

# VIESSMANN



## Climate Club Trophy



### CLUB TROPHY

### CASE STUDY CRAFTSBURY OUTDOOR CENTER

## A HOTBED OF SUSTAINABILITY INNOVATION IN VERMONT

The Craftsbury Outdoor Center (COC) is a non-profit organisation with a three-part mission:

- To support and promote lifelong participation and excellence in sports
- To use and teach sustainable practices
- To protect and manage the surrounding land, lake and trails.

Its mission ensures that COC approaches each action in a way that keeps **sustainability at the forefront of decisions**.



Bill McKibben visits GRP athletes 2022



Outdoor training session

### WHAT IS THE GOAL?

The COC operates a ski centre, rowing centre, sports hotel, and training centre for all levels of the athlete development pipeline. In biathlon, it offers beginner lessons for anyone, provides regular practices for local youth and junior athletes, and supports an elite level team. It also hosts biathlon training camps and races at all levels up to National Championships.

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COC aims for high performance but takes a holistic approach to sustainable sport from many angles in its programmes and facilities. Its goal, to be a model for sustainability, conservation, education, and stewardship in its community, is carried out in three main ways:

- Through minimising the impact that its activities have on local ecological systems;
- By conserving energy so that its facilities have a minimal footprint; and
- By raising awareness of initiatives to educate and inform guests, programme participants, and all other visitors so that they can learn how to create positive change in their own spheres of influence.



First test pile for snow depot 2018

### HOW IS THE GOAL ACHIEVED?

The Outdoor Center was founded in Vermont, in 1976. As such, some of COC's sustainability initiatives date back to the 1990s. However, many of the energy systems, solar, facility improvements, and programming expansions began in 2009, soon after COC's current leadership took over.

#### Some of the initiatives that demonstrate how COC has been achieving its goal include:

- Elite athletes promote sustainability and healthy lifestyles in their community.
- Using a snow depot storage system to guarantee early season snow each year
- Generating 65% of electricity needs through solar panels, with a new solar array being installed to increase to 100%
- Use of wood-fired boilers (burning local wood) to heat large tank of water and then distribute heat to many buildings at the centre.
- heat pumps for most of the space and water heating on the campus.
- Providing charging stations for visitors' electric vehicles
- Composting toilet systems in the ski lodge and dining hall.
- Organising an internal swap shop for employees and athletes to exchange and reuse clothing and equipment
- Setting up recycling and compost containers all over the campus
- Educating visiting skiers and guests about the importance of conserving resources
- Using local food from regional farms and growing vegetables in the centre's own gardens.
- Composting waste food on-site
- Creating a fluor wax ban policy in 2019
- And... beekeeping!

### WHICH IBU SUSTAINABILITY ISSUES DOES IT ADDRESS?

#### Emissions from energy use for heating, cooling and power

COC has 140 kW of solar energy from various solar arrays that generate approximately 65% of their electricity needs. A reduction in fossil fuel use has consequently increased electricity use by installing mini-split heat pumps and ground-sourced heat pumps for space and water heating. It also offers seven level 2 electric vehicle charging stations in its parking lots which its visitors can use for free.

The main heating system at the facility uses a large underground water tank to store heat produced in several ways: 1) burning local sustainably managed wood; 2) gathering waste heat from the snow-making generator when they are making snow; 3) using heat pumps to supplement as needed; and 4) using solar thermal panels in the summer.

#### Excellent sustainability communication

COC offers a unique support system for its elite, or "Green Racing Project" (GRP), athletes. In exchange for housing, food, coaching and race support, ath-



letes promote sustainability and healthy lifestyles in their community. Projects include working in the dining hall gardens, monitoring invasive species, helping maintain trail systems, measuring chlorophyll and phosphorus in the local lake, tutoring local students, and directing a nonprofit that advocates for women coaches. These projects give our athletes a connection to the local community, environment, and equip them with work experiences that they can take with them beyond their competitive careers.

**Increasing sustainability awareness among biathlon stakeholders**

COC educates thousands of visiting skiers and guests about campus energy systems and the importance of conserving resources by posting infographics on bulletin boards, toilet stall doors, showers, and other places around campus.

COC has also hosted various community education offerings, including a series of 6-8 summer lectures on topics related to forestry and conservation, as well as a "Sustainability and Soup" film night series.

**Use of water and energy for snowmaking / snow-farming**

Warming temperatures, more frequent melt events, and lower snowfall have forced COC to adapt to a changing climate with innovative snow solutions. In 2018, it created a snow depot storage system, which allows it to create snow in colder temperatures (more energy-efficient) and store it for the following year. It allows COC to guarantee early season snow which allows many local schools, club and university teams in the eastern US to avoid travelling.

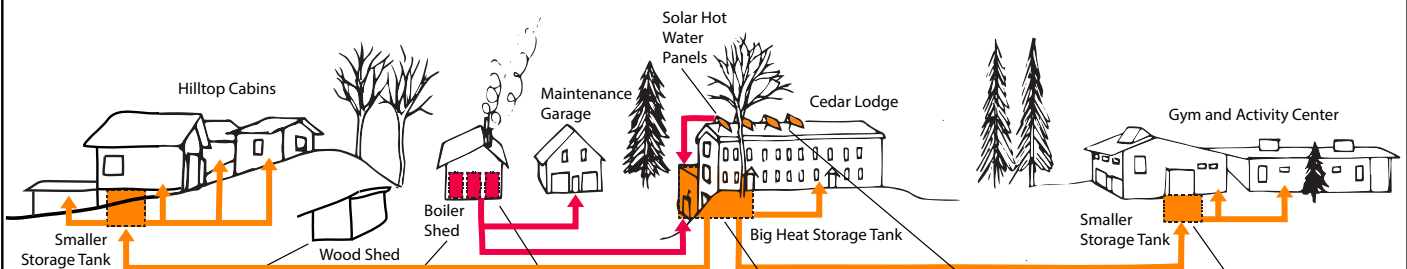
**Increasing biodiversity (outdoor venues)**

Stewardship of the local wetlands and forest ecosystem is very important to the Center and it has projects directed at maintenance and monitoring various aspects of these systems.

From June through September each week COC's GRP athletes go out on a nearby lake to take water samples and measure the clarity of the water. Lakes in Vermont are susceptible to pollution from agriculture and invasive species and it is important to continually measure the health of the lake through its chlorophyll and phosphorus levels.

**How Our Buildings are Heated**

Water is heated with wood or solar panels and stored in a central tank. The hot water is piped around to heat the buildings.



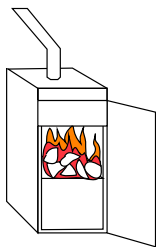
**Local Wood**

Wood is harvested at a sustainable rate from the forests around our trails and stored in our large wood shed. We use wood as a fuel because it can be harvested locally and it's a renewable resource. Although burning wood does emit CO2, it is not from ancient fossil carbon stores, and can therefore be part of a climate-neutral carbon cycle.



**Efficient Wood Boilers**

In the winter, our clean-burning, high-efficiency wood boilers provide the heat to maintain our 20,000 gallon hot water storage tank. Depending on the temperature and number of guests, 1-3 of the boilers may be fired.



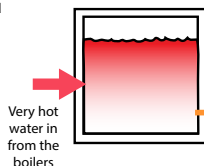
**Generator Heat Recovery**

Snowmaking requires a lot of energy, and unfortunately we have to use a diesel generator to power our snow guns because we don't have 3-phase power nearby. The generator also makes lots of waste heat. Our big tank allows us to capture and store that energy to heat our buildings. This is great because we usually make snow when it is very cold outside and the heat is much needed!



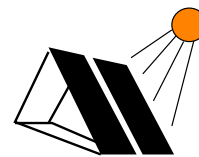
**Heat Storage**

Our insulated 20,000 gallon water tank acts as a giant battery for heat energy. It allows us to fire the boilers really hot and efficiently during the day, and keep the buildings warm overnight without more firing. It also allows us to store big inputs of heat from the snowmaking generator.



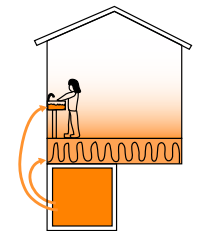
**Solar Hot Water**

During the summer months when the buildings aren't being heated, the big storage tank is maintained at a lower temperature by solar hot water panels on the roof of Cedar Lodge. Heat pumps in each of the buildings raise the water temperature for sink and shower use.



**Heat Distribution**

Hot water is pumped from the central tank to smaller storage tanks around campus. From there it is pumped to radiators and radiant floor tubing to heat the buildings, and it is used for sinks and showers.





Biathlete S Dunklee bee keeping

Another aspect of ecological stewardship that the GRP athletes have been doing in recent years is beekeeping. They maintain a small operation with a few hives at one of the athlete dorms. Beekeeping provides an essential ecological service, pollination (and the honey is an extra benefit!).

### Sustainable sourcing practices

COC's Kitchen works to use as much local food as is available and practical. It sources food from numerous farms in the local region (northern Vermont). In addition, it grows some of its own vegetables. GRP athletes assist with growing food as part of their work commitment. The Dining Hall serves highly nutritional food to its guests staying in the sports hotel, to its GRP athletes and employees. All food waste is composted on-site. The soil from its composting piles is cycled back into the gardens to grow food for the next year.



Our local food

### WHAT WERE THE CHALLENGES FACED?

Warming temperatures, more frequent melt events, and lower snowfall have forced COC to continually adapt to a changing climate with innovative snow solutions, such as some of those explained above.

These solutions, however, occasionally bring new challenges. For example, the 22/23 winter season had an unprecedented number of freeze/thaw cycles and very little natural snow throughout December and January. COC was able to stay open with a 3km loop when no other ski areas in the region could by making snow to supplement natural snow and the snow depot. However, this snow does require a generator that runs off of diesel.

One other area COC would like to improve in the future is finding more energy efficient systems for transporting and trucking snow (from the depot and from the snow making piles) around our trails. COC uses excavators to load and dump trucks to transport and these machines use a lot of fossil fuel. COC also hopes to find a way to reduce fossil fuel use in its grooming fleet in future years.



Electric vehicle charging station

### WHAT ARE THE NEXT STEPS?

The COC is well aware that there is always room for improvement, in so many ways. Some of the initiatives already underway, or on the radar, at COC include:

- Installing a 150 kW solar farm on an abandoned tennis court to meet its goal of producing all of its electricity with solar panels. This construction is underway.
- Transitioning its grooming equipment and other vehicles to electric ones. This will happen as soon as good options are available.
- Retrofitting several old buildings and making them more efficient.
- Continuing to grow its sustainability-related programming and outreach.