Alectra Utilities RPP Roadmap Pilot – Proposal for extension to October 31, 2019
May 9, 2019

Project Description and Objective

The goal of this project is to address research questions identified while developing the Interim Report of Alectra Utilities' Regulated Price Plan (RPP) Roadmap Pilot. Providing answers to these questions should assist the Ontario Energy Board (OEB) in its planning for the future of the Regulated Price Plan.

Project Scope and Rationale

The following proposed extension(s) to the existing RPP pilot project timeline over another RPP Summer period is intended to address prioritized research questions following from the Interim Impact analysis recently submitted to and accepted by the OEB. This proposal is intended to maximize research value and actionable insights regarding the Regulated Price Plan making use of the existing infrastructure and participant pool.

The following is the rationale and proposed experimentation plan for each of the three pricing pilots, including details of the pricing treatments. The estimated implementation dates and numbers of participants are also provided below.

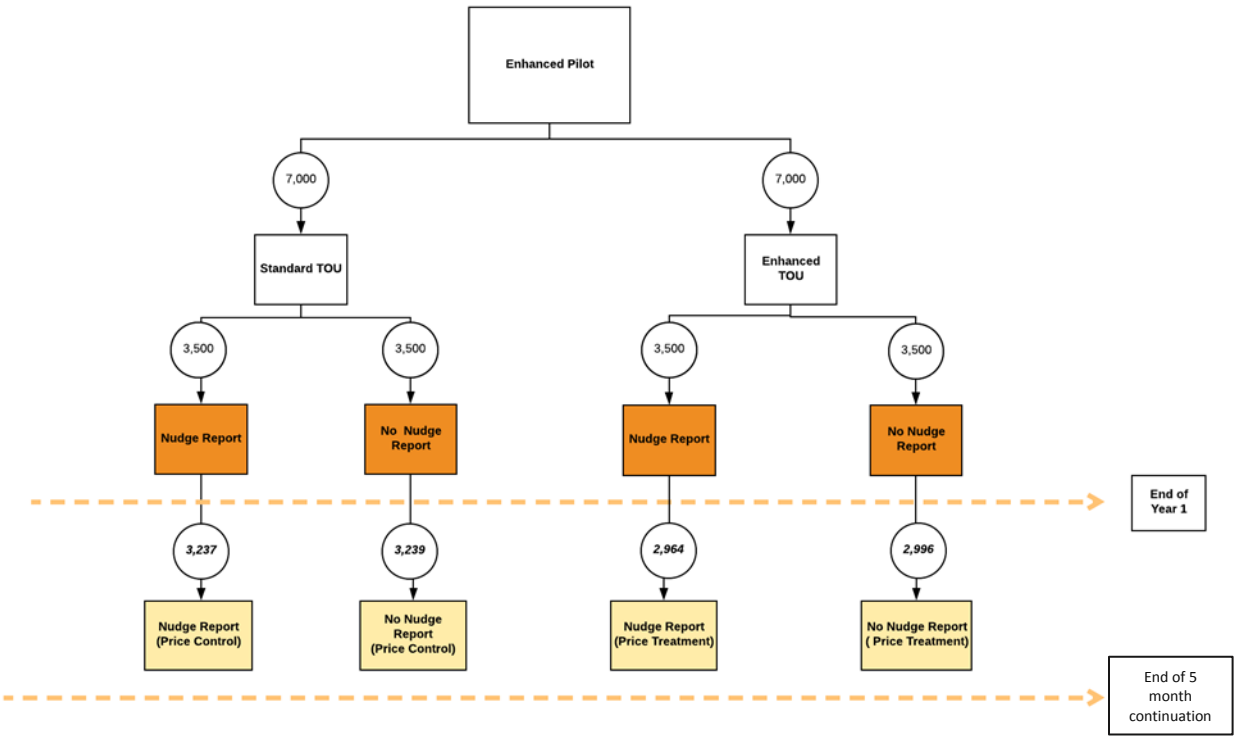
Enhanced Pilot

Research Question: Given that we have not yet seen conservation impacts during On-Peak times for Enhanced Treatment customers (as of the interim reporting milestone), it is possible that such effects may emerge over a longer-than-expected time period. It is hypothesized that since Enhanced pricing was designed as an opt-out scheme, awareness of program participation and motivation to enact behaviour change may be especially low among this group. Longer-term exposure to bill impacts (shadow bills) and communications (nudge reports) may result in measurable behaviour change.

Proposal #1a: Randomly select 3000 Enhanced pricing Treatment customers and 3,000 Enhanced Pricing Control customers and extend the current pilot over another summer period. Term: June 1-October 31, 2019.

The experimental design for proposal 1a is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design (3,500/cell). The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs. If approved, there would be 2,964 customers in Enhanced TOU receiving nudge reports and 2,996 customers in Enhanced TOU without nudge reports, for a total of 5,960 participants in the price treatment.

Proposal 1a - Diagram



Research Question: Given that Enhanced pricing was designed as an Opt-Out pilot, whereas Dynamic and Overnight Pilots were designed on an Opt-In basis, it is possible that conservation impacts would be observed for the Enhanced Pilot if it were also designed on an Opt-In basis.

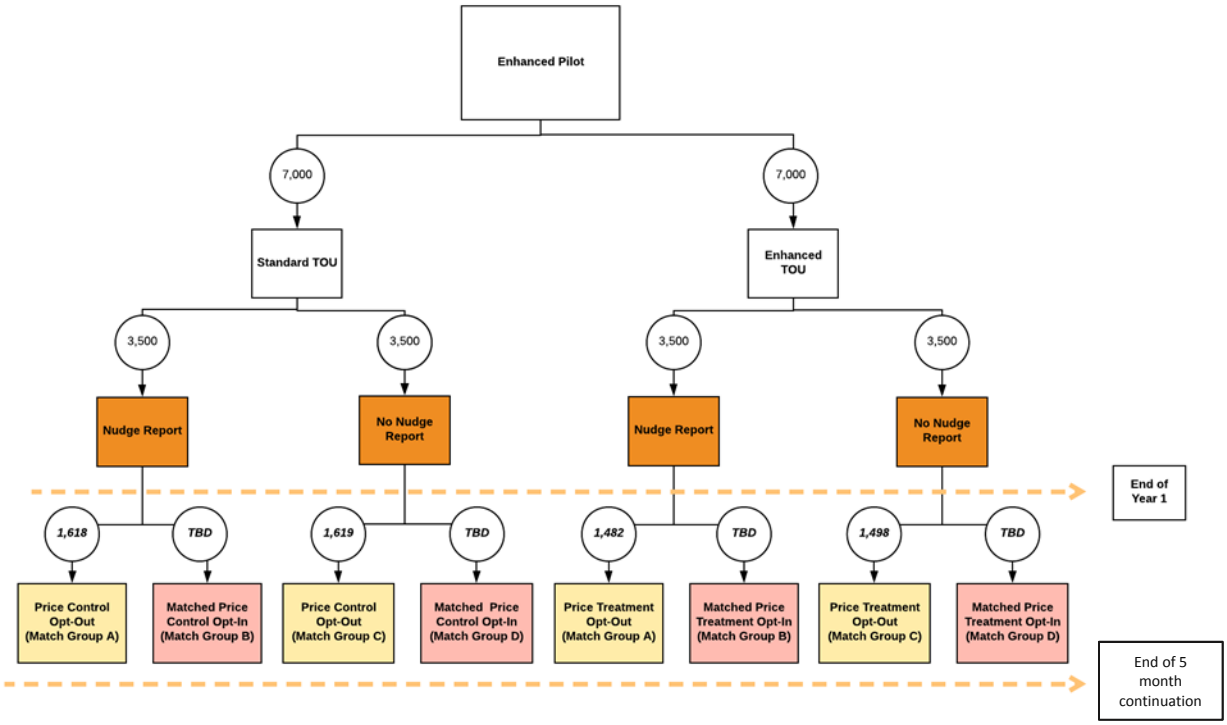
Proposal #1b: From the remaining ~3000 Enhanced Treatment customers, market Enhanced pricing to them over a period of approximately one month. For each customer who signs up, a matched control customer from the remaining pool of customers who did not sign up will be identified. Those customers who do not sign up and are not selected as matched controls will be removed from the pilot (BEworks estimates that this will result in the removal of approximately 5,000 customers from the existing pilot).

Customers would have until mid-June to sign up, so that there would be no interruption in their receipt of monthly reports (as the report process lags behind the end of the billing period by 2-3 weeks). Those who do not sign up by mid-June would be removed from the program effective May 31, 2019. Their final report would be for the billing period up to and including May 31, which they would receive sometime in June. This report would include a reminder that it will be their last report unless they sign up by the mid-June registration deadline date. Term: June 1, 2019 to October 31, 2019.

For clarity, Proposal #1b can only be implemented if Proposal #1a is also implemented; that is, that pursuing proposal #1b implies that proposal #1a must also be approved. This is because the research finding of comparing results between the programs can only be effected if there is both the existing program (#1a) and the alternate program (#1b) providing data during the same period. Budgets have been structured accordingly, so that program #1b relies on work activities that will be conducted under #1a. However, #1a can be effected without the incremental work done as part of #1b.

The experimental design for proposal 1b is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design. The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs.

Proposal 1b - Diagram



Dynamic Pilot

<u>Research Question:</u> Given the large conservation effects observed for Critical Peak periods, could similar impacts be observed if the number of CPP events was increased?

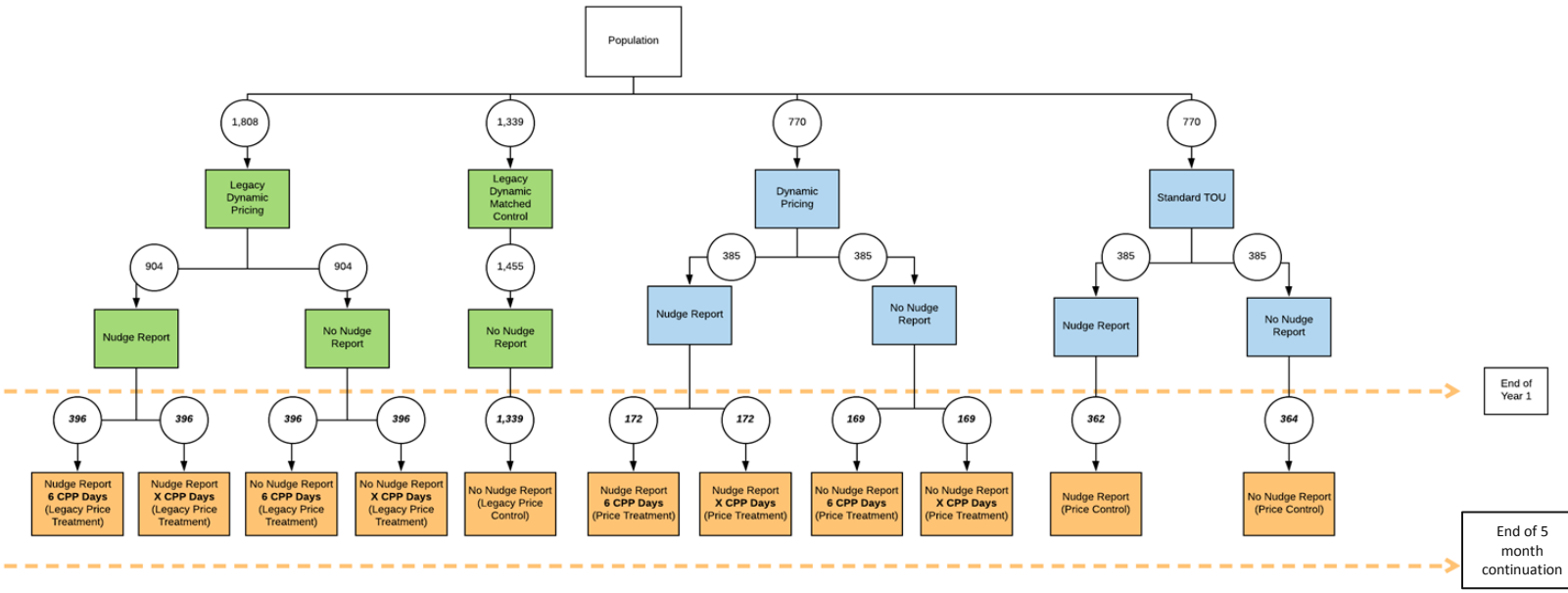
<u>Proposal #2a:</u> Divide the existing Dynamic Pricing Treatment customer pool into 2 randomly chosen groups (stratifying equally for Dynamic and Legacy Dynamic customers) – one group will receive the standard number of CPP events during the summer period extension (6) and the other group will receive a higher number of events over the same time period (a reasonable number of events might be 9, which is a 50% increase in event frequency; ultimately it is the Board's decision how many CPP events it wishes to implement for this group). Adjust either the ratio of price days (i.e., have fewer High/Medium price days) or the non-CPP price structure for the group receiving more CPP events (e.g., lower rates to off-set the increased number of CPP rate hours to maintain revenue neutrality between it and current TOU rates) to

maintain revenue neutrality for the two Dynamic groups. In either case, the price structure for the group remaining on the existing Dynamic structure would not change. Term: June 1-October 31, 2019.

The billing system will be able to accommodate two different CPP frequencies provided that additional events for the 9-CPP event group are not called until July. Until that time, both groups would receive the same CPP events (this functionality remains enabled from 2018 and can be used now). Once the 9-event (or however many CPP events is determined) infrastructure is created, it will receive the same events that are also experienced by the 6-event group, and also some events that only this group will receive. In other words, the 9-event group would experience the same CPP events as the 6-event group, with 3 additional CPP events during the months of July-September.

The experimental design for proposal 2a is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design. The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs.

Proposal 2a - Diagram



<u>Research Question:</u> Given that On-Peak conservation effects were quite large for High-On-Peak and Critical Peak days, it will be of value to understand whether these effects persist in the long-term or are merely an effect of novelty and salience.

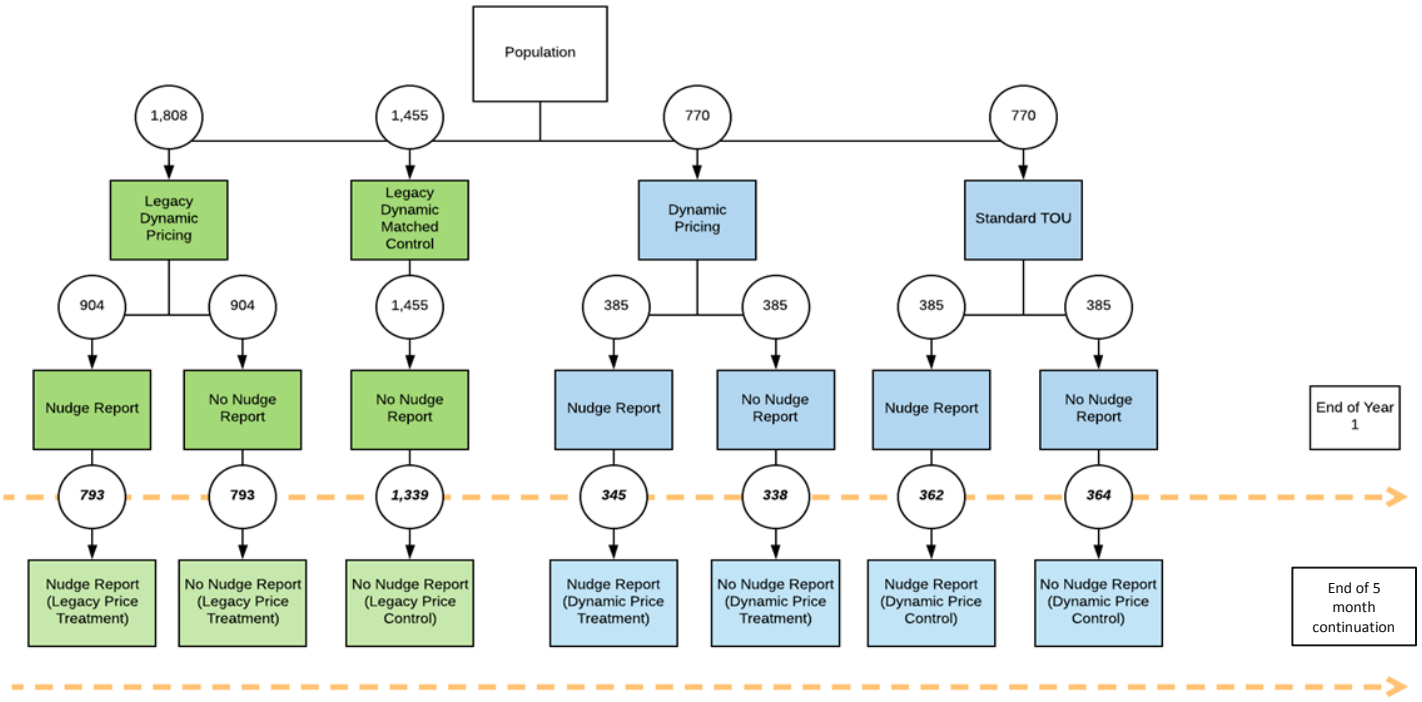
<u>Proposal #2b:</u> Extend the existing Dynamic pricing pilot over another summer period. Term: June 1-October 31, 2019.

For clarity, Proposal #2a can only be implemented if Proposal #2b is also implemented; that is, that pursuing proposal #2a implies that proposal #2b must also be approved.. This is because the research finding of comparing results between the programs can only be effected if there is both the existing program

(#2b) and the alternate program (#2a) providing data during the same period. Budgets have been structured accordingly, so that program #2a relies on work activities that will be conducted under #2b. However, #2b can be effected without the incremental work done as part of #2a.

The experimental design for proposal 2b is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design. The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs.

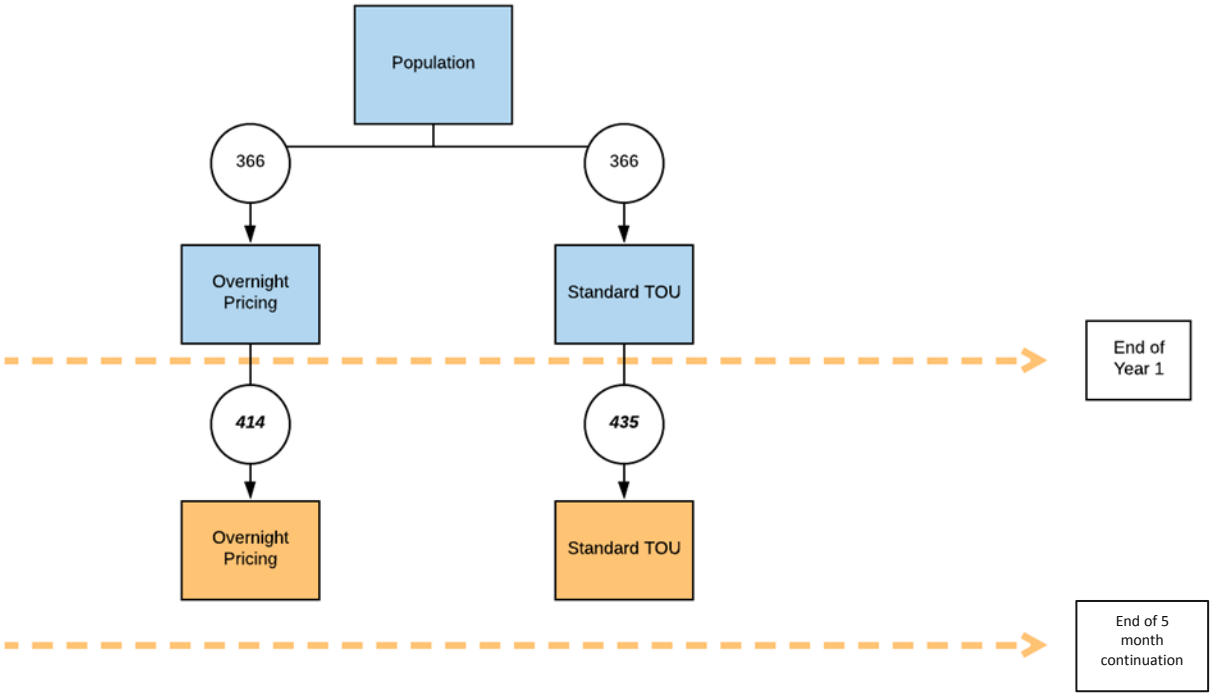
Proposal 2b - Diagram



Recognizing that revenue is being under-recovered under the current pricing scheme, adjust the prices so that adequate revenue is recovered given existing patterns of behaviour.

<u>Proposal #3a:</u> Extend the existing Overnight pilot over another summer period with adjustment to prices that are more reflective of rates that could be rolled out on a broader basis. Term: June 1-October 31, 2019.

The experimental design for proposal 3a is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design. The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs.

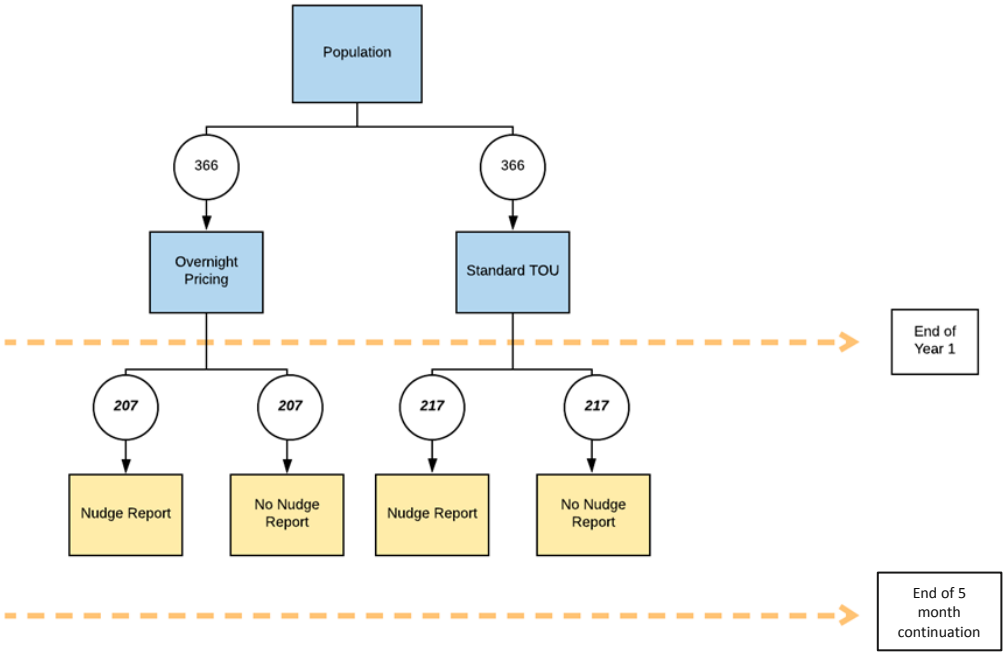


Research Question: What effect does the introduction of non-price communications (Nudge Reports) have on consumption behaviour? Because of lower than expected sign-up rates during recruitment for the initial pilot, it was assumed that there would not be sufficient sample size to introduce non-price communications as an additional experimental factor. Given the large effect sizes observed thus far, the existing sample is of sufficient size to allow for the introduction of Nudge Reports.

Proposal 3b: Randomly select half of Overnight Treatment customers (and their matched control customers) to receive Nudge Reports over the duration of the extension. Term: Customers could start receiving Nudge reports for billing periods ending after mid-late May, 2019 until the final report for the period ending October 31.

For clarity, Proposal #3b can only be implemented if Proposal #3a is also implemented; that is, that pursuing proposal #3a implies that proposal #3a must also be approved. This is because the research finding of comparing results between the programs can only be effected if there is both the existing program (#3a) and the alternate program (#3b) providing data during the same period. Budgets have been structured accordingly, so that program #3b relies on work activities that will be conducted under #3a. However, #3a can be effected without the incremental work done as part of #3b.

The experimental design for proposal 3b is shown below. The numbers in the Participant cells above the top dashed line reflect the original cell sizes based on the year one experimental design. The numbers in the participant cells below the top dashed line represent the current number of participants, based on current enrollment. These figures show the decline over time in the number of participants from both program opt-outs and customer move-outs. The increase in the Treatment population is caused by the number of customers for whom Alectra Utilities had less than one year worth of consumption data when the program started, but who now have this minimum period of data.



Technology

A few select forms of technology will continue to be offered to customers to provide insight into the value of enabling technology and to obtain more detailed consumption data.

<u>Thermostats:</u>

- Energate thermostats will continue to receive pricing and be enabled to adjust consumption to match the customers' rate plans. Efforts to re-establish remote connections between customers' thermostats and the flow of pricing data to encourage automated load shifting will be continued. The presence of an automated thermostat response to Critical and High on-peak periods has been demonstrated to be a strong driver of on-peak savings in previous evaluation reports of APP. This activity is included within the technical and program support provided by Alectra and Energate.
- A small number of Energate thermostats (~150) that were held back from year 1 can be deployed for customers in this summer period. This is both a way to ensure that the role of technology in the study can be investigated, and also a tactic to address a risk to study outcomes from attrition.
- ecobee customers will also be able to continue with APP price-responsiveness as Alectra has been able to negotiate access to customer thermostats for this summer for a minimal cost of $1,700 for the 700 customers who responded to Alectra's call to participate in this pilot in previous years. Customers with ecobee thermostats would be identified and able to be sent load control signals by Alectra Utilities during Critical Peak pricing events. Survey data and energy consumption data would also allow for analysis of energy impacts from automated versus behavioural changes. Similar agreements were not able to be negotiated with Nest and Honeywell, so these thermostats will not be included in the 2nd year as the effort and cost of extending their participation does not seem justified for the results that would be obtained.
- Since most customers in APP-Dynamic pricing have thermostats, and our EM&V plan includes an analysis of consumption impacts for those with and without thermostats, there is no expected impact to extending offers for the remaining thermostats to Dynamic customers. Thermostat deployment would be conducted over a short period of time (e.g., June) so that they are in place

during the days with peak demand, and not staggered over the course of the summer which would create noise in determining which customers had thermostats during the summer period, as customers' survey responses are compared to energy consumption data.

Project Partners

The role and type of in-kind contribution of each partner is listed in the table below; the two largest partners (BEWorks and Util-Assist) are also described in more detail below the table.

In general, the existing project partners will continue on in their current roles during the extension. Partners not continuing on with the project include Nest and Eaton (Honeywell) thermostat providers who did not have many customers participating onwards and so the benefit of including the customers' thermostats in the study did not merit the cost.

PROJECT PARTNERS		
Organization	**Project role (e.g. participant, funder)**	**Financial or in-kind contribution (indicate if confirmed).**
BEWorks	Experimental design, communications, evaluation	
Util-Assist	Shadow billing, comparison reports, customer onboarding, price/event communications	In-kind: reduced project management fees.
Bidgely	Data disaggregation	
Energate	Equipment, energy management service, load control platform	In-kind: reduced project management and technical support fees.
Ecobee	Load control platform	

BEworks provides program and experimental design, insights into customer outreach, evaluation planning and execution. This includes:

- weekly meetings with the APP management team;
- design of the recruitment plan and creation of balanced sample groups;
- design of the treatment plans (price and non-price);
- design of the evaluation plan consistent with the OEB's evaluation framework;
- input into nudge reports and customer communications;
- data acquisition and cleaning;
- creation of survey materials;
- analysis of survey data and energy data analysis.

All this work will then be reported on through a final report that will be incorporated into the final report from Alectra Utilities to the OEB.

Util-Assist provides all program-related operational activities: billing/reporting, customer support, customer outreach/engagement activities and overall program coordination. This includes:

- maintenance of customer information systems used for billing, reporting and settlement purposes;
- integration with Alectra's system to maintain accurate customer records, effect bill adjustments and settlement with IESO;
- Registration webpages and enrollment processes
- Thermostat installation and provisioning
- template and monthly creation of APP reports (bills/nudge reports);
- integration of disaggregated data into monthly reports
- Creation and maintenance of the online portal to access billing data and program announcements
- Development work for customization of rate plans
- Validation of meter data for use in rate plans/billing
- Customer support through accessible both by phone and email

Deliverables

In addition to regular program operations, the following activities are proposed to be carried out to evaluate and report on the extended study:

- A limited number (1-2) of customer surveys. These surveys may be targeted to more specific questions/customized for each group, rather than the generic surveys that were done as part of the first year pilot.
- An additional evaluation report completed after the conclusion of the additional period of the study. This report will incorporate into its analysis all data from the extension period (June 1-October 31, 2019) and any adjustments to the previous results reports as a result of the extension activities .
- The completion date for the final evaluation report is expected to be December 31, 2019..The deliverables from the existing RPP project will be documented in a report that will cover the original pilot period and the two month interim extension (to May 31, 2019) and it will be submitted by Aug 31, 2019.

Program Reporting and Evaluation

Additional notes on program management are described below:

- The existing (final) milestone 2 invoice would be postponed until December 31, 2019; no additional milestone payment would be required
- No new participant recruitment would be required
- All these proposals are feasible under the existing approved budget of $9,292,000.
- The full cost for implementing all options is $1,633,640. This can be broken down as follows:

Research activity description	**Cost**
Proposal 1a	$227,863
Proposal 1b	$174,167
Proposal 2a	$142,784
Proposal 2b	$129,524
Proposal 3a	$78,747
Proposal 3b	$36,769
Fixed costs	$937,494
Total	**$1,633,640**