



# NSPM Rate Design Pilot

## Stakeholder Meeting

May 5, 2017



# Agenda and Purpose

- Agenda

- Introduction of MN Pilot Development – A. Liberkowski
  - Concept and Goals
  - Pilot Development Timeline
  - MN Time of Use Rate Option – History and Status
- Overview of Pilot from Colorado – S. Wishart and K. Klemm
- Q&A

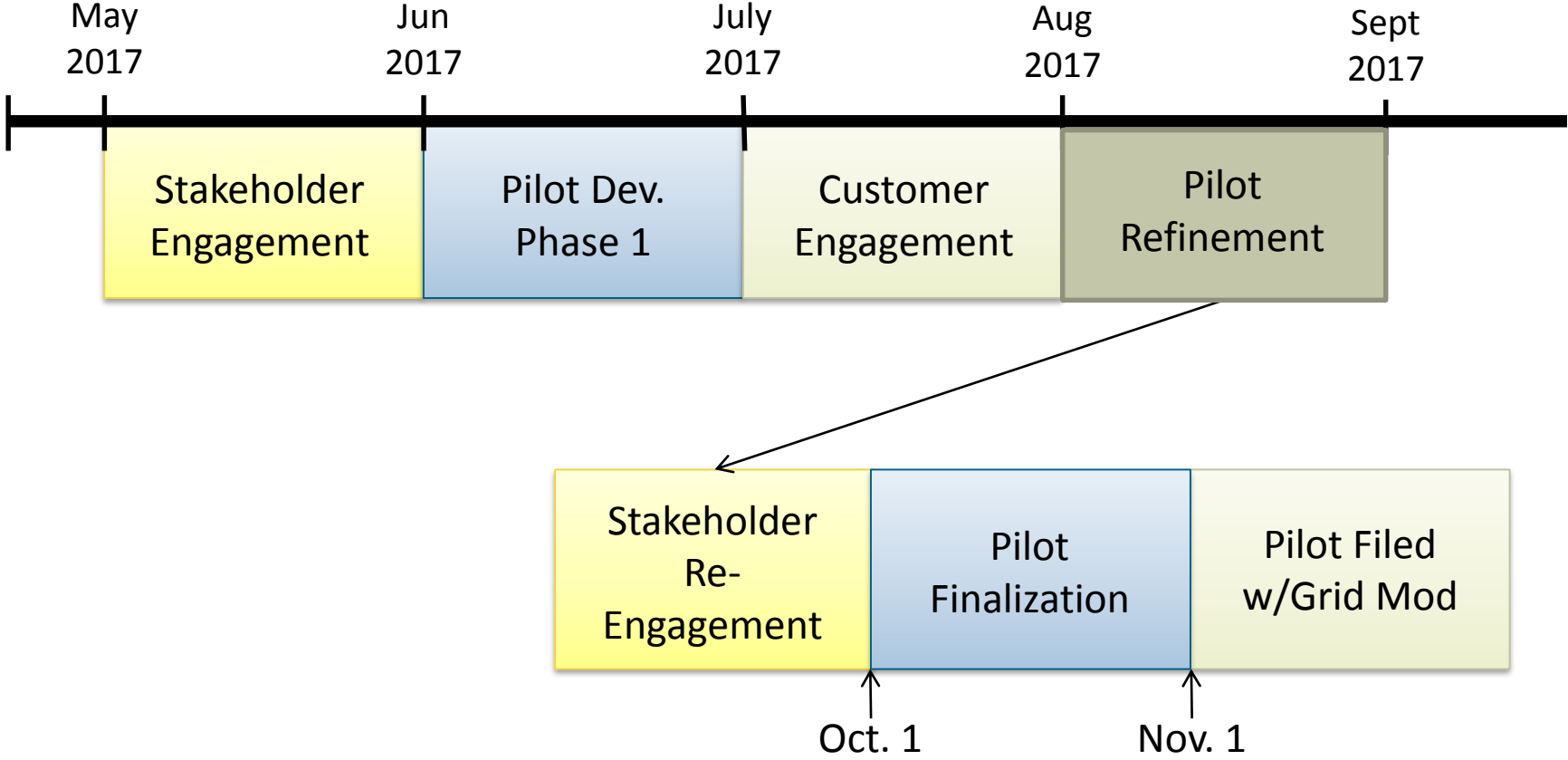
- Purpose

- Share rate design pilot concept, goals and timing
- Provide context – NSPM current rate design and recently developed CO pilot

# Concept and Goals

- Concept
  - Provide more focused peak periods to improve price response
  - Leverage new investments and rates to meet new DR requirement
  - Update current TOU offering to address emerging technologies
  - Share learnings with stakeholders
- Goals
  - Modify current TOU without offering incentives
  - Increase ratio of residential customer participation
  - Understand the changes to rate structure, marketing and education to increase the number of customers using time of use rates
  - Make progress towards requirement to add 400 MW of demand response by 2023
  - Engage stakeholders and customers

# Pilot Development Timeline



# History of Time of Use (TOU) rates in MN

- TOU design established about 1979
- Residential TOU pilot established in 2002 but cancelled before completion
- Developed following federal PURPA Act as rate option for customers and to recognize the lower cost of service for off-peak usage and to encourage load shifting

# Current TOU Customer Participation in MN

MN State - NSP <b>Current TOU Customers</b>	Voluntary Under 1 MW	Mandatory Over 1 MW	Total
Residential	525	0	
C&I Non-Demand - TOU Metered	2,900	0	2,900
C&I Non-Demand - non-TOU Metered <sup>(1)</sup>	8,000	0	8,000
C&I Demand	4,325	500	4,825
<b>TOTAL</b>	<b>15,750</b>	<b>500</b>	<b>15,725</b>

*(1) Traffic signal accounts and very low wattage accounts*

# Other Time-Based Pricing

- About half of residential customers with central air conditioning participate in the Savers' Switch program that provides a summer season energy discount in return for AC cycling on peak days



# Current Design Attributes

- Cost based (verified by consultant CEA report for ND Dec 2014)
- Easy to understand (Two periods with same hours every month)
- On-peak is 9AM-9PM weekdays, Off-peak is all day weekends and holidays
- Captures both summer peak hours and bimodal winter peak hours
- Manageable for C&I-Demand customers – represents half total sales
- 3 month trial period is available



# Current Design Observations

- Very low residential customer participation
- Shorter on-peak period provides more focused pricing and more customer response feasibility
- Limited education and data linkage to customers
- Price differentials only within days does not recognize day-to-day cost differences
- Limited customer usage information impedes comparisons with standard rates
- Current TOU cost differentials are below historical norms

# Q&A

# Colorado Rate Pilots

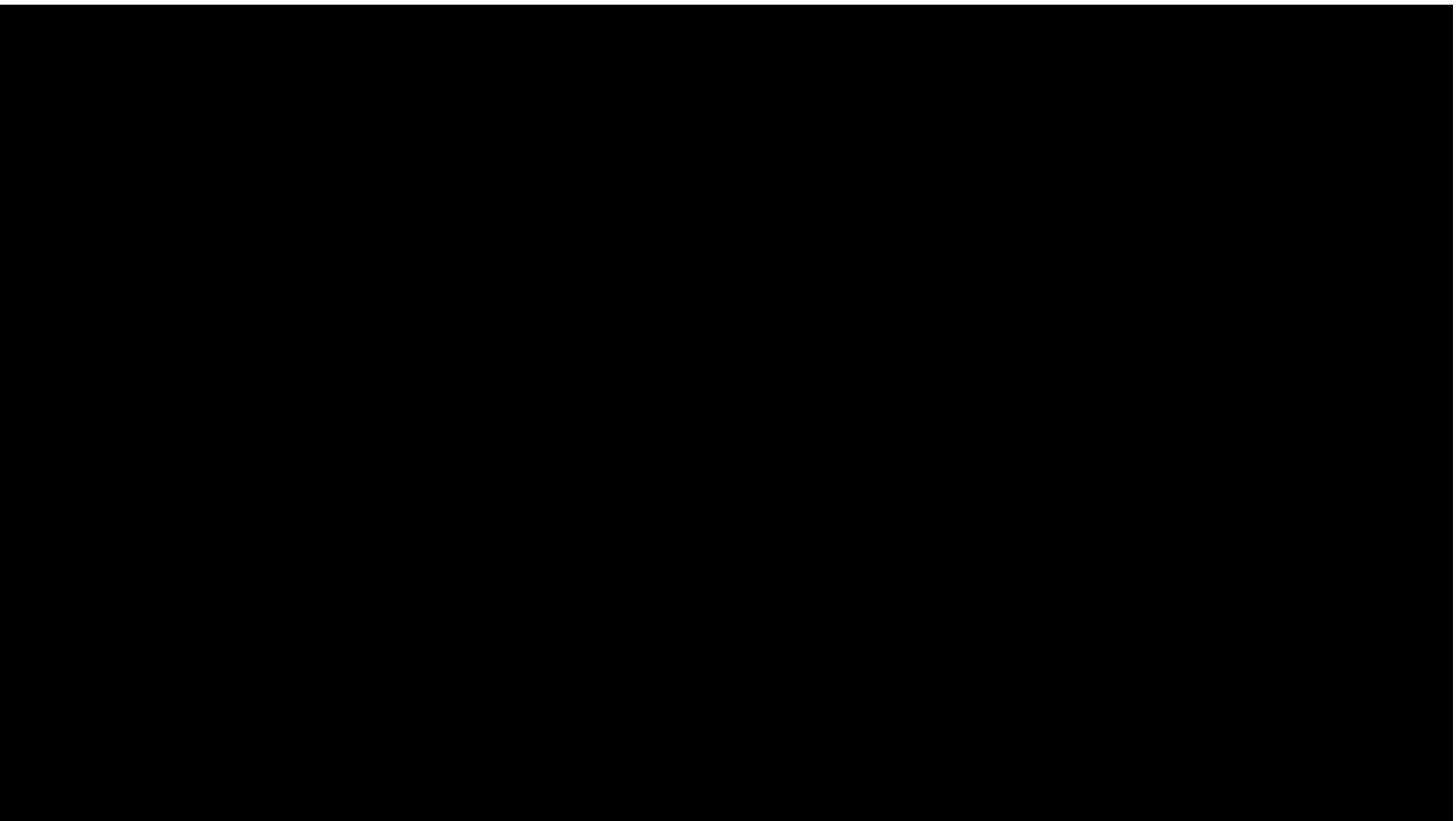
Time of Use Plan

Peak Demand Pricing Plan

Steve Wishart – Manager, Pricing & Planning Kerry Klemm –  
Manager, Renewable Choice Programs

May 3, 2017





# Public Service Company of Colorado

## Residential Demand – Time Differentiated Rate (RD-TDR)

- Monthly Service & Facility Fixed Charge
  - Same as base residential service (\$5.39/month)
  - Originally additional \$3.36 for bridge meter
- Demand Charges
  - Distribution - \$3.65/kW – 24x7 basis
  - Generation & Transmission – 2:00pm-6:00pm M-F
    - Summer - \$9.73/kW
    - Winter - \$6.81/kW
- Energy Charge - \$0.00461/kWh (based on VOM)
- Fuel Clause – TOU - On Peak 9:00am-9:00pm
- Other Riders – Peak demand – 2:00pm-6:00pm M-F

# Public Service Company of Colorado

## Residential Energy– Time of Use (RE-TOU)

- Monthly Service & Facility Fixed Charge
  - Same as base residential service (\$5.39/month)
  - Originally additional \$3.36 for bridge meter
- Energy Charges

	Summer Rate	Winter Rate	
On Peak	\$0.13814	\$0.08880	2:00pm-6:00pm M-F
Shoulder	\$0.08420	\$0.05413	All other hours
Off Peak	\$0.04440	\$0.04440	9:00pm-9am all days

- Fuel Clause – TOU - On Peak 9:00am-9:00pm
- Other Riders – flat kWh rates

# Public Service Company of Colorado

## Rate Design Principals & Consideration

- Revenue neutrality
  - Average customer *should* be indifferent between R, RD-TDR, & RE-TOU
- RD-TDR
  - Demand charges based on allocated Distribution, Transmission, and Generation cost
  - Meant to reflect cost causation
  - G&T Demand – 70% winter/summer differential
  - Mirror PSCo Commercial & Industrial rates
- RE-TOU
  - On Peak / Off Peak Ratio
    - 3.11 Summer & 2 Winter
  - Impact on net metering

# Public Service Company of Colorado

## Revenue Neutrality

- What exactly are residential max demands and residential TOU patterns?

Base Residential Rates					Billing Determinants			Annual Bills					
S&F	Base Rates	ECA	Other Riders	Total Rate		Annual	Monthly Average	Annual	S&F	Base Rate	ECA	Other Riders	Total
\$5.39					S&F	12	1	S&F	\$64.68				\$64.68
	\$0.05461	\$0.03213	\$0.01209	\$0.09883	Summer Tier 1	1,553 kWh	129 kWh	Summer Tier 1		\$84.81	\$49.90	\$18.77	\$153.48
	\$0.09902	\$0.03213	\$0.01209	\$0.14324	Summer Tier 2	1,321 kWh	110 kWh	Summer Tier 2		\$130.80	\$42.44	\$15.97	\$189.21
	\$0.05461	\$0.03213	\$0.01209	\$0.09883	Winter	4,674 kWh	389 kWh	Winter		\$255.23	\$150.17	\$56.51	\$461.91
					Total	7,548 kWh	629 kWh	Total	\$64.68	\$470.84	\$242.50	\$91.25	<b>\$869.27</b>
S&F	Base Rates	ECA	Other Riders	Total Rate									
\$5.39	<b>RE-TOU</b>				S&F	12	1	S&F	\$64.68				\$64.68
	\$0.13814	\$0.03762	\$0.01209	\$0.18785	Summer On-Peak	417 kWh	35 kWh	Summer On-Peak		\$57.65	\$15.70	\$5.05	\$78.39
	\$0.08420	\$0.03762	\$0.01209	\$0.13391	Summer Shoulder	1,270 kWh	106 kWh	Summer Shoulder		\$106.95	\$47.79	\$15.36	\$170.09
	\$0.04440	\$0.02337	\$0.01209	\$0.07986	Summer Off-Peak	1,002 kWh	83 kWh	Summer Off-Peak		\$44.47	\$23.41	\$12.11	\$79.99
	\$0.08880	\$0.03762	\$0.01209	\$0.13851	Winter On-Peak	566 kWh	47 kWh	Winter On-Peak		\$50.28	\$21.30	\$6.85	\$78.43
	\$0.05413	\$0.03762	\$0.01209	\$0.10384	Winter Shoulder	2,140 kWh	178 kWh	Winter Shoulder		\$115.83	\$80.51	\$25.87	\$222.21
	\$0.04440	\$0.02337	\$0.01209	\$0.07986	Winter Off-Peak	2,152 kWh	179 kWh	Winter Off-Peak		\$95.56	\$50.29	\$26.02	\$171.87
					Total	7,548 kWh	629 kWh	Total	\$64.68	\$470.75	\$239.00	\$91.25	<b>\$865.68</b>
S&F	Base Rates	ECA	Other Riders	Total Rate									
\$5.39	<b>RD-TDR</b>				S&F	12	1	S&F	\$64.68				\$64.68
	\$3.65			\$3.65	Distribution	44 kW	4 kW	Distribution		\$162.07			\$162.07
	\$9.73		\$2.70	\$12.43	Summer G&T	13 kW	1 kW	Summer G&T		\$126.56		\$35.12	\$161.68
	\$6.81		\$2.70	\$9.51	Winter G&T	22 kW	2 kW	Winter G&T		\$147.88		\$58.63	\$206.51
	\$0.00461	\$0.03762		\$0.04223	On-Peak	4,394 kWh	366 kWh	On-Peak		\$20.25	\$165.30		\$185.55
	\$0.00461	\$0.02337		\$0.02798	Off Peak	3,154 kWh	263 kWh	Off Peak		\$14.54	\$73.70		\$88.24
					Total	7,548 kWh	629 kWh	Total	\$64.68	\$471.30	\$239.00	\$93.75	<b>\$868.73</b>



# Public Service Company of Colorado

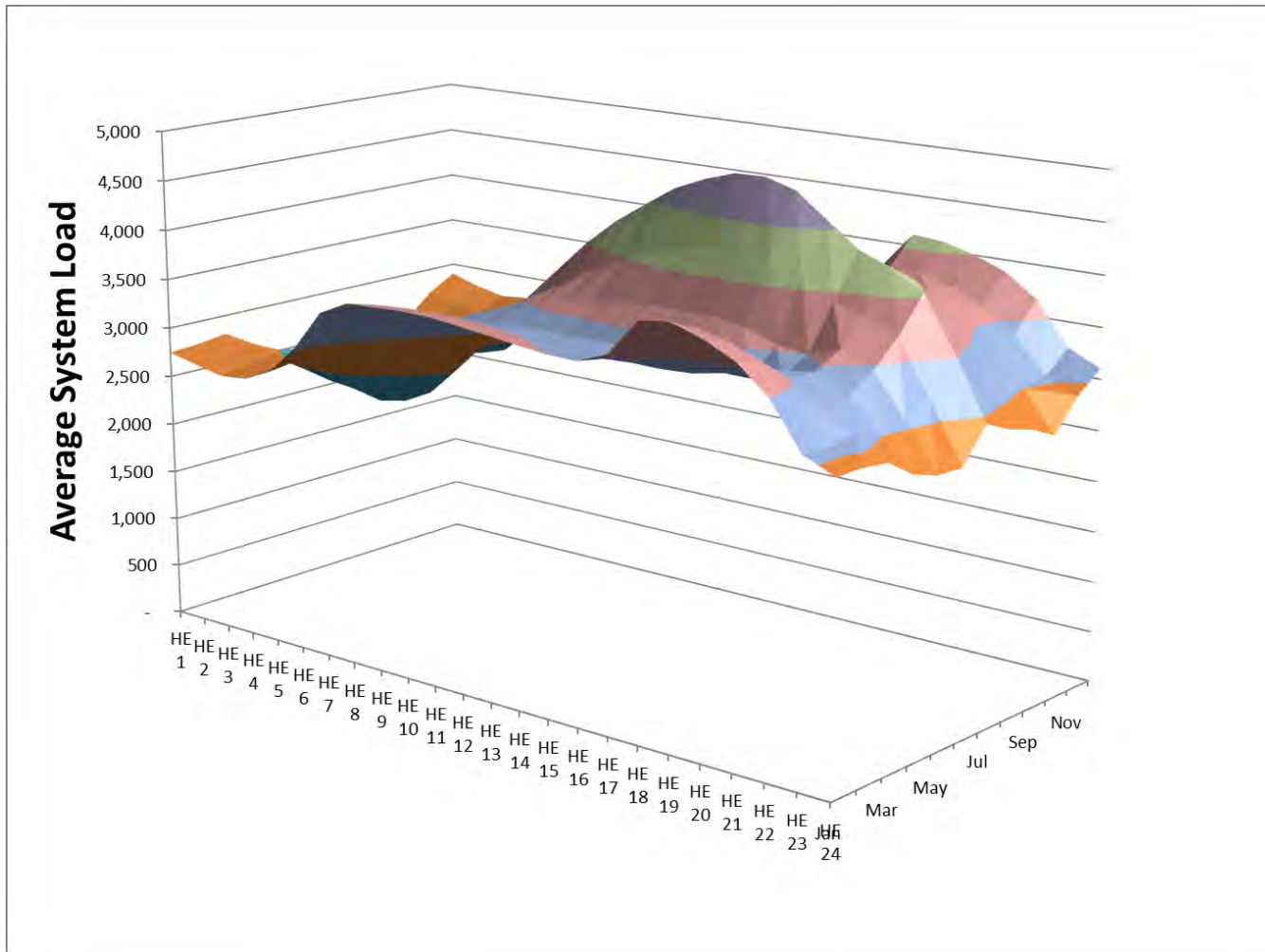
## Time Periods

## PSCo – Average load by hour

WINTER	Jan	2,748	2,682	2,622	2,644	2,775	3,072	3,468	3,611	3,625	3,639	3,633	3,603	3,568	3,533	3,500	3,492	3,608	3,971	4,008	3,912	3,766	3,504	3,064	2,929
	Feb	2,769	2,710	2,661	2,686	2,818	3,095	3,440	3,536	3,558	3,570	3,570	3,540	3,506	3,478	3,449	3,445	3,504	3,715	3,890	3,818	3,689	3,445	3,047	2,931
	Mar	2,810	2,738	2,704	2,708	2,783	2,953	3,176	3,316	3,370	3,395	3,411	3,406	3,389	3,376	3,359	3,339	3,334	3,350	3,411	3,513	3,482	3,335	3,109	2,898
	Apr	2,637	2,535	2,493	2,471	2,556	2,754	3,032	3,196	3,279	3,330	3,359	3,670	3,367	3,375	3,365	3,354	3,342	3,336	3,290	3,683	3,462	3,294	3,014	2,711
	May	2,502	2,349	2,289	2,256	2,340	2,544	2,854	3,153	3,329	3,442	3,536	3,621	3,670	3,694	3,691	3,690	3,651	3,537	3,497	3,606	3,462	3,070	2,624	
SUMMER	Jun	2,459	2,240	2,145	2,063	2,114	2,263	2,554	2,908	3,200	3,418	3,645	3,965	4,088	4,178	4,254	4,290	4,265	4,100	3,724	3,841	3,699	3,173	2,614	
	Jul	2,743	2,478	2,353	2,265	2,323	2,483	2,725	3,083	3,408	3,711	4,009	4,461	4,465	4,664	4,793	4,790	4,899	4,811	4,575	4,444	4,220	4,036	3,532	2,940
	Aug	2,687	2,523	2,436	2,333	2,413	2,612	2,866	3,139	3,404	3,640	3,886	4,225	4,255	4,414	4,531	4,568	4,561	4,470	4,259	3,983	4,052	3,782	3,308	2,815
	Sep	2,628	2,489	2,439	2,333	2,455	2,658	2,968	3,154	3,305	3,435	3,561	3,653	3,735	3,841	3,911	3,991	3,995	3,977	3,867	3,785	3,799	3,524	3,139	2,737
WINTER	Oct	2,497	2,363	2,313	2,221	2,379	2,634	3,071	3,321	3,397	3,450	3,502	3,566	3,528	3,554	3,564	3,568	3,598	3,718	3,563	3,612	3,360	3,013	2,603	
	Nov	2,740	2,662	2,624	2,659	2,786	3,044	3,321	3,416	3,453	3,473	3,481	3,473	3,460	3,442	3,434	3,458	3,588	3,849	3,831	3,743	3,611	3,393	3,044	2,909
	Dec	2,896	2,803	2,742	2,769	2,882	3,126	3,439	3,574	3,613	3,630	3,630	3,593	3,545	3,523	3,499	3,529	3,746	4,112	4,085	4,003	3,883	3,664	3,252	3,100
Weekends WW	2,647	2,565	2,502	2,466	2,484	2,567	2,722	2,825	2,922	3,002	3,050	3,061	3,042	3,028	3,023	3,051	3,161	3,373	3,446	3,449	3,416	3,256	2,949	2,740	
Weekends WS	2,570	2,415	2,321	2,215	2,207	2,251	2,299	2,440	2,718	3,018	3,294	3,516	3,686	3,826	3,928	4,017	4,074	4,066	3,947	3,829	3,767	3,582	3,173	2,712	

# Public Service Company of Colorado

## Time Periods



## **Customer Impacts**

- **Baseline results based on 2013 load data**
- **How will customer behavior change when customers are actually on the rate?**
- **Reduced on-peak TOU?**
- **Avoided peak demands 2:00pm – 6:00pm?**

# Public Service Company of Colorado

## C&I Critical Peak Pricing

- Secondary, Primary, and Transmission C&I customers
- 30 MW limit for total enrollment
- Approximate 40% discount on monthly demand charge
- \$1.50/kWh during Critical Peak events
  - 4 consecutive hours between 12:00pm – 8:00pm
  - Maximum of 15 days per year
  - Based on day-ahead load & resource assessment
    - Peaking condition or 10% reserve margin
  - Minimum 22 hour notification

# Q&A

NO TWO PEOPLE USE  
POWER THE SAME WAY.



NEW PRICING PLANS  
FROM XCEL ENERGY.

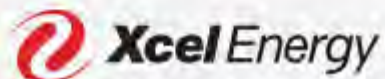
[Learn More](#)



## Colorado Rate Pilot Overview

NEW PRICING PLANS  
THAT FAVOR THE FLEXIBLE.

[Learn More](#)



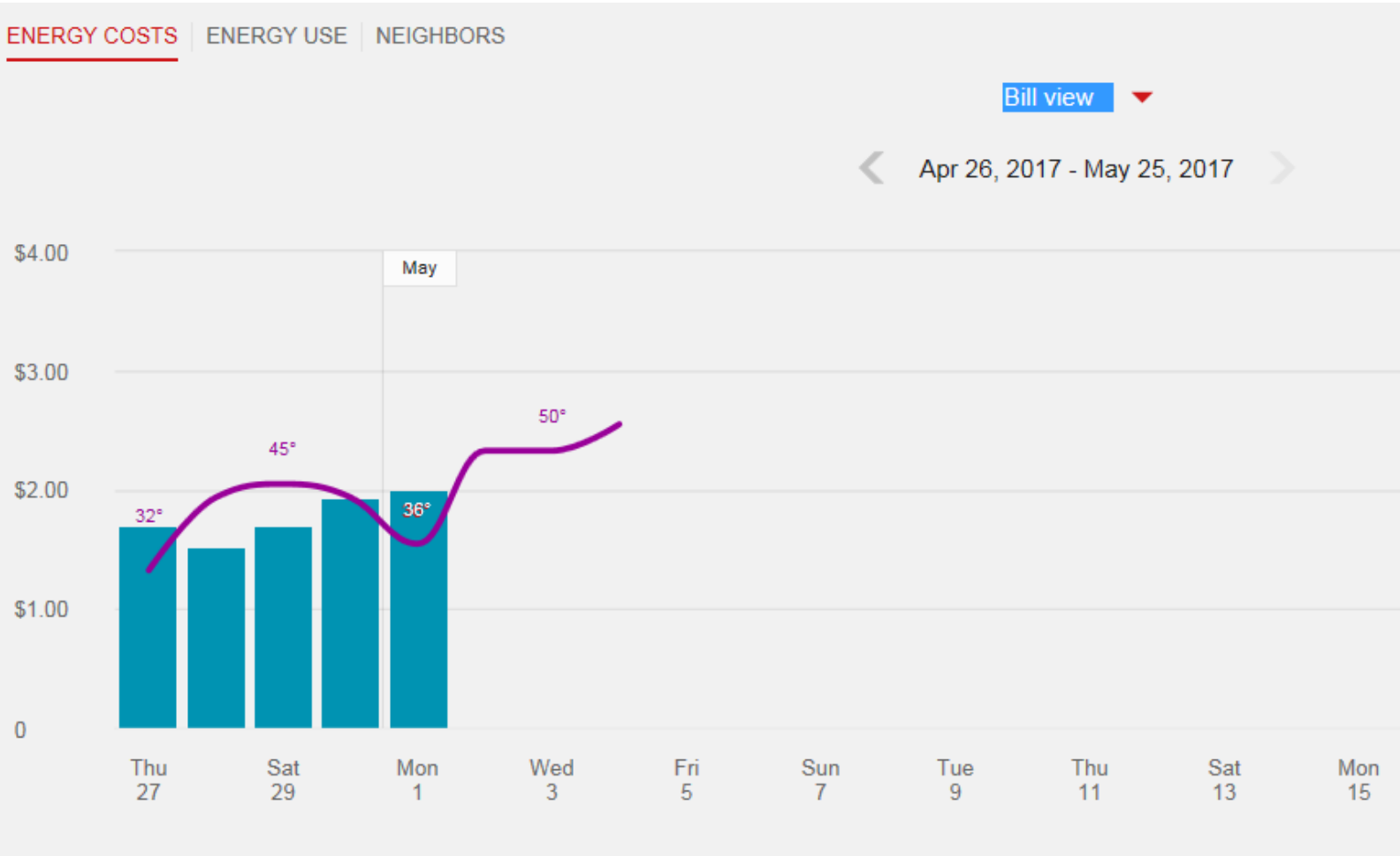
# Colorado Pilot Objective / M&V Design

## Pilot Objective:

To measure changes in customers' behavior and satisfaction after opting to enroll in time of use or peak demand pricing.

- Opt-in pilot design
- Enroll online – inside of MyAccount
- Set into M&V test or control groups within 3 days
- New meters needed for all participants & control group

# Example: Minnesota Daily Data in My Account





## Colorado Pilot

# Measurement & Verification Drives Pilot Size

Pilot Rate	Low Income	Solar	Electric Vehicles	Smart Thermostat	Renters	Seniors	General Pop	Total
RE-TOU	770	2,311	770	1,263	2,511	2,511	5,022	15,158
RD-TDR	770	2,311	770	1,263	1,843	1,843	2,511	11,311
Control	770	4,622	770	1,263	2,511	2,511	5,022	17,469
<b>Total</b>	2,310	9,244	2,310	3,789	6,865	6,865	12,555	<b>43,938</b>

- Test/Control group design to measure differences in usage, bill impacts, attitudes among very similar groups
- 2 sub-segments added during stakeholder groups
  - Renters
  - Seniors
- Sample size increased on stakeholder input
- Critical: expert M&V design prior to RFP for evaluator
- Rule of thumb: roughly 3,000 – 4,000 per measurement group for valid M&V results

~ 44,000  
14 months  
3,138/mo.

# Colorado Pilot

## Insights Into Existing Attitudes

Customers don't understand their bills or their energy use



"I'd be concerned about not being able to leave the TV on for my dog!"



Half of each group would sign up for 1 of the 2 plans

Need simple explanation of demand



Being in a control group was acceptable



Desire for ...

- High bill alerts / peak time notices
- More customized XE recommendations
- **Simplified messages**
- Customer examples / testimonials
- More info on HH energy/demand



No availability of granular real-time energy usage data in Colorado

# Colorado Pilot Phased Marketing Overview

## 1. Enrollments

- Marketing campaigns (awareness) drive to Web
- Web creates understanding to drive enrollment
  - Videos
  - Quiz
  - Participant case studies

## 2. Optimize the rate experience

- Understanding my bill & drivers (without real-time data)
- Knowing how to change behavior to lower costs
- Customer insights tool (out for RFP now)
- Appliance usage tools & infographics
- Work in Progress ....

[xcelenergy.com/residentialrates](http://xcelenergy.com/residentialrates)

# Colorado Pilot Example Insights Platform

## RFP out for insights tools to help customers succeed on rates

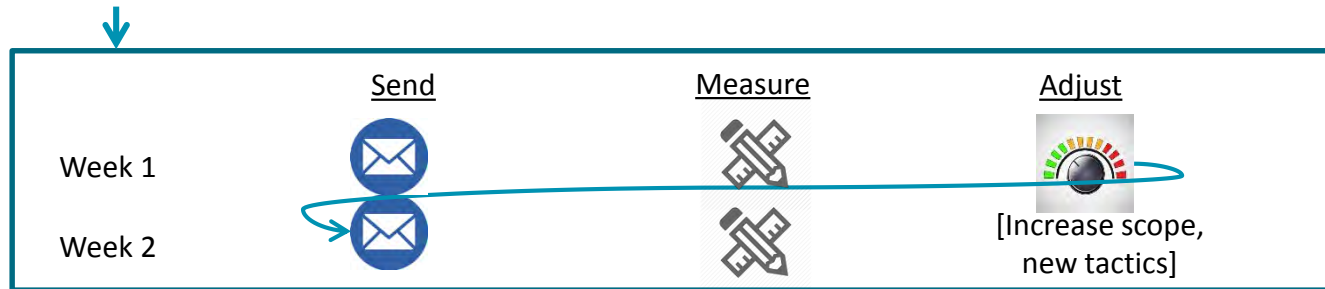
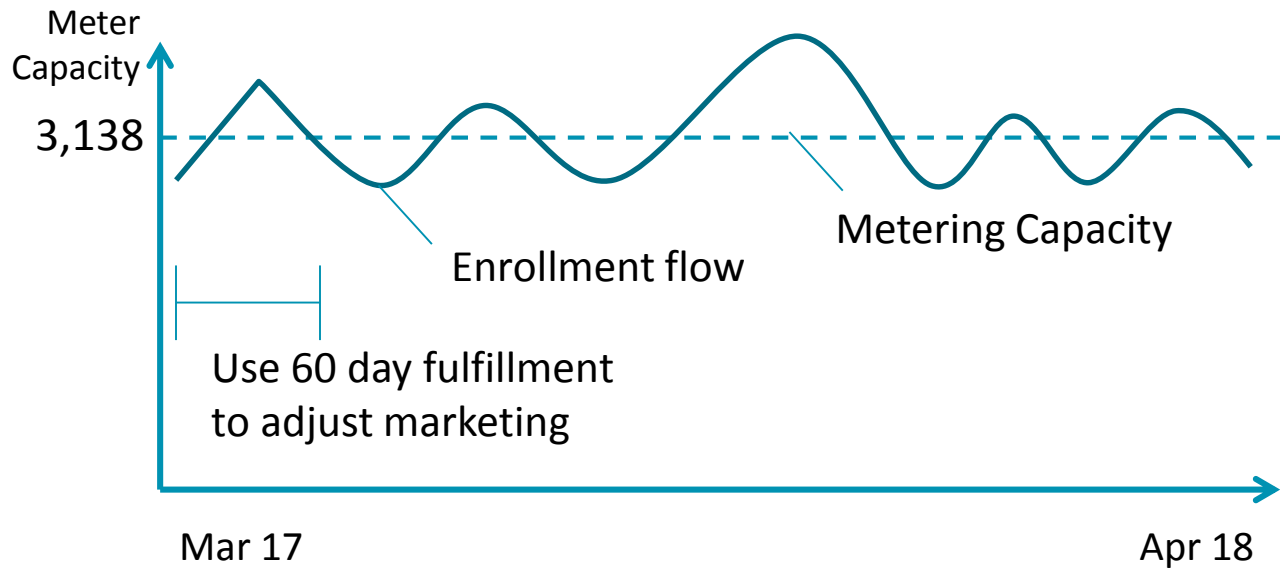
- Drive engagement with tools such as goal setting
- Weather related insights to consumption patterns to drive alerts or bill projections
- Customized tips based on usage analysis on what specific appliances customers could shift to save, relative to their specific rate structure
- Custom messaging to engage customers at regular intervals about how to save on their new rates



# Colorado Pilot Campaign Challenges

- We have a short window to achieve the goal
  - The message is a complex one that is not easily understood by the consumer
  - We do not know the response rate for this type of message
  - Capped monthly enrollments
  - 60 day test of channels and methods customer groups will inform next phase of enrollment marketing
- ▶ **High cost to go from 0 to 44,000 enrollments for new, complex program with limited value proposition**

# Colorado Pilot Marketing Operations



# Colorado Pilot Email Samples



## Your schedule, your plan

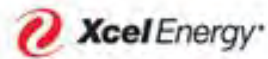
One pricing option doesn't always work for all our customers. That's why we're letting you choose the pricing option that best reflects how and when you personally use energy.

### Time of Use Pricing

You'll be able to save money by using energy more efficiently. Shift energy use to off-peak hours later in the evening and weekends; avoiding the high-priced, peak hours of weekdays from 2 p.m. to 6 p.m.

### Peak Demand Pricing

Have more control over what you pay by consistently shifting and staggering your energy use: shift use to off-peak hours and



## Take control of your home's energy bill.

Introducing new pricing plans that give you the power to choose an electricity rate that's right for you. These options are designed to provide potential cost savings based on how and when you use energy in your home. Take our quiz to learn more.

Take the Quiz

### Which option is right for you?

Can you do laundry on weekends? Run your dishwasher overnight?

- With **Time of Use Pricing** plan, the more you can shift energy usage to off hours such as nights and weekends, the more you can save.

Can you be flexible when you use your major appliances?

- **Peak Demand Pricing** could be a good option for you if you are

Awareness

Education

Enrollment

Fulfillment

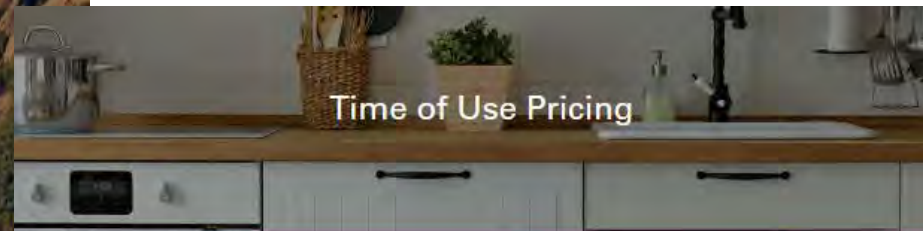


# Colorado Pilot Online Enrollment & Education

xcelenergy.com/residentialrates  
(Choose Colorado as state)

## Residential Rate Plans

Find the plan that fits your needs and lifestyle.



### Time of Use Pricing

You can save money by using less electricity during weekdays from 2 - 6 p.m., called the "on-peak period." Electricity will be priced at the most expensive rates during this period, while the "shoulder period" on either side of on-peak hours and the "off-peak period" at night and on weekends and holidays will be discounted. You pay based on when and how much energy you use, so the more you can shift usage to lower priced periods, the more you can save.

At Xcel Energy, we're always looking for ways to help customers reduce energy costs and have more options and control over their bills. We are offering new rate plans to choose from and new ways to save.

Enroll in Time of Use

Enroll in Peak Demand Pricing

New Colorado Pricing Plans

## New Colorado Pricing Plans



### How Time of Use Pricing Works

Understand the pricing behind this rate plan, and how shifting usage can save you money.

[Learn more](#)



### Is Time of Use Pricing Right for Me?

Can you be flexible with the use of appliances such as an electric dryer or dishwasher? Interested in having more control over your bill?

[Learn more](#)



### Customer Examples

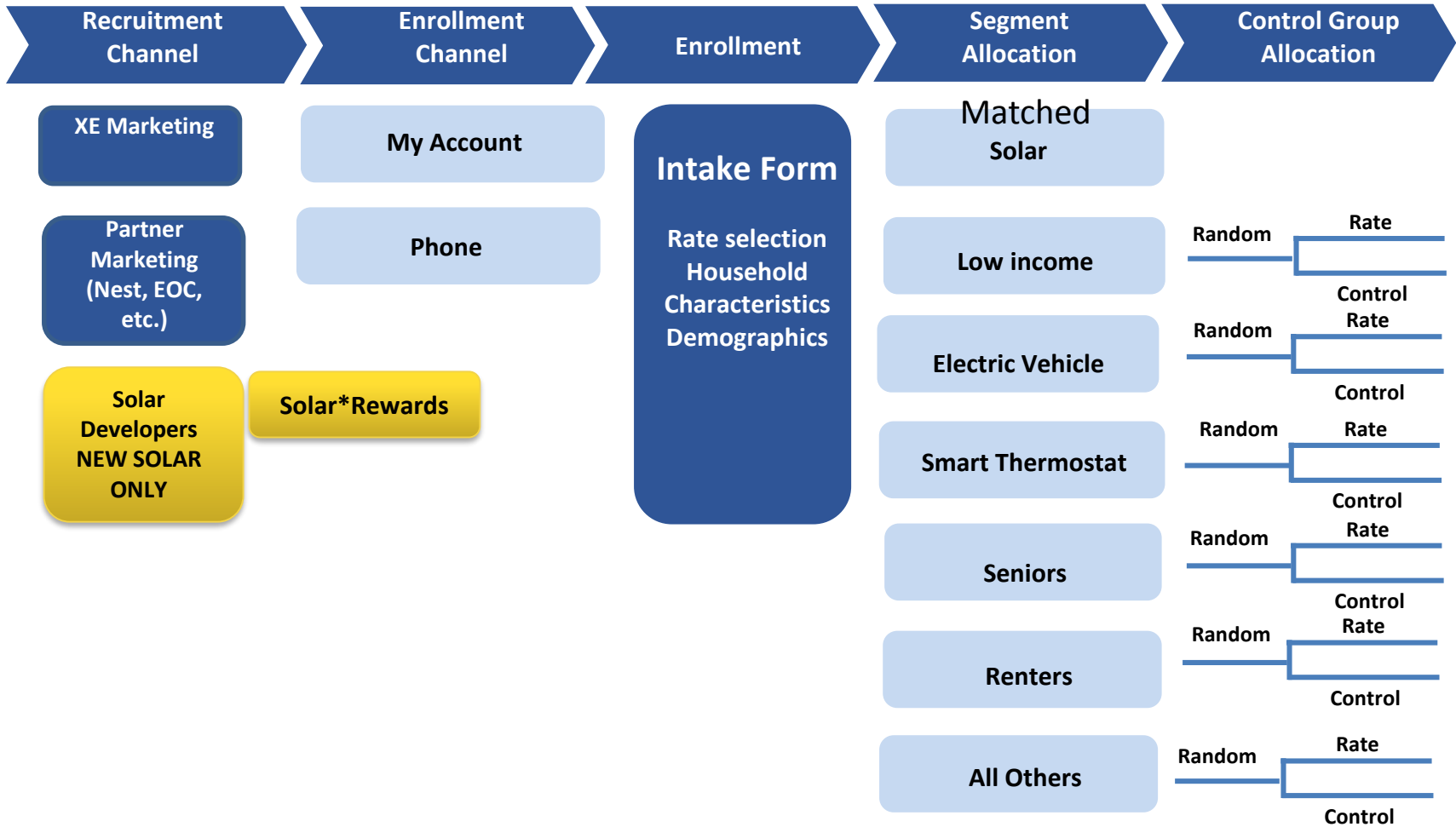
See how different types of customers do on the Time of Use Pricing compared to the general plan.

[Learn more](#)





# Colorado Pilot Complex Enrollment Process



# Colorado Pilot Current Status

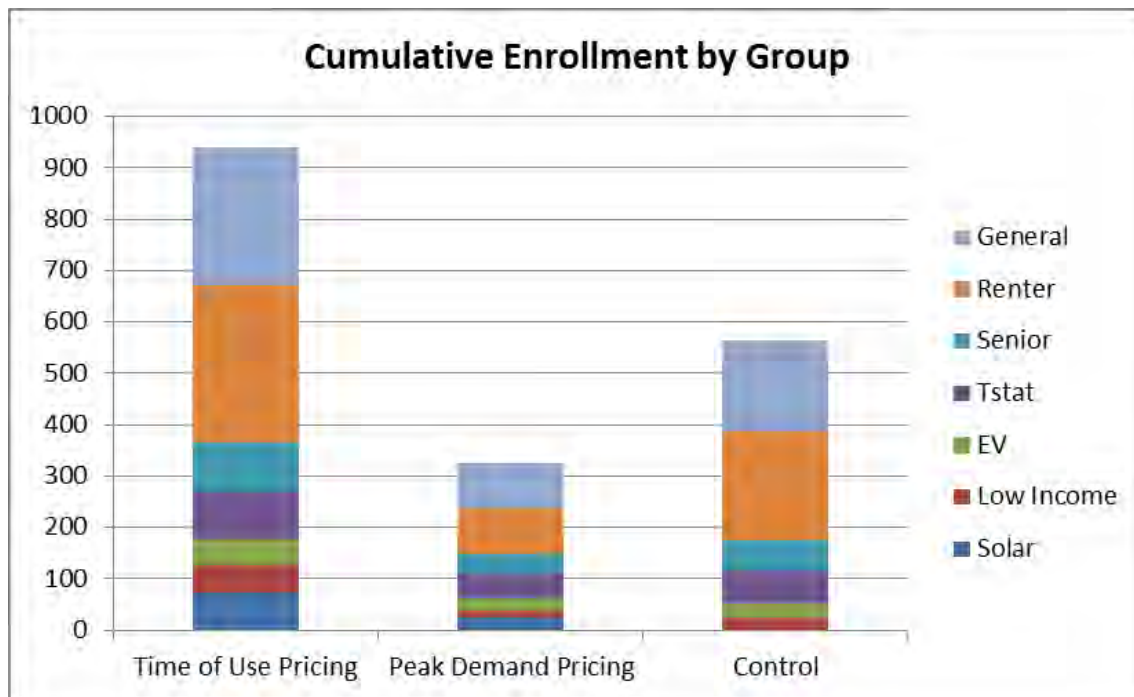
## Colorado Rate Pilot Weekly Status Report

	3/6 - 3/12	3/13 - 3/19	3/20 - 3/26	3/27 - 4/2	4/3 - 4/9	4/10 - 4/16	4/17-4/23	4/24-4/30	YTD
<b>Awareness &amp; Marketing</b>									
Emails Sent	126,046	143,596	264,242	82,343	-	-	-	-	616,227
Emails Opened	44,797	57,399	86,725	41,943	-	-	-	-	230,864
Email Click Throughs	5,909	6,132	10,295	4,070	-	-	-	-	26,406
Direct Mail Sent	-	-	-	-	-	-	-	-	-
Social Impressions	-	-	225,354	342,315	482,194	16,993	91,350	71,049	1,229,255
<b>Interest &amp; Education</b>									-
TOU Page Visits	2,164	646	1,374	887	666	466	426	380	7,009
Demand Page Visits	1,008	434	795	530	364	239	247	179	3,796
Video Views	200	62	155	168	125	61	42	41	854
Energy Expert Calls	184	143	121	140	125	77	110	72	972
<b>Enrollment</b>									-
Time of Use Pricing	202	136	186	150	72	60	10	123	939
Peak Demand Pricing	57	54	59	64	34	22	4	31	325
Control	119	111	77	101	46	22	7	82	565
<b>TOTAL</b>	<b>378</b>	<b>301</b>	<b>322</b>	<b>315</b>	<b>152</b>	<b>104</b>	<b>21</b>	<b>236</b>	<b>1,829</b>

# Colorado Pilot Current Status

## Colorado Rate Pilot Cumulative Enrollment

	Solar	Low Income	EV	Tstat	Senior	Renter	General	TOTAL
Time of Use Pricing	73	53	52	91	96	306	268	939
Peak Demand Pricing	25	14	24	47	38	88	89	325
Control	N/A	24	27	66	59	210	179	565
<b>Total</b>	<b>98</b>	<b>91</b>	<b>103</b>	<b>204</b>	<b>193</b>	<b>604</b>	<b>536</b>	<b>1,829</b>



# Q&A