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18-09008

Public Utilities Commission of Nevada
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December 03, 2021

Ms. Trisha Osborne
Assistant Commission Secretary
Public Utilities Commission of Nevada
1150 East William Street
Carson City, Nevada 89701-3109

RE: Docket No. 18-09008 Investigation and Rulemaking to examine current regulations governing Nevada's Renewable Portfolio Standard to determine whether providers of electric service should be authorized to utilize alternative solutions, including, but not limited to, blockchain-based solutions to track and certify Nevada portfolio energy credits.

Dear Ms. Osborne:

These Comments are being filed by Nevada Power Company d/b/a NV Energy ("Nevada Power") and Sierra Pacific Power Company d/b/a NV Energy ("Sierra Pacific" and, collectively with Nevada Power, "NV Energy"). NV Energy is providing the Public Utilities Commission of Nevada (the "Commission") an update regarding the Proof of Concept ("POC") pilot project most recently summarized in the letter filed with the Commission by NV Energy, Energy Web Foundation ("EWF"), and Blockchains Inc. ("Blockchains") on November 10, 2020. NV Energy collaborated with EWF and Blockchains on the POC.

Executive Summary

The goal of the POC pilot project was to explore the feasibility and evaluate the benefits of a blockchain-enabled solution for the full Portfolio Energy Credits ("PECs") lifecycle, including system registration, data collection directly from smart meters, PECs certification, direct PECs trading, and PECs retirement. The overall concept was to use smart contracts or a computer program or transaction protocol to automate significant portions of the process and create a full audit trail of the entire lifecycle of PECs on an immutable, tamper-free distributed ledger.

NV Energy, EWF, and Blockchains (the "POC Collaborators") collaborated regularly to lay the groundwork for creating greater participation in achieving Nevada's renewable goals by developing a POC that accepted the challenge and opportunity of innovating a new PEC management tool in Docket No. 18-09008.

As a part of this POC, Blockchains designed and built a prototype application comprised of a cellphone application and web portal which would allow the owners of small renewable generation systems to register their PECs, and the Commission to manage these PECs.

The POC achieved the objective of on boarding the users and registering the post-processed generation data provided by NV Energy[1] on a test chain. However, due to resource and cost restrictions, it was not able to achieve collection of meter generation data for the purpose of certification and validation on a public blockchain. In addition, the total cost of implementation

[1] Raw generation meter data was adjusted by the industry-standard validation, estimation and editing ("VEE") process by NV Energy systems.

and operation of a full blockchain-enabled solution relies on factors outside of the scope of the existing POC.

Additional resources would be required for additional study to provide a full picture and detailed insights, including cost comparison among the POC concept, other blockchain-enabled technology solutions, and alternative traditional options, such as traditional centralized database systems. However, based on the experience developing the POC, NV Energy does not view the POC as a viable option, and the POC Collaborators do not intend to pursue any further analysis beyond the conclusion of the POC. NV Energy does not recommend that additional resources or time be dedicated to the POC.

POC Architecture, Achievements and Shortcomings

For the purpose of this POC, the post-processed data from NV Energy's back office for five current customers with generation meters were anonymized and provided to Blockchains for utilization in their prototype application. The prototype application was comprised of a cellphone application (iOS based) which would enable the owners of small renewable generation systems to register with the Commission, certify the energy generated, and have the ability to market and sell the resulting PECs. Furthermore, a web application portal was developed for the Commission which would manage small scale generation tracking for the customers who registered through the cellphone application. Please refer to **Attachment A** for further description of the prototype and technical infrastructure. The POC achieved the following objectives:

- User onboarding: registration of non-commercial Renewable Energy Implementations;
- Certification of issuance of PECs based on renewable energy output;
- Tracking the balance of PECs and activity of the account;
- Web portal development enabling a PEC issuer to manage and approve users of small-scale generation devices;
- Test net validation of meter data for renewable generation and subsequent issuance of PECs; and
- Enable users with interface to track, claim, trade, and retire PECs on the blockchain.

Not every objective that was initially identified as a part of the POC was achievable. During the development of the POC, the POC Collaborators determined that the following objectives would require substantially more time and resources than were allocated for the POC, and they were therefore not achieved:

- Perform an Exchange (i.e., Sale, Transfer, Retirement) of PECs. Successfully executing a transaction requires enterprise software that would require significant custom development. The POC Collaborators agreed that the cost and administrative burden of the approval process to test with NV Energy customers outweighed the benefit. EWF, however, has demonstrated the technological feasibility of PECs exchange using the platform, EW Origin, and the fungible Energy Web Token.[2]

- Enable small-scale devices to be connected to the blockchain and directly communicate with a decentralized application. This includes collection of meter generation data by installing the blockchain minimal verification client, Incubed, to validate data directly verified on the public blockchain, Energy Web Chain. Due to cost considerations, the

[2] For further information, please refer to EWF whitepaper at: https://energyweb.org/wp-content/uploads/2019/05/EWF-Paper-TheEnergyWebChain-v2-201907-FINAL.pdf

implementation of an Incubed device was not demonstrated and data was instead collected through NV Energy's utility back office.

Engineers from Blockchains and Sensus, the smart meter manufacturer, dedicated significant efforts to install the Incubed device as a minimum verification tool, yet software incompatibility required more commitment than anticipated. As a result, all parties agreed to the next best alternative of collecting post-processed data provided by NV Energy.

- Demonstrate the advantages of a digitized, automated process that leverages blockchain as compared to the status quo. Although the POC Collaborators initially provided documentation of potential ways to achieve a streamlined solution incorporating these features, implementation of the POC itself could not accomplish this objective. Any such digital transformation initiative is unlikely to prove more cost-efficient than a centralized solution. The cost to adjust the operations of NV Energy and complete a systematic process overhaul may only prove efficient over time and as a result of active user participation to scale.

Outcomes

The POC Collaborators were able to develop a prototype application that would allow the participants to register and utilize the trustless blockchain technology for measuring, managing, and tracking PECs based on the post-processed energy production data. PECs issued through the app were recorded on the test chain and issuance did not require manual input by end users or administrators. This would allow buyers to access generators directly in a simplified and distributed way, with a full set of security and trust on both sides so that there is no double-counting, with full transparency of data.

The POC was not able to determine the total cost of implementation. The total cost of implementation and operation of a full blockchain-enabled solution relies on factors outside of the scope of the existing POC. The level of operating expenses depends on the transaction cost, which is also referred to as the gas fee. The POC was able to determine the gas fee in EW Chain's native token, but due to volatility of the cryptocurrency market, it is hard to forecast the cost in dollars. The scale of the POC was also not reflective of the true costs for establishing the software development and maintenance costs for a full blockchain-enabled solution, including the Incubed device.

Conclusion

The POC successfully achieved several objectives, including demonstrating that post-processed energy production data can be written to a blockchain. Nevertheless, several key objectives were not realized, including the research and development of a blockchain-enabled smart meter because of the resources that would be required to do so. In fact, NV Energy does not believe developing an Incubed device is a cost-effective option at this time. Significant additional resources would be needed to allow for additional study to provide a full picture and detailed insights. This includes cost comparison among the POC concept and other blockchain-enabled technology solutions. Alternative traditional options, such as traditional centralized database systems needs to be considered as well. However, based on the experience developing the POC, NV Energy does not view the POC as a viable option for registering, tracking and retiring PECs, and the POC

Collaborators do not intend to pursue any further analysis beyond the conclusion of the POC. NV Energy does not recommend that additional resources or time be dedicated to the POC.

Should you have any questions regarding this filing, please contact me at 775-834-5793 or Michael.knox@nvenergy.com.

Sincerely,

/s/ Michael Knox
Michael Knox
Senior Attorney

Attachment A

DESCRIPTION OF THE PROTOTYPE AND TECHNICAL INFRASTRUCTURE

Prototype

Figure 1 depicts a prototype of the custom-designed Service Provider portal to demonstrate how PEC issuers can easily manage small scale generation tracking.

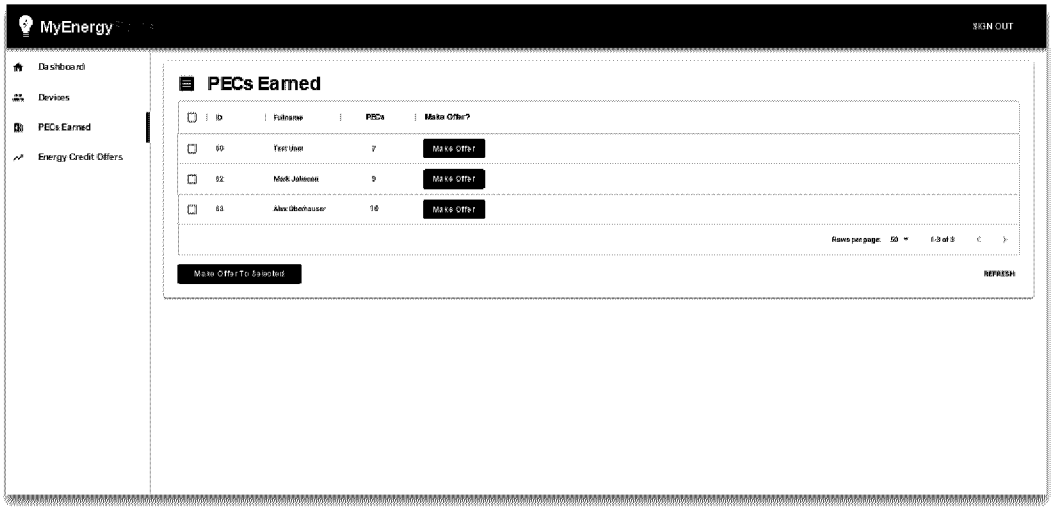

Figure 1: Web portal for PEC issuer

Figure 2 depicts the user interface of the prototype created to enable a PEC generation user in Nevada (e.g., an NV Energy customer) with the ability to register, track generation data, receive the offer to purchase available PECs and exchange PECs. This end user application demo[1] developed as part of the POC was customized for use in Nevada, as it exists for the sole purpose of communicating the potential of blockchain through the POC.

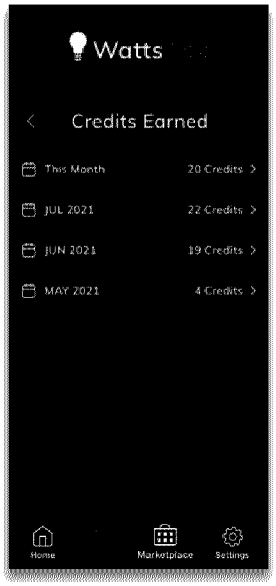

Figure 2: User Interface App [Wireframe]

[1] Available at: https://xd.adobe.com/view/05d3f4e5-a76a-4c90-b7a9-d16c32676032-5080

Technical Infrastructure

The completion of the POC required custom implementation and complex integration. In summary, Blockchains delivered the following key elements to enabling the onboarding of users and the exchange of PECs on blockchain through a test net in Nevada:

- Identity Management, Data Management, 1:1 Marketplace using Equs IDBridge v2.x Connectivity, a Software as a Service platform from Blockchains;
- Mobile POC iOS application connectivity; links user to the Equs ecosystem and stores PECs (as issued by EWF) in a blockchain-enabled wallet;
- Different Blockchain nodes run under Blockchains Inc.; based Quorum + Raft node for Data Management with privacy; EWF's Origin sandbox used to issue PEC and manage through Wallet;
- Web Apps for customer onboarding, Admin [Service Provider/PEC issuer], Admin User Interface ("UI"), and Marketplace Admin UI:

  Customer Onboarding: A mock/mimic web UI where customers sign up for PEC program onboarding.

  Admin UI: Allows a select Commission admin to approve customers with their meter information when they sign up through mobile app.

  Marketplace Admin UI: Allows a select Commission admin to request PECs from customers and incentivize them through this marketplace (only a provider can send requests to a customer, no broadcasting).

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing filing of **NEVADA POWER COMPANY D/B/A NV ENERGY AND SIERRA PACIFIC POWER COMPANY D/B/A/ NV ENERGY** in Docket No. 18-09008 upon the persons listed below by electronic mail:

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DATED this 3rd day of December, 2021.

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Nevada Power Company
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and Sierra Pacific Power Company
d/b/a NV Energy