THE SUSTAINABLE EVENTS FORUM

TSEF CAN

02.08.2021

HYBRID EVENT MOONSHOT REPORT

Let's start making events carbon negative!

Executive Summary

The purpose of this case study is to plan a carbon-negative hybrid event successfully. The team would follow the event-planning process while adopting sustainable event practices to create templates, educate and inspire event planners in the industry.

Introduction

Client

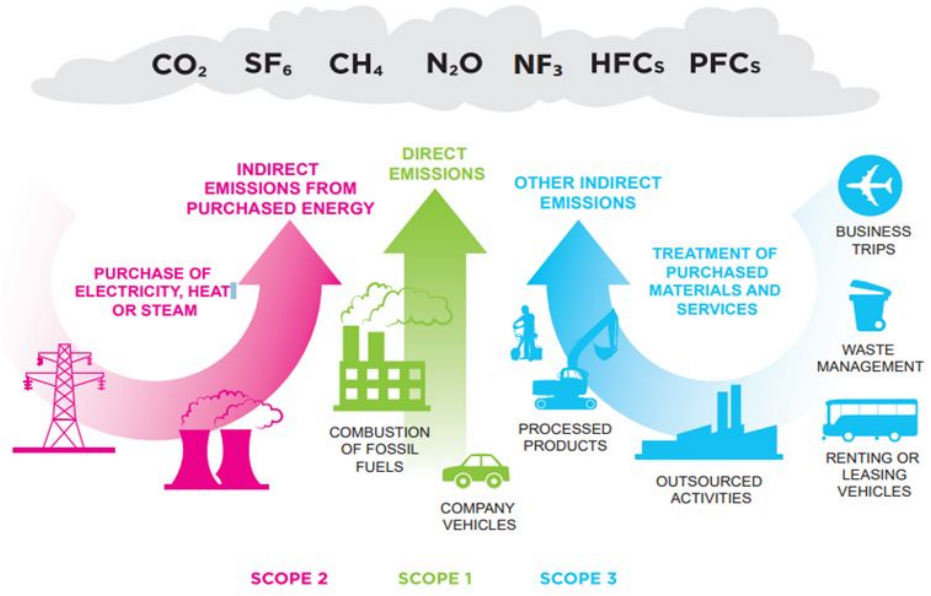
Our client was a traditional oil and gas company in Canada. The client wishes to be environmentally friendly from a reputational standpoint but is not fully committed to decreasing Greenhouse Gas (GHG) emissions. The client is cautious about a pivot towards sustainability and the potential to be called out by environmentalists.

Event Details

- Two-day event: July 13 - 13, 2021
- Hybrid: 200 in-person, 300 virtual
- Demographic:
    - A 45-year-old male with a Bachelor of Commerce (BComm)
    - Questions the environmental movement
    - Sustainability is encouraged by both their family and their company's marketing department.
- Agenda (*Figure 1a. and 1b.)*
- *Floor Plan (Figure 2.)*
- *Green Space Map (Figure 3.)*
- 16 speakers
    - 14 in-person
    - 2 streamed-in live
- 10 trade show exhibitors *(Figure 4.)*
- 7 sponsors *(Figure 5.)*

Disclaimer: *Edmonton Oil & Gas Forum is a fictional event. The purpose of this study is to portray an example of an event planning process and methodology designed for illustrative and educational purposes only*

Hybrid Carbon Negative Moonshot Analysis



We will measure the following emissions factors:

Scope 1 Controlled Direct Emissions	**Scope 2** Controlled Indirect Emissions	**Scope 3** Other Supply Chain Emissions
• Venue utilities • Heating sources	• Energy (Venue) • Energy (Virtual)	• Accommodation • Transportation of people • Food and beverage • Waste and materials • Transportation of goods

Carbon Accounting Tool

This case study's carbon accounting tool is by the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat to provide the general public with a free and up-to-date methodology for estimating greenhouse gas (GHG) emissions.

Note: The Hybrid team had to complete hand edits of some of the calculations to account for Alberta emissions standards.

THE SUSTAINABLE EVENTS FORUM

Location & Venue

Location

Location selection is key to emissions. We selected Edmonton, Alberta, as our destination city as it was the mid-point between 2 large oil centers, Calgary and Fort McMurray, Alberta. The team wanted to encourage exploring Edmonton within our event schedule. Edmonton has access to sustainable and accessible transportation options such as Lime bike share, Bird e-scooters, and Uber Green. Edmonton commits to a social, environmental, economic, and financially sustainable society. Lastly, Edmonton has an average of 16.5 hours of daylight in July, which played a significant factor in our daytime and evening schedules.

Venue

The Edmonton Convention Centre (ECC) was our venue of choice due to

- Venue size, hall selections, and spacing
- Healthy Venues COVID protocols (Edmonton Convention Centre, 2021)
- Green Key '5 key' Certified
- ASTM Certified
- Green infrastructure
    - Rooftop solar installation
    - Indoor greenhouse
    - Composting program that fertilizes Alberta farmland
    - Carbon management initiatives
    - Waste diversion program
- Sourcing of local businesses and growers
- Carbon accounting tracking accessibility
- Access to the River Valley Trail

Accommodation

The team selected the Fairmont Hotel Macdonald in Edmonton, Alberta. The hybrid team made the following assumptions to complete the calculations. Information used included origin city of all delegates, speakers, sponsors and staff:

1. Hotel accommodations (by night)
    a. 1 night accommodation: 16 rooms
    b. 2 night accommodation: 134 rooms

Emission Results

Total Rooms Nights	Emission Factor Kg C02e / per room / per night	tC02e
284 Room nights	20.84	5.901

(Ministry of the Environment, British Columbia, 2014)
(Rehmaashini, 2020)

Reduction Activities

1. **Select Eco-rated hotels**

   Fairmont Hotel Macdonald has a 4-key rating from Green Key Global.

2. **Consider logistics**

   The Fairmont Hotel Macdonald is a 4-minute walk away from the ECC. Both a convenient distance for those staying overnight and decreasing our plan's overall transportation emissions as delegates could walk to and from the venue.

3. **Educate hotel staff**

   It was important for the team to work with a hotel that was proactively tracking emissions and communicating emissions tracking with our team. Fairmont Hotel Macdonald also had communications material in-room to promote their internal sustainability initiatives to practice while staying at the hotel.

4. **Consider trusted brands**

   When auditing accommodations options, Fairmont Hotel Macdonald is committed to sustainable initiatives across the entire brand (Fairmont.com, 2021)

Transportation of People

To discourage medium- and long-haul air travel, the registration system would request an area code. The registration system would then give prompts to out-of-province delegates to select virtual attendance and incentives in the form of discounted virtual registration pricing. Out-of-province delegates who chose air travel to the live event would be prompted at registration to offset their emissions (through a calculator that tracks distance from the original-destination area code to Edmonton). The team assumed that out-of-province attendance at the live event would be lower than average and that flights to the conference will reflect those registration assumptions.

The organizers would offer coach buses at a discounted rate and convenient pick-up and drop-off times and locations to encourage bus travel, producing fewer emissions per kilometre/per person. We assumed 20% of delegates would take a shuttle bus to-and-from major cities (Calgary and Fort McMurray, Alberta). Coach buses from Calgary were public busses. Maximized use of the buses by the public drives down emissions per rider. The organizers privately chartered the Fort McMurray bus since the departure times and availability of existing transportation providers were limited and did not accommodate the conference schedule. Both bus providers follow strict COVID health & safety protocols, and protocols would be proactively sent to delegates upon registration to ensure that COVID restrictions will be adhered to.

Transportation of people is a combined total of emissions from air travel and ground travel. This includes travel by airplane, coach bus, chartered bus, private vehicle, and public transit. These calculations also consider the travel of event staff, speakers, exhibitors, and trips to and from the airport once they arrived in Edmonton. To simplify several calculations, we used 4 (four) major feeder cities: Fort Mcmurray, Calgary, Toronto, and Vancouver. This provided a reasonable estimate of short, medium and long travel distances while acknowledging that in actuality, departure cities would vary vastly to include regional feeder cities and towns.

General Assumptions

1. Attendees travelling by air would complete round-trip travel using the same mode of transport.
2. Estimates are exclusive of travel to and from the airport in the departure city.
3. Estimates are exclusive of individual inter-city travel routes.

1. **Transportation of People: Air Travel**
    a. In departure cities where more than one airport is available, we used the international airport.

b. For airport transfers, we assume 80% of air travellers will take SkyShuttle [24 people], and 20% would take a Taxi/Uber or private car [6 people] - Medium Gas Auto (10.2L / 100km). These emissions are included underground.
c. Transportation- coach and ground transportation - medium car, respectively.

2. **Transportation of People: Ground Travel - Coach & Chartered Bus**
    d. 20% of attendees from Fort McMurray and Calgary select bus transportation
    e. Fort Mac bus emissions based on a chartered, 12 seat diesel-fueled vehicle
    f. Calgary bus emissions based on kilometres travelled, using current Red Arrow bus routes (stopover in Red Deer)

3. **Transportation of People: Ground Travel - Own Vehicle**
    g. Four standard vehicle types were selected for sample: medium gasoline car, medium hybrid car, light gasoline truck, and light diesel truck. In actuality, the planner would likely record several additional vehicle types with corresponding emissions factors.
    h. Gasoline and diesel trucks are assumed to be driven by a more significant portion of these event attendees, given the demographic and region.
    i. For simplicity, distances are calculated from city center to city center.

Results

Transportation of People - Air Travel

ROUTE	PEOPLE	Kg C02e
Toronto – Edmonton	18+1 speaker + 1 staff	8346.7
Vancouver – Edmonton	12	2408
Kitchener - Edmonton	1 staff	538

(The ICAO Carbon Emissions Calculator, 2021)

Transportation of People - Ground Travel- Coach & Chartered Bus

ROUTE	PEOPLE	DISTANCE	Fuel	Factor	Kg C02e
Calgary - Edmonton	32 (+9 speakers and 1 from tradeshow)	297km (one way) = 24948km	Unknown	0.02732	681.58

Fort McMurray - Edmonton	8	Entire Shuttle (435km one way) = 870km	Diesel	0.9108	790
Edmonton - Edmonton International Airport	24	30km (one way) = 1440km	Unknown	0.02732	39.34

(UK Government GHG Conversion Factors for Company Reporting, Department for Business, Energy & Industrial Strategy, 2019)

Transportation of People - Ground Travel- Own Vehicle

TRIP	VEHICLE	PEOPLE	ROUND TRIP DISTANCE (km)[1]	Factor	Total km travelled
Saskatoon - Edmonton	Small Car	1 staff	1050	0.14836	1050
			TOTAL (for 1050km)		**155.78kg C02e**
Calgary – Edmonton	Medium Car	10	600	0.18659	10800
Edmonton – Edmonton	Medium Car	10	22[2]	0.18659	220
Fort Mac – Edmonton	Medium Car	1	875	0.18659	875
Edmonton - Edmonton International Airport	Medium Car	6	**30**	**0.18659**	360
			TOTAL (for 11,895km)		**2286.66 kg C02e**

[1]Calculated from city center to city center.

[2] Pulled from historic ECC commuting averages for past events (2019) for delegates travelling to ECC events (average distance, 22kn)

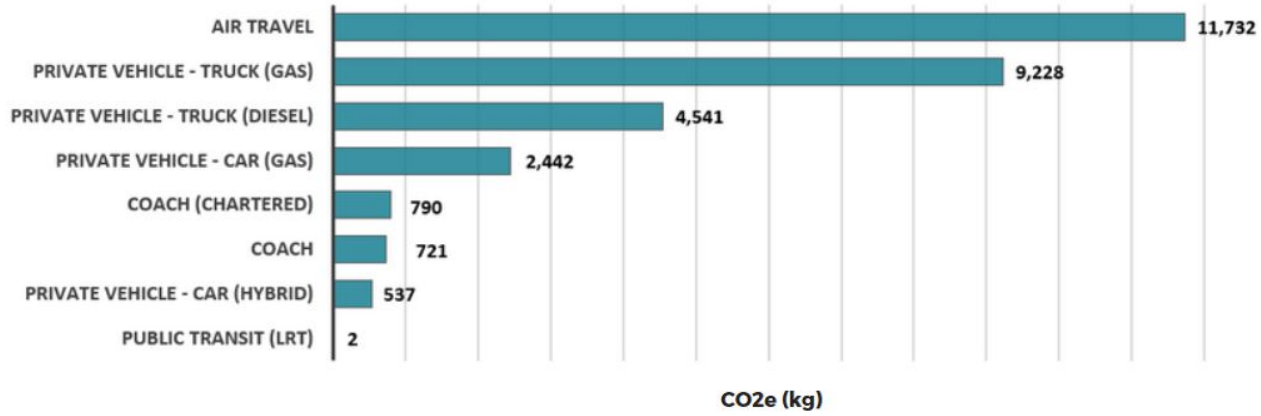
Calgary – Edmonton	Medium Car - Hybrid	8	600	0.10698	4800
Edmonton – Edmonton	Medium Car - Hybrid	10	22	0.10698	220
Fort Mac – Edmonton	Medium Car - Hybrid	0	875	0.10698	0
			TOTAL (for 5020km)		**537.04 kg C02e**
Calgary – Edmonton	Medium Truck Gasoline	26 (+ 3 speakers)	600	0.3959	17400
Edmonton – Edmonton	Medium Truck Gasoline	30	22	0.3959	660
Fort Mac – Edmonton	Medium Truck Gasoline	6	875	0.3959	5250
			TOTAL (for 23,310 km)		**9228.43 kg C02e**
Calgary – Edmonton	Medium Truck Diesel	4 (+6 tradesho w)	600	0.4251	6000
Edmonton – Edmonton	Medium Truck Diesel	10 (+4 tradesho w)	22	0.4251	308
Fort Mac – Edmonton	Medium Truck Diesel	5	875	0.4251	4375
			TOTAL (for 10,683)		**4541.34 kg C02e**
Edmonton - Edmonton	Walk or Bike	5	NA	NA	0

Edmonton – Edmonton	LRT	5	16[3]	0.02991	80
			TOTAL (for 80km)		**2.39 kg C02e**

(UK Government GHG Conversion Factors for Company Reporting, Department for Business, Energy & Industrial Strategy, 2019)

Conference Transportation of People Emissions Totals

- Air: 11.73 tCO2 (39%)
- Ground: 18.6 tCO2e (61%)



Energy (Venue & Virtual)

Emission Sources

Energy use emissions for this event include i) estimates for electricity drawn from the Alberta electrical grid at the Edmonton Convention Centre site and ii) electricity used for telecommuting.

From the very beginning, the hybrid group acknowledged that energy could be a very substantial portion of the event's carbon footprint. That energy prominence was especially true for the in-person event portion that was utilizing a large event space. Energy use in the Edmonton Convention Centre venue is attributed to many different areas; lighting, cooling, and equipment such as moving/handling equipment, kitchen equipment, cleaning equipment, and office/ AV equipment.

[3] Pulled from historic ECC commuting averages for past events (2019) for delegates travelling to ECC events that indicated their mode of transportation was Edmonton public transit (average commute, 16 km)

Electricity use in the venue was estimated using historical data from previous years and an average energy use per square footage of occupied space. Given the number of energy reduction initiatives the planning team would implement, we estimated the Moonshot event will consume only approximately 30% of a regular event electrical use. These reduction activities are detailed below. The completed building-integrated solar photovoltaic rooftop solar installation at the Convention Centre will also offset a portion of the electricity used in July. Estimates use annual system performance averages, but in July, Edmonton's sunniest time of the year, the system performance would likely be higher.

Reduction Activities

The event team opted to bring in additional portable solar generators to address the electricity needed to power the event audio/ visual and streaming equipment. These generators total a 20 kW capacity, 80 kWh (Single Phase & Three Phase Configurations), and 17.2 kW rated with a 30 kW surge. Most exhibitors are not do not require booth power. If an exhibitor does require energy, they will be able to source it through a small scale solar power battery provider that partners with the Edmonton Convention Centre. Exhibitors do not use wall sockets.

Using rooms for the plenary with floor-to-ceiling windows meant that the lighting in both Hall D and Riverview room could remain off for the event. Since Edmonton has long summer days in July, set-up and tear-down could also be done without lighting. The foyer (tradeshow) space and the support office would require lighting, but the lights in these spaces are LED and can be adjusted using controls to provide adequate lighting levels.

Building mechanical equipment, such as elevators and escalators, also draw substantial amounts of energy to operate. The Edmonton Convention Centre has an Escalator Operation Policy that would be enforced and shared with exhibitors. The freight elevators should be used for trade show deliveries but not to move employees or staff. Escalators are powered on only during event hours and not on set-up and tear-down days.

Lastly, we were able to reduce energy consumption from the responsible use of air conditioning. When we look at historical data from the Edmonton Convention Centre, we can see that July is the second highest month for building chillers' operation (the equipment that controls temperature in the building). It was important to ensure that the event space was comfortable for attendees while still ensuring that we weren't wastefully operating cooling equipment. For the event we would request that the air conditioning be set at a higher temperature during set-up and

tear-down days (25-26 degrees C) and brought down to a colder level on the event days (21-22 degrees C). We would also communicate with our out-of-town attendees in pre-event communications to ensure they knew what weather to expect in Edmonton over the event days. This advanced knowledge would allow our attendees to pack the appropriate clothing and dress comfortably for the temperature.

Assumptions

Venue Energy Assumptions

i. Based on 38,000 square feet of occupied space for 48 hours (set-up and tear-down included). Meter estimates are based on historical data collection from July 2019 at the Edmonton Convention Centre and an estimated 0.495kwh/sq.ft2 of occupied space.

ii. No lighting used in main rooms (Hall D or Riverview). Lighting is used in i) the Foyer space ii) offices, and iii) for set-up/ tear-down in the evenings (as needed) but only at 50% lighting levels (no architectural lighting).

iii. Electrical savings are estimated at 50% for escalators and 2x freight elevators.

Virtual Energy Assumptions

i. 300 virtual attendees using the Hubilo platform. Attendance and camera use is estimated as follows:

<u>Day 1:</u>

- Streaming sessions (cameras off): 8:45-12pm and 2-4pm, assume 300/300 attend live sessions
- Virtual trade show: 12-2pm (cameras on), let us assume 250/300 attend the tradeshow
- Virtual networking: 4-5pm (cameras on), let us assume 200/300 attend the networking hour

<u>Day 2:</u>

- Streaming sessions (cameras off): 8:30-11:30am and 1-2:30pm, let us assume 300/300 attend live sessions
- Virtual networking: 11:30-1pm (cameras on), let us assume 100/300 attend

ii. Emails sent from organizers to event attendees is estimated based on a previous event calculation (Le Réseau des femmes en environnement, 2021)

iii. Emissions from pre-event planning and committee zoom meetings are estimated using ~45 hours of zoom calls (with camera on).

Venue Energy Emissions

Activity	Region	Unit	Amount	Factor	Kg C02e
Grid Electricity (estimate) [4]	Canada	kwh	11580	0.2314	2679.87
(Less) Generated Electricity Estimate	Canada	kwh	(-3276)	(-0.2314)	(-758.13)
				Total	1921.73

(United Nations Framework Convention on Climate Change, Harmonized Grid Factors, 2019)

Virtual Event Energy Emissions

Activity	Kg C02e
Day 1 (inclusive of streaming sessions, virtual tradeshow and virtual networking)	673.00
Day 2 (inclusive of streaming sessions, virtual tradeshow and virtual networking)	145.00
Email correspondence (estimate) for pre/post event emails and web page data [5]	100.00
Pre-event committee meetings/planning (Zoom)	45.00

[4] Assuming an estimated total savings of ~70% energy use through reduction activities.
[5] Includes emissions from webpage access (virtual swag bag) are estimated to be between 1-2k of C02e for 500 webpage visits (Wholegrain Digital, Website Carbon Calculator) using data centre energy use from the Green Web Foundation.

(Le Réseau des femmes en environnement (2021). www.rgfe.org, 2021)

Heat & Water

Heat is a scope 1 emission because it results from burning natural gas in the building we selected as our conference venue. Most people think that you won't have any emissions related to heat because you are running an event in July. But we can't forget that year-round, we need hot water for handwashing, dishwashing, and food preparation. Natural gas heats the water in the Edmonton Convention Centre. Happily, the water measure (inclusive of all water used for bathrooms and kitchen) is simple: it can be read off the building's water meter.
Though we could not make huge reductions in our emissions in this area, we deliberately planned some of our activities to lessen our impact. For instance, we were responsible for lunches on two consecutive days, and we supplied drinking water to delegates every day of the conference.

1. By offering a fresh lunch menu that did not have to be heated, we estimate that we used -15% less natural gas used in the kitchen. Also, by offering hand-held sandwiches, we circumvented the need for plates and cutlery and therefore did not use much hot water for wash-up.
2. The ECC has low-flow faucets and toilets so that keeps the emissions down. And it follows a practice of watering its atrium plants with the carafe water that remains at the end of a conference day, ensuring that no water goes to waste.
3. The date of the conference was part of the challenge, but we were fascinated to discover that having an event in the summer rather than the winter can not only save on emissions (that seems obvious) but also can dramatically reduce the footprint of the event. Indeed, natural gas usage in February at the ECC was 11,362 GJ. In July, it was only 1,587.11. Having a conference in July thus saved over 7 times the natural gas usage or involved using ~600% less. In July, Edmonton's average temperature is 23C, compared to 27-28C in eastern and southwestern Ontario, and 26C in Montreal and Winnipeg. This more temperate climate would require less AC use.

Emissions Results:

Our total emissions in this area were 2.90 tC02e.
We used 42 GJ of natural gas and 75 cubic metres of water.

On average, convention centres use 40.95 litres per attendee (GreenView, Green Venues Report, 2018)
We are at 37.5 L per attendee. So, our usage is below average.

Food & Beverage

The following are the assumptions made to calculate food & beverage emissions sources accurately:

Note: 2 speakers and 2 staff are streaming in (virtually) and therefore do not require food and beverage.

I. **Roasted Chicken Submarine Sandwich**
   A. 170 delegates
   B. 3 staff
   C. 11 speakers
   D.

II. **Ham & Swiss Submarine Sandwich**
   A. 170 delegates
   B. 3 staff
   C. 11 speakers
   D.

III. **Erdmann's BRT Sandwich (Plant-based)**
   A. 30 delegates
   B. 1 staff
   C. 3 speakers
   D.

IV. **Beverage**
   A. Roasti Coffee
   B. tabl'eau Filtered Water
   C. ECC water refill stations

Emissions Results

Packaging, transportation and production are included in the below emission results.

Food Item	Unit	Factors	Amount	kg CO2e
Non-alcoholic beverage	litre	0.20	496	*99.12
Meal, vegan	meal	1.69	83	140.27
Meal, with ham	meal	3.90	177	689.95

Meal, with chicken	meal	3.39	177	600.03

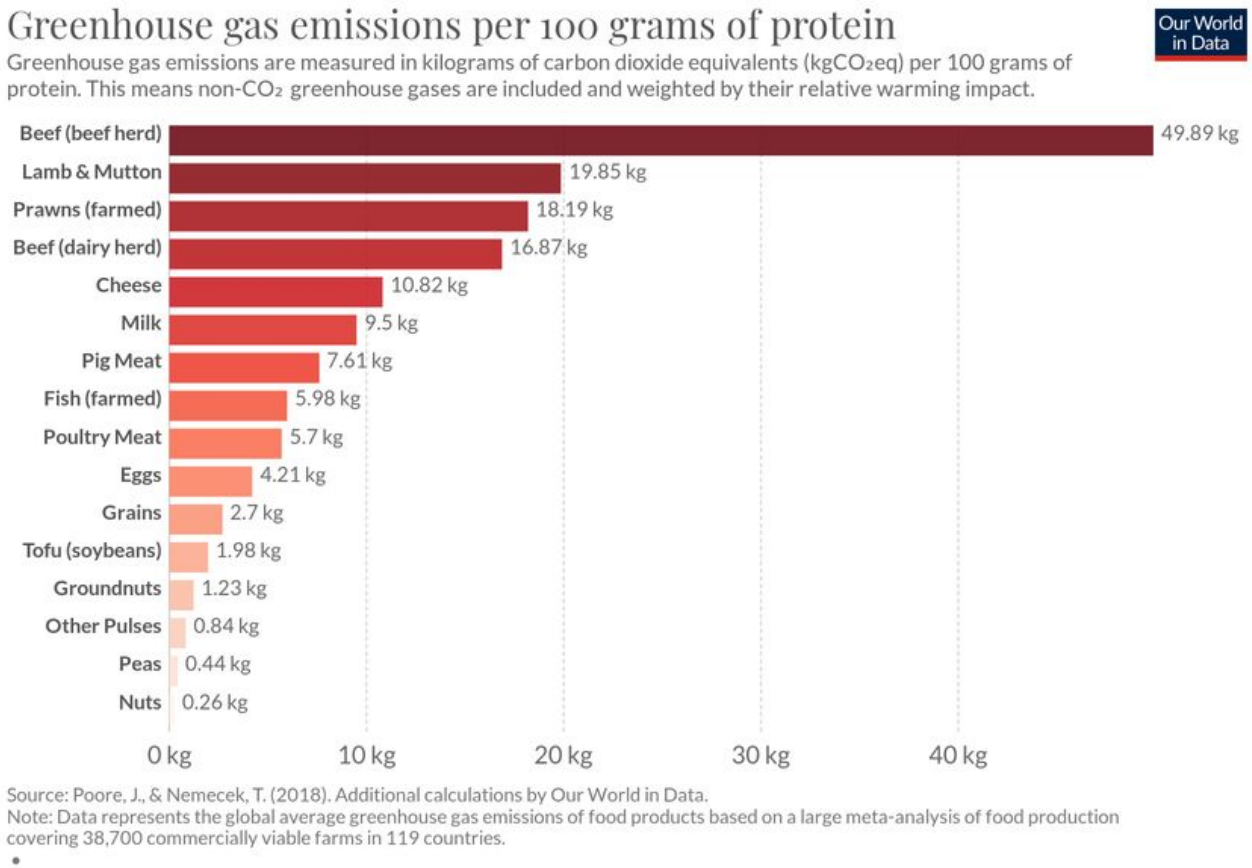
*0.12 per cup of coffee/tea (with fixins)

Emissions per meal

1. Roasted Chicken Submarine Sandwich: 3.51 kg CO2e
2. Ham & Swiss Submarine Sandwich: 4.2 kg CO2e
3. Erdmann's BRT Sandwich (Plant-based): 1.81 kg CO2e

Reduction Activities

1. **Choosing a low-emission protein meat source**



2. **Limit supply chain packaging**
    a. Purchase in bulk to limit single-use packaging
    b. Utilize reusable totes and bins from local producers
    c. Food preparation in-house at ECC

3. **Source Local (90% of ingredients sourced locally)**
    a. Roasted Chicken Submarine Sandwich
        i. Chicken sourced South Edmonton Produce (hormone-free). The whole chicken is used to reduce plastic packaging.
        ii. Fresh baked italian buns from Italian Centre Bakery. Italian Centre Bakery is committed to low-carbon operations and was the first grocery store to join the Edmonton Corporate Climate Leaders Program in 2019.
        iii. Balsamic Onion Jam from Fruits of Sherbrook. Fruits of Sherbrook make products for sale and donate fruit snacks and dried fruit to high needs schools and citizens of Edmonton experiencing food insecurity.
        iv. Lettuce from Swiss Leaf Farms. Shipped in reusable storage containers to decrease single-use packaging.

    b. Ham & Swiss Submarine Sandwich
        i. Ham from Irving Farm. Free-range and hormone-free. The entire nugget is purchased and sliced at ECC to reduce packaging.
        ii. Fresh baked italian buns from Italian Centre Bakery. Italian Centre Bakery is committed to low-carbon operations and was the first grocery store to join the Edmonton Corporate Climate Leaders Program in 2019.
        iii. Blue Kettle Honey Mustard. Delivered in commercial-sized jugs to decrease packaging.
        iv. Old School Cheesery Swiss
        v. House-grown and made pickles.
        vi. Sprouts are grown in ECC's indoor greenhouse.

    c. Erdmann's BRT Sandwich (Plant-based)
        i. Watermelon radish, beet, and tomato from Erdmann's Gardens. Delivered in reusable totes to decrease single-use packaging
        ii. Fresh baked and seeded italian buns from Italian Centre Bakery. Italian Centre Bakery is committed to low-carbon operations and was the first grocery store to join the Edmonton Corporate Climate Leaders Program in 2019.
        iii. Sprouts are grown in ECC's indoor greenhouse.
        iv. Blue Kettle mustard miso. They were delivered in commercial-sized jugs to decrease packaging.
        v. Chickpeas are purchased in bulk; hummus made on-site at ECC.

    d. Beverage
        i. Local coffee from Roasti

ii. Bulk purchased sugar and milk. Alternative milk options available: almond, oat
iii. Spoons instead of stir sticks

4. **Education**
    a. Share stories and unique sustainability practices of local growers and producers in your event marketing

Note: All food and beverage serviced by designated ECC employees to adhere to healthy venues COVID protocols. Sanitization is also available.

Materials & Waste

Due to ECC's thorough waste diversion program, we assumed the following would be our material & waste emissions sources:

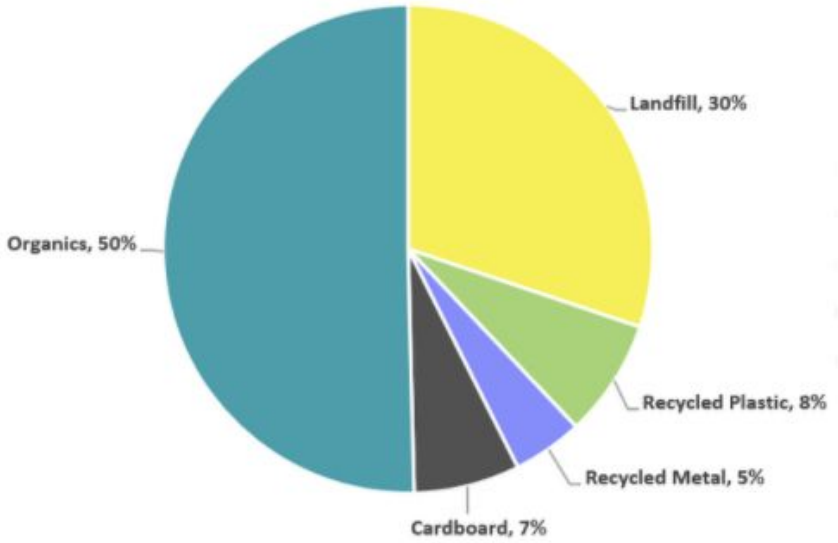
1. Landfill waste
2. Water

Emissions Results

Below is a breakdown of waste measured from the Edmonton Oil & Gas Forum:

Source	Landfill	Recycling Plastic	Recycling Metal	Cardboard	Organics
Weight (kg)	50	12.9	7.7	11.6	83.5

Emissions distribution



In Canada, the average conference attendee produces 1.89 kg of waste per day.

Our moonshot brought in 0.33kg of waste per guest per day. Of the 0.33kg, only 0.1kg ended up in the landfill due to ECC's waste diversion program.

Reduction Activities

1. **Event promotional material**
    a. Sustainable procurement and 'Terms of Reference' Agreements (Figure 6a. And 6b.)
    b. Assigning QR codes to each trade show exhibitor. When scanned via mobile device or tablet, will take delegates to their e-brochure.
    c. Loaned lanyards from Fairware.com
    d. Encouraging digital signage throughout ECC
    e.
2. **Divert waste from landfills**
    a. Complete 'Event Waste Audit' on both days of The Edmonton Oil & Gas Forum. Make an announcement each morning to inform delegates of the audit and encourage them to dispose of materials appropriately.
    b. Venue's in-house waste diversion program
        i. Back-of-house eco-stations
        ii. Front-of-house 4-stream waste sorters
    c. Ask attendees to compost sandwich packaging and napkins in the public-facing compost bins.
    d.
3. **Electronic Gift Bags**
    a. Curated Bandcamp playlist
    b. Audiobook credit
    c. Event 'grub crawl' credits to local restaurants and cafes
    d. Digital brochures from sponsors
    e.
4. **Food & Beverage Management**
    a. Partnered with Edmonton Food Bank's Second Helping' food rescue program
    b. Encourage guests to bring reusable bottles and coffee mugs via pre-event communications
    b. tabl'eau Filtered Water Station. Filtering and carbonating directly on-site reduces the added transportation, production, and recycling supply chain related to traditional packaged, boxed, and delivered water

i. Assuming guests will consume the recommended 8 cups of water per day. With delegates, staff and speakers, an approximate total of 844.18 x 16.9 oz Nestle single-use bottles are diverted from landfills.

c. ECC refill stations positioned throughout the entire conference centre
d. Post-event write up: share information on waste diversion estimates for sustainable promotion and education.

Transportation of Goods

j. Emission Sources

This emissions category measures transportation emissions from delivery or shipment by freight. This can be ground travel (ex. Truck or car), rail, air or sea. In the case of this event, the group selected only ground transportation of goods.

Reduction Activities

One way to reduce transportation of goods emissions may be to source locally. Our uniforms were produced locally and our printing was done in-house at the ECC, which eliminated the needs for shipping.

When looking at the emission factors for different types of fuel, it was clear that selecting gasoline-fueled vehicles over diesel and eliminating aviation fuel in air travel would be a useful tactic to reduce emissions as well.

In fact, when we compared using air travel over ground travel for our lanyards, we discovered that freight by air would have resulted in 4x the amount of emissions than for shipment by truck.

k. Assumptions
    i. All items (rented) are returned to the original shipping location. Same transportation method used for inbound and outbound trip.
    ii. Assuming transportation of pedal power bike requires individual transportation (entire vehicle)
    iii. Item weights are estimated based on the best available product description.

l. Results:

Source Description	Route[1]	Activity Data	Vehicle Type	Distance Travelled	Freight Weight (t)	Units	Fuel Type	kg CO2e
Generators Shipment [Inbound]	YYC - YEG	Weight Distance (e.g. Freight Transport)	Road Vehicle - HGV - Rigid - Engine Size 3.5 - 7.5 tonnes	300km	0.59874	Tonne km	Road Diesel Fuel	15.00
Generators Shipment [Inbound]	YEG- YYC	Weight Distance (e.g. Freight Transport)	Road Vehicle - HGV - Rigid - Engine Size 3.5 - 7.5 tonnes	300km	0.59874	Tonne km	Road Diesel Fuel	15.00
Bicycle Shipment [Inbound]	YEG- YEG	Vehicle Distance (e.g. Road Transport)	Light Truck (15.7L / 100km)	1.6km	NA	km	Road Diesel Fuel	0.68
Bicycle Shipment [Outbound]	YEG- YEG	Vehicle Distance (e.g. Road Transport)	Light Truck (15.7L / 100km)	1.6km	NA	km	Road Diesel Fuel	0.68
Lanyards Shipment [Inbound]	YVR- YEG	Weight Distance (e.g. Freight Transport)	Road Vehicle - HGV - Rigid - Engine Size Unknown	1160	0.00200	Tonne km	Road Diesel Fuel	0.001
Lanyards Shipment [Outbound]	YEG-YVR	Weight Distance (e.g. Freight Transport)	Road Vehicle - HGV - Rigid - Engine Size Unknown	1160	0.00200	Tonne km	Road Diesel Fuel	0.001
tabl'eau System Shipment [Inbound]	YYC- YEG	Vehicle Distance (e.g. Road Transport)	Light Goods Veh - Gas - Year 1996-present	300km	NA	km	Road Gas Fuel	117.00
Tabl'eau System Shipment [Outbound]	YEG- YYC	Vehicle Distance (e.g. Road Transport)	Light Goods Vehicle - Gasoline - Year 1996-present	300km	NA	km	Road Gas Fuel	117.00

(Greenhouse Gas Protocol, GHG Emissions from Transport or Mobile Sources, 2015)

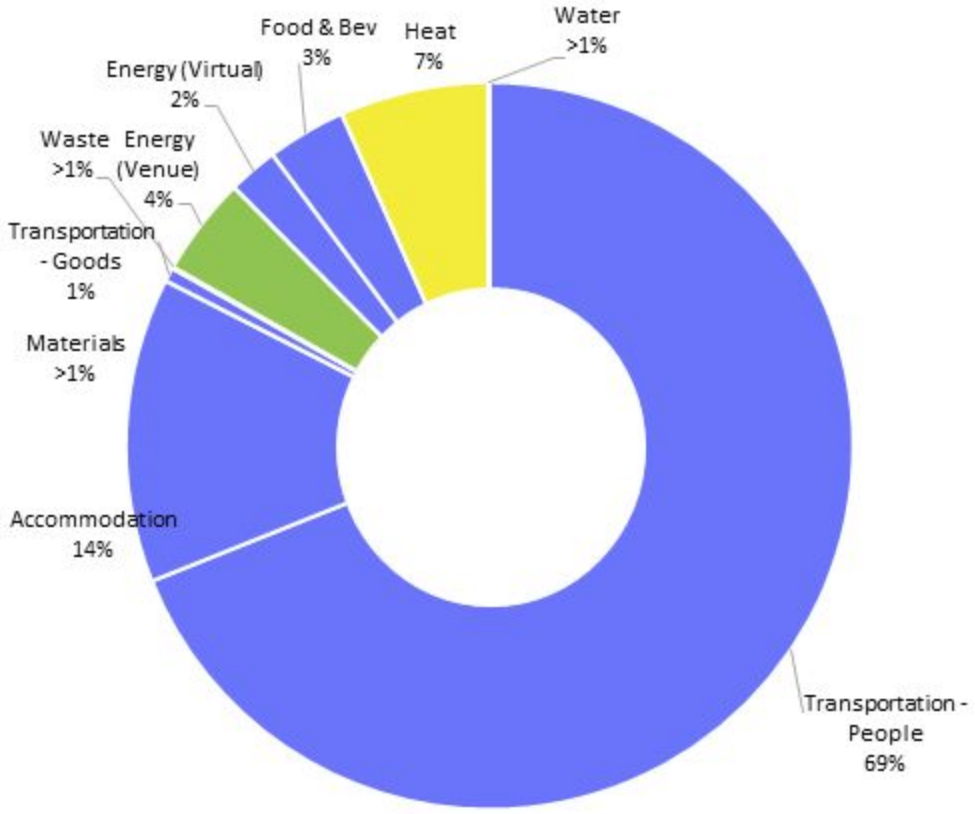
[1]All modes are road travel

Total analysis:

Chartered Freight Total: **30kg C02e - Road Vehicle - HGV (Diesel)**
Delivery (Entire Vehicle): **235.36 kg C02e - Light Good Vehicle**
Total Transportation of Goods Emissions = **0.27 t C02e**

Total Emissions Results

Scope 1
Scope 2
Scope 3



Total Footprint
43.55 tCO2e
Per Attendee
87 kg CO2e

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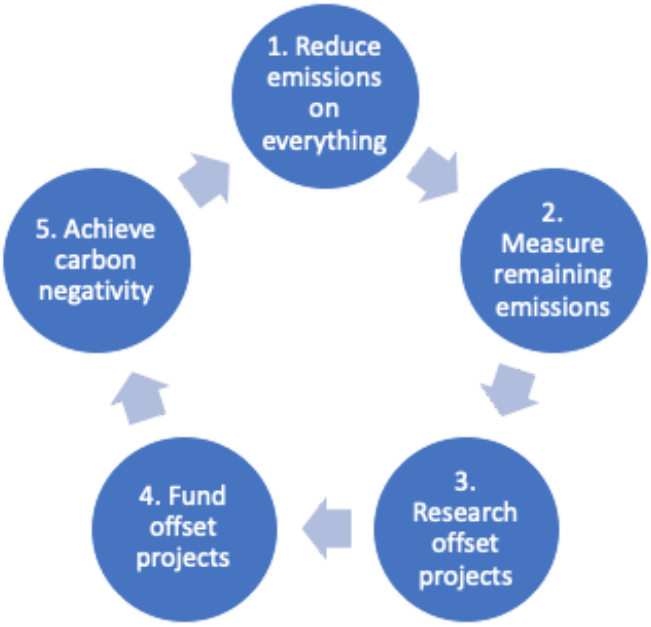
The total event carbon footprint was 43.55 t Coe2 or 87kg per attendee (inclusive of virtual and live attendees). In the total emissions chart, it's clear that the most significant portion of the event emissions, in this case, was ground transportation. As event professionals, we can use this to determine how to best prioritize efforts - what decisions in the planning process will have the most significant impact on driving emissions down. And moreover, to start to see year-over-year progress and, where appropriate, to set reduction targets.

When you compare this footprint to other events - the average footprint per attendee is over twice as much. According to a study done using a sample group of 56 conference across North America, the average carbon emitted per attendee for an average conference is 176kg (MeetGreen, 2014

The Path to Carbon Negativity: Offsets

The goal of carbon negativity is absolute reduction strategies in Scope 1, 2, and 3 as an elimination strategy. The last resort is to offset emissions where reduction and elimination are not available currently.



Research Carbon Offset Projects

Phase 3 of our path to carbon negativity begins in the burgeoning and often confusing world of carbon offset projects. In some circles, carbon offsets have a bad reputation for offering moral acquittal for thoughtless behaviour. If pursued only after one has reduced emissions as

much as possible, offsets allow us to take responsibility for our emissions, demonstrate leadership, and provide an income stream for project developers.

Since GHG emissions are not stationary and disperse throughout the world, there is no reason to choose a project in any specific region. But we thought that for this conference, delegates may look more kindly on an Alberta project for its "offset plus" factors, so that's what we searched for and found.

We considered several major areas when looking for a suitable project:

1. Type of Project
2. Additionality
3. Verification

Type of Project

Projects are grouped into 2 basic categories: emissions avoidance (reducing GHG's being emitted) and carbon sequestration (collecting and containing GHG's). Reducing GHG's is preferable to sequestering them.

Emissions-avoidance projects can be ranked as:

1) Renewable energy: Although GHGs emissions will occur during manufacturing and maintenance)
2) Energy efficiencies: Reducing fuel consumption
3) Emission reductions: Cleaner energy production - these are often seen as somewhat dubious, such as capturing instead of flaring or venting associated gases

Additionality

To be "additional," an offset project can't happen without the incentives arising from the offset market. So, the project must be one that would not have otherwise occurred, and it would therefore actually reduce a measurable amount of GHG.

A project that strives for energy efficiency in cooking stoves used by the poor in underdeveloped countries would most likely be deemed valid. In contrast, a project for developing oil extraction tools that use cheaper fuels more efficiently would be suspect since it could be argued that these would have been developed anyway for the purpose of economic efficiency. That is, saving on fuel costs.

Verification

Projects in their entirety should be verified by third parties, such as a reputable sustainability auditor (The Gold Standard is generally recognized as the best). Such things should include:

- **Economic efficiencies:** Costs and resource distribution in terms of the amount of money going to project vs. amount retained by the company proposing/operating project)
- **Additionality**; **leakage:** Whether the reduction of GHGs from project increases GHG emissions someplace else
- **Permanence:** How long will the benefits of GHG emissions/sequestration last
- **Offset plus:** Other environmental, health, social, economic benefits to people, especially locals

We researched projects offered by Emissions Reduction Alberta, Alberta agricultural carbon offsets, Terrapass's sustainable living projects, and Alberta Carbon Registries.

We did not choose offset projects that rely on storing carbon, like tree planting or agricultural sequestration, because if soil or trees are ever harmed by fire, logging, or disease, they can release some or all of their stored carbon back into the atmosphere, which would erase the climate benefit of the original offset and render it worthless. We also steered away from offset projects that seemed to mitigate some of the oil and gas industry's effects because these remained invested in the industry itself.

We concluded that renewable-energy and energy-efficiency projects are generally most likely to offer high-quality offsets and help support the transition to a clean-energy economy. With this in mind, we chose Ardenville Wind Farm Offset Project, Project ID:3863-7255, from the Alberta Carbon Registries to offset our emissions.

It is a preferred project as it eliminates GHGs, is very high on additionality (and appears to have one of the higher levels of reduction in GHGs), and is verified by 6 different auditors (although things such as financial details are not readily discernible). Leakage is hard to find (except for construction, but any power generation will have initial construction costs). At present, it has a 13-year benefit period (one of the longest ones on the Registry list). As for **offset plus**, we can say that wind energy is domestic; it creates jobs; it reduces public health costs by eliminating harmful pollution. Another positive factor is that it is not contributing to the profits/economic efficiencies of the oil and gas industry but rather helping to pave a way to more renewable resources. This is not to say that our research showed wind energy was perfect.

On the contrary, wind energy has amenity impacts, such as acoustic and visual intrusion. It may also affect the terrestrial ecosystem (as any power-generating system will) and affect birds'

behaviour (as they fly to avoid the blades and sometimes collide with them). But the positive possibilities seemed to outweigh the negative repercussions of building a wind farm or contributing to its sustainability.

We were looking to offset at least **44 tCO2e** to achieve carbon negativity. Our total emissions were 43.55 tCO2e, and the cost of the offset was $11 per metric tonne mT for a total of $484.

Obstacles Encountered During Case Study

1. **There is no 'one size fits all' carbon accounting tool.**
    a. Broad emission factors
    b. Selection of the most relevant emission factor to measure

Opportunity: Creation of a Canadian averages carbon accounting tool, with individual sections that can further factor emissions by province. Address obstacles, decision criteria should be used to evaluate the alternative?

2. **Where is the data?**
    a. Availability of Scope 3 data
    b. Prioritization of time vs. impact on emissions

Opportunity: Set boundaries around time and emission source totals. Our case study had a thorough waste management system, but the team knew that transportation would be our highest emissions so, we assigned more focus to transportation and less on waste area.

3. **Shifting the planning culture**

Opportunity: Develop a carbon negative planning framework that adapts the event planning process to incorporate sustainability goals

Recommendations

In understanding the GHG protocol and Scope emissions sources, you can understand the negative impact that Carbon Dioxide (CO2) emissions have on our planet. CO2 is one of the greenhouse gases that accumulate in our atmosphere radiation and prevents heat from leaving our atmosphere. The excess accumulation of heat disrupts the overall natural balance on earth, increases global temperature averages, and overall impacts weather patterns. This impact on overall climate is commonly referred to as ‘climate change’ and ‘global warming’.

As global citizens, we need to take accountability for our actions on our planet. The time for aggressive, proactive action is now. As you can see from this case study, event planning can have a large carbon footprint, and it is possible to plan an impressive event while aiming for carbon negative.

The following are the recommended action steps needed by event planners and industry professionals:

1. **Start with understanding the scopes**
    a. Learn about the GHG Protocol Scopes 1, 2, and 3
    b. Assess Scopes of the buildings, equipment, products, and supply chain that you will need/want for your event
    c. Set and consider Scopes emissions in each stage of the planning process

2. **Terms of Reference and Sustainability Agreements**
    a. Get everyone on the same page early on
    b. Create an agreement with clients, vendors and exhibitors
    c. Everyone involved has sustainability as a part of their job description

3. **Where is your time best served?**
    a. If you are unable to find relevant data and your time is limited - let go of scope 3 emissions that are not as impactful

4. **Incentivize positive action**
    a. Encourage low-emission travel
    b. Create offsets for delegates who will have to travel
    c. Go hybrid
    d. Stream in speakers
    e. Turn camera's off for segment of virtual event program

5. **Emissions diet**
    a. Start with carbon emission reduction strategies
    b. Find more reduction strategies
    c. Tapped out? Then offset (if needed)

6. **Sourcing**
    a. Source and support local
    b. Consider event destinations that are adopting and applying policies to reduce carbon emissions
    c. Check for sustainable Certifications and Designations
    d. Assess to see if source can track and communicate carbon emissions
    e. Rethink protein sources

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Appendix

Figure 1. - Edmonton Convention Centre Floor Plan

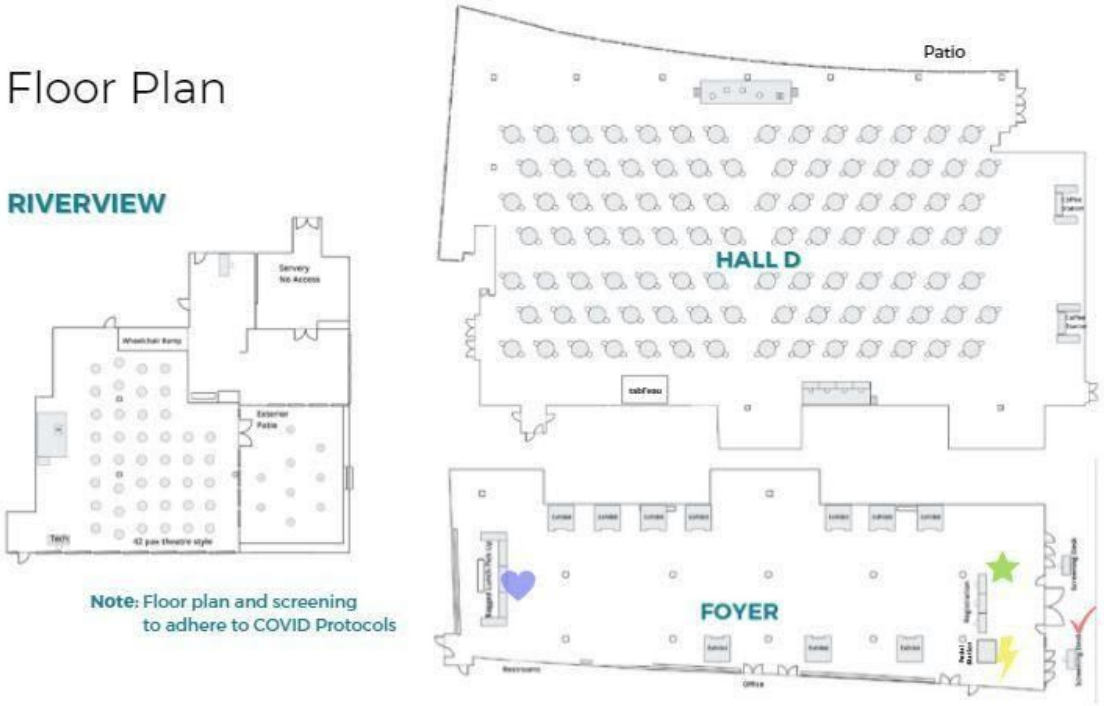

Figure 2. - Green Space Map

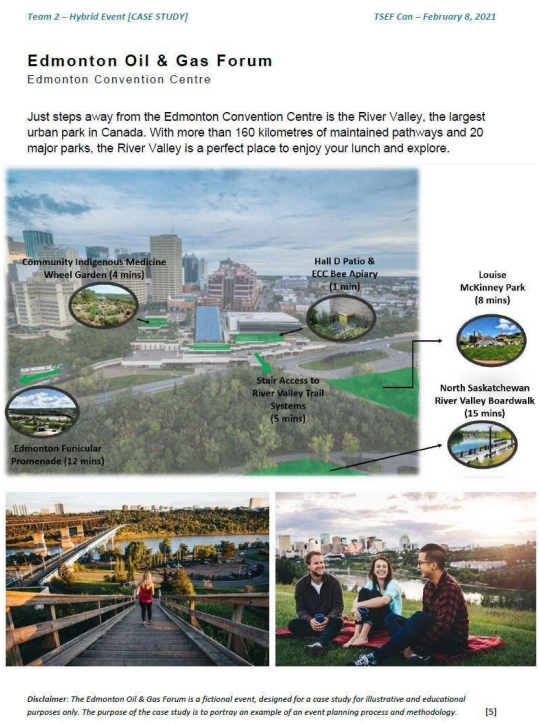

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Figure 3 - Terms of Reference: Conference - Sustainability Policy

Conference – Sustainability Policy

The conference strives to be an environmentally conscious event and achieve the goal of being a carbon neutral event. This will be accomplished by working with sustainable partners and actively integrating sustainable processes throughout the entirety of the event planning and execution process. We aim to reduce our impact through the following actions:

Reduce\Reuse
Avoid single-use, disposable items and encourage reusable ware
Reuse materials where available and avoid production of new materials

Key Actions:
- Print signage and conference materials using recyclable material, wherever possible and responsibly dispose of materials and signage where it is not possible to recycle or reuse.
- Do not offer delegate gifts\bags
- Encourage delegates to bring their own reusable water bottles\coffee mugs
- Recycle and/or reuse name badges and lanyards

Resources
Utilize digital innovations to reduce paper and product consumption on-site.
Waste reduction\diversion – reduce waste through clear recycling and composting programs

Key Actions:
- Provide a 3-bin waste system with clear signage at the venue
- Utilize a conference app instead of a full detailed printed program
- Use digital signage and communication, where possible

Carbon offset/Carbon impact
Take responsibility for our carbon emissions that can't be eliminated through the purchase of high standard carbon offsets

Key Actions:
- Collect necessary information to accurately calculate carbon emissions associated with attendee travel and accommodation, energy usage at the event venue and waste produced at the event
- Purchase quality carbon offsets from a reputable offset provider to offset above calculated emissions.

Venues
Select a Green Key, ASTM or LEED certified venue to host the conference and ensure that sustainability is top of mind in the planning

Key Actions:
- Select the Edmonton Convention Centre as the host venue, which has a Green Key level five status and is ASTM certified
- Select the (Insert Hotel) as the host hotel, which (insert accommodation sustainability actions here).

Food & Beverage
Recognizing the important role that food, menu selection and food waste plays on the environment and making environmentally conscious decisions

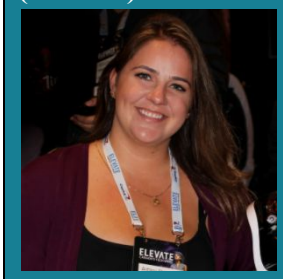
Key Actions:
- Donate leftover food and product to the Edmonton Food Bank's Second Helping Program
- Compost all food waste.
- Use local suppliers and food vendors, where possible.
- Choose a seasonal, locally sourced, plant-based menu.

Teamwork
Encourage our attendees and suppliers to contribute to the sustainability of the event through their own actions

Key Actions:

- Include sustainable messaging in our conference promotions and pre-event emails
- Remind delegates of their impact during mainstage programming
- Provide clear signage of 3 tier waste reduction program
- Educate all organizers about sustainability goals for the conference and be able to answer questions and queries on-site.
- Use the conference as an example to encourage future conferences and events to pursue sustainability.

Post-Conference Reporting
The conference will evaluate the event's overall environmental impact through detailed GHG measurements, with support from the Edmonton Convention Centre and their partners. As per the Greenhouse Gas Protocol, the conference's environmental impact assessment will capture all emissions under Scope 1 and Scope 2, and as much of Scope 3 as reasonably possible. The post-conference GHG measurement report will capture the conference's overall carbon footprint and will be inclusive of emissions relating to delegate travel, delegate accommodation, energy usage at the event, waste production and paper use at the event.

Jeffrey Fehr (He/Him) 	**Travel Trade Specialist, Tourism Saskatoon** LinkedIn: www.linkedin.com/in/jeffrey-fehr-154633111 "Taking on climate change one carbon at a time."
Melissa Radu (she /her) 	**Venue Sustainability Manager, Explore Edmonton** LinkedIn: https://www.linkedin.com/in/melradu/ Twitter: @melissa_radu “If you are going to bother doing something, you ought to bother measuring it.”
Ashley Stephens (she/her) 	**Hybrid Team Lead** **Director, Marketing & Events at tabl’eau Filtered Water** LinkedIn: https://www.linkedin.com/in/ashleymariestephens/ Twitter: @theashstephens https://twitter.com/theashstephens “When it comes to sustainability, change is coming whether companies are ready or not. A positive shift towards carbon neutrality for organizations will come in 2 forms: those who feel the fire or those who see the light. Which team do you want to be on? Be an early adapter.”
Marie Zimmerman (she/her/elle) 	**Executive Director, Hillside Festival** LinkedIn: https://www.linkedin.com/in/marie-zimmerman-2247bb33/ “People are fundamentally good, kind and hardwired to work together. Trust in those certainties when you are trying to motivate change”