VPPSA EV/EVSE Tariff Rider Implementation Plan

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Bellawatt

1.0 Executive Summary

The Vermont Public Power Supply Authority (VPPSA) is a joint action agency that provides services and solutions to municipal and cooperative electric utilities in and outside of Vermont. VPPSA has engaged Bellawatt to research, derisk, design & potentially build a sustainable and affordable solution for its members to meet the Vermont Governor's *Act No. 55, Section 33 - PEV Electric Distribution Rate Design*[1].

VPPSA has progressive fossil fuel reduction and electrification goals, and plans on leveraging this program to "lead and leapfrog" the industry by providing affordable power and utility grid edge solutions while ultimately supporting the member's core principles and complying with the order from the Public Utility Commission.

Built upon the concepts of Dynamic Energy Pricing through Time-of-Use rates, VPPSA seeks to deploy a dynamic, time varying and formula-based, prices-to-devices tariff rider to measure, calculate and bill incremental loads from EV/EVSE charging. To ensure equity of access, preserve customer choice/device autonomy, and mitigate connectivity restrictions found in rural service territories, VPPSA seeks to deploy a non-proprietary framework and data sharing architecture to enable data sharing of at least day-ahead hourly pricing and hourly interval data collection to and from end-customer EV/EVSE devices, rather than just to the whole home via the meter.

As part of the effort to create the plan to implement such a technology, Bellawatt worked with VPPSA and member utility stakeholders to conduct primary and secondary research to enhance our understanding of VPPSA and member utility operational requirements, specific needs, and long term plans. In addition,Bellawatt canvassed the energy hardware market and developed relationships with energy software providers to formulate a product roadmap to not only design, develop, and deploy a near term-program that balances program priorities and strong customer experience given available technologies, but to also build the foundation for a scalable program that can grow and interoperate with VPPSA's diverse technological and physical infrastructure among its members.

Ultimately, Bellawatt recommends launching an EV/EVSE Tariff Rider Pilot program leveraging a partnership with Enode, a distributed energy resource data integration company, to not only comply with Act 55's regulations, but to ensure a high quality customer digital experience that is crucial for a technology-dependent program like this to succeed.

[1] All State electric distribution utilities shall offer PEV rates, which may include rates for electricity sales to an entire customer premises, for public and private EVSE not later than June 30, 2024.

Over time, Bellawatt believes the initial solution deployment can be strategically expanded to unlock even greater value for members and customers. In conjunction with upcoming advanced metering infrastructure upgrades and billing and customer information softwares, an initial fully compliant Act 55 solution can grow to enhance operational efficiencies for members and could even potentially expand to include additional devices like batteries. This document and its supporting work streams establishes the initial steps in a larger electrification roadmap.

This Implementation Plan is organized into our stakeholder interview findings, EV/EVSE tariff rider risk assessment, and EV/EVSE Tariff Rider Implementation Plan. Bellawatt is proud to be contributing to VPPSA's vision of providing affordable power and utilizing grid edge solutions to unlock new opportunities for member and customer value creation.

2.0 Stakeholder Interview Key Takeaways

In its analysis, Bellawatt first conducted in-depth stakeholder interviews to understand & align on stakeholder needs, priorities, and technical & operational considerations key to designing and derisking anything we propose building. Our method was especially important in the context of this project given the complexity of managing the many member utility stakeholders and their associated technical and operational infrastructure as related to the goals of this initiative.

Between February 20th and March 1st, Bellawatt interviewed VPPSA IT & program staff, and key stakeholders from Hardwick, Orleans, Swaton, Enosburg, Lyndonville, and Morrisville member utilities. Interview questions covered the current state of utility billing systems, future plans for upgrades, customer EV/EVSE adoption rates, overall electrification sentiments, and additional or ad-hoc considerations regarding rates, processes, and general program feedback.

Key issues identified include no single billing system & operation between utilities, mixed automation capabilities, and that manual usage & billing data entry processes are exacerbated by complex programs like NEM. While there are plans to standardize systems in the coming years, the current implementation of the EV/EVSE rider will need to work around these complexities and limitations as best as possible, with a particular focus on supporting the customer experience and reducing customer support burdens. Future billing system standardization and AMI meter deployments would introduce potentially significant operational efficiencies for the EV/EVSE program.

Below we summarize our findings in greater detail. The Member Utility Interview Guide and additional notes can be found in the Appendix.

2.1 Current State Utility Billing and Customer Information Systems

Bellawatt received the following list from VPPSA program stakeholders when asked about CIS software and member utilities. Member utilities prefer to automate processes where available, so we augmented the list to include our assessed potential for each billing system to accept CSV or other files (a potential avenue for process automation), and the number of monthly billing cycles for each utility, which have ramifications for data architecting and user experience requirements.

Member	Interview Date	Billing System	CSV File Potential	Billing Cycles
Enosburg	February 28	Harris	Moderate	2 per month
Morrisville	March 1	Northstar (Harris)	High	3 per month
Lyndonville	February 29	Northstar (Harris)	High	9 per month
Swanton	February 28	Cogsdale (Harris)	Moderate	4 per month
Orleans	February 27	El Dorado	Low	1 per month
Hardwick	February 27	Meridian	Low	2 per month
Johnson	N/A	NEMRC	Low	TBD
Barton	N/A	NEMRC	Low	TBD
Jacksonville	N/A	NEMRC	Low	TBD
Northfield	N/A	MUNIS	Low	TBD
Ludlow	N/A	NISC	High	TBD

Our primary finding is that there are a wide variety of billing systems, processes, and capabilities to automate key steps in the billing process. There are a total of eight different billing systems across the 11 member utilities, with four of the member utilities using Harris platforms and three using NEMRC. In addition, an important note raised by a Morrisville stakeholder is that while the utilities may be using the same platform, their internal processes and operations (adjacent software, data entry, net energy metering (NEM) calculation methodology, etc) may be different. For Bellawatt and VPPSA, this raises potential issues and additional considerations if we target standardizing automated processes across member utilities.

The "Low" potential rating for CSV file usage potential for automation for NEMRC[2] and MUNIS are based on Bellawatt's research into billing system technical capabilities; the "High" confidence rating for NISC's billing system automation capabilities is based on Bellawatt's previous experience in working with the NISC platform from similar initiatives[3].

In addition to the complexity of billing systems and operations, there are ongoing upgrades and changes to processes that the program will need to take into account as part of planning. As one utility stakeholder mentioned during an interview, *"Everything we tell you about our current system will change once we upgrade"* - indicating the need for a forward looking approach to implementing an EV/EVSE tariff rider.

[2] Bellawatt canvassed the NEMRC (https://www.nemrc.com/index.php) and MUNIS (https://www.tylertech.com/products/enterprise-erp/enterprise-utilities) homepages in search of technical documentation for systems integrations.
[3] Bellawatt previously worked with the NISC billing system to design custom data integrations via API endpoints.

2.1.1 Utility Usage & Load Data Processes

An EV/EVSE specific prices to devices program requires the ability to gather customer device usage data and enter it into a utility billing system. Ideally this is an automated process; however, utility billing systems and operations determine what's possible, thus Bellawatt did an in-depth investigation into the current state of member utility customer usage & load data processing for billing purposes. Our key findings are that most member utilities are limited in their ability to automate device-level usage & load data processing for billing; however, we may be able to leverage certain billing system CSV file capabilities to streamline operations.

We outline our current state usage data system findings below.

2.1.1.1 Regular Meter Readings

VPPSA stakeholders noted that all but one of the member utilities currently do on-site meter readings and manually enter monthly usage data into handheld devices. This data is then sent to the billing system and used to generate the customer's monthly bill. There are automated meter reading pilot programs in place where information can be downloaded within a certain range, however the vast majority of meter readings happen on foot.

If there are errors or oddities in manual data entries, there are processes in place to correct and update data; in one such process, a work order is created and a technician checks the meter again, or the customer can call in for an investigation.

Bellawatt validated these VPPSA stakeholder insights during our member utility stakeholder interviews. We outline our detailed findings below:

- **Orleans** performs manual meter readings from the field, where meter readers go to each individual meter, manually write data onto meter cards, and return to the office where data is inputted into the El Dorado billing system.
- **Enosburg** reads meters in the field manually, entering usage data into a mobile handheld device, which then returns to the office and uploads data manually into the Harris billing system manually via a Flexibill integration.
- **Hardwick** sends usage information to the Meridian billing software via an Itron integration, which calculates bill amounts and sends bills to customers.
- **Swanton** performs manual meter readings from the field, where meter readers go to each individual meter, manually input readings into a handheld device, returns to the office and transfers data from the handheld to Cogsdale via Bluetooth.
- **Lyndonville** performs manual meter readings, inputting data into a handheld device which is returned to the office where data is inputted into the Northstar billing system through an ITron integration.

- **Morrisville** performs manual readings from the field, entering usage data into handheld devices, and returns to the office where data is imported into the Northstar platform through an Encite integration.

Overall, out of the six member utilities interviews, five carry out manual processes for their regular meter read processes; data is input into either handheld devices or meter cards, and transferred into the billing systems where it is processed into customer bills. Oddities, errors, and exceptions are generally carried out manually, and on a per-occurrence basis, and member utilities follow various billing cycles.

2.1.1.2 Automation Opportunities

Bellawatt and VPPSA discovered that the Harris platform utilizes CSV files for information transfer from handhelds to the billing software; Morissville and Lyndonville stakeholders mentioned a static format for these CSV files[4].

For Bellawatt, this indicates a potential automation for the EV/EVSC tariff rider: we may be able to automate usage/price/billing data transfer by sending CSV files to utilities that are able to accept and process the files, depending on file formats, data input requirements, and utility billing software considerations. This would require requirement gathering and design work in Phase 2.

When speaking with Hardwick, stakeholders mentioned that all data processing and rate updates are done by their billing system vendor, Meridian. Hardwick stakeholders noted a lack of publicly-available technical documentation[5], and mentioned "any Meridian provided documentation would be massive". Interfacing with third party software vendors will pose both a schedule and budget risk to VPPSA and the member utility, with respect to EV/EVSE tariff implementation; risks that would need to be addressed early in Phase 2.

Hardwick stakeholders described a multistep process for developing new rates:

> *There is development and programming required when a customer comes with a new rate within our current software. We build the programming to calculate it, and if needed integrate with a third party vendor. There is a separate step they work on, better to connect with IT people directly, and the documentation would be massive. There are lots of third party integrations.*

Additionally, Hardwick stakeholders said "it is easier to get raw data to [Meridian] and let them do the calculations". When asked about automating processes, Orleans stakeholders

[4] It may be possible that the other Harris platforms are capable of receiving and processing CSV files - this would require additional discovery work in Phase 2.
[5] Bellawatt could not find technical or systems integration documentation when researching the Meridian billing software: https://www.meridian.coop/

(who use the El-Dorado billing software) noted that they can do different rate options, like a customer getting two bills for regulatory purposes. When asked about automating manual billing processes and upgrading their software, they noted:

> *We have manually intensive processes, especially with NEM. We don't have a lot of NEM customers, so it is hard to justify going out and spending a lot of money [to upgrade billing systems].*

2.1.1.3 Net Energy Metering

Bellawatt learned that recording and crediting NEM data is more involved than the regular meter readings. The current billing systems listed in the previous sections (other than NISC) cannot handle the complexity and nuances required for NEM, which result in manual processes for the member utilities. These are mainly manual processes for the member utilities, which include manual credit calculation, entry, and customer support. An additional challenge raised was displaying credits and usage on the energy bills; some utilities stated they have limited space on their customer bills, and adding an additional page can add significant costs.

Bellawatt believes this raises additional risks for the utilities and customers in data presentation and auditability[6]. These learnings spurred additional discussions around auditability, both for customers receiving their bills with new line items, and the potential operational impacts this may have on the utility through an increase in customer calls and inquiries.

Utility feedback around NEM will play a vital role in Bellawatt's EV/EVSE tariff rider recommendations. Avoiding manual processes where possible, potentially leveraging existing data transfers, and providing user friendly, and keeping the end-customer's experience in mind to reduce additional questions to utility staff will be focus areas of our recommendations.

2.2 Billing System Future State Planning

2.2.1 CIS/Billing System Upgrade

Bellawatt discovered that VPPSA and the member utilities are planning to standardize the CIS and billing systems and associated business processes. Currently, each utility may output data in different formats creating inefficiencies in VPPSA's data analysis and report generation. The goal is to get as many utilities using the same software and output the same format data to streamline financial and usage data processes. A priority and key

[6] Bellawatt outlines auditability and billing risks in the EV/EVSE Tariff Rider Implementation Risks Analysis section.

consideration for a billing system vendor is the ability to handle and manage net energy metering.

A leading contender for the billing system upgrade is NISC[7], a platform designed for cooperative utilities. NISC is currently used by Ludlow for electric usage data, and is capable of managing net energy metering. We learned that VPPSA had a demonstration of NISC capabilities, and is planning a demo with NISC for the end of March. Another billing system vendor mentioned was Sprypoint[8], a SaaS platform for utilities.

When asked about timelines for the remaining utilities to implement NISC, we learned that it would take approximately three years; NISC said they can manage to implement the software to three utilities per year.

When discussing future billing systems, Hardwick stakeholders informed Bellawatt that:

> *There were similar efforts to get everyone on the same billing and processing in the past. It was for Harris, it only landed four out of 11 utilities. I got us out of Harris and into Meridian. [Harris] has a multiproduct, I wouldn't recommend it.*

One Orleans stakeholder notes that they see two alternatives for billing, however "it's not going well. Utilities do not agree on the same thing, everyone wants something different. We see nice software, but it will be pricey for customers".

VPPSA stakeholders also noted that while there are discussions with NISC, the platform may be cost prohibitive for the smaller utilities, as some fees are charged on a per-implementation basis.

Bellawatt believes the above findings indicate a possibility that future billing/CIS software upgrades may be met with similar resistance ultimately resulting in delays of deviations from original plans. We will consider these factors and timelines for the upcoming EV/EVSC tariff rider implementation; if new billing systems are likely to be installed in 2025 or onwards, then the Phase 2 focus may need a temporary and interim manual solution to register customers and transmit data to and from the devices.

2.2.2 Advanced Metering Infrastructure

VPPSA and member utilities are in the process of implementing Advanced Metering Infrastructure (AMI). VPPSA has been approved by the Public Utility Commission to begin purchasing and rolling out hardware, and VPPSA is also moving forward in other areas like software licensing, security reviews, and enhancements.

[7] https://www.nisc.coop/
[8] https://www.sprypoint.com/

VPPSA sees AMI as a solution for many of the member's pain points noted above; the ability to remotely and automatically collect usage data can reduce manual efforts in monthly meter readings and other operational calculations. Additionally, Bellawatt sees AMI as a technology that can, for similar reasons, enhance and automate the EV/EVSE tariff rider program.

That said, Bellawatt discovered that utilities have mixed opinions on the importance and relevance of AMI for their operations. When we asked Swanton stakeholders if AMI can improve their operations, they said:

> *[AMI] won't. We're doing it because the state is telling us to. We only have one meter reader, and not all customers will get AMI, some will opt out. We're doing it because we have to. Someone will have to be there to interrogate the AMI software. Meter readers will still need to read and work with AMI software, and spend their free time redeploying. We'll still have a truck, have TOU rates for AMI, and it will cost more money to have AMI. There isn't enough time, [my colleague] doesn't & won't have time to do it, we still need verification processes, billing processing takes a long time and ties their computer up. I don't see savings.*

Responding to the same question, an Enosburg stakeholder noted:

> *AMI would make us more efficient - seeing live data, where customers are at, seasonality since we have lots of maple syrup farms and pumping. We wouldn't need manual meter reading, we'd have better outage reports, know where outages are, where they are located. I'd expect about 30 to opt out, since they can in Vermont.*

Similar to billing system updates, Bellawatt will consider AMI timelines for our EV/EVSE tariff rider recommendation, however the focus will likely need to be on interim solutions that focus on near term feasibility.

2.3 EV/EVSE Tariff Rider Implementation Discussions

Bellawatt and internal VPPSA stakeholders discussed potential utility integration points and processes for the EV/EVSE tariff rider platform.

2.3.1 Streamlining Manual Processes

VPPSA internal stakeholders noted that each member may have different processes making it difficult to scope effort for automated billing. VPPSA also stated that members

will likely want any new processes created for the EV/EVSE program to be automated, but it will likely be cost prohibitive.

When discussing alternative approaches to share usage data, a VPPSA stakeholder noted that a viable solution could be bypassing some of the manual work member utilities may need to do to calculate customer bills by automating the calculation to then simply display a monthly bill credit and volume (in kWh) to the member utilities, who can then more easily enter it into their billing system. Key benefits raised are:

- This is a streamlined manual entry process, without the complexities of the existing processes (from the member's perspective).
- The initial small scale of data entry; given this is a new program and depending on VPPSA's enrollment and customer outreach strategy and overall near term program goals, there could be a limited number of EVs registered, resulting in a minimal increase in monthly operational efforts for the members.
- Leveraging the existing billing system features to input manual adjustments or credits; a process that the members are familiar with and likely currently utilizing.

Other options discussed with VPPSA stakeholders, aimed at reducing overall manual effort include:

- Sending files such as CSV, DAT, or delimited flat files to the member utility's billing systems that are able to accept and process CSVs.
- Creating virtual meters within the billing system or Bellawatt platform, where the meter reader would read and record usage or billing data into the handheld devices.

Bellawatt and VPPSA aligned that the end goal of any alternative approaches should be to minimize additional work for the members, and make program implementation and participation as easy as possible. Integrating with existing manual processes and preparing for AMI implementation were noted as ways this could be accomplished.

2.3.2 Customer Sentiment, Education, & Support

Bellawatt asked utility stakeholders about customer sentiment towards EV and EV chargers. Stakeholders noted that EVs and home chargers appear to be taking off in the area, but it's difficult to tell because they do not always get calls for questions or installations. Stakeholders mentioned that many of the calls regarding EV chargers are from customers asking if they can save money on their bills, asking if they have sufficient feed, and asking if they have to upgrade their panels before installing chargers.

An Orleans stakeholder raised a notable sentiment that is in-line with VPPSA's EV/EVSE tariff rider goals when discussing customer perceptions:

We don't want to implement top down controls. It's bad if the utility controls everything, it's better to send price signals and allow people to make their own decisions. There is credibility in using real time pricing, and giving members the choice to charge hourly. These are all things we need to figure and work out.

Utility stakeholders raised customer support as a potential pain point, stating that "the utility staff is already overworked", and even if customers have access to their usage and pricing data, "there is still a possibility to get phone calls".

Prioritizing customer controls, reducing manual data entry and utility operational impacts, and optimizing customer data access, will be key considerations stemming from our VPPSA and utility stakeholder interviews.

3.0 EV/EVSE Tariff Rider Risk Assessment Report

Bellawatt leveraged its stakeholder interviews, technology investigations, and general market research to identify program feasibility & scheduling/budget implementation risks. Program feasibility risks address external and internal constraints to achieving the program vision in a viable way. Budget / schedule risks identify risks to budget and timelines, focusing on managing time and financial resources efficiently to meet the program objectives. Both types of risks are critical in program implementation, necessitating different strategies for identification, assessment, and mitigation. Bellawatt's risk assessment and recommended mitigation strategies are outlined below.

3.1 Program Feasibility Risks

Program feasibility risks pertain to the fundamental ability to complete the project as envisioned. Feasibility risks are concerned with whether the program's goals can be achieved given the constraints and realities of technology, regulations, and VPPSA/utility capabilities.

3.1.1 Rate Design & Cross Subsidies

There is a program feasibility risk stemming from the design of the EV/EVSE tariff rider rate. Act 55 discusses preventing cross subsidies and encouraging peak management. If the EV/EVSE tariff rider is designed in a way where adders or hourly pricing provide significant discounts to EV owners, and do not provide financial or other incentives to encourage off-peak charging, then the program risks not adhering to Act 55 guidelines.

Mitigations include a rate design that encourages both off peak charging (for example, charging hourly rates lower than the default rate during off peak hours), and disincentivizing on-peak charging (charging a higher than default rate during on peak hours). Bellawatt recommends VPPSA review different rate options and structures internally early in Phase 2 to ensure the EV/EVSE tariff rider program adheres to Act 55 regulations and guidelines.

3.1.2 Usage Data Access

There are high risks associated with the ability to access customer energy usage data. These include:

1. Usage data access due to limited internet connectivity
2. Load data usability due to how it is recorded and transferred (ex. Batch charging data based on charging session vs continuous/hourly/daily usage data)

Mitigations for these risks include:

1. VPPSA defining and stating clear program requirements for internet connectivity as part of program terms and conditions.
2. Leveraging alternative means of data communication, such as the EV's built in 3G connectivity.
3. VPPSA defining and stating clear program participation requirements, for example making it a program requirement to devices with known data import/export capabilities to ensure program compatibility.
4. Leveraging "go-between" devices to augment existing chargers by reading and sending energy usage data, such as smartplugs.
5. Investigating third party vendors to facilitate data transfer between the Bellawatt platform and customer devices, such as Enode.

Applications of these mitigations are discussed in the EV/EVSE Tariff Rider Implementation section of this document.

3.1.3 Personally Identifiable Information (PII) and Data Privacy

There are inherent risks with Bellawatt storing customer's personal data, such as name, address, phone number, and account number, which can be used to identify them. This data will likely be necessary for utilities to register customers for the EV tariff rider and perform operational tasks like applying bill credits.

Bellawatt reviewed online Vermont legislature[9] for PII guidelines and best practices, and believes there are minimal program risks associated with collecting and storing PII. However for further PII risk mitigation, Bellawatt recommends VPPSA perform a detailed analysis into other relevant documentation and guidelines.

VPPSA stakeholders also raised risks of data privacy and access if leveraging third party integrations or OEM data directly from customer accounts.

3.1.4 Potential for Fraud

There is a risk of tech-savvy customers editing usage data that is sent to the utilities (ex. adjusting kWh usage data sent to the utility to receive lower bills). It may be challenging to detect a sufficiently realistic report.

Bellawatt recommends a fraud mitigation strategy and leveraging utilities' existing processes to check customer energy usage and variances. The mitigation strategy will depend highly on the risk sensitivity of the utility. Alternatively, fraud risks can be mitigated by leveraging customer data sourced directly from the OEM, since the customer would likely not have access or the ability to manipulate the data in transit.

[9] https://legislature.vermont.gov/statutes/fullchapter/09/062

3.1.5 Customer Device Usage Management

There is currently no “out-of-the-box” way for customers to automatically respond to hourly price signals. Most existing chargers also do not have a built-in mechanism to respond to price signals. Currently, customers would need to manually check or monitor prices and make charging decisions on an hourly or daily basis, or use existing built-in time-scheduling functionalities that some home chargers and EV apps may feature.

These options can cause significant friction and lower enrollment, participation, and overall value delivered to customers. The need to constantly check price signals or time-schedule based proxies charging at suboptimal times can lead to an overall negative end-customer experience. In addition, there is a high chance of customer error risk that may lead to unexpected bills, and further customer dissatisfaction.

Bellawatt recommends VPPSA evaluate customer behavior risks in the context of the EV/EVSE tariff rider goals and the desired customer experience. The program risks reduced participation or sub-optimal performance if customers are expected to play a large or frequent role in manually responding to price signals. On the other hand, there are public perception and regulatory considerations for the program providing “optimized charging” as there is a risk of the utility or a third party aggregator appearing to take control away from the customer.

Mitigations for sub-optimal customer experiences include communication features, such as emails or text messages to send day-ahead prices that help customers choose the best times for them to charge their EVs based on expected prices. The application can send communications to customers on when to avoid charging, based on potential price spikes; Bellawatt recommends additional analysis is performed on historical prices to estimate the frequency and severity of price spikes. VPPSA can also consider optional “optimized charging” programs and features, with clearly defined cost structures in place to ensure the customer receives the full value for their participation in the EV/EVSE tariff rider program.

An additional mitigation to reduce customer behavior and participation risks is leveraging a home charger's built-in control mechanisms. The Bellawatt application can potentially be used to send activation and deactivation signals to a customer’s charger based on the application’s own assessment of price signals. As with data collection, this would require the customer’s permission, with additional override features so the customer is not locked out of their equipment if the need arises. Any optimization features that Bellawatt would have to develop will increase scope and complexity to the application.

Ultimately, the customer experience is the most important consideration for determining the successful uptake and reception of the program. Failing to meet high quality customer experience expectations will lead to poor program uptake and retention.

3.1.6 Utility Stakeholder Alignment

A notable program feasibility risk is stakeholder alignment. We recommend alignment and buy-in from all 11 member utility stakeholders to set the program up for success and provide maximum value to utility customers. Understanding the potentially accelerated timelines, technical challenges, and number of stakeholders involved, there is a stakeholder alignment risk if approval is required from all utility stakeholders who will be participating in or facilitating the program.

To mitigate this risk, Bellawatt recommends that VPPSA act as the EV/EVSE Tariff Rider signing authority for Bellawatt and perform change management in a timely manner. This can streamline Bellawatt design and development, and give utilities sufficient time to prepare for the program's implementation.

3.1.7 Third Party Integrations and Dependencies

A risk, should VPPSA align on partnering with third parties (primarily for data integrations), is OEMs change their policies around providing third party access to their customer data. A practical example of this is partnering with an energy company who builds data pipelines that enable data transfer between OEM applications and external applications (assuming the customer authorizes the data transfer). Program participation and overall feasibility would be impacted if certain OEMs prevent data integrations and the Bellawatt platform is no longer able to accept data from these sources.

While the benefits may outweigh risk, should data access issues arise, mitigations include developing contingency plans for alternative means of data access, such as establishing direct relationships with said OEMs. In addition, program design could include flexibility in program requirements, so that if a certain OEM becomes unavailable, alternative OEMs can be leveraged to make up for the participation magnitude losses of OEMs that no longer become available.

3.2 Budget & Schedule

Budget and schedule risks are related to the planning aspects of the program, specifically whether the work can be completed within the set timelines and allocated budget. Scheduling and budget risks focus on the efficiency and resource management aspects, rather than on the basic viability of the program itself.

3.2.1 Billing Data Format

Accommodating different utility data format needs poses a schedule risk for program implementation, and potentially a budget risk for utilities who will require custom programming from their billing system vendors.

There are several approaches to mitigate this risk; Bellawatt may recommend:

- Default manual processes for importing data into each billing application,
- Detailed technical evaluation of the member utility billing systems to determine potential automation opportunities, or
- A hybrid approach where Bellawatt designs a semi-automated process for the utilities that can accommodate a relatively simple file import, and a manual process for the utilities where automations are cost or schedule prohibitive.

The potential approaches will be discussed in greater detail in the EV/EVSE Tariff Rider Implementation section of this document.

3.2.2 Billing Cycles

Bellawatt discovered during stakeholder interviews that utilities have different billing cycles based on various factors (routes, geography, rate types). Programmatically defining the various billing cycles and accommodating these within the EV tariff rider program for all 11 utilities poses a moderate schedule and budget risk.

To mitigate this risk, Bellawatt recommends placing special focus during Phase 2 on determining the optimal user experience to define and accommodate different utility billing cycles.

3.2.3 Price Data

Accessing the ISO-NE API for day head pricing poses a low schedule risk. There is technical documentation, however it is light and there are seven possible endpoints to retrieve data from.

Bellawatt recommends more research is done to determine the best endpoint, and early conversations are required with VPPSA to determine the ISO-NE adder.

3.2.4 Billing Reconciliation

There is a moderate risk stemming from the need for the Bellawatt application to calculate the user's bill separately from the utility. Rate calculation is non-trivial as utilities have different rate structures and rate elements, and complications and nuances can set back development of the application.

Bellawatt or the application will not have access to the customer's home energy usage data; the application will only be able to display energy usage information from the customer's device. There are currently open questions around how to reconcile the energy usage of the EV/charger from the total home usage. For example, if a utility has a tiered rate, it is not possible to determine what tier a customer's usage reaches using information from the EV/charger alone.

Additionally, there is a risk for VPPSA and the utility in compensating customers for their participation in the EV/EVSE tariff rider; these risks are rooted in both application of the compensation and potential regulatory requirements. VPPSA stakeholders noted that the PUC regulates how bills are structured and that certain information must be included on the bill, and auditors will question how credits are applied. Utility stakeholders noted that some customer paper bills do not have physical space, and adding line items or second pages to the bill may be costly for the utilities.

Mitigations include early focus on rate structures and rate elements, and designing necessary logic to calculate bills credits. Utility, VPPSA, and Bellawatt responsibilities should also be outlined early in Phase 2 to ensure early alignment and allow ample time to define manual processes or test and implement automatic integrations for bill credit applications, as well as determine how the EV/EVSE tariff rider compensation information will appear on the customer bills. Additionally, for utilities with tiered rates, a potential mitigation is assuming each registered customer's home energy usage will fall into the tail block tier.

3.2.5 Compatible Hardware

There are numerous EV chargers available on the market, and there is no single standardized protocol, API, or format to universally enable two-way communication between utilities and devices. We may need to access several different APIs to get charger data, and work with hardware OEMs to enable price signal communication to the chargers. This poses both a schedule risk (depending on the number of charger makes/models required), and budget risk (depending on hardware OEM's appetite for custom development and compatibility).

A mitigation, similar to that of usage data access, is VPPSA defining and stating clear program participation requirements, for example making it a program requirement to devices with known data import/export capabilities to ensure program compatibility. Once the program is live and overall demand/participation is assessed, VPPSA can explore opportunities to expand the eligible hardware for the EV/EVSE tariff rider.

Additional mitigations include leveraging third party vendors and platforms that enable data integrations and communications across multiple device types, makes, and models.

One such example is Enode, a vendor which specializes in establishing back-end data connections to energy devices, and allows for customers to authorize transfer of their data to third parties, like VPPSA and Bellawatt.

3.2.6 Auditing

There is a low budget risk in storing auditable data in the form of database space and additional design requirements. It is likely that some data will need to be presented to the utility and customers for internal and external auditing purposes.

To mitigate this risk, Bellawatt recommends an early and thorough discussion in Phase 2 of billing communication requirements, including legal and compliance requirements. This will allow Bellawatt to design a system that limits data storage to what is deemed necessary for auditing and compliance, and optimize overall technical performance.

3.3 Program Feasibility Assessment

Bellawatt's risk assessment concludes that while both program feasibility and scheduling/budget risks may pose challenges to the EV/EVSE Tariff Rider program, there are mitigations and potential solutions available to enable a successful program launch.

High impact risks and mitigations Bellawatt identified are:

- Customer device registration and experience,
- Usage data access, and
- Utility billing and operations.

Lower impact, but still significant risks identified include:

- Customer outreach,
- ISO-NE integrations,
- Utility CIS integrations, and
- Customer support.

Through Bellawatt and VPPSA proactively addressing these uncertainties, and clearly defining and identifying program roles and responsibilities, we can enhance the implementation efficiency, ensuring the successful achievement of its goals.

4.0 EV/EVSE Tariff Rider Implementation Plan

As a trusted partner, Bellawatt's goal is to launch a successful platform as efficiently as possible to meet VPPSA's technology and program goals. Bellawatt's in-depth investigation into VPPSA stakeholder needs and market opportunities validated key problem and opportunity areas to build a solution that not only complies with Act 55 requirements, but provides a high quality user experience and meaningful value to utility customers.

This upfront research provides a strong foundation for outlining a program structure and specific product features areas to meet VPPSA goals and address utility needs, and mitigate potential risk areas to get ahead in achieving our shared goals.

VPPSA and Bellawatt's shared goal for this engagement is to launch an EV/EVSE Tariff Rider that cost-effectively complies with Vermont regulations while infusing VPPSA customers with innovative optionality. Bellawatt believes in designing a solution that not only meets VPPSA's immediate requirements, but also enables and encourages both program and technical expansion.

Act 55's goals include:

- Support greater adoption of PEVs;
- Adequately compensate PEV operators and owners of EVSE available to the public for the value of grid-related services, including costs avoided through peak management;
- Adequately compensate the electric distribution utility and its customers for the additional costs that are directly attributable to the delivery of electricity through a PEV rate;
- Include a reasonable contribution to historic or embedded costs required to meet the overall cost of service;
- Do not discourage EVSE available to the public; and
- Do not have an adverse impact to ratepayers not utilizing the PEV rate.

4.1 Proposed Application Design & Development

Bellawatt proposes designing, developing, and implementing an EV/EVSE Tariff Rider Pilot platform that combines new, streamlined manual VPPSA and utility processes with automated notification and data transfer processes.

Our key findings and opportunity areas from stakeholder interviews are:

1. Utilities have diverse billing platforms which pose challenges for process standardization: 11 utilities are using 8 different billing systems, and despite some utilities sharing platforms, there may be variations in processes and data management.

2. Manual processes are the standard (meter reads, data entry and validation, NEM calculations), however select billing systems have potential to automate data transfer with CSV files.
3. AMI and billing system updates are planned, but will not be available for the first iteration of the program. Future utility enhancements, while showing great potential to enhance the EV/EVSE Tariff Rider pilot/program should have minimal impact on our initial recommendations.

Additionally, our market and technical research findings surfaced:

1. Utility billing system providers provide little technical documentation for integrating into the systems or leveraging existing technical processes to design/implement automations.
2. While openADR is a widely recognized standard, aggregator and device support for openADR is not guaranteed and there is little "out-of-the-box" functionality. Custom development for each OEM will likely be needed for full device connectivity, and advanced technical literacy is required to set up the necessary technical components (VENs, VTNs) for a stable and robust connection[10].
3. Many OEMs (like Tesla, Flo, and Chargepoint) track individual device usage data and make it available to customers via custom applications and user accounts; similarly third party APIs can leverage these for additional use cases. Additionally, there are data integration vendors like Enode[11] that have built data pipelines, connecting and exposing (with customer authorization and permission) data to third party applications.

Considering the above learnings and their associated risks, Bellawatt recommends a 3 to 4 month pilot program with customer enrollment limited to a small group of eligible customers to allow VPPSA, utilities, and customers to become familiar with the program processes, requirements, and provide an opportunity to learn and plan for post-pilot enhancements. When possible, we typically recommend rolling out complex programs in stages to ensure that technology and operations are streamlined before wide marketing and adoption.

Bellawatt recommends the following key features and characteristics:

Program/Tariff Enrollment

- *Customer Outreach:* Defining eligibility requirements and initially limiting participation to a focused pilot group (pre-selected customers whom VPPSA or

[10] openADR is a technically heavy protocol designed for large scale demand response; it is aggregator oriented, meaning optimal use cases are centered around one entity (ex. An EV or charger OEM) registers/controls many devices, rather than a customer-first implementation where individual customers can register single devices.
[11] https://enode.com/

member utilities have an existing relationship with); leveraging existing communication channels for long-term, post-pilot outreach.
    - Bellawatt recommends a pilot program of 5 to 10 VPPSA/utility selected customers (ideally with different EV makes/models from various member utilities) for a duration of 3 to 4 months.
- *Customer Engagement:* Bellawatt recommends customer engagement via automated emails with energy prices sent to registered customers. This will allow customers to make informed decisions on when and how long to charge their vehicles, based on the day-ahead pricing schedule.

Device Enrollment & Validation

- *Customer Registration & Device Integration:* Self-serve customer enrollment via Bellawatt webpage.
    - Customers would be able to enroll their eligible EVs via their existing EV OEM accounts and log-in credentials.
    - Utility staff would be required to manually approve customer registrations prior to customers participating in the EV/EVSE Tariff Rider program.
- *Customer Facing Pages:* Utility customer page for EV/EVSE tariff enrolled customers for self-serve information gathering (number past usage and prices, current hourly prices) to better understand their billing and energy use.

Usage Reporting

- *Usage Reporting:* Leveraging customer usage data from EV OEM APIs and ISO-NE price signals to present relevant customer usage information to member utilities.
- *Member Utility Admin Page:* VPPSA member utility admin pages/dashboards for member utility staff to retrieve relevant customer registration information.
- *VPPSA Admin Page:* Admin page for VPPSA staff to control ISO-NE adders, view information around registered devices, energy usage, pricing, and showcase general program related statistics.

Processing Pricing Events

- *ISO-NE Integration:* Leverage ISO-NE API integrations to pull hourly day ahead pricing combined with VPPSA defined price adder.
    - The VPPSA Admin page will have functionality to set the price adders for the ISO-NE hourly prices.

Billing Cycle Reconciliation

- *Bellawatt Billing Calculation:* Bellawatt platform determines the VPPSA bill cost with the utilities tail-end rate and customer usage, and the EV/EVSE tariff rider cost with the hourly prices and customer usage. Bellawatt platform to display bill credit and/or send flat files (or other relevant price/usage information to utilities and VPPSA).

VPPSA/Utility Onboarding and Training

- *EV/EVSE Tariff Rider Onboarding:* Onboard VPPSA and utility staff prior to pilot launch; includes creating login credentials, setting up user accounts, and testing key functionalities.
- *EV/EVSE Tariff Rider Training:* "Train the trainer" approach - Bellawatt trains key VPPSA staff on key platform functionalities and processes, who in turn train the member utilities prior to pilot launch.

We outline each component, listing recommendations and requirements for each in the section below.

4.2 Detailed Process & Product Mapping

We detail EV/EVSE Tariff Rider processes and components in detail below, providing recommendations and rationale for our proposal.

4.2.1 Program/Tariff Enrollment

Bellawatt recommends defining clear EV/EVSE eligibility requirements for customers to enroll in the EV/EVSE Tariff Rider program; these requirements may include, but are not limited to:

- Residing in member utility territory / receiving service from member utilities,
- Owning specific EV makes or models (to ensure technical compatibility),
- Stable broadband or cellular service (to ensure reliable data transmission),
- Other requirements, potentially leveraging those from PowerShift[12] or other similar programs (to be determined in the next phase).

Bellawatt also recommends initially limiting enrollment and participation for the EV/EVSE Tariff Rider program to a limited "pilot" group of customers. We recommend piloting the program with a group of 5 to 10 eligible customers (as determined by VPPSA/member utilities) for a period of 3 to 4 months. A limited pilot prior to full rollout would benefit VPPSA and Bellawatt by allowing for:

- Greater risk mitigation; we would be able to closely monitor device enrollments and data flow on a smaller scale, reducing potential risks associated with a full-scale launch. If the pilot uncovers issues, Bellawatt and VPPSA can address them before they become more significant, costly, or wide-spread.

[12] https://www.efficiencyvermont.com/powershift

- Focused feedback and iterations; the pilot can provide valuable feedback from a controlled group of users, enabling Bellawatt to iterate and improve the program, processes, and overall utility/customer experiences based on real-world usage.
- Training and development; the pilot can offer a practical training ground for VPPSA and member utilities to learn the necessary processes and transition smoothly into regular operations.
- Regulatory compliance and standards testing; given VPPSA and member utilities must follow regulations and standards, the pilot can help in testing compliance with regulatory standards and in obtaining any stakeholder approvals/reviews prior to a wider rollout, avoiding potential legal and operational challenges.
- Overall program adaptability; information gathered from the pilot will allow the EV/EVSE Tariff Rider program to be more adaptable - VPPSA, utilities, and Bellawatt can gain valuable insight from the pilot and make informed decisions on how to proceed or if pivots are required based on evidence and insights, rather than assumptions or forecasts.

Overall, an EV/EVSE Tariff Rider Pilot will allow VPPSA, utilities and Bellawatt to test, learn, and refine the program in a controlled manner, increasing the chances of success for a full scale rollout. Upon pilot completion, Bellawatt recommends review of program metrics and learnings to make an informed decision on opening the program for all customer enrollments.[13]

To enroll customers in the EV/EVSE Tariff Rider program, Bellawatt recommends building a webform for customer device enrollment with utility notification features, enabling utilities to validate/approve customer participation. In this webform, customers would enter their utility information, potentially including:

- Name on utility bill
- Address of utility service
- Utility name
- Utility account number
- Other contact information (email, phone number)

Once a customer enrolls and the utility approves the enrollment[14], the customers can be taken to a customer dashboard, with their specific program information (current and past hourly energy prices, devices registered, usage, etc.) can be displayed. Bellawatt also recommends leveraging automated email services to send day-ahead pricing information to registered customers, allowing customers to plan and make informed decisions on their EV charging.

[13] A potential alternative to an official pilot (though preferable) is a “soft launch” where the program goes live, but is not heavily marketed until ready.
[14] This step may require less streamlined operations, like calling the utility to complete enrollment or the like. This will be determined during the design phase.

4.2.2 Device Enrollment and Validation

Bellawatt recommends allowing customers to register their eligible EVs once the utilities have approved the customer's enrollment. Eligible device enrollment can be completed through the customer dashboard, following a process where customers authorize data transfer (including energy usage and home charging location data) from their EV OEM accounts to the Bellawatt platform.

To facilitate the device enrollment process, Bellawatt recommends partnering with Enode[15], a third-party vendor specializing in back end DER data integrations to enable data transfer between customer devices and the Bellawatt EV/EVSE tariff rider platform[16].

Enode has a predefined device enrollment process, where customers...

- Can learn about the data transfer process,
- Are made aware of the data they are sharing,
- Select their eligible EV,
- Log in to their existing EV OEM account, and
- Select their vehicle to participate in the EV/EVSE Tariff Rider program.

Sample screens of the Enode device enrollment process can be found in the slideshow attached in the VPPSA Solutions Alignment deck, found in the Appendix.

4.2.3 Usage Reporting

Bellawatt recommends leveraging customer usage data from the customer's Enode integration. The usage data will be combined with the ISO-NE derived pricing data, and made available to member utility staff and VPPSA for reporting and billing purposes.

Bellawatt recommends the usage and price information is displayed on a member utility admin page/dashboard as part of our manual process streamlining for member utilities. Key functionality of the dashboard will include:

- Utility specific dashboard logins, including user management (by VPPSA or member utilities),
- High level information displays, including metrics like number of enrollment , requests, total number of registered customers, usage statistics, etc.
- Search functions to find specific customers enrolled,
- Billing cycle definition features to accommodate for different customer billing cycles, and
- Full scale device and price auditability features for customer inquiries and compliance.

[15] https://enode.com/
[16] More information and summaries on Enode offerings are available in the Appendix.

In addition to a utility admin page, Bellawatt recommends a VPPSA admin page, where VPPSA staff can control the ISO-NE adders and see relevant program information, including number of registered devices, total energy usage, and past and current price signals. Bellawatt recommends price and usage auditability as key components for the VPPSA admin page.

4.2.4 Processing Pricing Events

Bellawatt recommends leveraging an ISO-NE API integration to retrieve pricing events for the EV/EVSE Tariff Rider pilot and program. These prices will be ingested into the Bellawatt platform, combined with the VPPSA defined adders, and be used to calculate the customer billing information.

Bellawatt recommends VPPSA provide their recommended ISO-NE API and credentials early in Phase 2 to ensure timely Bellawatt validation, integrations and testing prior to pilot launch.

4.2.5 Billing Reconciliation

Bellawatt recommends that all EV/EVSE billing reconciliation be done within the Bellawatt platform. Leveraging the following data:

- Usage data from the Enode integration,
- Pricing events from the ISO-NE integration and VPPSA adder, and
- Utility specific tail end default rates,

The Bellawatt platform can calculate the customer-specific bill credits for EV/EVSE Tariff Rider participation. A sample spreadsheet, showing the calculations and logic for the recommended billing reconciliation process can be found in the Appendix.

We recommend the member utilities manually enter the bill credits into the billing system, under the appropriate line items (as determined by VPPSA or the member utility).

During stakeholder interviews, Bellawatt and VPPSA uncovered that Harris and Northstar billing systems may be able to ingest CSV files. In an effort to determine if there are opportunities for billing system integrations, Bellawatt recommends a joint investigation into CSV formats and requirements for potential automations. Should Bellawatt and VPPSA align on a path forward where a standard CSV file is ingested by select utilities, the functionality may be included for the EV/EVSE Tariff Rider program.

4.2.6 VPPSA/Utility Onboarding and Training

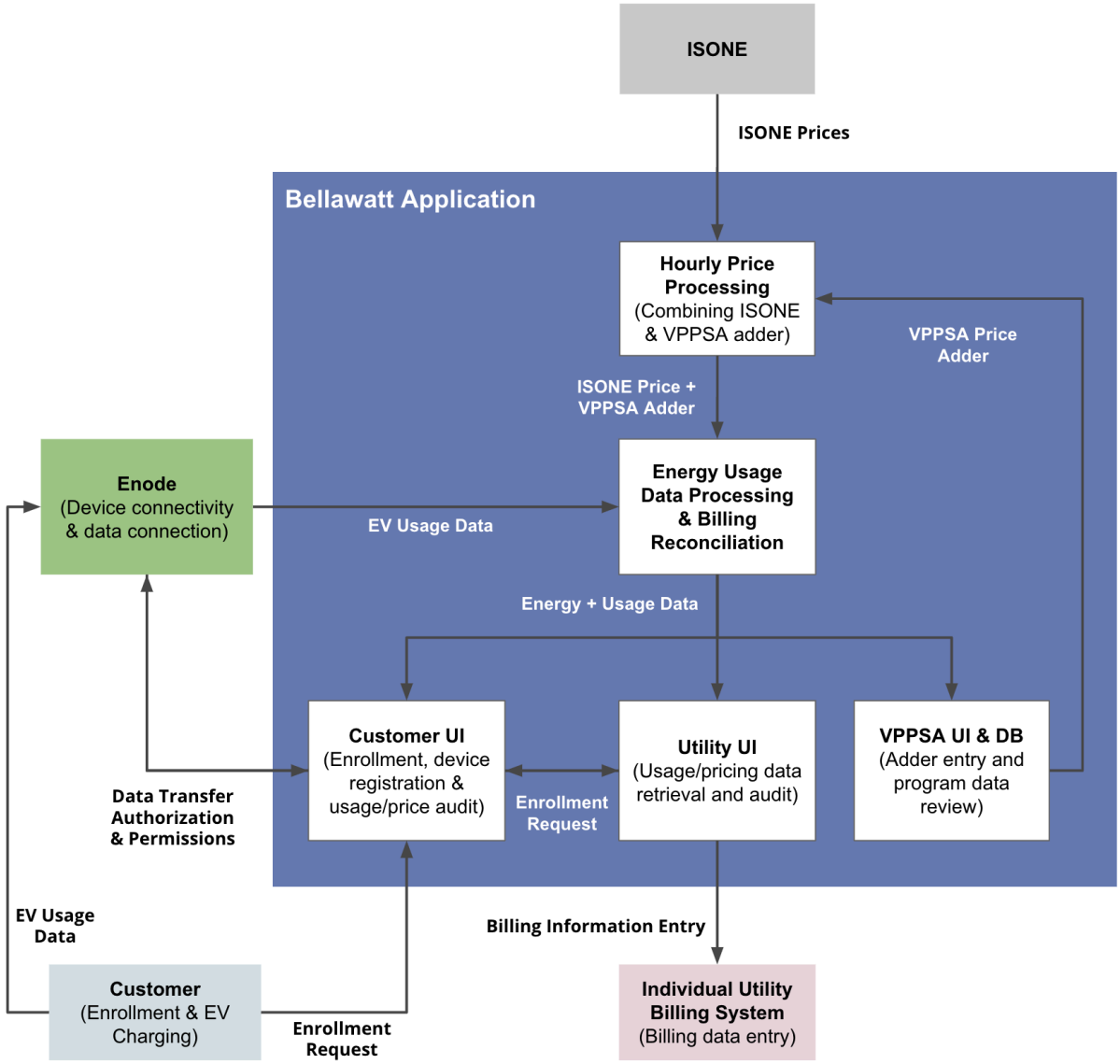
Bellawatt recommends all necessary VPPSA and utility staff are onboarded prior to pilot launch. This includes, but is not limited to tasks like:

- Creating login credentials for admin pages and dashboards
- Setting up necessary user accounts
- Testing key functionalities (registration confirmation, data retrieval, etc.)

Additionally, we recommend a “train the trainer” approach to ramping up utility staff, prior to pilot launch. This would include Bellawatt creating necessary training material for utility staff (standard operating procedures, slide show presentations, etc.) and training VPPSA staff as if they were utility stakeholders. We recommend VPPSA staff then train all key utility stakeholders on the EV/EVSE Tariff Rider processes. After VPPSA conducts the training, Bellawatt can answer any questions raised by the utilities to ensure thorough understanding of the program processes and requirements.

4.3 System Diagram of Proposed Solution

Below is a system diagram of Bellawatt’s proposed EV/EVSE Tariff Rider pilot solution. It outlines components within the Bellawatt application, and outlines data flows between different components of the program.



4.3.1 Automated vs. Manual Processes

Bellawatt recommends the following manual processes for the EV/EVSE Tariff Rider standard operating procedures:

- VPPSA setting ISO-NE price adders
- Customer enrollment for the EV/EVSE Tariff Rider
- Utility confirmation of customer enrollment requests
- Customer registering eligible devices for the EV/EVSE Tariff Rider program
- Customer participation in the EV/EVSE Tariff Rider program (customer manually controlling the charging of their EVs, no automated charging or managed charging features)
- Utility staff entering usage/billing data into the utility billing system

- There may be opportunities for the Bellawatt application to send CSV files to select billing systems; Bellawatt recommends investigating this early in Phase 2

Bellawatt recommends the following automated processes for the EV/EVSE Tariff Rider program:

- Notifications to the utility of customer enrollment requests
- Billing reconciliation - calculating customer bill credits using the utility's default tail block rate and appropriate tariff rider pricing

These recommendations stem from Bellawatt's understanding of VPPSA and member utility's current state systems and operations, and timelines for billing system and hardware enhancements.

Bellawatt recognizes the operational challenges associated with current NEM processes, including manual meter reads, utilizing multiple spreadsheets, and applying different rule sets depending on specific customer data points. To mitigate similar challenges with the EV/EVSE Tariff Rider program, Bellawatt recommends automating the billing reconciliation process to remove manual calculation requirements[17].

4.4 Customer Outreach & Engagement

Below is an editable, VPPSA branded presentation that illustrates the end-customer's experience to enroll/participate in the EV.EVSE Tariff Rider program. It outlines the device registration process, which leverages the pre-defined Enode data/privacy/authentication process.

VPPSA can edit this document, and utilize it for customer outreach and engagement, sharing with the regulators, utility staff, aggregators, and end-customers.

VPPSA - EV/EVSE Tariff Rider Enrollment

4.5 Proposed Implementation Plan

We outline key components of our recommended EV/EVSE Tariff Rider Pilot implementation based on our stakeholder interviews, market research, and risk assessment, below.

[17] Direct integrations with utility billing systems will be challenging, considering the program's external timelines, existing system functionalities, and potential costs associated with engaging the software vendors.

4.5.1 Timeline & Major Milestones

Bellawatt recommends leveraging our 3Phase[18] approach to design, development, and delivery of the proposed EV/EVSE Tariff Rider pilot, augmented with a pre-design kickoff and post-delivery commissioning and support phase. We outline timelines and major milestones below.

4.5.1.1 Kick-off & Check-Ins

Bellawatt recommends a kickoff meeting with VPPSA stakeholders to start Phase 2 to align on key milestones, goals, timelines, and deliverables. Additionally, keeping with the initial EV/EVSE Tariff Rider SOW, we recommend regular weekly check-ins to report on progress, blockers/issues, and overall project status.

4.5.1.2 Design

The design phase will focus on defining and designing all key pilot components, based on the Implementation Plan. Timely VPPSA feedback will be key in ensuring success of this phase, and allow Bellawatt to create necessary program and technical documentation. The output will be detailed designs to kickstart and guide development of the EV/EVSE Tariff Rider pilot platform.

Duration	Approximately 4 weeks, beginning after kickoff.
Scope Items & Descriptions	*Customer Outreach & Registration* • Bellawatt and VPPSA to define and align on pilot parameters (duration, number of customers, customer identification). • Bellawatt to design customer enrollment and device registration processes, leveraging Enode functionalities. *Program Billing Components* • Bellawatt and VPPSA to align on billing reconciliation processes, ISO-NE API integrations, define prie adders. *Program Page Designs* • Design of VPPSA and utility admin pages and associated processes. • Design of customer facing pages and associated processes. *Training Processes and Documentation* • Design and creation of VPPSA/utility program training documentation.

[18] https://www.bellawatt.com/delivery

Bellawatt Responsibilities	• Definition and design of all major product and program requirements and components. • Output of phase will be a program and technical requirements document for Bellawatt engineers, and training material for VPPSA and utilities.
VPPSA Responsibilities	• Timely feedback on program parameters and requirements. • Utility stakeholder management; includes presenting designs, obtaining timely utility stakeholder design feedback (if necessary), and preliminary change management.
Cost Drivers & Potential Timeline Risks	• Extended feedback cycles resulting in schedule delays or rework.

4.5.1.3 Development

Development will focus on developing all key pilot components, based on design documentation. Ideally, there will be minimal revisions or updates to designs and documentation during this phase to allow for streamlined delivery; however in the event of technical challenges or roadblocks, it is crucial VPPSA and Bellawatt communicate efficiently and align on solutions and paths forward to maintain development velocity.

The output of development will be a staging environment with all key processes and functionalities internally tested by Bellawatt, ready for VPPSA User Acceptance Testing (UAT).

Duration	Approximately 10 weeks, beginning after design, with potential for parallel work during the design phase.
Scope Items & Descriptions	*Development of program components (web pages, technical processes and integrations)* • Customer registration forms with utility integrations. • ISO-NE integrations and data storage. • Enode integrations for device registration and usage data retrieval. • Customer, utility, VPPSA dashboards with all associated processes, databases, and auxiliary web pages. • Billing reconciliation processes and calculations.
Bellawatt Responsibilities	• Develop all key EV/EVSE Tariff Rider pilot components, aligned with design phase outputs.

	• Output of phase will be a pilot staging environment ready for VPPSA testing.
VPPSA Responsibilities	• Timely feedback and alignment on potential changes in program parameters and planning.
Cost Drivers & Potential Timeline Risks	• Unforeseen technical considerations and challenges potentially arising from early development.

4.5.1.4 Delivery

Delivery will focus on training VPPSA staff UAT, utility training and feedback, and overall pilot launch and support. During delivery, Bellawatt will request VPPSA to conduct user acceptance testing on all key functionalities and provide timely feedback on potential updates or enhancements. Bellawatt will also train necessary VPPSA staff, as if VPPSA were the end utility stakeholder/operator, enabling VPPSA to train the necessary utility stakeholders prior to pilot launch.

The output of delivery will be a pilot program, ideally with VPPSA customers enrolled and receiving the appropriate compensation for their participation.

Duration	Approximately 4 weeks, beginning after design, with potential for parallel work during the development phase.
Scope Items & Descriptions	*Program Training and Q&A* • Bellawatt training VPPSA staff (to prepare VPPSA staff to train utility stakeholders) on program functionalities and required procedures. • Bellawatt responding to questions raised by VPPSA and member utilities from training sessions. *VPPSA User Acceptance Testing (UAT)* • VPPSA performing UAT and providing feedback to Bellawatt, Bellawatt actioning feedback prior to pilot launch. *Pilot Launch* • Launch of EV/EVSE Tariff Rider Pilot program into production; setting up all necessary user accounts, ensuring open VPPSA/utility questions are addressed. *Post Launch Support*

	• Addressing utility/VPPSA questions post production launch, potentially assisting in initial customer registrations, launching fast follows, patches, bug fixes.
Bellawatt Responsibilities	• Ensure VPPSA staff are equipped to train utility stakeholders on program processes and requirements. • Action training session and UAT feedback in a timely manner. • Provide post launch support to VPPSA, utilities, and potentially customers, action feedback in a timely manner. • Output of phase will be a launched and stable EV/EVSE Tariff Rider pilot, with VPPSA customers enrolled, receiving appropriate bill credits for their participation.
VPPSA Responsibilities	• Conduct utility training and UAT, and provide feedback to Bellawatt in a timely manner. • Provide post launch feedback to Bellawatt in a timely manner.
Cost Drivers & Potential Timeline Risks	• Unforeseen technical considerations and challenges potentially arising from launch.

4.5.2 Staffing Requirements

In order to design, develop, and deliver the proposed EV/EVSE Tariff Rider pilot within the 18 week timeframe proposed, we need the following Bellawatt staff on the project:[19]

- Day-to-Day Team:
    - Product Manager - Key point of contact for VPPSA, and product owner, decision maker, and project manager for the rest of the day-to-day team.
    - Designer - For the duration of the Design phase to provide feature ideation, user interface design, user experience design, and visual design.
    - Full Stack Developer - Ramped to full capacity at Development phase kickoff. May optionally consist of a Front End and a Back End engineer splitting their time collaboratively on respective parts of the product engineering.
- Management Oversight for the duration of the engagement:
    - Chief Product Officer - Ensuring quality of Product team output and coordinating with CTO for engineering team efforts.
    - Chief Technology Officer - Ensuring quality of Engineering team output and coordinating with CPO for product team efforts.

[19] Resource estimates reflect ideal conditions; however, Bellawatt will make adjustments in project scope as needed to meet VPPSA's specific budgetary and timeline constraints.

4.5.3 Assumptions

The following section outlines the key assumptions that form the foundation of the program requirements and the successful implementation of the EV/EVSE Tariff Rider Pilot. These assumptions provide a framework for collaboration between Bellawatt and VPPSA to help guide decision making and approval processes. They cover various aspects, including technical support, vendor selection, stakeholder involvement, risk assessment, testing and security considerations. By acknowledging and addressing these assumptions, we can ensure a seamless delivery in Phase 2.

- This Implementation Plan outlines Bellawatt's recommendation for initial design, development, and deployment of the EV/EVSE Tariff Rider Pilot program, and near term support.
- VPPSA personnel will be available to provide feedback and make key product decisions based on Bellawatt's assessment and recommendations in a timely manner.
- VPPSA will conduct all pilot customer identification and outreach for initial pilot participants.
- VPPSA personnel will be the signing authority on all product/program webpage, user interface, and process designs; VPPSA will take the necessary steps to communicate upcoming required operational changes to utility stakeholders to ensure their alignment and acceptance.
- Bellawatt's preferred notification/email platform will be used to send day ahead prices to customers.
- Bellawatt and VPPSA will follow a "train-the-trainer" approach to training and onboarding utilities to the EV/EVSE Tariff Rider pilot program; Bellawatt will train VPPSA staff on program functionality and process, and VPPSA will train the member utility stakeholders.
- VPPSA will ensure completion of User Acceptance Testing (UAT) and provide timely production readiness feedback.
- The EV/EVSE Tariff Rider pilot/platform does not utilize openADR or any of the following technical components: virtual end nodes (VENs), virtual terminal nodes (VTNs) or any associated integrations/communication pathways.
- VPPSA will be responsible for legal considerations and contracting between VPPSA and the utilities and customers; Bellawatt will be available during the design, development, and delivery phase to address clarifying questions on technical program functionalities and requirements.

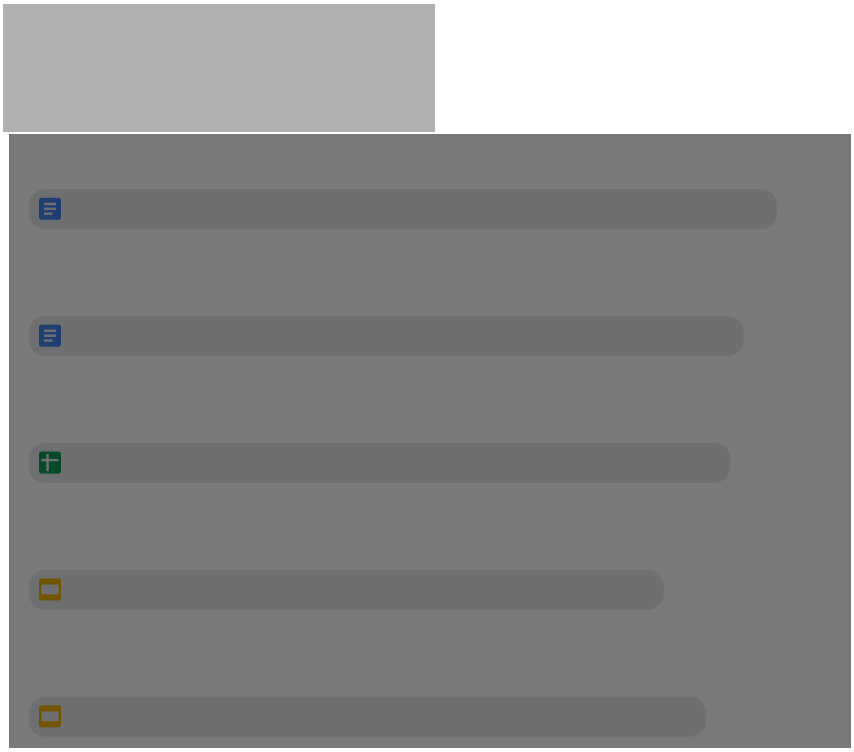
4.5.5 Post-Pilot Recommendations

Once the pilot is completed, Bellawatt recommends the following be done to inform future decisions and actions:

- Perform a comprehensive evaluation of the pilot's outcomes against its goals; assess both quantitative data (number of devices enrolled, number of customers expressing interest, energy consumption, monetary value delivered), and qualitative feedback (utility sentiments to new process implemented, customer satisfaction, public utility commission feedback) to understand the pilot's success areas and opportunities for improvement.
- Report findings and insights; create a detailed report summarizing the findings from the pilot, including both success and challenges. Highlight key statistics (number of EVs registered, energy consumed, bill credits applied), technical issues encountered, resolutions, and future opportunities. This report can serve as a foundational document for decision making regarding the program's future.
- Develop a scaling strategy; If the pilot is deemed successful and a decision is made to proceed, develop a detailed strategy for scaling the program. This can include

enlisting support from the pilot implementor, external vendors, utility stakeholders, and should include considerations for utility specific hardware and software enhancements. Additionally, expansions into additional distributed energy resources, like solar panels and backup batteries can be considered at this stage.

- Plan for integration and compatibility; similar to scaling, plan post-pilot activities for future VPPSA/utility systems and infrastructure. Plan for any necessary program enhancements or integrations to ensure successful transitions and implementations.
- Consider long-term sustainability; assess the long-term viability and sustainability of the EV/EVSE Tariff Rider program, including financial impacts, utility operational requirements, future compliance and regulatory needs, and public relation implications. Plan for future development, maintenance, and potential market or regulatory changes that can impact the project.



Thank You

Bellawatt extends our sincere thanks to all VPPSA colleagues and partners whose insights and contributions have been invaluable in shaping this report. Your dedication and expertise not only enriched our understanding of your organization, but also drove us towards our shared goals. As we move forward, we remain committed to fostering continued collaboration and innovation, inspired by the collective vision and efforts of everyone involved.

- The Bellawatt Team