

20 January  
2022

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# Comparing the carbon footprint of the SPE CCUS virtual conference with a traditional “attendee” conference.

Conducted on behalf of SPE (Society of Petroleum Engineers), Aberdeen

# The brief

SPE CCUS conference organisers have requested that the carbon footprint for the forthcoming virtual CCUS conference be calculated and benchmarked against a traditional attendee event.

- The basis for this calculation is the GHG Protocol industry benchmark spreadsheet suite/tool.
- All emission factors used in the calculation are fully traceable GHG Protocol embedded numbers. No custom emission factors were used.
- Data inputs to the calculation have been derived from publicly available information:

Scenarios considered for comparison:

1. Traditional “in person” conference held at TECA, Aberdeen whereby fuel used to power the site is primarily derived from renewable sources;
2. Traditional “in person” conference held at TECA, Aberdeen whereby fuel used to power the site is primarily derived from non-renewable sources;
3. Virtual conference.

Each scenario assumes 200 attendees at the conference.

# Data inputs

Data used to confirm boundaries of the emission sources and to identify key parameters relevant to the production of greenhouse gases, included:

- Aberdeen City Council, Aberdeen Anaerobic Digestion Gasto Grid Plant, Permit Application PPC/A/1188451.
- Reference Plant fact sheet, Aberdeen Council / TNV Thöni Wet Anaerobic Digestion Semi Dry, Aberdeen (UK), Integration into a renewable energy network
- Aberdeen City Council Press release, Contractor appointed to build anaerobic plant at new AECC/TECA complex, 31 January 2019
- Aberdeen City Council, Capital Programme Committee report, RES/19/277: The Event Complex Aberdeen Project Update.
- Detailed Planning Permission, P151390 Demolition of existing buildings and erection of Exhibition Centre, 24 August 2015
- Mott Mac Donald, Aberdeen Exhibition and Conference Centre Development - Aloft Hotel Travel Plan
- Department for Transport Vehicle Licensing Statistics, Annual 2020
- Grant Faber (2021) A framework to estimate emissions from virtual conferences, International Journal of Environmental Studies, 78:4, 608-623, DOI: 10.1080/00207233.2020.1864190

# Application of the GHG Protocol tool

Key activity data, emission factors and assumptions used to calculate the quantity of carbon emissions associated with each scenario were modelled using the GHG protocol spreadsheet suite.

Activity data for the TECA facility has been derived from publicly available reports, fact sheets and press releases describing:

- the power generation capacity of the on-site Anaerobic Digestion (AD) plant;
- power demand of the site
- electricity demand,
- and traffic planning expectations
- number of expected attendees.

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Figures for the virtual conference have been benchmarked with the report by:

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**Introduction** Parameters Input Scope 1 Stationary Combustion Scope 1 Mobile Combustion Scope 1 Embedded Scope 2 Purchased Electricity Scope 2 Transportation Results Summary Emission Factors

**GREENHOUSE GAS PROTOCOL** **Vysus Group**

Welcome to the GHG Emissions Calculation Tool  
A calculation tool for estimating GHG emissions based on the GHG Protocol

**How to use this tool**

\* If the company and facility information in the "Parameters" sheet. Also, provide any custom emission factors here for use in subsequent worksheets.  
\* The tool uses default emission factors, which vary by country. These are free to use and publicly available, and the tool includes links of where to obtain them. Currently, separate sets of emission factors are available for the UK and US. Location-based Scope 2 emission factors are also available for the US, Canada and Australia, while market-based residual mix emission factors are available for the US, Canada and all European countries.  
\* On the "Parameters" tab, users can supply custom emission factors, adjust the default global warming potentials, and choose whether to use radiative forcing factors for air travel.  
\* The maximum number of facilities for this tool is 10. Additional rows cannot be added to the Facility table.  
\* Use each of the sheets to input inventory data for the various activities. Make sure to choose custom emission factors, if any, and to select the proper units.  
\* If the results don't show, please make sure that all the relevant options have been selected and that the correct Emission Factors have been chosen.  
\* To add more rows to any table, click on the "Insert Row" button next to the table. Do not try adding rows manually as that might affect the cell formulae.  
\* The GHG emissions results for each activity types are provided in the "Results Summary" sheet, with an option to print the results.

**Data entry fields are color-coded as follows to guide you:**

- light blue: numeric or text data entry
- orange: option selection (dropdown data entry field)
- light gray: data that you can not edit on the current page
- teal: cells that should not be edited as they are not relevant for the selected options

**Disclaimer: the tool does not necessarily cover all sources relevant to the user**

The tool covers the following cross-sectoral emission sources:  
Scope 1 - Stationary Combustion, Mobile Combustion, and Fugitive Emissions from Air Conditioning  
Scope 2 - Purchased Electricity and Purchased Heat/Steam  
Scope 3 - Upstream Transportation and Distribution, Business Travel, and Employee Commuting

Companies will have other emissions sources in their value chain and potentially also their internal operations. Companies should strive to calculate these other emissions, when appropriate. The VFAQ units Scope 3 Evaluator offers one approach for estimating emissions for a

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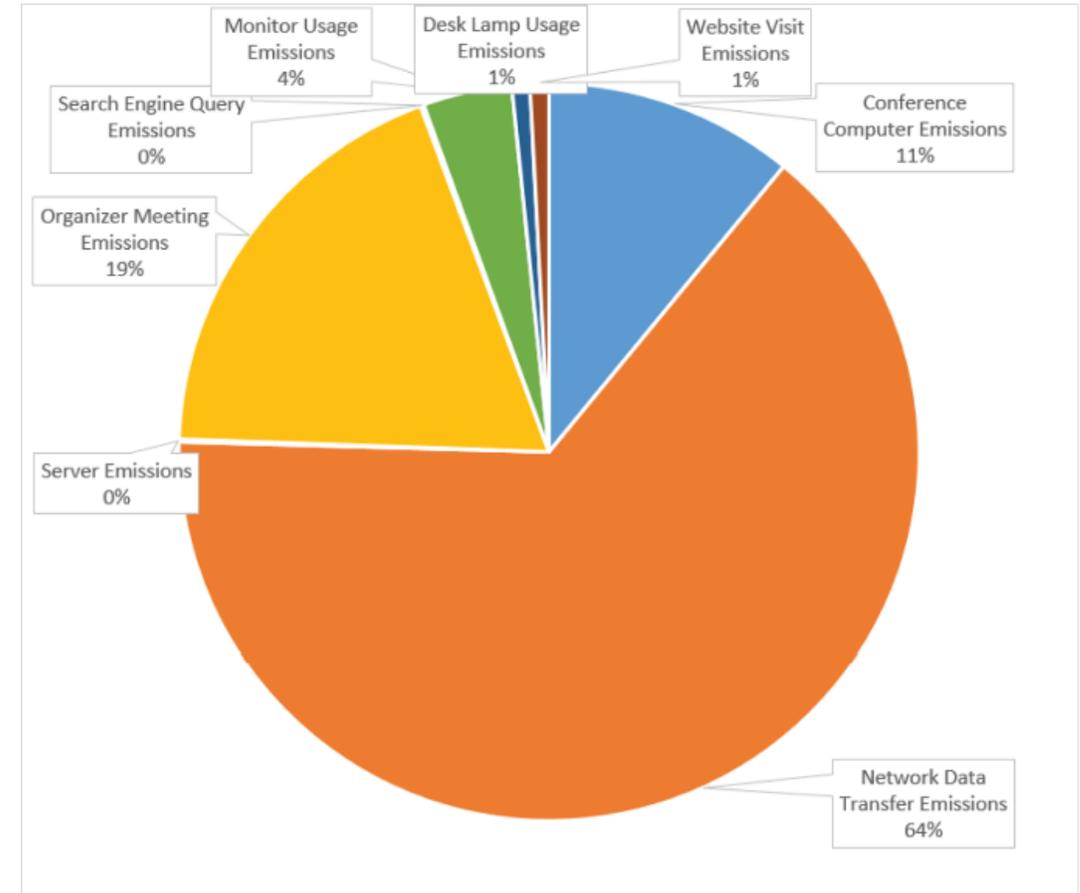
# Estimate of emissions for virtual conference – 200 attendees

Figures for the virtual conference have been benchmarked with the report by:

- Grant Faber (2021) A framework to estimate emissions from virtual conferences, International Journal of Environmental Studies, 78:4, 608-623, DOI:10.1080/00207233.2020.1864190

**Figure 1.** CO2 allocation associated with virtual conference activities.

Formula	Emissions (kg CO <sub>2</sub> -eq)
1: Allocated Computer Life Cycle	145
2: Data Transfer Energy Use	854
3: Server Energy Use	2
4: Organiser Meetings	249
5: Search Engine Queries	2
6: Allocated Monitor Life Cycle	51
7: Desk Lamp Energy Use	10
8: Website Visits	11
<b>Total</b>	<b>1,324</b>



**Figure 2.** Distribution of contributing factors to conference emissions.

# Results of GHG footprinting comparison

Facility / Mode	Scope 1 activity data (Fuel use)	Scope 2 activity data (electricity)	Scope 3. Transport (Private car)	Scope 3. Transport (Public bus)	Scope 3. Transport (Taxi)	Scope 3. Transport (Public train)	Total CO2e (tonnes)
Scenario 1 – TECA operated, as intended.	AD derived biogas. • 148.59 MWh • <b>0.774 tonnes CO2</b>	Purchased electricity. • 4.93 MWh • <b>2.936 tonnes CO2</b>	Total milage = 5700. • 1.653 tonnes CO2 • Assumes 57% of total 200 attendees • Assumes 50 mile average round trip.	Total milage = 60. • 0.010 tonnes CO2 • Assumes 3% of total 200 attendees • Assumes 10 mile average round trip.	Total milage = 340. • 0.082 tonnes CO2 • Assumes 17% of total 200 attendees • Assumes 10 mile average round trip.	Total milage = 5100. • 0.335 tonnes CO2 • Assumes 17% of total 200 attendees • Assumes 150 mile average round trip.	<b>5.79</b>
Scenario 2 TECA clone run on non renewable fuel sources.	Nil	Purchased electricity. • 153.52 MWh • 91.438 tonnes CO2	Total milage = 5700. • 1.653 tonnes CO2 • Assumes 57% of total 200 attendees • Assumes 50 mile average round trip.	Total milage = 60. • 0.010 tonnes CO2 • Assumes 3% of total 200 attendees • Assumes 10 mile average round trip.	Total milage = 340. • 0.082 tonnes CO2 • Assumes 17% of total 200 attendees • Assumes 10 mile average round trip.	Total milage = 5100. • 0.335 tonnes CO2 • Assumes 17% of total 200 attendees • Assumes 150 mile average round trip.	<b>93.518</b>
Scenario 3 Virtual conference	Nil	Bought in electricity. • Figures based on literature review.	Nil	Nil	Nil	Nil	<b>1.324</b>

Assumes 200 attendees @ 1 day conference.

# Conclusion

Using publicly available data to compare the emissions of like for like conferences, we can conclude:

- The TECA is 16 times more efficient than a comparable venue that uses fossil fuel for power and heat.
- A virtual conference is:
  - 4 times more efficient than the TECA venue that primarily uses bio-renewable fuel for power and heat; and is
  - 70 times more efficient than a comparable venue that uses fossil fuel for power and heat.

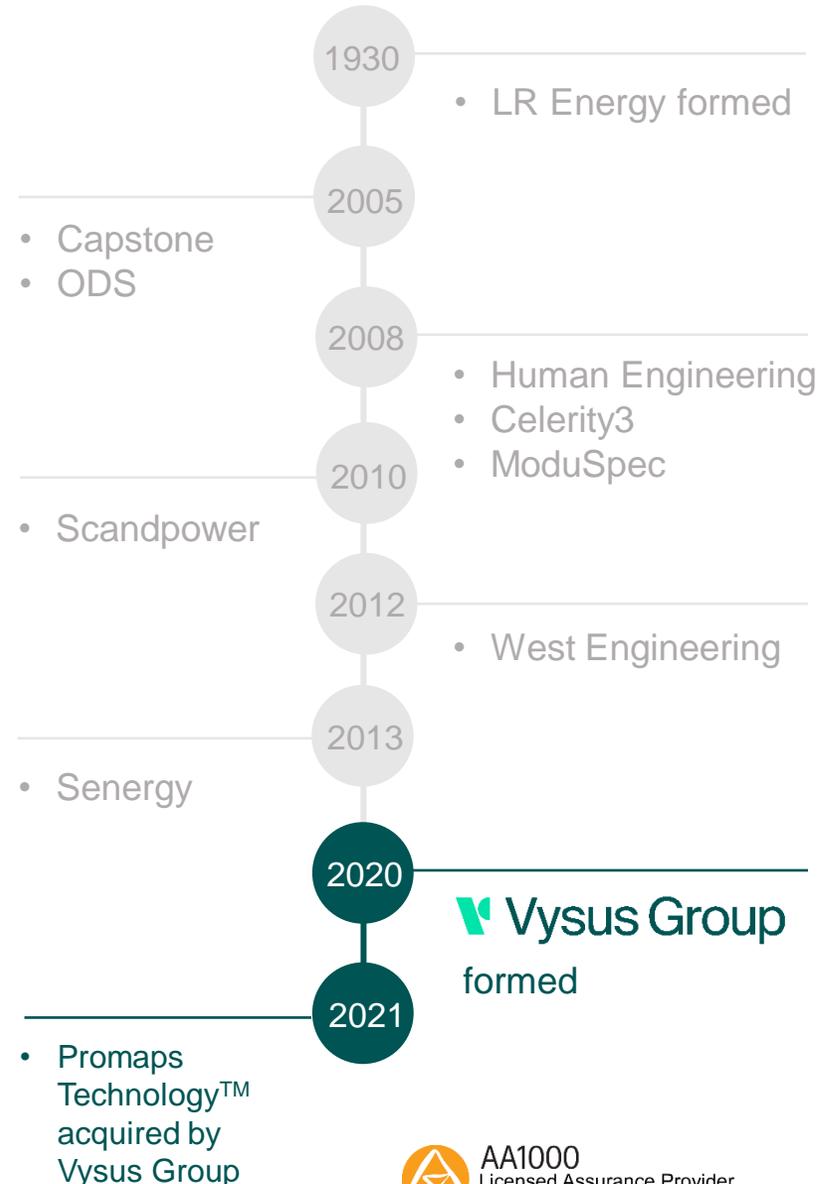
# Significant footprint and legacy

80+ years

Heritage

650+

Employees worldwide



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# Thank you



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