

# Genesee Carbon Conversion Centre (GC<sup>3</sup>) Project



## Project Information

Capital Power is involved in the global transition to a low-carbon energy future and is proudly supporting and advancing the deployment of carbon conversion technology.

*Capital Power is seeking regulatory approval to build the Genesee Carbon Conversion Centre (GC<sup>3</sup>), a commercial scale production facility of carbon nanotubes (CNTs). GC<sup>3</sup> will be located at our Genesee Generating Station.*

Announced in December 2019, Capital Power is progressing its plans to construct a carbon capture and conversion facility known as the Genesee Carbon Conversion Centre (GC<sup>3</sup>) (the Project). GC<sup>3</sup> will use innovative technology developed by C2CNT LLC to capture carbon dioxide (CO<sub>2</sub>) from the flue gas at Genesee Unit 3 and through an electrolysis process, create high-quality carbon nanotubes (CNTs).

*C2CNT is currently among five finalists competing in the natural gas track of the NRG COSIA Carbon XPRIZE competition. As part of the XPRIZE competition, C2CNT is testing their technology at demonstration scale at the Alberta Carbon Conversion Technology Centre located in Calgary at the Shepard Energy Centre (co-owned by Capital Power and ENMAX).*

GC<sup>3</sup> will have an initial production capacity of 2,500 tonnes of CNTs per year and once completed will be capable of generating 7,500 tonnes annually. At full scale, the Project is expected to consume 30,000 tonnes of CO<sub>2</sub> per year for use in CNT production (four tonnes of CO<sub>2</sub> are required to produce one tonne of CNTs).

## We encourage and welcome your feedback.

We will be applying to the Alberta Utilities Commission (AUC) in Q1 2021 for approval to construct and operate GC<sup>3</sup>. Your feedback is important.

To learn more about the AUC application and review process, please consult the AUC's public involvement brochure (attached) or visit [www.auc.ab.ca](http://www.auc.ab.ca).

***If you have any questions, comments or concerns, we want to hear from you. Please contact us anytime by one of the methods listed on the on the last page (pg.6) of this newsletter.***

## What are CNTs?

Carbon nanotubes or CNTs are stronger than steel and lighter than aluminum. They are a highly valuable product that provide improved properties of tensile strength and electrical conductivity when used as an additive. CNTs can be used in multiple applications such as structural materials (cement, steel), batteries (Li-Ion), polymers and more. Capital Power's inaugural application of CNTs is focused on concrete. In addition to improving the strength properties, using CNTs reduces the volume of cement required. The production of cement is an intensive carbon emitting process.

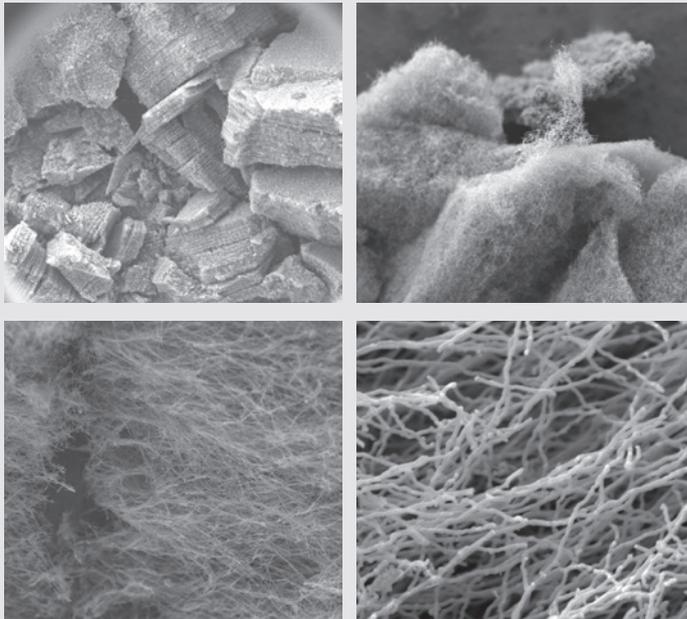
### Carbon Nanotubes

**Stronger**

than Fe (steel)

**Lighter**

than Al (aluminum)



### Using carbon nanotubes displaces CO<sub>2</sub> emissions in two ways:

1. The carbon capture process reduces power generation emissions at source and then transforms the carbon emissions into carbon nanotubes.
2. By using carbon nanotubes as an additive in applications such as industrial processes (e.g. manufacturing concrete or steel) it reduces the amount of carbon-intensive materials needed to deliver the product. For example, it has been estimated that for every tonne of CNT used in cement, 840 tonnes of CO<sub>2</sub> is avoided.

Carbon nanotubes as viewed at varying magnification levels.

## Project Location

GC<sup>3</sup> will be located entirely within the boundaries of the existing Genesee Generating Station, located approximately 50 kilometres west of Edmonton (Section 25, Township 50, Range 3, west of the 5th Meridian) within Leduc County, AB.

Minimal ground disturbance for the Project is expected. The facility will be located immediately east of Genesee Unit 3 where an existing mechanic's shop will be expanded. It will have an overall height of approximately 7.9 metres.

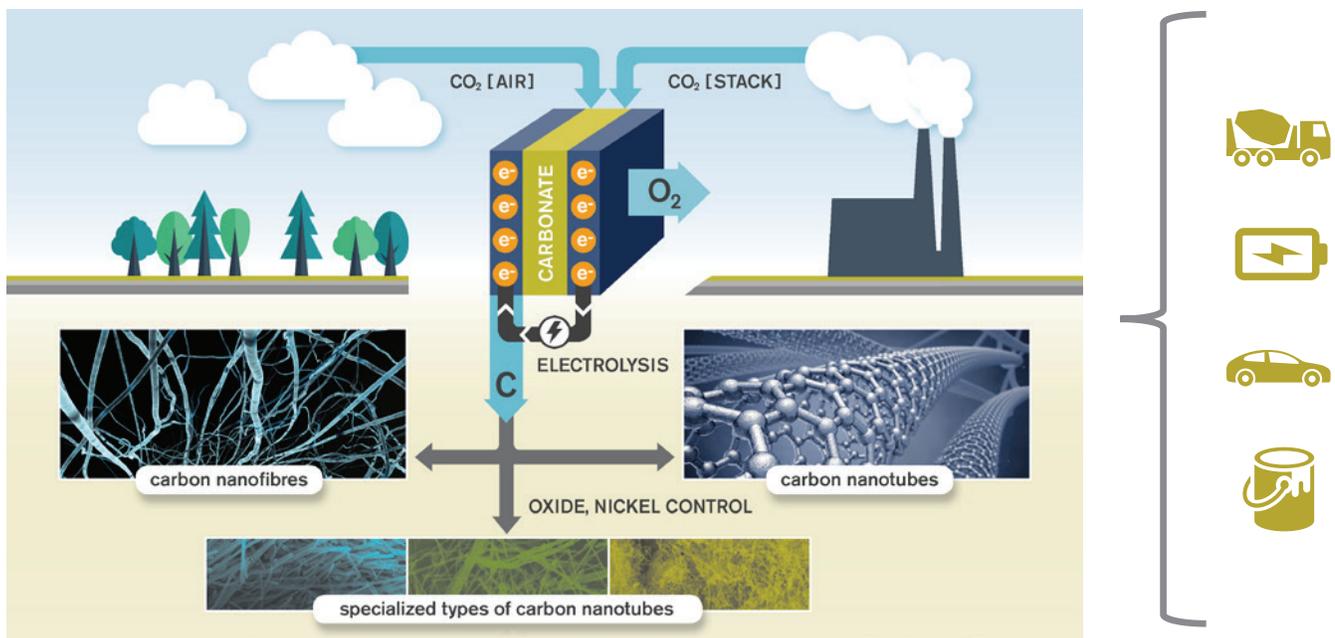


## Carbon Capture Integration to Genesee Unit 3

Carbon capture technology will be integrated into the existing operations of Genesee Unit 3. A new duct from Genesee Unit 3's existing flue gas ductwork will connect to a CO<sub>2</sub> Concentrator. The Concentrator will separate the CO<sub>2</sub> from the waste stream flue gas that currently exits the Unit's stack into the atmosphere.

The concentrated CO<sub>2</sub> will then be sent into an electrolyzer located inside the GC<sup>3</sup> facility where it undergoes an electrolysis process to create the valuable product of CNTs. The CNTs are then extracted and stored, and oxygen (O<sub>2</sub>) generated from the process is released. Although O<sub>2</sub> is released in the initial phase of this Project, it may be captured to optimize processes in future Phases.

## Transforming Carbon Emissions into Leading-Edge Carbon Nanotube Products with C2CNT



## Environmental Approvals

The project has positive environmental benefits as described above. GC<sup>3</sup> will reduce air emissions by capturing CO<sub>2</sub> from Genesee Unit 3 that would otherwise be discharged to the atmosphere and convert the CO<sub>2</sub> into CNTs. The facility itself will result in minor emissions.

Capital Power will obtain all required regulatory approvals prior to constructing and operating the facility. We are in the process of preparing an application to

the AUC to amend Genesee Unit 3's Power Plant Approval. We are also reviewing the project with Alberta Environment and Parks in order to ensure the project meets all *Environmental Protection and Enhancement Act* requirements.

GC<sup>3</sup> will require a limited amount of water use, which will be drawn from Genesee's existing system. No alterations to Genesee's existing water licenses are necessary.

## Proposed Schedule

We anticipate submitting our regulatory application to the Alberta Utilities Commission (AUC) for the Project in Q1 2021.

Prior to construction, we will apply to Leduc County for building and other development permits. Pending a successful outcome of the regulatory review, we expect construction to begin in Q2 2021, with an anticipated in-service date in March 2022.

### Proposed Project Timeline

Activity	Timing
Stakeholder engagement and consultation	Ongoing
Front end engineering and design studies	Complete
Detail engineering	Q1 2021
Equipment procurement	Q1 - Q3 2021
Application to AUC	Q1 2021
Construction	Q2 2021 onward
Operational date	March 2022
CNT production ramp up	2022

## Committed to Health and Safety

Health and safety is a core value and a fundamental principle of how we operate. There are also strict regulations we must meet, and these regulations are in place to protect the environment and public health and safety.

Capital Power is reviewing the occupational safety and environmental risks associated with CNTs and will ensure that all necessary controls are in place. We are also in consultation with the Substances Branch of Environmental and Climate Change Canada to ensure the CNTs are registered and comply with the New Substance requirements of the *Canadian Environmental Protection Act* and the United States Environmental Protection Agency's *Toxic Substance Control Act*.

### Privacy Policy

Capital Power respects your right to privacy. Any personal information Capital Power collects about you, including your name, address, phone number and email address, will only be used to contact you for the purposes of the consultation process. For further information, please see Capital Power's Privacy Policy at [www.capitalpower.com](http://www.capitalpower.com).

### Contact Information

[canadadevelopment@capitalpower.com](mailto:canadadevelopment@capitalpower.com)  
**1-855-703-5005**

### Mailing Address

**Genesee Carbon Conversion Centre Project**  
**C/O Stakeholder Engagement**  
**10th Floor, EPCOR Tower**  
**1200 – 10423 101 St. N.W.**  
**Edmonton, AB T5H 0E9**

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

The Commission supports ongoing efforts to reach an agreeable outcome for the applicant and all affected parties. The Commission encourages the applicant and those who have filed a statement 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 at an AUC hearing.

## Step 6: The public hearing process\*

The AUC will issue a notice of hearing if there continues to be legitimate unresolved concerns with the application. The notice of hearing will provide a hearing date and location in addition to a process schedule. The AUC conducts public hearings in its Edmonton and Calgary hearing rooms and, where suitable venues exist, in communities closer to the proposed project area.

The public hearing process allows persons with standing that have unresolved concerns about the application, to express their views directly to a panel of Commission members.

An AUC hearing is a formal, evidence-based, court-like proceeding. The public can attend the hearing in person or listen to hearings online through the AUC's website.

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 Commission to be 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: *Local Intervener Funding*, recovery of costs is subject to the Commission assessing the value of the

contribution provided by the lawyer and technical experts. People with similar interests and positions are expected 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 application decision no more than 90 days after the hearing is complete. The Commission can approve, or deny an application and can also make its approval conditional upon terms or conditions. All AUC decision reports are available to any member of the public on the AUC's website or by obtaining a printed copy from the AUC.

## Step 8: Opportunity to appeal

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

An applicant or dissatisfied participant can also ask the Commission to review its decision. An application to review a Commission 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 and Variance of Commission Decisions*.

## Step 9: Construction, operation and compliance

An applicant that receives approval to build and operate a facility from the Commission 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 under "Compliance and enforcement."

## \*Opportunity for public involvement

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.

## Contact us

Phone: 310-4AUC (310-4282 in Alberta)  
1-833-511-4AUC (1-833-511-4282 outside Alberta)  
Email: [info@auc.ab.ca](mailto:info@auc.ab.ca)

Eau Claire Tower 1400, 600 Third Avenue S.W. Calgary, Alberta T2P 0G5	106 Street Building 10th Floor, 10055 106 Street Edmonton, Alberta T5J 2Y2
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The Alberta Utilities Commission is 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.



Participating  
in the AUC's  
independent  
review process

# Application review process

**Step 1: Public consultation prior to application by proponent**

**Step 2: Application filed with the AUC**

**Step 3: Public notice issued by the AUC**

**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**

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

## The AUC's regulatory role in needs and facility applications and its independent review and hearing process:

The AUC uses an established process, outlined in this brochure, to review social, economic and environmental impacts of facility projects to decide if approval is in the public interest. Approvals from the AUC are required for the construction, operation, alteration and decommissioning of transmission lines and electric substations.

Approvals are required for:

- The need for transmission upgrades.
- The route and location of transmission facilities.
- The siting of power plants, including renewables such as wind and solar more than five megawatts.

Sometimes a needs application is considered together with a facility application in a single hearing; sometimes separate hearings may be held to consider each application.

### Step 1: Public consultation prior to application\*

Prior to filing an application with the AUC for the approval of a proposed utility development, the applicant must engage in a public consultation program in the area of 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 and Hydro Developments*, and AUC Rule 020: *Rules Respecting Gas Utility Pipelines*.

Potentially affected parties are strongly encouraged to participate in the initial public consultation, as early involvement in discussions with an applicant may lead to greater influence on project planning and what is submitted to the AUC for approval.

The Alberta Electric System Operator, as the system planner, will notify potentially affected stakeholders of applications on the need for transmission development.

### Step 2: Application filed with the AUC

When the participant involvement requirements have been completed, the applicant files its application with the AUC through a public filing system, called the eFiling System, on the AUC website.

The application is then reviewed to ensure the information required by the Commission is included. If the required information is not provided, the AUC may close the application or request more

information from the applicant. In the application, any issues that were raised during the public consultation and any related amendments to the proposal should be identified. All unresolved objections or concerns identified during the public consultation must be described in the application.

### Step 3: Public notice

The AUC generally issues a notice by mail directly to those who live, operate a business or occupy land in the project area who may be affected by the Commission's decision on the proposed project. The notice for larger facility projects with potentially greater impacts may also be published in local newspapers.

The notice will specify a submission deadline. The information required by this deadline is general in nature as outlined in Step 4. Additional opportunities to provide evidence and additional information will arise after this deadline.

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

The AUC review process is referred to as a proceeding. Anyone with unresolved objections or concerns about the application can file a brief written statement with the AUC on the proceeding. The easiest way to file a statement is to fill out the form through the eFiling System found on the AUC website. The statement must include your contact information, where you reside or own property in relation to the proposed facility, your concern or interest in the application, an explanation of your position and what you feel the AUC should decide.

The AUC uses the information it gathers through the forms to decide whether to hold a hearing on the application(s). The Commission must hold a hearing if a person can demonstrate that he or she has rights that may be directly or adversely affected by the Commission's decision on the application. Such a person is said to have standing before the Commission. If the AUC decides to hold a hearing, the AUC will provide further opportunities for participants with standing to understand the application and present their position on the application either in writing or in person.

Subject to some limited exceptions, all information and materials provided as part of an AUC proceeding will become part of the public record and will be available through the eFiling System. The AUC's treatment of some types of information as confidential is rare and only available under limited circumstances to ensure that the AUC's process is open and transparent.

### AUC eFiling System

The eFiling System is the 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 and is how to provide your input to the AUC and monitor the 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.

**\*Opportunity for public involvement**