
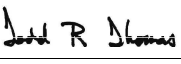



**ANNEX B**  
**INDEPENDENT ENGINEER'S REPORT**

The Independent Engineer Report included as Annex B to this Offering Memorandum has been prepared by Hatch Ltd.

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## Buffalo Energy Mexico Holdings, S.A. de C.V. Valia Bond Offer Technical Due Diligence Report

|              |             |               |   |  |   |                    |
|--------------|-------------|---------------|---|--|---|--------------------|
|              |             |               |  |  |  |                    |
| 1/5/2024     | 3           | For Use       | T. Ghantous   | T. Thomas  | K. Meghari  |                    |
| 11/1/2023    | 2           | For Use       | T. Ghantous   | T. Thomas  | K. Meghari  |                    |
| 10/26/2023   | 1           | For Use       | T. Ghantous   | T. Thomas  | K. Meghari  |                    |
| 9/7/2023     | 0           | For Use       | T. Ghantous   | T. Thomas  | K. Meghari  |                    |
| <b>Date</b>  | <b>Rev.</b> | <b>Status</b> | <b>Prepared By</b>  | <b>Checked By</b>  | <b>Approved By</b>  | <b>Approved By</b> |
| <b>HATCH</b> |             |               |   |  |   | <b>Client</b>      |

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This report was prepared by Hatch Ltd. (“Hatch”) for the benefit of Buffalo Energy Mexico Holdings, S.A. de C.V. (BEMH) (the “Client”) for the purpose of providing our review of the Valia assets in connection with a proposed offering of debt securities (the “Securities”) pursuant to Rule 144A and/or Regulation S, in each case, under the U.S. Securities Act of 1933, as amended (the “Offering”). The Valia assets include the following power generation stations: EVM Energía del Valle de México, S.A.P.I de C.V (“EVM I”) Open Cycle Gas Turbine (OCGT) plant with a capacity of 100 MW and EVM Energía del Valle de México Generador, S.A.P.I de C.V (“EVM II”) Combined Cycle Gas Turbine (CCGT) plant with a capacity of 850 MW, Central Saltillo, S. A. de C.V. (“CSO” or Saltillo) CCGT plant with a capacity of 247.5 MW, Central Anahuac, S. A. de C.V. (“CAC” or Rio Bravo II) CCGT plant with a capacity of 495 MW, Central Lomas de Real, S. A. de C.V. (“CLR” or Rio Bravo III) CCGT plant with a capacity of 495 MW, Central Valle Hermoso, S. A. de C.V. (“CVH” or Rio Bravo IV) CCGT plant with a capacity of 500 MW, Electricidad Aguila de Altamira, S. de R.L de C.V. (“EAA” or Altamira II) CCGT plant with a capacity of 495 MW, and a 57.9 km natural gas pipeline known as Gasoducto Del Rio, the assets combined form the “Portfolio”.

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The report contains the expression of the professional opinions of Hatch, based upon information available at the time of preparation. Hatch has conducted this investigation in accordance with the methodology outlined in its proposal document. It is important to note that the methods of evaluation employed, while aimed at minimizing the risk of unidentified problems, cannot guarantee their absence. Even though the information provided by the Client was reviewed, we were required to rely on this information without being able to independently verify its accuracy. Hatch accepts no responsibility or liability with respect to any unidentified problems or problems or defects associated with Client-provided data.

Based on the Client's Pro Forma (financial model definition), we have included projections of revenues, expenses, and net operating revenue of the Facility and debt service coverage on the Notes, which are attached as Appendix D to the Report (the "Projected Operating Results").

1. For the avoidance of doubt, we have not reviewed the Pro Forma for mathematical accuracy, mechanical integrity, or consistency with the financing agreement or any other financing documents. Other than the Technical Inputs and O&M costs discussed herein, which were identified in the Pro Forma for us by the Client, we have not reviewed the methodology and assumptions used by the Client in the Pro Forma. Hatch is not responsible for the accuracy or integrity of any such Client provided information or model.

2. The Projected Operating Results incorporate projections of the Mexican electricity market prices, natural gas prices, emissions costs, and the Facility's dispatch factor prepared by [AFRY Management Consulting (USA) Inc. ("AFRY") and presented in its Independent Energy Market Expert Report \ (the "Market Consultant Report"). We have not reviewed AFRY's methodology and approach in its development of these projections but instead have assumed this use to be reasonable based upon their previous experience in developing similar projections. Hatch is not responsible for errors or omissions associated with Projected Operating Results attributable in whole or part to the Market Consultant Report.]

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## ***List of Appendices***

### **Appendix A**

Summary of Major Events Impacting Availability

### **Appendix B**

Client Model Inputs

### **Appendix C**

Client Capital Budget Forecast

### **Appendix D**

Client Projected Operating Results

## Acronyms

|      |                                    |
|------|------------------------------------|
| BEMH | Buffalo Energy Mexico Holdings     |
| CCGT | Combined Cycle Gas Turbine         |
| CSA  | Contractual Service Agreement      |
| EAF  | Equivalent Availability Factor     |
| EFOR | Equivalent Forced Outage Rate      |
| EUOF | Equivalent Unplanned Outage Factor |
| FSA  | Fuel Supply Agreement              |
| GE   | General Electric                   |
| GT   | Gas Turbine                        |
| HHV  | Higher Heating Value               |
| HRSG | Heat Recovery Steam Generator      |
| LTSA | Long Term Service Agreement        |
| MDH  | Management Data Highway            |
| MPA  | Mitsubishi Power Americas          |
| OCGT | Open Cycle Gas Turbine             |
| PDH  | Plant Data Highway                 |
| PPA  | Power Purchase Agreement           |
| PSM  | Power Systems Manufacturing        |
| UDH  | Unit Data Highway                  |

## **1. Executive Summary**

Hatch was engaged by Buffalo Energy Mexico Holdings, S.A. de C.V. (BEMH) to conduct a technical due diligence review of the Valia assets located in Mexico. These assets include the EVM I Open Cycle Gas Turbines (OCGT), the EVM II Combined Cycle Gas Turbine (CCGT) plant, previously known as the EVM assets; and the Saltillo CCGT plant, the Rio Bravo II, II and IV CCGT plants, the Altamira II CCGT plant, and a 57.9 km natural gas pipeline, previously known as the Falcon assets. Combined, all the assets are known as the "Portfolio." These assets are summarized in Table 1-1.

Table 1-1: Summary of Stations/Plants

|                                  | EVM I                     | EVM II                    | Saltillo                   | Rio Bravo II                                       | Rio Bravo III                                      | Rio Bravo IV                                       | Altamira II                    | Gasoducto Del Rio            |
|----------------------------------|---------------------------|---------------------------|----------------------------|--|--|--|--------------------------------|------------------------------|
| <b>Location</b>                  | Axapusco, State of México | Axapusco, State of México | Ramos Arizpe, Coahuila     | Valle Hermoso, Tamaulipas                          | Valle Hermoso, Tamaulipas                          | Valle Hermoso, Tamaulipas                          | Altamira, Tamaulipas           | Tamaulipas                   |
| <b>Contracted Capacity</b>       | 94 MW                     | 750 + 90 MW               | 247.5 MW                   | 495 MW   | 495 MW   | 500 MW   | 495 MW                         | 410,000 MMBTU/d              |
| <b>Technical Capacity</b>        | 100 MW                    | 850 MW                    | 275 MW                     | 540 MW   | 560 MW   | 547 MW   | 539 MW                         | -                            |
| <b>Configuration</b>             | Simple Cycle              | 2x1 Combined Cycle        | 1x1 Combined Cycle         | 2x1 Combined Cycle                                 | 2x1 Combined Cycle                                 | 2x1 Combined Cycle                                 | 2x1 Combined Cycle             | 57.9 km natural gas pipeline |
| <b>Gas Turbine Technology</b>    | GE LM6000PF               | GE 7HA.02                 | Siemens W501FD2            | Siemens W501FD2                                    | Siemens W501FD2                                    | Siemens W501FD2                                    | Mitsubishi M501F3              | -                            |
| <b>Fuel</b>                      | Natural Gas               | Natural Gas               | Natural Gas and Diesel     | Natural Gas and Diesel                             | Natural Gas  | Natural Gas  | Natural Gas and Diesel         | -                            |
| <b>LTSA Contractor</b>           | GE                        | GE                        | PSM                        | Mitsubishi Power Americas, Inc                     | Mitsubishi Power Americas, Inc                     | Mitsubishi Power Americas, Inc                     | Mitsubishi Power Americas, Inc | -                            |
| <b>HRSG</b>                      | -                         | Horizontal GE             | Horizontal Nooter/ Eriksen | Vertical Cockerill Mechanical Industries           | Vertical Cockerill Mechanical Industries           | Vertical Cockerill Mechanical Industries           | Horizontal CERREY              | -                            |
| <b>Steam Turbine</b>             | -                         | GE                        | Alstom                     | Alstom   | Alstom   | Alstom   | Mitsubishi                     | -                            |
| <b>Cooling System</b>            | -                         | Air Cooled Condenser      | Air Cooled Condenser       | Air Cooled Condenser with supplemental wet cooling | Air Cooled Condenser with supplemental wet cooling | Air Cooled Condenser with supplemental wet cooling | Wet Cooling Tower              | -                            |
| <b>Commercial Operation Date</b> | January 1, 2017           | January 1, 2021           | November 18, 2001          | January 18, 2002                                   | April 1, 2004                                      | April 1, 2005                                      | May 1, 2002                    | August 1, 2003               |

## 1.1 Method

Hatch conducted a review of the Portfolio based on the virtual data room set-up by the Client and discussions during the management presentation on February 17, 2021, for the former Falcon assets. In addition, Hatch conducted a site visit to the associated power plants on March 9-11<sup>th</sup>, 2021. A site visit for the former EVM assets was conducted on September 20<sup>th</sup>, 2022, for a high level walkdown of the sites and interview key personnel at each plant and attendance of the management presentation. Hatch has prepared this report based on the findings of the initial due diligences and updated information from the Client for the period of operation since the initial due diligences.

## 1.2 Portfolio Operations

The Portfolio sells capacity and net energy output to the Comisión Federal de Electricidad ("CFE") through Power Purchase Agreements. The Portfolio is dispatched by Centro Nacional de Control de Energía ("CENACE"), the entity responsible for managing Mexico's electrical grid and dispatch regime. The PPAs are tolling arrangements where the Client is paid for being available and gas costs are passed through based on guaranteed heat rates. The heat rate and capacity guarantee for the former Falcon assets are calculated using a Math Model for each of the plants that applies correction factor to account for various ambient conditions and operation at partial loads. EVM I is a peaking power station and EVM II is a combined cycle power station, both utilize capacity and energy payments with heat rate and availability requirements, under PPAs with a CFE subsidiary company ("CFE Calificados"). The expected pass-through performance of the assets has been included in the Client Inputs.

## 1.3 O&M Practices

Based on Hatch's review of the Portfolio we consider the useful life of the power plants to be 40 years of service from the original commercial operation date to be reasonable provided that the plants are operated and maintained in accordance with the OEM recommended practice and prudent industry practice. Currently all generating assets are being maintained by the OEM or a third-party service company that is providing gas turbine parts and services with associated guarantees for performance both thermal and run duration. Critical lifetime extension CAPEX is required for the Portfolio and amounts have been budgeted within the Financial Model.

The facilities are being operated by Valia's operating company COMEGO or NAES. COMEGO and NAES are utilizing industry standard practices with programs that are well developed and documented.

## 1.4 Plant Performance

High level plant operating data provided for the Portfolio is included in Table 1-2. This data is a summary of the data provided in the monthly reports by the Client.



**Table 1-2: Summary of Key Performance Indicators based on the Average from Monthly Operations Reports**

| Plant         | Period                   | Availability (%) | Heat Rate (kJ/kWh) | Unscheduled Outage Rate (%) |
|---------------|--------------------------|------------------|--------------------|-----------------------------|
| EVM I         | January 2020 – Nov. 2023 | 98.8             | 9,759              | 1.09                        |
| EVM II        | January 2021 – Nov. 2023 | 93.1             | 6,749              | 3.09                        |
| Saltillo      | January 2020 – Nov. 2023 | 89.1             | 7,325              | 7.53                        |
| Rio Bravo II  | January 2020 – Nov. 2023 | 88.4             | 7,403              | 8.27                        |
| Rio Bravo III | January 2020 – Nov. 2023 | 94.7             | 7,110              | 2.07                        |
| Rio Bravo IV  | January 2020 – Nov. 2023 | 89.7             | 7,092              | 5.88                        |
| Altamira II   | January 2020 – Nov. 2023 | 91.0             | 6,928              | 5.48                        |

Both EVM I and EVM II are operating above the performance metrics required to meet the requirements of the PPA.

For the former Falcon plants, the higher heat rate performance relative to their contractual guarantees has resulted in less than 100% pass-through of fuels costs under the PPAs from time to time for the Portfolio. Duct burning is regularly used during the summer months to meet the Contract Capacity requirements and has penalized the heat rates in the Portfolio. It is noted that the average heat rate performance for each plant is better than the associated PPA target. The Client has taken steps to improve their capacity and heat rate performance through the installation of upgrades such as combustion turbine parts and firing temperature and supplemental combustion air upgrades for the gas turbine that have been implemented in the Portfolio. The gas turbine upgrades also allow for extended maintenance interval to 32,000 hours from the 25,000 hours which will help improve the availability of the former Falcon Portfolio.

## 1.5 Conclusion

The portfolio of plants is operating within expectations outside of a few key equipment issues. The Client has experienced a few major equipment availability issues on the gas turbine generator sets that are latent design issues and out of their control. The Client has worked closely with the equipment suppliers to determine the root causes of the issues and has driven them to closure through outage opportunities and spare equipment strategies. With these issues either addressed or scheduled to be addressed at the next opportunity the portfolio should perform at modeled levels.

## 2. Introduction

Hatch was engaged by Buffalo Energy Mexico Holdings, S.A. de C.V. (BEMH) to conduct a technical due diligence review of the assets of Valia, which includes six combined cycle power plants, one open cycle power plant and a pipeline asset (collectively “the Portfolio”). A summary of the Portfolio is shown in Table 2-1.

**Table 2-1: Summary Valia power plants**

| Project           | Commercial Capacity (MW) | Fuel      | Technology | Commercial Operation Date     | Location                  |
|-------------------|--------------------------|-----------|------------|-------------------------------|---------------------------|
| EVM I             | 100 MW                   | NG        | OCGT       | January 1 <sup>c</sup> 2017   | Axapusco, State of México |
| EVM II            | 850 MW                   | NG        | CCGT       | January 1 <sup>c</sup> 2021   | Axapusco, State of México |
| Saltillo          | 247.5 MW                 | NG/Diesel | CCGT       | November 18 <sup>c</sup> 2001 | Ramos Arizpe, Coahuila    |
| Rio Bravo II      | 495 MW                   | NG/Diesel | CCGT       | January 18 <sup>c</sup> 2002  | Valle Hermoso, Tamaulipas |
| Rio Bravo III     | 495 MW                   | NG        | CCGT       | April 1 <sup>c</sup> 2004     | Valle Hermoso, Tamaulipas |
| Rio Bravo IV      | 500 MW                   | NG        | CCGT       | April 1, 2005                 | Valle Hermoso, Tamaulipas |
| Altamira II       | 495 MW                   | NG/Diesel | CCGT       | May 1, 2002                   | Altamira, Tamaulipas      |
| Gasoducto del Rio | 410,000 MMBTU/d          | NG        | Pipeline   | August 1, 2003                | Tamaulipas                |

The location of the assets within the Portfolio is shown in Figure 2-1.

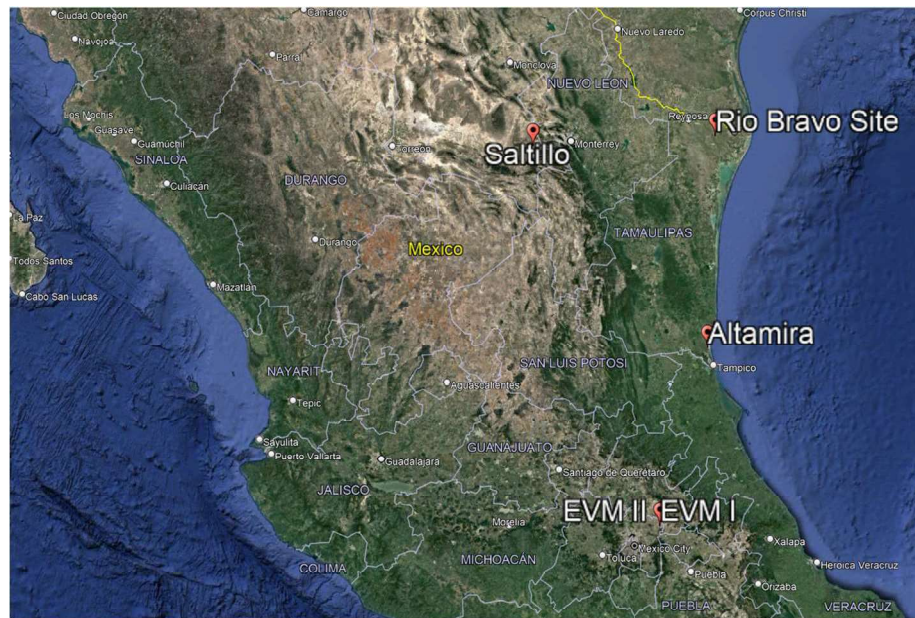


Figure 2-1: Valia Portfolio Map

The review was conducted based on the information provided during the due diligence for the acquisition of the assets of the Falcon Group and EVM Energia.

In review of the Falcon Group assets, Hatch conducted a site visit and participated in a management presentation in February and March 2021. In review of the EVM Energia assets, Hatch conducted a site visit and participated in a management presentation on September 20<sup>th</sup>, 2022.

Hatch utilized this information and supplemental information provided by the Client for the preparation of the report on the Portfolio.

## 2.1 Key Risks

During the review, Hatch undertakes a risk review of the Portfolio for both potential technical and commercial risk. We use a risk matrix that considers both the likelihood and impact to prioritize risks and highlight mitigating measures. Figure 2-2 provides the legend of the risk rating used by Hatch to establish the overall score for each risk.

|            |                | Impact     |       |          |       |        |    |
|------------|----------------|------------|-------|----------|-------|--------|----|
|            |                | Negligible | Minor | Moderate | Major | Severe |    |
| Likelihood |                | Score      | 1     | 2        | 3     | 4      | 5  |
|            | Rare           | 1          | 1     | 2        | 3     | 4      | 5  |
|            | Unlikely       | 2          | 2     | 4        | 6     | 8      | 10 |
|            | Possible       | 3          | 3     | 6        | 9     | 12     | 15 |
|            | Likely         | 4          | 4     | 8        | 12    | 16     | 20 |
|            | Almost Certain | 5          | 5     | 10       | 15    | 20     | 25 |

Figure 2-2: Risk Rating Legend

Table 2-2: Risk Summary

| Plant                | Key Findings  | Risk Type   | Likelihood | Impact | Score | Mitigation Plan   | Post Mitigation Likelihood | Post Mitigation Impact | Mitigation Score |
|----------------------|---|-------------|------------|--------|-------|---|----------------------------|------------------------|------------------|
| EVM-II               | Row 1 Nozzle Distress. The units have experienced nozzle and wear strip failures due to plugging of the cooling holes. This is caused by overheating of mild steel components up stream which causes oxidation debris liberation. | Operational | 5          | 4      | 20    | The issue has resulted in failures of portions of the Row 1 Nozzles. This issue has been monitored every 6 months by borescope inspection and is planned to be resolved during outages in 2023 and 2024. The OEM is actively pursuing resolution on the performance issue. Outages to identify potential findings prior redesigned parts installation and outage for the final installation of redesigned parts are included in the model. Spare nozzles are currently stored in the warehouse. | 1                          | 4                      | 4                |
| Former Falcon Plants | Fuel pass through for all Falcon CCGT plants has been less than 100% due to both the commodity pricing pass through under the PPA and the performance relative to their heat rate guarantees under the PPA.                       | Operational | 5          | 4      | 20    | Based on the analysis of the heat rate, the Falcon CCGT assets generally is not able to pass-through 100% of the gas costs under the PPA due their plant technical heat rates being near the contractual heat rates under the PPA. Valia continues to improve efficiency of the Falcon CCGT assets. Assumptions in the financial model are consistent with the current and future performance.  | 4                          | 1                      | 4                |

| Plant  | Key Findings   | Risk Type   | Likelihood | Impact | Score | Mitigation Plan   | Post Mitigation Likelihood | Post Mitigation Impact | Mitigation Score |
|--------|--|-------------|------------|--------|-------|---|----------------------------|------------------------|------------------|
| EVM-II | Axial Fuel Staging Studs, potential liberation and ingestion by the turbine section. Fleet event resulted in turbine damage while remaining operable. This may not be the case for other events. | Operational | 2          | 4      | 8     | GE using instrumental field testing to gather more data on stress/strain and temperatures in aft of AFS locations. Meanwhile an improved (better TBC) set of unbodies is available on site to be replaced during the next outage. | 1                          | 3                      | 3                |
| EVM-II | New Transition Piece Seal design has been installed on the units but has not been proven in extended service.  | Operational | 2          | 4      | 8     | Monitor seal performance during annual borescope.   | 1                          | 3                      | 3                |
| EVM-II | Gas metering is completed as a difference between Trunk connection and EVM-I causing EVM-II to rely on the difference in measurement between two meters for reporting.                           | Commercial  | 5          | 2      | 10    | A project is currently in place to improve gas measurement within the coming year.  | 1                          | 1                      | 1                |

## 3. EVM I Plant

### 3.1 Plant Overview

The EVM I plant is situated in the town of Jaltepec in the municipality of Axapusco in the state of México, Mexico, pictured in Figure 3-1. With a net technical capacity of 100 MW, EVM I is a peaking power plant that operates on natural gas on an as-needed basis.

EVM I is a well-developed asset deploying equipment that has significant utilization in the power generation market as a great contributor as a grid reliability backup. The design provides for independence between the generating units and includes features to protect the equipment and site performance during operation on the upper and lower end of the design envelop. The contracts associated with EVM I all support the operation of the plant at full load 24 hours a day.

An asset summary of the plant is provided in Table 3-1 and the plan view of the site is provided in Figure 3-2.



Figure 3-1: EVM I Plant Location



**Table 3-1: EVM I Asset Overview**

| Parameter                    | Value                            |
|------------------------------|----------------------------------|
| Contracted Capacity          | 94 MW                            |
| Location                     | Axapusco, State of México        |
| Commercial Operation Date    | January 1 <sup>st</sup> , 2017   |
| Technology and Configuration | OCGT                             |
| Fuel                         | Natural Gas                      |
| Off taker                    | Comisión Federal de Electricidad |
| PPA Expiry                   | December 31 2037                 |
| Gas Supplier                 | CFEnergia S.A. de C.V.           |
| Fuel Supply Agreement Expiry | December 31 <sup>st</sup> , 2037 |

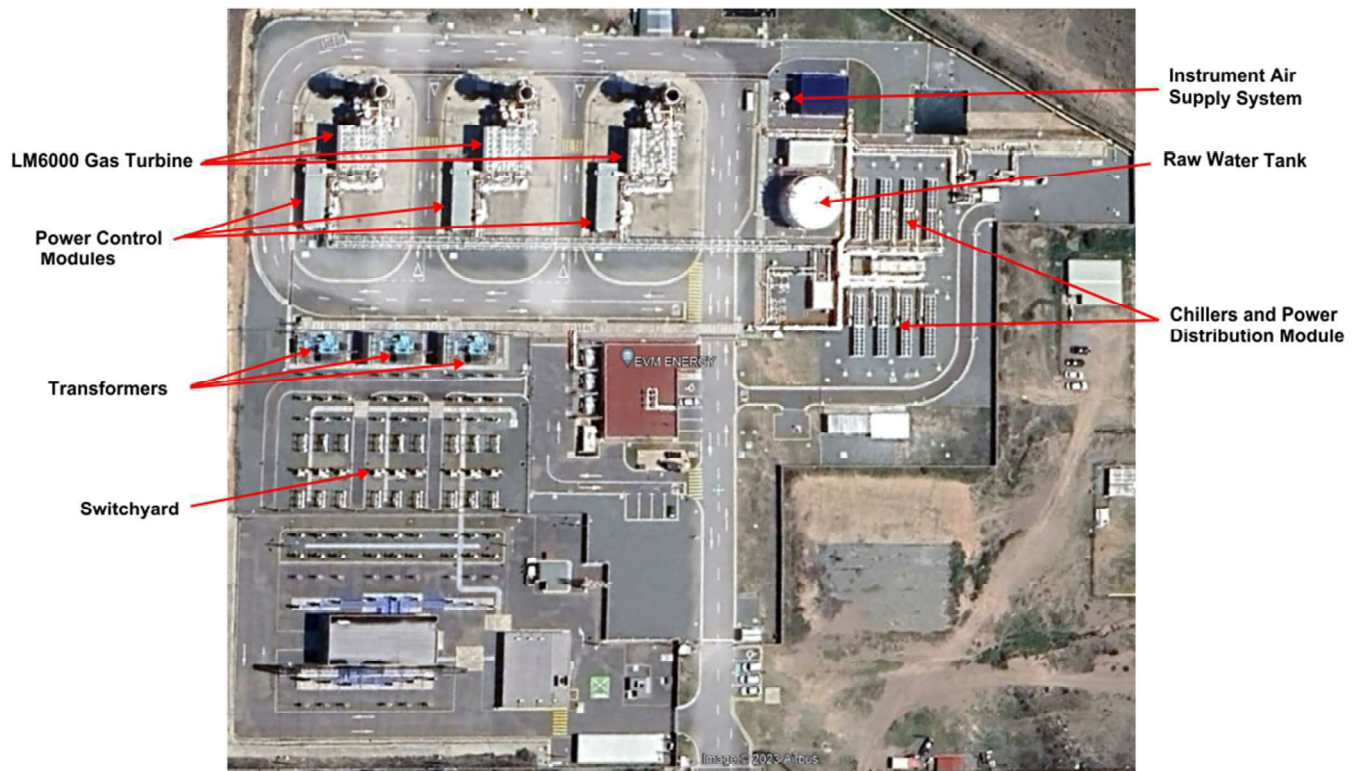




Figure 3-2: EVM I Site Plan View

## 3.2 Major Equipment Overview

This section covers the technology and major equipment overview of the EVM I site. It details the specific equipment and their function in the plant. The plant consists of three aeroderivative gas turbines with auxiliaries, operating in open cycle. Each turbine has a chilled water inlet air cooler to maximize output during high ambient conditions. The exhaust of the gas turbines is directed to a stack for each unit with continuous emissions monitoring for reporting air emissions. A compressor cleaning system is used to preserve unit performance and utilizes demineralized water.

A summary of the major equipment at EVM I are shown in Table 3-2 below.

Table 3-2: EVM I Major Equipment Summary

| Name                 | Manufacturer      | Model / Serial Number |
|----------------------|-------------------|-----------------------|
| Combustion Turbine   | GE Aeroderivative | LM6000PF              |
| CT Generator         | Brush             | BDAX 7-290ERJT        |
| CT Generator Exciter | GE                | L63585P01             |
| CT Transformer       | PROLEC-GE         | G3152                 |

### 3.2.1 Gas Turbine

All three gas turbines at EVM I are of the General Electric (GE) LM6000PF model. The specifications for this unit at ISO conditions are listed in Table 3-3 below.



**Table 3-3: GE LM6000PF Specifications**

| Description                      | Quantity               |
|----------------------------------|------------------------|
| ISO Rating (MW)                  | 44.7                   |
| Pressure Ratio                   | 12:1                   |
| ISO Heat Rate (kJ/kWh)           | 8702                   |
| Turbine Exhaust temperature (°C) | 456.6                  |
| Fuel                             | Natural Gas            |
| Rotor speed (min-1)              | 3600                   |
| Air flow (m³/min)                | 9500                   |
| NOx Control                      | Dry low NOx combustion |

### 3.2.2 Inlet Cooling and Heating System

EVM I utilizes an inlet air cooling system that is supplied with chilled water from an air-cooled chiller system. The water circuit is a closed water circuit with 20% glycol. This system is used to lower the compressor inlet air temperature during high ambient conditions to ensure the gas turbines can perform at the contracted capacity. The chillers and auxiliary power enclosure for the system are shown in Figure 3-3.



**Figure 3-3 Chillers and Power Distribution Module**

The chilled water system provides double duty during low ambient temperatures by warming the inlet air. The water system is warmed by a gas fired heater to bring the inlet air temperature above the icing potential temperature for the gas turbine compressor.

### 3.2.3 *Fuel Systems*

EVM I is a single fuel site that burns natural gas. Natural gas is received from the CFenergia through CENAGAS Pipeline and is filtered, regulated, and metered in the metering and regulation station shown in Figure 3-4. The incoming natural gas pressure is reduced to 240 psi (16.5 bar) through a single train regulating station on each unit.



Figure 3-4: EVM I Natural Gas Station

### 3.2.4 *Water Treatment System*

There is no water treatment system on the EVM I site. This power plant operates in a OCCT configuration, requiring little water usage for daily operations. Demineralized water is trucked to the site and is used for the turbine washing system. Service water is used in service stations throughout the site. The demineralized water and service water storage tanks are shown in Figure 3-5 below.



Figure 3-5: EVM I Demineralized Water Tank (right) and Service Water Tank (left)

### 3.2.5 *Electrical*

All three GT generators at the EVM I site are connected to the 230 kV CFE transmission grid. Figure 3-6 shows the back side of the GE gas turbine generator at the EVM I site. The technical specifications for the EVM I generators are documented in Table 3-4 below.

Table 3-4: EVM I Generator Specifications

| Parameter         | GT Generators |
|-------------------|---------------|
| Model             | GE            |
| Rated Power (MVA) | 72.8 MVA      |
| Cooling System    | Air Cooled    |
| Power factor      | 0.85          |
| Voltage           | 13.8 kV       |





**Figure 3-6: EVM I GE Gas Turbine Generator**

There are three generator step-up transformers ("GSU") at the EVM I site, one for each of the gas turbine generators. The GSU takes the generator voltage of 13.8kV and raises it to 230kV transmission voltage.

All three GSUs are manufactured by Prolec-GE. The specifications for the transformers on site are provided in Table 3-5. Transformer T-02 is pictured in Figure 3-7 below. The transformer ratings in MVA are based on natural air circulation; forced air circulation with 55°C winding temperature; and forced air circulation with 65°C winding temperature.

**Table 3-5: EVM I Transformer Specifications**

| Unit     | Manufacturer | Phases | Cooling   | MVA              | Voltage (kV) |
|----------|--------------|--------|-----------|------------------|--------------|
| GT1 Main | PROLEC-GE    | 3      | ONAN/ONAF | 35/46.2/51.8 MVA | 230/13.8 kV  |
| GT2 Main | PROLEC-GE    | 3      | ONAN/ONAF | 35/46.2/51.8 MVA | 230/13.8 kV  |
| GT3 Main | PROLEC-GE    | 3      | ONAN/ONAF | 35/46.2/51.8 MVA | 230/13.8 kV  |



**Figure 3-7: EVM I Transformer**

The auxiliary power system is supplied by three auxiliary transformers, with one feeding each GT unit. The auxiliary transformers take power from the generator bus at 13.8kV and provide 480V to the auxiliary loads. The 480V buses are provided with cross ties to support operational flexibility and maintenance opportunities. All electrical gear is enclosed in power control modules as shown in Figure 3-8.



**Figure 3-8 Power Control Modules**

The 480V Essential Service Bus is dual fed from Units 1 and 2 with interlocked breakers. The bus supplies power to the battery chargers and can be powered by the emergency diesel generator.

### **3.2.6 Control System**

The control system is the Woodward Micronet+ control system. The system is extended to control the balance of plant equipment. The Micronet+ is an industry standard system and is often used to control aeroderivative gas turbines.

The EVM I control screens are pictured in Figure 3-9.



Figure 3-9: EVM I Control Room

### 3.2.7 Fire Protection

The fire fighting system consists of one electric pump and one diesel engine driven pump which can be used in the event of a power outage. An electric jockey pump maintains pressure in the piping system.

The fire water for the system is drawn from the service water tank, shown in Figure 3-10. The service water tank includes a standpipe to protect the fire water system storage capacity. CO<sub>2</sub> bottles are used for the GE LM6000 gas turbine modules fire protection.

Figure 3-7 shows the transformer's fire protection in the EVM I switchyard.



Figure 3-10: Service Water Tank

### 3.2.8 **Emergency Diesel Generator**

The Emergency Diesel Generator is a 700 KVA generator with 480V, 3 Phase output voltage. It is connected to the 480V Essential Service Bus to provide power to essential loads during black plant conditions. The generator is pictured in Figure 3-11.



Figure 3-11 Emergency Diesel Generator

### 3.2.9 **Summary**

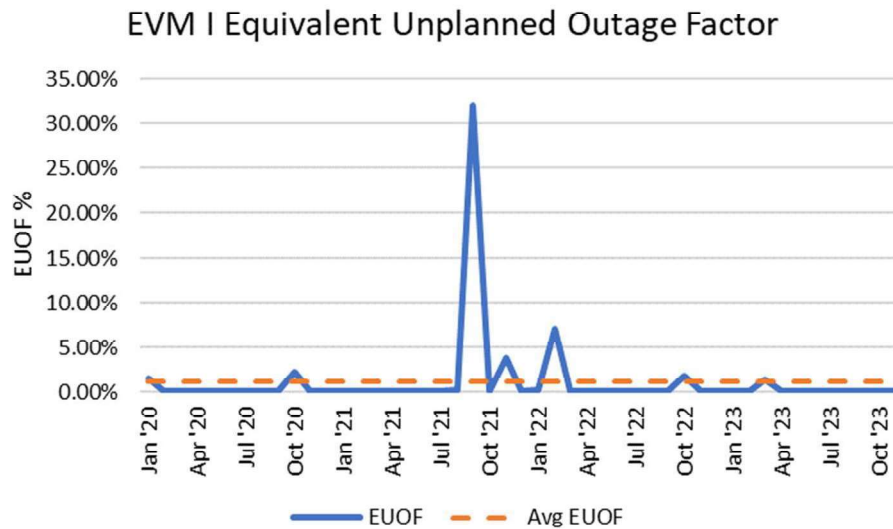
Hatch regards the GE LM6000 gas turbine as a proven, reliable, and efficient gas turbine. Hatch considers that the design and equipment selected for EVM I are consistent with the desired performance, availability, and operational requirements of the facility.

## 3.3 **Operations Review**

### 3.3.1 **Forced Outages**

The monthly equivalent unplanned outage factor (EUOF) of the plant from January 2020 to November 2023 is shown in Figure 3-12. The average EUOF for EVM I is 1.09%. The EUOF trend is a low and stable across the months, signifying steady plant operation. Major events that have impacted plant EUOF are included in Appendix A.





**Figure 3-12: Monthly EUOF for EVM I from January 2020 - November 2023**

### 3.3.2 Heat Rate

The monthly heat rate (HHV, kJ/kWh) for the plant from January 2020 to November 2023 is shown in Figure 3-13. The average heat rate for EVM I during this period is 9759 kJ/kWh-HHV. Changes in plant heat rate are caused by short operating duration and low load operation. The Heat Rate and Capacity curves have an inverse relationship. Operation at low loads has been avoided since this condition was discovered by modifying the day ahead capacity nomination. In this way the plant avoids the dispatch at loads that are uneconomical (heat rate above contracted heat rate)



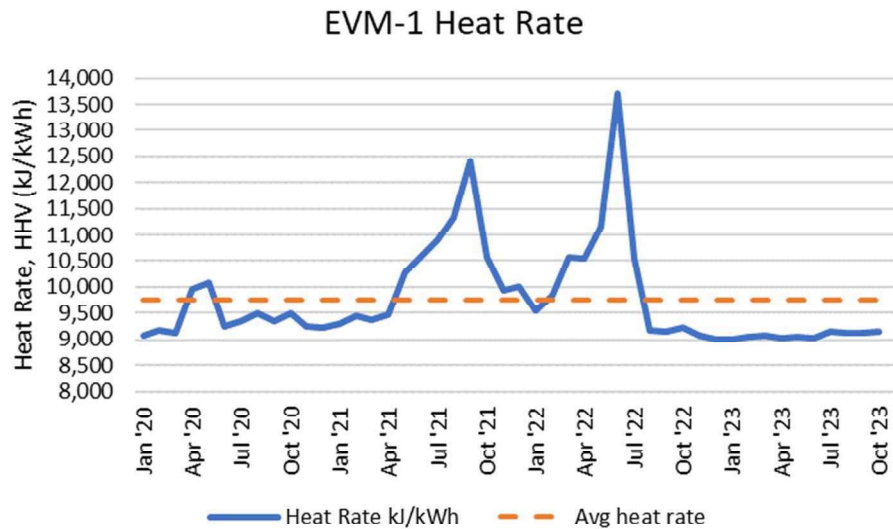


Figure 3-13: Monthly HHV Heat Rate (kJ/kWh) for EVM I from January 2020 - November 2023

### 3.3.3 Generation

The monthly power generated (GWh) by the plant from January 2020 to November 2023 is shown in Figure 3-14. The average net power generated for EVM I during this period is 14.8 GWh per month. Power output fluctuations are caused by variations in system demand, with some impact caused by maintenance outages.

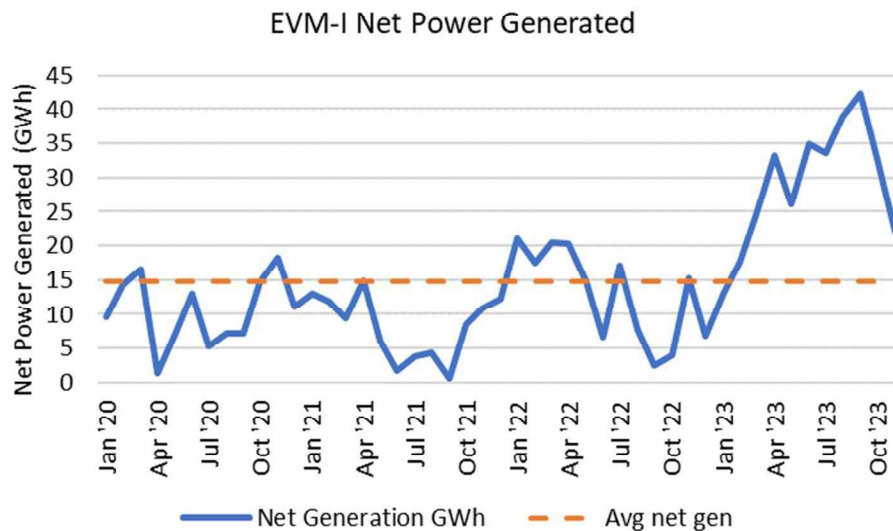


Figure 3-14: Monthly Net Power Generated (MWh) from January 2020 - November 2023

## 3.4 Maintenance Review

Maintenance for the facility is primarily covered by the Contract Service Agreement with General Electric (GE). Other areas of the plant fall under the management and control of

North American Energy Services (NAES). NAES has deployed industry standard tools and programs to ensure the operation and maintenance of the facility are consistent with industry best practices.

### **3.4.1 Spare Parts Inventory**

All gas turbine parts are covered through the CSA with GE. Inventory requirements are minimal, and no turbine components are identified and stored in inventory.

The site maintains a full complement of spare parts that are cataloged against the associated equipment. The inventory is organized and suited for the operating demands of the peaking facility. No adjustments to the spare part program are expected.

### **3.4.2 Maintenance Programs**

The proper and long-term operation of the facility is dependent on the judicious application of maintenance programs for the critical systems and components that support the performance and longevity of the plant. Maintenance programs for work management, outage management, electrical system maintenance and high energy piping are critical programs that help ensure successful operations.

#### **3.4.2.1 Work Management**

The station is operated and maintained by North American Energy Services (NAES). NAES provides the work management program for the facility based on their standards for power plant management. The plant cataloged in the Maximo Asset Management System (AMS). The AMS is utilized to log, track, plan, estimate, and execute work. Additionally, the AMS is utilized to procure materials and track inventory.

The work management program has the systems and components ranked based on criticality to operations and to aide in decision making on work order priority and outage spending.

#### **3.4.2.2 Outage Management**

The scheduling of outages for a simple cycle power plant is critical for successful operation and maintenance of the facility. The Client has contracted with GE for a Contract Service Agreement (CSA) that provides routine inspections and services for the gas turbines and control system. These required maintenance services are scheduled based on projected unit operating hours. The CSA for EVM-I is condition based and the first HGPI has been moved from 24k hours to 35k hours based on the performance of the gas turbine. The timing of the maintenance is supported by the load forecast that is coordinated through the PPA with CENACE. With confidence in operating hours and maintenance intervals the outage plans should be executed near the scheduled dates to support work and financial planning.

In addition to the work that is planned and scheduled for the turbines and generators, detailed electrical work and testing is in place for the transformers and electrical gear. Planned testing on electrical transmission and distribution equipment is paramount to ensuring the availability of the power plant and avoiding equipment casualties.

### 3.4.2.3 Turbine and Generator Service Bulletin

Service Bulletins (SB) are the key communication method between General Electric and their customers operating their equipment. The SB process breaks down potential issues with the equipment with severity and recommendations and can include mandatory shutdown. EVM I has a CSA with GE which promotes coordination on SBs and provides a clear means of communication between GE and the EVM I O&M Staff.

Currently there are a total of 32 individual SBs for the plant that are open. The SBs are issued against the Gas Turbine/Generators.

**Table 3-6 Active SB Status Table**

| Active/Open Planning Status SBs |             |            |
|---------------------------------|-------------|------------|
| Status                          | SB Category | # of TIL's |
| Planning                        | Alert       | 1          |
| Planning                        | Campaign    | 14         |
| Planning                        | Optional    | 5          |
| Planning                        | Routine     | 12         |
|                                 |             | <b>32</b>  |

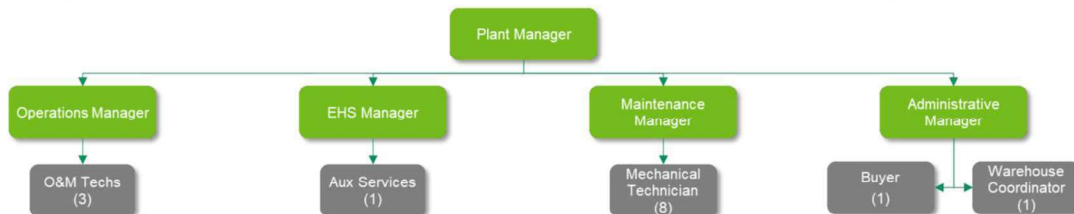
#### Critical Classification SBs:

The SB described is classified as an alert/critical as it may cause harm to the equipment and should be monitored frequently.

Bulletin SB-LM6000-IND-310-R2: which is active/open for field work, was issued on December 20, 2020, and is for High Pressure Compressor Rotor Stages 3 Through 5 Blades Dovetail Coating Refurbishment. The inspection should be completed at the first opportunity prior to the cycle limit and is scheduled to be performed in the first half of 2024 in line with OEM recommendations.

## 3.5 O&M Staffing

EVM-I is effectively staffed with a full complement of support staff through the O&M Contractor NAES. The effective staff complement is shown in Figure 3-15. Sharing of resources between an intermediate or base load facility and a peaking station that is located nearby is an industry best practice. The overall staffing model meets industry best practices.



**Figure 3-15: EVM I O&M Staffing**

The plant is controlled from EVM-II, therefore relieving the rotating staff needs for operations. This flexibility allows EVM-I Operations team to support unit operations as dispatched.

### 3.6 Project Agreements

This section provides an overview of the project agreements for EVM I. A summary of the contract End Dates is shown in Table 3-7 below.

**Table 3-7: EVM I Project Agreements End Dates**

| Agreement                          | Contract End Date   |
|------------------------------------|---|
| Power Purchase Agreement           | December 31, 2037   |
| Contractual Service Agreement      | December 31, 2038   |
| Grid Interconnection Agreement     | May 16, 2046  |
| Market Participant Agreement       | Remains in effect unless terminated by either party                           |
| Gas Supply Agreement               | December 31, 2037   |
| Operations & Maintenance Agreement | Ten (10) year term till 2031 with auto-renewal for increments of one (1) year |

#### 3.6.1 Power Purchase Agreement

A Power Purchase Agreement (PPA) has been entered into by CFE Calificados S.A de C.V. ("Supplier") and EVM Energía del Valle de México S.A.PI. de C.V ("Generator") in November 2016. The contract term is set for 20 years from the Commercial Effective Date of January 1<sup>st</sup>, 2018. This means the PPA ends December 31, 2037.

The guarantees under the PPA include the following:

- The Generator undertakes to make available to the Supplier and the Supplier undertakes to acquire from the Generator the amount of 94 MW of guaranteed capacity year-round.
- Contracted energy up to 778,150 MWh per calendar year.
- The Generator guarantees a net unit thermal consumption based on Higher Heating Value (HHV) of 10,381 GJ/MWh.
- The Generator guarantees a plant availability equal to 94.5% per year in an open cycle configuration.

The monthly contract payments consist of two components, power charges and energy charges. The power charges consist of fixed charges for capacity as well as fixed charges for operation and maintenance. The energy charges are based on the fuel charge. If the asset is not capable of meeting the guaranteed heat rate, the fuel cost will not fully pass through to the Commission. The asset will be penalized for not being able to meet the guaranteed heat rates by having to pay the additional cost of fuel. This can have significant financial implications; however, we do not expect this to happen based on plant operating performance.

The contract does not mention an early termination for low capacity or unavailability. However, there are termination clauses and penalties for the following:

- Breach of payment obligation of the Generator to the Supplier.
- Failure of the Generator to maintain, extend or increase the operation guarantee.
- Failure to Maintain Insurance Policies
- Generator fails to meet COD (180 days after original scheduled COD date) or other critical event with 180 days lag time
- The guarantees reported and delivered by the Generator are incorrect and within 30 days are not rectified
- Generator falls into financial insolvency (unable to pay its debts), requesting the imposition of a trustee
- Definitive revocation of the Generation Permit
- Final termination of the interconnection contract
- Definitive termination of the market participant contract
- Generator ceases to have a base fuel supply contract
- Generator consolidates or merges with another entity, ceases to conduct a substantial part of its activities or sells or transfers without informing the Supplier.

The station is well suited to meet the requirements of the PPA throughout the operating life.

The Power Charges consist of a Fixed Capacity Charge, Fixed O&M Charge, and a fixed charge for fuel reserve capacity. The fixed fuel reserve charge is a passthrough cost based on the guaranteed heat rate for the capacity reserve on fuel supply. The Energy Charges consist of a Variable Fuel Charge based on the Guaranteed Heat Rate and transferable fees consisting of transmission services charges and market operation fees charged by CENACE related to the wholesale electricity market. The variable fuel charge reimburses the Company for natural gas at the commodity price of gas charged by CF Energía under the GSA.

EVM I is registered with CENACE hourly for each day a bilateral financial transaction in the short-term energy market ("TBFIn") for the lesser of (1) the delivered energy supplied to CFE Calificados, subject to dispatch by CENACE, and (2) the energy associated with Contracted Capacity times the guaranteed monthly availability set forth in the CFEC PPAs (the "Contracted Electric Energy"). The TBFIn is not registered in the energy market if the Company's guaranteed cost of generation exceeds the local marginal price in the energy market. If during any month the delivered energy supplied to CFE Calificados is lower than the Contracted Electric Energy for reasons other than force majeure or if the Guaranteed Cost of Generation exceeds the local marginal price, the Company is to pay CFE Calificados a penalty as set forth in the PPA.

### 3.6.2 **Contractual Service Agreement**

A Contractual Service Agreement (CSA) has been entered into by GE International Operations Company Inc. and EVM Energía del Valle de México S.A. de C.V. ("Owner"). The contractual service agreement was entered into on December 31, 2013, with a commercial operations date of January 1, 2017. The contract term will remain in effect until all units have reached their Performance End Dates. For each unit, the Performance End Date is

the later of either 232,000 Fired Hours of operation from the Maintenance Start Date or completion of the Fourth Planned Maintenance Major Overhaul performed under the Agreement. If the units are dispatched to their full potential the Performance End Date would occur in 2042.

The equipment covered under the CSA includes three LM 6000 PF gas turbines and associated auxiliaries. The CSA includes guarantees for availability. The guaranteed availability or Equivalent Availability Factor is 96.5%. Contract payments include a monthly fee and the applicable performance bonus or applicable credit for liquidated damages based on the availability guarantees. Each "Monthly Fee" shall consist of a Variable Monthly Fee which is \$190.00 USD per Fired Hour of each Gas Turbine. The price is escalated annually based on a material price index and labour price index.

The total liability of the contractor, on all claims of any kind accruing during any calendar year will not exceed US \$2,000,000. The first US \$250,000 of the price for Parts and Services required for correction of each Unplanned Maintenance Outage for each Covered Unit shall be borne by Contractor, up to a maximum of US\$1,000,000 for Unplanned Maintenance in any one calendar year

The terms of the CSA are customary within the power industry and provide incentive for the service provider to exceed the performance conditions in the PPA.

### 3.6.3 **Gas/Fuel Supply Agreement**

A gas supply agreement is in place between the CFEnergia S.A. de C.V. ("Supplier") and EVM Energía del Valle de México S.A.PI. de C.V ("Customer"). The contract was signed on October 31, 2017, for a term that begins on November 16, 2017, until December 31, 2037, or until the contract is terminated. This matches the term of the PPA period. The contract is for the supply of natural gas on an interruptible basis at an agreed upon fuel composition. The maximum daily fuel supply quantity that the Supplier is obliged to supply to EVM I is 22,200 MMBtu/day. The maximum daily fuel supply is sufficient for operating the three combustion turbines at a combined output of 94MW for a 24-hour period.

If the natural gas that is supplied or is going to be supplied at the Delivery Point does not meet the Specifications (the "Gas Out of Specifications"), the Customer shall notify said circumstance to the other Party as soon as reasonably possible after becoming aware of said circumstance. The Customer will always have the right to reject, in whole or in part, the gas out of specification.

The gas supply agreement is sufficient to meet the operating requirements of the station.

### 3.6.4 **Operations & Maintenance Agreement**

An operations & maintenance agreement has been entered into by NAES Energía, S. de R.L. de C.V. ("NAES") and EVM Energía del Valle de México S.A.PI. de C.V ("Owner"). The Amended & Restated (A&R) Agreement Effective Date is September 1, 2021, with a 10-year term, and the renewal date is December 31, 2031, with auto-renewal for increments of one year until a party notifies their decision to end the contract with at least one-year prior notice.

NAES shall perform the Services in accordance with the Facility Manuals, applicable Budget and Plans, Applicable Laws, Prudent Practices, insurer requirements delivered to NAES by Owner in writing and the requirements in the Facility Agreements.

In compensation for its services under the Agreement, Owner shall pay NAES all Site Costs, Home Office Costs, Site Services Costs, and the Services Fee plus, to the extent earned by NAES, the Bonus. The Site Costs, Home Office Costs and Site Services Costs are paid on a cost reimbursable basis. The annual service fee is \$181,480.20 during the agreement period paid in equal monthly installments with a maximum bonus of \$113,424.45 per year. The maximum bonus/liquidated damages are \$113,424.45 per year. The Services Fee, Maximum Bonus and Maximum Liquidated Damages shall be escalated based on the US Consumer Price Index with 2021 as the Base year.

The total Employee Bonus for Site Personnel shall be derived by taking twenty-five percent (25%) of EVMI Facility results and seventy-five percent (75%) of EVM II Facility results; provided, however, that the foregoing percentages shall be subject to change upon mutual agreement of the Parties.

The Bonus/Liquidated Damages for each year depends on the following:

- Health and Safety Indicators
- Environmental Permit Compliance
- Equivalent Forced Outage Factor
- Equivalent Availability Factor
- Starting Reliability
- Completion of Scheduled PMs
- Budget Management
- Employee Training
- Owner Evaluation of Operator Performance

The O&M agreement is structured to provide industry standard care for the station and includes incentives for the provider to exceed the requirements of the PPA.



## 4. EVM II Plant

### 4.1 Plant Overview

The EVM II plant is situated in the town of Jaltepec in the municipality of Axapusco in the state of México, Mexico, pictured in Figure 4-1. EVM II is a combined cycle power plant with a 2x2x1 configuration and a capacity of 850 MW. The plant operates on natural gas. An asset summary of the plant is provided in Table 4-1.

EVM II is a well-developed asset deploying equipment that has significant utilization in the power generation market. The GE 7HA.02 gas turbines have a growing asset base and are accumulating run hours rapidly. GE is focused on the equipment and has proven to work aggressively to resolve issues that are identified as the fleet of turbines matures. The steam turbine, HRSGs, air-cooled condenser and other BOP equipment are industry standard offerings that are deployed worldwide. The design provides for independence between the generating units and includes features to protect the equipment and site performance during operation on the upper and lower end of the design envelop. The contracts associated with EVM II all support the operation of the plant at full load 24 hours a day when considering the actual plant performance capability.



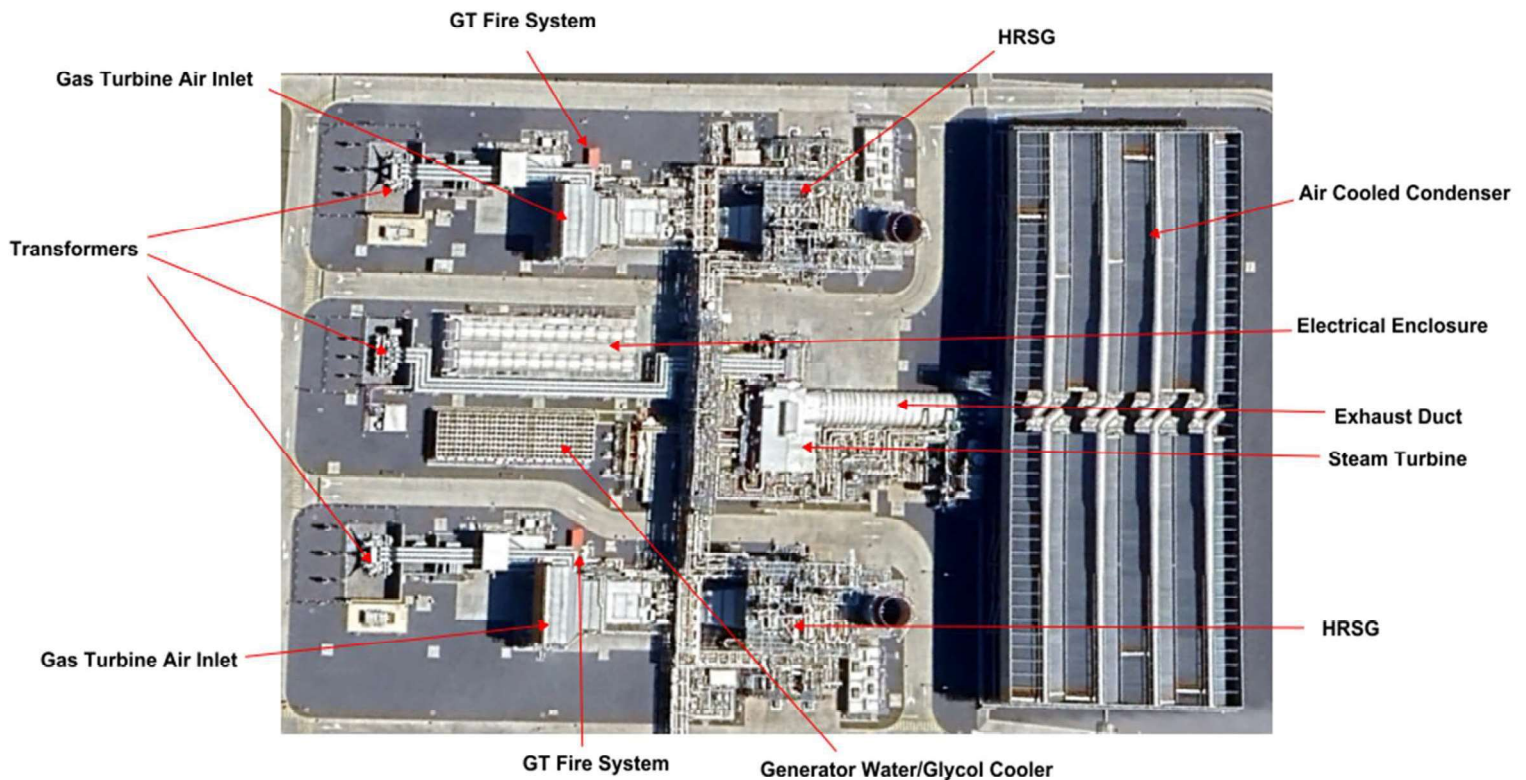
Figure 4-1: EVM II Plant Location



**Table 4-1: EVM II Asset Overview**

| Parameter                    | Value                          |
|------------------------------|--------------------------------|
| Contracted Capacity          | 797 MW                         |
| Commercial Capacity          | 840 MW                         |
| Location                     | Axapusco, State of México      |
| Commercial Operation Date    | January 1 <sup>st</sup> , 2021 |
| Technology and Configuration | CCGT, 2x1                      |
| Fuel                         | Natural Gas                    |
| Off taker                    | CFE Calificados S.A. de C.V    |
| PPA Expiry                   | January 1 <sup>st</sup> , 2041 |
| Gas Supplier                 | CFEnergia S.A de C.V.          |
| Fuel Supply Agreement Expiry | January 1 <sup>st</sup> , 2041 |

The EVM II plant layout is shown in Figure 4-2.



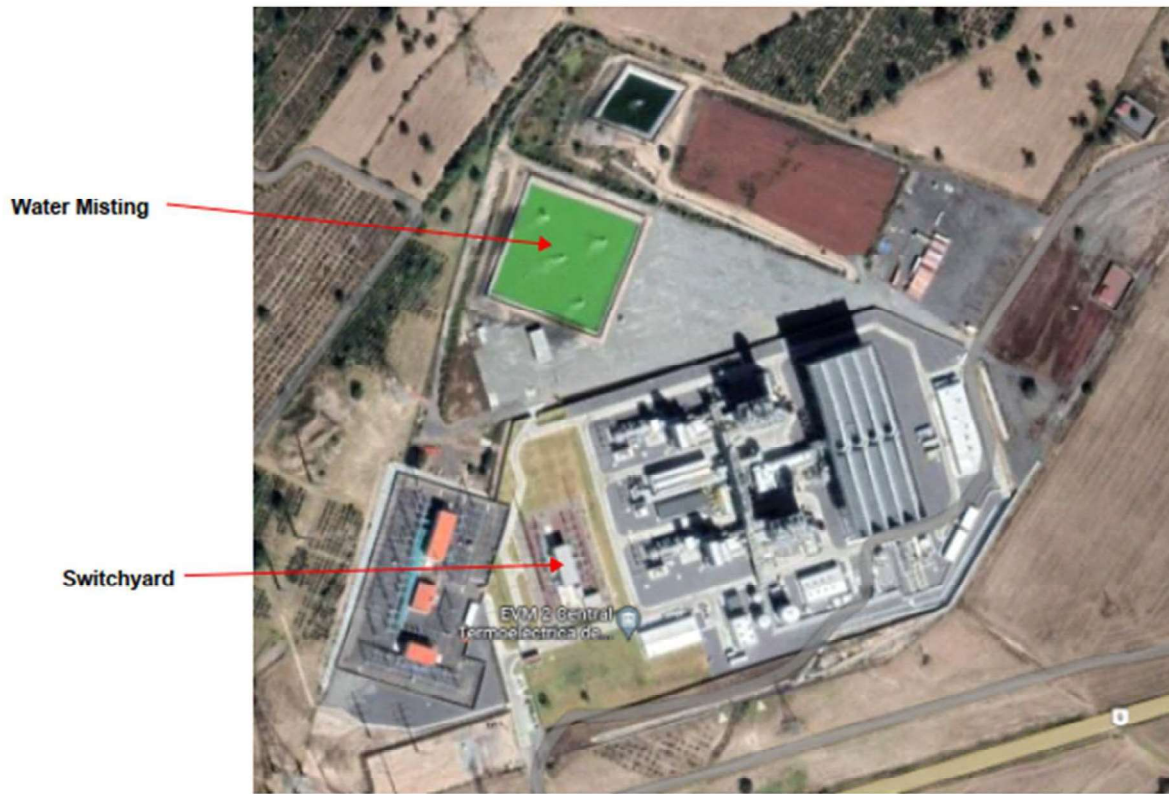


Figure 4-2: EVM II Site Plan View



Figure 4-3: EVM II GSU and Air Inlets

## 4.2 Major Equipment Overview

The Plant consists of a 2x1 combined cycle power plant with supplemental duct firing, and evaporative coolers. The HRSGs are horizontal, triple pressure, drum type units. The steam

turbine is triple pressure unit with a dual flow LP section. The steam turbine exhausts to an Air-Cooled Condenser. The steam turbine and gas turbine generators are connected to transformers which connect to the national grid via the 400 kV and 230 kV CFE transmission lines. The plant is fueled with natural gas provided by CF Energia. It shares a trunk connection to the supplier with EVM I. The balance of plant systems include: an air-cooled component cooling system, a fuel supply system, a demineralized water system for gas turbine washing and steam cycle makeup, an electrical distribution system, a distributed control system, a fire protection system, and an emergency diesel generator for essential services during a black plant condition.

**Table 4-2: EVM II Major Equipment Summary**

| Name                       | Manufacturer | Model / Serial Number |
|----------------------------|--------------|-----------------------|
| Combustion Turbine         | GE           | 7HA.02                |
| CT Generator               | GE           | H53, 1154163G         |
| CT Generator Exciter       | GE           | EX2100                |
| CT Transformer             | PROLEC-GE    | 400:18kV, 320MVA      |
| HRSG(Boiler)               | GE           | Triple Pressure       |
| Steam Turbine              | GE           | 370T027               |
| ST Generator               | GE           | H53, 1154163S1        |
| ST Generator Exciter       | GE           | EX2100                |
| ST Transformer             | PROLEC-GE    | 230:18kV, 390MVA      |
| Air-Cooled Condenser (ACC) | SPG          | A-Frame Forced Draft  |

## 4.2.1 Gas Turbine

The gas turbines in use at the EVM II plant are the GE 7HA.02 model. The specifications for this unit at ISO conditions are listed in Table 4-3 below. The GE 7HA.02 is an air-cooled gas turbine known for its high output and efficiency. The EVM II CSA for the gas turbines is with GE Global Parts & Products GMBH, GE International Inc, and GE Global Services GMBH.

**Table 4-3: GE 7HA.02 Specifications**

| Description                      | Quantity   |
|----------------------------------|--|
| ISO Rating (MW)                  | 384 MW   |
| Pressure Ratio                   | 20.2:1   |
| ISO Heat Rate (kJ/kWh) LHV       | 8450   |
| Turbine Exhaust temperature (°C) | 656.7, GE Heat Balance, 10/10/2017, Ambient 26°C 60% RH, 0.747 bar |
| Fuel                             | Natural Gas  |
| Rotor speed (min <sup>-1</sup> ) | 3600   |
| NOx Control                      | Dry low NOx combustion   |

## 4.2.2 Heat Recovery Steam Generator

Heat Recovery Steam Generators (HRSGs) are used to recover waste heat from the exhaust of GTs to produce steam. The steam generated is used to produce power in the steam turbine.

The EVM II site has two, drum type, horizontal triple pressure HRSGs. Exhaust gas from the GT flows horizontally over vertical tubes transferring heat into the steam cycle. The HRSG has three pressure sections: low pressure (LP), intermediate pressure (IP), and a high pressure (HP). The condensate from the condenser is passed to the LP economizer where it is pre-heated prior to entering the LP drum. The LP drum serves as the deaerator for the feedwater system and provides the suction source for the Feedwater Pumps. Excess LP Steam is supplied to the LP section of the steam turbine. The Feedwater Pumps provide feedwater to the IP and HP Drums. Both streams pass through associated economizers between the feedwater pumps and the drums. Both the IP and HP drums feed saturated steam to superheaters prior to exiting the HRSGs and supplying the Steam Turbine. The IP steam supplements the cold reheat steam and the HP steam feeds the HP section of the steam turbine. Each HRSG is provided with duct burners that provide supplemental heat for additional steam production. The duct burners utilize natural gas and excess air in the gas turbine exhaust, with the burners firing upstream of the HP Drum steam generating section. The HRSG specifications are displayed in Table 4-4 below.

**Table 4-4: HRSG Specifications**

| Parameter               | High Pressure Section | Intermediate Pressure Section | Reheat Section | Low Pressure Section |
|-------------------------|-----------------------|-------------------------------|----------------|----------------------|
| <b>Pressure (bara)</b>  | 178.75                | 45.83                         | 43.3           | 5.4                  |
| <b>Temperature (°C)</b> | 582.5                 | 331.4                         | 585.8          | 324.5                |
| <b>Mass flow (kg/s)</b> | 97.3                  | 2.8                           | 98.9           | 9.2                  |

\*GE Heat Balance, 10/10/2017, Base Load, Fired, 26°C, 60% RH

## 4.2.3 Steam Turbine

The steam turbine at the EVM II plant is manufactured by GE. It is a triple pressure reheat steam turbine, with a single-flow HP steam, a single-flow IP steam, and dual-flow LP steam section. The steam produced in the HRSG is used to drive the steam turbine. The steam expands through the HP portion of the turbine and is routed back to the HRSG reheat section as “cold reheat” steam. The HRSG outlet “hot reheat” steam is then brought back to the ST and expands through the IP section. The IP section exhaust is then combined with LP steam from the HRSG and fed to the LP turbine where it further expands in the LP section and exhausts to the air-cooled condenser. The mechanical power generated by the turbine is converted to electrical power by the generator connected to the steam turbine shaft. Table 4-5 below highlights the specifications of the steam turbine at the EVM II site.



**Table 4-5: Steam Turbine Specifications**

| Description                            | Value  |
|--|--|
| <b>ST Model:</b>                       | GE STF-D65-40  |
| <b>Type:</b>                           | Triple Pressure, Reheat Steam Turbine<br><br>Triple casing design; single flow HP steam, single flow IP steam, and dual flow LP steam. |
| <b>Rated Power, Generator (MW):</b>    | 342 MW   |
| <b>Turbine Inlet Temperature (°C):</b> | 574.5  |
| <b>Turbine Inlet Pressure (MPa-a):</b> | 16.6   |
| <b>Rotor Speed (min-1):</b>            | 3600   |

#### 4.2.4 *Steam Turbine Condenser*

The condenser system at EVM II is an air-cooled condenser (ACC), shown in Figure 4-4. The steam from the steam turbine exhaust flows into the ACC where it condenses. The steam condenses through the finned tubes as ambient air is blown outside the finned tubes by the forced draft fans. After the steam condenses, it returns as condensate to the HRSG. The ACC is shown in Figure 4-4.



**Figure 4-4: EVM II ACC Unit**

#### 4.2.5 *Fuel Systems*

The fuel system at the EVM II site consists of a natural gas regulating station. Natural gas is used as fuel for the gas turbines as well as supplemental firing in the HRSGs. The Natural Gas is received by a branch connection to the EVM I gas supply Figure 4-5. Fuel is routed through a knockout drum and coalescing filter, then, a water bath dewpoint heater then to a two-train regulating station. The regulating station has a Master/Monitor style self-actuated regulating train with a safety shutoff valve. This design is fault tolerant and prevents the release of large quantities of gas on a system failure. The redundant design allows for maintenance during normal operation of the generating facility. The natural gas is received at

a pressure between 35-80.4 bar and undergoes pressure reduction to 33-34.5 bar for the gas turbines. Additionally, the fuel undergoes pressure reduction to 5.5 bar for the HRSG inlet.

Gas metering for EVM II is currently measured as the difference between the trunk meter and the EVM I meter. A project is in development to reconnect the EVM I metering to the trunk valve to ensure discrete metering is utilized to support custody transfer to the plant.



Figure 4-5: EVM II Natural Gas Pipeline

#### 4.2.6 **Water Treatment System**

The water treatment process at EVM II is a three-step process which begins with raw water. The first is an initial ultrafiltration system followed by a silica removal stage and use of reverse osmosis (RO) and electro-deionization (EDI) to attain quality demineralized water.

Due to water treatment limitations with the original RO system an additional water treatment plant was constructed that utilizes the initial pre-treated water for supply. Pre-treated makeup water is taken from the raw water storage tank, passed through an activated carbon filter to remove contaminants from the water. The filtered water is fed directly to a new RO system with two dual pass RO units. The permeate from the RO modules is stored in the permeate tank for supply to the EDI system for further purification. The purified water is then stored in a 600 m<sup>3</sup> demineralized storage tank. The RO permeate is also utilized for the evaporative cooler system on the gas turbine inlets. The improved facility meets the water supply requirements of the station.

#### 4.2.7 **Electrical**

The generators at the EVM II site are connected to 400 kV and 230 kV CFE transmission lines which cross the western and southern boundaries of the site, respectively. Both GT generators operate at 18kV and are connected to the 400 kV grid. They utilize low side generator breakers. ST generator operates at the 18kV and is connected to the 230 kV grid and utilizes a high side generator breaker.