



DATE: Thursday, October 27, 2016
TIME: 1:30 PM
LOCATION: Xcel Energy Larimer Office

MEETING MINUTES FOR PILOT AND TRIAL PROGRAM STAKEHOLDER GROUP

Call to Order

- **RE-TOU Trial & RD-TDR Pilot Program Stakeholder Group**
- **Meeting to Discuss**
 - Overview of Pilot Program
 - Discussion of Comments to Draft Trial and Pilot Study
- **Attendee Names**

Xcel Energy	Scott Brockett, Tandy Dilworth, Marci McKoane, Ryan Matley, Louise Wood, Neil Cowan, Joani Mauro, Carla Scarsella, Jennifer Augustine, Steven Wishart
DVN-GL	Craig Williamson
CEO	Ellen Kutzer, Lindsey Wedewer
COSEIA	Rebecca Cantwell, John Bringenberg, Gary Price
CPUC	Fiona Sigalla, Jason Peuquet, Erin O'Neill
EFCA	Jake Schlesinger, Brian Warshay
EOC	Jennifer Gremmert, Skip Arnold
OCC	Cindy Schonhaut, Tom Dixon, Cory Skluzak
Sunrun	Kevin Fox, Gracie Walovich
Vote Solar	Rick Gilliam
WRA	Gwen Farnsworth, Erin Overturf

Approval of Previous Minutes

Not Applicable

Discussion

Summary: The Company's Customer Solutions team presented a summary of its measurement and verification plan ("M&V") related to the RE-TOU trial and the RD-TDR pilot programs to initiate the discussion for the planned November 15, 2016 filing. The discussion centered on the number of participants in the study inclusive of the control groups, the subgroups that the Company has used for categorization of the participants. The number of meters that will be required and the installation rate of those meters will be an informative part of the study and the rollout plan. Per the Global Settlement Agreement, the Company will treat both the trial and pilot programs the same inclusive of the enrollment process and timing. Additionally, the Company walked through each of the comments from the parties to the M&V plan and discussed our response and how the particular issue would be treated in the final study.

Detailed Discussion

Sunrun: The Company's marketing, education, and recruitment plans for participation were not included in the Plan.

XE: The focus of the Study and Evaluation plan is on the Company's methodology for experimental design, sample targets, and customer research. The Company plans to share marketing, education, and recruitment plans (much of which are contingent on M&V plans) in December after the Study and Evaluation Plan has been finalized.

EFCA: Will the charter be the same for each of the stakeholder groups?

XE: Yes, but stakeholders will have an opportunity to review the charter within each stakeholder group.

Sunrun: What will be the frequency of the meetings?

XE: This Stakeholder Group is required to meet semi-annually, but the Company will consider meeting more frequently on a quarterly basis or as needed.

Vote Solar: Will there be an opportunity to present different views in the documents that will be filed with the Commission?

XE: The Company will file the report and stakeholders can weigh in. The meeting minutes will capture consensus, opinions and opposing positions and will be posted publicly. The meeting minutes will not be included in the filing.

Vote Solar: Will there be more direct input into the process with the Commission if parties are not on the same page to provide an alternative in the document?

XE: We can discuss as the issue arises, however we don't have Commission input on how this would work procedurally. Likely this would be a question for counsel.

EFCA: Will the filing be submitted in the consolidated proceeding?

XE: Yes, Proceeding No. 16AL-0048E.

PILOT STUDY PRESENTATION (Ryan Matley presented on behalf of Xcel Energy)

Sunrun: Is the Company looking for customers with existing enabling technology?

XE: We can market the rates to customers with enabling technology since we know who those customers are and what type of technology they have through current Demand Side Management ("DSM") programs e.g. smart thermostats. Also, we can ask what technologies customers have when we enroll them.

OCC: The Company states this is an opt-in program but there is an opt-out provision for six months.

OCC: Will the sample groupings be equal or based on a percentage of the Company's customer base with the exception of Low Income?

XE: The sample targets will be based on the number of data points necessary within each grouping (based on variance and expected savings) to ensure statistically valid results.

PUC: It may be more difficult to extrapolate with a hybrid approach of extrapolating and recruitment waves.

XE: The Company has not settled on the method yet.

EFCA: What do you mean by extrapolating results?

XE: Using the results to make inferences about the entire population if the program was rolled out to all Schedule R customers.

EFCA: How will the Company utilize the AMI meter data prior to the advice letter filing?

XE: The Company will collect the data but is unsure how it will incorporate the information. There will not be a lot of data prior to the advice letter filing. There will be a partial data collection cut off five months prior to the filing. The Company may not have

data for the critical summer season in the last year. The Company will continue to analyze the data after the filing and approval of the RE-TOU rate.

WRA: The RE-TOU trial data should continue to be evaluated beyond the filing date and have comparable time periods for both the RE-TOU and RD-TDR.

OCC: Why is intense recruitment in waves better?

XE: The Company will randomly select customers rather than using email blasts and then do another random selection in hopes of increasing enrollment. Focusing on waves increases the odds of reaching customers beyond the “early adopters” which would provide a more representative sample.

PUC: Will the Company be constrained by how the meters are used? How quickly can we install meters? What is the targeted monthly installation?

XE: The Company is working on this monthly forecast.

WRA: 2,000 meters installed per month as discussed during the Settlement.

EOC: Will the Company sweep through neighborhoods, by city, or by sections? Does this geographic selection contribute to the selection bias? Who selects the customers, how, and why?

XE: The Company will use a broader rollout than AGIS. AGIS will be geographically targeted.

OCC: Will the Company have knowledge of customer demographics we target through mailing notices?

XE: Yes, but not always. The Company has some knowledge, but it’s not perfect, on customers who have solar, smart thermostats, etc. but don’t always know who has EV.

Vote Solar: Will the data collected be available to the entire stakeholder group?

XE: Yes, unless there are any issues related to data privacy rules.

Sunrun: The M&V plan addresses other studies – the Settlement addresses the sample sizes.

WRA: If 2,000 meters apply to AMI and bridge meters, is it a constraint on the meter rollout if the Company cannot meet the request for the trials? How will the Company comply with customer requests?

XE: We will re-verify the meter installation rate with our metering department.

EFCA: Why recruit smaller sample sizes? What data is there on demand rates?

XE: There is limited data on demand rates.

PUC: Should the Company consider a lottery and recruit from all customers? There would be less bias by providing everyone with the information. PUC does not prefer a targeted group and feels the EV group would jump on the enrollment.

WRA: There is a need to target EV. If there are certain groups we want to study specifically, then we must target those groups. However, the overall sampling should be randomized. The study would be a failure if it only included solar and EV.

Sunrun: Is the target group only new solar for both rates?

XE: It doesn't have to be, but it is easiest and the best way to recruit customers. The Company anticipates that mainly new solar customers will select the demand rate. It does not discourage existing solar to opt in.

EFCA: EFCA disputes treating the solar customers differently. Is it possible to use the load research data as a baseline comparison?

XE: It is not a like for like comparison. Additionally, there are only a couple hundred load research customers so we'd be unable to attain sample control targets (which number in the thousands)

EFCA: In the recruit and deny scenario, who pays for the bridge meters?

XE: The pilot control meter costs will be deferred to the next rate case.

WRA: Could the Company place smart meter customers on a bridge meter and then convert to an AMI in order to compare their data from the bridge meter to AMI?

XE: We will not be able to include these customers as part of the study.

EFCA: If we use 9.1% and the result is lower, would that mean the result is not significant?

XE: Yes, there is a risk that if we overestimate that the results are not as useful. If we underestimate then we could install too many control meters.

EFCA: What is the cost difference?

XE: Each incremental meter costs \$133.

PUC: We are not talking about using the in-home display. Why is 9.1% more relevant than 7.8%?

XE: The Company is not planning on installing separate in-home devices, but has other access to account data such as My Account. The Company is amenable to a lower number than 9.1%, but a lower number would drive the costs higher.

WRA: What would be the increased cost and how does that differ than what the Settlement allows? Why wouldn't the Company target 7.8%? What are the costs we are concerned about?

XE: The 10,000 control customers will not be on the rate, but the Company will have to incur the cost of the control meters.

Sunrun: How is the Company recruiting solar customers?

PUC: Can the Company recruit a higher sample size in certain groups to analyze sub-groups?

EFCA: Agrees with the PUC.

XE: The Company believes we would also have to increase recruitment of control groups to match the increase in pilot groups. The Company will check on whether it's possible to have control/treatment groups of difference sizes and impact to statistical precision.

WRA: When looking at the sample groups, explain why the Company shouldn't have larger sample sizes in the general group?

XE: To measure savings, the size of the sample is based on the energy use and what savings we expect. It is not based on the proportion of that sample to the overall population.

PUC: Is the 2,000 a month meter rollout low based on AGIS rolling out all customers in 3 years?

XE: AGIS is a larger expense and will be rolled out geographically so we can install easier and faster due to economies of scale. The Company estimated installing 2,000 per month and will roll out more meters if possible.

PUC: Is the April 1 a realistic implementation date? Should the RE-TOU rollout come first due to the window of time for the advice letter?

XE: No, per the Settlement Agreement, the Company is treating the RE-TOU and RD-TDR equally and activities in one program will be mirrored in the other.

COSEIA: What is the timing of the enrollment and customer engagement plan? How will this be communicated to the public and when? Would like input on the communication plan.

XE: The Company will provide the marketing and enrollment plan in December.

WRA: The time critical deadline is directly tied to the RE-TOU in order to complete the advice letter filing. There should be an initial push for the RE-TOU and a priority to enroll people because the deadline is critical to ensure two years of data.

WRA: Can you start installing meters in January so you can have 3 months of meters installed without billing?

XE: Solar customers will be more challenging for the meter installation. The other issue is the billing and whether the Company can be set up to bill prior to or on April 1.

PUC: Can the data prior to the billing and rate implementation be used?

XE: The Company is willing to explore using this data.

EFCA: Recruitment for RE-TOU ends in 2019 while RD-TDR ends in 2021. Should the Company accommodate on the front end for the TOU?

XE: The Company is obligated to recruit similarly and will treat both rates equally per the Settlement.

XE: The Company will set up a meeting in mid-December to discuss customer communications and outreach.

STAKEHOLDER COMMENTS AND XE REPLY COMMENTS

CEO: There may not be enough EV customers to participate. There could be outliers. It is acceptable to have high goals.

OCC: The discussion and presentation provided were helpful to understanding the mandatory opt-out. Why does the control group need any incentive?

XE: They are customers who chose to opt-in but are not selected for the rate. The Company felt it would keep the customer engaged. The Company will add a goal to measure whether people want to be on the TOU or if they notice or prefer it without changing the expense.

OCC: The purpose of the trial is to understand customers' reactions to TOU rates and if customers will understand and accept the TOU rate and the goal is to address how to measure this and how valid the measurement is.

OCC: Can the Company drop a footnote in the November 15 filing to explain the control group?

XE: Yes, we will do that.

PUC: Did the Company net out the S&F charge on the meter from the \$50 incentive?

XE: The Company will confirm.

WRA: When you sample residential customer interval data, do customers know they are load research customers?

XE: The Company will confirm.

EFCA: Should customers know they are part of the control group? Will the control group change their behavior if they know they are being watched?

PUC: The price signal is what matters. Need to determine the communication to help customers understand.

OCC, PUC, WRA, and EFCA: All had concerns around the messaging for the control group.

EFCA: Will vendor selection and options be discussed on the front end to eliminate bias vendors?

XE: The Company will consider options for stakeholders to engage in the RFP process to eliminate potential bias.

Parties had concerns about using Brattle Group.

PUC: Will the PUC have the ability to audit the vendor and vendor selection process?

XE: Yes.

EFCA: All raw data will be shared with parties and we can do our own analysis and crunch our own numbers?

XE: Yes.

EFCA: What is the timing to respond to the RFP prior to selection? The Company should include non-bias as part of the RFP and consider whether the vendor has industry bias or recent publications favoring demand or time of use rates.

XE: The Company will consider these concerns about vendor bias and determine a plan for moving forward.

EFCA: Can any person with a PhD in statistics crunch the numbers?

XE: It would be better for individuals who have experience with utilities and knowledge of this work to do the analysis.

OCC: What's the advantage for the Company to have a biased study? It's in the best interest of the Company to choose a vendor who is unbiased.

XE: The Company will send out the RFP for comments and will get back to the group on when.

EFCA: Would customers be grouped in the categories and then be broken out by the enabling technology? Can the Company call out the technologies rather than averaging them all in one group?

XE: The Company will look at subsets of types of enabling technology, but have not nailed those subsets down yet. There will be a survey for customers prior to enrolling to find out more information that we don't currently have so the Company can understand the makeup of customers. The Company will also look into e-bill to extract information regarding home appliances, etc. Include a footnote for further clarity.

EFCA: The extrapolation of opt-in results would be unreliable and require making many imperfect assumptions and caveats. The Company should get better results.

WRA: Does the RFP allow for that flexibility?

XE: Can we submit a report as-is and keep in mind these pitfalls? The Company will refine the language on page six related to extrapolation.

PUC: Why is EV more important to understand than other technologies?

EFCA: Table should only include TOU studies, there's reference to a CPP study.

XE: Double check on the CPP Study in Table 7 to see if we need to remove this study. If it is a CPP study, we will remove, but we will retain the expected 9.1% peak reduction.

XE: The Company will look at implications to using a lower expected reduction assumption and having larger samples.

XE: The Company will consider removing results from the in-home device studies from Table 7. Most comments from stakeholders in the discussion are around achieving sufficient precision rather than concern for cost.

XE: Both rates are to be evaluated on the same basis and equally.

XE: References to “pilot” are to be changed to “pilot and trial.”

XE: Will schedule a meeting next week with WRA to discuss their comments.

XE: Action items will be sent early next week.

Filings / Commission Requirements / Items Pending Action

1) Pilot Metrics and Evaluation – due November 15, 2016

2) Self Selection Bias Methodology – due December 31, 2016

Adjournment

The frequency and date of the next meeting is to be determined.

Action Items / Next Steps

1. XE: Develop the customer enrollment and marketing plan along with the communication plan.
2. XE: Collect the data from the customers who get a meter due to the AMI rollout and have them tagged. Need to flag them in the system.
3. XE: Determine whether the 2,000 meter per month installation rate is related to only the bridge meters or does that also include the AMI meters? This might be a limiting constraint? Go back to the meter group to understand how many meters we can install per month.
 - a) Completed. Meter group has agreed to PUC increase to ~3,100 meters month.
4. XE: Include in the M&V plan a discussion of flagging people who are in the control group and then get an AMI meter and thus go onto the rate, but don't opt out and compare their before and after information.

- a) We told the OCC that we'd remove mention of AGIS from the Plan so we won't be able to note this in the plan itself, but we can certainly flag this for future analysis.
5. XE: Explore the start of the RE-TOU program to see if we can start installing meters even if the rate won't be available more than 60 days out.
6. XE: Add a goal to the M&V plan to address whether we can measure customer acceptance of the TOU rates in some manner.
 - a) Completed.
7. XE: Add a footnote in the M&V plan to explain the logic of why we are doing the incentive for the non-solar control group based on our discussion on page 6-7 along with the total estimated cost for the incentive of \$324,441.
 - a) The Company has backed off the need for this incentive.
8. XE: Answer the question of do the 230 or so customers in the load research data know that they are in the sample for the general population?
 - a) Complete. We sent them an information letter informing them of their selection and as a result we believe about half of the individuals selected actively know that they are in the sample. Some may not read the communication and others who do read the communication may not recall the specifics over time.
9. XE: Send RFP to Stakeholder Group and Stakeholder Group to respond.
 - a) We will send in late November, after the study Evaluation Plan is filed.
 - b) Parties will respond in another week.
10. Solar Developers are one resource that the Company hopes to leverage to help recruit customers for the trial and pilot programs in order to meet the target rates for solar.
11. XE: Double check on the CPP Study in Table 7 to see if we need to remove this study. If it is a CPP study, we will remove, but we will retain the expected 9.1% peak reduction.
 - a) It is a CPP study but it was adjusted for TOU conditions. We recommend keeping this in, but dropping the IHD studies which lowers our average to

7.8 for all except the smart thermostat segment which will use 11% (the average of the IHD studies).

12.XE: Set up a conference call to discuss WRA's comments in the M&V plan.

a) Complete

13.XE: Get out the action items, wrap up and next steps to the group by Monday of next week or shortly after WRA comment discussions.



DATE: Wednesday, November 2, 2016
TIME: 10:30 AM
LOCATION: Xcel Energy Larimer Office

MEETING MINUTES FOR PILOT AND TRIAL PROGRAM STAKEHOLDER GROUP

Call to Order

- **RE-TOU Trial & RD-TDR Pilot Program Stakeholder Group**
- **Meeting to Discuss**
 - Comments submitted by WRA

- **Attendee Names**

Xcel Energy	Carla Scarsella, Liz McKinnie, Tandy Dilworth, Louise Wood, Ryan Matley, Steve Wishart, Marci McKoane, Scott Brockett
CEO	Lindsey Wedewer
SWEEP	Adam Bickford
EFCA	Jacob Schlesinger
WRA	Gwen Farnsworth, Erin Overturf
CPUC Staff	Jason Peuquet, Fiona Sigalla, Gene Camp, Erin O'Neil
OCC	Cindy Schonhaut, Cory Skluzak
OAG	Paul Kyed

- **On the Phone:**

EOC	Skip Arnold, Craig Williamson
EFCA	Brian Forchet
SunRun	Kevin Fox, Gracie Walovich
OAG	Tom Dixon

Approval of Previous Minutes

Not Applicable

Discussion

REDUCING SAMPLE BIAS IN RECRUITING AND ASSESS IMPACT ON PSCO REVENUE RECOVERY

XE: The Company is amenable to include reduction sample bias and adding language about revenue recovery to make it more explicit.

WRA: Expecting that when studying impact of rate design it would not be just peak energy use but overall energy use will be part of the study. Scott confirmed the expectation as correct.

PARTICIPATION CAPS

XE: This was covered at the last session on October 27. No other comments.

TARGETTED PARTICIPANTS

XE: This was covered a little bit at the last session on October 27.

WRA: Thinks this will come up in SWEEP smart thermostat stats comments and Staff enabling technologies comments. Will central air conditioning be specifically addressed? What technologies would a Smart thermostat afford if I do not have central AC? How would sampling work? Need to understand how the control group and sub-sampling analysis would work.

EFCA: Sampling determination differentiation (enabling and non-enabling) for groups/sub groups is needed. Can we really stratify correctly? Need meaningful analytical groups. Important to have a distinction between air conditioning and evaporative cooling.

Company to WRA and EFCA: For efficiency, questions concerning sub-group targets, larger sampling, the number of meters to rollout and the other rollouts can be addressed

at the discussion of Staff's comments. Stakeholders were in agreement with this approach.

EFCA: Is it possible to add to the customer intake form a question about evaporative cooling, as well as, central air conditioning? Important to have a distinction between the two.

Company to EFCA: Thinks the question is already in there. The Company did not specify all appliances in the evaluation plan but there is an exhaustive list.

BILL PROTECTION

WRA: Didn't grasp from the study proposal (Page 6) in the Company's response that all other participants, non-low income, could get annual bill protection or annual rebate to reduce selection bias and reduce disincentives to participate. Is the Company proposing this?

XE: No, the Company did not recommend this, but gave it as an option. Not recommended.

WRA: Equal treatment of groups. Want to line up the categories; low-income are getting bill protection, control groups are getting some kind of financial incentive, RD-TDR are getting declining incentive in rec payment and rec payment adder includes the impact of meter costs. If so, are the RE-TOU group are the only trial group not getting an incentive? Are we really providing equal treatment to RE-TOU if not part of the control group? Recommends using an annual rebate mechanism.

PUC: Need to be careful. This was not presented to the Commission in the Settlement Agreement and may require a change (especially if \$1 million or more).

XE: We were going back to look at this right? Let's be clear are you talking about solar rewards customers in particular? If you put option B aside then it is equal right. Except for meter charge for Solar Rewards. **Action: Ryan will confirm if the REC incentive calculation included the incremental meter charge. Doesn't believe that it did.**

EFCA: For RD-TDR 40% will be solar rewards. The REC steps down so the "sugar" goes down.

OCC: Issues with the “holding harmless”. Low-income is one thing but don’t think it ends up telling you they have no skin the game. (Gwen clarified it relates only to the meter charge.)

WRA: – Is rec payment in meter charge? **Recommends tabling discussion until we know the answer.**

WRA: **Do the REC payments for solar customers on RD-TDR offset the cost of the meter charge?**

XE: Don’t think it does.

XE: **ACTION: Steven Wishart will confirm.**

SELF SELECTION BIAS

No additional comments.

MATCHED CONTROL GROUP

No additional comments.

BRIDGE METER CHARGE

XE: Control group customers will not be charged an additional monthly charge for the bridge meter.

CONTROL GROUP INCENTIVE

WRA O.k. with answer but still raises an issue of equal treatment across the groups. But with this caveat, o.k.

Staff: Did we decide about meter charge? The \$50 per participant is accurate but they won’t get the cost of the meter, correct?

XE: We should have adjusted \$50 charge down for the incremental cost to \$10 charge for meter. We didn’t pull in S&F charge. Average saving falls to \$10. This payment is for one year.

WRA: Is the \$50 dependent on usage?

XE: Yes.

EFCA: Global question. Assumption that Settlement Agreement (SA) is an opt-in. SA says voluntary. Can't it be voluntary and opt-out?

WRA: This seems inconsistent with the spirit of the SA.

XE: From Company perspective opt-out is a no-go and hard to implement.

OCC: How would you even have voluntary customers and opt-out? We didn't anticipate that.

XE: Clarify. Suppose it was \$10. Is anyone opposed to offering this for more than one year?

Staff: Yes because we don't want them to opt out.

XE: Is anyone not supportive?

WRA: Is it needed the second year. Unlikely the customer would say I don't want the meter anymore. It isn't clear about how this links.

Staff: Suggests paying after the survey. Compensating for providing demographic information, participating in another way.

XE: Ok with giving \$10 for one or two years?

SWEEP: Wants some control over control group and supports Staff's recommendation of paying after survey. Thinks multiple years would be necessary. **ACTION: Ryan - Calculate payment based on multiple years. Completed – we have removed the control group incentive.**

PILOT MESSAGING

XE: This will be in the context of the messaging meeting occurring in December.

SunRun: Has there been any education communication planned post enrollment or just the recruitment process.

XE: The Company is looking at both. More work is being done right now on recruitment because it's coming up sooner.

PUC: Caution that trial communications should mimic expectations of roll-out to entire class. Should be the same or similar.

SunRun: Make sure that any education effort is equal across the two groups.

LOAD RESEARCH STRATIFICATION

WRA: What are the stratification variables being used for the random samples. Wonders if there is an extremely high energy user that gets randomly selected it seems that the strata would be over represented even though an extremely high energy user represents only approximately 5% of customers. Should that customer be dropped out? Is there room for removing this extreme outlier?

XE: Took this question back to load research to get a better understanding. That 5% customer has a wider variable load and is built in for average usage for that strata. There is a single customer influencing the strata but load research is comfortable with the inclusion.

XE: To provide more context, we use this data to make an approximation for the variability of the general population we expect to see to determine sample size. We are not looking at this sample other than one assumption that is needed in this calculation to determine sample size.

SOLAR CUSTOMER SAMPLE SELECTION

No additional comments.

GENERAL POPULATION AND NO TECH SAME CATEGORY

No additional comments.

CATEGORIZING AND TRACKING CENTRAL AIR CONDITIONING PARTICIPANTS

Tabled for Staff discussion.

MATCHED CONTROL GROUPS FOR RE-TOU AND RD-TDR SOLAR

No additional comments.

NOTING SIGNIFICANT DIFFERENCES IN PILOT PARTICIPANTS

No additional comments.

AMENDING APPLIANCES LIST IN CUSTOMER INTAKE FORM

No additional comments.

COMMUNICATION FEEDBACK PROCESS

WRA: O.k. to discuss further in the messaging group.

TARGETING DMS OR RENEWABLE PROGRAM PARTICIPANTS

No additional comments.

PROACTIVE CUSTOMER MESSAGING AND MEASUREMENT

WRA: Will there be a point where stakeholders can separately review survey questions?

ACTION Company (Ryan): We can look at that. May not have them at December meeting but can share what is available. Concerning post implementation, we have time to refine those and add to them, want foresight to make sure we are asking the right questions.

WRA: We want to know if a customer understands what it means to be on a demand rate our time of use. It's tricky to find out through a survey. We do not want to simply find out if a customer simply likes the tariff or not. It's helpful but only a part of what we want to find out in addition to behavioral responses.

SWEEP: Does seem that to grasp customer understanding would require some complex indices. Having some examples of what the Company wants to use prior to the first survey is important especially understanding index discretion issues and correlations. Want comfort that a higher level of analytic rigor has been applied. Hoping to see a document describing some of the analytic steps taken.

XE: We will probably rely on the vendor to help with a lot of this. They are the experts who do surveys all the time and that will be one of the important selection criteria for choosing a vendor.

EFCA to Staff: You said earlier that you thought it was important the education conducted for the pilot group be the same as the broader rollout but what if the results

of the survey show that it wasn't effective. Isn't the point to make sure the messaging was right?

Staff: There will certainly be tweaks but then any tweaks will introduce new uncertainties in the cross results of the evaluation study and what we expect to see in the population so as much as we can reduce that uncertainty the more certain we will be. Put as much thought into it the first time.

FINAL COMMENTS (SCOTT)

Good discussion! Recommends two hours for next meeting to discuss Staff and SWEEP's comments which will be this Friday, Nov. 4, 1-3 p.m., tentatively. **ACTION:** Send out invitation to Friday's meeting.

Adjournment

Next meeting tentatively set for Friday, November 4, 1-3PM.

Action Items / Next Steps

1. XE: Ryan will confirm the Rec incentive calculation and determine whether it includes incremental meter charge.
2. XE: Ryan will calculate payment based on multiple years.
3. XE: Look into whether Stakeholders can separately review survey questions?
4. XE: Send out invitation to Friday's meeting.
 - a) Completed



DATE: Friday, November 4, 2016
TIME: 1:00 PM
LOCATION: Xcel Energy Larimer Office

Meeting Minutes for 2017-19 RE-TOU & RD-TDR Design and Sampling

Call to Order

- **2017-19 RE-TOU & RD-TDR Design and Sampling**
- **Meeting to Discuss**
 - Additional Comments

- **Attendee Names**

Xcel Energy	Carla Scarsella, Ryan Matley, Steve Wishart, Marci McKoane, Scott Brockett, Julia Schneyer, Louise Wood
SWEEP	Adam Bickford
WRA	Gwen Farnsworth, Erin Overturf
CPUC STAFF	Jason Peuquet, Erin O'Neill
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Scott skipped recommendation, addressed comments of Comments

Discussion

Staff: Believes there are two central issues:

- (1) Agreed-upon evaluation plan representative of broader residential class, initial presentation did not represent all elements (half solar and EV, half non-tech) of society;
- (2) To evaluate broader population a larger sample size.
 - Staff wants three additional sample buckets: items 3, 4, 5 of Staff's Comments page
 - Still wants a discussion but are not firm on bucket allocation, stresses importance of larger sample size

Staff: Objective of pilots is to inform Commission of impacts of TOU trials

- Not idle curiosity but to understand different segments of residential population

XE: Seven groups, suggested eighth group be residual population to study

STAFF: Agrees residual group could help analysis if sample size is larger, but not necessary

SWEEP: Suggests stratifying selection process to address usage by region to the extent that those divisions are different from one another

- Divisions should allow for customers in each area to be in final analysis and control groups; structural variables (seniors vs. non-seniors) there, analytical variables also important – do we have the information on hand to make a sample for these groups?
- Focus on intake mechanism to have large sizes when we get to analysis

- Enabling technologies – who has this technology now?, we probably don't currently have but could maybe get zip code information at customer level but build up so we have enough people to differentiate between customers who have and who don't have these technologies
- Believes some stratification is necessary to capture all conditions, structural variables are very clear

Staff: We don't know all characteristics for all household, approaches to target individuals

WRA: Supports a broader sample size

- SWEEP wants geography and usage, Staff wants other buckets

SWEEP: Suggests a different approach for different buckets

- Wants sufficient pool of customers, random assignment for controls and stresses importance of selecting pools properly beforehand

XE: Agrees diverse pool is necessary

- Questions which are the right independent buckets? Within those buckets, how do we make sure they're diverse?

SWEEP: Explains that diverse pools are done by having general buckets (region, energy use, staff wants zip code)

Staff: Suggests use of a proxy for income to be zip code in lieu of geography since zip codes can provide income data

XE: Asks how do we define these buckets? With many permutations, the matrix gets large, so we need to focus on manageable number for participation

SWEEP: We know that with the general population having a few buckets and criteria (energy use and geography), we know that the chance we get similar age distribution in sample will be close to age distribution in general population

- Wants a random sample

WRA: Agrees but sample can consist only of people who opt-in

XE: We will determine the best way to recruit these opt-ins before enrollment ends.

Staff: With various buckets to ensure statistical significance to make conclusions, there is a higher probability we will get conclusions we want

WRA: Questions what will be interesting to the audience? (Primary audience is Commission) what will they determine from broader information? This is a sample/cost budget

SWEEP: We should start looking at census stats, but this info could be wrong so we shouldn't make too many points

Staff: Points out that the job of the third party vendor is to limit points

SWEEP: Proposes two-stage sampling approach

XE: Concerned of budget and rollout numbers

- Explains that buckets (control vs. treatment) are to measure change in energy consumption and demand based on trial
- Understands response to rate is end goal;
- We can still pull from other enrolled customers to understand bill impacts and percent participation and survey their response and reaction;
 - What do we want to learn from them?

Staff: Settlement was quite clear on goals for RE-TOU and RD-TDR

- High enrollment allows us to reach Settlement goals

DNV GL: Overlapping and crossing of buckets presents logistical challenges to ensure each category is met.

- Sees potential issue with seniors who aren't home during the day (not well represented)

SWEEP: Issue is structural vs. variable statistics

Staff: Random sample will not ensure each category is met because individuals will self-select out

- We won't get seniors, low income or renters
- Believes we will have to make a concerted effort to get these groups
- Understands keeping buckets small to target direction and work against self-selection bias
- Questions what are the buckets and their priority?

(Ryan, Jason, Craig) – Bucket size: 1,000 to 2,000 with attrition

- Control group brings total to ~5,000 customers

Staff: Concerned if there are that many out there willing to participate and says we need to try and find those customers

Confusion as to how many low income needed (Erin from Staff says 2,500 with attrition, Gwen thought it was currently 500)

XE: Points out that pilots have caps, and dropping 9.1% to 7.8% doubled solar participation and raised other caps

- Including everyone in pilot to MV?, agree to control size
- Thinks we can't do 18,000 control customers

Staff: Highlights balance between cost and participation

OCC: Asks if Commission has ranked buckets by importance

XE: Proposed solution: bump up no-tech (general) to 5,000, which brings us to limit to roll out meters

Staff: Objects that the new total doesn't bring pilot size to goal of Settlement

XE: Clarifies that these are minimum enrollment amounts and says we will still recruit

Staff: Wonders if people can participate but not be part of the study? Doesn't see the value of having people join rate

XE: Our main concern is cost, and how to target-market

Erin, Gwen – Underlining issue is cost but they would rather see a larger study to get more granular data and statistical significance

- Suggest more non-technology (bigger bucket)
- Believe it is worth more money to get that data since there is value in data

XE: Issues about spending vs. recovery

- Deferral for larger control groups cost

Staff: Asks how much more will it cost?

- Incremental cost for incremental information.
- \$133 for bridge meters
- Wants to spend a little more to get more granularity in control (no tech bucket)

XE: Has no objection to increased cost if everyone is willing to pay for it

- Reminds all of the caps on enrollment and how much can be placed in recovery

Staff: Believes capacity and meter rollout per month (RE-TOU) need to be higher

- Asks if there can be a faster rollout rate?

XE: **Will inquire about a possible faster rollout rate. Complete.**

- The current rollout of 2,000 meters per month we provided is pretty accurate
- Option we have is to have vendor hire more people

- Might get pushback for temporary timeframe
- To increase capacity, we have to think of another option

Staff: AGIS outlines 60,000 per month

- Assumes vendor will hire people to meet this rollout, so believes hiring more people for the pilot seems feasible

XE: Explains that the two projects cannot be equally compared

- AGIS is concerted effort to reinstall all residential meters
- There's a chance we can go beyond current vendor, but we couldn't promise AGIS-size rollout
- **Scott will find more details about raising monthly rollout (possibly more costs). Complete.**

Staff: Believes value of this information is really important

SWEEP: Doesn't know if cost trade-off is right

- Wants information to be right on rates once AGIS is installed
- Buckets varying means larger sample, which seems reasonable
- Control group: in most control group studies, control group is not as large
- What is the optimal control group size for parity(?)

Staff: Settlement anticipates 18,000 participants

- Might be difficult with meter readers
- Pushing for settlement goal
- Understands there might be constraints

XE: Points out that we finalized Settlement with test groups not control group

XE: Outlines the sets of characteristics (home, not home, seniors, non seniors, renters, owners)

Staff: Believes second-best outcome is big bucket to slice

- Will compromise to add a few more buckets to general population

Discussion on population of renters in Colorado: (*Wishart, Adam, Jason, Gwen*)

- About half of Colorado residents rent
- Unknown amount of renters who pay their utility bill (billed directly to them)
- It could be hard group to target this group (they might be unlikely to adopt new technologies)
- We can switch out meters for renters since it's Xcel's meter (no permission, but cooperation)

DNV GL: Not too concerned about having too many people not home in the day or non-seniors

- Concerned with **targeting people who are home during the day and who are seniors, and have enough renters**
- How do we increase participation in these groups?

Discussion on separate bucket for renters (*Gwen, Erin, Jason, Adam*)

- Separate bucket for renters?
- No separate bucket for non-renters, separate bucket for renters
- Challenge to ensure enough renters and seniors

Staff: Just because it's a bucket doesn't guarantee statistical significance

SWEEP: We can start with the proposed, but we might have fewer buckets when we get to the analysis stage

Definition of buckets (*Adam, Gwen, Scott, Ryan*):

- SWEEP has two, Staff has three, that gives us five
- WRA I thought there were other buckets based on energy usage
- SWEEP clarified that their criteria is the difference in energy use by region
 - Not really a factor anymore, since space heating is a smaller percentage of population and air conditioning has evened out energy usage between regions
- No current data on energy use per customer, average size of home, and how that differs based on region
- SWEEP: Assumes there would be a difference in usage between regions, Greeley, Denver-metro, Telluride, etc.
- **Before proposing sample design, SWEEP wants to know as much as possible about regions' energy usage and renters vs. homeowners statistics in Denver.**
- Having a larger sample group allows for good representation of customers between groups but not a bucket itself
- SWEEP: geographic representation is not primary concern and would rather have get widespread participation

XE: Group agrees to get rid of geography bucket and now defines four buckets:

- (1) Low income
- (2) Technology [to become Smart Thermostats, per Staff (*Jason*)]
- (3) Electric vehicle
- (4) General population

a. Staff wants Gen Pop broken into:

(1) Seniors

(2) Renters

(3) People home during day

Xcel: Including all buckets, there would be approximately 16,000 per pilot and approximately 19,000 for the control groups, totaling 51,000 meters (previous pilot sizes were 27,000 total)

- approximately 3,400 meters installed a month; assumes consistent
- approximately \$6.8M in meters
- approximately \$2.5M control

XE: Roll-out buffer to be approximately 4,000 meters per month

Staff: **Wonders if it's as simple as hiring a second vendor? Deferring to Scott to provide answer. Complete.**

WRA: Buckets will overlap, so is there a separate category of low income that may overlap with renters and seniors?

Xcel: Low income is separate because they're held harmless

- Suggests we develop priorities for other category overlaps (ex: seniors who rent)
- Groups are not mutually exclusive, we could create a Venn diagram

Discussion on bucket priority (Scott, Ryan, Gwen, Craig, Erin, Tom, Louise)

- Other studies have focused on vulnerable populations such as seniors, low income and the general population
- Interesting idea but targeting vulnerable populations seems less important for our purposes

- Renter/owner seems likely to be represented in general population
 - Renters likely behave differently because they might not invest in new appliances
 - Because they are less likely to invest in new appliances, will they still be represented enough?
- Does not affect master meters because they are not the customer of record.
- Some customer research could provide renter information
 - **To do: get this information, if small re-evaluate.**

XE: Currently have approximately 2,900 participants in each of the seven buckets

- Incremental group is approximately 500 per month

Discussion of agreed upon groups with geographic representation (*Scott, Adam, Jason, Erin*):

- (1) Low income
- (2) Solar
- (3) Electric Vehicle
- (4) Technology (smart thermostat)
- (5) Renters
- (6) Home during day (self-reporting)
- (7) Seniors
- (8) General populations (homeowners who aren't home during day who aren't seniors or low income, etc.)

XE: We can't target people home during day because there are no proxies

DNV GL: Suggests we stratify upfront so we will have a pretty good idea from current data who are seniors, although we might not be able to tell renters vs. owners

- Thinks it will be hard to determine who is home during day

XE: Suggests we rely on self-reported data

DNV GL: Explains that we can't design bucket upfront without this data

XE: We could try and randomize but proportion won't be representative of actual population. For example, the General Population bucket will likely have a larger proportion of homeowners, non-seniors, etc. or those we've turned away from the other targeted buckets. This will impact how those results can be interpreted.

- What are the consequences?

DNV GL (*Craig*), Staff (*Erin*) – With predefined strata, it's doable since we will know how many in each group there are so we can weight results

- When based on self-reported data, it's hard to determine how many of the general population will have those characteristics
- Prism codes defined as people you think apply to one segment
- Outline five buckets, four within one piece;
 - Rollup of impact of different buckets and understand impact
- One of two things must be true:
 - (1) Recruit only from that population without over-representing
 - (2) There be some prior knowledge (doable for seniors)

XE: Extrapolating populations we're most concerned about is the most important fact

- Outline impact and response
- Is there information we need regardless of extrapolation?

Staff: If we don't segmentize non-tech, we will still have self-reporting bias

DNV GL: Thinks there might be ways to adjust from survey data

XE: Where do we draw the line?

Staff: Believes these eight buckets fit Settlement goals well, doesn't know which to eliminate

XE: Sample sizes limited by meter rollout

Discussion of Solar Rewards Capacity (*Ryan, Erin, Gwen, Louise, Scott*):

- Questions whether clarifying goal or cap is necessary
- A portion of solar reward capacity is set aside for demand rate
- Approximately 9,000 customers against cap limited by capacity in tariff
- These solar customers are tied to RD-TDR
 - If they want to take it, we have to take them until capacity
 - After one year it rolls over
 - If these customers choose to take it, we will have RD-TDR issue alone
 - We need to treat rates equally
- Shooting for 2018 cap to give time to study trial
- Take this as constraints we're given to treat rates similarly
 - With the residual after we assign solar being different for each rate, we can only treat equally to a point
 - Concern that RD-TDR will be primarily solar
 - Keeping room for potential RD-TDR customers causes constraints

Discussion on how to backfill buckets and targets (*Erin, Ryan, Scott, Jason, Craig*):

- How do we populate groups if solar is not as prevalent as expected?
- As we backfill non solar, we want to do it in proportion of buckets before we hit the solar RD-TDR constraint
- Do we need a smaller sample size for each bucket in RD-TDR?
 - Essentially, if half is reserved for solar

XE: Likes that we narrowed down to eight buckets

- Will check with metering vendors and see if we have to submit another proposal
- If we have proposal by Nov. 15, we will file then.

Discussion on solar market segment (*Jason, Ryan, Craig, Gwen*):

- We don't expect many existing solar customers, since there is a designed rec incentive to offset change to new solar customers
- We need to treat trials similarly, which means allowing new customers
 - Desire to treat customers equally
- Is there anything to prevent solar customers from signing up and excluding them from general population bucket?
 - No, they will be net metered in general population bucket
 - General population bucket could look interesting because of solar customers
 - It may be representative of actual population
 - Is there a reason to keep solar customers as RE-TOU (new) instead of existing solar RD-TDR?

- New customers may not be different enough, but might be as long as control group has similar makeup

Staff: Suggested checking with EOC to recruit low income (Skip had dropped off)

- Much higher than 500 low income customers we had before

EFCA: Will there be more time to work on overall plan to overcome selection bias?

- **Company to do redline edit of original pilot before filing. Complete.**

XE: Still include extrapolation as RFP in selection task, gives us optionality to use or not use in future

XE: Will provide redline document to parties by Tuesday, meet after redline.

- **Target meeting for Wednesday 11 a.m. Complete.**

Adjournment

Next meeting for Wednesday, November 9, at 11am.

Action Items:

1. We will determine the best way to recruit these opt-ins before enrollment ends
2. Scott will find more details about raising monthly rollout (possible more costs); will inquire about a possible faster rollout rate
 - a. Wonder if it's as simple as hiring a second vendor?
3. Before proposing sample design, SWEEP wants to know as much as possible about regions' energy usage and renters vs. homeowners statistics in Denver
4. Gather customer research to provide renter information
5. Company will send out redline edit of original pilot by Tuesday



DATE: Wednesday, November 9, 2016
TIME: 11 AM
LOCATION: Xcel Energy Larimer Office

**Meeting Minutes for 2016 RE-TOU and R-TDR Pilot Study and Evaluation Plan
Call to Order**

▪ **Meeting to Discuss**

- To discuss comments submitted by Staff and SWEEP.
- Review of redline evaluation plan and RFP process

▪ **Attendee Names**

Xcel Energy	Carla Scarsella, Jennifer Augustine, Tandy Dilworth, Louise Wood, Ryan Matley, Steve Wishart, Marci McKoane, Scott Brockett
SWEEP	Adam Bickford
WRA	Gwen Farnsworth
CPUC STAFF	Jason Peuquet, Erin O'Neill, Fiona Sigalla
DNV GL	Craig Williamson
OCC	Cindy Schonhaut, Cory Skluzak, Tom Dixon
EFCA	Jake Schlesinger

• **On the Phone:**

EOC	Skip Arnold
EFCA	Brian Forchet
SUNRUN	Gracy Walovich
CPUC STAFF	Michael Santisi

Discussion:

- A repository docket will be set up to capture the additional documents that are a result of the group.
- The Company will figure out how to address the tariff filings.

Study and Evaluation Plan:

- Sample target goals are still below the caps – still want the total to be 18,000 participants even if we do not want to include a subgroup of individuals that are home during the day.
- We are constrained by the meter installation rate. We cannot get vendors to bid on installing more meters. There is no practical path to get to more meters.
- Staff is concerned that we will not get enough information to inform the Commission about the TOU rate. The advice letter is driving this, not RD-TDR. Staff may not support the resulting study to the Commission if there are insufficient meters deployed early on in the field.
- The control group meters were not considered during the settlement agreement negotiations, which has impacted our study group meter installation rate.
- Meter installation is an obstacle. Given that the meter shop has indicated that we would have to use a vendor that would deploy overtime in order to get to the 2,000 meters per month. We don't have a meter vendor that could ramp up to get us more at present, particularly to the 4,000 meters per month.
- There are other groups that Staff would want to study possibly later so they would like to see more participants in the sample in order to study more subgroups.
- One of the questions is, who is being impacted by the peak rate the most and how do they respond? Are there people who cannot respond to these rates and if so why not? We don't know up front the characteristics of all of these individuals.
- WRA would like to see what happens to the RE-TOU customers that are placed onto the rate as a result of an AGIS meter. We will not have any pre-treatment data to use to understand any changes that these customers made as a result of their meter change. We can understand how the usage of these individuals is distributed, but not how it has changed. Staff will only support AGIS if we are able to support the installation through the Pilot Study. Staff would not support this application based on a 2,000 per month meter rollout, which assumes a 1,000 per month RE-TOU implementation absent any other information.
- We cannot commit to more meters right now. What can we agree to that meets the constraints?

- Staff - 1) get more meters, 2) cut sample size, 3) delay RD-TDR in favor of RE-TOU.
- WRA - Why would the 2019 date be the final date for data collection? We can continue collecting data even after an Advice Letter filing to the Commission which could be viewed as an interim check-in? This will affect the AGIS application decision. Does the Company have plans to continue to study the data for both rates? Could the parties request the PUC not to automatically put everyone on the rates until a later point in time when there is additional data.
- There is no prohibition by Settlement to stop studying the RE-TOU, but the question of what to do was left open.
- The RFP will specify a 2019 end date, for both the RD-TDR and the RE-TOU. We can extend it after the fact once we have results from the initial study.
- Is it possible to open up some of the constraints that were imposed by the settlement agreement? i.e. the date of the advice letter filing, etc.
- Where can we get to from a meter installation vantage point that parties can accept? We are somewhere between 2,000 and 4,000 meters per month. OCC proposed 3,000 for the meter installation rate.
- Delay in RD-TDR and delay in Advice Letter filing are non-starters for the Company and for Staff respectively.
- Staff would agree to a lower number of meter installations than 4,000 per month if the Company agrees to delay the RD-TDR until September.
- Staff will look at a different number.
- Why did we leave the solar bucket intact across all scenarios, option 1 and option 2? The Company believed that this was the direction that the stakeholder group provided.
- While we will not have incentives for the control group, we will consider incentives to get people to respond to the survey.
- We will discuss how to inform customers that opt in, but are part of the control group that they are not on the rate and/or that they are getting a new meter.
- The REC incentive that was calculated included the grid use charge and the meter for both the RE-TOU and the RD-TDR.
- Any parties that have questions or comments about the redlined version of the M&V plan should provide those comments by Thursday, November 10th, COB.
- WRA people can opt in the rate even after the study has been filled and that data can be studied.
- EFCA is there a difference between the meters and how they interact with other smart in home devices? Is this the same for the bridge meter?

- XE the bridge meter capability is different and will not be the customers end meter.
- XE different than smart grid city, the meters will respond to your smart device and the IHD can be set based on the price or price signals.
- WRA have the meters been selected and can parties get information about types of signals those meters send?
- XE we have selected bridge meters and can provide specs to the Stakeholder group. They provide 15 minute interval data.

Comments: