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|  | Regulated Price Plan Roadmap Pilot Program Project Overview Application  |

Instructions

1. Review all eligibility criteria to confirm that your project is eligible for the Regulated Price Plan Pilot Program.
2. All fields must be completed. Incomplete submissions will not be considered. Maximum 10 pages excluding attached documents.
3. All answers, rationale and substantiation must be provided in this document in the space provided. Do not provide attachments unless letters of support from project partners, links or other references as these will not be considered in the review of your application.
4. **Attach this completed document, in Word format (no PDFs) to an email and submit to:** BoardSec@ontarioenergyboard.ca *citing “EB-2016-0201: RPP Pilot Application” in the subject line.*
5. Within one week of submission, you will receive a response confirming that your application was received with further information regarding the timeline for review.
6. If you have questions you may reach the OEB by calling 1-888-632-6273 or by emailing IndustryRelations@ontarioenergyboard.ca *citing “EB-2016-0201: RPP Pilot Program” in the subject line*.

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| **A. Key Information**  |

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| **Project title:**  | Testing Multiple Approaches to Time-Variant Rate Design for Ontario Consumers |
| **Distributor(s):** | PowerStream Inc |
| **Applicant(s) Contact name:** | Daniel Carr |
| **Applicant(s) Contact title:** | Manager, Smart Grid Projects |
| **Mailing address:**  | 161 Cityview Blvd, Vaughan, ON L4H 0A9 |
| **Phone:** | 905-532-4570 |
| **Email:** | Daniel.Carr@PowerStream.ca |
| **Submission date:** | August 22, 2016 |

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| **Receipt of an application does not constitute a commitment by the Ontario Energy Board to approve the application.**  |
| **B. Project Overview (check all that apply)** |
| **Regulated Price Plan Roadmap Category** |
| [x]  Price | [x]  Non-Price |
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| **Target Market(s): Residential Market Only** |
| [x]  Existing Homes | [x]  High Usage Customers |
| [x]  New Homes  | [ ]  Other:\_\_\_\_\_\_\_\_\_\_\_\_ |
| [ ]  Multi-family |  |
| [x]  Single-family |  |
| [x]  Low Income Customers |  |
| **Project Type** |
| [x]  Time-of-use | [x]  Other Pricing |
| [x]  Critical Peak Pricing |  |
| [x]  Appliance/Household Automation |  |
| [x]  Information Provision |  |

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| **Expected Project Duration**: ***24* Months** |

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| **Funding\*\*\**:*** Applicants are encouraged, but not required, to contribute support or have project partners contributed support to the proposed project. Differentiate between cash and in-kind support to the proposed project. Please indicate if the funding is confirmed. “Requested Funding” represents your funding request to the OEB.IF THIS SECTION IS LEFT BLANK YOUR APPLICATION WILL NOT BE CONSIDERED |
|  | **Cash ($)** | **Cash (% of total project value)** | **In-kind ($)** | **In-kind (% of total project value)** |
| **PowerStream** | $25,000 | 0.5% | $100,000 | 2% |
| **Util-Assist** | $ | 0% | $75,000 | 1% |
| **BEworks** | $ | % | $50,000 | 1% |
| **Nest** | $ | % | $25,000 | 0.5% |
| **Energate** | $ | % | $25,000 | 0.5% |
| **Ecobee** | $ | % | $10,000 | % |
| **Opower** | $ | % | $10,000 | % |
| **Bidgely** | $ | % | $25,000 | 0.5% |
| **Rogers** | $ | % | $25,000 | 0.5% |
| **Subtotal** **(non-OEB funding contribution)** | **$25,000** | **%** | **$345,000** | **6%** |
| **Requested Funding** | $5,737,600 | 94% | N/A | N/A |
| **Totals** | $5,398,600 |  | $345,000 | 6% |
| **Total project value (all cash costs + in kind)** | **$5,743,600** |

\*\*\*These fields may be amended at a later stage if required.

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| **1. PROJECT CONCEPT AND RATIONALE** |
| **A.** In one sentence, state the ultimate goal of this project. How will the objectives of the Regulated Price Plan Roadmap be achieved as a result of this project? |
| The ultimate goal is to provide guidance to the Ontario Energy Board on the future direction of the Regulated Price Plan by obtaining robust, validated results from pilot projects testing multiple rate treatments, automation technologies and feedback mechanisms. |
| **B.** Discuss in detail the specific objectives of the Regulated Price Plan Roadmap that this project addresses (e.g. technical challenge, energy literacy gap, etc.).  |
| The RPP Roadmap identified three objectives, which can be summarized as: * setting the price structure to achieve efficient electricity system operation and investment;
* giving consumers incentives and opportunities to reduce their electricity bills; and
* enhancing consumer energy literacy and response through non-price tools.

This project will address all three objectives. On rate structures, PowerStream proposes to test out several rate structures, including a TOU rate structure with three variants; and an extension of its existing variable peak pricing program. The changes in customers’ electricity consumption patterns that result from these alternate rate structures will be assessed to determine what, if any, impact the rate structures had. At this stage, these rate structures are expected to identify the results from a change in the price differential of the current TOU framework (“Enhanced TOU”) to shift daily consumption towards off-peak periods; the effectiveness of critical peak pricing in shifting demand away from system peak hours; and to the potential of shifting electricity to overnight use through the use of very low rates. This could eventually replace the free overnight EV charging initiative the provincial government plans to support from 2017-2020. The second objective will be met by analyzing customer bills in concert with their energy consumption profiles. Since all projects will include time-variant rates, it is possible that customers could spend more, less or the same while consuming more, less or the same amount of electricity. Pricing provides the incentive and opportunity for customers to lower their bills; the analysis will test to see whether the response matches the expectations of behaviour change through alternate rate structures. For the TOU rate project, PowerStream is working to provide rates through the existing customer bill. For APP, shadow bills will likely have to be continued due to the timing of the rate structure not falling within the provincial regulation for on-peak time-of-use billing (3-9pm vs. 7pm), and the complexity of adopting this rate structure into PowerStream’s existing billing system.Changes to energy literacy will be tested by providing several mechanisms of providing feedback to customers: on-demand through a mobile application and through reports, using either real-time or delayed data, and through a variety of framing and content messages. The impact of enabling technology will also be studied by providing technology to customers in different rate treatments, and comparing the impacts of the technology against participants with the same technology in different rate treatments, and participants with different technology in the same rate treatment.Results will be measured through several lines of evidence, including billing data, data from deployed technology (e.g., thermostat setpoint, response to critical peak events), surveys, focus groups and other in-person research,  |
| **C.** How will your project’s activities and outputs address the objectives of the Regulated Price Plan Roadmap outlined above? What solution is this project designed to develop?  |
| This project aims to investigate the impact on customer behaviour by both default and optional rate structures, a variety of enabling technology, and strategic communications enhanced through behavioural science.While still investigating the feasibility of various implementation approaches (including the customer risk for opt-out approaches), PowerStream endeavors to test out an opt-out approach for the default rate structure, and an opt-in approach for optional rate structures. Different non-price tools will be available for either opt-in or opt-out approaches.As part of the proposal development process, PowerStream will work with its partners and Board staff to establish the sample sizes and treatments for the different pilot approaches. This will ensure that data on the most important elements are sufficient to produce meaningful results. The combinations of rate, technology and feedback will be established. An RCT design will be used for opt-out program models; for opt-in approaches, RED will likely be used to simplify the process of getting a representative control group for each treatment group. To ensure the external validity of our findings we will employ participant group stratification and/or covariate analyses to control for important demographic factors that may contribute to the responsiveness of consumers to our proposed interventions. For optional rate treatments, PowerStream expects to offer enabling technology to help support customer adoption and benefit from these rate structures. Among the tools PowerStream expects to offer are smart communicating thermostats and smart EV charging solutions. If possible, PowerStream will also explore the possibility of recruiting customers with air-source heat pumps to provide data on responsiveness to winter pricing events. PowerStream will leverage existing infrastructure as much as possible (both pilot participants and customers with their own devices), but expects that new equipment will need to be installed. A mix of incentive types will be used to obtain participants with enabling technology; speed (to meet May 1 start date), cost and efficacy will be the primary considerations of which incentive approaches are used. PowerStream has already been in discussion with several providers of enabling technology, including Nest, Energate and AddEnergie.PowerStream expects that the project activities and outputs will be refined through discussion with Board staff to ensure that the proposed project provides valuable insight to the Board as it develops the RPP of the future. |
| **D.** Explain how your project compares to other initiatives/ technologies already deployed/ piloted in Ontario and elsewhere. Provide diagrams, etc. as necessary (within this document). |
| PowerStream’s proposed project is larger and more relevant than any other project underway or completed in Ontario with respect to testing out different rate options. Currently, PowerStream is testing out a variable peak pricing project (Advantage Power Pricing), which is being funded by the IESO’s Conservation Fund. The proposed project includes several additional rate designs (enhanced TOU, critical peak pricing, super low off-peak pricing) and non-price elements (feedback mechanisms, customer control/ automation) to this project. Hydro One is also currently running a number of dynamic rate treatments in its service territory. The proposed project has larger sample sizes, is more targeted to the OEB’s needs, and includes a suite of price and non-price elements which represent enabling technology that could be deployed to a mass market population.This project would have access to a team of behavioural scientists, energy experts, and innovators through BEworks. This unique composition of expertise offers a powerful perspective on energy demand management and conservation that focuses more on the human component rather than the economic rationale of dynamic pricing. Non-price treatments have been run in Ontario before – specifically, a 2015 pilot conducted by Hydro Ottawa in conjunction with the Ontario Ministry of Energy, expanding the scope of study to measure the effect of communication channel and message framing on peak load reduction. In this pilot, the impact of communications delivered through email will be compared to the impact of communications delivered over the phone using interactive voice response technology, which does not appear to have been done previously in Ontario. Additionally, the effect of message framing on load impact will be evaluated through the study of environmental/health framing vs. community framing. Finally, by running for two consecutive summers, the impact of familiarity by customers will be able to be measured from one year to the next. |

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| **2. PROJECT PLAN** |
| **A.** In no more than ten sentences, outline the project plan. |
| At a high level, the project consists of distinct major treatment groups, which will provide insight into both price and non-price treatments. While further investigation will be required to develop a finalized experimental design, preliminary planning has identified the following five treatment groups: * Enhanced TOU
* Enhanced TOU with Critical Peak Pricing (CPP)
* Enhanced TOU with a super-low overnight rate
* Variable peak pricing with CPP (an extension of PowerStream’s existing Advantage Power Pricing rate treatment)
* Non-price treatment

The project will unfold with several work streams running in parallel; an elaborated project plan informed by discussions with the OEB and project team partners will be an essential beginning to the project to define priorities, finalize capabilities and costs, and ensure common understanding of project objectives, scope and timing. PowerStream intends to work with BEWorks to implement its 5-step methodology to provide robust results based on the scientific method.Each of the treatment groups will be offered a specific cluster of enabling technologies and feedback tools to test out customer response and interactivity with the enabling technologies; where possible, a self-install model for technology installation will be used, but in some cases a utility direct install approach will be required. The type of tools offered will be based on the expected value to the electricity system of the investment, given expected customer behaviour with respect to the rate treatment (e.g., real-time AMI data will only be offered to customers who are subject to Critical Peak Pricing). To test out the business case of offering these enabling services as part of rate evolution, PowerStream will participate in IESO markets (e.g., demand response, operational flexibility, regulation services) where feasible for the resources developed as part of this project. The timeline for this project to launch for May 1 is aggressive, given the number of customers to be brought in to the program and the variety of technologies to be made available and integrated into various platforms. Where possible, an opt-out approach will be used, but for options that would require customers to opt-in, they will need to be enrolled individually; this will necessitate a strong and active marketing and customer acquisition approach, for which PowerStream will leverage its experience and existing processes as much as possible. |
| **B.** Describe each of the major task areas for this project (e.g. program design, development of training, measurement and verification, research, communications, knowledge transfer, etc.).  |
| **Confirm the objectives***.* In consultation with the OEB, the PowerStream team will to refine the approach to this pilot, and how best to use price and non-price changes to reduce peak demand. During this phase, the experimental infrastructure will also be reviewed in light of logistical constraints. **Literature Review**. This will feature a review of the energy consumption literature, project evaluation reports and previous project experience to identify barriers to consumer behaviour change. **Identify and prioritize interventions.**In this phase, PowerStream will finalize the pilot treatments that will result in observable customer behaviour changes. PowerStream will develop messages and message framing to motivate consumers to reduce their on-peak electricity consumption. **Develop customer education materials:** Customers will need to be educated about the opportunity that is provided by this program. Education materials and participant agreements will need to be developed to define and explain the program. These materials will then need to be printed and disseminated to the target populations.**Selection, recruitment and onboarding**: This involves identifying target populations, marketing and recruitment (for opt-in programs), and importation into program databases. Registration processes and tools will need to be developed. It is expected that the price treatments alone will require several thousand participants (approximately 5,000-10,000). The non-price treatment will require an additional approximately 80,000 customers, who will be brought in through an opt-out approach. **Installation, testing and hardware incentive processing:** This work stream comprises the physical installation of the hardware, which will be undertaken either by the homeowner or a utility contractor. Testing will establish that the equipment is connected to the utility communication system and is functioning properly. Once established that the equipment is functioning, incentive payments will be made to the customer (for customers who used a BYOT approach).**Testing and Configuration:** This encompasses the work to integrate and store the data pathway for automated data transfer (price, billing information, etc), and to populate servers with customer information to enable them to use the tools provided to them. **Engage and support participants:** This workstream represents the work of working with participants to help promote satisfaction with the initiative, and monitoring and refining systems to improve performance. These processes will be interactive so that improvements are made based on participant feedback, and participants are coached on benefitting from the alternate rate structure and supporting technology.**Public communications:** The purpose of this task is to promote awareness of the project and to share results as they become available. As this project is expected to break new ground in several areas, it will be of interest to a variety of audiences.**Evaluation:** The outcomes of the project will be monitored and analyzed throughout the course of the project to provide an opportunity for shortcomings to be addressed and new opportunities to be explored. Multiple lines of evidence will be explored, including: customer and participant feedback (surveys, in person discussion/focus groups, calls to call centre); billing data (electricity consumption by day/time of day), market service capability (demand response, frequency regulation, operational flexibility) and communication integration effectiveness (data throughput, latency). **Deliver results and recommendations:** Using the evaluation report as well as feedback from PowerStream and its partners, PowerStream will provide to the OEB its recommendations for evolution of the RPP. PowerStream will also support knowledge transfer to other LDCs through meetings, presentations and other support.**Project management:** Managingthis large and complex project will require rigorous project management. PowerStream will be responsible for overall project management and will delegate responsibility for specific tasks to partners/vendors through clear assignment of roles and responsibilities. PowerStream will manage project budgets to monitor and control costs, and re-assign resources as required to get the best possible value for project spending. This workstream also includes vendor/partner management, which will be executed through legal agreements. |
| **C.** Describe each of the major deliverables that will be provided to the OEB as part of this project.  |
| * **Discovery Workshop.** Workshop notes exploring key questions and to develop operational definitions of the challenge and target behaviors.
* **Literature Review.** A document detailing empirically-based barriers to changing consumers’ energy consumption.
* **Technology analysis.** An assessment of the functionality of the various technologies (both customer and utility) and how they can support the customer experience through different experimental designs.
* **Prioritization Workshop.** Workshop notes prioritizing a list of interventions to implement in the in-field experiment.
* **Experiment design.** A detailed experiment plan that outlines the sample size calculation, the statistical analyses to be used, the dependent variables to be measured, and the hypotheses to be tested.
* **Communications materials.** Materials to attract and on-board participants; to communicate results and encourage behaviour change to support customer benefits.
* **Project Evaluation.**  plan and then a report by a 3rd party summarizing the energy and cost impacts of the various treatments with recommendations for improvements
* **Playbook**: A Playbook containing lessons learned from the project and evidence-based recommendations to drive policy objectives of the OEB.
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| **3. PROJECT TEAM & PARTNERS** |
| A. In this section, please outline the composition of the project team and list any project partners. Discuss the role that each person and organization participating in the project will play. Include the applicant organization in this table. If a 3rd party is not yet part of the team, please identify the accountability they will be responsible for and enter TBD for the name and organization. |
| **PROJECT TEAM** |
| **Project team member**  | **Organization and job title** | **Major accountability** |
| Neetika Sathe | VP, Corporate Development and Smart Grid | Project sponsor  |
| Daniel Carr | Manager, Smart Grid Projects | Project lead |
| Fahimeh Kazempour | Smart Grid Student | Project analysis  |
| Linas Medelis | VP, Customer Service | Project steering committee member |
| Raegan Bond | VP, CDM | Project steering committee member, CDM integration |
| Colin MacDonald | SVP, Regulatory Affairs & Customer Service | Project steering committee member |
| Marlene Strange | Manager, Billing | Billing system integration |
| Eddie Augusto | Manager, Metering | Metering integration |
| Sandy Dorschu | Sr. Coordinator, Comms. | Communications to customers |
| **PROJECT PARTNERS** |
| **Organization** | **Project role (e.g. participant, funder)** | **Financial or in-kind contribution (indicate if confirmed). Please note that if you are invited to submit a proposal your partner must confirm their contribution in writing to the OEB.** |
| Util-Assist | Billing, customer communications, project implementation support | In-kind (amount unconfirmed) |
| BEWorks | Project design and implementation advisor | In-kind (amount unconfirmed) |
| Navigant | Project evaluation, technology advisory |  |
| Nest | Hardware, customer communications | In-kind (amount unconfirmed) |
| Energate | Hardware, customer communications | In-kind (amount unconfirmed) |
| Ecobee | Hardware, customer communications | In-kind (amount unconfirmed) |
| Rogers | Hardware, customer communications | In-kind (amount unconfirmed) |
| AddEnergie | Hardware, customer communications | In-kind (amount unconfirmed) |
| Bidgely | Price & non-price treatment | In-kind (amount unconfirmed) |
| Opower | Non-price treatment | In-kind (amount unconfirmed) |

**Attach this completed document, in Word format (no PDFs) to an email and submit to:** BoardSec@ontarioenergyboard.ca *citing “EB-2016-0201: RPP Pilot Application” in the subject line.*