

Solar power installation at HI-Athabasca Falls – Canada

SUMMARY

Project Description: This project consists in implementation of existing solar power installation at HI-Athabasca Falls in the Jasper National Park in Alberta to become totally independent of the current diesel generator in operation. The project also includes an educational dimension, giving information to guests and employees through signage about the off-grid power system.

Project Type: Sun

National Association: Hostelling International Canada

Project Location: HI-Athabasca Falls, Alberta



Estimation of number of reduced tonnes of CO₂: Taking the weather patterns into account, the proposed installations should save 15 tonnes of CO₂e emissions per year and will avoid the burning of about 6 litres of diesel per year.

Total Funds Requested: £ 7,000

Total Project Cost: £ 29,915

Annual £ saves and ROI (return of investment):

Contribution of the project activity to sustainable development: Reduction of CO₂ emissions from the hostel operations, provision of an educational opportunity for guests and employees to gain a greater understanding of operating with an off-grid power system generated through a natural renewable energy source.

Why should this project be funded ahead of others?

At HI-Athabasca Falls, guests are able to enjoy the extraordinary mountain setting and many hiking trails in the Alberta wilderness, ranging from easy to challenging.

This hostel, like others in the Canadian Rockies does not generate adequate revenues to recapitalize itself, relying on the much higher capacities and activity levels of our resort and urban properties. Nevertheless, HI-Athabasca Falls provides a mountain hostelling experience like none other and is open all year round. Beyond its appeal to the general population, this hostel also had been retrofitted to support wilderness adventurers with limited mobility so they can enjoy the benefits of being close to nature and the some of the challenges the mountains have to offer, such as adapted hiking (trail riding) and hand cycling in this spectacular setting. It is these unique and memorable experiences that linger longest and most profoundly in the minds of those who make the journey. These are the reasons for supporting this hostel.

Given HI-Athabasca Falls' location in a wilderness location of a National Park, this hostel needs this upgrade to truly reflect the values, educational and cultural experiences it is trying to reflect to its guests – that of respecting, experiencing and gently impacting the environment in which it stands. Given its location in a National Park, the hostel needs the upgrade to reflect the values, educational and cultural experiences it is trying to reflect to its guests.



DETAILED PROJECT INFORMATION

Purpose/objectives of the project activity

Expanding the existing solar power installation at HI-Athabasca Falls in the Jasper National Park in Alberta will allow this hostel to operate completely independent of an external electricity source. As such, it will no longer draw power from the existing large and deteriorating diesel generator currently in place serving a Parks Warden station and the highway telephone service. The diesel generator has reached the end of its life and is being decommissioned.

HI Athabasca Falls is one of our **uniquely adapted wilderness hostels with wheelchair access ramps** to the cookhouse and sleeping cabins. These improvements have allowed us to broaden the scope of our wilderness hostel experience and offer adapted adventure groups to people with limited mobility, along with their friends and family, to realize the health and well-being benefits to being close to nature.

Although it is one of our larger wilderness facilities, this is a relatively small hostel with four sleeping cabins (one 12 bed multi-share, one 16 bed multi-share and 2 private rooms that have one double bed and 4 single beds), one cookhouse, one manager's cabin and two outhouses.

Objectives:

1. Reduce CO₂e emissions by eliminating diesel fuel consumption
2. Offer an educational opportunity and experience for guests as they gain an understanding of using power generated through a natural renewable energy source

Methodology (How)

The operations of the HI-Athabasca Falls Wilderness Hostel currently draw an estimated 5000 kWh per year. The project will install a solar panel module system at the hostel intended to provide electricity for all of the demands of the hostel and our guests. The design of the system will include eighteen solar panel modules that will provide electricity on demand as well as generate electricity to be stored in a battery array. The battery array will have a 30kW storage capacity, for periods of prolonged clouded weather conditions, allowing for an estimated two to three day supply, at 50% discharge.

Other elements of the project include the construction of a utility building to house the system backup generator, electrical equipment and the battery array.

Monitoring plan

The consumption of diesel to generate electrical power will cease completely.

The modest amount of propane required to generate power, when the weather and time of year offer only limited sunlight, will be monitored via consumption records kept for all hostels in the mountain parks. Monitoring will be a simple matter of comparing the annual propane consumption to similar sized hostels and previous years, including comparisons of consumption per overnight and sqft.

Contribution of the project activity to sustainable development

In addition to reducing the CO₂e emissions from the operations of this hostel, the expanded solar power installation will provide an educational opportunity for guests and employees to gain a greater understanding of operating **with an off-grid power system generated through a natural renewable energy source**. Information posters will give information relative to the system's installation, the fuel and emissions reductions and the safety features.



Environmental impacts

Reduced CO₂e emissions

Estimations of emission reductions (CO₂e tones)

NOTE: Hyperlinks in text provide connection to information sources.

We estimate that operations at HI-Athabasca Falls consumes 5,000 kWh per year. Further, we estimate that HI-Athabasca Falls electricity draw has required the burning of about 6,600 litres of diesel in the over-sized and old generator currently in operation.

Environment Canada publishes a schedule of CO₂e emissions from various sources, a [GHG Emissions Quantification Guidance](#) document. From Table 4: Emission Factors for Refined Petroleum Products, the emission factor of burning diesel is: 2.663 kg/litre.

Electricity consumed annually	5,000 kWh
litres diesel burned annually to generate electricity	6,600
CO₂e emitted in a year (assuming 2.662 kg/litre burned)	17,582

Given that the backup generator (propane) may be required for prolonged cloudy weather patterns ([sun days in Jasper, Alberta 325 days out of 365](#)), we estimate that **15 tonnes of CO₂e emissions will be avoided** through the proposed solar power installation at HI-Athabasca Falls.

Saved Funds and ROI (return of investment)

The remote location of this hostel makes it difficult to calculate a traditional return on investment for this installation. The replacement of the electrical power source is a significant undertaking and, since there is no option of connecting “to the grid”, factors of guest comfort, safety and continued appeal are critical:

- The estimated annual reduction in electrical power consumption is estimated at 5000 kWh. As this hostel is not connected to the municipal grid, there are no recent invoices for electrical power consumption for over ten years and it is not realistic to compare the per kWh costs to average municipal rates.

The only power generation to the solar installation to would be to purchase a generator at a cost of **\$5,000 CDN** and an estimated annual operating cost of **\$1,500 CDN**. In addition, we would be emitting CO₂e associated with a propane generator that would need to run 24/7. We avoid this capital outlay and the annual operating cost with the installation.

- Maintenance in safety from stable availability of communications
- Avoidance of increase safety hazards by maintaining electrically powered lights (and being required to install propane fueled lighting).
- Maintain guest services (with little to no interruption in available power)
- Marketing appeal of a wilderness hostel environmental supported by a micro-hydro generator will increase overnight activity at this hostel.

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