SPARC 7th General Assembly

Multi-hub for a lower carbon footprint

Decarbonising conference travel: testing a multi-hub approach

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Background and Motivation

SPARC community driven idea

- Discussion around the carbon footprint impact of SPARC meetings started at a DynVAR/SNAP meeting in Madrid in 2019.
- Researchers (incl. several ECRs) suggested a multi-hub conference approach to reduce the carbon footprint related to conference travel but at the same time, retaining face to face interaction → a compromise between a traditional single site conference and a fully online meeting.
- Charlton-Perez et al. (2021) proposed a multi-hub approach for SPARC GA, which was implemented in 2022.

Motivation

- For many researchers, the high footprint associated with in-person travel to international scientific conferences presents an urgent ethical dilemma.
- We need to find new ways to reduce the carbon budget of conference travel, work on multi-hub formats suggests substantial reductions (around 80%, Klöwer et al., Nature 2020).

SPARC General Assembly 24 to 28 Oct 2022

Qingdao, China | Boulder, USA | Reading, UK

Online

Attendees: 414 participants in total, 162 online and 252 in-person

Calculating the carbon footprint (travel only)

Gathering information

- Registration requested every attendee to provide their **travel details to attend the conference** (departure city, the destination city, and travel mode).

Calculate footprint

- Travel distances and associated GHG emissions were calculated using a mobility-service app (Wegener Center of the University of Graz, Austria) and emission factors provided by mobitool.
- Emissions factors depend on the countries that the traveller crossed.
- The tool distinguishes between short and long-haul flights, and works with real travel distances, using train maps and street maps for trains, cars, and buses.

Results

- Average travel carbon → **885 kgCO_2eq per attendee**
- The multi-hub model reduces the travel carbon footprint by a factor of up to 4.1 (depending on location).

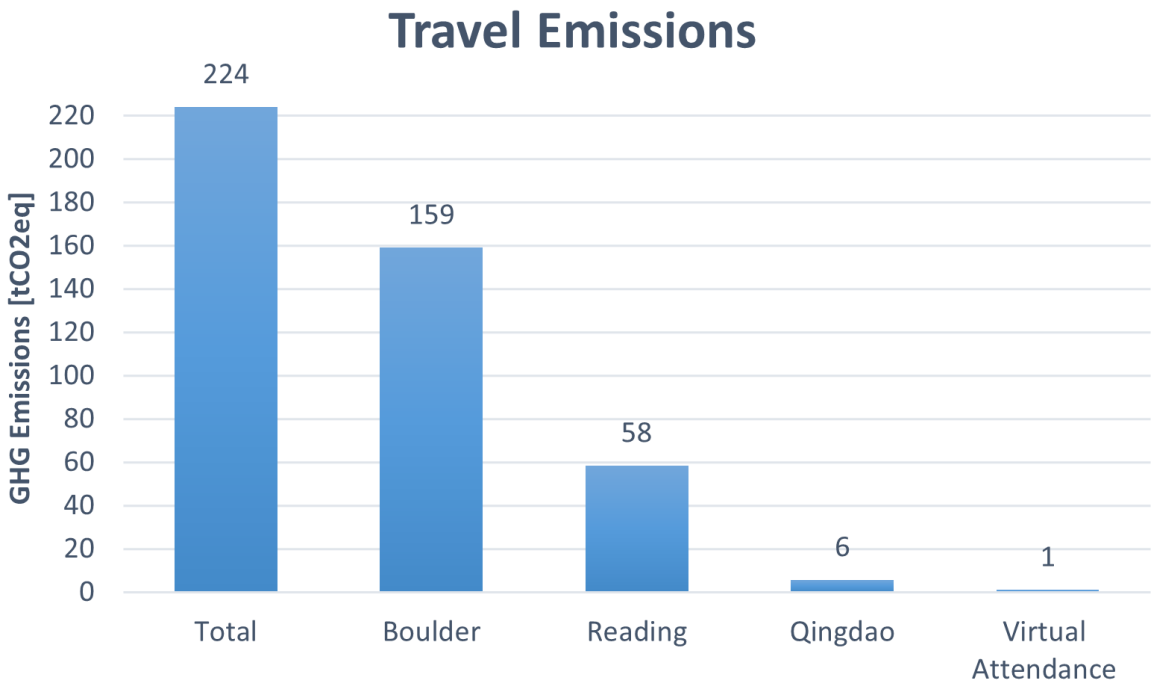

Figure 1: GHG emissions because of travel to the SPARC multi-hub conference, given in [tCO2eq], and the individual contributions for three conference venues and virtual attendance.

Results discussed in detail in Kremser et al. Decarbonizing conference travel: Testing a multi-hub approach – submitted.

Did it work?

- **Yes, it did! – clearly** the conference achieved one of its aims in reducing travel GHG emissions compared to a single site conference.
- To understand if this came at too high a cost to the aims of the conference, we asked participants to complete an online survey at the end of the conference: “Was the reduction in carbon worth the carbon saving?”
  - It was not: 23%
  - The emission saving was worthwhile even though the conference was worse than a single site conference: 34%
  - The multi-hub format was the same or better: 41%
- The judgement was similar across career stages and the majority would attend another multi-hub conference.

What could be improved on?

- Travel emissions estimate: Include questions around travel mode to/from airports/train stations.
- Interaction between poster presenters and participants from different hubs and for online poster presenters was lower than we had hoped.
- The format also necessitated long conference days, but there are ways to work around this.
- Collaborative discussions in the breaks were limited to attendees of an individual hub. – provide **dedicated quiet sessions and online tools to enable collaboration** and personal connection with online poster presenters and researchers from different hubs.

Lessons learned

- **Invest in professionals**: high-quality, technical support to setup the technology, solve problems as they occur and keep the conference flowing.
- **Invest in required technology:** The multi camera setup in each hub gave a sense of immediacy and cross-hub conversation.
- **Do not underestimate the work for the local organisers**: Everything needs to happen three times, often in slightly different ways. Finance, visas, travel are all different between the three hubs and there is some additional financial exchange rate risk.
- The **importance of playing the recorded talks** in the main lecture hall was underestimated. A large proportion of attendees were present for all the recordings and even clapped when the recorded talks finished.
- **Closed captions:** we should have invested more time in producing closed captions for the talks which would have been beneficial for both online and in-person participants.

Thank you

If you are considering a similar conference approach the organizers would be happy to share their data and experience. (contact: sparc-office@dlr.de).