Real-Time Reporting
Sustainability and Wellbeing

International Sustainable Campus Network Conference

Hosted by University of British Columbia and City of Vancouver

June 26-28, 2017

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Real-Time Reporting: Sustainability and Wellbeing

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Executive Summary

The University of British Columbia (UBC) wanted to create a legacy of real-time reporting for the International Sustainable Campus Network (ISCN) conference. The goal of real-time reporting was to fully understand the sustainability footprint of the ISCN conference and to develop shareable tools to capture, measure and report on the environmental footprint and sense of wellbeing at the conference in real time.

The annual ISCN conference was hosted by UBC and City of Vancouver from June 26th to June 28th, 2017. Delegates had the opportunity to experience UBC's campus and Vancouver's Olympic Village while visiting diverse venues to learn about innovative sustainability initiatives.

To complete the real-time reporting project, Emily Mann, a graduate student, was hired as part of the UBC Sustainability Scholars program. Working with conference organizers and experts on campus she researched and designed the real-time reporting process outlined in this report. To the team's knowledge, this is the first attempt of real-time sustainability reporting at an academic conference.

During the conference, real-time reporting was communicated through a Sustainability Metrics Dashboard, an interactive poll, and motion graphics on digital signage. This report will explain the research and reporting process that includes: metrics selection, data collection, and data analyses.

Real-time reporting proved to be valuable in helping delegates to realize the environmental and wellbeing impacts of the ISCN conference at UBC while they were participating in conference activities. The following report can be used as a guide to implement real-time sustainability reporting at future ISCN and other academic conferences.

Introduction

Why Real-time Reporting?

The goal of real-time reporting is to fully understand the sustainability footprint of the ISCN conference and to develop shareable tools to capture, measure and report on the environmental footprint and sense of wellbeing at the conference in real time.

The shareable tools were meant to:
1. Provide accessible information about participants' impact on the sustainability footprint of the conference and promote awareness of wellbeing during the conference
2. Promote action during the conference to increase sustainability and wellbeing
3. Inform attendees of sustainable conference design and sustainable practices at UBC

Conference Design

Real-time reporting helped to create awareness of the conference's unique design that kept sustainability and wellbeing at the heart of every decision. The conference design curbed participant behaviour through choices that reduced the conference's carbon footprint and increased wellbeing. For example, a major design decision was to cluster venues to promote walking as the main mode of transportation. This both reduced the carbon footprint by almost eliminating car travel during the conference, and increased wellbeing by promoting physical activity and personal interaction throughout the day. Real-time reporting helped to make the conference design decisions more transparent and engage delegates.

Initial Investigation

Event sustainability is becoming a large topic as many academic institutions increase their commitments to sustainability. Many events have been evaluated for their environmental impact, but this is often reported long after events occur. A real-time reporting approach, however, can have greater impact because it helps participants to connect the impact of the event's activities to the spaces in which the event is held. This creates awareness of the environment and wellbeing, and potentially causes behavioural change during the conference.

Real-time sustainability reporting at the ISCN conference used carbon footprint analysis to determine the climate change impact of the event. As carbon footprint analyses are intricate studies, it was important for real-time reporting to keep in mind the practical limits of data collection and means of communication during the conference when choosing sustainability indicators.

Sustainability indicators were chosen based on the following criteria:
- Indicator has a large impact on the carbon footprint of the conference or attendees have a real impact on the indicator
- Attendees can take action to mitigate their impact on the indicator
- Indicator is relatively easy to measure
- Measurement of indicator is replicable to some degree on other campuses

Scope
Real-time reporting attempted to capture the conference's carbon footprint at UBC and in Vancouver. The carbon footprint of the conference extends beyond the scope of real-time reporting, however, setting practical limits for data collection allowed for more accurate data collection and more effective communication during the event.

The scope for Real-Time Reporting was the following:
Time: Monday, June 26th at 12:01am to Wednesday, June 28th at 11:59pm
People: All delegates who attended the conference, UBC Sustainability Initiative Staff, and Conference Guest Speakers
Travel: Travel to Vancouver and travel during the conference including daily commutes to venues, and travel coordinated by the conference (i.e. Coach buses)
Accommodation: UBC Ponderosa Hotel. Accommodation off campus was used by few participants and could not be accurately accounted for
Venues: UBC venues and BMO theater. Big Rock Brewery could not be accurately accounted for and the Sage Bistro dinner fell out of the time scope
Meals: All meals at UBC during the time scope. Meals at BMO Theater and Big Rock Brewery could not be accurately accounted for and Sage Bistro fell out of the time scope

Limitations
This report is intended to provide insight into how to conduct real-time reporting for future ISCN conferences, or other academic conferences on campuses internationally. It is understood that every university and every sustainability department has different capabilities in terms of data collection and sharing, interdepartmental communication, access to resources. UBC was well equipped to initiate this study and hopes that the processes described here can be adapted to other campuses.

The carbon footprint analysis performed looked only at the climate change impact of certain aspects of the conference. Because of the necessities of real-time reporting, not every factor of the event could be analysed in detail. Real-time reporting focused on aspects of the event that contributed most to the carbon footprint, or could be significantly affected by participant behaviour.

Guiding Questions

The process for researching and selecting reporting metrics was driven by the following key questions:
- What sustainability and wellbeing metrics were most interesting to report?
- What was done on UBC's campus in terms of sustainability initiatives and data collection for chosen metrics?
- What metrics were easy to communicate and easy for delegates to interpret?

➢ UBC has many sustainability initiatives that extend to diverse areas of campus including UBC food services, energy management, behavioral studies, building management, and campus engagement among others.

➢ Many of the leaders of UBC's sustainability initiatives were eager to offer advice or participate in real-time reporting. Building and food service staff were also eager to learn about the project and contribute to data collection.

➢ Effective communication was imperative to real-time reporting. The two key communications considerations for real-time reporting were first, the diversity of conference delegates who had varying levels of sustainability and wellbeing expertise, and second, limited time for reporting. To meet these considerations, graphic data representation was used and sustainability metrics were chosen that were thought to be widely understood, relatable, and communicable with tangible quantities.

Real-Time Sustainability and Wellbeing Reporting

Sustainability and wellbeing reporting was done through different communication channels. The following will explain the real-time reporting process by first outlining the sustainability dashboard and each reporting metric, and second, describing the two aspects of wellbeing reporting, the step count and the happiness poll.
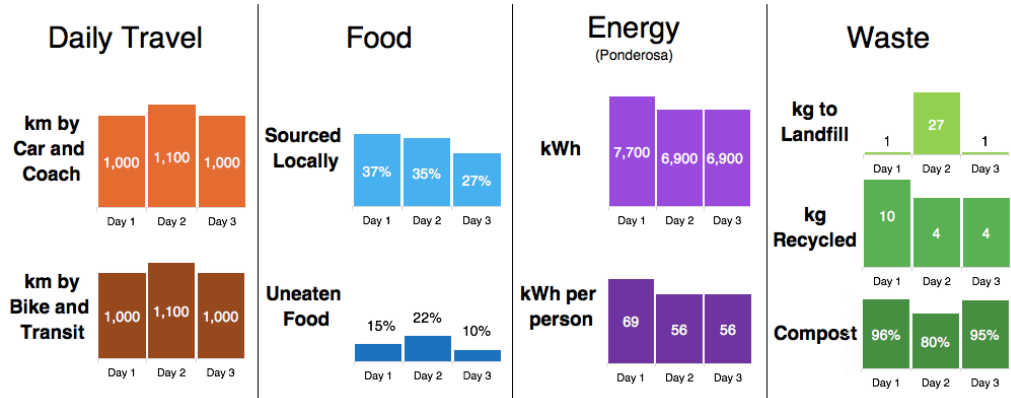
Sustainability Reporting

For real-time sustainability reporting, it was important to measure changing sustainability metrics as well as the carbon footprint. To evaluate which sustainability metrics would be reported, the conference was broken into the following organizational categories: Travel, accommodation, venues, food, waste and communication material. Each category was initially evaluated for its carbon footprint contribution, data collection practicality, and easily communicable content. From this initial analysis, the real-time reporting categories were narrowed down to those that offered interesting metrics for the dashboard, and had the largest impact on the conference's carbon footprint. The categories that were chosen for real-time reporting were: Travel, Energy use in the Ponderosa Hotel, Food, and Waste.

Conference venues were not included in real-time reporting because often the conference did not occupy an entire venue and therefore had minimal affect on the building's energy use. In addition, data from buildings off campus was not obtainable in real-time. Communication material was not included in real-time reporting because it was very minimal and therefore had a negligible impact on the conference's carbon footprint.
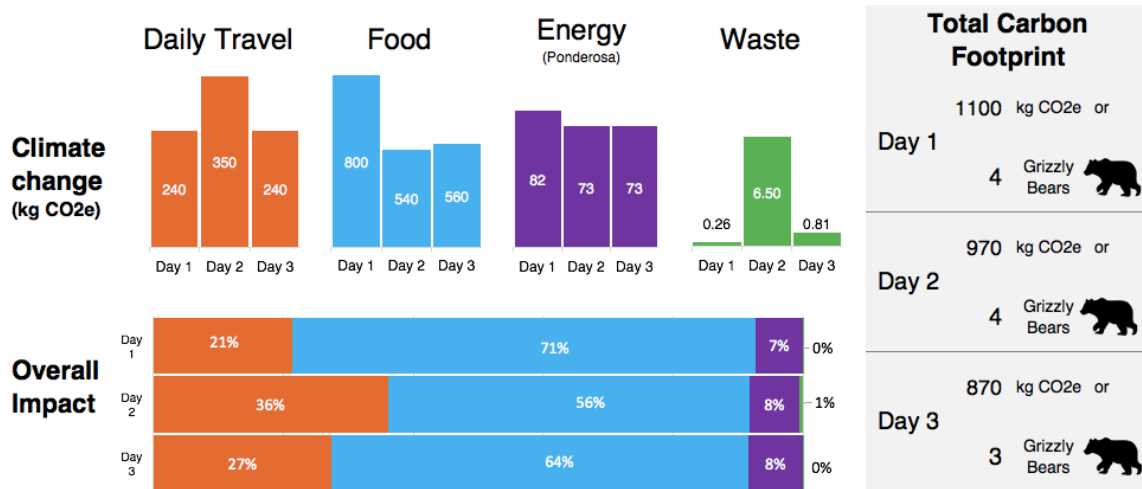
Real-time reporting was complimented by informational slides that appeared during transition periods of the conference. These slides provided context to the real-time reporting by providing additional facts and information in each organizational category. See Appendix 1 for the informational slides.

Below are the sustainability dashboards that updated daily with results. As reporting was done in the late afternoon on each day of the conference, results reflected each day from 12:01am to "now," the time the report was posted. The results below reflect the conference as described in the scope.

Daily Real-Time Sustainability Metrics Dashboard with conference results

Daily Real-Time Carbon Footprint Dashboard with conference results*

*Climate Change Impact or the Carbon Footprint is measured in kilograms of carbon dioxide equivalents (kg CO2e).

Metrics

The following section will explain how data was gathered to report on the metrics of each organizational category in the dashboard.

Travel

Travel was measured by separating data into "Travel to Vancouver" and "Travel During the Conference." It was important to measure travel to Vancouver because of the large carbon footprint of air travel, and also important to measure travel during the conference to illustrate how minimal this impact was due to the conference design.
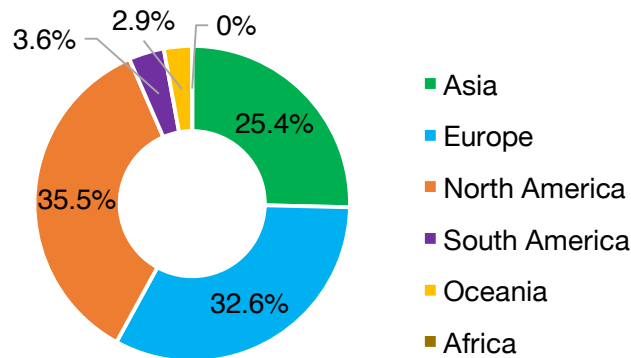
To measure distance traveled and the climate change impact of "Travel to Vancouver", the registration survey was used to learn where delegates were travelling from and which mode of transportation they were taking. Flight distances were calculated using myclimate.org. Transit and car travel distances were calculated using Google Maps. The carbon footprint factor for each mode of transportation was taken from EcoInvent 2.2. Vehicle occupancy rates were assumed to be the industry average, and everyone was assumed to fly economy class. If lower vehicle occupancy rates or business class travel was assumed, the carbon footprint of travel would have been higher.[1]

To measure "Travel During the Conference", the registration survey was used to learn about delegate's accommodation choices which also provided information on daily commute distances. For delegates who stayed off campus, it was assumed they commuted an average 20km roundtrip to the conference each day and used a mix of public transit and cars. The scope of reporting was limited to one round-trip commute per delegate, as well as pre-arranged conference transportation, such as coach buses. All other travel, such as taxis taken by delegates during free time could not be captured.

Data for both "Travel to Vancouver" and 'Travel During the Conference" was separated into participant type to capture assumed differences in travel patterns both to Vancouver and during the conference. These three groups of participants were: Delegates attending the conference, Staff from UBC Sustainability Initiative, and Guests (i.e. guest speakers). The major differences in travel patterns are: Delegates typically travelled internationally to get to Vancouver, staff from UBC Sustainability Initiative used vehicles to transport items during the conference, and Guests typically only attended one day of the conference.

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[1] The GHG emissions per business class plane passenger are 1.9 times greater than they are for an economy class passenger because of the larger amount of space occupied by business class passengers. MyClimate.org.

Delegate Travel to Vancouver by Region

- Asia — 25.4%
- Europe — 32.6%
- North America — 35.5%
- South America — 2.9%
- Oceania — 0%
- Africa — 3.6%

Delegate Travel to Vancouver by Mode

Mode	Delegates	% of Delegates	Total km	Average km	Climate Change* (kg CO2e)
Bike	1	1%	50	50	1
Car	9	7%	14,000	1,600	1,900
Plane	122	88%	1,600,000	13,000	200,000
Transit	6	4%	11,000	1,800	530
Total**	**138**	**100%**	**1,620,000**	**17,000**	**208,000**

Travel During Conference by Mode

Mode	Distance (km)	Climate Change* (kg CO2e)
Bike	360	5
Car	3,000	460
Coach	50	61
Transit	2,700	320
Walk	3,900	0
Total**	**3,750**	**840**

*Climate Change Impact factor from EcoInvent 2.2
**May not sum to total due to rounding

Travel Key Takeaway

Travel is typically one of the largest sources of greenhouse gas (GHG) emissions at academic conferences because of international flights. As face-to-face interaction is presently perceived to be invaluable, this is seemingly an unavoidable source of GHG emissions for academic conferences and is mitigated by purchasing carbon offsets. ISCN purchases carbon offsets to account for participant air travel to their conferences. A key question for future academic conferences is, how can air travel be limited?
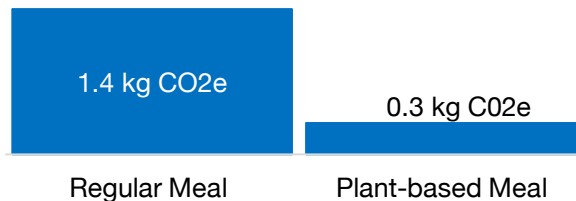
Food

The sustainability metrics dashboard was used to highlight one of UBC's food initiatives, sourcing locally, as well as to show unseen food waste. UBC Food Services has made significant commitments to sourcing locally to help mitigate the climate change impact of food ingredients and to support local agriculture production. UBC Food Services helped to determine how much of the food served at the conference was locally sourced. "Locally Sourced" is defined as food that is raised, grown, processed and/or produced within BC.
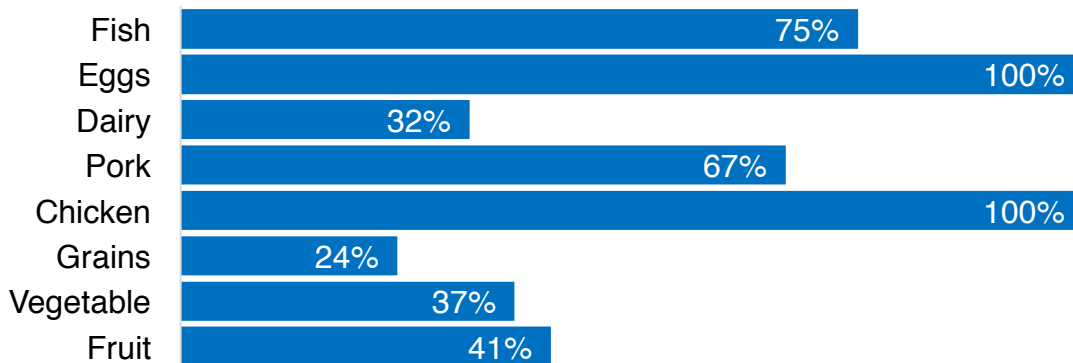
Food waste can often go unseen at events because it occurs in kitchens when prepared food goes uneaten. Though unseen, this can be a large source of waste. When planning conference meals, conscious efforts were made avoid over-ordering of food. Chefs and food servers were consulted to determine how much food was left over at the end of each meal.

The carbon footprint of conference food was determined by evaluating the average ingredient composition of a 400g meal.[2] This calculation uses a proxy ingredient for each food type, such as apples to represent fruit. The climate change impact factor was determined for each ingredient using EcoInvent 3.1. The menu at the conference involved limited meat, eggs and dairy, and focused heavily on plant-based ingredients. Therefore, the average ingredient composition of a 400g meal was skewed to reflect the greater use of plant-based ingredients during the conference.

Climate Change Impact of a Plant-based meal vs. Regular meal

Locally Sourced Food Ingredients

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[2] Estimation from Report - Bilan carbone de la SEMGEST (2008) p.10-14.
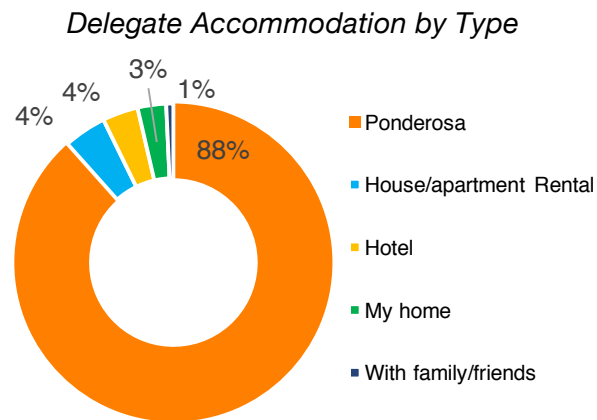
Food Key Takeaways

UBC's sustainable food commitments make the carbon footprint of the conference meals smaller than they would have been 20 years ago before the current sustainability initiatives. In addition to focusing on locally sourced food, it would have been interesting to look at other dimensions of sustainable food sourcing such as fair trade, or 3rd party certified sustainable food.

Electricity in Accommodation

Energy was measured by looking at Electricity use in the conference hotel, Ponderosa. At UBC, electricity data was easy to collect because data for many buildings is available on a publically accessible website. Data was extracted from the online database for each real-time reporting period and analyzed. The climate change impact factor per kwh of electricity is from BC Hydro.[3] To calculate the climate change impact of other aspects of accommodation, such as construction, water and wastewater, the climate change emissions factor was taken from EcoInvent 3.1.

The Ponderosa campus hotel is one of UBC's sustainably designed residence complexes. To increase its sustainability, the complex does not have air-conditioning in the rooms and is heated with UBC's district energy system that increases the efficiency of heating buildings while decreasing GHG emissions on campus.[4]

Delegate Accommodation by Type

Legend:
- Ponderosa
- House/apartment Rental
- Hotel
- My home
- With family/friends

Values shown: 88%, 4%, 4%, 3%, 1%

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[3] 2016-2017 BC Best Practices Methodology for Quantifying GHG Emissions, Government of BC.

[4] UBC's Academic District Energy System (ADES) is a steam to hot water conversion project that has been underway since 2011. ADES will provide the platform to achieve UBC's long-term target of eliminating the use of fossil fuels on campus by 2050. UBC Energy and Water Services.

Waste

For real-time reporting of waste, the weight of bins was estimated in each venue in three waste categories: Landfill, recycling and compost. Upon arriving in each venue, bins were checked to make sure they were empty and a quick measure of their weight was taken upon leaving. Because waste was determined be a minor contributor to the conference's overall carbon footprint, it was decided that this quick measuring system was sufficient to communicate the impact of waste.

Though making a minimal contribution to the carbon footprint, waste is a tangible way for conference delegates to contribute to decreasing the environmental impact of the conference. Waste was therefore included in real-time reporting to encourage sorting waste and to communicate how small this impact is in comparison to other aspects of the conference.

Key Figures
95% of food waste, including disposable plates, cutlery and napkins were composted.

Waste Diversion Rates

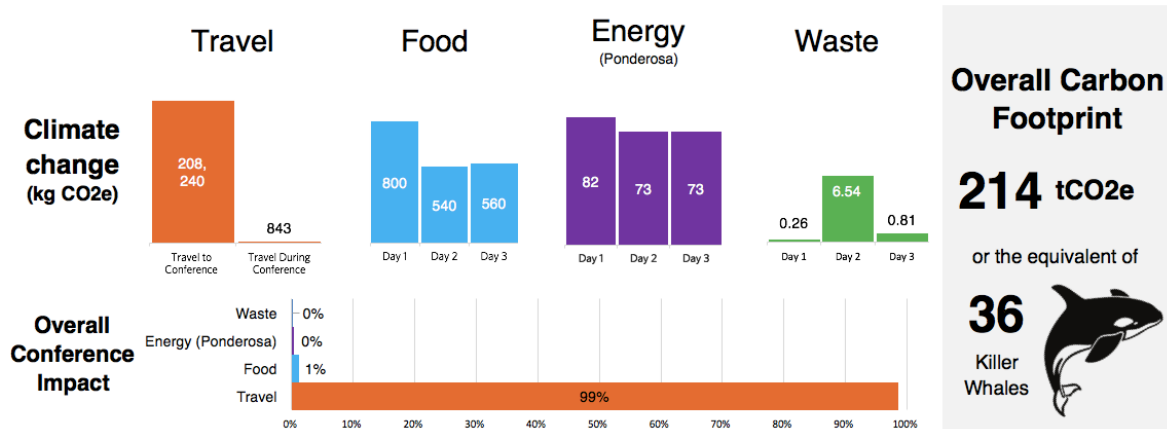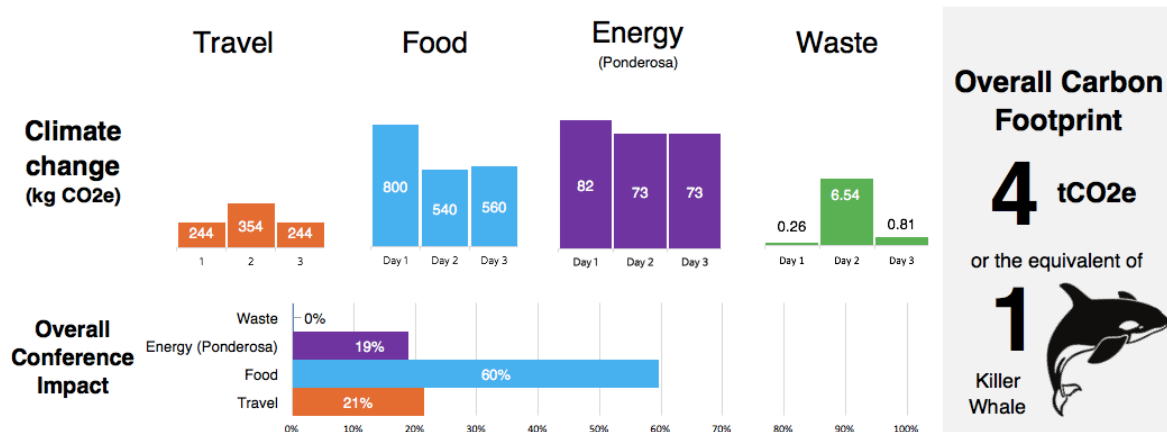| **Diversion from landfill rate at UBC venues**	**Diversion from landfill rate at off campus venues**
89%	**0%**

Waste Sorting at UBC

Results

Carbon Footprint Dashboard
Below are the Carbon Footprint dashboards that were used to present the overall carbon footprint of the conference. Two versions of the dashboard were displayed to show the impact of the conference when travel to the conference was included, and the impact when it was excluded.

Conference Carbon Footprint: Including Delegate Travel to Vancouver, and Conference activities at UBC and City of Vancouver

Conference Carbon Footprint: Conference activities at UBC and City of Vancouver
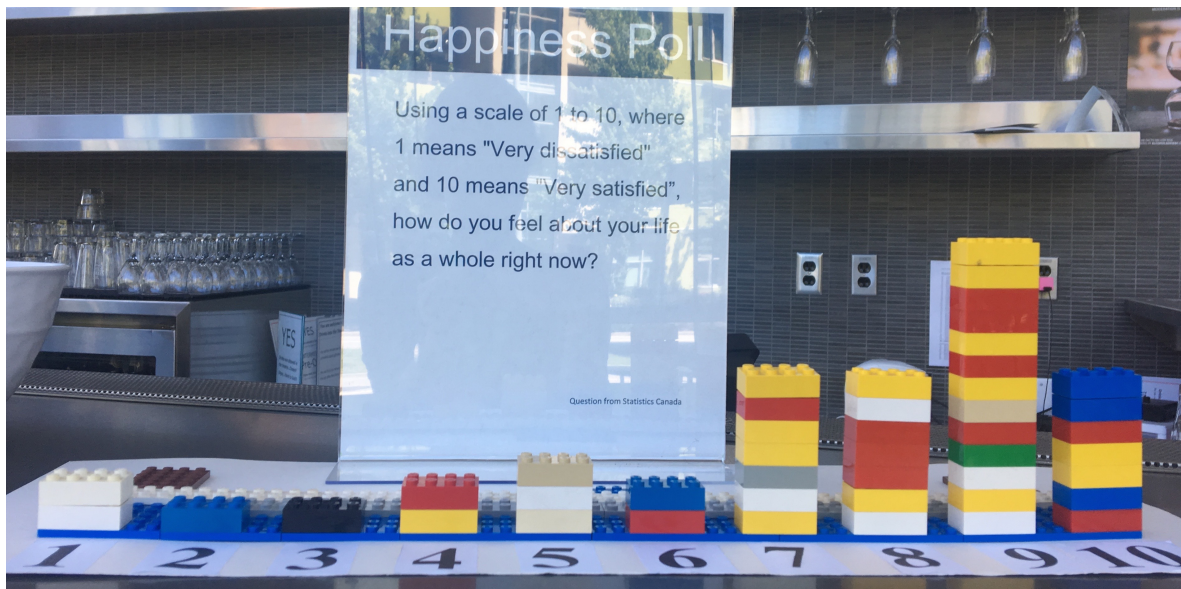Excluding travel to Vancouver, the conference's carbon footprint was significantly smaller.

Happiness

Subjective wellbeing was evaluated in the Happiness Poll. The poll asked a similar question to that used by Statistics Canada to measure subjective wellbeing. The question asks, "Using a scale of 1 to 10, where 1 means 'Very dissatisfied' and 10 means 'Very Satisfied', how do you feel about your life as a whole right now?" The question asks about "life as a whole" because all aspects of a person's life affect how they are feeling at any given moment. Wellbeing indicators are being increasingly used to measure performance on academic campuses and are also increasingly influencing decision making. The World Happiness Report states that "policy makers are increasingly using happiness indicators to inform their decision making" and, in addition, happiness is "increasingly considered a proper measure of social progress."[5]

An interactive poll was used to increase engagement in wellbeing as a performance indicator. Moreover, interactive activities that increased personal connections and active learning were used throughout the conference to increase delegate wellbeing.

Happiness Key Takeaway

The interactive display made from Lego building blocks was enthusiastically received and many people took pictures to post on social media or to show colleagues. Though attracting a lot of initial enthusiasm, the repetitiveness of the question and task caused participants to lose interest over the three days of the conference. A more effective engagement mechanism could have been to look at different dimensions of wellbeing by asking different questions with the same Lego poll.

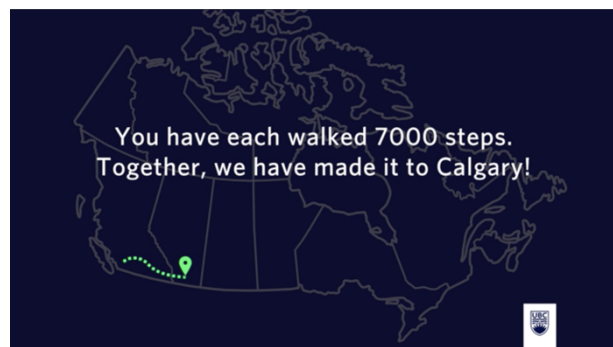---

[5] World Happiness Report, 2017

Steps

To measure the number of steps participants took each day, pedometers on phone apps and watches were used. Data was collected from four conference delegates who volunteered to report their steps each day. These sample delegates provided daily step counts from which to estimate the average daily steps taken by each conference delegate. There is a lot of variance in how devices measure steps and in individual stride length, and therefore the volunteers' reported steps were taken to be an approximate indicator of how many steps each delegate took.

The step display was done with a motion graphic on digital signage that updated four times throughout the conference. Illustrated is the distance walked across Canada on day one (Calgary), and on day three (Thunder Bay). The graphic ended with a reminder for participants to stay active.

Increasing participant activity levels above those at a typical conference was important to the conference design and crucial to increasing delegate wellbeing. Long periods of sedentary activity, such as those associated with a typical office job, have been proven to have negative health affects. The conference design emphasized the importance of daily activity by limiting sedentary time.

Steps Key Takeaway

Steps display was the most engaging part of the real-time reporting. Great enthusiasm was shown for the initial question, "Can we walk across Canada?" This was accompanied by a graphic that was done by UBC's digital communications team who were keen to participate in the real-time reporting to experiment with ways to effectively engage students in campus research.

Conclusion

Real-time reporting served as an interesting exercise to help conference attendees see the environmental and wellbeing impacts of the ISCN conference at UBC. Overall, delegates were engaged in the process and received results with enthusiasm. Assigning one person the responsibility of data collection and reporting throughout the conference, was successful and not overbearing. This created smooth information transfer, and a single point person to answer questions regarding the sustainability metrics or carbon footprint during the conference.

Though, not a perfect science, comparing the carbon footprint of the conference's organizational categories is an effective way to evaluate where sustainability efforts should be focused during conferences and to help delegates see which aspects of the conference have the largest impact. Performing real-time reporting in future ISCN conferences can help organizers to first, evaluate which aspects of their conference have the largest climate change impact, second, determine where sustainability efforts should be focused, and third, help communicate their sustainability efforts to conference delegates while they are at the conference and engaged in the campus. There are benefits to be gained if campuses internationally performed real-time reporting analyses because processes and regional differences in carbon footprints could be compared. In addition, real-time reporting could eventually be expanded to include other impact categories such as human health. Our hope is that this report serves as a useful first guide for real-time sustainability reporting for events on campuses around the world.

Appendix 1: Static Reporting

SUSTAINABILITY REPORT

Real-time impact.

We are reporting on the climate change and wellbeing impact of the following:

- Travel
- Food
- Happiness
- Energy
- Waste
- Daily Activity

1

SUSTAINABILITY REPORT

See the impact IN REAL TIME

- **Travel:** Air + ground
- **Food:** Sourcing local + uneaten food
- **Energy:** Energy use in Ponderosa
- **Waste:** Landfill, recycling and compost
- **Happiness:** All things considered, on a scale of 1-10, how happy are you right now?
- **Steps:** Can we walk across Canada?

2

SUSTAINABILITY REPORT – GET INVOLVED

Help to reduce the environmental impact of this event. Sort your waste!

3

SUSTAINABILITY REPORT - HAPPINESS

Did you know?

"Governments and civil society organizations increasingly use happiness indicators to inform their policy decision making... Happiness is increasingly considered the proper measure of social progress and the goal of public policy."

World Happiness Report, 2017

4

SUSTAINABILITY REPORT – HAPPINESS

Did you know?

Reports of Happiness depends on:

Social Support
Healthy life expectancy
Freedom to make life choices
Perceptions of corruption
GDP per capita
Generosity

World Happiness Report, 2017

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SUSTAINABILITY REPORT - FOOD

Nutritionally Sound.

UBC's commitment to being a **Nutritionally Sound** Campus "increases accessibility to and intake of safe, healthy food; promotes food skills and knowledge development for all members of the UBC community; and models an integrated food system which promotes health, wellbeing, and sustainability."

UBC Food Services

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SUSTAINABILITY REPORT - FOOD

UBC is committed to sustainable food procurement.

This includes:
- Sourcing from UBC's very own 24 hectare farm
- Sourcing local: grown, processed or produced within BC
- Free-range, grass-fed meat and cage-free eggs
- Ocean Wise or Marine Stewardship Council certified fish
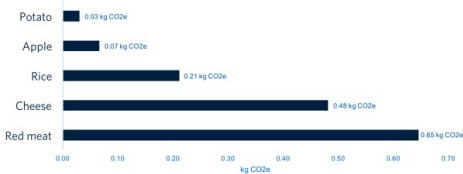- Fair Trade (in 2011, UBC was designated Canada's first fair trade campus)

UBC Food Services

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SUSTAINABILITY REPORT - FOOD

What is the Climate Change footprint of different foods?

Food	kg CO_2e
Potato	0.03 kg CO_2e
Apple	0.07 kg CO_2e
Rice	0.21 kg CO_2e
Cheese	0.48 kg CO_2e
Red meat	0.65 kg CO_2e

kg CO_2e

Climate Change Factor from Ecoinvent 3.1

9

Did you know?

Sedentary behaviour is likened to smoking in terms of its damaging health effects.

150 minutes of physical activity each week is recommended to maintain a healthy lifestyle.

It is recommended that you break-up sitting by moving at least every 30 minutes.

Sit less and move more.

BC Physical Activity Strategy

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Did you Know?

Sitting less and moving more can have health benefits such as:
- Reducing risk of heart disease
- Lowering blood pressure
- Maintaining body weight
- Improving sleep
- Improving mental health

Canadian Physical Activity Guidelines

11

Did you know?

At academic conferences, air travel is the largest contributor to GHG emissions.

97% of this conference's GHG emissions came from flights.

What is the future of air travel to conferences?
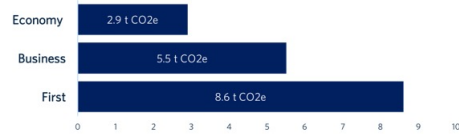
Climate change factor from Ecoinvent 2.2

12

Flying in Economy Class reduces your carbon footprint.

Climate change impact of flying from London to Vancouver in different classes:

Class	CO_2e
Economy	2.9 t CO2e
Business	5.5 t CO2e
First	8.6 t CO2e

0   1   2   3   4   5   6   7   8   9   10

MyClimate.org

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1. **Objective** | Outline the goal for real-time reporting

Real-time reporting should communicate the sustainability footprint and sense of wellbeing at the conference using shareable tools that capture, measure and report.
The shareable tools should:
1. Provide accessible information about participants' impact on the sustainability footprint of the conference and promote awareness of wellbeing during the conference
2. Promote action during the conference to increase sustainability and wellbeing
3. Inform attendees of sustainable conference design and sustainable practices at UBC

2. **Research** | Meet with experts and analyze impact

Campus Collaboration: Work with key groups on campus to understand sustainability and wellbeing. These groups could include: faculty researchers, energy and building management, food services, waste removal, engagement, health and wellbeing offices, etc.
Understand how these groups can contribute to the conferences sustainability:
1. Sustainability commitments
2. Data collected
3. Interesting and shareable information

Carbon Footprint Analysis: divide the conference into organizational categories and analyse which aspects have the largest impact on the carbon footprint.

3. **Metrics** | Choose Sustainability and Wellbeing Indicators

Conference indicators should meet the following criteria:
1. Indicator has a large impact on the carbon footprint of the conference or attendees have a real impact on the indicator
2. Attendees can take action to mitigate their impact on the indicator
3. Indicator is relatively easy to measure
4. Indicator is engaging and interpretable by the average conference attendee

Define the scope of real-time reporting for practical data collection during the conference.
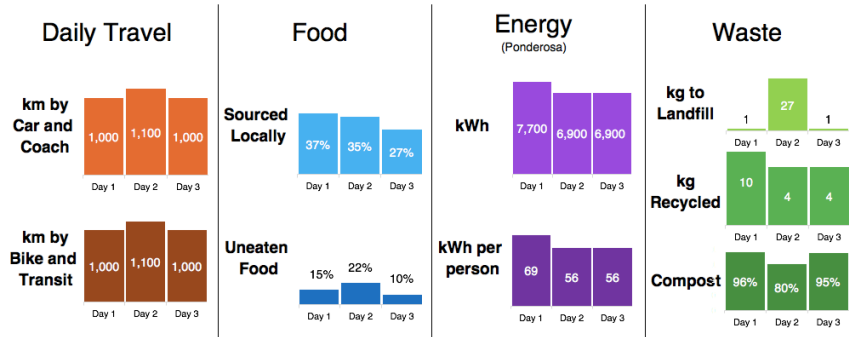
4. **Communication** | Decide when and where to report

Sustainability and wellbeing data can be complicating. Choosing simple and graphic communication can help with interpretation of results and engagement in reporting.

Interactive reporting styles can help to increase conference participant's engagement with the real-time reporting.
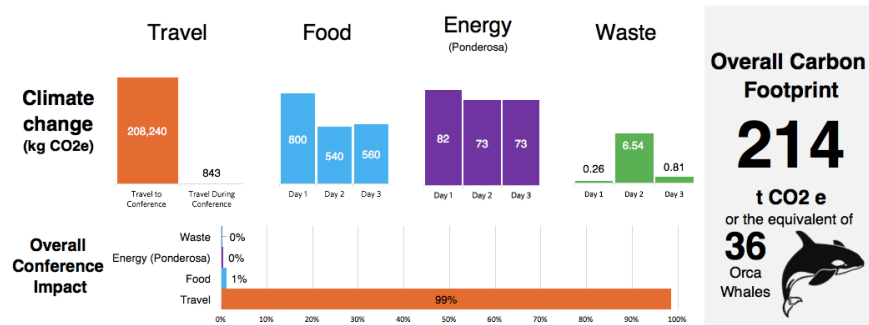
Real-Time Reporting Dashboards

Daily Sustainability Metrics

Overall Carbon Footprint
Includes travel to Vancouver and all conference activities in Vancouver.

Overall Carbon Footprint at UBC and in Vancouver
Excludes travel to Vancouver to evaluate the impact of conference activities at UBC and in Vancouver alone.