Reducing of the CO$_2$ footprint of business air travel at EPFL

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Business air travel produces 1/3 of EPFL’s CO$_2$ emissions
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Aim: Addressing the environmental impact of business travel in the EPFL community

No financial barriers to travel

Neglected environmental impact

Dataset (2014-2017) ➔ 80 % of total EPFL air travels
## Travelling and CO₂ impact increase with seniority

**CO₂ emitted per capita (kg)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Doctoral assistant</th>
<th>Scientific collaborator</th>
<th>Senior scientist</th>
<th>Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>401</td>
<td>831</td>
<td>1912</td>
<td>826</td>
</tr>
<tr>
<td>2015</td>
<td>526</td>
<td>938</td>
<td>1920</td>
<td>643</td>
</tr>
<tr>
<td>2016</td>
<td>532</td>
<td>841</td>
<td>1847</td>
<td>605</td>
</tr>
</tbody>
</table>

- 1 Professor = 10 PhDs = 5 Postdocs

**Graph:**
- **Total travel footprint per person in 2014-2017 (CHF km/kg):**
  - Money spent: ~60% of total CO₂
  - Distance travelled: ~58.3% of total CO₂
  - CO₂ emitted: ~49.8% of total CO₂

**Facts:**
- The 10% biggest travellers emit ~60% of total CO₂.
- BIGGEST CONSUMER:
  - Money spent: 64.0% of total CO₂
  - Distance travelled: 58.3% of total CO₂
  - CO₂ emitted: 49.8% of total CO₂

**Smallest consumer:**
- Money spent: 20.7% of total CO₂
- Distance travelled: 20.5% of total CO₂
- CO₂ emitted: 19.5% of total CO₂
Travelling and CO₂ impact increase with seniority

The difference between air travellers at EPFL is larger than for the worldwide income.
17% CO₂ reduction if all higher class flights replaced by economy

Higher classes emit 2 to 3 times more CO₂ than economy class

Reduction potential

- Economy class: 10.24 ktons
- Continental higher classes: 0.1 ktons
- Intercontinental higher classes: 0.07 ktons
- Replaced by economy class: 1.84 ktons

Reduction of 800 ton CO₂/year (17%) and CHF 850 000/year (22%)
Up to **15 % CO$_2$ reduction** if all short flights replaced by train

15 % of CO$_2$ emissions on continental trips, 78 % on intercontinental
Up to 15% CO$_2$ reduction if all short flights replaced by train

Replacing all flights up to 600-800 km (5-7h train ride) $\Rightarrow$ -9 to -15% CO$_2$
8.6 % reduction if we would replace all indirect trips by direct

Indirect flight: more kilometers + extra takeoff ➔ more CO₂
Overall CO₂ emissions could be **reduced by 20 - 30 %**

<table>
<thead>
<tr>
<th></th>
<th>Full potential</th>
<th>50% potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoided flights (videoconference)</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Business and first class ➔ economy</td>
<td>-17 %</td>
<td>-8.5%</td>
</tr>
<tr>
<td>Short trips ➔ Train</td>
<td>-15 %</td>
<td>-7.5 %</td>
</tr>
<tr>
<td>Indirect ➔ Direct</td>
<td>-8.6 %</td>
<td>-4.3 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-36 %</td>
<td>-19 %</td>
</tr>
</tbody>
</table>
Towards new travel policy

- Correlation between academic performance and business travel
- Understanding cultural aspects and habits in business travel
- New EPFL business travel policy
- CO₂ compensation (ticket price)
- Incentives
- Videoconference possibilities

... make people aware of their impact.