

## Genesee Generating Station Carbon Capture Project



### Carbon Capture Project Specific Information Package

## The heart of Alberta's decarbonized future

Located west of Edmonton, Capital Power's Genesee Generating Station has provided reliable baseload generation for decades. Today, the facility is being transformed. Genesee 1 and 2 are being repowered to use best-in-class combined cycle natural gas technology and we are exploring carbon capture technology to reduce emissions and optimize the facility to provide flexible, dispatchable power for decades to come. Genesee 3 is being converted from supercritical coal technology to operate exclusively on natural gas and will also continue to provide reliable and competitive electricity to Alberta's grid.

***The carbon capture project (CCP) is anticipated to start capturing carbon as early as 2027 – capturing 95% of the CO<sub>2</sub> emitted from the two repowered units. This will position Genesee 1 and 2 amongst the cleanest baseload thermal generation facilities in the world.***

## Genesee Carbon Capture Project Overview

Capital Power has partnered with Mitsubishi Heavy Industries Group (“MHI”) and Kiewit Energy Group (“Kiewit”) on a front-end engineering and design (FEED) study for the carbon capture facility. The project will capture CO<sub>2</sub> from the flue gas of Genesee 1 and 2 using MHI’s proven Advanced Kansai Mitsubishi Carbon Dioxide Recovery Process™.



On December 1, 2022, Capital Power announced it is moving to limited notice to proceed (LNTF) for the \$2.3 billion project with a final investment decision expected by the third quarter of 2023. The decision to move to LNTF reflects the positive interim results from the FEED study and continued progress on the programs the Alberta and Federal governments have taken to encourage and accelerate deployment of carbon capture technology. The Project is anticipated to start capturing carbon as early as 2027.

***Together the transformation underway at the Genesee Generating Station will make the facility a near-zero emitting source of reliable energy and support for system services on Alberta’s grid that will be essential as renewable generation levels continue to increase.***



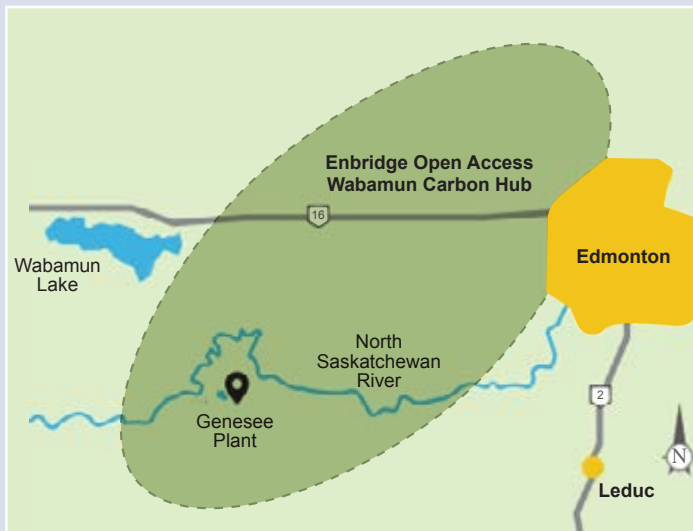
In July 2022, the project was awarded \$5 million in funding from the Government of Alberta through Emissions Reduction Alberta.





## Enbridge Open Access Wabamun Carbon Hub

Separately, Enbridge is responsible for the transportation and storage of the captured CO<sub>2</sub> from Genesee 1 and 2. The captured CO<sub>2</sub> will be safely transported via an underground pipeline and injected deep underground. Here it will be permanently sequestered (stored) in the Enbridge Open Access Wabamun Carbon Hub (the “Hub”), located in the vicinity of the Genesee Generating Station in Leduc County, with injection wells anticipated to be within 10 to 20 km from Genesee.



**Carbon capture and sequestration is the process of capturing carbon dioxide (CO<sub>2</sub>), so it's not emitted into the atmosphere. The captured CO<sub>2</sub> will be transported via a pipeline and injected deep underground for permanent sequestration.**

The Hub project was awarded rights in early 2022 as part of the Alberta Government's Carbon Capture and Sequestration (CCS) hub process. Enbridge has partnered with industrial emitters like Capital Power and Lehigh Cement to utilize their Hub.

***Capital Power and Enbridge are responsible for separate and distinct regulatory approvals for their respective projects.***

Enbridge has also partnered with Alexander First Nation, Alexis Nakota Sioux Nation, Enoch Cree Nation, Paul First Nation and the Lac Ste. Anne Métis Community Association to ensure that local Indigenous communities in Alberta have an ownership stake in the Enbridge project. Capital Power is also committed to Indigenous participation for the carbon capture project.



For more information about Enbridge's project, including its application:

**1-888-967-3899 (toll free)**  
**projects@enbridge.com**



## Carbon Capture Project Location



The equipment for the carbon capture project will be located on an approximately 10-acre brownfield site (previously developed land) on the south-side of Capital Power's existing Genesee Generating Station in an area where the coal and ash handling equipment are located. Some of this equipment will be retired and dismantled because it will no longer be needed following the transition from coal.

Genesee is located approximately 50 km west of Edmonton (Section 25, Township 50, Range 3, west of the 5th Meridian) within Leduc County.

Capital Power will own, operate and maintain the carbon capture equipment located inside the existing boundaries "inside the fence" of the Genesee Generating Station.

### Major new equipment to be installed and integrated for each of Genesee 1 and 2:

- Flue gas quencher
- Carbon capture absorber vessel
- Regeneration unit
- CO<sub>2</sub> compression and dehydration units
- Intake and outfall cooling water structure and pipelines
- CO<sub>2</sub> offtake pipeline (to fence line)

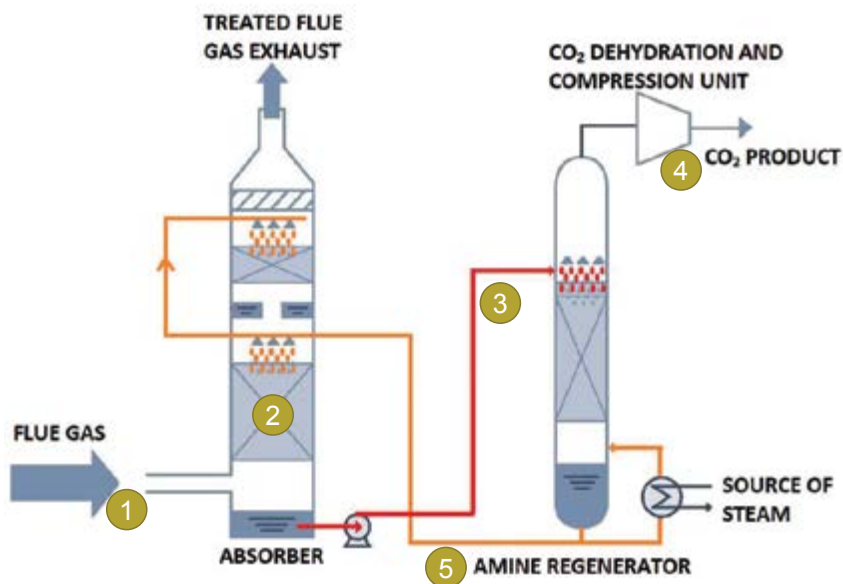
### Existing Genesee 1 and 2 equipment to be reused:

- Circulating water system (Cooling Pond)
- Water treatment facilities and make-up water system

### Existing Genesee 1 and 2 equipment to be retired and dismantled:

- Coal and ash handling equipment
- Coal storage and processing (coal house, crushers and conveyor)
- Fly ash silos and conveyors

## Simplified Post-Combustion Carbon Capture Flow Diagram



1. Flue gas from Genesee Units 1 & 2 stack is circulated through down-flowing amine solution
2. Proprietary amine solvent absorbs CO<sub>2</sub> from flue gas
3. Amine solvent returns to regenerator and uses heat from steam to release absorbed CO<sub>2</sub>
4. CO<sub>2</sub> is dehydrated and compressed to pipeline
5. Amine solvent returns to capture more CO<sub>2</sub> from flue gas



Capital Power and Enbridge are responsible for separate and distinct regulatory approvals for their respective projects.



**~3 million tonnes of CO<sub>2</sub> annually**

Located entirely within the footprint of the existing Genesee operation, the carbon capture project is expected to capture up to approximately 3 million tonnes of CO<sub>2</sub> annually and is a significant step forward to meet our net-zero by 2045 target.

## Environmental and Noise Impact Assessments

Capital Power has retained WSP to complete environmental engineering work and assist in preparing the environmental approval applications. Their work will include conducting required air modeling, wildlife monitoring, fisheries assessment and water quality (chemical and thermal) modelling.

### Environmental Surveys/Studies

Terrestrial baseline studies, including wetland, soils inventories and wildlife assessments were undertaken in 2022. The information was used to locate infrastructure, so that no wetlands would be impacted by the project. Given that the project's footprint is within an industrial brownfield site with no identified sensitive habitat, the project poses no impact to wildlife.

Preliminary air modeling work indicates that the emission profile from the carbon capture project will meet the Alberta Ambient Air Quality Objective guidelines for nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ammonia (NH<sub>3</sub>), and aldehydes.

### Noise

WSP is also preparing a Noise Impact Assessment (NIA) according to the requirements of *AUC Rule 012 – Noise Control* that will be submitted as part of Capital Power's application to the Alberta Utilities Commission (AUC). *AUC Rule 012* requires that potential noise impacts be assessed at receptors corresponding to dwellings located within 1.5 km of the Project. With the addition of the carbon capture equipment, the operations at Genesee will remain compliant with *AUC Rule 012* at all receptors.

*AUC Rule 012* permissible sound levels (PSLs) at occupied dwellings in the project area are:

 **40 dBA Leq**  
AT NIGHTTIME

 **50 dBA Leq**  
AT DAYTIME

dBA = A-weighted decibel level  
Leq = Equivalent continuous sound level

As an example, 40 dBA equates to a library or refrigerator and 50 dBA equates to a conversation in a home or washing machine.

## Environmental Performance

- Reduce CO<sub>2</sub> emissions up to approximately 3 million tonnes annually, which is equivalent to taking approximately 650,000 passenger vehicles off the road.
- Utilizing the existing brownfield site.

## Regulatory Requirements

Capital Power anticipates submitting regulatory applications for the CCP in the first half of 2023. Separate applications will be filed to amend the existing approvals for Genesee 1 and 2 to Alberta Environment and Protected Areas (formerly Alberta Environment and Parks) and the Alberta Utilities Commission (AUC). Prior to construction, we will also apply to Leduc County for building and other development permits. Pending regulatory approval, we expect construction to begin in Q2 2024, with an anticipated in-service date in late Q4 2027.

The Project will utilize the existing industrial cooling pond and there is no anticipated need for additional water draw from the North Saskatchewan River outside what is currently permitted for the Genesee Generating Station. Should a change to the existing *Water Act* (Diversion Licence) approval be needed, supporting applications would be developed.

Over the next several months, Capital Power will provide opportunities for stakeholders to learn more about the proposed CCP, share their feedback, have opportunities to be heard and provide input and ask questions to the project team in-person, by telephone or email, and at community open houses, or other forums as needed.



If you have any questions, or comments about the proposed carbon capture project we want to hear from you. Please contact us at [canadadevelopment@capitalpower.com](mailto:canadadevelopment@capitalpower.com) or 1-855-703-5005.

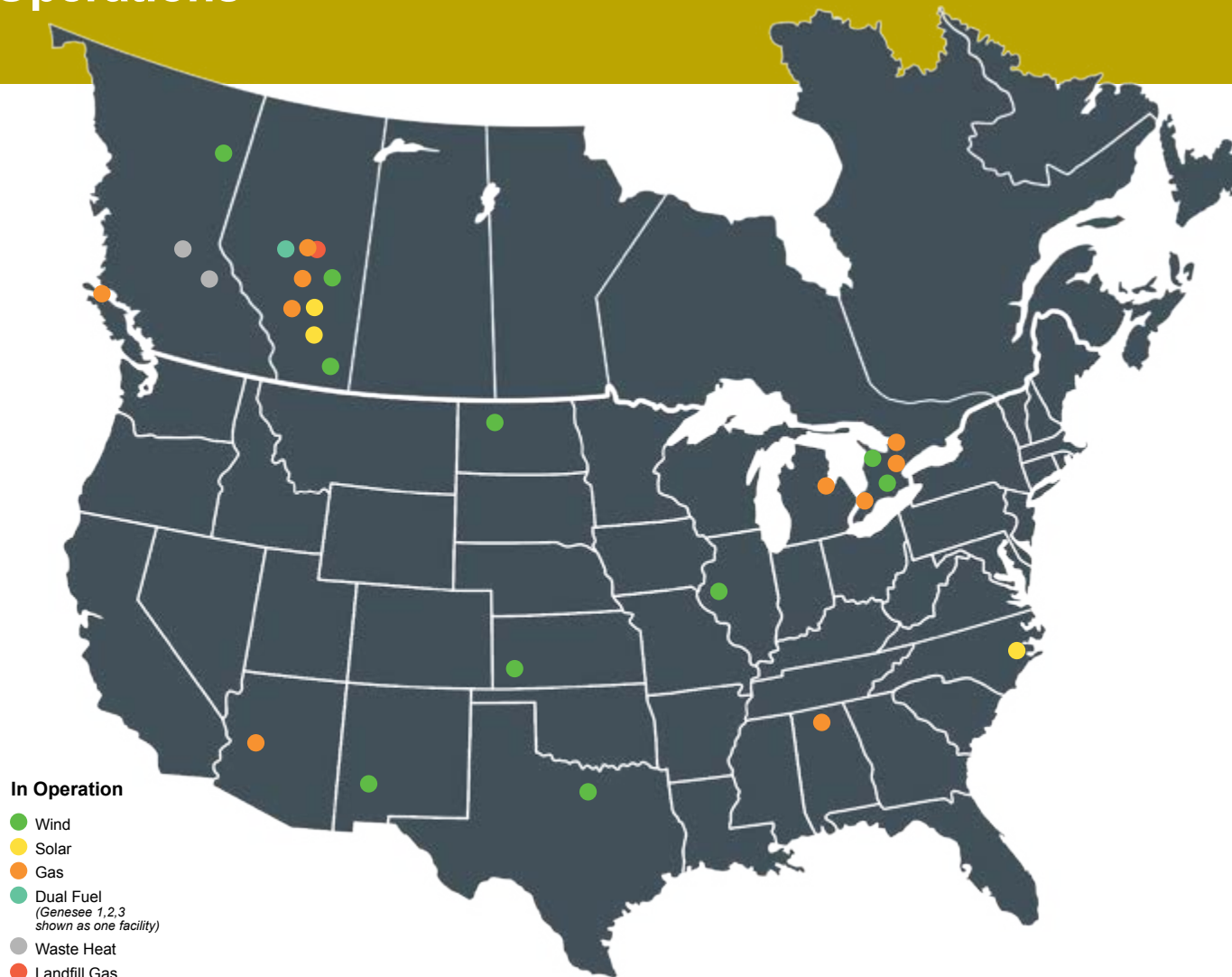
## Proposed Project Schedule

Activity	Timing <sup>1</sup>
Engineering/Project Design	Q2 2021 to Q2 2025
Stakeholder engagement and consultation	Ongoing throughout
Complete and submit Alberta Environment and Protected Areas Environmental Protection and Enhancement Act (EPEA) amendment application	Q1 2023
Complete and submit Alberta Utilities Commission(AUC) amendment application	Q2 2023
Front End Engineering and Design (FEED) study complete	Q3 2023
Procurement of major equipment	Q3 2023 to Q2 2024
County permits	Q1/Q2 2024
Target for construction to begin	Q2 2024
Commissioning	Q3/Q4 2027
Anticipated commercial operations date (COD)	Late Q4 2027

<sup>1</sup> Anticipated schedule, pending regulatory approval and final investment decision.



## Our Operations



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### ESG Performance Reporting

We are committed to sharing transparent, accurate and detailed reports on our financial, environmental, social and governance performance. You can view our Integrated Report, Climate Change Disclosure Reports and sustainability reports on our website:

[www.capitalpower.com/sustainability/sustainabilityreports](http://www.capitalpower.com/sustainability/sustainabilityreports)



[www.capitalpower.com](http://www.capitalpower.com)







## Participating in the AUC's independent review process to consider facility applications

[www.auc.ab.ca](http://www.auc.ab.ca)

### The AUC regulatory review process to consider facility applications for utility projects



The AUC uses an established process to review social, economic and environmental impacts of facility projects to decide if approval of a project is in the public interest.

The AUC considers applications requesting approval of the need for transmission development and facilities applications seeking approval to construct, operate, alter and decommission electric and natural gas facilities. Applications, as specified in AUC Rule 007, are required for:

- The need for transmission upgrades.
- The route and location of transmission facilities.
- The siting of power plants.
- The construction of a battery storage system.
- The designation of an industrial system.
- The need for and siting of natural gas utility pipelines.

Sometimes the Alberta Electric System Operator's needs identification document application is considered together with a facility application in a single proceeding; sometimes separate proceedings are held to consider each application.

### Application review process



Step 1: Public consultation prior to applying to the AUC

Step 2: Application filed to the AUC

Step 3: Public notice

Step 4: Public submissions to the AUC

Step 5: Consultation and negotiation

Step 6: The public hearing process

Step 7: The decision

Step 8: Opportunity to appeal

Step 9: Construction, operation and compliance

### Application review process

#### Step 1: Public consultation prior to applying to the AUC



An applicant seeking approval of a proposed utility development project is required to engage in a participant involvement program prior to filing an application with the AUC. The public involvement program involves consultation with persons whose rights may be directly and adversely affected by the proposed project so that concerns may be raised, addressed and, if possible, resolved.

The application guidelines and requirements for facility applications can be found in AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines*.

Potentially affected parties are strongly encouraged to participate in the public consultation, also called a participant involvement program. Early, active and ongoing discussions with an applicant may lead to greater influence on project planning and what is submitted to the AUC for approval.

#### Step 2: Application filed to the AUC



When the applicant has concluded its consultation with potentially affected parties and the participant involvement requirements have been completed, the applicant files its application through the AUC online public filing system, called the eFiling System.


AUC staff members review each application submitted to verify that all of the application requirements in Rule 007 have been met before an application is deemed complete. If all of the required information is not provided, the application may be closed or missing information will be requested of the applicant. Rule 007 specifies, among other requirements, that applicants must submit the results of a public involvement program in its application that includes information about how applicants consulted and notified stakeholders and Indigenous groups and identifies any unresolved objections and concerns about the project.

#### Step 3: Public notice



When the AUC receives an application it is assigned a proceeding number and the AUC generally mails a notice of application directly to those who live, operate a business or occupy land in the project area who may be directly and adversely affected if the AUC approves the application. The notice initiates the opportunity for formal intervention in the proceeding to consider an application or applications. The notice of application will also set out important dates and information about where to find the application and other items being considered. The five-digit eFiling System proceeding number in the notice is the most efficient way to find information about a proposed project through the AUC website.

#### Step 4: Public submissions to the AUC



Prior to the submission deadline provided in the notice, formal submissions of outstanding concerns and unresolved objections about a project may be submitted to the AUC. To submit a concern, participants will need to register to participate in the proceeding, which involves providing a brief written statement called a statement of intent to participate. Submissions are filed electronically through the eFiling System. The information filed becomes part of the public record and is an important part of the process to ensure that outstanding concerns are heard, understood and considered.

The AUC uses the information gathered through statement of intent to participate submissions to decide whether to hold a hearing on the application(s). The AUC must hold a hearing if a concerned person can demonstrate that they have rights that may be directly or adversely affected by the AUC's decision on the application. Such a person is said to have standing before the AUC. If the AUC decides to hold a hearing, the AUC will provide further opportunities for participants with standing to ask the applicant questions on the public record and present their position on the application either in writing or in person. Hearings may

be held in writing, in person or virtually through web-conference software.

### AUC eFiling System

The eFiling System is the online tool that the AUC uses to manage applications and submissions in its proceeding-based review. The eFiling System gives access to all public documents associated with an application. The system is also used to submit your concerns and provide input to the AUC and can be used to monitor related proceeding filings. Those who do not have access to the internet can send submissions, evidence and other material by mail and the AUC will upload the submission on their behalf.

### Step 5: Consultation and negotiation (if applicable)



The AUC supports efforts to reach a mutually agreeable outcome among the applicant and affected parties. The AUC encourages the applicant and those who have filed a statement of intent to participate to continue to attempt to resolve any outstanding issues. If all concerns can be satisfactorily resolved this may eliminate the need for a formal hearing. However, if there continues to be unresolved issues, those matters will typically be addressed in an AUC hearing.

### Step 6: The public hearing process



The AUC will issue a notice of hearing if a person with standing continues to have legitimate unresolved concerns with the application. The notice of hearing will provide a hearing date and location, or specify if the hearing will be held in writing or virtually. When the AUC holds a public hearing, registered parties are given the opportunity to express their views directly to a panel of Commission members. Any member of the public can listen to an in-person or virtual oral hearing. An oral public hearing operates similar to a court proceeding.

Participants in a hearing can either represent themselves or be represented by a lawyer. In addition, participants may hire experts to assist in preparing and presenting evidence to support their position.

### Cost assistance



A person determined by the AUC to have standing or a local intervener can apply for reimbursement of reasonable costs. Those who hire a lawyer or technical experts must be aware that while reimbursement for the costs of legal and technical assistance is available under AUC Rule 009: *Rules on Local Intervener Costs*, recovery of costs is subject to the AUC’s assessment of the value of the contribution provided by the lawyer and technical experts in assisting the AUC to understand the specifics of the case. It is also subject to the AUC’s published scale of costs.

People with similar interests and positions are expected and encouraged to work together to ensure that expenditures for legal or technical assistance are minimized and costs are not duplicated.

### Step 7: The decision



The AUC’s goal is to issue its written decision no more than 90 days after the close of record. The AUC can approve, or deny an application and can also make its approval conditional upon terms or conditions. AUC decisions are publicly available through the AUC website at [www.auc.ab.ca](http://www.auc.ab.ca).

### Step 8: Opportunity to appeal



An applicant or participant in a proceeding may formally ask the Court of Appeal of Alberta for permission to appeal an AUC decision. An application for permission to appeal must be filed within 30 days from the date the decision is issued.

An applicant or participant in a proceeding can also ask the AUC to review its decision. An application to review a decision must be filed within 60 days from the date the decision is issued and satisfy the limited grounds described in AUC Rule 016: *Review of Commission Decisions*.

### Step 9: Construction, operation and compliance



An applicant that receives approval to build and operate a facility from the AUC is expected to follow through on any commitments it has made to parties and must adhere to any conditions that were set out in that approval. If concerns about compliance with approval conditions and post-construction operations cannot be resolved with the applicant, they can be brought to the AUC’s attention for consideration. The AUC has significant compliance and enforcement powers for all approved applications. Additional information is available on the AUC website.

The Alberta Utilities Commission is an independent, quasi-judicial agency of the government of Alberta that ensures the delivery of Alberta’s utility services take place in a manner that is fair, responsible and in the public interest.

We are committed to ensuring that Albertans whose rights may be directly and adversely affected by a utility development project are informed of the application and have the opportunity to have their concerns heard, understood and considered.



### Contact us

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