



Alberta Electric System Operator

3000, 240 4 Avenue SW

Calgary, AB • T2P 4H4

aeso.ca

In the Matter of the Need for the Oyen 2 Solar Project Connection

And in the matter of the *Electric Utilities Act*, S.A. 2003, c. E-5.1, the *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2, the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16, the Regulations made thereunder, and *Alberta Utilities Commission Rule 007*

Application of the Alberta Electric System Operator for Approval of the

Oyen 2 Solar Project Connection

Needs Identification Document

Date: July 28, 2026

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PART A - APPLICATION

1 Introduction

1.1 Application

Pursuant to Section 34(1)(c) of the *Electric Utilities Act* (Act), and in accordance with further provisions set out in legislation,¹ the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Oyen 2 Solar Project Connection Needs Identification Document* (Application). This application is submitted in accordance with AUC Rule 007, Section 7.1.2, *Abbreviated needs identification document application information requirements*.

1.2 Application Overview

The market participant, UK Solar West Ltd. (market participant), requested system access service to connect its approved Oyen 2 Solar (the Facility)² to the transmission system in the Oyen area (AESO Planning Area 42, Hanna). The Facility includes a collector substation, designated as the Robin 1135S substation. The market participant expects the Facility to be commercially operational in May 2029.

The market participant's request includes a new Rate STS, *Supply Transmission Service*, contract capacity of 162 MW and a new Rate DTS, *Demand Transmission Service*, contract capacity of 1 MW. The market participant's request can be met by adding a switching substation, to be designated as North Lanfine 1119S, connected to the existing 240 kV transmission line 9L46 using an in-and-out configuration, and adding one 240 kV circuit to connect the Facility to the proposed North Lanfine 1119S substation (the Proposed Transmission Development, as further described in Section 2.2).

The scheduled in-service date for the Proposed Transmission Development is April 1, 2029.

This Application describes the need to respond to the market participant's request for system access service, and the AESO's determination of the manner in which to respond to the request. Having followed the AESO Connection Process,³ the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. The Proposed Transmission Development is consistent with the AESO's long-term plans for the Central Planning Region, which includes the Hanna area. The AESO submits this Application to the Commission for approval in accordance with the AESO's responsibility to respond to requests for system access service and having determined that transmission development is required and is in the public interest.^{4,5}

1.3 AESO Directions to the TFO

During the AESO Connection Process, the AESO issued various directions to the legal owner of the transmission facility (TFO), in this case ATCO Electric Ltd. (ATCO) including a direction to submit, for

¹ The *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2, the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16, the Regulations made thereunder, and Alberta Utilities Commission Rule 007 (AUC Rule 007).

² Decision 29307-D01-2026: UK Solar East Ltd. and UK Solar West Ltd. Oyen 1 and Oyen 2 Solar Projects, January 9, 2026.

³ For information purposes, refer to note iv of Part C of this Application for more information on the AESO Connection Process.

⁴ For information purposes, some of the legislative provisions relating to the AESO's planning duties and duty to provide system access service are referenced in notes i and ii of Part C of this Application.

⁵ Note v of Part C of this Application describes the Application scope in more detail.

Commission approval under the *Hydro and Electric Energy Act* (HEEA), a Facility Proposal for the Proposed ATCO Development, as defined in Section 2.2.⁶

2 Need Overview and Proposed Transmission Development

2.1 Duty to Provide Transmission System Access Service

The AESO, pursuant to its responsibilities under Section 29 of the Act, must provide system access service on the transmission system in a manner that gives all market participants a reasonable opportunity to exchange electric energy and ancillary services.

The AESO, in consultation with the market participant and ATCO, has determined that the Proposed Transmission Development is the preferred option to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In accordance with Section 34 of the Act, the AESO has determined that the Proposed Transmission Development will result in an expansion or enhancement of the capability of the transmission system thereby establishing the need for this Application. The market participant has made the appropriate applications to the AESO to obtain transmission system access service.

Through the AESO Connection Process, the AESO, in consultation with the market participant and ATCO, has determined the Proposed Transmission Development and has assessed the impacts that the Proposed Transmission Development and the associated generation would have on the Alberta interconnected electric system.

2.2 Proposed Transmission Development

The Proposed Transmission Development, as shown in Figure 2-1, involves the following elements:⁷

- Add a switching substation, to be designated as North Lanfine 1119S, including three 240 kV circuit breakers, connected to the existing 240 kV transmission line 9L46 (between Lanfine 959S and Pemukan 932S substations) using an in-and-out configuration;
- Add one 240 kV circuit, approximately 3 km in length with a minimum capacity of 180 MVA, to connect the Facility to the North Lanfine 1119S substation;⁸ and
- Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.

⁶ The directions are described in more detail in the following sections of this Application and in Part C, note vi.

⁷ Details and configuration of equipment required for the Proposed Transmission Development are more specifically described in the AESO's Functional Specification included in ATCO's Facility Proposal. Also, further details will be determined as detailed engineering progresses and the market participant's operating requirements are finalized. Routing and/or siting of transmission facilities do not form part of this Application and are addressed in ATCO's Facility Proposal. Line numbering and substation names provided here are for ease of reference and are subject to change as engineering and design progresses. The market participant's facilities that may subsequently be connected to the Proposed Transmission Development are the responsibility of the market participant and are not included in the Application.

⁸ The 240 kV circuit will connect the market participant's proposed Robin 1135S substation, which is part of the Facility. Through detailed routing and siting activities the TFO has estimated that the 240 kV circuit will have a length of approximately 3 kilometres. This is subject to change as routing and/or siting is finalized by the TFO.

Alternative 1a - T-tap connection to the 240 kV transmission line 9L46 - This alternative involves adding one 240 kV circuit, approximately 2 km in length, to connect the Facility to the existing transmission line in a T-tap configuration.

Alternative 1a was ruled out as this connection was offered to another project more advanced in the AESO connection process (P1567 EDPR Sharp Hills Wind Farm). Therefore, adding an additional tap onto 9L46 to connect the Facility would create a 4-terminal configuration. Four terminals on a transmission line can pose potential protection coordination challenges and may result in adverse impacts on system stability and reliability. This configuration negatively impacts transmission and generation facility reliability and can result in an increased probability of forced and planned outages on these facilities. These risks are exacerbated with the unavailability of validated hardware and lack of field and operational experience by the TFOs to implement four-terminal protection schemes.¹¹

Alternative 2a - T-tap connection to the 240 kV transmission line 9L24 - This alternative involves adding one 240 kV circuit, approximately 11.5 km in length, to connect the Facility to the existing transmission line 9L46 in a T-tap configuration.

Alternative 2a was ruled out as the connection was offered to another project more advanced in the AESO connection process (P2464 Sunnynook Solar Battery). Similar to Alternative 1a, adding an additional tap onto 9L24 to connect the Facility would create a 4-terminal configuration and was ruled out for the same rationale. In addition, the connection involves increased transmission development, and hence overall increased cost and environment and land use impacts, compared to the Proposed Transmission Development.

Alternative 2b - In-and-Out connection to the existing 240 kV transmission line 9L24 - This alternative involves adding a switching substation, including three 240 kV circuit breakers, connected to the existing 240 kV transmission line 9L24 using an in-and-out configuration. Alternative 2b also requires adding one 240 kV circuit, approximately 11.5 km in length, to connect the Facility to the switching substation.

Alternative 2b was ruled out as the connection involves increased transmission development, and hence overall increased cost and environment and land use impacts, compared to the Proposed Transmission Development.

Alternative 3 - Radial connection to the existing 240 kV Lanfine 959S substation - This alternative involves adding one 240 kV circuit, approximately 12 km in length, to connect the Facility to the Lanfine 959S substation, and adding one 240 kV circuit breaker to the Lanfine 959S substation.

Alternative 3 was ruled out as the connection involves increased transmission development, and hence overall increased cost and environment and land use impacts, compared to the Proposed Transmission Development.

2.5 Connection Assessment

Central Cluster

A total of eighteen new generation and energy storage projects were studied in the Central Cluster which included the Oyen 2 Solar Project Connection.

Power flow, transient stability, voltage stability and short-circuit studies, were conducted to assess the impact that the Central Cluster would have on the transmission system. Power flow and short-circuit studies were

¹¹ More information regarding 4-terminal configurations is available in Exhibit 30668-X0001.

conducted for both the pre-Cluster and post-Cluster scenarios. Transient and voltage stability studies were performed for post-Cluster scenarios.¹²

Post-Cluster Assessment Results

All of the pre-cluster thermal criteria violations were exacerbated in the post-Cluster scenarios under Category A and Category B conditions. Transient stability criteria violations were observed under Category B conditions.

Mitigation Measures

The Category A thermal criteria violations observed in post-Cluster scenarios can be managed by applying Section 302.1 of the ISO rules, *Real-Time Transmission Constraint Management* (TCM Rule) to curtail generation. The need for system developments to address these thermal criteria violations will be assessed according to the forthcoming Optimal Transmission Planning (OTP) framework.¹³

Real-time operational practices and the modification of RAS 201 can be used to mitigate the post-connection thermal criteria violations observed under certain Category B conditions. The total amount of generation tied to modified RAS 201 is expected to exceed the AESO Maximum Severe Single Contingency (MSSC) limit of 466 MW. Therefore, pre-contingency generation curtailment under the Category A condition may be required using real-time operational practices to prevent generation curtailment above the MSSC limit during Category B conditions. New RASs and reduced fault clearing times can be used to mitigate the transient stability violations observed under Category B conditions.

2.6 Transmission Dependencies

The Proposed Transmission Development does not require the completion of any other AESO plans to expand or enhance the capability of the transmission system prior to connection.

2.7 AESO Participant Involvement Program

The AESO directed ATCO to assist the AESO in conducting the AESO's participant involvement program (PIP).

Between January 2026 and April 2026, ATCO and the AESO used various methods to notify stakeholders about the need for development and the AESO's preferred option to respond to the system access service request. This included a notification to market participants within the Central Cluster Region that may be affected by the Proposed Transmission Development. No concerns or objections were raised regarding the need for the Proposed Transmission Development or the AESO's preferred option to respond to the system access service request.¹⁴

2.8 Environmental and Land Use Effects

ATCO has advised that the Proposed Transmission Development is not expected to result in significant environmental effects.

2.9 Approval is in the Public Interest

Having regard to the following:

- the transmission planning duties of the AESO as described in Sections 29, 33 and 34 of the Act;

¹² The Detailed Assessment Report is included as Appendix B.

¹³ More information about Optimal Transmission Planning (OTP) is available on the AESO Engage website.

¹⁴ Further information regarding the AESO's PIP for this Application is included in Appendix D.

- the market participant request for system access service and the AESO's assessment thereof;
- the AESO's project connection assessment;
- the AESO's detailed assessment of the Central cluster region;
- the cost estimate provided by ATCO;
- ATCO's assessment of environmental and land use effects;
- confirmation from ATCO that no significant environmental effects are expected;
- information obtained from AESO PIP activities; and
- the AESO's long-term transmission system plans;

it is the conclusion of the AESO that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. In consideration of these factors, the AESO submits that approval of this Application is in the public interest.

3 Request to Combine this Application with the Facility Proposal for Consideration in a Single Process

3.1 Facility Proposal

Pursuant to Subsection 35(1) of the Act, the AESO has directed ATCO to prepare a Facility Proposal corresponding with this Application.

The AESO understands that the ATCO Facility Proposal will be filed shortly.¹⁵ The AESO requests, and expects ATCO will request, that this Application be combined with the Facility Proposal for consideration by the Commission in a single process. This request is consistent with Section 15.4 of the HEAA and Section 7.1 of AUC Rule 007.

3.2 Purpose

While it is believed that this Application and the Facility Proposal will be materially consistent, the AESO respectfully requests that in its consideration of each, the Commission be mindful of the fact that the documents have been prepared separately and for different purposes. The purpose of this Application is to obtain approval of the need to respond to the market participant's request for system access service and provide a preliminary description of the manner proposed to meet that need, having regard for the AESO's determination that the Proposed Transmission Development is required to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In contrast, the Facility Proposal will contain more detailed engineering and designs for the Proposed Transmission Development and seek approval for the construction and operation of specific facilities.

¹⁵ The AESO understands that ATCO intends to file a Facility Proposal relating to this Application to be titled *Oyen Solar West Transmission Project*.

4 Relief Requested

4.1 Approval is in the Public Interest

The AESO submits that its assessment of the need to meet the market participant's request for system access service is technically complete and that approval is in the public interest.

4.2 Request

For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application, including issuing an approval of the need to respond to the market participant's request for system access service, and to connect the Facility to the transmission system, by means of the following transmission development:

- A. Add a switching substation, designated as North Lanfine 1119S, including three 240kV circuit breakers; connected to the existing 240kV transmission line 9L46 using an in-and-out configuration;
- B. Add one 240 kV circuit to connect the Facility to North Lanfine 1119S; and
- C. Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.

All of which is respectfully submitted this 28th day of July, 2026.

Alberta Electric System Operator

"Electronically Submitted by"

Pravin Koshti, P.Eng., PMP
Director, Customer Access and Project Engineering

PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A).

APPENDIX A **Project Connection Assessment** – Appendix A contains the AESO *Project Connection Assessment – P2758 Oyen 2 Solar Project* that summarizes the AESO's assessment of connection alternatives, the rationale for selection of the preferred connection alternative, and any required project specific mitigation measures.

APPENDIX B **Detailed Assessment Report** – Appendix B contains the AESO *Detailed Assessment Report – Central Cluster* that summarizes the results of the connection studies that were completed by the AESO to assess the impact of all the projects in the Central cluster region on the performance of the Alberta Interconnected Electric System.

APPENDIX C **Capital Cost Estimate** – Appendix C contains a detailed cost estimate prepared by ATCO corresponding to the Proposed Transmission Development. The estimate for the Proposed Transmission Development is to an accuracy level of +20%/-10% which exceeds the accuracy required by AUC Rule 007, Section 7.1.2, NID 11.

APPENDIX D **AESO PIP** – Appendix D contains a summary of the PIP activities conducted, in accordance with requirements of NID12 and Appendix A2 of AUC Rule 007, regarding the need to respond to the market participant's request for system access service. Copies of the relevant materials distributed during the PIP are attached for reference.

PART C – REFERENCES

- i. **AESO Planning Duties and Responsibilities** – Certain aspects of the AESO's duties and responsibilities with respect to planning the transmission system are described in the Act. For example, Section 17, Subsections (g), (h), (i), and (j), describe the general planning duties of the AESO.¹⁶ Section 33 of the Act states that the AESO "must forecast the needs of Alberta and develop plans for the transmission system to provide efficient, reliable, and non-discriminatory system access service and the timely implementation of required transmission system expansions and enhancements." Where, as in this case, the market participant (refer to note ii below) is requesting system access service, and the AESO has determined that the request requires or may require the expansion or enhancement of the capability of the transmission system, the AESO must prepare and submit for Commission approval, as per Section 34(1)(c), a needs identification document that describes the need to respond to requests for system access service, including the assessments undertaken by the AESO regarding the manner proposed to address that need. Other aspects of the AESO's transmission planning duties and responsibilities are set out in Sections 8, 10, 11, and 15 of the *Transmission Regulation*.
- ii. **Duty to Provide Transmission System Access** – Section 29 of the Act states that the AESO "must provide system access service on the transmission system in a manner that (a) subject to clause (b), gives all electricity market participants [UK Solar West Ltd.] wishing to exchange electric energy and ancillary services a reasonable opportunity to do so."
- iii. **AESO Transmission Planning Criteria** – In accordance with the Act, the AESO is required to plan a transmission system that satisfies applicable reliability standards. Transmission Planning (TPL) standards are included in the Alberta Reliability Standards, and are generally described on the AESO website.

In addition, the AESO's *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix B.

- iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described on the AESO website.
- v. **Application for Approval of the Need to Respond to a Request for System Access Service** – This Application is directed solely to the question of the need to respond to a request for system access service, as more fully described in the Act and the *Transmission Regulation* and the AESO's determination of the manner in which to respond to the request. This Application does not seek approval of those aspects of transmission development that are managed and executed separately from the needs identification document approval process. Other aspects of the AESO's responsibilities regarding transmission development are managed under the appropriate processes, including the ISO rules, Alberta reliability standards and the ISO tariff, which are also subject to specific regulatory approvals. While the Application or its supporting appendices may refer to other processes or information from time to time, the inclusion of this information is for context and reference only.

Any reference within the Application to market participants or other parties and/or the facilities they may own and operate or may wish to own and operate, does not constitute an application for approval of

¹⁶ The legislation and regulations refer to the Independent System Operator or ISO. "AESO" and "Alberta Electric System Operator" are the registered trade names of the Independent System Operator.

such facilities. The responsibility for seeking such regulatory or other approval remains the responsibility of the market participants or other parties.

- vi. **Directions to TFO** – Pursuant to Subsection 35(1) of the Act, the AESO has directed ATCO, in its capacity as a legal owner of transmission facilities, in whose service territories the need is located, to prepare a Facility Proposal to meet the need identified. The Facility Proposal is also submitted to the Commission for approval. The AESO has also directed ATCO, pursuant to Section 39 of the Act and Section 14 of the *Transmission Regulation*, to assist in the preparation of the AESO's Application. ATCO has also been directed by the AESO under Section 39 of the Act to prepare a service proposal to address the need for the Proposed Transmission Development.
- vii. **Capital Cost Estimate** – The provision of capital cost estimates in the Application is for the purposes of relative comparison and context only. The requirements applicable to cost estimates that are used for transmission system planning purposes are set out in Section 25 of the *Transmission Regulation*, AUC Rule 007, and Section 504.5 of the ISO rules, *Service Proposals and Cost Estimating*.