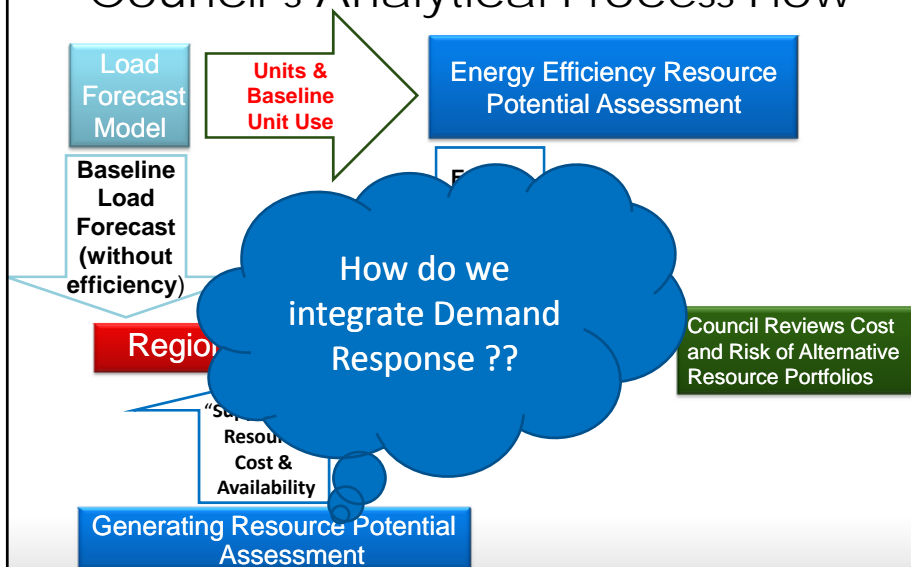


# Demand Response Characteristics Assumptions for use in RPM

CRAC Meeting  
March 24, 2015

## Council's Analytical Process Flow



## Distinguishing New DR Resources

### **Main Drivers in RPM for New DR Acquisition**

- Summer and Winter Peaking Capability
  - RPM determines Need
  
- Cost
  - RPM determines Cost-Effectiveness

## Development of Demand Response Inputs for RPM

- Leveraged Navigant Demand Response Potential study (commissioned by Council) and stakeholder responses to the study for cost and regional potential
- Developed “Supply Curves” for DR resources that address *peak demand*
  - *Demand response resources can be used for other purposes (i.e., flexibility and balancing) but these are not modeled in the RPM*

## Demand Response Programs Included in Potential Study

### Summer Peaking

- **Irrigation Pumping** - *DLC and AutoDR*  
(Agricultural /Industrial)
- **Space Cooling** – *DLC and AutoDR*  
(Residential and Commercial)

### Winter Peaking

- **Space Heating** – *DLC and AutoDR*  
(Residential and Commercial)

### Year-Round Peaking

- **Water Heating** - *DLC and AutoDR*  
(Residential)
- **Curtable/Interruptible Tariffs** -  
*DLC and AutoDR*  
(Agricultural/Industrial)
- **Lighting Controls** – *AutoDR only*  
(Commercial)
- **Load Aggregators** – *AutoDR only*  
(Agricultural/Industrial)

## Demand Response Acquisition Logic Used in the RPM

### How will the RPM determine whether to acquire DR?

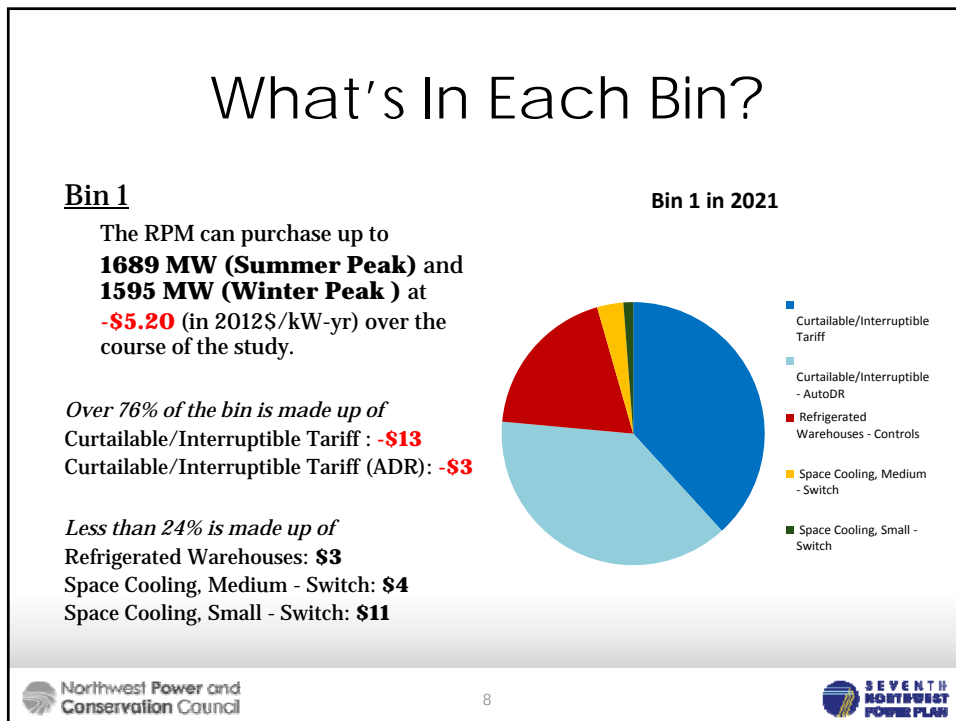
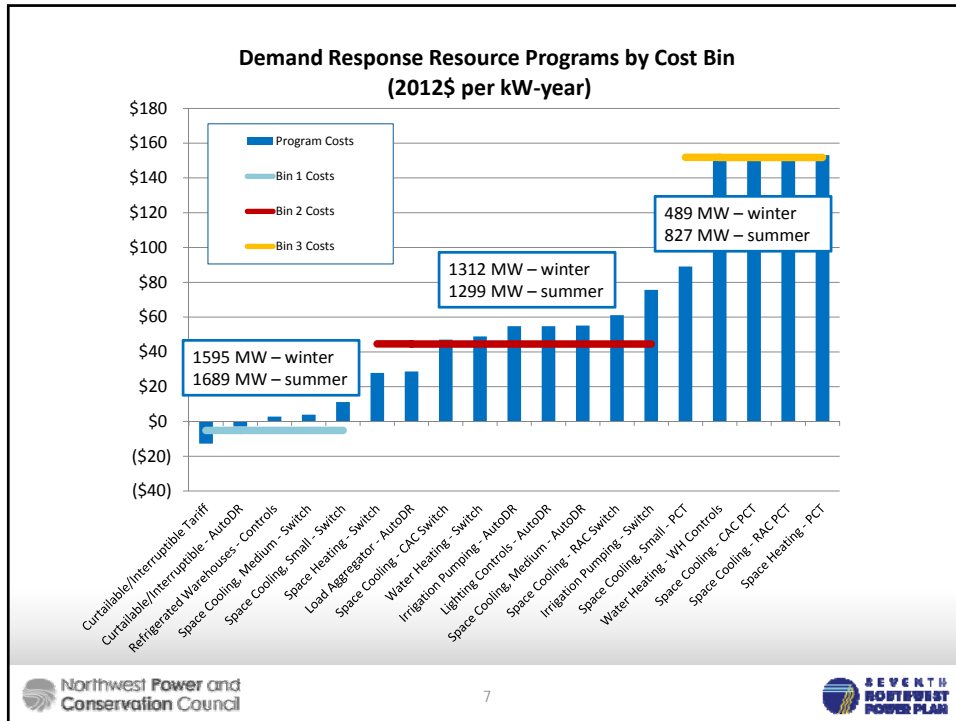
- DR resources will be acquired using logic similar to that used for acquiring a supply-side resource in the RPM

### When will the RPM likely acquire DR?

- When it is economic and least cost

### *But more likely...*

- When there is insufficient peak capacity to meet system peak demand, i.e., to maintain resource adequacy



## Bin 1 Cumulative MW

<u>Bin 1</u>	2016	2017	2018	2019	2020	2021		2035
Curtaillable/Interruptible Tariff	26	131	238	348	462	550		646
Curtaillable/Interruptible - AutoDR	26	131	238	348	462	550		646
Refrigerated Warehouses - Controls	13	65	119	174	231	275		323
Space Cooling, Medium - Switch	4	17	27	34	39	46		54
Space Cooling, Small - Switch	1	6	10	13	15	17		20

## What's In Each Bin?

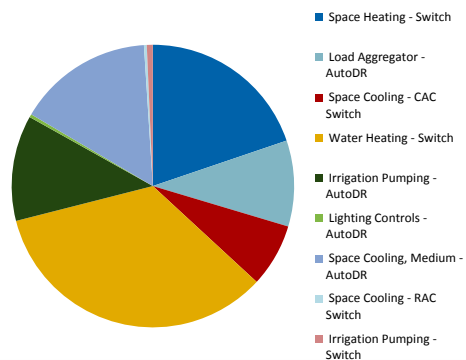
### Bin 2

The RPM can purchase up to **1299 MW (Summer Peak)** and **1312 MW (Winter Peak)** at **\$44.53** (in 2012\$/kW-yr) over the course of the study.

*Over 54% of the bin is made up of Residential Water Heating: \$49*  
Space Heating - Switch: **\$28**

*Less than 46% is made up of*  
Space Cooling, Medium (ADR): **\$55**  
Irrigation Pumping (ADR): **\$55**  
Load Aggregator (ADR): **\$29**  
Space Cooling, CAC Switch: **\$47**  
Irrigation Pumping - Switch: **\$76**  
Lighting Controls (ADR): **\$55**  
Space Cooling, RAC Switch: **\$61**

Bin 2 in 2021



## Bin 2 Cumulative MW

<u>Bin 2</u>	2016	2017	2018	2019	2020	2021		2035
Load Aggregator – AutoDR	6	33	60	87	115	138		161
Space Heating – Switch	21	98	159	204	231	276		325
Space Cooling - CAC Switch	8	36	58	74	85	101		119
Water Heating - Switch	22	113	206	302	400	477		562
Irrigation Pumping - AutoDR	0	1	2	3	4	5		6
Lighting Controls – AutoDR	8	40	73	107	142	169		198
Space Cooling, Medium - AutoDR	7	40	80	127	182	217		254
Space Cooling - RAC Switch	0	2	3	3	4	5		5
Irrigation Pumping - Switch	0	2	4	6	8	10		11

## What's In Each Bin?

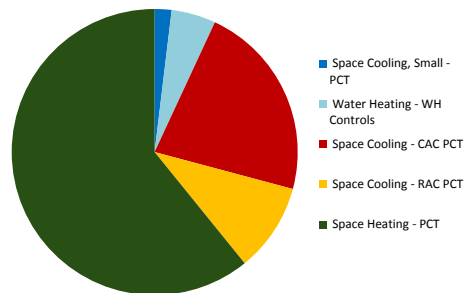
### Bin 3

The RPM can purchase up to **827 MW (Summer Peak)** and **489 MW (Winter Peak)** at **\$151.81** (in 2012\$/kW-yr) over the course of the study.

*Over 60% of the bin is made up of*  
Space Heating – PCT: **\$153**

*Less than 44% is made up of*  
Space Cooling, CAC PCT – Switch: **\$153**  
Space Cooling, RAC PCT- Switch: **\$153**  
Water Heating (ADR): **\$152**  
Space Cooling, Small – PCT: **\$89**

Bin 3 in 2021



## Bin 3 Cumulative MW

<u>Bin 3</u>	2016	2017	2018	2019	2020	2021		2035
Space Cooling, Small – PCT	1	4	8	12	17	20		24
Water Heating - WH Controls	2	13	23	34	44	53		62
Space Cooling - CAC PCT	8	44	87	138	198	236		278
Space Cooling - RAC PCT	4	20	39	62	89	106		125
Space Heating – PCT	21	120	238	378	540	644		759

## Are the DR Resources Selected by the RPM “the Plan”?

- The RPM DR resource acquisition results *will* guide parts of the narrative in the Plan.
- The RPM DR resource acquisition results *are NOT necessarily* the same as the resource strategy recommendations for the Plan.

# Questions?

