Staff Summary

Innovative Crude Oil Production Method Application

Chevron U.S.A. Inc (Chevron) and Solar Star Lost Hills, LLC (Solar Star)

Cahn Solar Plant

Lost Hills Oil Field

Kern County, California

Date of Application: 03/27/2020, Date Posted for Public Comment: 05/20/2020

Date Approved: 06/05/2020

Project Summary

Under the Low Carbon Fuel Standard (LCFS), a crude oil producer may generate credits for oil that has been produced using innovative methods and delivered to California refineries for processing. Pursuant to section 94589(c)(2) of the LCFS regulation, Chevron U.S.A. Inc (Chevron) and Solar Star Lost Hills LLC (Solar Star) have submitted an application as joint applicants for a proposed solar electricity project at the Lost Hills Oil Field in Kern County (Solar Plant). The Project is estimated to generate approximately 38,700 MWh of solar electricity per year to displace power currently provided by Pacific Gas & Electric (PG&E). An additional 5,300 MWh of solar energy per year will be stored in batteries and dispatched later in the day when solar electricity output is less than oil field demand.

Photovoltaic Power Generation

The Solar Plant consists of several arrays of photovoltaic (PV) panels, inverters and a substation with transformers to step up power voltage to 70kV for export to Chevron. The project incorporates a single-axis tracking system to optimize power production. The Solar Plant is designed to produce a maximum of 29MWAC (megawatts of alternating current) with an estimated initial annual production of approximately 75,000 megawatt-hours (MWh). Output of the PV panels is expected to degrade by approximately 0.5% per year.

The design is also planned to incorporate lithium ion batteries that will be DC-coupled with the solar inverters. The battery modules will store energy generated by the solar arrays during peak solar output, reducing the excess power exported to the grid, and will dispatch it later when solar output is lower for consumption by the oil field. The battery storage component will have 20 MWh of capacity and is expected to be

constructed and online during the fourth quarter of 2020. Battery capacity is expected to degrade by approximately 2.5% per year.

The Solar Plant will be owned and operated by Solar Star, and Chevron will purchase all of the solar electricity output under a power purchase agreement. The solar electricity will be used to power oil production and fluid handling facilities in the Lost Hills oil field with a de minimis amount consumed in the oil field control room and field office. Solar energy generated in excess of Chevron's real-time demand will be exported to PG&E from the Solar Plant according to California's Net Energy Metering 2.0 program. A bi-directional meter will measure export of excess solar energy to the PG&E grid and imports of grid electricity used by Chevron when solar energy production is not adequate to meet Chevron's demand.

Estimate of Innovative Method Credits

The solar project will generate LCFS credits arising from reduction of greenhouse gas emissions resulting from the generation and use of solar electrical power onsite for crude oil production. Estimated emissions reduction from solar electricity directly supplied to the oilfield is 19,800 metric tons CO_2e per year, which exceeds regulatory threshold level of 5,000 metric tons CO2e per year. Therefore, this project meets the eligibility criteria for the LCFS innovative crude oil production method provision. The battery storage component is estimated to reduce an additional 2,700 metric tons CO_2e per year when battery storage capability is fully functional. Excess solar electricity exported to the PG&E grid is not eligible for LCFS credits.

Materials Provided by the Applicants

The applicants, Chevron and Solar Star, have provided all the required application documentation, including a description of the innovative method, engineering drawings that illustrate the innovative method and clearly identify system boundaries and relevant process equipment, and a map including global positioning system coordinates for the facilities. The applicants have also shown that the project will meet the minimum threshold requirement for innovative method, and attest to the accuracy of the information submitted in the application to represent the intended long term, steady-state operation of the solar electricity project. The applicants have designated confidential business information in the application, and provided a redacted version for public posting.

Reporting and Verification Requirements for Credit Issuance

Credit issuance based on 2020 data and thereafter requires third-party verification pursuant to section 95500(e). The method for calculating the net GHG reductions and credits described in this document requires ongoing monitoring and recordkeeping for the solar electricity project.

The applicants must report quarterly (through a Project Report) and maintain records for at least ten years showing the following:

1. The volume (barrels) of crude oil produced or transported using the approved innovative method and the crude name(s) under which it is marketed
2. If the crude oil produced or transported with an approved innovative method is marketed as part of a crude blend that is not wholly refined in California, the

name of the blend and the volume fraction that the crude produced with the innovative method contributes to the blend

3. Documentation showing the innovative crude was supplied to one or more California refinery, total volume (barrels) of innovative crude supplied to California refineries, and the total volume (barrels) of innovative crude exported from California
4. Total electricity consumed at the crude oil production or transport facilities during the quarter (kWh)
5. Metered data on the solar electricity generated and supplied to the oil field by the Solar Plant (direct solar electricity from the PV system and stored battery power) during the quarter (kWh)
6. Metered data on the export of excess solar electricity from the Solar Plant to the PG&E grid during the quarter (kWh), metered by the bi-directional meter located at Chevron's sub-station
7. Metered data on the import of PG&E power during the quarter (kWh), metered by the bi-directional meter located at Chevron's sub-station; and
8. An attestation letter stating that all solar electricity was supplied directly for crude oil production and that the solar electricity reported for generating LCFS credit did not produce renewable energy certificates or other environmental attributes recognized or credited by any other jurisdiction or regulatory program, other than the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800)

Staff Analysis

Staff reviewed the innovative method application and finds that the application meets the requirements of the Innovative Crude Oil Production Methods Credit Program per 95489(c) of the regulation. The application was posted for public comments pursuant to section 95489(c)(3)(B). No comments were submitted during the 10 day public comments period. The application has been approved and the project is eligible for credits for GHG reductions occurring in Q2, 2020 and beyond. The actual amount of credits will be determined and issued after the verification of data and calculations submitted by the applicants. The applicants may elect to receive credits quarterly or annually.