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An Overview of CHP & Geothermal Measures

About ERA

MANDATE

Reduce GHG emissions and grow Alberta's economy by accelerating the development and adoption of innovative technology solutions.

VISION

Alberta has competitive industries that deliver sustainable environmental outcomes, attract investment, and are building a diversified, lower carbon economy.

STRATEGIC PRIORITIES



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Measure Categories

Compressed Air

Solar PV

Lighting Systems and Controls

Motors and Drives

Combined Heat and Power
(CHP)

Refrigeration

Geothermal

HVAC

Water Heating

Process Heating

Building Envelope
and Windows

COMING SOON

Food Service



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Important Note: Pre-Project Application Submissions

- If a pre-project application is submitted, but is not approved, it does not hold a place in the line for the incentive reservation
- The incentive is only reserved after the pre-project application is approved
- It is important to submit good-quality applications with complete documentation or the review cannot occur comprehensively; this delays the review and approval process



Eligible Measures Types

Combined Heat and Power (CHP)

Ground Source Heat Pump (GSHP)



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Combined Heat & Power

- Simultaneous production of electricity and thermal energy on-site
- Prime mover can be gas turbines or reciprocating engines
- Incentives available up to 4MWe
 - \$400/kW for system efficiency $\geq 50\%$ & $< 60\%$
 - \$500/kW for system efficiency $\geq 60\%$



Eligibility: CHP Systems

- Must comply with the Micro-generation Regulation (Alberta Reg 27/2008)
- Eligible prime movers include ICE or turbines
- The system must be connected to the electricity grid
- All thermal energy must be used within the facility
- The minimum overall system efficiency must be 50%
- The minimum system utilization factor must be 85%
- The system design must be approved by an engineer licensed in Alberta
- New construction and retrofit projects are eligible
- For more details, please refer to the “Additional Eligibility Requirements for CHP Systems” in the Participant Terms and Conditions



Requirements: CHP Systems

- Must submit the Gen Set Engineering and Specification sheets
 - Provide spec sheets for the associated equipment as applicable
- Must submit Form A in the application's supporting documents section
 - Interconnection approval and executed agreement will be required at post-project submission
- Must provide the following details:
 - Annual Electrical and Useable Thermal Energy output
 - The use of thermal energy
 - The estimated annual hours of operation
 - The Building type and its square footage
 - The contact details of the professional engineer and their engineering firm
 - The Annualized Electrical and Thermal Load (examples on next slide)



Application: CHP

STEP 1

Select the type of heating measure to be added to the application.

ADD MEASURE ✕

Measure Category
CHP ▼

Measure Type
On-Site Power Generation - CHP ▼

Measure
Select a Measure ▼
CHP - 50% to less than 60% of System Efficiency
CHP - 60%+ System Efficiency



Application: CHP

STEP 2

Provide the required measure specific required information.

MEASURE SPECIFIC INFORMATION

Quantity ⓘ
Enter here

Is it Retrofit or New Construction?

Prime Mover
Select from list

Status of Interconnection Application
Select from list

Interconnection Form A Application
Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Use of Thermal Energy
Select from list

Engineering Firm ⓘ
Type here

Engineer Name
Type here

Building Type
Select from list

Facility Area (Sq Ft)
Enter here

Facility Annual Hours of Operation ⓘ
Enter here



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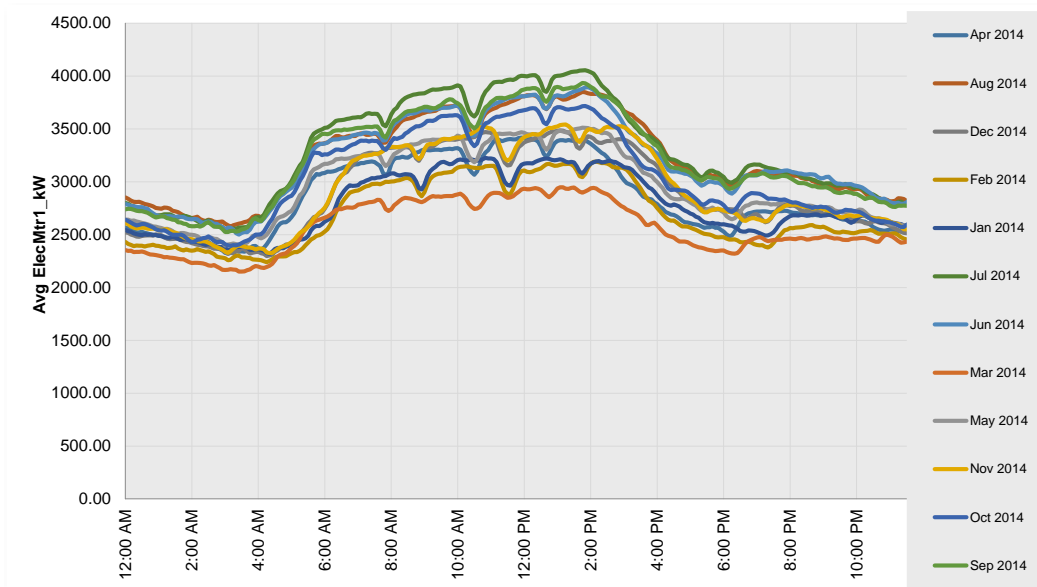
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Application: Annualized Electrical Energy Profile

OPTION 1

Provide the hourly interval data showing 24-hr load variation for each month.



Annualized Electric Energy Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Annualized Thermal Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: Options for Annualized Electrical Energy Profile

OPTION 2

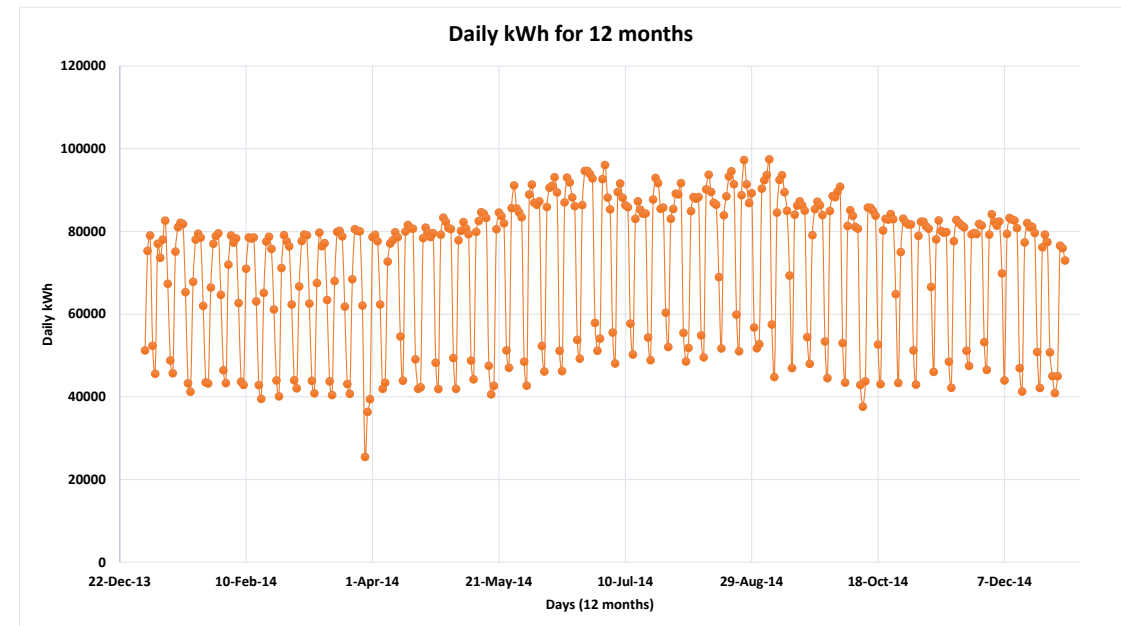
Provide the daily kWh for a period of 12 months.

Annualized Electric Energy Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Annualized Thermal Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: Options for Annual Thermal Profile

OPTION 1

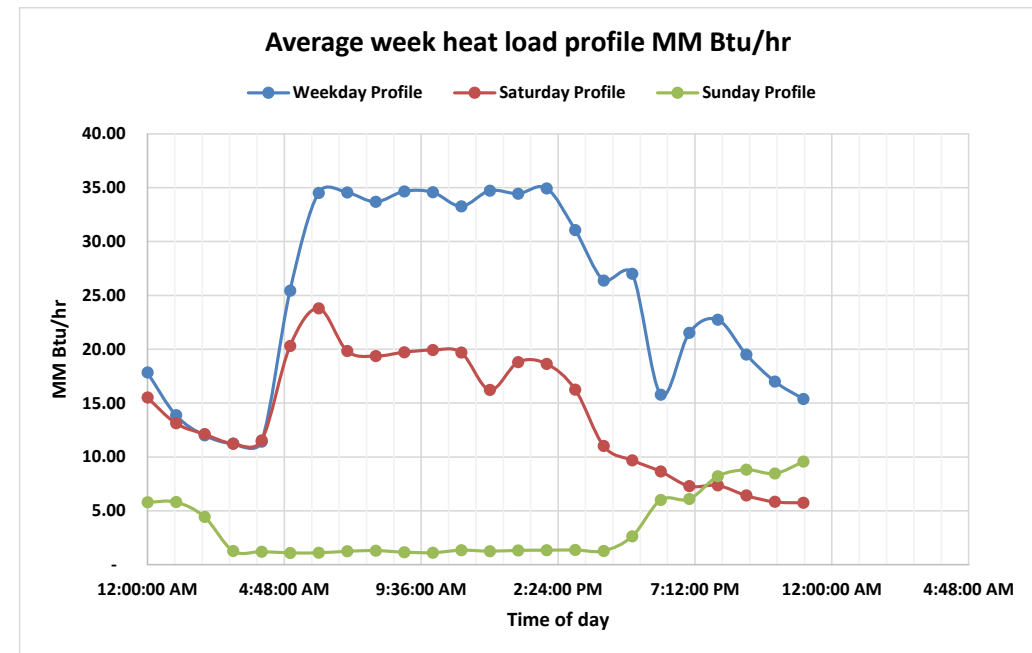
Provide hourly interval data showing 24-hr load variation for each month.

Annualized Electric Energy Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Annualized Thermal Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: Options for Annual Thermal Profile

OPTION 2

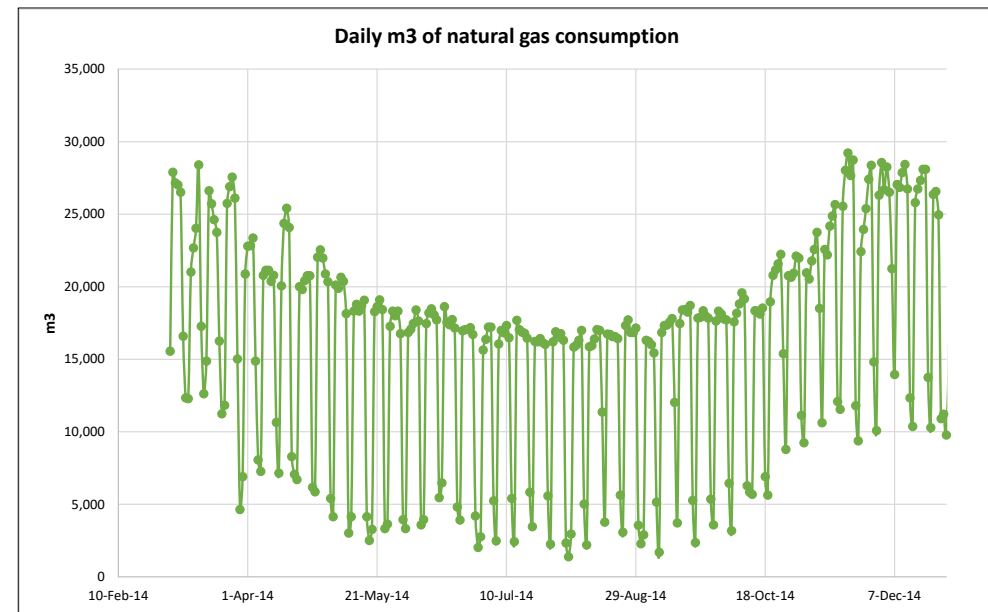
Provide daily natural gas consumption for a period of 12 months.

Annualized Electric Energy Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Annualized Thermal Profile ⓘ

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: CHP

STEP 3

Provide the rest of the required measure specific required information

CHP Project Description

Type here

CHP Electrical Rated Capacity ⓘ

Enter here

CHP Usable Thermal Rated Capacity

Enter here

Single Line Electrical Drawing



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: CHP

STEP 4

Provide the required measure specific required information.

P&ID Drawing

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Annual Electrical Energy Output (kWh)

Enter here

Useable Thermal Energy Output (MMBtu)

Enter here

System Annual Operating Hours ⓘ

Enter here

Gen Set Engineering Specification Sheet

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Heat Recovery Engineering Specification Sheet

Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: CHP

STEP 5

Final Measure Fields

Is Overall CHP System Efficiency over 60%?

Overall CHP System Efficiency

If CHP System Utilization Factor over 85%?

System Utilization Factor

Per Unit Emissions Reduction



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Geothermal (Ground Source Heat Pump)

- Uses the earth's natural heat for heating and cooling
- Incentives available for system up to 200 tons at \$2,500 per ton



Eligibility: GSHP

- All heat must be used within the eligible facility
- Must only use ground or groundwater
- Must comply with ANSI/CSA C448
- Must comply with the “Additional Eligibility Requirements for GSHP” within the Participants Terms and Conditions
- The system design must be approved by an engineer licensed in Alberta and accredited as a Certified Geo Exchange Designer by the IGSHPA or equivalent
- GSHP must be installed by an IGSHPA-accredited installer



Application: GSHP

STEP 1

Select the type of measure to be added to the application.

ADD MEASURE ✕

Measure Category
Geothermal ▼

Measure Type
Geothermal (GSHP) ▼

Measure
Select a Measure ▼
Geothermal (GSHP)



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Application: GSHP

STEP 2

Provide the required measure specific required information.

MEASURE SPECIFIC INFORMATION

Quantity ⓘ
Enter here

Is it Retrofit or New Construction?

Building Type
Select from list ▼

Building Size (Sq ft)
Enter here

Existing, Proposed or Back-Up Heat Source
Select from list ▼

DHW Existing or Proposed Fuel Source
Select from list ▼

What Efficiency Measures are in the Building? ⓘ
Select all that apply ▼

Total Capital Costs for Efficiency Measures Selected (\$ / Sq ft)
Enter here

Soil Thermal Conductivity
Select from list ▼

Borefield Spacing
Select from list ▼



Application: GSHP

STEP 3

Provide the required measure specific required information.

GSHP Efficiency
Select from list

GSHP COP
Enter here

GSHP Capacity (Tons)
Enter here

Drilling Cost Estimate (\$/ Sq ft)
Enter here

Conventional Equipment Cooling Efficiency (EER or COP)(Optional) ⓘ
Enter here

Conventional Equipment Cooling Efficiency
Select from list

Conventional Equipment Heating Efficiency (%)(Optional) ⓘ
Type here

Conventional Equipment Heating Efficiency
Select from list



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Application: GSHP

STEP 4

Provide the required measure specific required information.

Electricity Cost (\$/ kWh)

Enter here

Heating Fuel Cost

Enter here


Heating Fuel Cost Units

Select from list

Heat Pump Specification Sheet 



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

In-Ground Items Specification Sheet 



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

System Design Report



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Energy Model Output



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx

Field Site Plan/Layout



Select from computer (or) Drag and Drop documents to upload. Acceptable file types: .JPEG, .PNG, .PDF, .Docx, .xlsx



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Application: Emissions and Costs

The emissions reduction estimates are automatically calculated.

Add the various costs associated with the project and ensure that they have been accurately recorded. They will be compared to the cost quote(s) uploaded in the application.

The incentive is capped to 50% of the total cost.

NOTE: Installation costs should be included in the labour costs. All other costs should be included in the design costs.

Per Unit Emissions Reduction
0.193
Total Emissions Reduction
Calculated value
Equipment & Material Costs ⓘ
Enter here
Labour Cost ⓘ
Enter here
Design Cost ⓘ
Enter here



Application: Calculated Incentives

STEP 4

Review the calculated values.

Maximum Eligible Measure Incentive is the calculated incentive cap relative to the total eligible project cost.

The screenshot shows a web interface with three input fields, each with a title and an information icon (i) to its right. The first field is titled 'Measure Incentive' and contains the text 'Calculated value'. The second field is titled 'Maximum Eligible Measure Incentive' and also contains 'Calculated value'. The third field is titled 'Total Eligible Measure Incentive' and contains 'Calculated value'. Below these fields is a green button with the text 'GET CALCULATED VALUES' in white capital letters.

Measure Incentive is the incentive based on the measures list.

The Total Eligible Measure Incentive is the lower of the two above values.



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Support Team

Website: eralberta.ca/esb

Email: support@esbprogram.ca

Phone: 1-844-407-0025

By chat on the ERA website and program portal