Toolbox FlyingLess
Flight Reduction in Academia

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ifeu INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

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- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
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Flowchart Toolbox



Module 1
Introduction
„Why a toolbox?“

Module 2
Checklist
„Where do we stand?“

Let's get started right away!



Module 5
Measures
„Which measures can I implement ?“

Module 6
Next steps
„Where do we go from here?“



We need more background!



Module 3
Background & supporting arguments
„Which background is useful?“

Module 4
Methods & Tools
„Which tools are available?“



3.1 **Relevance**

3.2 **Travel reasons**

3.3 **Framework conditions**

3.4 **Success factors & stumbling blocks**

3.5 **Sufficiency**

4.1 **Project management**

4.2 **Stakeholder management**

4.3 **Strategy development**

How to use the toolbox?

The **FlyingLess Toolbox** is a modular collection of content and methods on the topic of reducing air travel.

Depending on the occasion or need, suitable modules or individual modules or individual slides can be selected and used.
The order of the modules is only a recommendation.

Depending on your level of knowledge and interest, you can start with different modules.

The FlyingLess logo and the link to the website (www.flyingless.de) should remain on the slides.

On some slides, questions that can be discussed in the institution are listed in green.

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Module 1
Introduction
"Why a toolbox?"

How do we work with the Toolbox?
Introduction and tips

22 slides – version September 2023

Dr. Susann Görlinger, Project Manager FlyingLess, ifeu Institute

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Toolbox content

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3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

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Flowchart Toolbox



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"Why a Toolbox?"

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"Where do we stand?"

We want to get started right away!



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Measures
"What measures can I implement?"

Module 6
Next steps
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We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
- 3.4 **Success factors & Stumbling blocks**
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Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
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Module 1: Introduction

What do I find in this module?

- An overview of the topics and modules as well as information on how to use the Toolbox FlyingLess
- A flowchart in the form of a map for navigating within the toolbox
- Individual profiles for each module: What does the module contain and what can I use it for?
- A method slide with tools for a good introduction to a workshop

What can I use this module for?

- Gaining an overview: What the Toolbox is about and how to use it
- Gain insight into the individual modules
- Finding a tool for a positive start to a stakeholder workshop

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How to use the Toolbox

The Toolbox ...

... contains modules for your workshops and events from which you can choose for the concrete situation in your institution.

... consists of slide sets, videos and documents.
These can be individualised as required and used in your own selection and sequence.

The Toolbox modules offer

Contents
... address key issues and fundamentals for the reduction of flight emissions in the academic world, and

... can be used asynchronously in advance if necessary (videos, slides) so that the time spent together in the events can be used effectively for discussions and joint search for solutions.

Tools and participatory methods
... help to ensure that your workshops, meetings and events contribute to a successful change process.

... are part of module 4 (methods and tools) with project management, stakeholder management and strategy development.

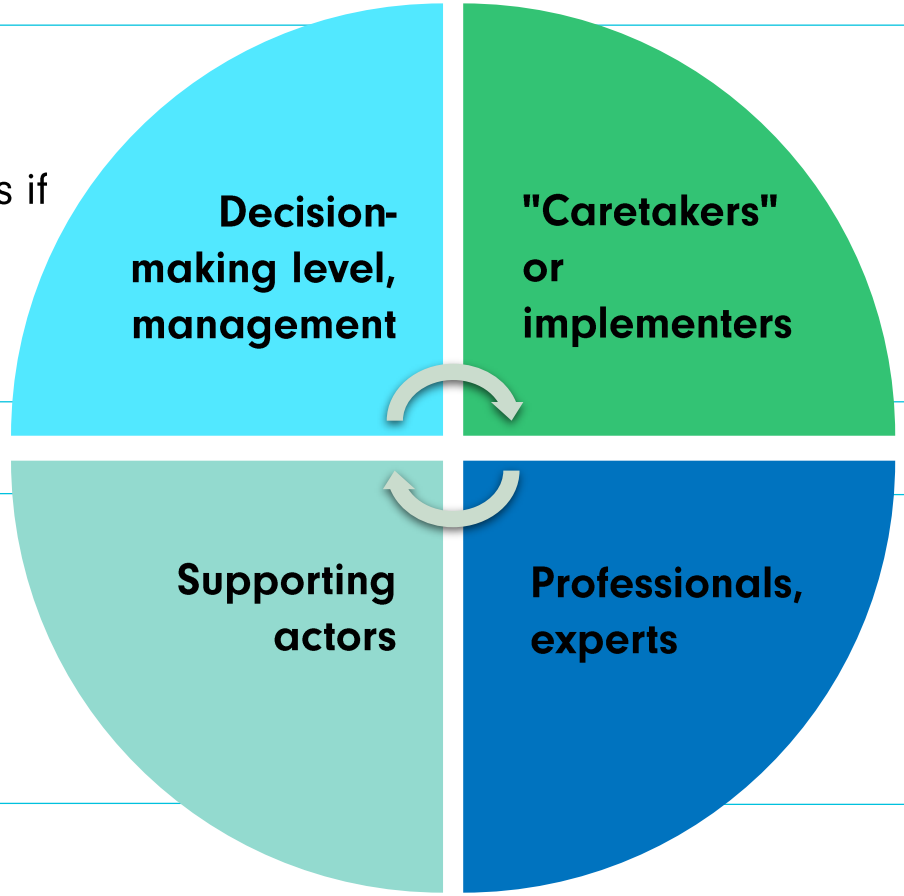
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The toolbox offers support for different roles

One person can take on different roles, what is important is role clarity

- Provision of resources and mandates
- Set goals, decide on measures if necessary
- Demand results, sanctions for non-compliance



- Process management
- Facilitators
- Monitoring
- Stakeholder management

- Role models
- Advocates
- Multipliers

- Consulting
- Technical impulses, inputs

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The toolbox serves different possible formats of a participation and implementation process by the project partners

Information events

WHO: entire institution, administration, if necessary within the framework of existing formats.

WHAT FOR: transparency, attention

Focus groups

WHO: central status groups (administration, professors, students, etc.)

WHAT FOR: attention, lobbying, motivation, creative solution-seeking, counselling

Workshops

WHO: per organisational or work unit

WHAT FOR: attention, transparency, advising on solutions, planning measures

Continuous communication and activation

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Module 2: Checklist

What do I find in this module?

- This module is a key module, it contains a detailed **checklist** to get an overview of where you are and what steps are needed for the implementation
- The most important points are summarized on a view slides
- The detailed checklist is available as a PDF file

What can I use this module for?

- Gain an overview of what the checklist is about and how to use it
- Gain insight into one's own status quo and the individual steps taken

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Module 3: Backgrounds & arguments

What do I find in this module?

› This module contains background information and arguments on the following topics:

Module 3.1 Relevance

Module 3.2 Travel reasons

Module 3.3 Framework conditions

Module 3.4 Success factors & stumbling blocks

Module 3.5 Sufficiency

What can I use this module for?

› From the collection of slides with different topics, a set of slides can be compiled for internal and external use as needed

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Module 3.1: Relevance

What do I find in this module?

- This module contains a wealth of information and sources on the relevance of flight reduction and the overarching theme of net zero

What can I use this module for?

- Depending on the question, the various information and sources on the topic of the relevance of reducing air travel can be used
- Collect arguments to increase awareness and willingness to act on the issue of reducing flight emissions

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Module 3.2: Travel reasons

What do I find in this module?

- The module lists reasons for travel, shows the purpose, costs and benefits of travel, compares in-person vs. virtual conferences and provides food for thought on alternatives

What can I use this module for?

- The module helps to shed more light on the topic of reasons for travelling with information and questions

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Module 3.3: Framework conditions

What do I find in this module?

- In the module, the internal and external framework conditions regarding air travel are highlighted and possible courses of action are shown via questions

What can I use this module for?

- This module supports the analysis of the internal and external framework conditions and their adaptation

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Module 3.4: Success factors & stumbling blocks

What do I find in this module?

- This module is about tips to help you navigate well through the change process

What can I use this module for?

- With the annotated systematic checklist you can benefit from available experiences for the process at your institution
- Gain insight into relevant actors, steps and challenges
- Impulses to keep an eye on success and learning experiences on the way to the goal together with your fcolleagues

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Module 3.5: Sufficiency

What do I find in this module?

- The need for sufficiency as part of the sustainability strategy
- Definition and content of sufficiency
- Operationalisation of sufficiency in the field of action of flying in science

What can I use this module for?

- Get to know the concept and content of sufficiency
- Scientific justification of the need for reduction as a basis for argumentation
- Suggestions for implementation as a source of inspiration
- Get to know how to systematically exploit reduction potentials

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Module 4: Methods & Tools

What do I find in this module?

- The module includes a variety of methods and tools to consult and decide on possible measures

What can I use this module for?

- The methods offer support when you want to select from different possible measures and approaches in workshops or meetings with the relevant actors and come to a jointly supported decision.
- From the list of methods you can choose the ones that are suitable for your organisation

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Module 4.1: Project management

What do I find in this module?

- For change processes - and that is what the transformation towards net zero emissions in the academic sector is all about - to work, structured and effective project management is needed
- In the following, different elements of project management are presented for this purpose

What can I use this module for?

- Find out about core elements of project management's core elements
- Identify relevant tools for different aspects of project management
- Anticipate opportunities and risks of project management

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Module 4.2: Stakeholder management

What do I find in this module?

- Project success usually depends on a variety of different actors, which may vary according to interest, power, legitimacy and other factors. Accordingly, it is important to have an overview of relevant actors, to understand their role and to know concrete methods for interacting with these actors
- Stakeholder management consists of various components, such as stakeholder mapping, stakeholder analysis or concrete participation techniques
- The slides in this module offer concrete methods that can help you with taking the steps for effective stakeholder management

What can I use this module for?

- Find out about core elements of stakeholder management
- Identify relevant tools for different aspects of stakeholder management
- Anticipate opportunities and risks of dealing with different actors

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Module 4.3: Strategy development

What do I find in this module?

- Future work under net zero conditions needs to be positive and attractive
- This module is therefore about presenting different methods for strategy development
- In principle, strategies can be developed both individually and participatively
- Due to the need for transdisciplinary approaches in the context of flight reduction, the focus is on interactive strategy development methods

What can I use this module for?

- Develop a concrete and, if possible, attractive scenario of what science can look like under the conditions of net zero in your institution / status group / organisational unit in 2030 and what co-benefits will be possible as a result of this
- Jointly and creatively develop solutions and options for action to achieve the desired scenario

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Module 5: Measures

What do I find in this module?

› This module presents a diverse range of measures

What can I use this module for?

› From the list of measures you can choose the ones that are suitable for your organisation

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Module 6: Next steps

What do I find in this module?

- The module provides an overview of further possible as well as concrete steps to drive the transformation process forward and implement changes permanently

What can I use this module for?

- Move from talk to action in workshops and meetings
- Mobilise momentum and support for the change process
- Increase commitment and create visibility for the issue

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Content (in alphabetical order): L. Brischke, H. Büttner, K. Foshag, S. Görlinger, M. Huneke, M. Jungmann, C. Merrem
Ideas and input: N. Aeschbach, G. Hirsch-Hadorn, H. Wernli
Layout: suwadesign
Support: N. Arslan, A. Matthaei, R. Zappe
We hope that the toolbox will help to reduce flight emissions substantially and sustainably.

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Module 2 **Checklist**

with key implementation questions

Important additional Information

FlyingLess Guideline about Measures
(https://doi.org/10.5281/zenodo.7848954)

Report "Reduction of flight emissions at ETH Zurich: Definitions"
(https://doi.org/10.5281/zenodo.7848978)

Based on the experience of academic institutions that have been working on reducing flight emissions in recent years, the following list of key questions has emerged. They are to be understood as suggestions and should facilitate an efficient implementation at your institution.

Governance

1. **Institutional/structural embedding**
   a. Where is the issue of reducing air travel embedded in the organisation?
   b. Who is in charge and responsible (see also point 6, personnel responsibility)?
   c. Who has the competences to make decisions?
2. **Strategy**
   a. Is climate neutrality or net zero part of the organisation's overall strategy?
   b. How do you deal with conflicting goals, e.g. internationalisation versus net zero?
   c. Who decides about priorities?
3. **Goals, targets and rules**

Are the reduction goals defined centrally or decentrally, top-down, bottom-up or in a combination? What targets are set? Are they mandatory or merely recommendations? Are concrete rules established (e.g. in the travel guidelines)?

   a. Centralised (management level, department, etc.) versus decentralised (each unit, group)
   b. Top-down: Goals, targets and implementation set by the management level
   c. Bottom-up: goals, targets and implementation are developed in the units
   d. Combination of top-down and bottom-up: general goals and targets from the management level, concretisation and implementation in the units

4. **Changed framework conditions that enable a transformation of science towards net zero**

   (see module 2.2)

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5. **Sanctionability**
   a. Are the guidelines and rules such that they can be sanctioned?
   b. Who is responsible for this, and who controls?

6. **Who has the personnel responsibility for implementation?**
   a. Who at the management level is responsible?
   b. Who leads the process (project management), where is the project management **located**, how close is the exchange with the management level, what competences, budget does the project management have?
   c. Are there responsible persons at different organisational levels (e.g. in the department, institute, group) who are legitimised and provided with a time and financial budget?
7. **What is the responsibility of the individual, what is that of the organisation?**
8. **How are the different groups (management level, professors, senior/junior scientists, administration, students) involved?**
9. **Are there internal steering committees or groups at different levels (e.g. project steering group, sounding board, task force in each organisational unit, core group of pioneers)?**

Operationalisation: data, reduction target, timeframe, reduction path, carbon budget

Suggestions on this topic can also be found in the document "Reduction of flight emissions ETH Zurich: Definitions" on the FlyingLess website.

1. **Is there a database of flight emission in your organisation? If yes, which database is used?**
   a. Which unit is used? (e.g. in t CO_2 eq)
   b. What is the system boundary? (e.g. flights of staff paid by the organisation (and therefore in the financial system), of invited guests and of students within the curriculum)?
   c. What is the baseline? Is the reduction target defined relative to emissions in a given year or multi-year period?
   d. Monitoring
      - Where is information on air travel collected (on paper, digitally)?
      - How are emissions calculated (incl. emission factors, RFI, etc.)?
      - Who calculates the emissions and at what intervals (monthly, annually)?
      - Who receives information about the calculated emissions and with what frequency? Do only a few in the organisation or does every group have access to the (own) emissions?
2. **What is the reduction target**
   a. Is there a quantitative reduction target?
   b. By when must this target be achieved?
   c. Is the reduction target per FTE or for the whole unit?
   d. Does the reduction target take into account the annual increase in efficiency of the airlines (approx. 1-2%/year) or not?
   e. How (process), at what level (whole organisation or only individual units) and by whom (top-down vs. bottom-up, individuals vs. participatory) is the quantitative reduction target set?

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f. Is there a uniform reduction target for the whole organisation or different targets for the units (with or without a minimum target)?

g. Do the same goals apply to all within a unit or are they differentiated (e.g. according to frequent or infrequent flyers, status groups, career level)?

3. **Is there an interim goal?**
4. **Is there a predefined reduction path over the reduction period? Or is it sufficient if the reduction target is achieved at the end?**
5. **Is there a carbon budget for the organisation and for the units, derived from the reduction target (to make transparent how much emissions are available to each unit over a certain period of time)? Is the carbon budget consistent with the net zero target?**

Measures to achieve the reduction target

See also Module 7 and FlyingLess Guideline on Measures

1. **How are the measures selected (top-down, bottom-up)?**
2. **Do the same measures apply to all or are they differentiated (e.g. according to frequent vs. infrequent flyers, status group, career level)?**
3. **How, by whom and to whom are the adopted measures communicated?**
4. **How and by whom are the measures implemented, who is responsible?**
5. **Are there incentives for sustainable travel?**
6. **How can role models or multipliers be recruited and involved who, as respected and committed opinion leaders, position and promote the issue?**
7. **Are the measures sufficient to achieve the goal?**

Communication

1. **Is there a communication concept?**
2. **Who is the target group for internal and external communication, is the communication target-group specific?**
3. **Who (management level, communication department, project management, sustainability office, units, etc.) communicates regarding goals, measures, successes / failures?**
4. **What and how often is the topic communicated?**
5. **How is communication carried out? (e.g. newsletter, organisation-wide events, workshops, social media)**
6. **How often do major events on the topic take place?**

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Reporting

Topics: internal and external reporting on emissions, progress, resistance, best practices, etc.

1. **Are there reports on emissions? How often are emissions reported? (e.g. annually)**
2. **Is there information/report on progress, resistances and best practices**
3. **Are there any guidelines for the format of the reporting? (e.g. a template)**
4. **Who is responsible for this?**
5. **To whom do these reports go and where are they discussed?**
   a. to superordinate bodies (e.g. state government, Max Planck Society)
   b. to the management level (e.g. annual talks, target agreements)
   c. within the unit (e.g. regular topic at departmental or institute meetings)
6. **What happens if targets are not met (sanctions)?**
7. **How much transparency is there inside and outside the organisation regarding emissions, targets, measures, achieved or missed goals, etc.? Are units and persons anonymised in the reports or not? Are the reports made available on the intranet / internet?**

Schedule of implementation

1. Who sets the schedule?
2. Who supports the implementation?
3. Who controls the timely and target-oriented implementation?

Networks

Is there good networking with other universities (national and international)?

Evaluation

Is there regular evaluation, assessment and possible adjustment of the goals, measures and their implementation?

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Module 2
Checklist
"Where do we stand?"

12 slides – version September 2023

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Flowchart Toolbox



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We want to get started right away!



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Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

How to use the toolbox?

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Module 2: Checklist

What do I find in this module?

- This module is a key module.
  It contains a detailed "checklist" to get an overview of where one stands and which steps are necessary for implementation.
- The most important points are summarised on some slides.
- The detailed checklist is available as a PDF

What can I use this module for?

- Gaining an overview: What the checklist is about and how to use it
- Gain an insight into one's own status quo and the individual steps to be taken

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Governance

- Institutional/structural **embedding**
- **Strategy**
- **Goals, targets and rules**
- **Sanctionability**
- Where is the personnel **responsibility for implementation** located?
- What is the **responsibility** of the individual, what is that of the organisation?
- How are the different **groups involved**?
- Are there internal **steering committees** or groups at different levels?

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Operationalisation

Data, reduction target, timeframe, reduction path, carbon budget*

- Is there a **database**?
  If yes, which database is used?
- What is the **reduction target**?
- Is there an **interim goal**?
- Is there a **predetermined reduction path**?
- Is there a **carbon budget**?

*See also "Reduction of flight emissions ETH Zurich, definitions" on the FlyingLess website

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Measures

- **How** are the measures selected (top-down, bottom-up)?
- Do the **same measures** apply to everyone?
- How, by whom and to whom are the adopted measures **communicated**?
- How and by whom are the measures **implemented,** who is responsible?
- Are there **incentives** for sustainable travel?
- How are role models and **multipliers** recruited and involved?
- Are the measures **sufficient** to achieve the goal?

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Communication

- Is there a **communication concept**?
- Who is the **target group** for internal and external communication?
- **Who** communicates regarding the goals, measures, successes/failures?
- **What and how often** is the topic communicated?
- **How** is communication done?
- How often do major **events** on the topic take place?

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Reporting

- How frequently are emissions **reported**? Is there information/reporting on **progress, resistance and best practice?**
- Are there any guidelines for the **format** of the reporting?
- **Who** is responsible for this?
- **To whom** do these reports go and where are they discussed?
- What happens if targets are not met (**sanctions**?)
- How much **transparency** is there inside and outside the organisation?

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Schedule, networks, evaluation

- **Timetable of implementation**
  - Who sets the schedule?
  - Who supports the implementation?
  - Who controls the timely and targeted implementation?
- **Networks**
  - Is there good networking with other universities (national and international)?
- **Evaluation**
  - Is there regular evaluation, assessment and possible adjustment of the goals, measures and their implementation?

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About FlyingLess

The aim of the FlyingLess project is to support universities and research organisations in reducing air travel, which causes a significant part of their total greenhouse gas emissions.

FlyingLess develops approaches to reduce air travel in the academic sector, which are implemented at different levels (research, teaching and administration).

The project is being carried out in close cooperation with four pilot institutions - EMBL (European Molecular Biology Laboratory) and MPI Astronomy in Heidelberg as non-university research institutions and the Universities of Konstanz and Potsdam as universities.

Further information can be found on the website www.flyingless.de.

The project is being led by ifeu Heidelberg in close cooperation with the TdLab Geography at the Institute of Geography at Heidelberg University.

The project is funded over 3 years as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Protection.

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Module 3
Backgrounds & Arguments
"What backgrounds should I know?"

Module 3.1
Relevance

Relevance of the topic

81 slides – version September 2023

Dr. Susann Görlinger, Project Manager FlyingLess, ifeu Institute

ifeu INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

Toolbox content

1 **Module 1** Introduction: "Why a Toolbox?"

2 **Module 2** Checklist: "Where do we stand?"

3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4 **Module 4** Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5 **Module 5** Measures: "What measures can I implement?"

6 **Module 6** Next steps: "Where do we go from here?"

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Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
- 3.4 **Success factors & Stumbling blocks**
- 3.5 **Sufficiency**

Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
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On some slides, questions that can be discussed in the institution are listed in green.

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Module 3.1: Relevance

What do I find in the module?

› This module contains a wealth of information and sources on the relevance of flight reduction and the overarching theme of net zero

What can I use the module for?

› Depending on the question, the various information and sources on the topic of the relevance of reducing air travel can be used

› Collect arguments to increase awareness and willingness to act on the issue of reducing flight emissions

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Overview module 3.1

1. Why do we need to reduce emissions?
2. The concept of climate neutrality/GHG neutrality, net zero
3. Net zero targets (states, academic institutions)
4. What does net zero mean for science?
5. Who has what responsibility?
6. Why is flight reduction relevant in academia?
7. FlyingLess Survey Scientists and Students
8. Emotions
9. Technological solutions
10. Conclusion

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1 Why do we need to reduce emissions?

- Global warming of 1.2 degrees already today compared to pre-industrial times (6th IPCC Assessment Report (2022), p. 248)
- Paris Climate Agreement of 2015: Keep warming < 1.5-2 degrees
- The **CO_2** budget would be used up in approx. 8 years (1.5 degree target) or 25 years (2 degree target) if emissions remain constant*.
- The world population can still emit a maximum of 235 Gt **CO_2** in order to remain within the 1.5 degree target with a high probability**.
- Or: 29.8 t **CO_2** per person in total, if the remaining **CO_2** budget is distributed equally among all 7.9 billion people***.
- I.e. if someone emits more than approx. 30 t of **CO_2** during their lifetime and thus uses up their budget, the budget of the other people is reduced.

*Remaining carbon budget - Mercator Research Institute on Global Commons and Climate Change (MCC) (mcc-berlin.net)
**6th IPCC Assessment Report (2021), p. 27
***https://branch.climateaction.tech/issues/issue-4/the-fermi-problem-of-climate-change/

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1.1 Examples of emission calculations per person

From: Frankfurt/Main Airport (return flight)*

- London Heathrow : 0.53 t CO_2
- Boston: 3.9 t CO_2
- San Francisco: 6.56 t CO_2
- Sydney: 17.93 t CO_2

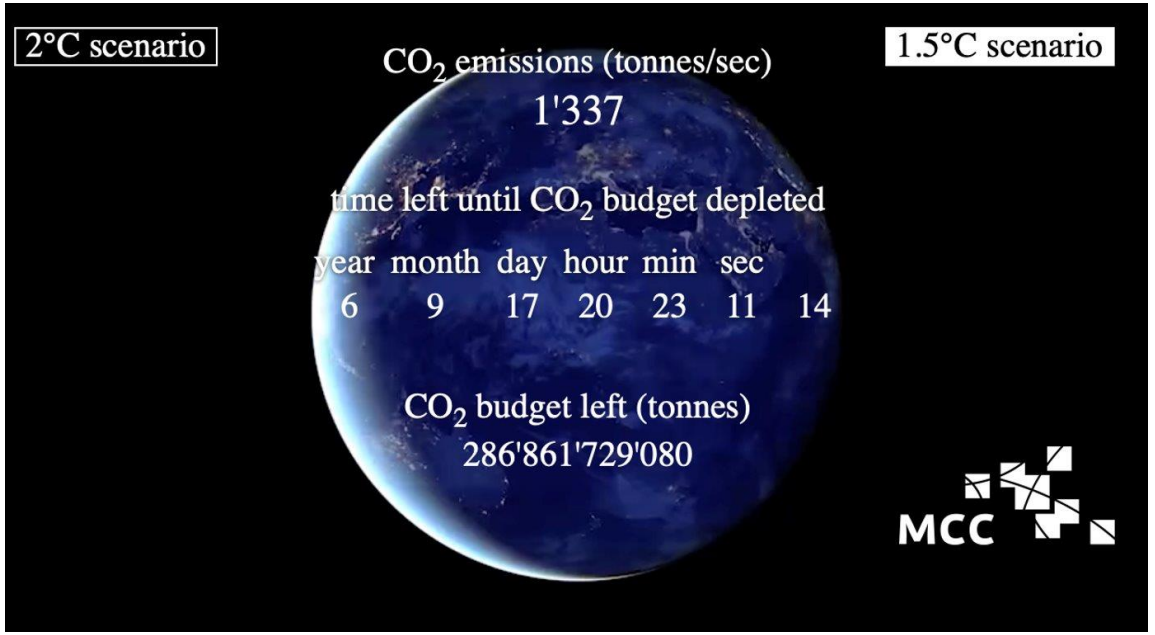
Source: FlyingLess GHG Monitoring Tool, calculation according to EWF100. Further information: https://flyingless.de/en/ghg-monitoring-tool

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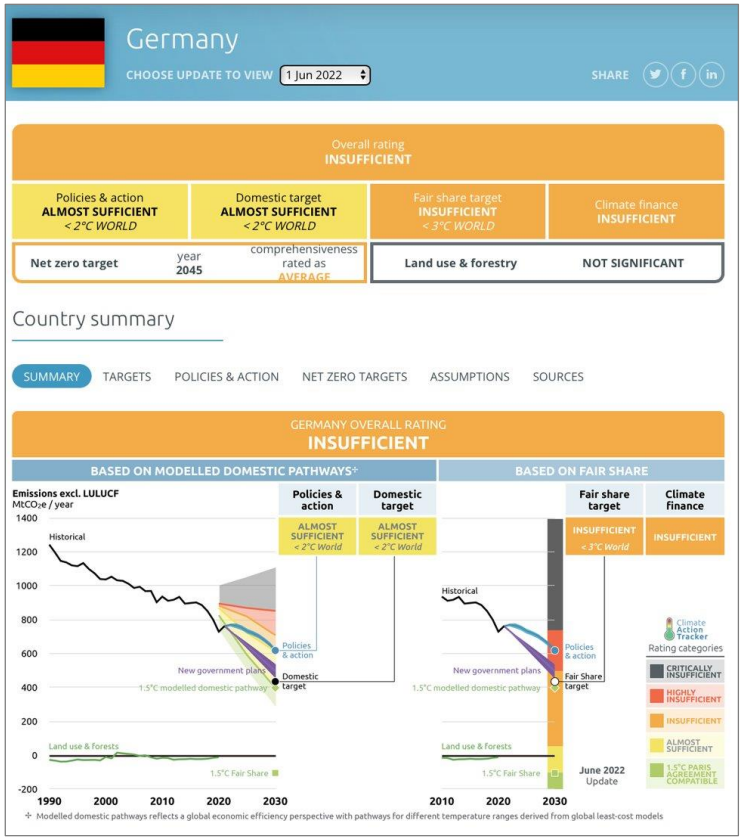
1.2 References to online sources for illustration

Live graphic "This is how fast the CO_2 clock is ticking".



Mercator Research Institute on Global Commons and Climate Change MCC
https://www.mcc-berlin.net/forschung/co2-budget.html

Climate Action Tracker



Current implementation Climate protection; e.g. country profile Germany:
https://climateactiontracker.org/countries/germany/

Image source: right image CO_2 clock by MCC, further information www.mcc-berlin.net/co2-uhr; left image © Climate Analytics and NewClimate Institute

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2. The concept of climate neutrality, GHG neutrality or net zero



Image source: © Lucia Fabiani

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2.1 What does climate neutrality, greenhouse gas neutrality or net zero mean?

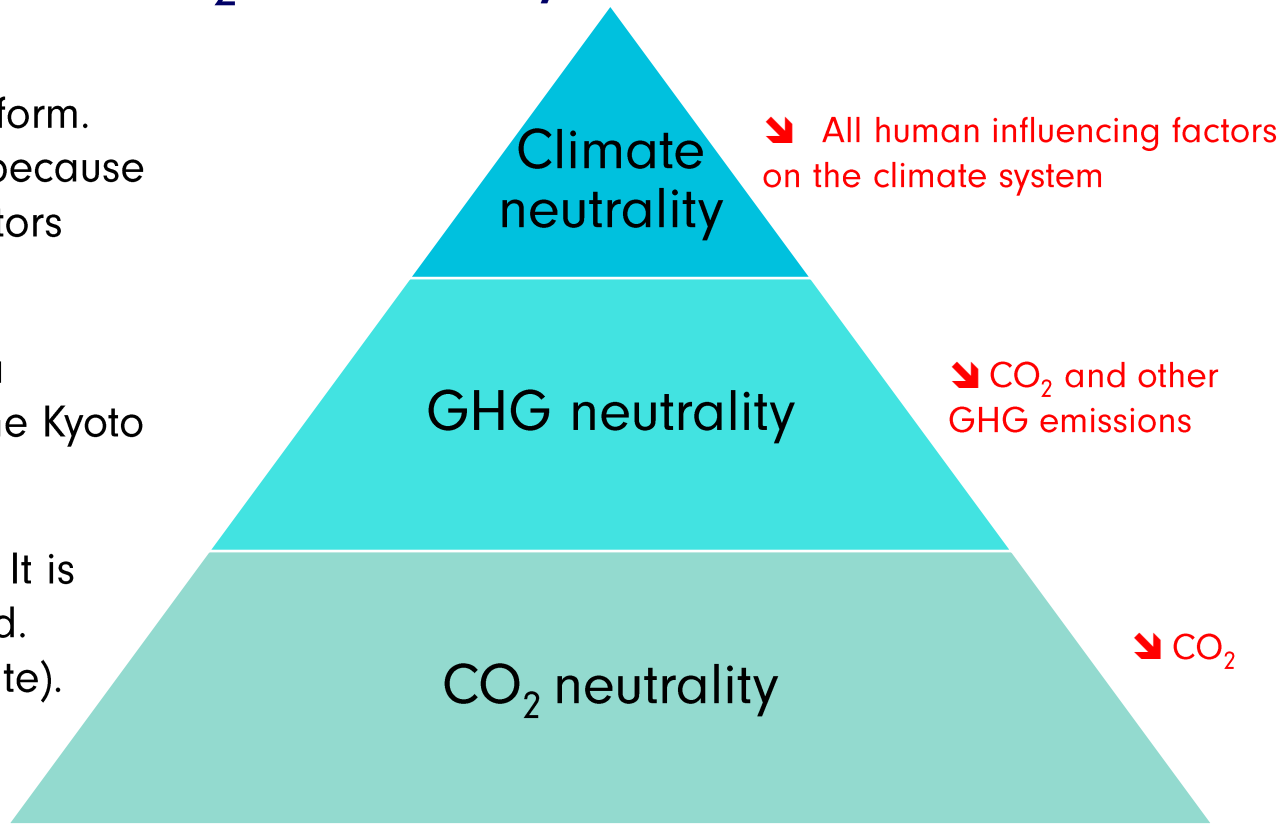
- There are different terms: climate neutrality/greenhouse gas neutrality/net greenhouse gas neutrality or net zero
- Definition IPCC*:
  - "Net zero **CO_2** and carbon neutrality have different meanings in this assessment, as is the case for net zero GHG and GHG neutrality. They apply to different boundaries in the emissions and removals being considered.
  - Net zero (GHG or **CO_2**) refers to emissions and removals under the direct control or territorial responsibility of the reporting entity.
  - In contrast, (GHG or carbon) neutrality includes anthropogenic emissions and anthropogenic removals within and also those beyond the direct control or territorial responsibility of the reporting entity.
  - At the global scale, net zero **CO_2** and carbon neutrality are equivalent, as is the case for net zero GHG and GHG neutrality."
- Oxford University has a website with explanations and examples** and the Stay grounded website has a factsheet

*6th IPCC Assessment Report (2021), p. 27 https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Chapter_03.pd
**https://netzeroclimate.org

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2.2 Conceptual distinction between climate neutrality, greenhouse gas neutrality and CO_2 neutrality*:

- **Climate neutrality** describes the most comprehensive form. The global average temperature remains unchanged because all natural and anthropogenic temperature-related factors balance each other out.
- **GHG neutrality** "describes the state in which there is a balance of sources and sinks of all GHGs defined in the Kyoto Protocol and Doha Amendment".
- **CO_2 neutrality** is the least ambitious form of neutrality. It is achieved when all **CO_2** sources and sinks are balanced. Climate warming continues (albeit at a much slower rate).



Graphic: Own illustration based on data from https://www.zora.uzh.ch/id/eprint/195545/1/ZORA195545.pdf

2.3 What does climate neutrality or net zero mean for air travel?

- In aviation, it is not only GHG emissions that play a role, but also other effects due to the formation of contrails and the resulting cirrus clouds; **these non-GHG effects increase the climate effect by a factor of 2-5.**
- These non-GHG effects remain with alternative fuels (Brazzola et al., 2022, NatureCC). Therefore, sustainable aviation fuels (SAF) can be GHG neutral, but they are not climate neutral.
- Brazzola et al. therefore propose to speak of climate neutrality in air travel instead of GHG neutrality

Brazzola, N., Patt, A. & Wohland, J. Definitions and implications of climate-neutral aviation. *Nat. Clim. Chang.* **12**, 761–767 (2022). https://doi.org/10.1038/s41558-022-01404-7
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2.4 What does climate neutrality or net zero mean for aviation?

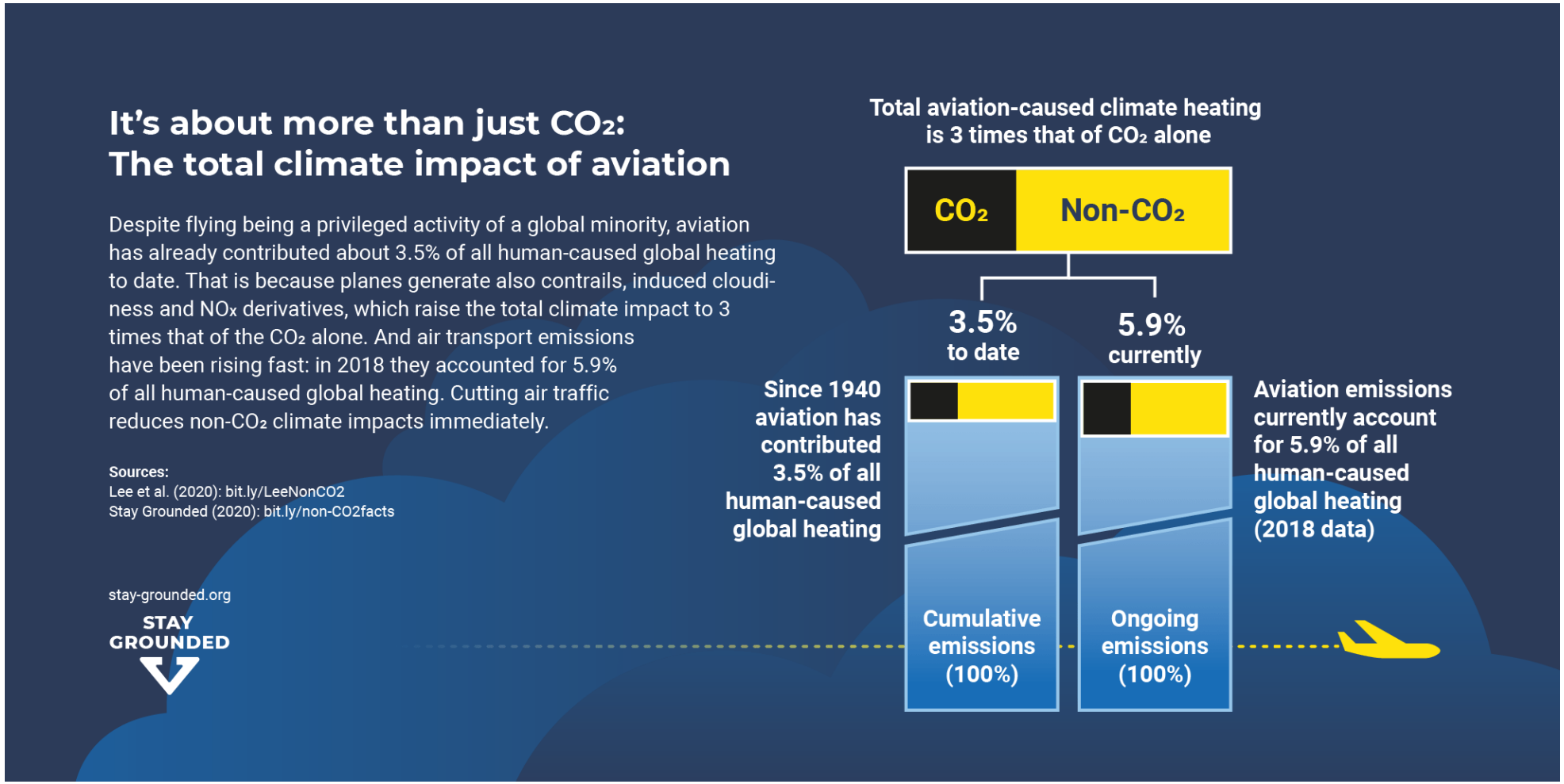


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3. Examples of climate neutrality or net zero of states

- GHG emission reduction targets on the way to net zero:
  - Green Deal EU: Reduction of 55% compared to 1990 by 2030
  - Germany: Reduction of 65% compared to 1990 by 2030

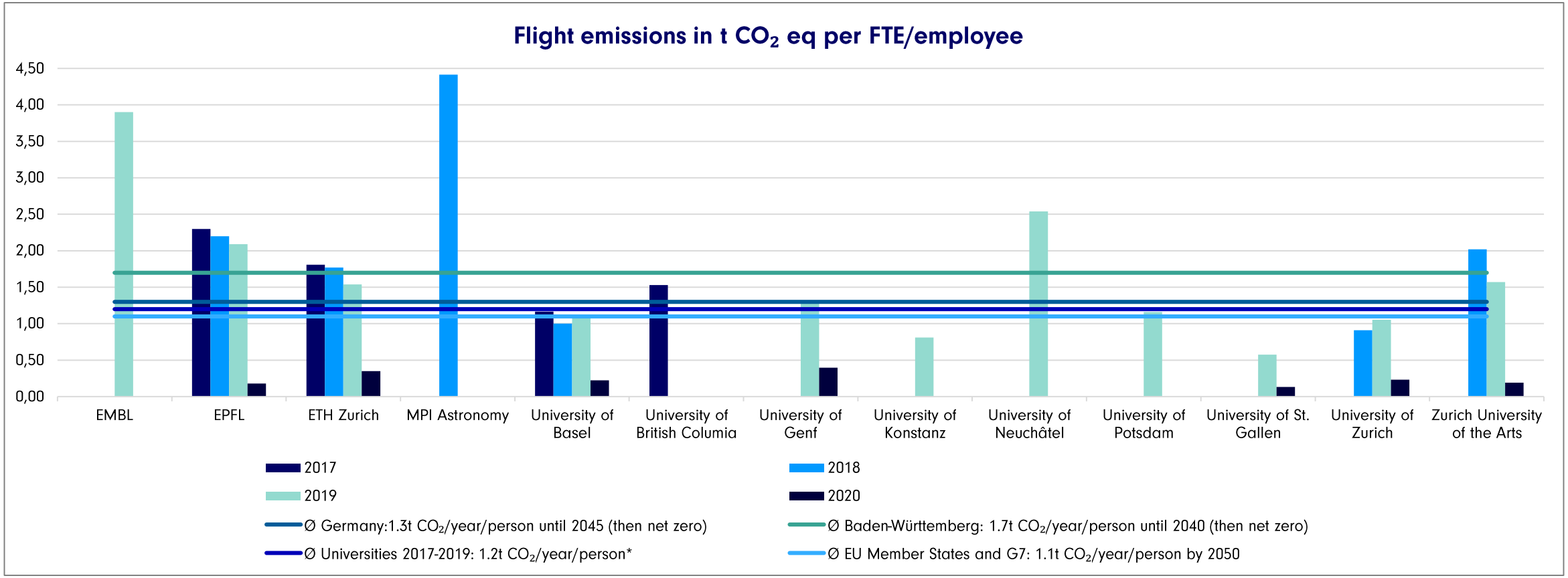
- Example net zero targets:
  - **Baden-Württemberg until 2040:** everyone still has 1.7 t **CO_2** /year/person until 2040, after which emissions must be zero or offset
  - **Germany until 2045**, from 2050 negative emissions: 1.3 t **CO_2** /year/person until 2045
  - **EU, Switzerland, all members of the G7, South Korea and South Africa by 2050:** each still has **approx. 1.1 t CO_2 /year/person by 2050**
  - PR China until 2060

Net emissions must be zero, i.e. remaining emissions must be offset by removing CO_2 from the atmosphere.

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3.1 Comparison of emissions from different research institutions

Emissions per person and year, for the years 2017-2020 and, in comparison the emissions per person and year to achieve net zero goals (see slide 15)



System boundaries and calculations of emissions differ between institutions.
Graphic: Own illustration, ifeu.

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3.2 Examples of climate neutrality or net zero from academic institutions (1/2)

2025

- **FU Berlin**: climate neutral
- **University of California**: carbon neutral
- **University of Melbourne**: carbon neutral (climate positive by 2030)

2030

- **ETH Zurich**: Net zero
- **HU Berlin**: climate neutral
- **University of St. Gallen**: climate neutral
- **University of Vienna**: climate neutral
- **University of Zurich**: climate neutral

What are your organization's net-zero targets, by when should climate neutrality be achieved?

Do at least the target and the date of the corresponding federal state apply (e.g. 2040 for BW) or 2045 for Germany?

What are the interim goals?

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3.2 Examples of climate neutrality or net zero from academic institutions (2/2)

2035

- **Alliance of Science Organisations** (Alexander von Humboldt Foundation, German Research Foundation, Fraunhofer Society, German Rectors' Conference, Leibniz Association, Leopoldina National Academy of Sciences, German Academic Exchange Service, Helmholtz Association, Max Planck Society, German Science Council): climate neutral

2040

- **University of Edinburgh**: Net zero
- **Boston University**: Carbon neutral
- **EPFL**: carbon neutrality through offsetting

2045

- **University of Neuchâtel**: Net zero

2048

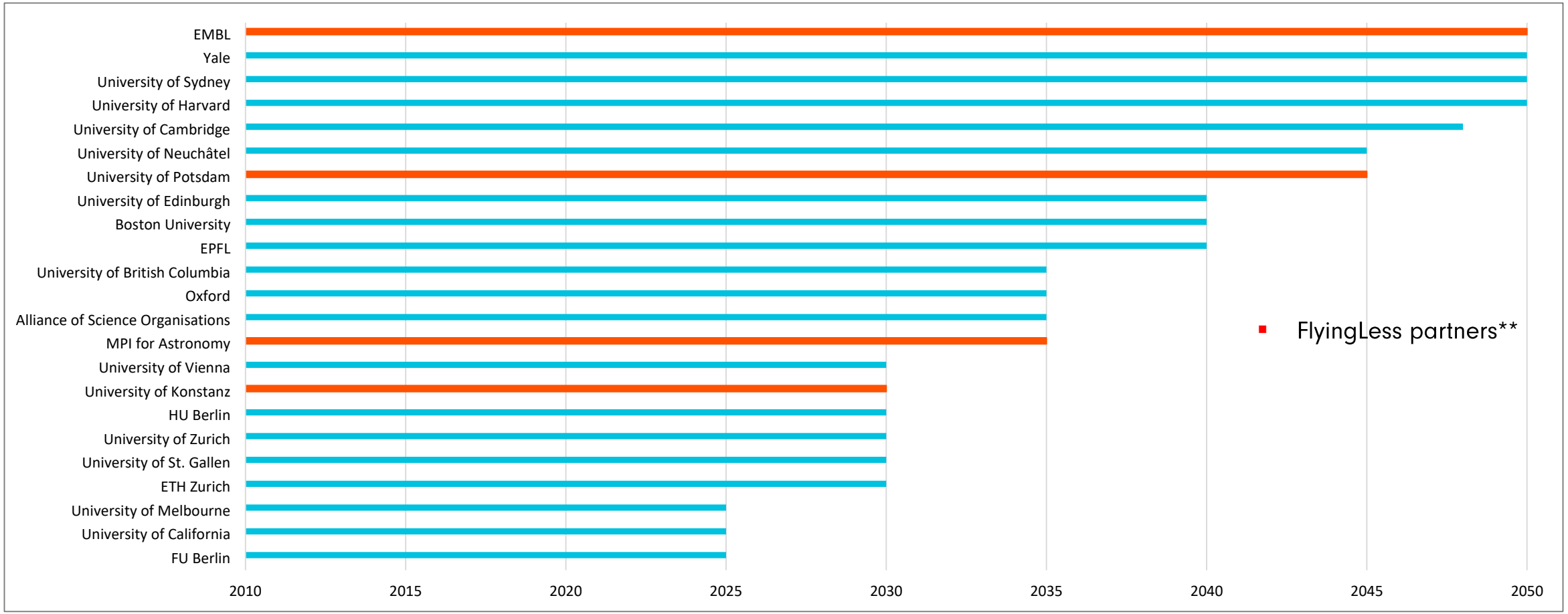
- **University of Cambridge**: Net zero

2050

- **University of Harvard**: Fossil fuel-free (fossil fuel-neutral by 2026)
- **University of Sydney**: Global emissions neutrality
- **Yale**: zero actual carbon emissions (net zero emissions by 2035)

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3.3 Net zero targets of the FlyingLess partners and various academic institutions*



FlyingLess partners, if they do not have net-zero targets or if they deviate from higher-level targets, the higher-level net-zero targets were assumed here.
Graphic: Own illustration based on data from ifeu and Allea Report https://doi.org/10.1007/978-981-16-4911-0

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4 What does climate neutrality or net zero mean for science?

- Universities and research institutions are (mostly) (co-)financed by public funds and are therefore subject to the social and political framework conditions (including the net-zero target)
- Many academic institutions have set themselves a more ambitious net zero target
- This also includes the flight emissions
- These must therefore be drastically reduced, i.e. either
  - no flight emissions or
  - the (few) aviation emissions must be removed from the atmosphere to the same extent

Who will "receive" these emissions in the future, who will be allowed to fly?

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4 What does climate neutrality or net zero mean for science?

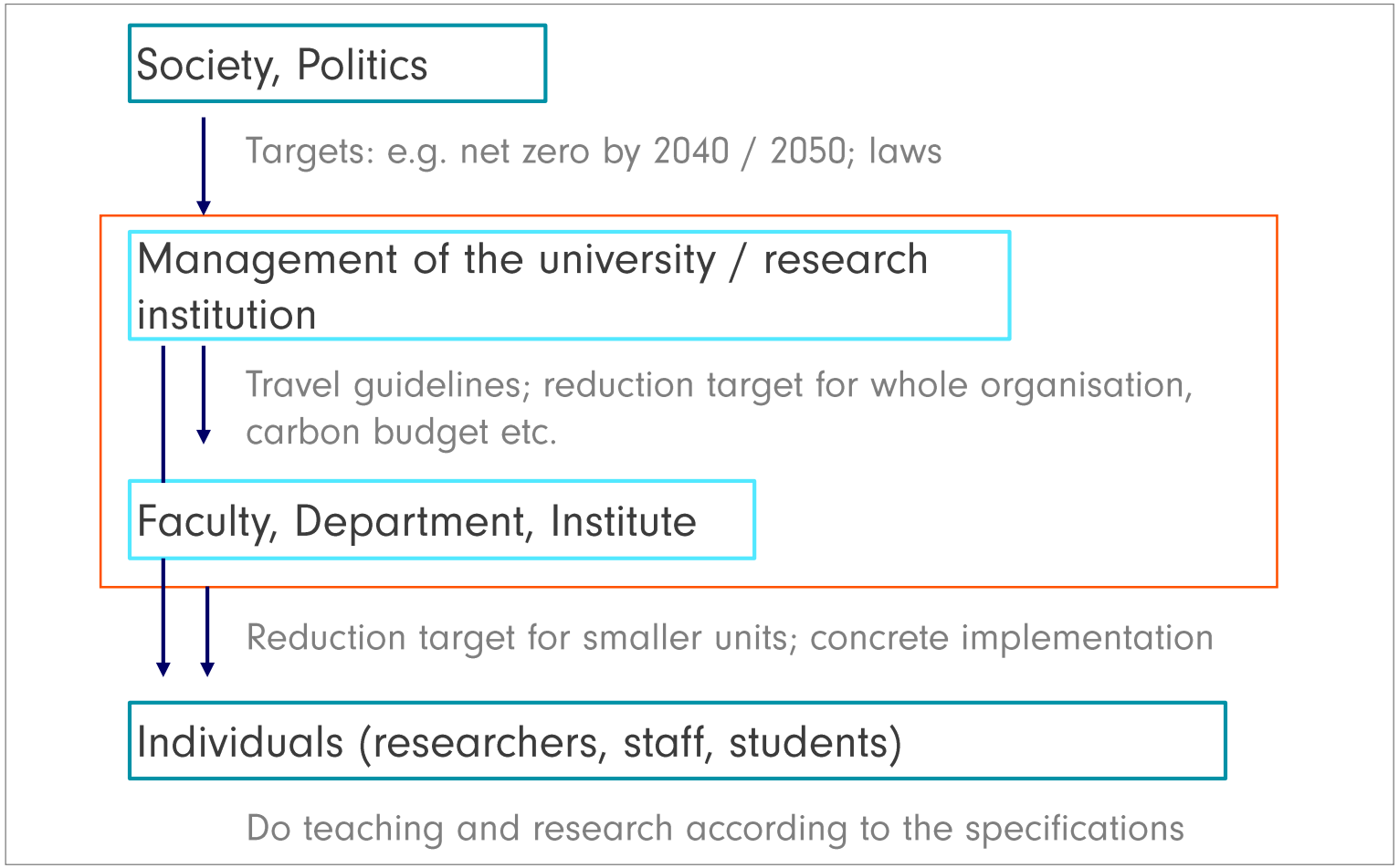
- How do you do excellent science in the future under the conditions of climate neutrality/net zero, i.e. with (almost) no flights?
- What does this science look like, i.e. how are individual scientific activities and science organisations affected?
- How do you make the transition?
- Who is responsible for initiating and steering this process (responsibility and accountability)?

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5 Who has what responsibility?

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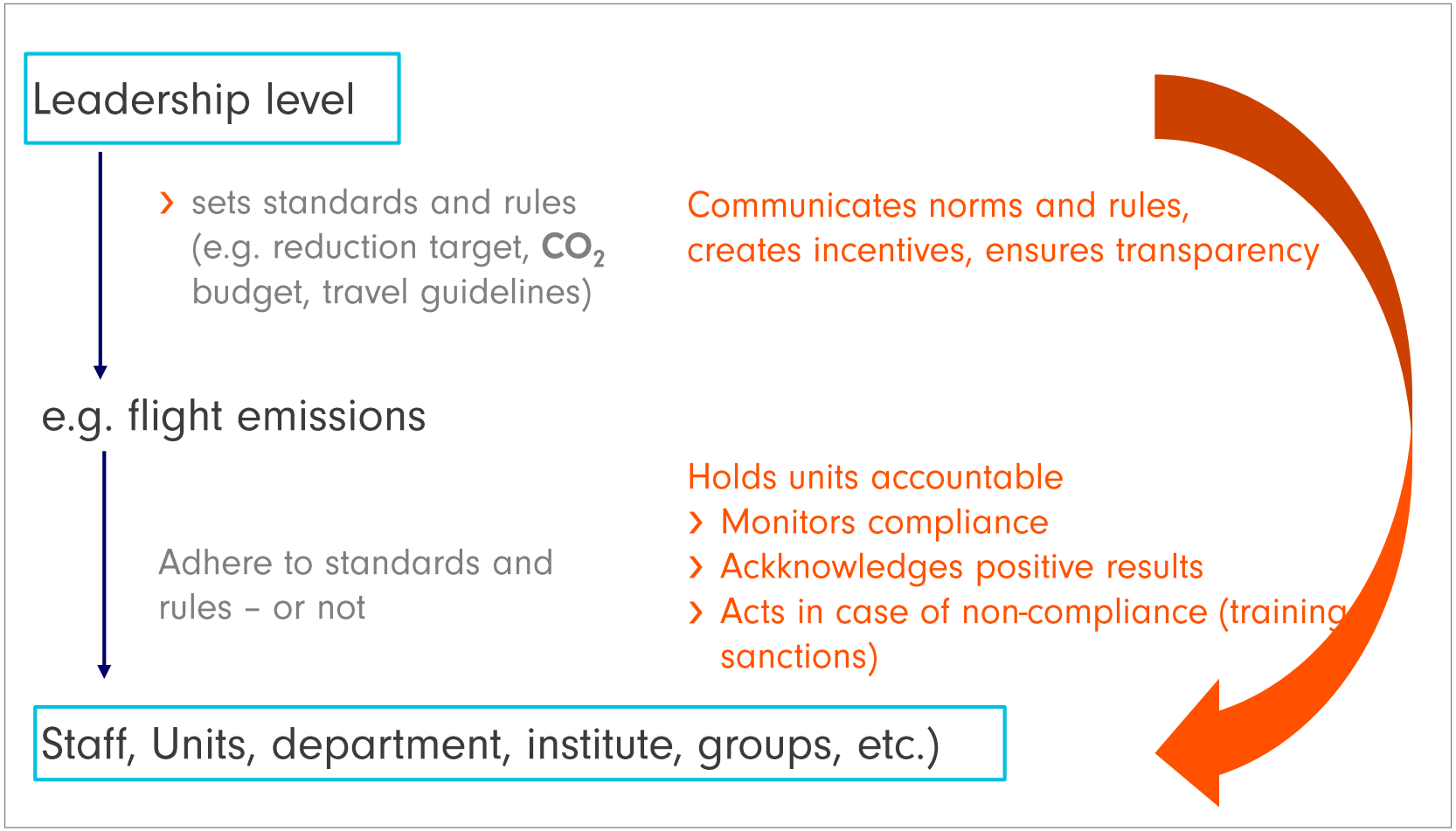
5.1 Who is responsible for what?



Slide adapted from Hirsch-Hadorn, Baumberger, ETHZ. The slide only represents the top-down and not the participatory bottom-up version. Each level can therefore hold the next level accountable.
Graphic: Own illustration adapted from Hirsch-Hadorn, Baumberger, ETHZ.

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5.2 Who can hold whom responsible and how (internal control)?



In order to prevent "organised irresponsibility" (Beck 1988), institutions must be so designed that responsibility becomes clear and can be claimed.

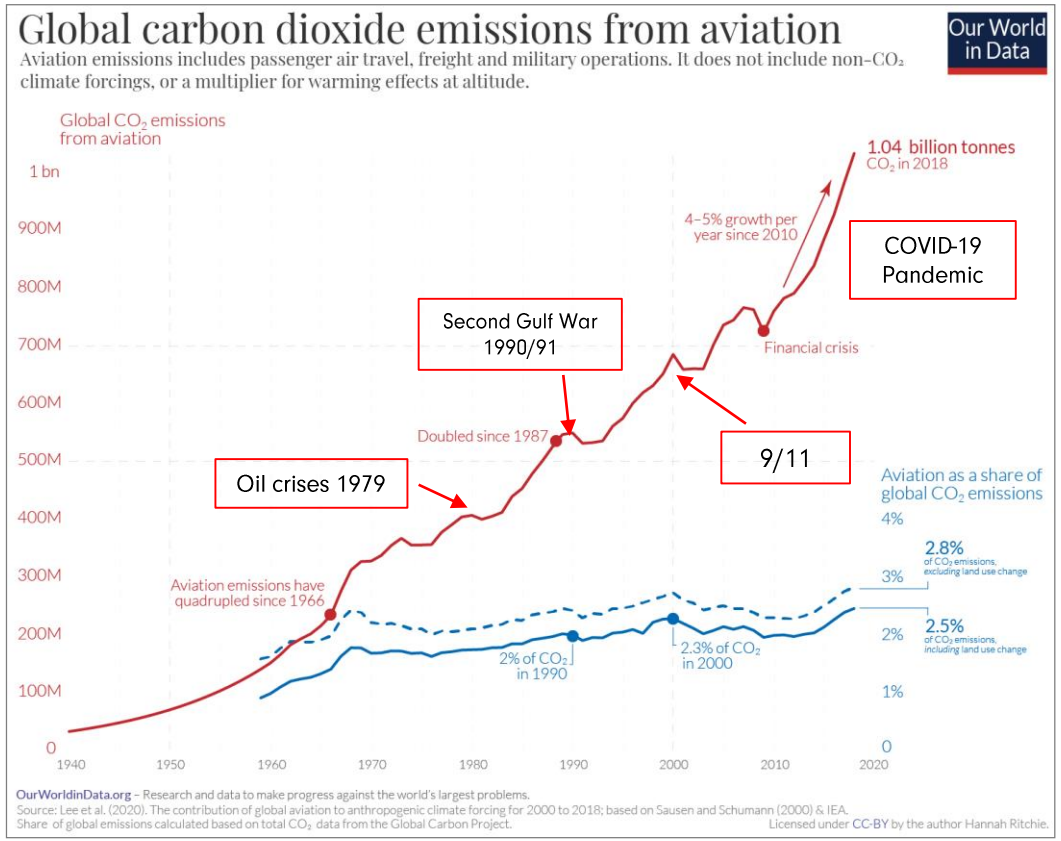
Graphic: Own illustration adapted from Hirsch-Hadorn, Baumberger, ETHZ.

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6 Why is flight reduction relevant in academia?

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6.1 Development of worldwide flights since 1940 and increase in air traffic at universities in Baden-Württemberg



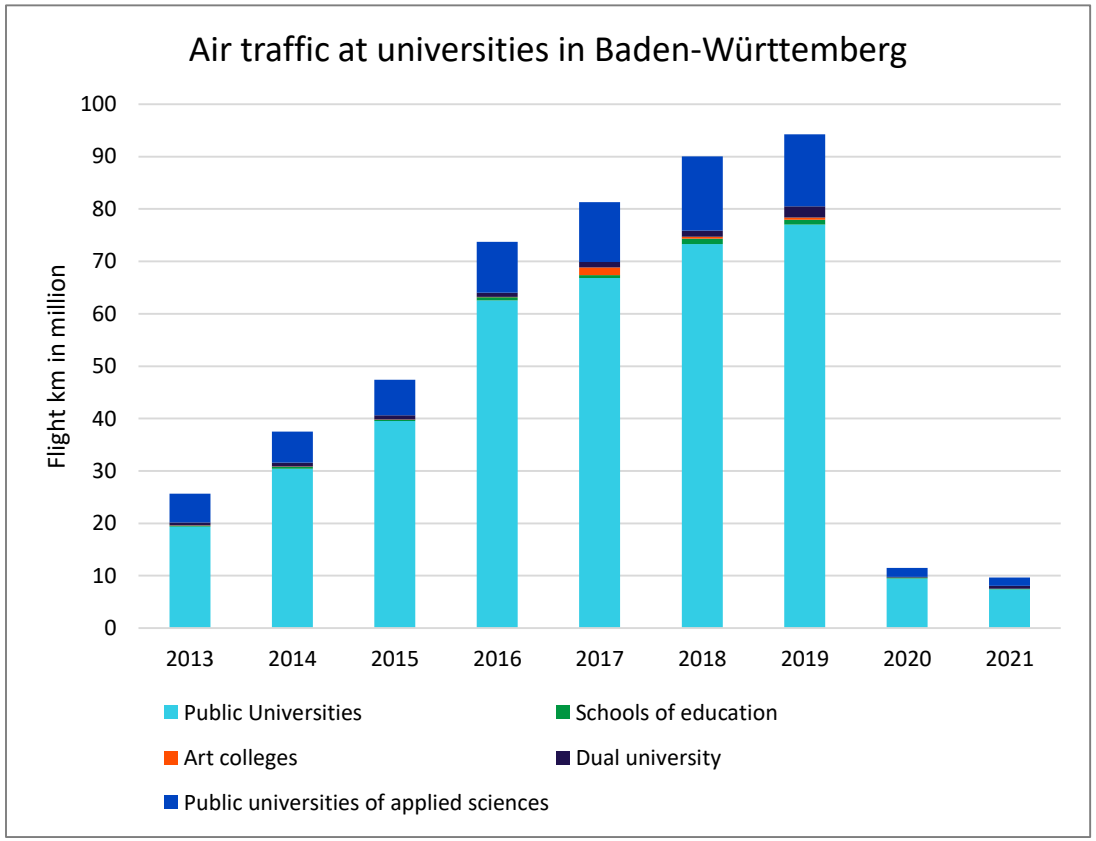
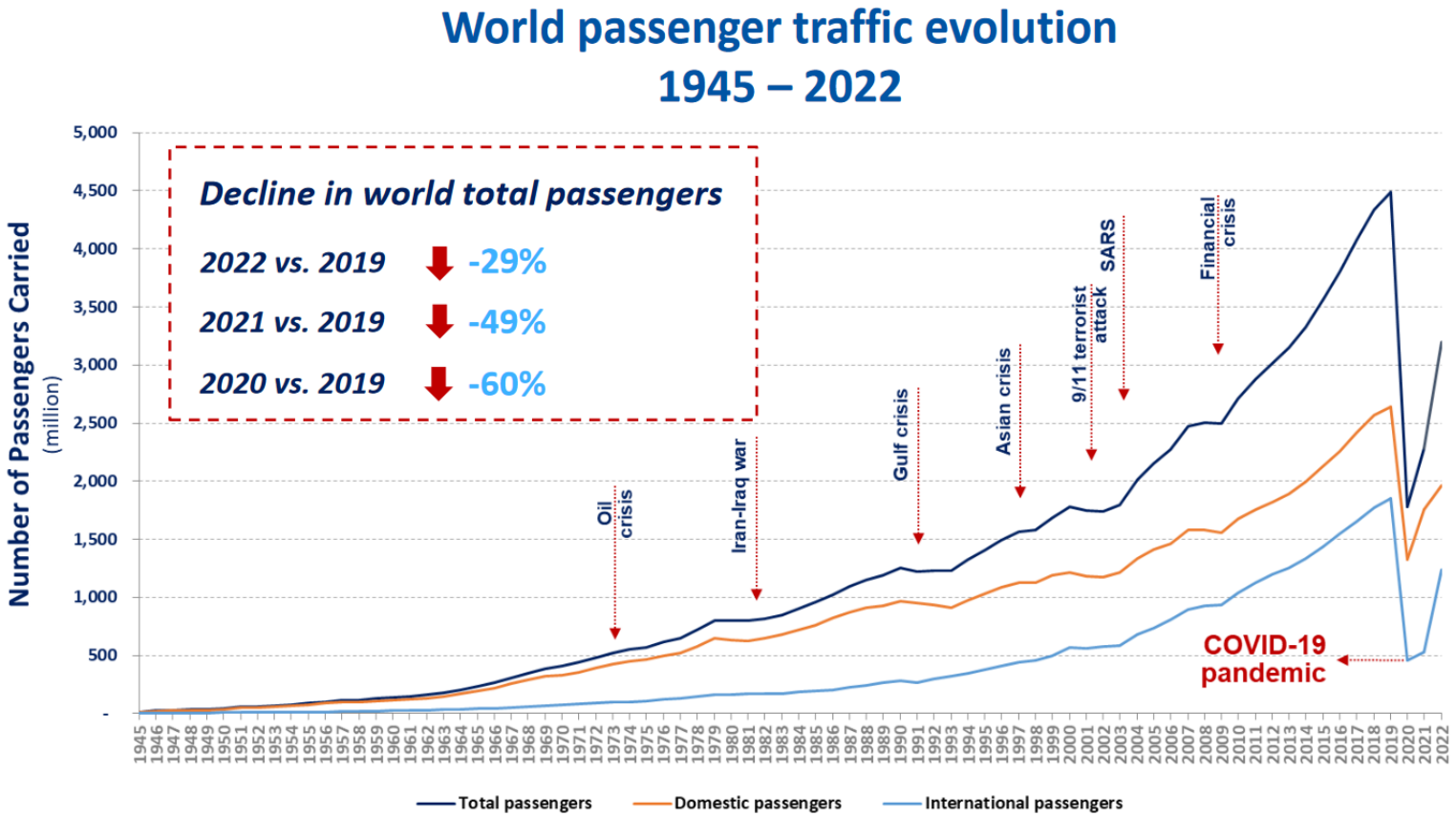


Image source: Author Hannah Richie, License: CC BY 4.0. https://ourworldindata.org/co2-emissions-from-aviation

Graphic: Own illustration based on data from Drucksache 16/6716 – Antrag SPD – Entwicklung des Flugaufkommens der Landesverwaltung (16.9.2019)

6.2 Development of air passengers since 1945

Despite decline during COVID-19, passenger numbers in 2020 are as high as 20 years ago!



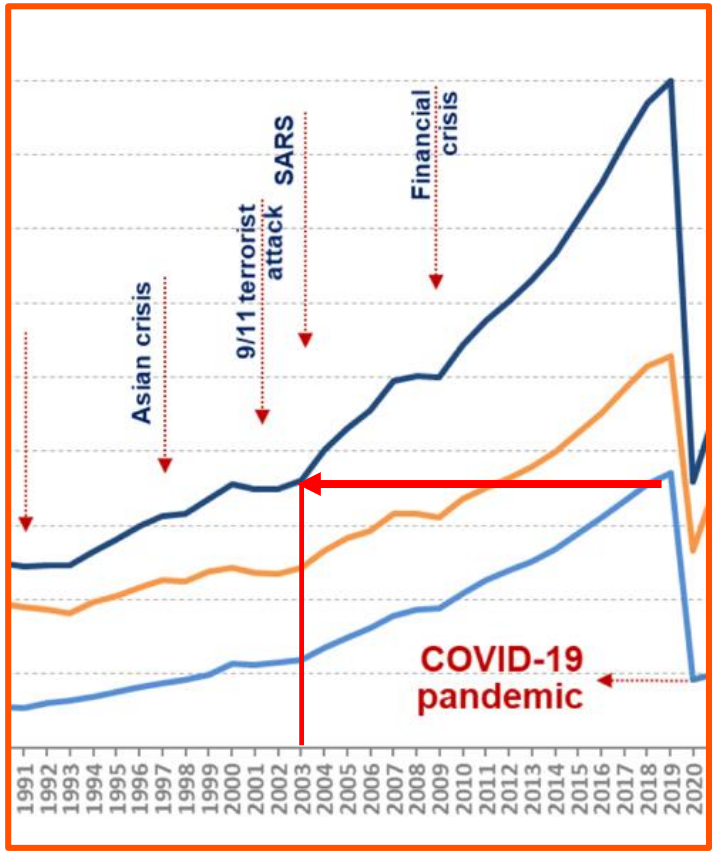


Image source: © ICAO, https://www.icao.int/sustainability/Documents/COVID-19/ICAO%20COVID-19%20Economic%20Impact_2023%2004%2027.pdf

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6.3 Global air traffic and the (short-term) corona effect

- Global air traffic has increased sharply in recent decades. From 310 million passenger flights in 1970, the number grew to 4.3 billion* in 2018.
- By 2018, global aviation emissions had risen to 1,034 Mt CO_2 per year (increase by a factor of 6.8 compared to 1960). In 2018, global aviation emissions thus accounted for around 2.4% of anthropogenic CO_2 emissions**.
- Taking into account non-CO_2 emissions (with their uncertainties), the total warming caused by aviation amounts to about 0.04 ± 0.02°C by 2019, i.e. about 4% of the current human-induced warming of the planet of just under 1.2°C*.
- Due to the COVID-19 pandemic, air traffic decreased dramatically in 2020***.
- However, Gudmundsson et al. (2020) predicted that the pandemic will only temporarily slow down the air traffic growth curve by 2.4 years.

*Klöwer et al. 2021; **Lee et al. 2021, S. 2; ***Le Quéré et al. 2020

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6.4 Climate impact of different modes of transport

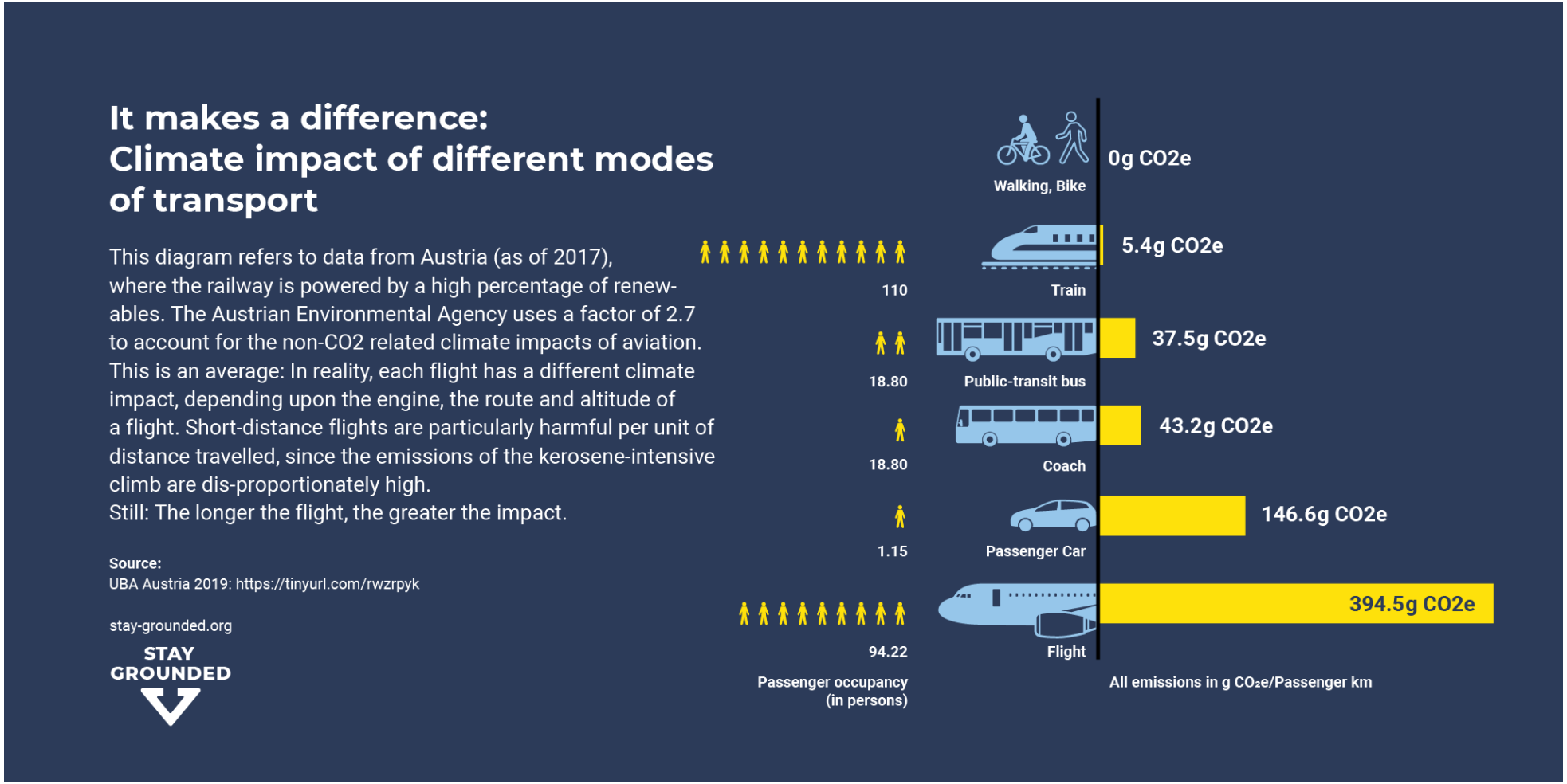


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6.5 Why is the reduction of air travel relevant? (1/3)

1. **Researchers fly significantly more than the average population** (Burian, 2018)
2. **Few fliers are responsible for most emissions**
   - Study by Wynes and Donner (2018) about the flight emission of around 1500 persons at 8 departments of the University of British Columbia:
     - 1/3 did not fly
     - 80% of the emissions were caused by 25% flyers
     - 50% of the emissions were caused by 8% flyers
- Inequality of flight emissions is a topic in further studies (Gössling and Humpe, 2020; Hopkinson and Cairns, 2020)

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6.5 Why is the reduction of air travel relevant? (2/3)

3. **Fairness**
   Increased air travel has increased **inequality as** not everyone has the same opportunities to travel (finances, visa requirements, remote regions, caring responsibilities)

4. **Leading by example and credibility**
   "Researchers lose public credibility if they do not follow their own advice" (Attari et al., 2016)

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6.5 Why is the reduction of air travel relevant? (3/3)

5. **Scientific success**
   Air travel has a small impact on:

- scientific success (h-index) (Wynes et al., 2019),
- number of citations (Chalvatzis and Ormosi, 2021),
- academic social capital, i.e. beneficial academic relationships (Schaer et al., 2021)

However, Berné et al. (2022) find a correlation between flights and h-index, but raise the following question, if there is also a causality:

"Is it that scientists who travel more obtain more scientific visibility and hence get more citations, collaborations and papers (exposure effect), or is it instead that scientists who are more visible because of their work get to travel more (reputation effect)?"

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6.6 Who flies?

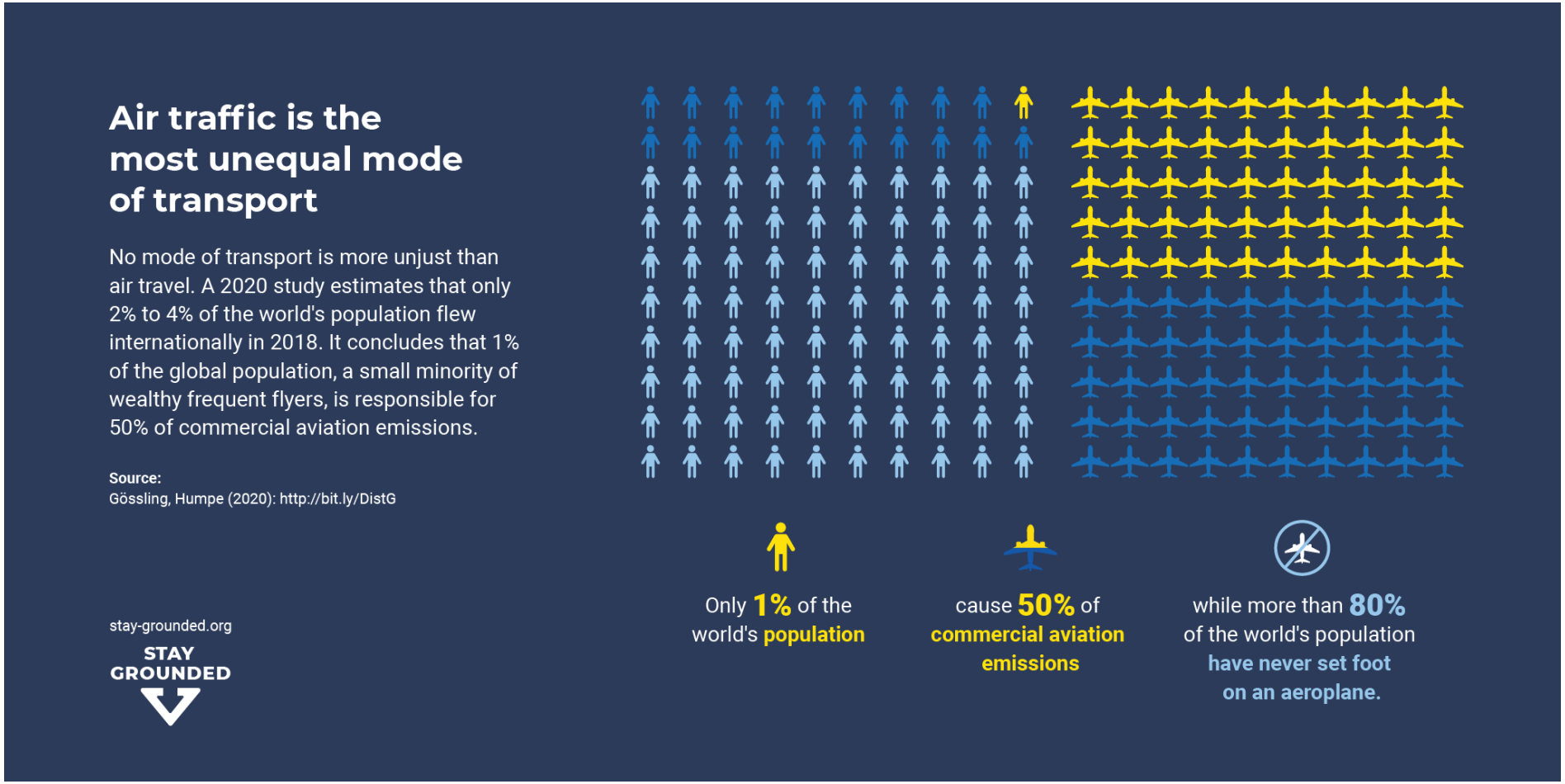
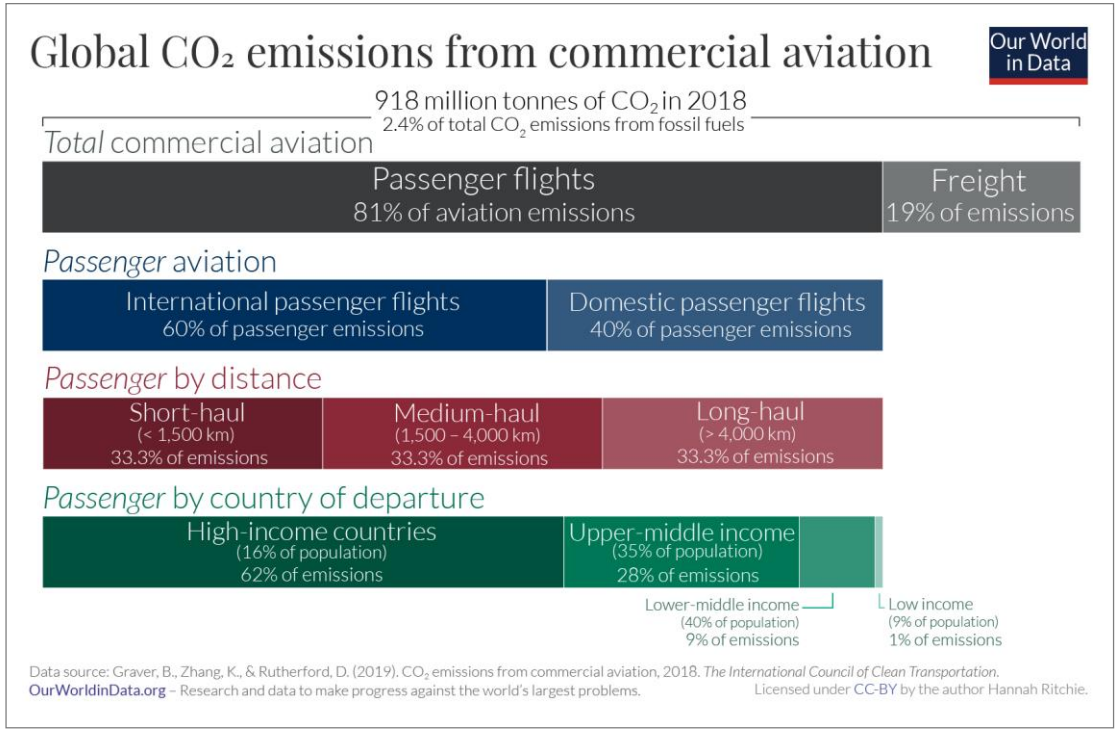


Image source: https://de.stay-grounded.org License: CC BY-NC-SA 3.0.
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6.7 Breakdown of global aviation emissions and inequalities in aviation emissions consumption between low-to-high-income countries



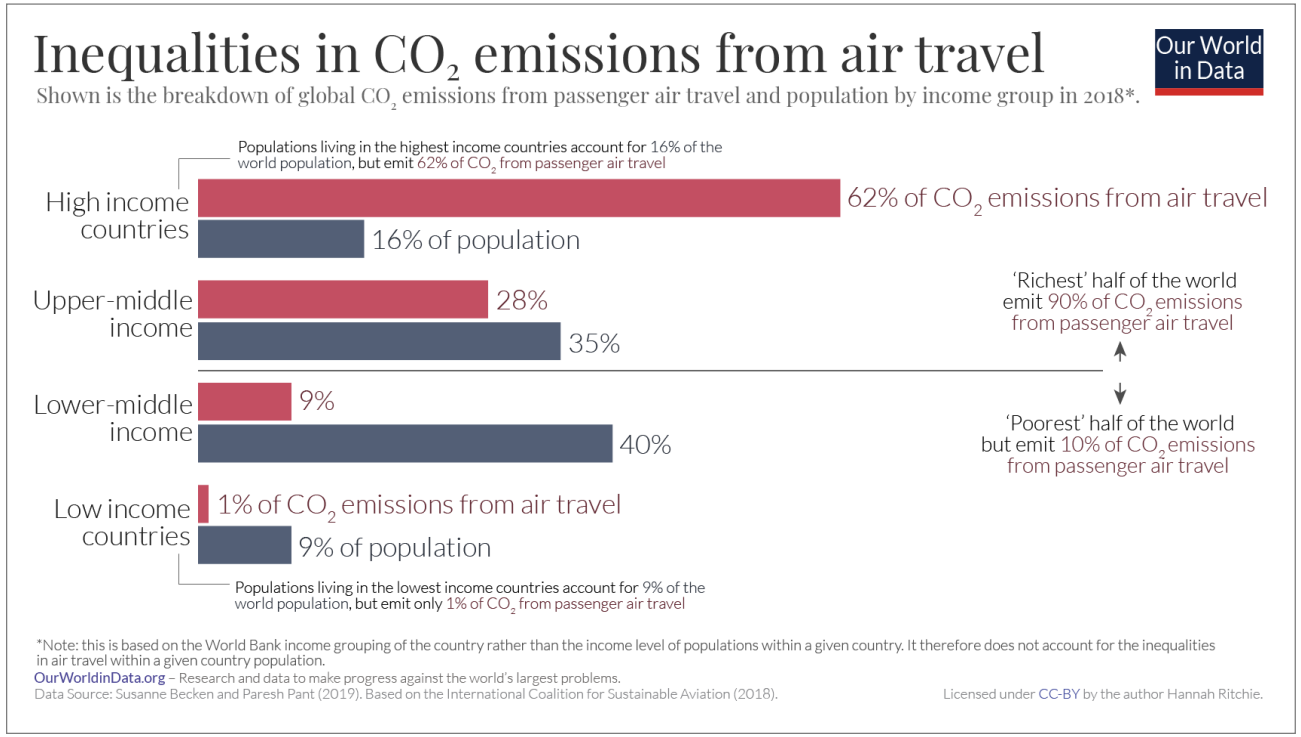


Image source: Author Hannah Richie, License: CC BY 4.0. https://ourworldindata.org/transport#passenger-vs-freight-domestic-vs-international-where-do-aviation-emissions-come-from

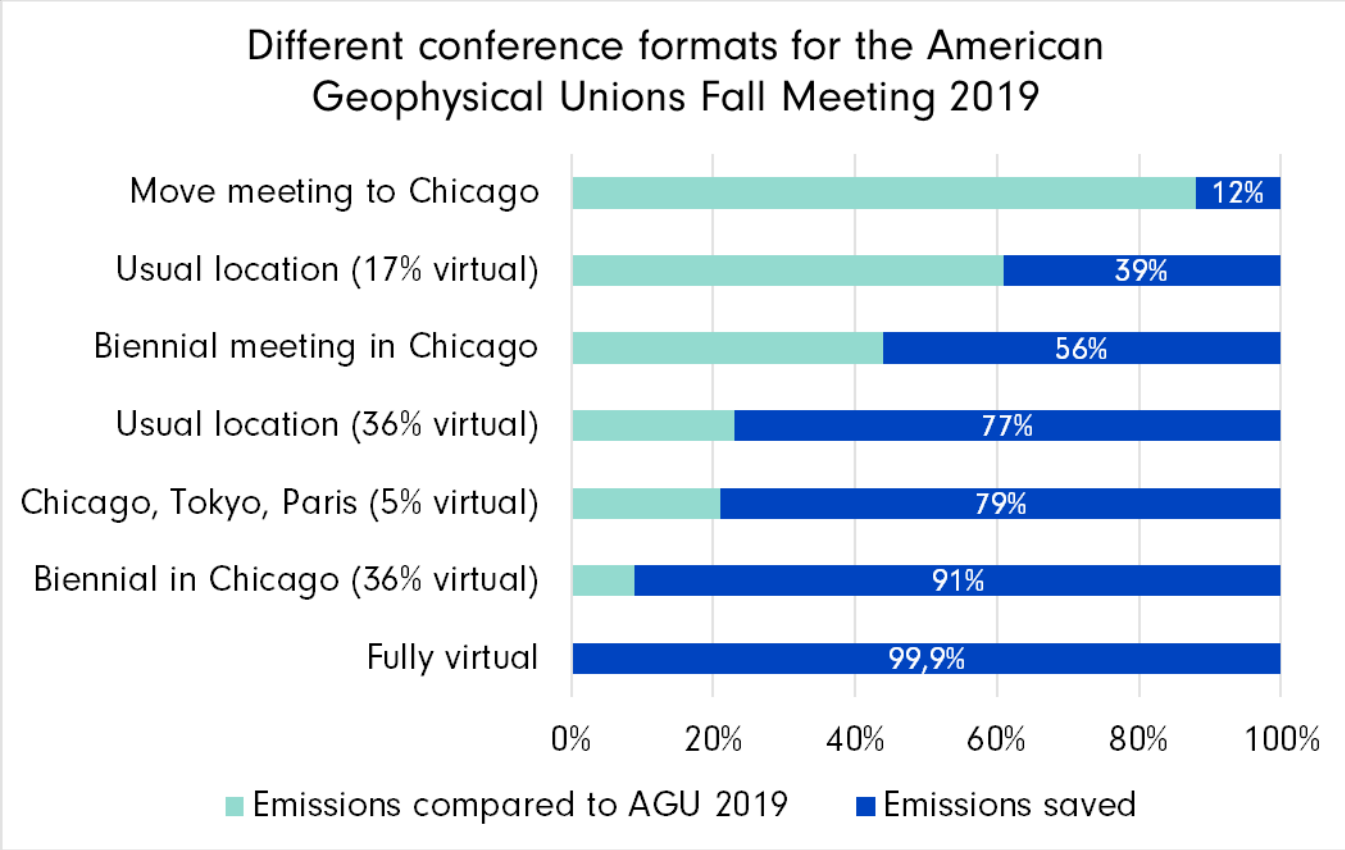
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6.8 Scientists a travellers
Example international conferences

American Geophysical Unions Fall Meeting 2019

- 28,000 participants, 80,000 t CO2 equivalent
- 75% of which from flights over 8,000 km
- 20% (>2 months) of the annual emissions of the city of Constance

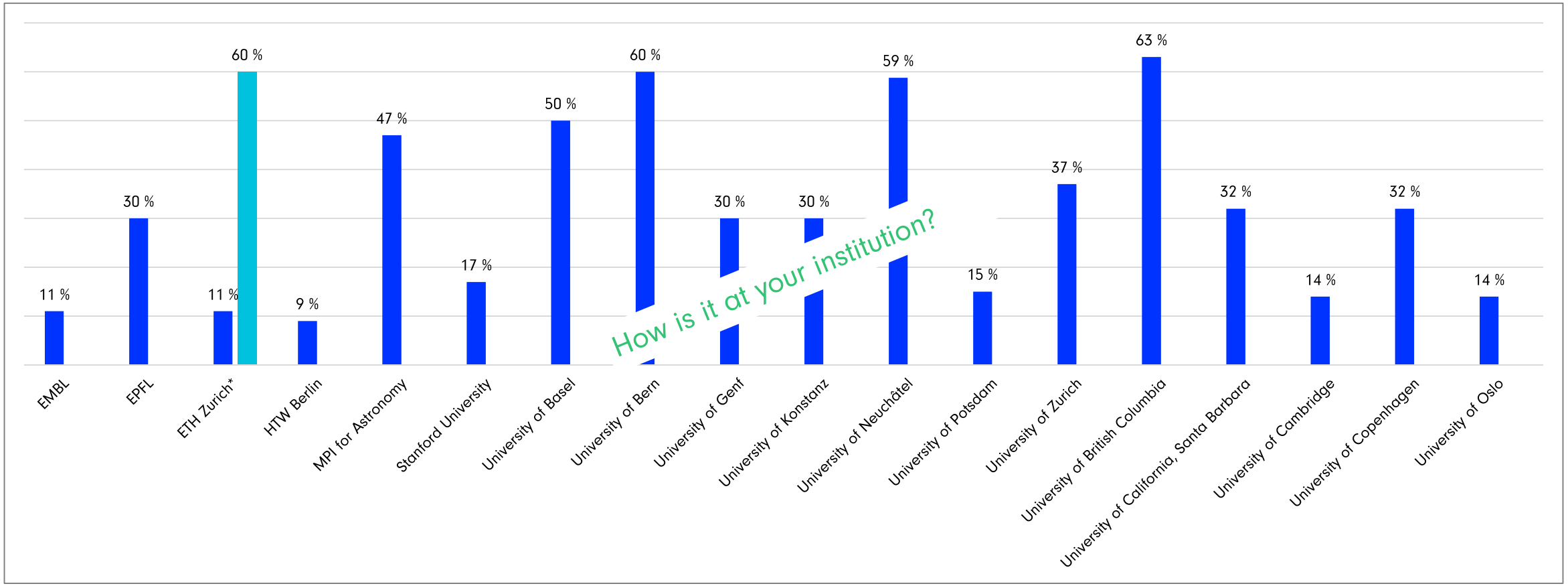


Graphic: Own illustration based on data from Klöwer 2020, https://doi.org/10.1038/d41586-020-02057-2

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6.9 Contribution of flights to total emissions

Different research institutions



*ETH Zurich: the contribution of flights to total emissions varies between 11 % and approx. 60 %, depending on system limit.
Graphic: Own illustration, ifeu.

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7 FlyingLess Survey

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7.1 FlyingLess survey scientists and students
Methodology

2022 project, a survey was conducted at eight different academic institutions (in Germany).

Target:

› Capture a broad behavioural and opinion picture on academic air travel within the academic community and among students.



Content

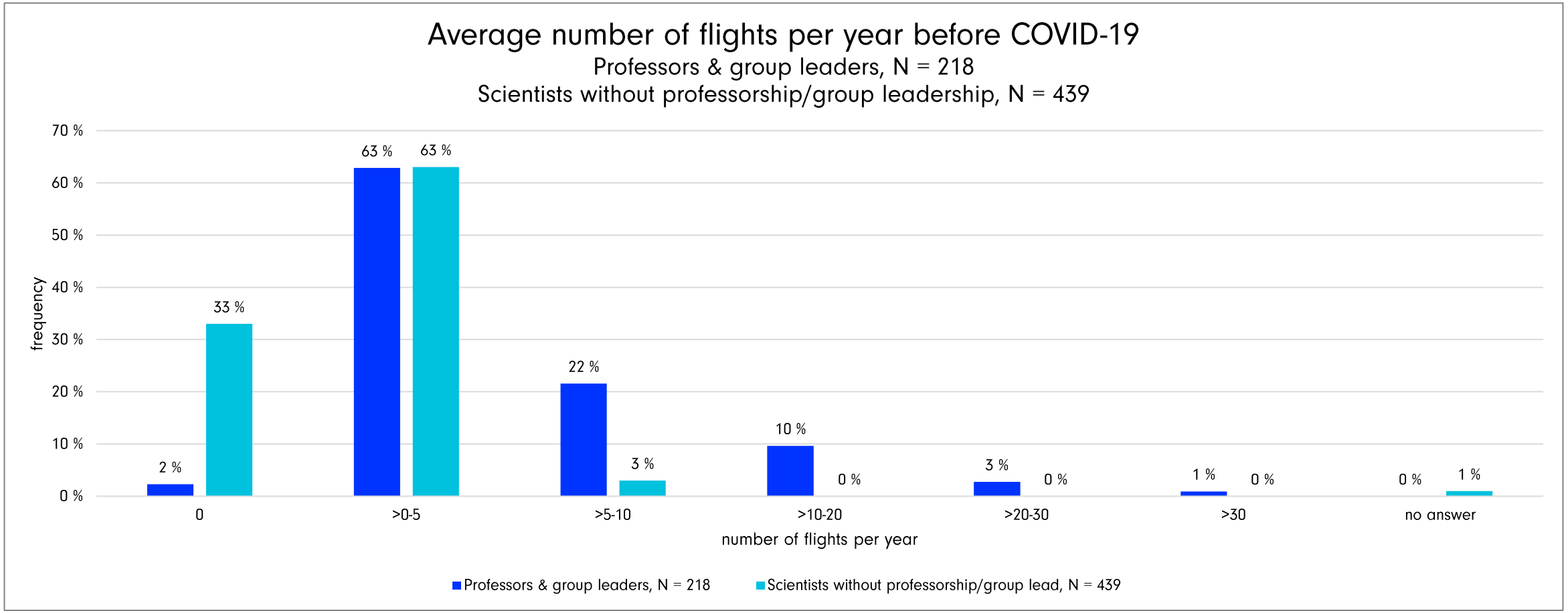
› Mobility behaviour in relation to academic long-distance travel and student air travel
› Reasons for the corresponding mobility behaviour
› Factors related to travel (resource) decisions
› Assessment of potential flight reduction measures & internal framework conditions
› Behavioural changes with regard to future academic missions

Response

› Scientists, N = 657
  → Professors & group leaders, N = 218
  → Scientists without professorship/group leadership, N = 439
› Students, N = 525

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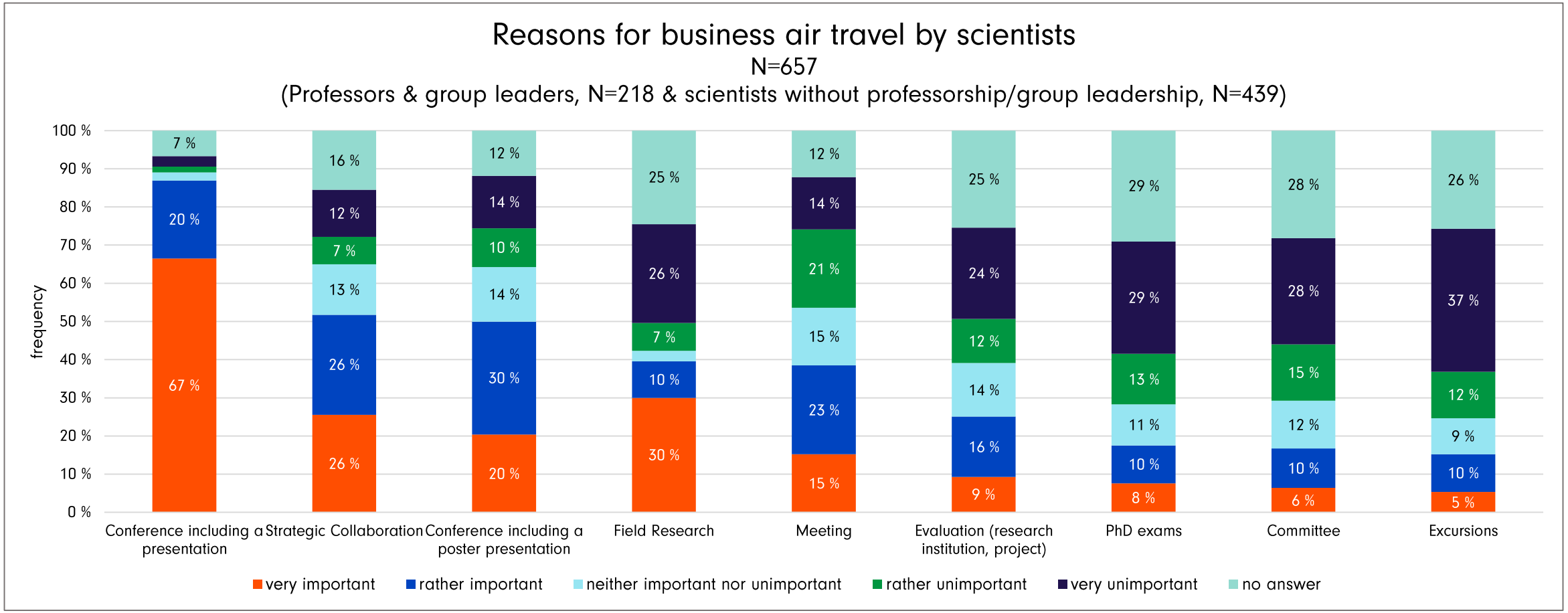
7.2 FlyingLess survey - scientists (1/8)



Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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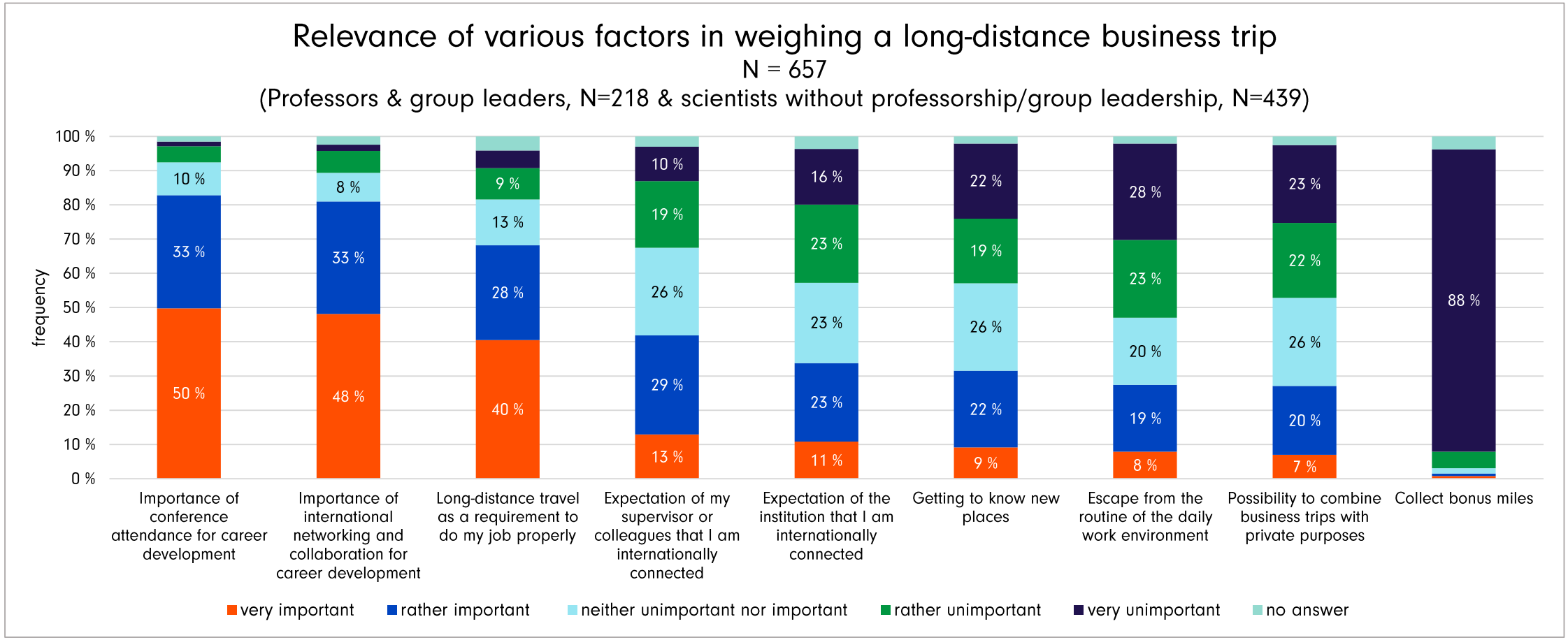
7.2 FlyingLess survey - scientists (2/8)



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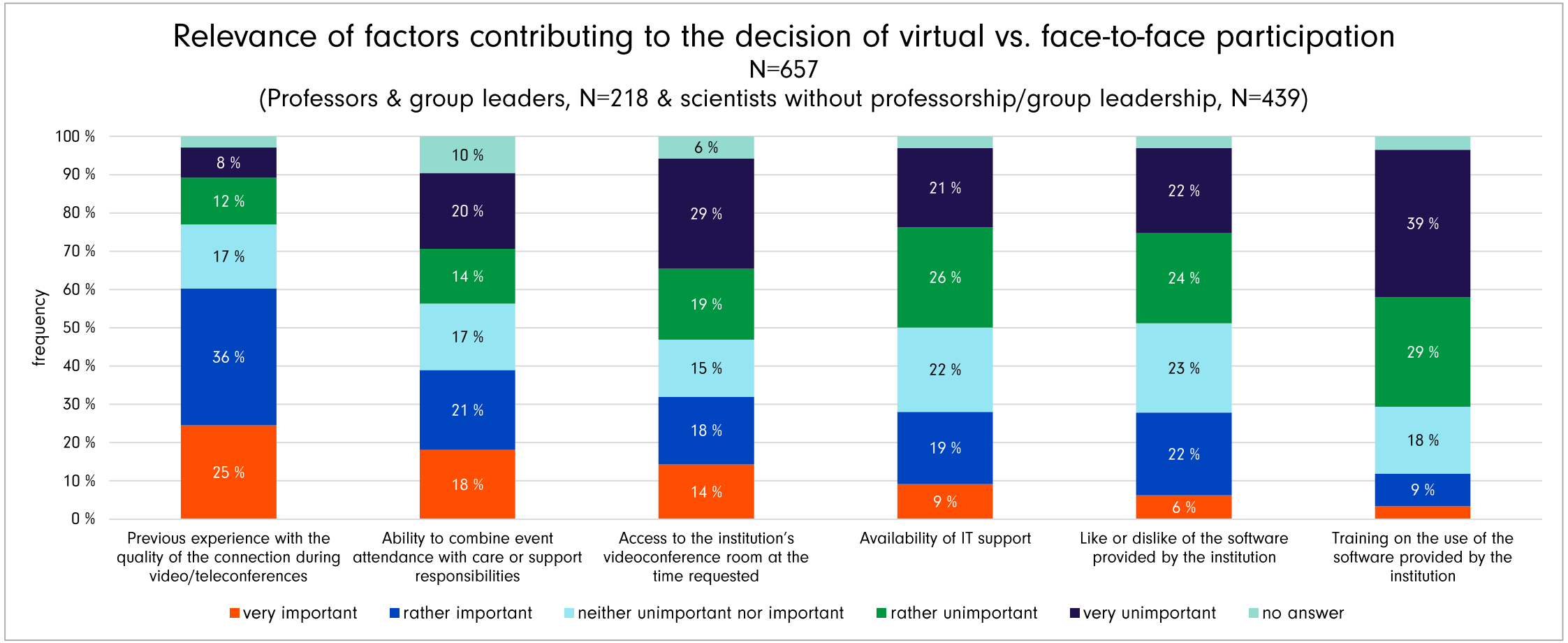
7.2 FlyingLess survey - scientists (3/8)



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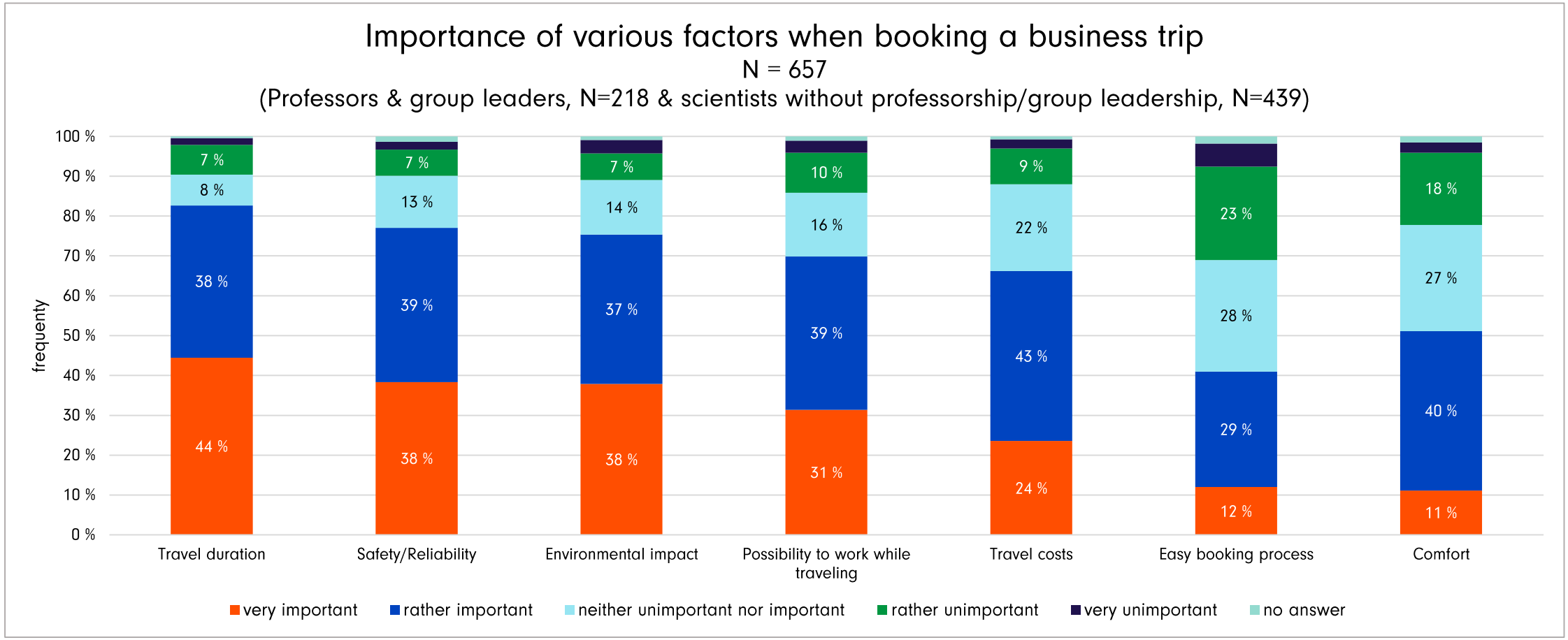
7.2 FlyingLess survey - scientists (4/8)



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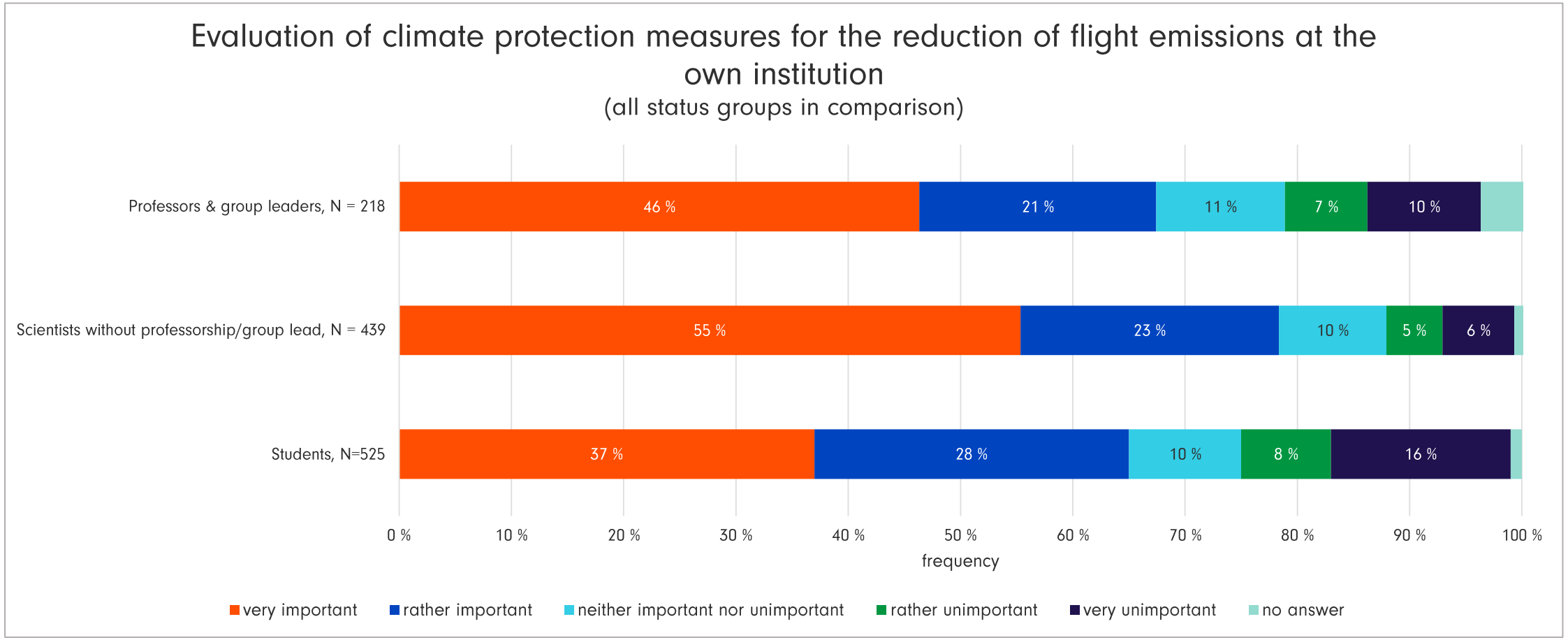
7.2 FlyingLess survey - scientists (5/8)



Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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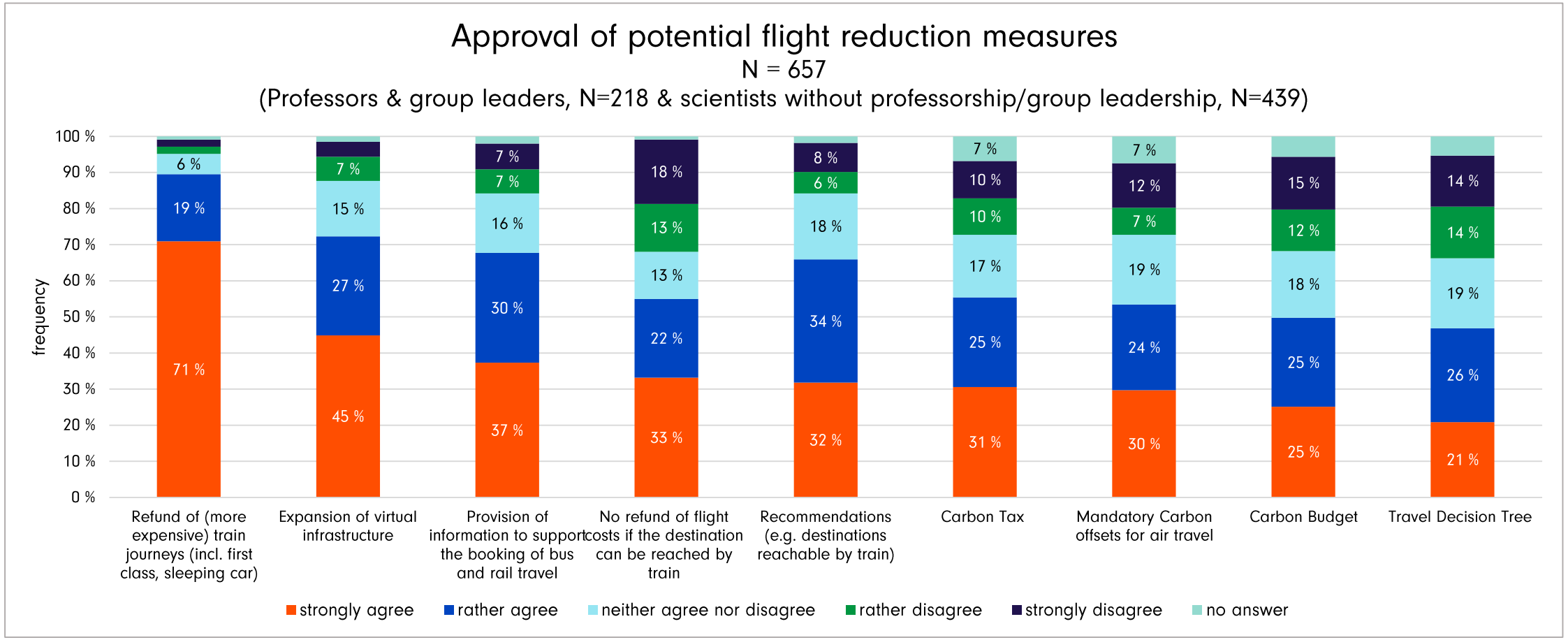
7.2 FlyingLess survey - scientists (6/8)



Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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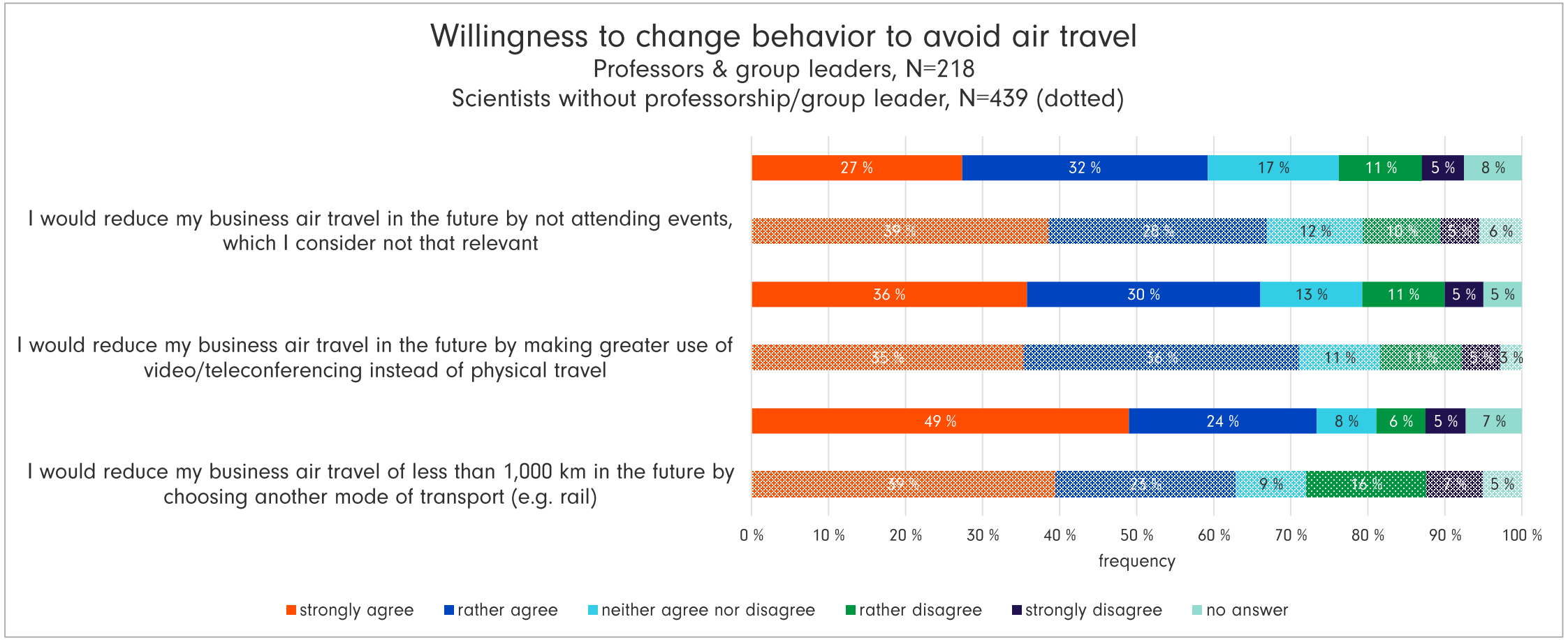
7.2 FlyingLess survey - scientists (7/8)



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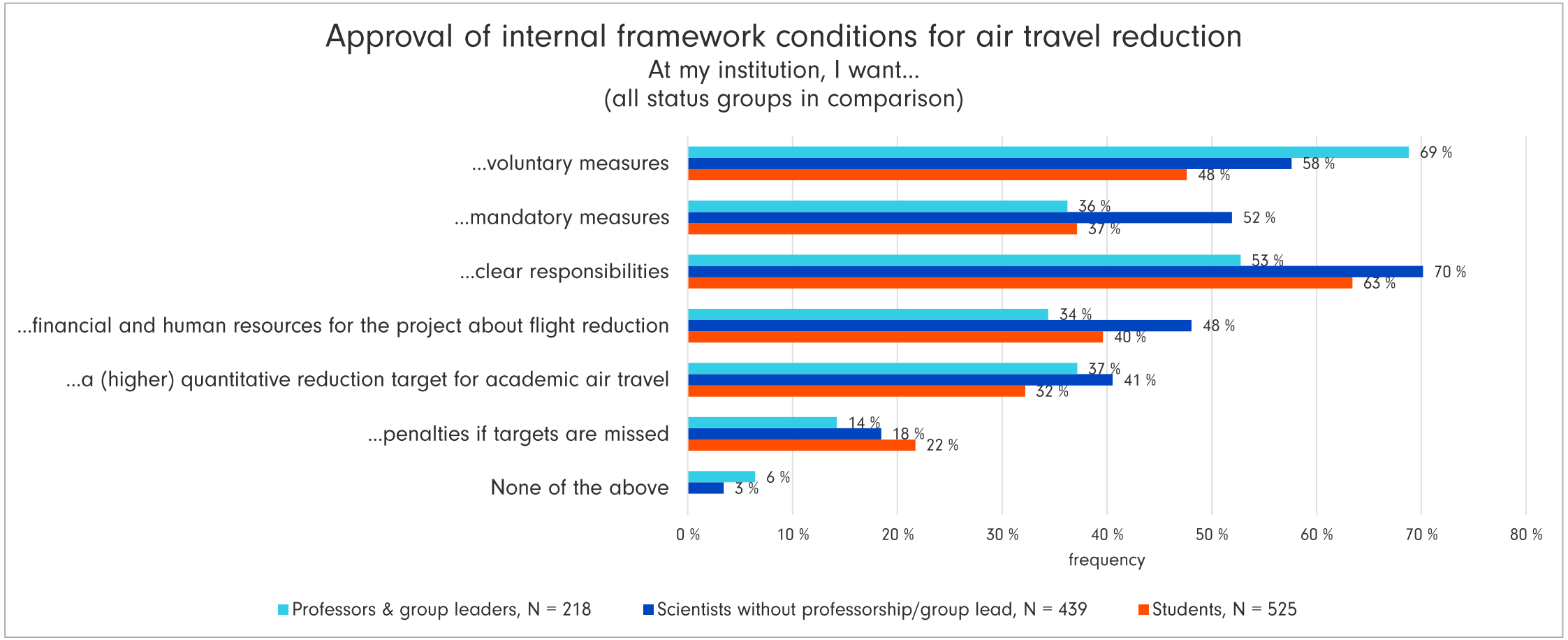
7.2 FlyingLess survey - scientists (8/8)



Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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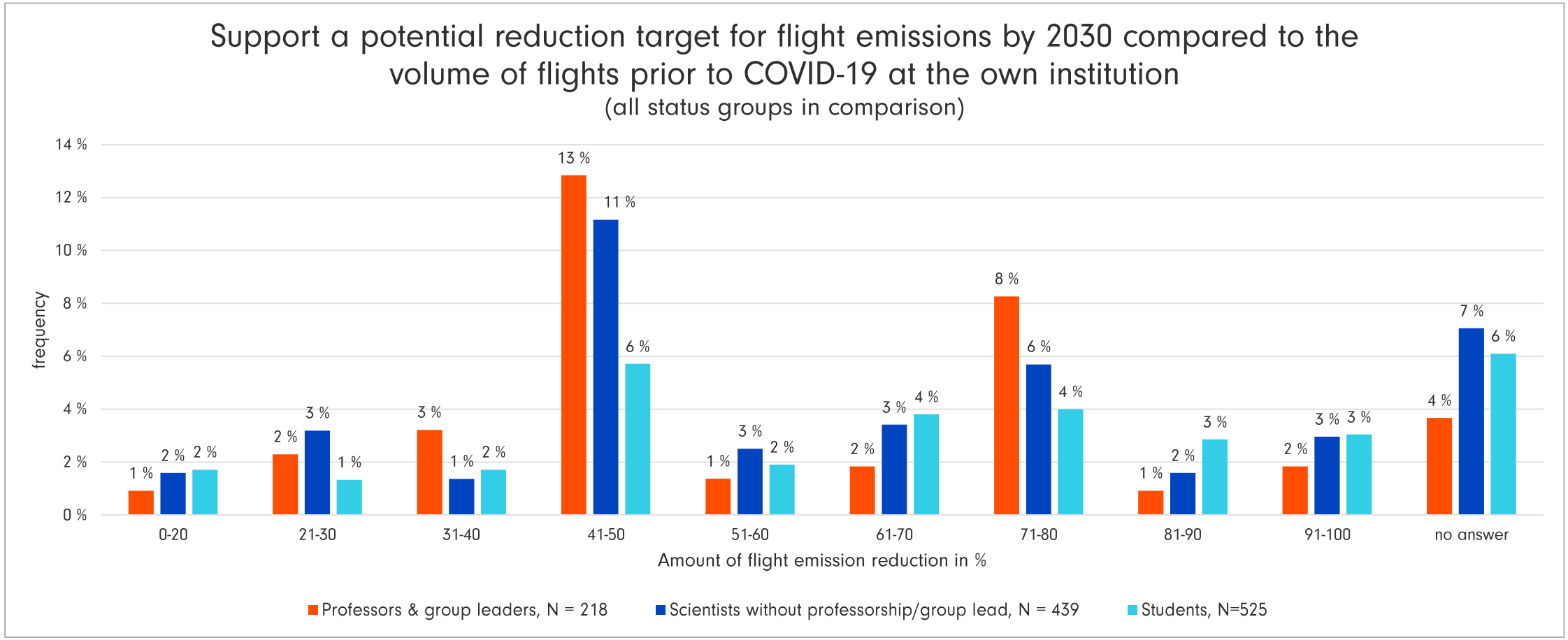
7.3 FlyingLess survey – students (1/2)



Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.3 FlyingLess survey – students (2/2)



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7.4 Student air travel (1/16)

Student flights differ from staff flights in a number of ways:

- Reasons for travel: e.g. exchange, excursion, internship, summer school
- Travel decisions are made by:
  - From the university offering courses as part of the curriculum
  - from the individual students

A study on flight emissions at ETH Zurich (Medhaug, 2021) shows that:

- Student flights cause approx. 10% of the emissions from employee flights
- The emissions are unequally distributed between the groups: 1 Prof causes about as many emissions as 2 Guests/5 Senior Researchers/8 PhD/25 Admin/84 Students
- Approx. 90% of emissions are caused by long-haul flights, similar to employee flights

FlyingLess survey 2022: C. Merrem
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7.4 Student air travel (2/16)

› Student mobility has a large CO_2 footprint - Davies and Dunk (2016) studied 25 UK universities

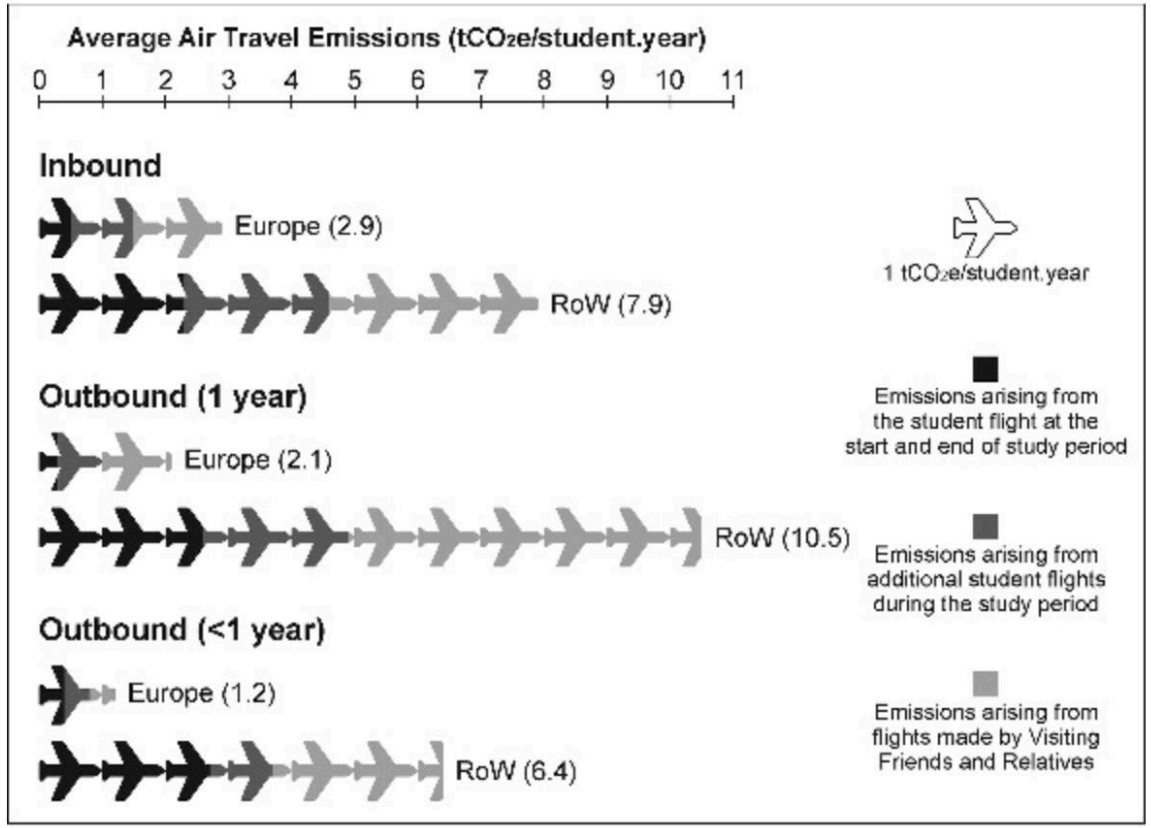


Image source: Jonathan C. Davies & Rachel M. Dunk (2015) Flying along the supply chain: accounting for emissions from student air travel in the higher education sector, Carbon Management, 6:5-6, 233-246, DOI: 10.1080/17583004.2016.1151503, reprinted by permission of the publisher (Taylor & Francis Ltd, http://www.tandfonline.com)

7.4 Student air travel (3/16)

International student mobility - background information

- The pros and cons of student mobility is a particularly controversial and also emotionally debated topic, with social benefits versus environmental costs.
- International student mobility is a global phenomenon that is influenced by economic, educational, and political factors (Shen et al., 2022)
- Shen et al. also provide a conceptual framework for knowledge and international academic mobility and global knowledge system

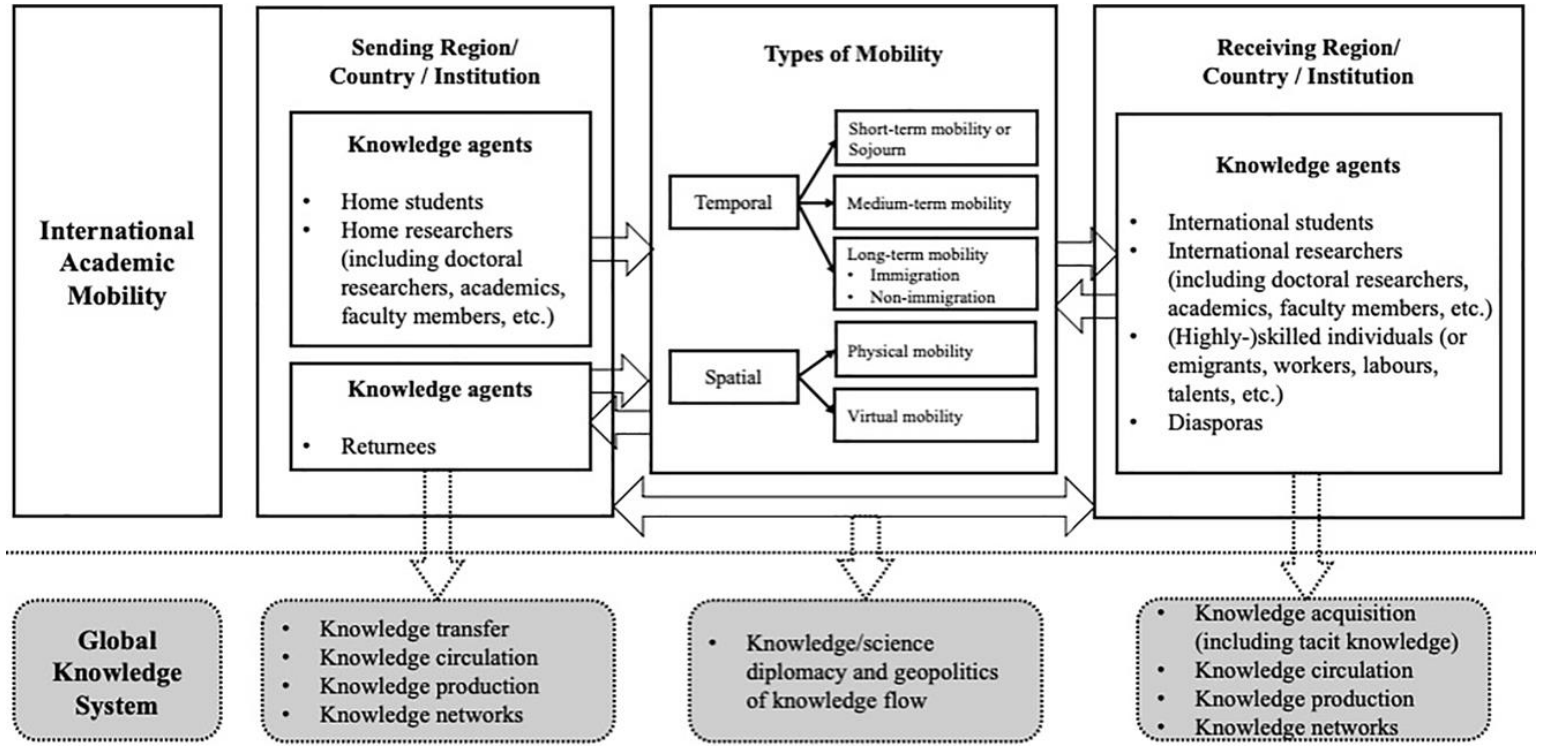


Image source: Shen et al. (2022): "Reconceptualising International Academic Mobility in the Global Knowledge System: Towards a New Research Agenda." Higher Education 84 (6): 1317–42. https://doi.org/10.1007/s10734-022-00931-8, reproduced with permission from SNCSC.

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7.4 Student air travel (4/16)

International student mobility - background information

Shields (2019) summarizes the literature in favor of student mobility as follows:

- The number of students who go abroad for higher education has grown rapidly, from 1.4 million in 1999 to 4.8 million in 2016 (UNESCO Institute for Statistics, 2018)
- Mobility is a global phenomenon, with students from 209 countries studying abroad in at least 143 hosting countries (UNESCO Institute for Statistics, 2018)
- Newly industrialized countries with growing disposable income account for a large share of students who go abroad for higher education (e.g. China and India, they accounted for a combined total of 26.7% of outgoing international students in 2014)
- Several factors are responsible, including neoliberal funding regimes that require institutions to increase revenues from international student fees (Bessant et al., 2015), global labour markets that place a high premium on skills (Autor, 2014; Gürüz, 2011), and the formation of cosmopolitan identities that shape individuals' identities and aspirations (Tran, 2016; Rizvi, 2011)
- International student mobility is also closely tied to international labour market migration, with many students migrating to the host country and contributing to the labour force in important areas (Kahanec and Kralikova, 2011)
- Literature suggests several important benefits to international study, including intercultural proficiency (Clarke et al., 2009), employability (Crossman and Clarke, 2009; Norris and Gillespie, 2009), and engagement in global issues (Paige et al., 2009), with benefits to both hosting economies and institutions (Luo and Jamieson-Drake, 2013; Perna et al., 2014)

Shields, Robin. 2019. "The Sustainability of International Higher Education: Student Mobility and Global Climate Change." Journal of Cleaner Production 217 (April): 594-602. https://doi.org/10.1016/j.jclepro.2019.01.291

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7.4 Student air travel (5/16)

International student mobility - background information

There are also problematic aspects in the literature (Shen et al., 2022):

- For master's students, the positive influences of mobility on the labour market are minimal, which also vary largely across their backgrounds (e.g. Lindberg, 2009)
- Internationalisation of higher education in countries with more outbound mobilities may be hindered by brain drain (e.g. Teferra & Altbach, 2004)
- Geopolitics of knowledge production, as well as the relationship between this dilemma and global inequality in higher education (e.g. Burford et al., 2021)
- The Peoples' Sustainability Treaty on Higher Education (2012) from the Rio.20 conference argues, "Before higher education can genuinely contribute to sustainable development, it must transform itself. The dominant education paradigm is centred on values and priorities that threaten sustainable development (Shields, 2019)

Shields, Robin. 2019. "The Sustainability of International Higher Education: Student Mobility and Global Climate Change." Journal of Cleaner Production 217 (April): 594-602. https://doi.org/10.1016/j.jclepro.2019.01.291

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7.4 Student air travel (6/16)
FlyingLess survey

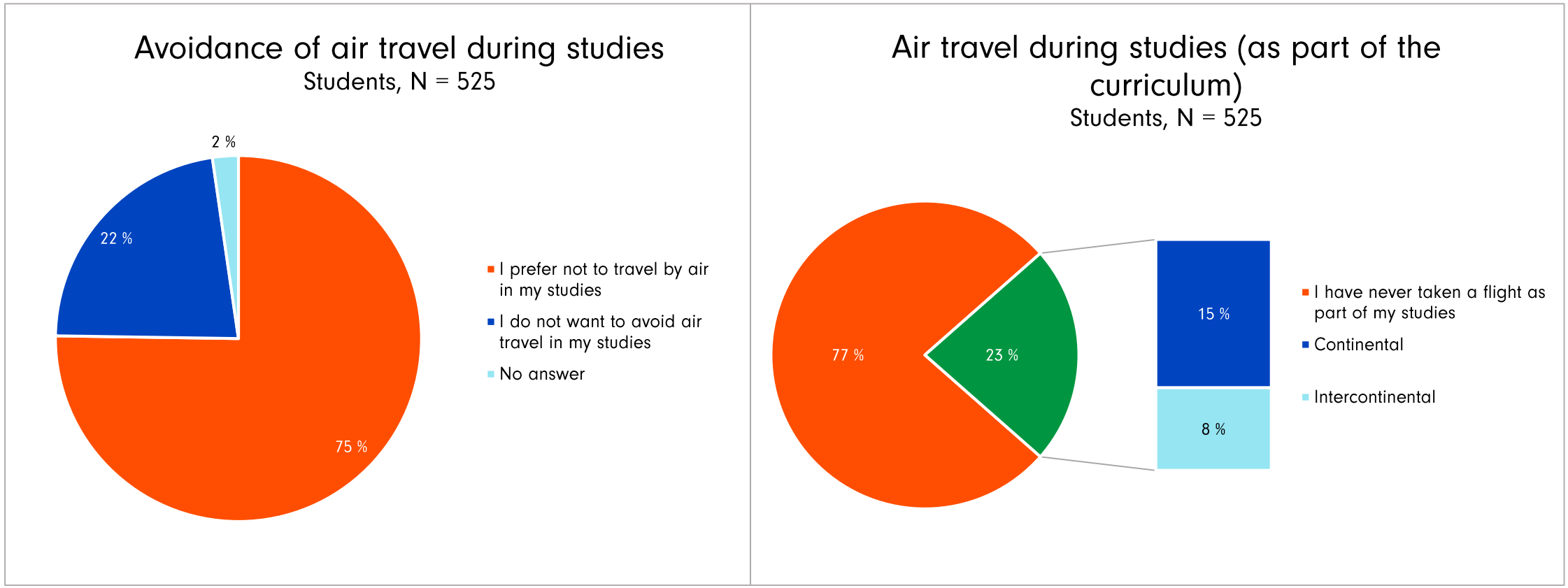
To provide information concerning travel reasons and factors for student flights in Germany, we performed in 2022 a survey at six universities as part of the FlyingLess project.

Shields, Robin. 2019. „The Sustainability of International Higher Education: Student Mobility and Global Climate Change". Journal of Cleaner Production 217 (April): 594–602. https://doi.org/10.1016/j.jclepro.2019.01.291

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7.4 Student air travel (7/16)

FlyingLess survey at six universities in Germany

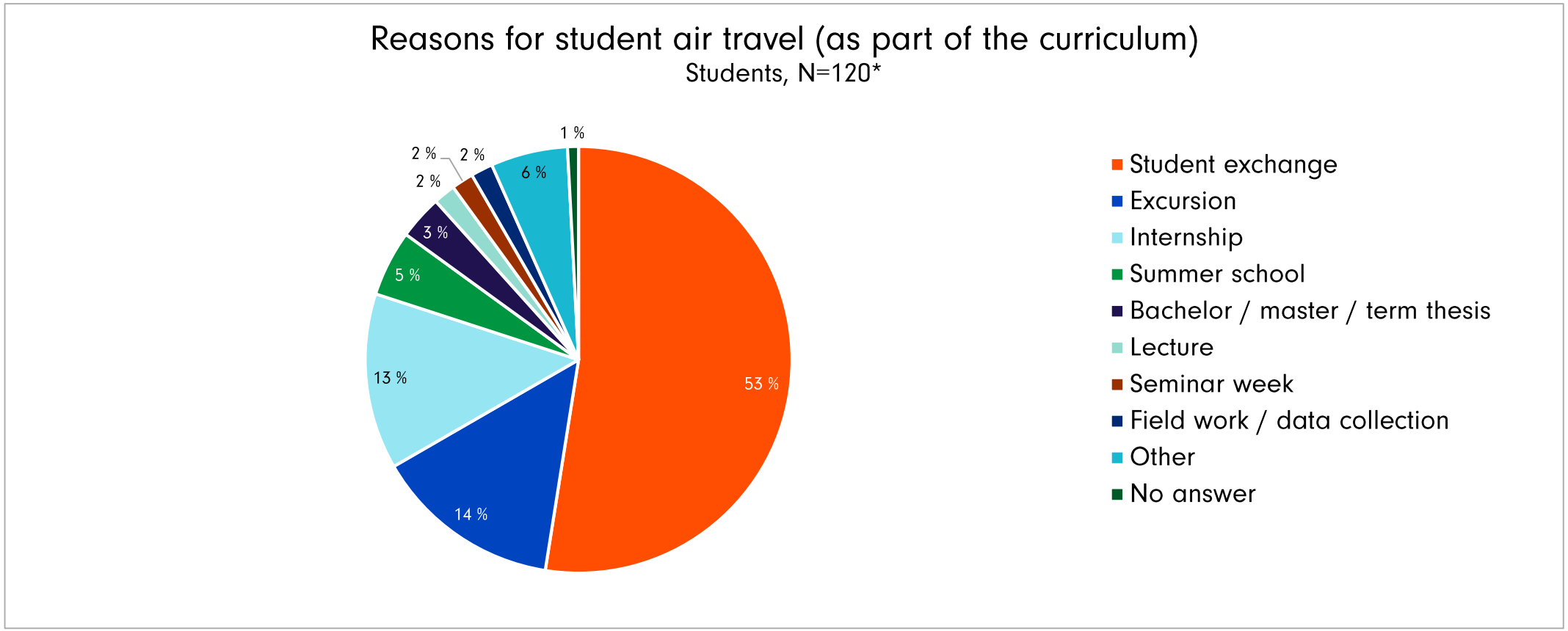


Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (8/16)

FlyingLess survey at six universities in Germany



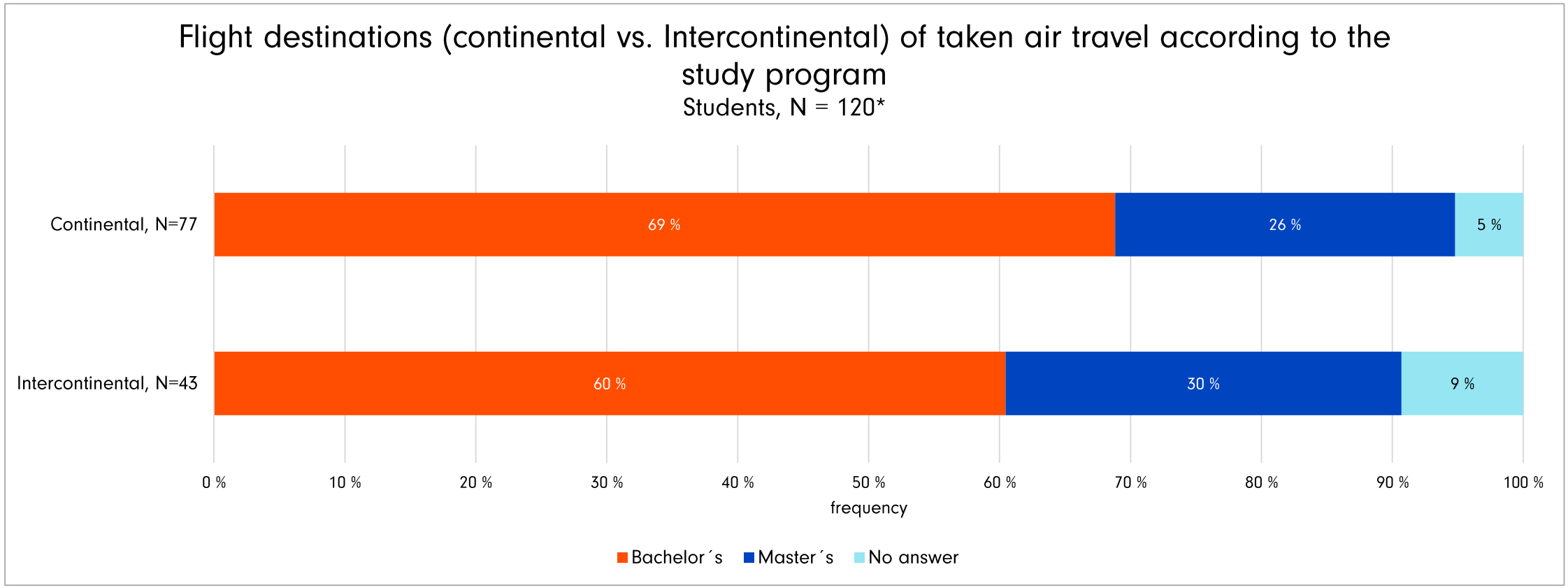
*Students who stated they took a flight during their studies were asked about their most recent flight.

Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (9/16)

FlyingLess survey at six universities in Germany



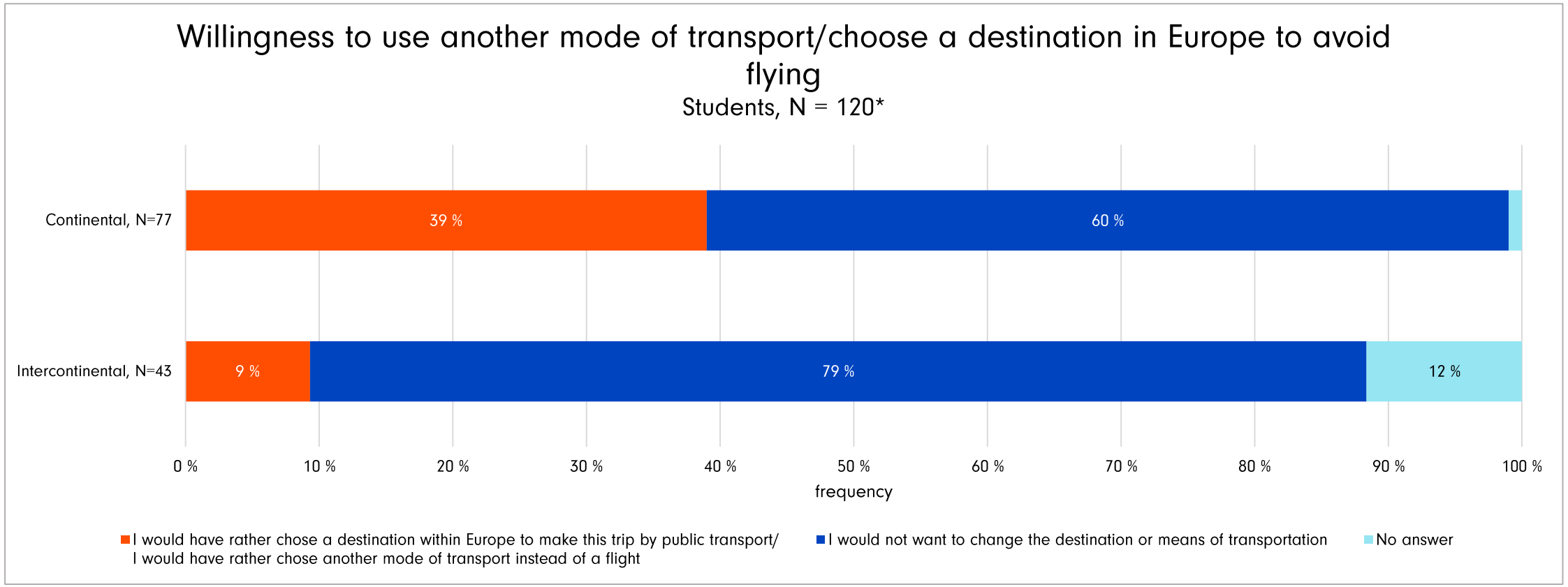
*Students who stated they took a flight during their studies were asked about their most recent flight.

Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (10/16)

FlyingLess survey at six universities in Germany



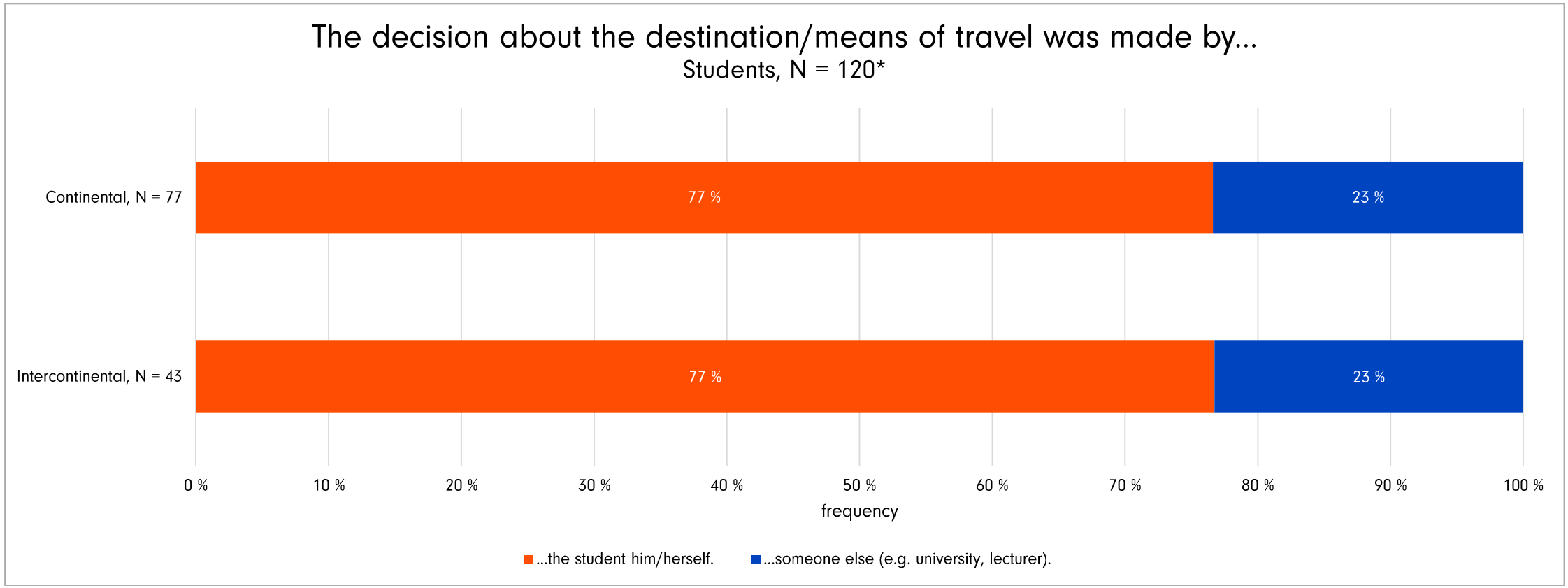
*Students who stated they took a flight during their studies were asked about their most recent flight.

Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (11/16)

FlyingLess survey at six universities in Germany



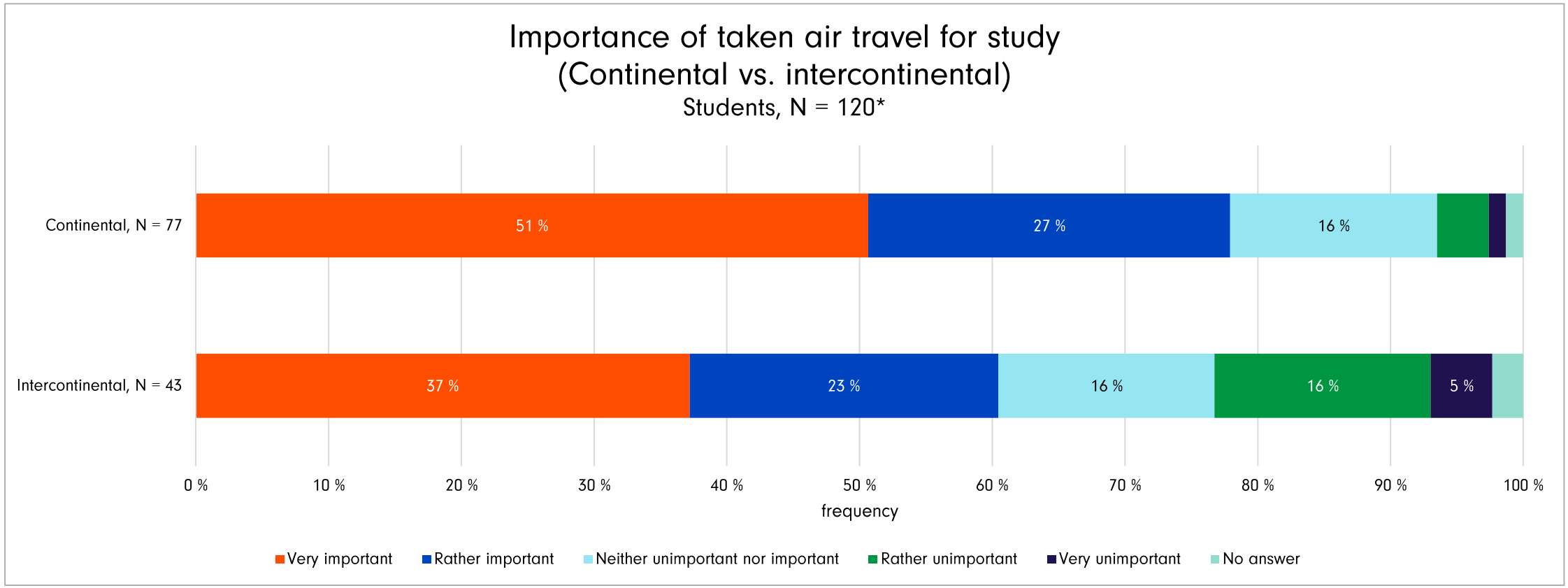
*Students who stated they took a flight during their studies were asked about their most recent flight.

Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (12/16)

FlyingLess survey at six universities in Germany



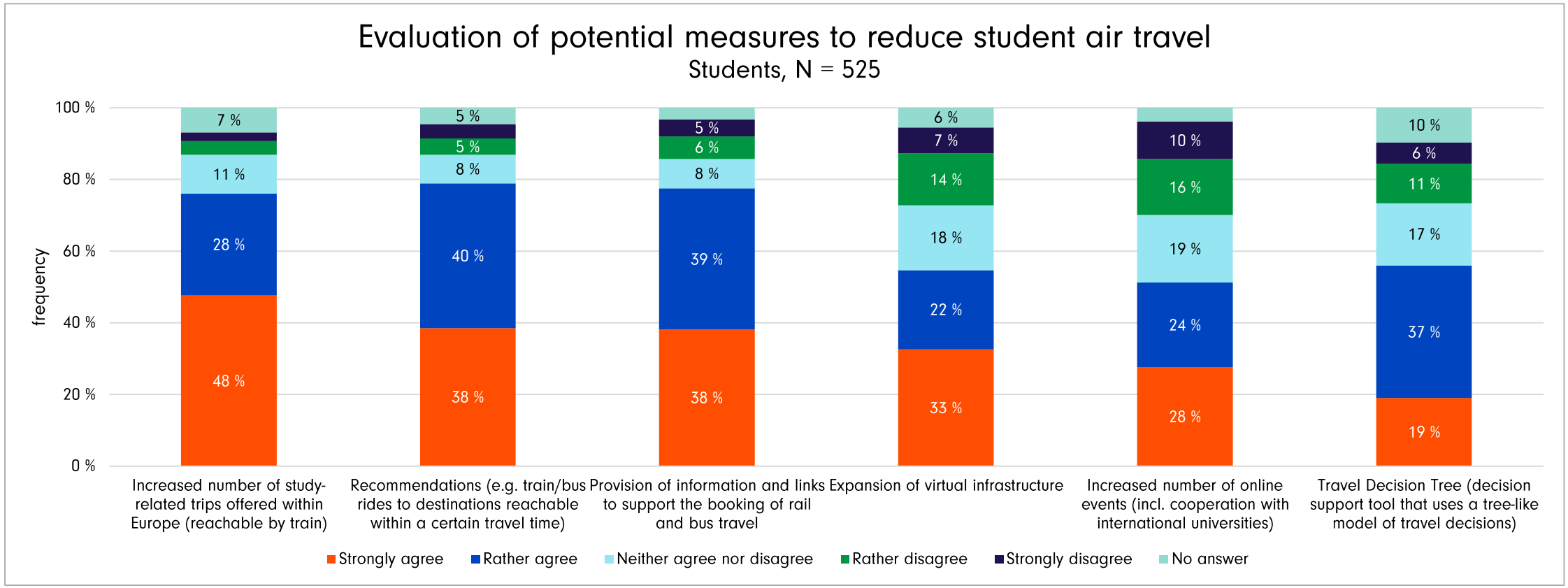
*Students who stated they took a flight during their studies were asked about their most recent flight.

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7.4 Student air travel (13/16)

FlyingLess survey at six universities in Germany

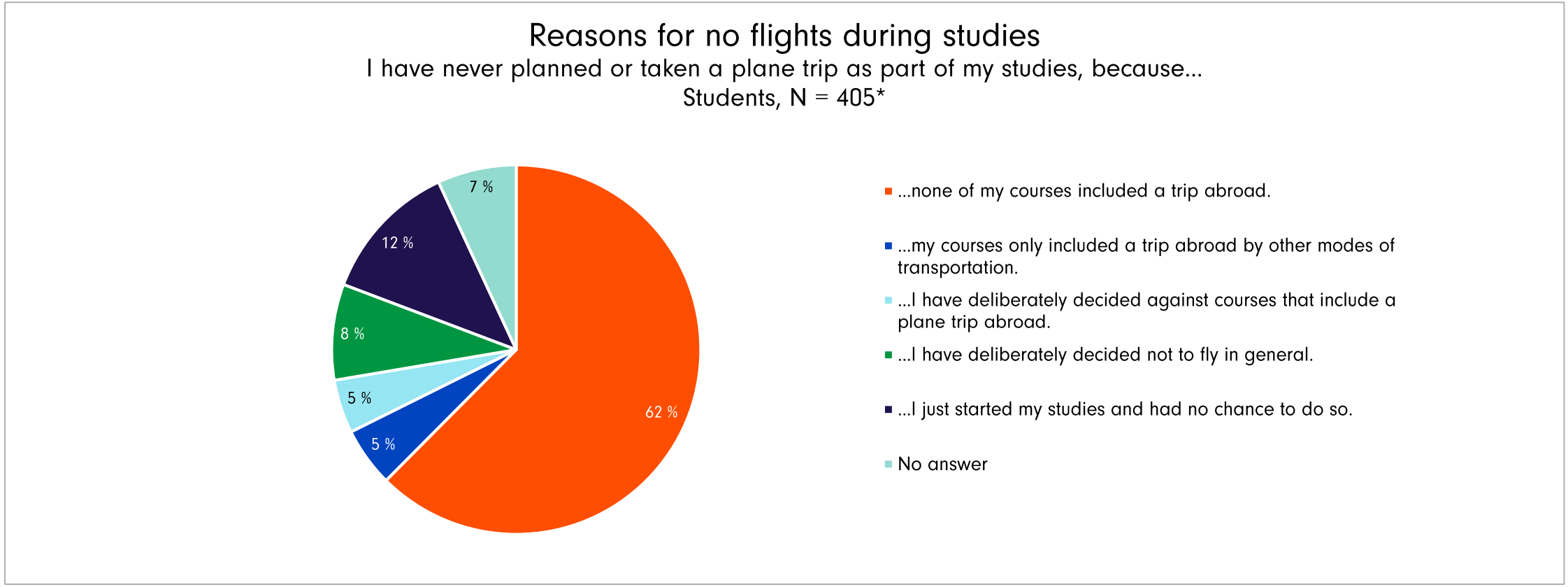


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7.4 Student air travel (14/16)

FlyingLess survey at six universities in Germany

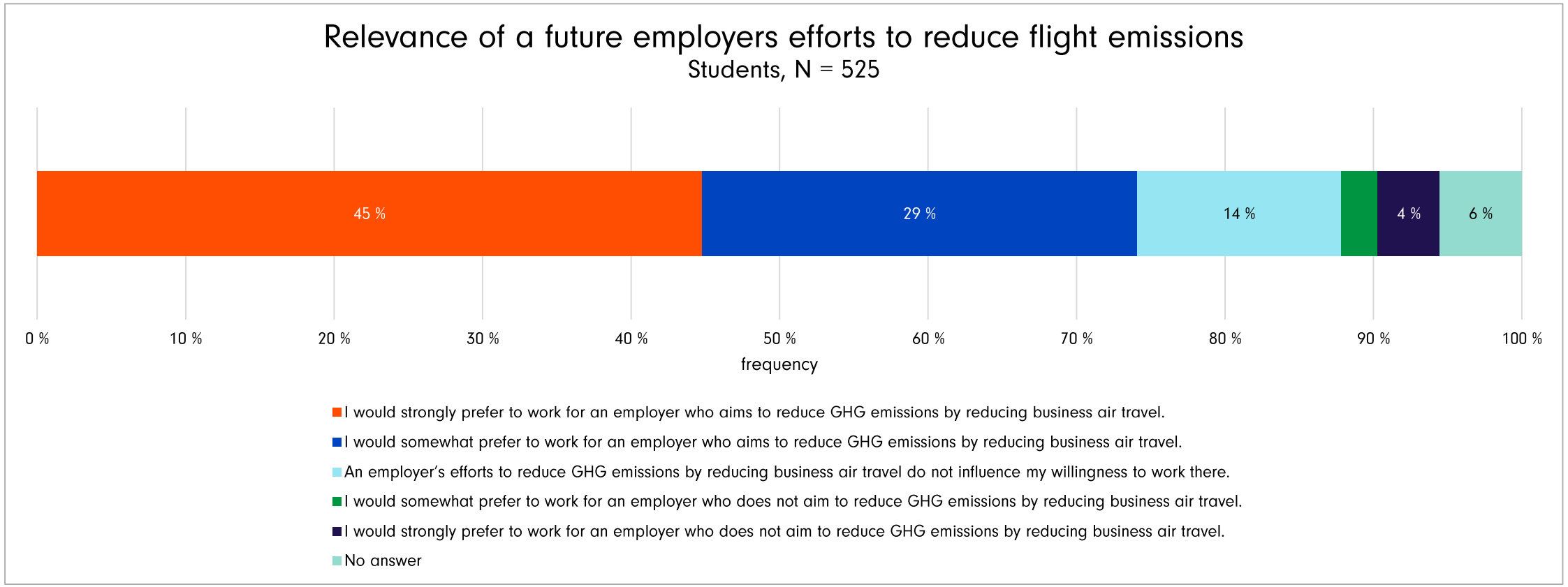


* 405 of the students surveyed stated that they had never flown as part of their studies or planned to do so. The relative frequency given refers to the sample size of 405 students.

Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

7.4 Student air travel (15/16)

FlyingLess survey at six universities in Germany

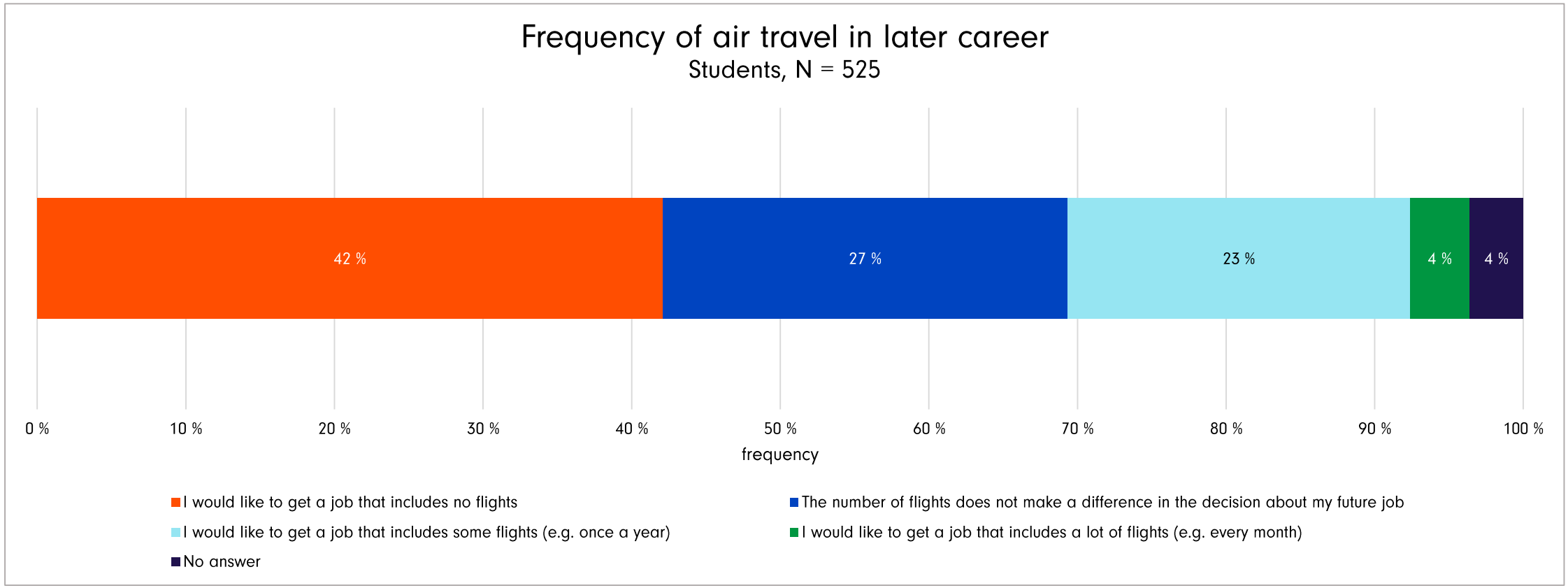


Graphic: Own illustration, FlyingLess Survey 2022: C. Merrem, ifeu.

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7.4 Student air travel (16/16)

FlyingLess survey at six universities in Germany



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8 Emotions in Business Travel (1/3)

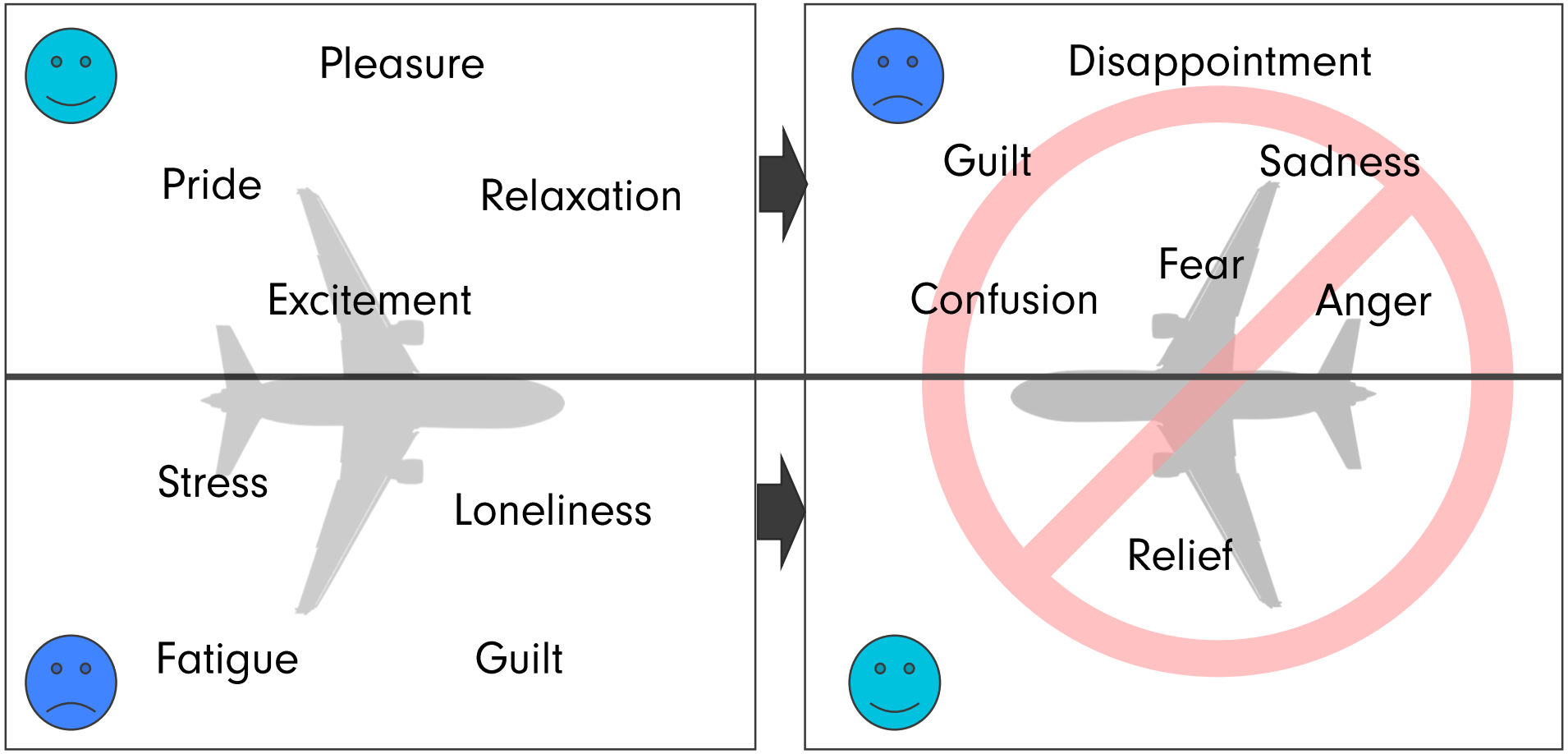


Image source: Agnes Kreil.

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8 Emotions in Business Travel (2/3)
Reactions

- Deny, downplay information that is too uncomfortable ("But the printing paper is much worse!")
- Getting angry, question your agenda, feel betrayed, snap at you ("Should we all stop breathing then?")

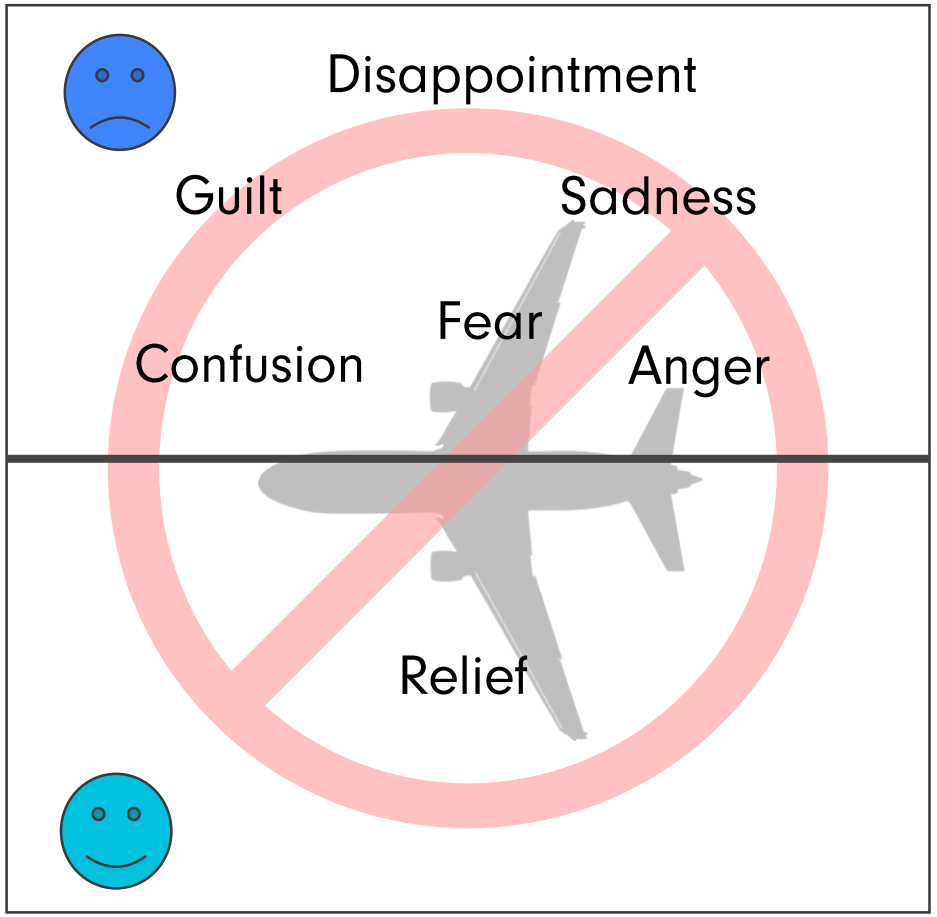


Image source: Agnes Kreil.

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8 Emotions in Business Travel (3/3)
How can emotional barriers be overcome?

- Be sensitive
- Do not expect an immediate change
- Run your campaign from a common standpoint
- Run a campaign with ambivalence
- Affirm feelings, not assumptions

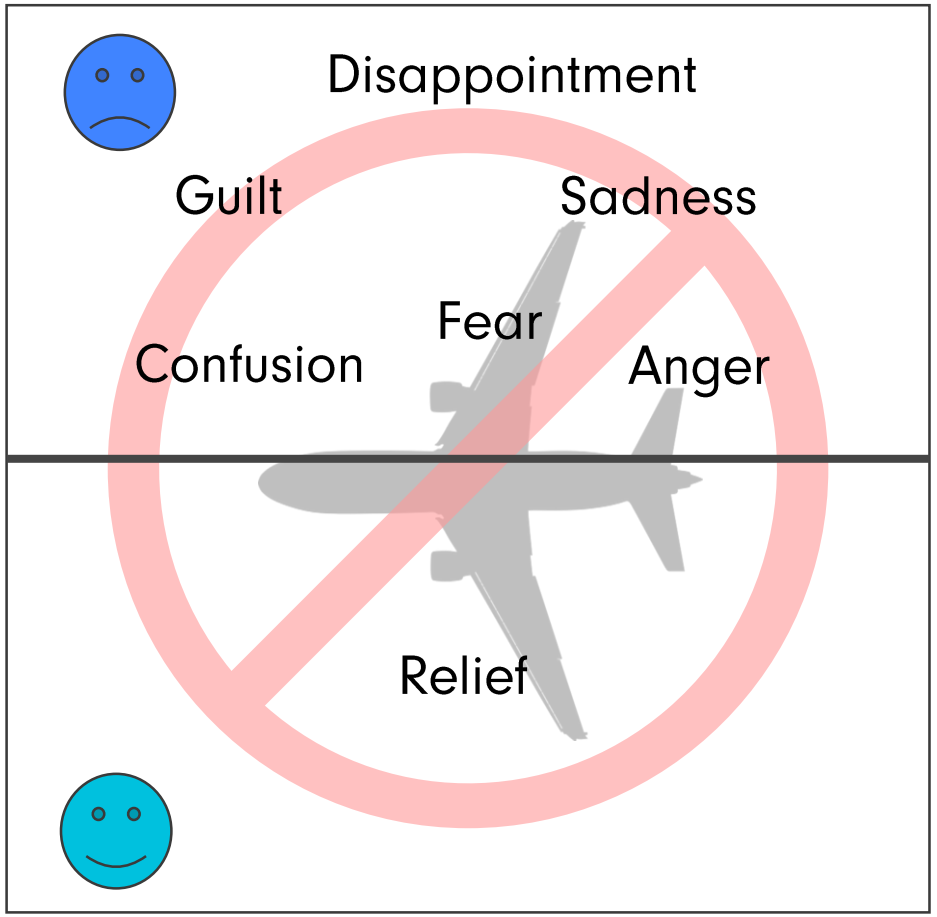


Image source: Agnes Kreil.

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9 Technological solutions

- The following slides contain a selection to present different aspects and views on technological solutions and do not necessarily represent the opinion of FlyingLess.
- To reflect the range, both academic publications, blogs and information from website like Stay grounded are listed.
- The following article also provides a brief overview of technologies: Zero CO_2 emissions aviation, Peeters, P., Lyle, C. & Goodwin, H; 2021

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9.1 Technological solutions (links and conclusion)
Synthetic fuels/Sustainable Aviation Fuels (SAFs)

Links

- Drop-in fuels from sunlight and air
- Nature Power-to-liquid via synthesis of methanol, DME or Fischer-Tropsch-fuels: a review - Energy & Environmental Science (RSC Publishing) DOI:10.1039/D0EE01187H
- https://www.rolandberger.com/en/Insights/Publications/Sustainable-aviation-fuels-Key-solution-to-achieving-net-zero.html
- https://stay-grounded.org/wp-content/uploads/2021/08/SG_factsheet_8-21_Biofuels_print_Lay02.pdf
- https://www.pik-potsdam.de/de/aktuelles/nachrichten/e-fuels-wahrscheinlich-noch-lange-knapp-pik-analyse-papier

Conclusion

- **Advantage:**
  Infrastructure is available, flight is **CO_2**-neutral
- **Disadvantage:**
  (still too) expensive, supply cannot (yet) meet demand, high (renewable!) energy demand, non-**CO_2** effects still present (even if less than conventional paraffin)

Source: Links and conclusion by Curdin Spirig, ZHAW
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9.2 Technological solutions (links and conclusion)
Batteries

Links

- Technological, economic and environmental prospects of all-electric aircraft | Nature Energy
- Performance Metrics Required of Next-Generation Batteries to Electrify Commercial Aircraft | ACS Energy Letters
- https://theicct.org/aviation-global-expecting-electric-jul22
- https://stay-grounded.org/wp-content/uploads/2021/08/SG_factsheet_8-21_Electricity_print_FIN_korr.pdf

Conclusion

- **Advantage:**
  High efficiency, flight is climate neutral
- **Disadvantage:**
  Energy density (still too) low at most short-haul flights, high (renewable!) energy demand, lack of infrastructure

Source: Links and conclusion by Curdin Spirig, ZHAW

9.3 Technological solutions (links and conclusion)
Hydrogen

Links

- Hydrogen powered aircraft : The future of air transport - ScienceDirect
- Hydrogen-powered aviation and its reliance on green hydrogen infrastructure - Review and research gaps - ScienceDirect
- https://stay-grounded.org/wp-content/uploads/2021/08/SG_factsheet_8-21_Hydrogen_FIN_Korr.pdf
- https://www.airbus.com/en/newsroom/press-releases/2020-09-airbus-reveals-new-zero-emission-concept-aircraft; https://www.reuters.com/business/aerospace-defense/airbus-tells-eu-hydrogen-wont-be-widely-used-planes-before-2050-2021-06-10/

Conclusion

- **Advantage:**
  Flight is **CO_2** neutral
- **Disadvantage:**
  Energy density per kg is high (approx. 3 times higher than paraffin), but per volume 4 times smaller than paraffin and that with liquid H_2 (from -252.9°C), non-CO_2 effects still exist to a small extent, lack of infrastructure.

Source: Links and conclusion by Curdin Spirig, ZHAW
Dr. Susann Görlinger
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9.4 Technological solutions (links and conclusion)
Carbon Capture and Storage

Links

- Carbon capture and storage (CCS): the way forward - Energy & Environmental Science (RSC Publishing) DOI:10.1039/C7EE02342A
- The technological and economic prospects for CO2 utilization and removal | Nature
- https://www.greenpeace.org/international/story/54079/great-carbon-capture-scam/

Conclusion

- Despite the broad consensus that CCS is central to achieving climate goals and its technical maturity, it has not yet been deployed on a scale commensurate with the ambitions formulated ten years ago.
- The potential for CCS is in the gigatonnes range, but the barriers to implementation remain significant.

Source: Links and conclusion by Curdin Spirig, ZHAW
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9.5 Technological solutions (links and conclusion)
Direct Air Capture and Storage (DAC+S)

Links

- Direct air capture: process technology, techno-economic and socio-political challenges - Energy & Environmental Science (RSC Publishing) DOI:10.1039/D1EE03523A
- A review of direct air capture (DAC): scaling up commercial technologies and innovating for the future - IOPscience
- Climate policy for a net-zero future: ten recommendations for Direct Air Capture - IOPscience

Conclusion

- In recent years, DAC+S has undergone considerable technical development, so that commercial companies are now also active on the market and there is the prospect of a significant expansion of CO_2 capture.
- However, the framework conditions still need to be significantly improved so that these technologies can be applied on a large scale worldwide

Source: Links and conclusion by Curdin Spirig, ZHAW
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9.6 Technological solutions (links and conclusion)
Compensation

Links

https://www.researchsquare.com/article/rs-3149652/v1

https://www.spektrum.de/news/waldschutz-zertifikate-die-grosse-kompensationsluege/2173485?utm_source=pocket-newtab-de-de

CO2-Kompensation (admin.ch)

Freiwillige CO2-Kompensation durch Klimaschutzprojekte | Umweltbundesamt*

The inconvenient truth of carbon offsets | Nature

https://de.stay-grounded.org/emissions-offsetting-a-modern-sale-of-indulgences/

Conclusion

Better than no compensation, though:

- Effects are overrated
- Partly multiple compensation (certificates are sold several times)*
- Side effects lead to more emissions*
- „Greenwashing“
- If certificates are used, they should comply with the gold standard

Source: Links and conclusion by Curdin Spirig, ZHAW

9.7 Technological solutions
Virtual tools (1/5)

Links

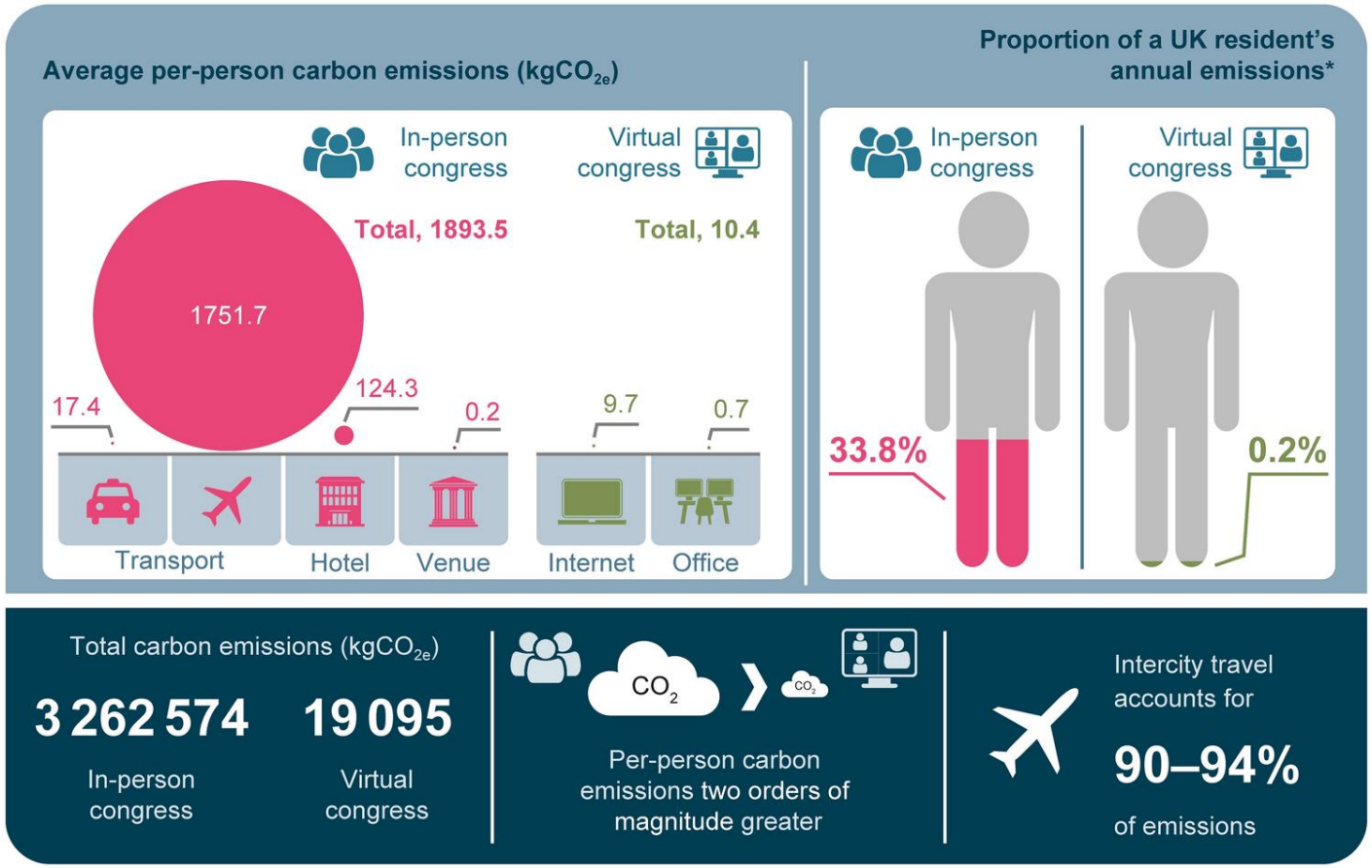
- https://thefutureofmeetings.wordpress.com/
- Online matchmaking Minglr: https://doi.org/10.1145/3411764.3445776
- For more inclusivity, diversity and equality
  Source: https://doi.org/10.1038/s41893-021-00823-2
- Virtual conferences can contribute to a 94% reduction in carbon footprint and a 90% reduction in energy use
  Source: https://doi.org/10.1038/s41467-021-27251-2

Conclusion

Virtual tools are essential for reducing emissions from long-haul flights. These can already be used, but need to be expanded and improved.

Source: Ariane Wenger, ETHZ

9.7 Technological solutions
Virtual tools (2/5)

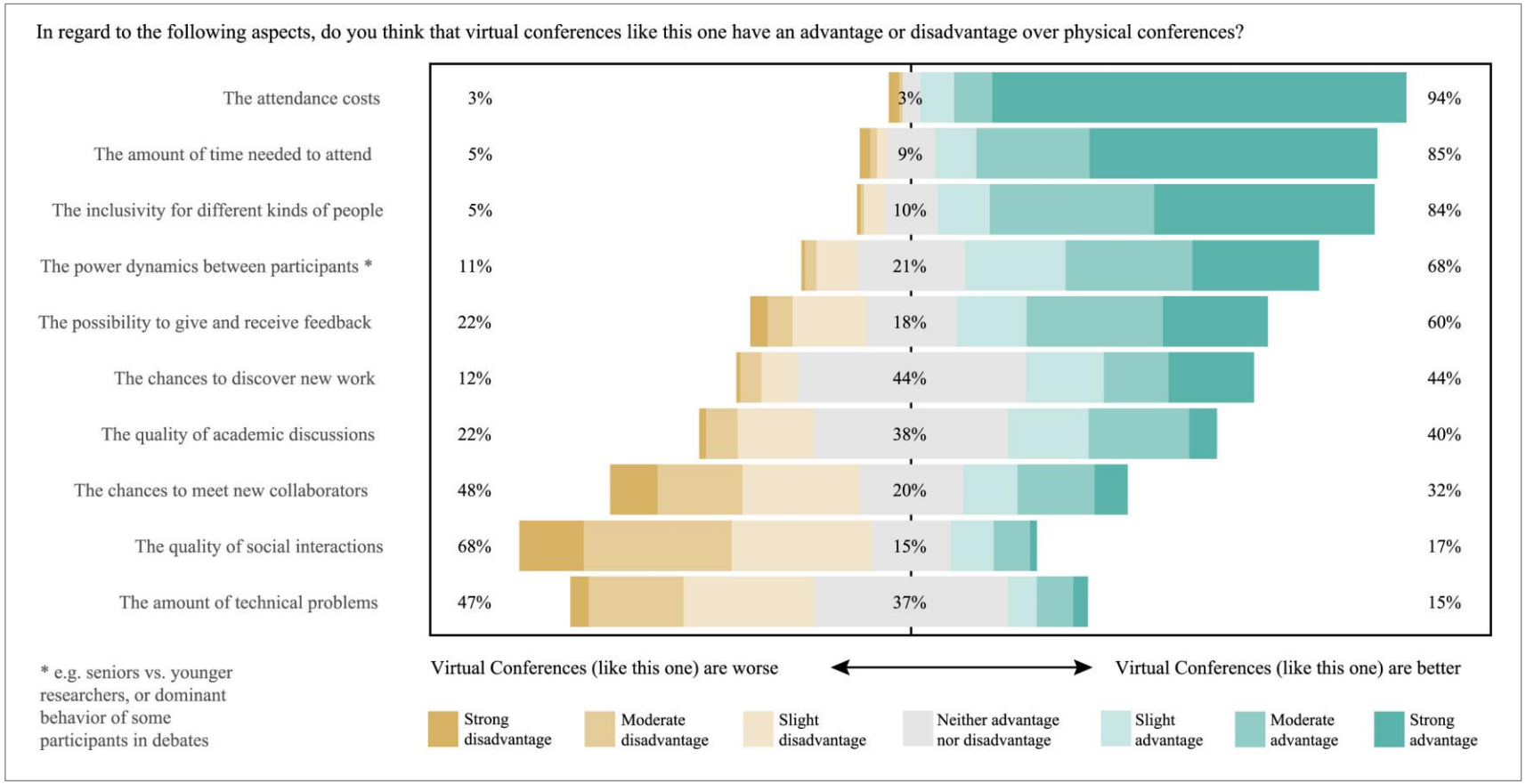


Comparison of in person and virtual congresses (average of four congresses).

Source: https://doi.org/10.1007/s40290-022-00421-3

Image source: William T. Gattrell, Aurélie Barraux, Sam Comley, Michael Whaley, Nicholas Lander «The Carbon Costs of In-Person Versus Virtual Medical Conferences for the Pharmaceutical Industry: Lessons from the Coronavirus Pandemic» (2022). License: CC BY-NC 4.0. https://doi.org/10.1007/s40290-022-00421-3

9.7 Technological solutions
Virtual tools (3/5)



Benefits and challenges of virtual conferences...

Source: https://doi.org/10.1016/j.jclepro.2021.126287

Image source: Joël Foramitti, Stefan Drews, Franziska Klein, Théo Konc. «The virtues of virtual conferences» (2021). License: CC BY 4.0. https://doi.org/10.1016/j.jclepro.2021.126287

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9.7 Technological solutions
Virtual tools (4/5)

	In-person conferences		Virtual conferences	
	M	SD	M	SD
Best attended conferences	8.13	1.71	6.46	2.15
Average attended conferences	6.88	1.39	5.42	1.85
Worst attended conferences	4.35	2.02	3.10	1.94

Variables were measured on a scale from 1 (extremely useless) to 10 (extremely useful).

Usefulness of best, worst and average in-person and virtual conferences participants had attended. Results from a survey among early career researchers in environmental psychology.

Source: https://doi.org/10.3389/fpsyg.2022.906108

Image source: Jan K. Köhler et al. «The Need for Sustainability, Equity, and International Exchange: Perspectives of Early Career Environmental Psychologists on the Future of Conferences» (2022).
License: CC BY 4.0, https://doi.org/10.3389/fpsyg.2022.906108

9.7 Technological solutions
Virtual tools (5/5)

- What is the goal of the meeting? How can I achieve it? With which formats and tools?
- Where is it possible and useful to use virtual tools? Where do face-to-face meetings (still) need to be held?
- How can very good virtual tools be further developed and expanded to cover different purposes (meetings, conferences, informal interactions, field work, etc.)?
- How does one interact differently virtually (compared to presence), what adjustments are needed in virtual interaction?
- More experience needed with different hybrid formats. What is the best way to connect online and physically present?
- How do you encourage testing and experimenting with mixed / augmented / virtual reality?
- What is the significance of social media networking (Twitter, LinkedIn, etc.)?
- How do you develop and test new formats for scientific exchange?

Source: Ariane Wenger, ETHZ

10. Conclusion

- We need a **transformation** - this needs creativity and innovation
- Different **framework conditions** are needed
- Change triggers **emotional** reactions, takes some **getting used to** and needs **time**

We need to rethink our scientific system and exchange, conferences, teaching, evaluation criteria and the role of policy and funders.

A change in values and culture is needed.

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About FlyingLess

The aim of the FlyingLess project is to support universities and research organisations in reducing air travel, which causes a significant part of their total greenhouse gas emissions.

FlyingLess develops approaches to reduce air travel in the academic sector, which are implemented at different levels (research, teaching and administration).

The project is being carried out in close cooperation with four pilot institutions - EMBL (European Molecular Biology Laboratory) and MPI Astronomy in Heidelberg as non-university research institutions and the Universities of Konstanz and Potsdam as universities.

Further information can be found on the website www.flyingless.de.

The project is being led by ifeu Heidelberg in close cooperation with the TdLab Geography at the Institute of Geography at Heidelberg University.

The project is funded over 3 years as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Protection.

Contact

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Module 3
Backgrounds & Arguments
"What backgrounds should I know?"

Module 3.2
Travel reasons

Why do scientists fly and what are possible alternatives?

22 slides – version September 2023

Dr. Susann Görlinger, Project Manager FlyingLess, ifeu Institute

ifeu INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

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Toolbox content

1

Module 1 Introduction: "Why a Toolbox?"

2

Module 2 Checklist: "Where do we stand?"

3

Module 3 Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4

Module 4 Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5

Module 5 Measures: "What measures can I implement?"

6

Module 6 Next steps: "Where do we go from here?"

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Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

Module 4
Methods & Tools
"What tools are available to me?"



- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
- 3.4 **Success factors & Stumbling blocks**
- 3.5 **Sufficiency**

- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

How to use the toolbox?

The **FlyingLess Toolbox** is a modular collection of content and methods on the topic of reducing air travel.

Depending on the occasion or need, suitable modules or individual modules or individual slides can be selected and used.
The order of the modules is only a recommendation.

Depending on your level of knowledge and interest, you can start with different modules.

The FlyingLess logo and the link to the website (www.flyingless.de) should remain on the slides.

On some slides, questions that can be discussed in the institution are listed in green.

The Toolbox can be used under the terms of the CC-BY 4.0 license. Each module has its own copyright notice and constitutes a separate work under the CC-BY 4.0.

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Module 3.2: Travel Reasons

What do I find in this module?

- The module lists reasons for travel, shows the purpose, costs and benefits of travel, compares in-person vs. virtual conferences and provides food for thought on alternatives

What can I use the module for?

- The module helps to shed more light on the topic of reasons for travelling with information and questions

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What are travel reasons?

- Conference / workshop
- Colloquia / seminar lecture
- Project meeting
- Fieldwork
- Examinations (e.g. PhD examinations)
- Commissions / advisory boards
- Student excursion
- Summer / winter school
- Other

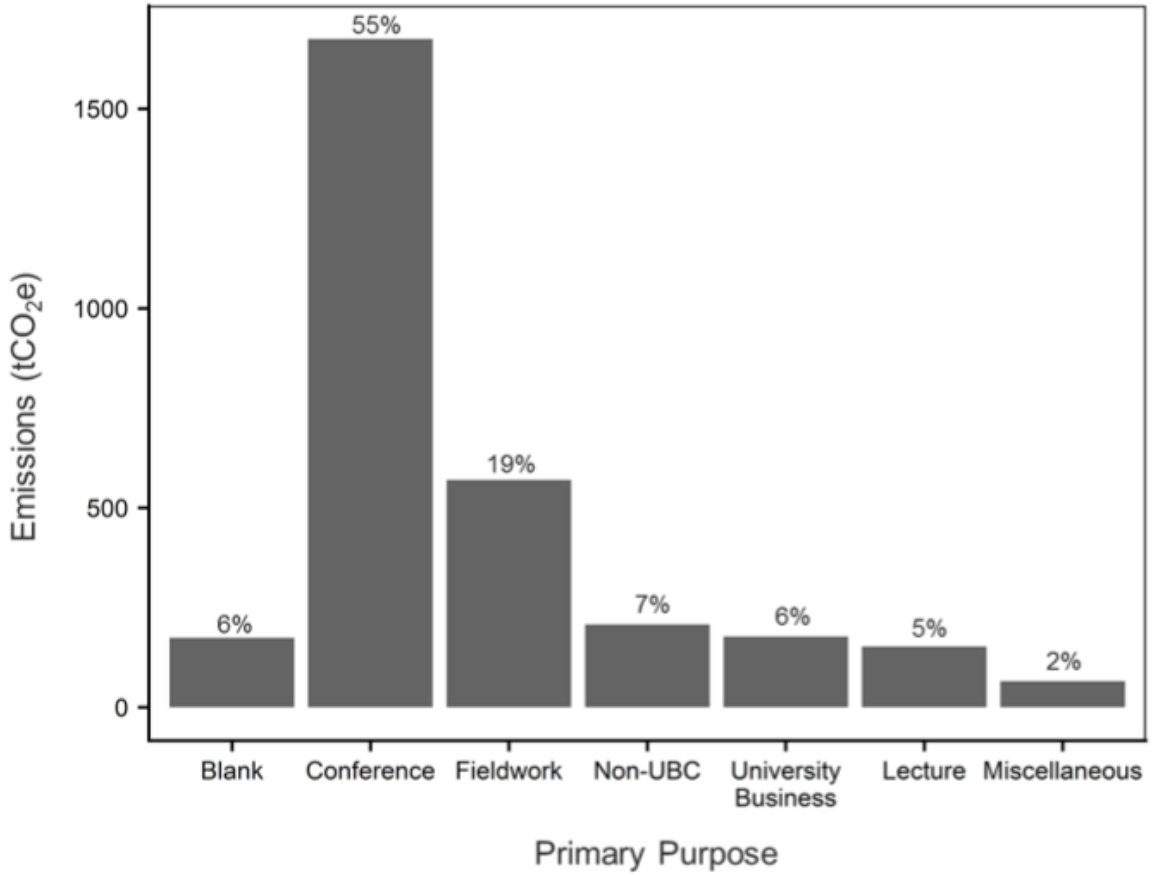
What are our most important travel reasons?

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What are travel reasons?

University of British Columbia*, reasons for travel and length of stay



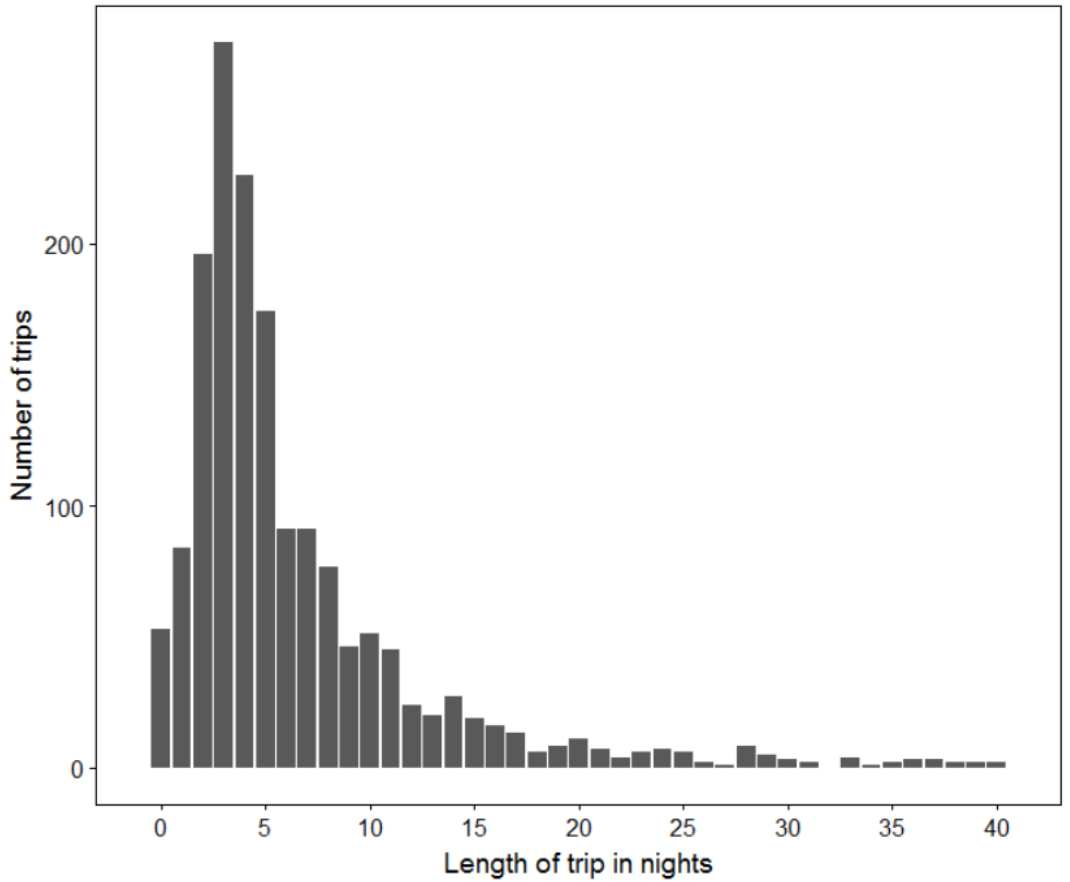
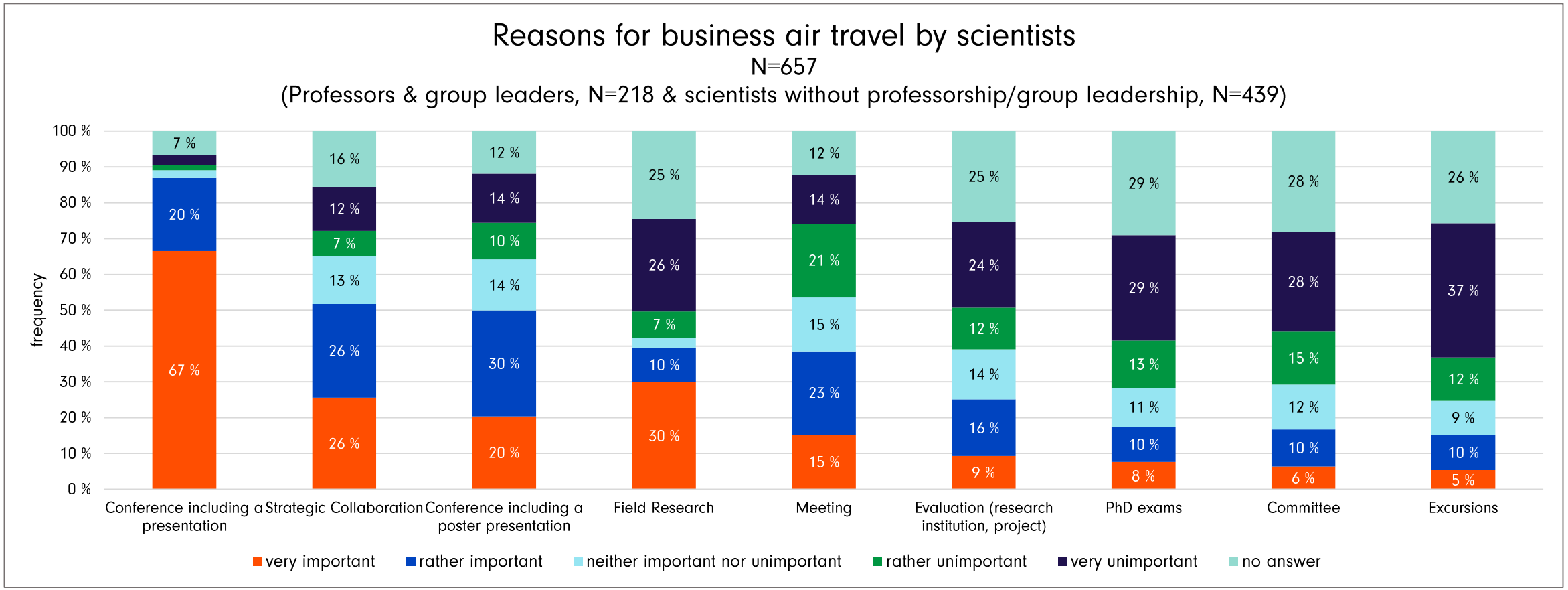


Image source: Wynes, S.; Donner, S., D. (2018): Addressing Greenhouse Gas Emissions from Business-Related Air Travel at Public Institutions: A Case Study of the University of British Columbia. Pacific Institute for Climate Solutions. https://pics.uvic.ca/sites/default/files/AirTravelWP_FINAL.pdf

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What are travel reasons?

Surveys FlyingLess at eight different academic institutions

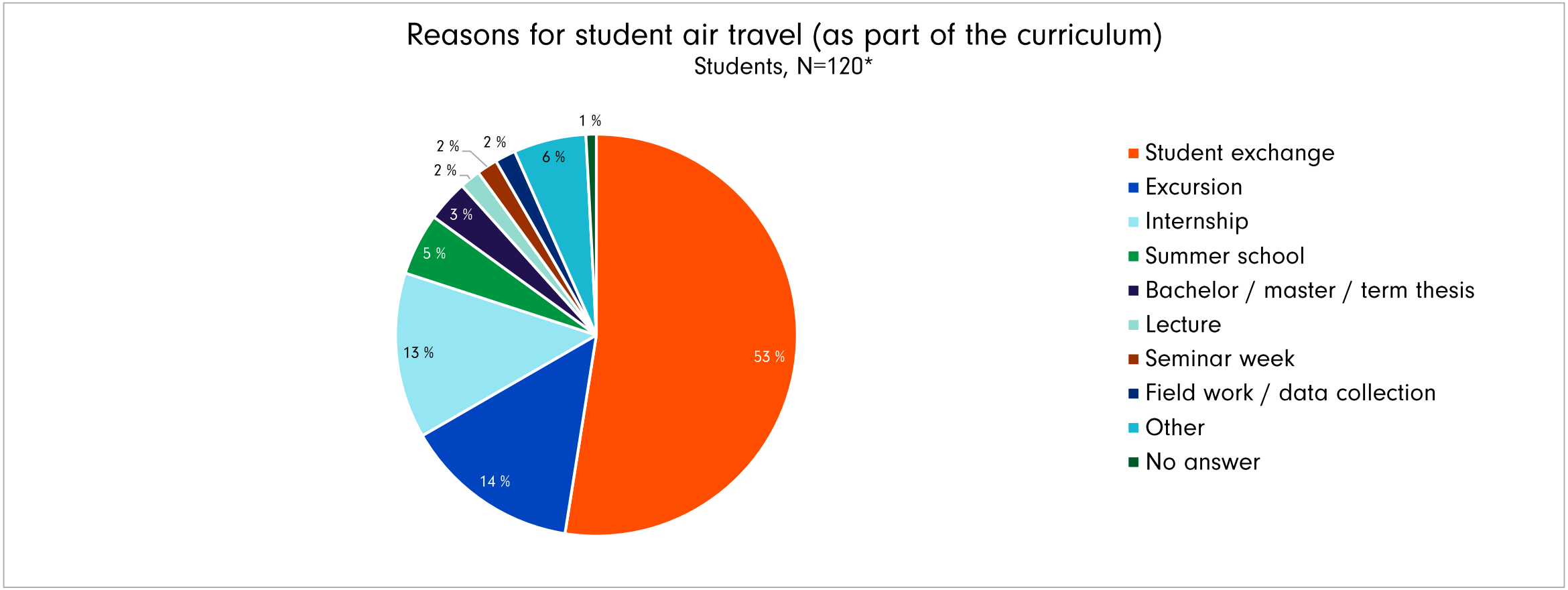


Graphic: Own illustration, FlyingLess survey 2022: C. Merrem, ifeu.

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What are travel reasons?

Surveys FlyingLess at six different universities



*Students who stated they took a flight during their studies were asked about their most recent flight.

Graphic: Own illustration, FlyingLess survey 2022: C. Merrem, ifeu.

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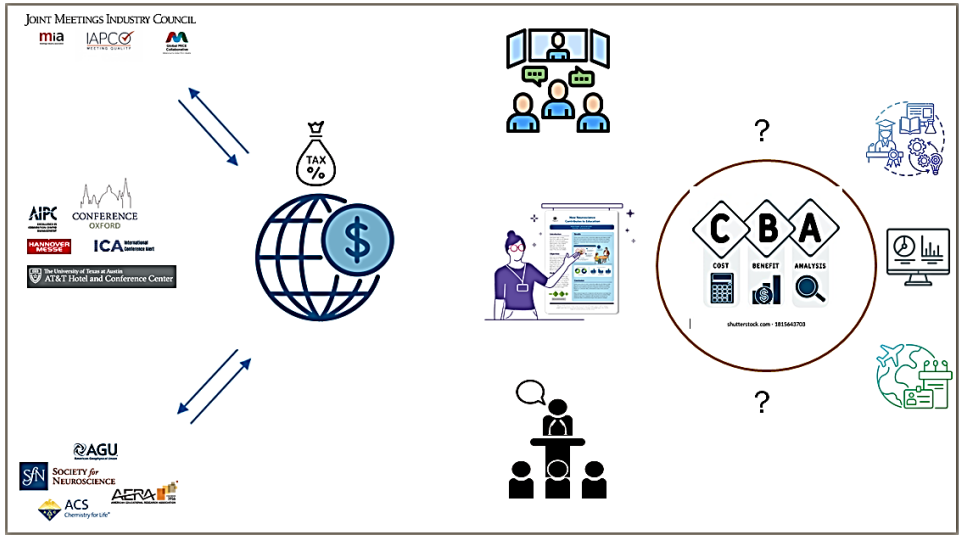
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Conferences as a global business

- As a global business, conferences attract enormous resources from conference organizers, scientific organizations and public and private institutions.
- Conferences are part of the overall meetings industry, which is one of the biggest taxpayers in the world

2017-2030

$805 billion	in 2017
$916 billion	in 2019
$1,439 billion	in 2025 (projected)
$1,780 billion	in 2030 (projected)



Academic, scientific and professional conference sector

28,077 web-present Higher Education Institutions	37,500 scientific associations & learned societies (active)	• Local • Regional • National • International	7.8 million global multi-disciplinary researchers @ 1,300 disciplines	∞ immeasurable professions, organisers & funders

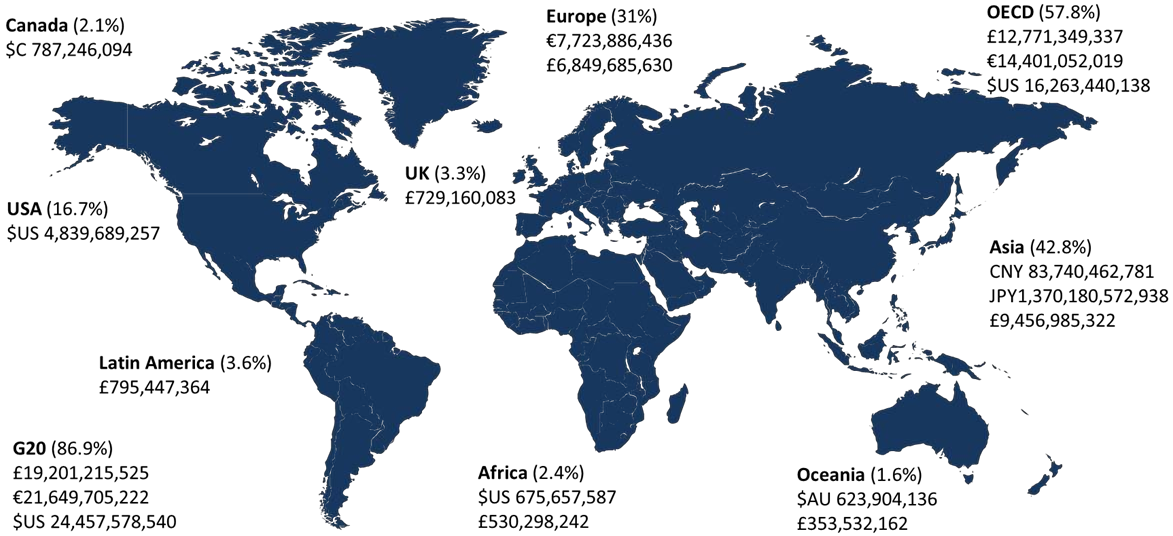
Graphic: Nicholas Rowe, Finnland poster.researcher@outlook.com
Rowe, N. (2017). Academic and Scientific Poster Presentation - A Modern Comprehensive Guide. Springer Nature.

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Expenditure for conferences

- Using conservative estimates we spend over € 25 billion on conferences every year, and conference presentations exceed the most current estimates of that journal articles by 110 %.
- But the conversion rates of conference abstracts to full published papers is only 37 % and for posters less than 1 %.
- Interesting facts: The first conference proceedings was published in 1644, 21 years before the first journal appeared.
- "Lost" or unpublished conference research costs in the region of € 4.6 billion per year.

Extrapolated annual cost expenditures of conference delegates by global researcher share (UNESCO 2015)



Global cost: £GB 22,095,760,098 ($US 28,981,516,689 / € 25,133,119,350)

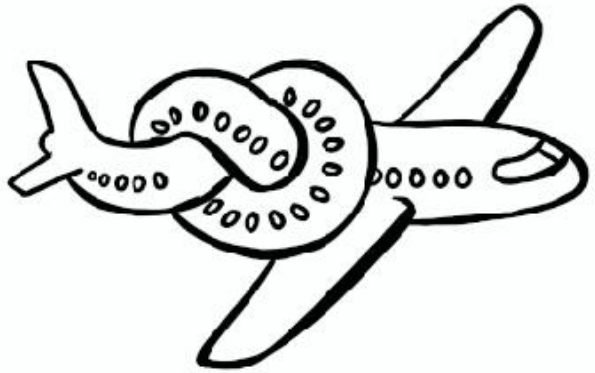
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Graphic: Nicholas Rowe, Finnland poster.researcher@outlook.com
Rowe, N. (2019) 'The Economic Cost of Attending Educational Conferences'. International Journal on Social and Education Sciences, 1(1), pp30-42. doi:10.6084/m9.figshare.8718569.

What we do not know about conferences

Despite the investments ...

1. Conferences are not really defined as a sector of scientific communication or learning.
2. Conferences are not monitored or clearly reported (events, participation, etc.).
3. Their funding is obscure and unaccounted (costs, sources).
4. Conferences are not clearly researched in terms of mechanisms, outcomes, etc., although their efficacy can be questioned.



But we continue to invest in conferences without measuring our commitments and the return on our investment

... and we continue to travel at significant cost to the environment.

Attending an physical international conference raises the individual carbon footprint by more than 6.7 times the normal EU daily level of production.

Graphic: © Lucia Fabiani.

Rowe, N. (2019). 'Poster, poster, on the wall; were you even there?' - a mixed-methods research on the effectiveness and perception of conference poster presentations [Doctoral dissertation]. Acta Electronica Universitatis Lapponiensis # 254, University of Lapland, Finland. doi:10.13140/RG.2.2.36568.96003

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What do you want to achieve with the trip?

- Conference/ workshop: networking, presentation of own research results, external input/ feedback, getting to know new colleagues, career planning, scientific exchange, shows public character of research, one represents one's own research personally, comparison with others, where do I stand?
- Colloquia/ seminar lecture: presentation of own research results, reputation
- Project meetings: cooperation, joint development of ideas
- Fieldwork: data collection
- Examinations (e.g. PhD examinations): quality assurance, reputation
- Commissions / advisory boards: advice, control, quality assurance, reputation
- Student excursion: education
- Summer / winter school: training, network

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What are the benefits and costs of flying? (tangible & intangible)

Benefit

- Presentation of results
- Exchange/ discussion
- Data from distant regions
- Enhancement of reputation (own person, institution, scientific field)
- Networking
- New projects, cooperations
- Job enrichment
- Cultural exchange
- Increased career opportunities
- Fulfilment of expectations (own, institution, science system)
- Costs compared to the train

Costs

- Financial costs
- Time
- Absence for teaching/ research
- Personal costs (family, health, overtime)
- GHG emissions
- Great inequality in who can travel (finances, time, etc.)

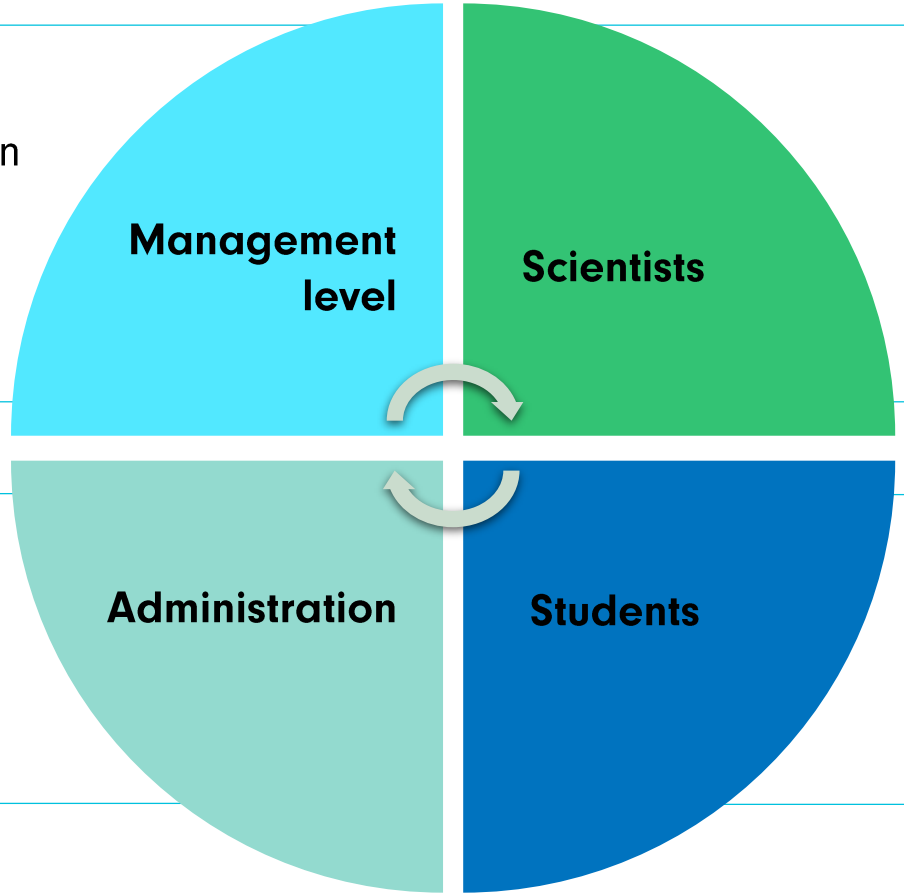
What's at stake if you don't fly?

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Different groups travel for different reasons

→ Differentiated consideration necessary to identify alternatives

- Representation of the institution
- Committees
- Strategic cooperation



- Conferences, committees, meetings
- Field research - excursions
- Strategic cooperation
- PhD exams
- Reviews (Research unit, project)

- Administrative support of international projects
- Committees
- Strategic cooperation

- Excursions
- Field research
- Internships

Graphic: Own illustration, ifeu.

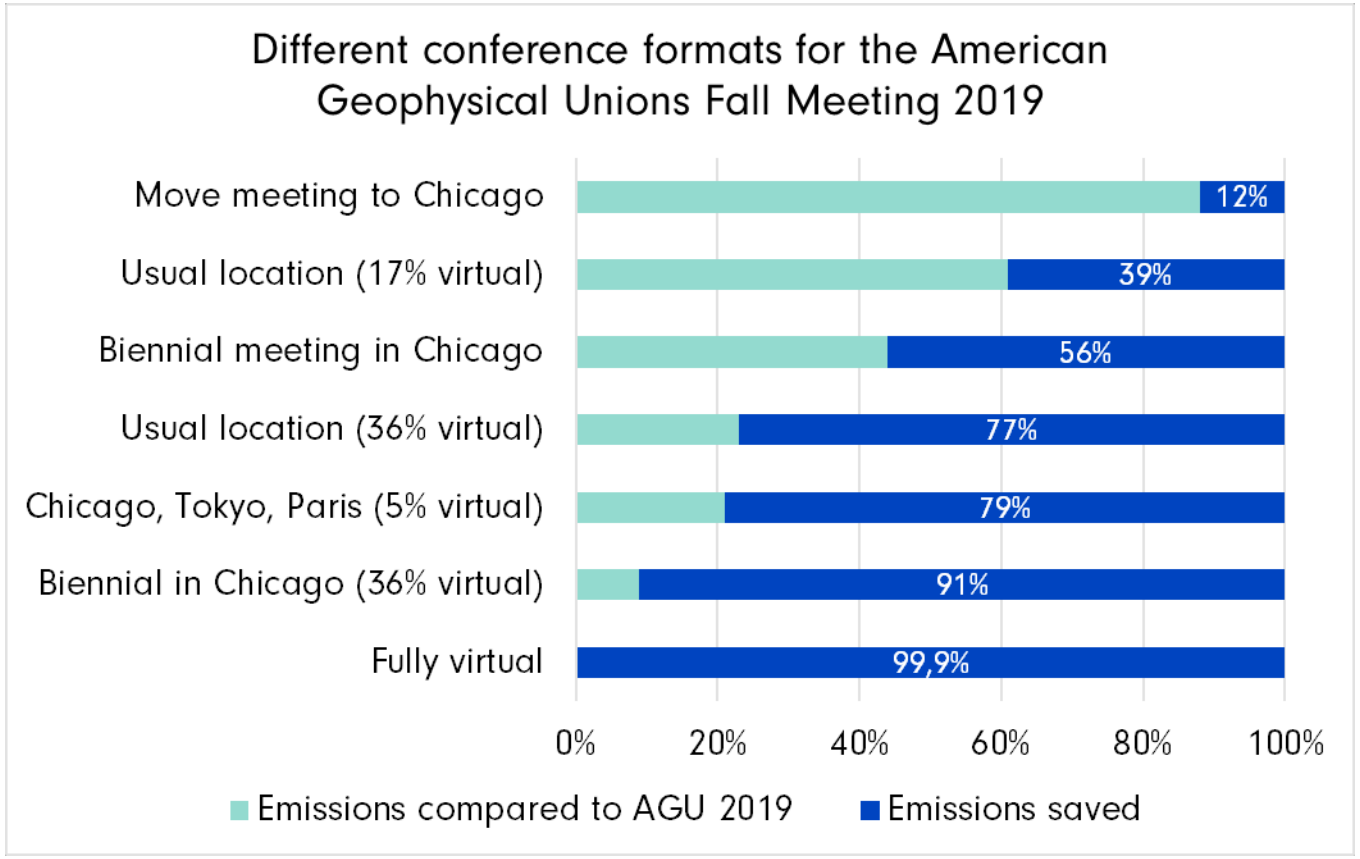
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Conferences are one of the most common reasons for travel and cause high emissions

What are possible alternatives?

- 28,000 participants, 80,000 t CO2 equivalent
- 75 % from flights over 8,000 km
- 20 % (> 2 months) of the annual emissions of the city of Constance

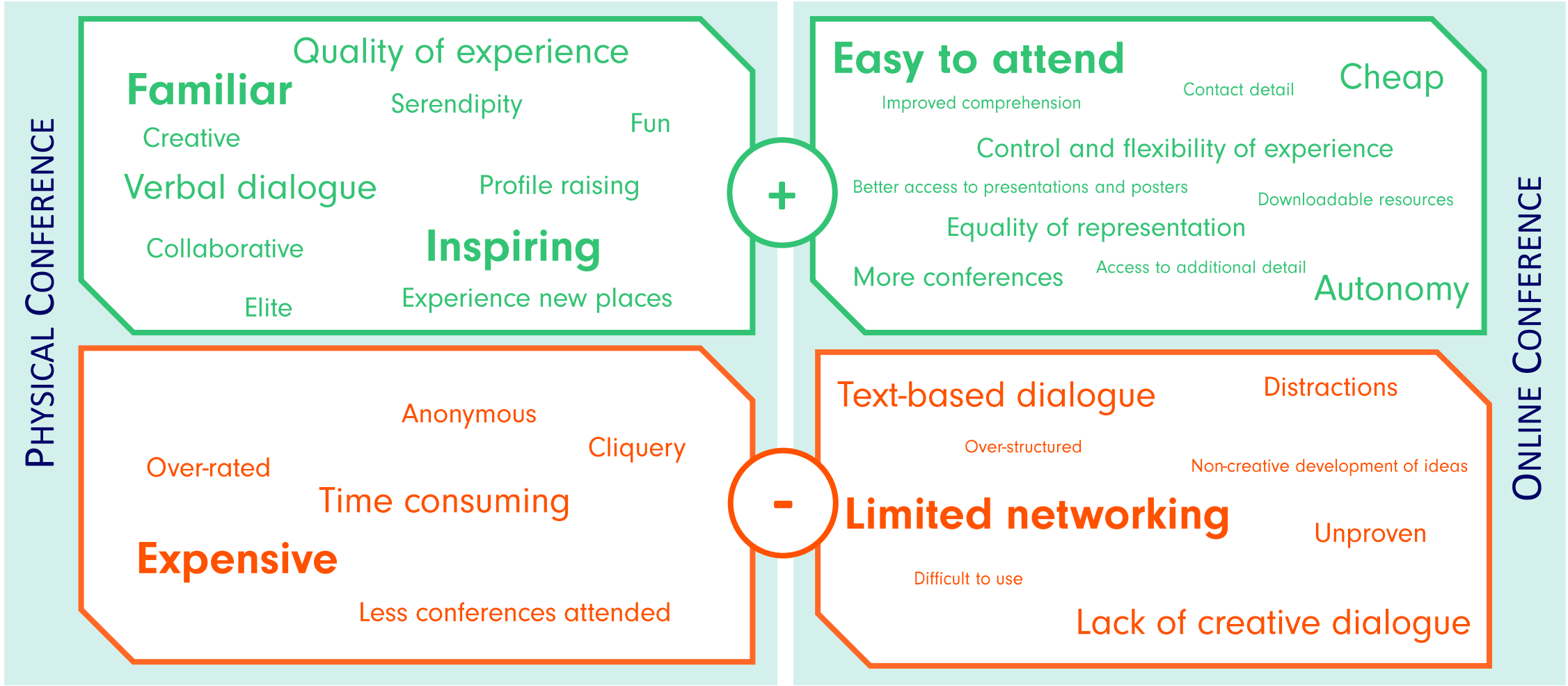


Graphic: Own illustration based on data from Klöwer 2020, https://doi.org/10.1038/d41586-020-02057-2

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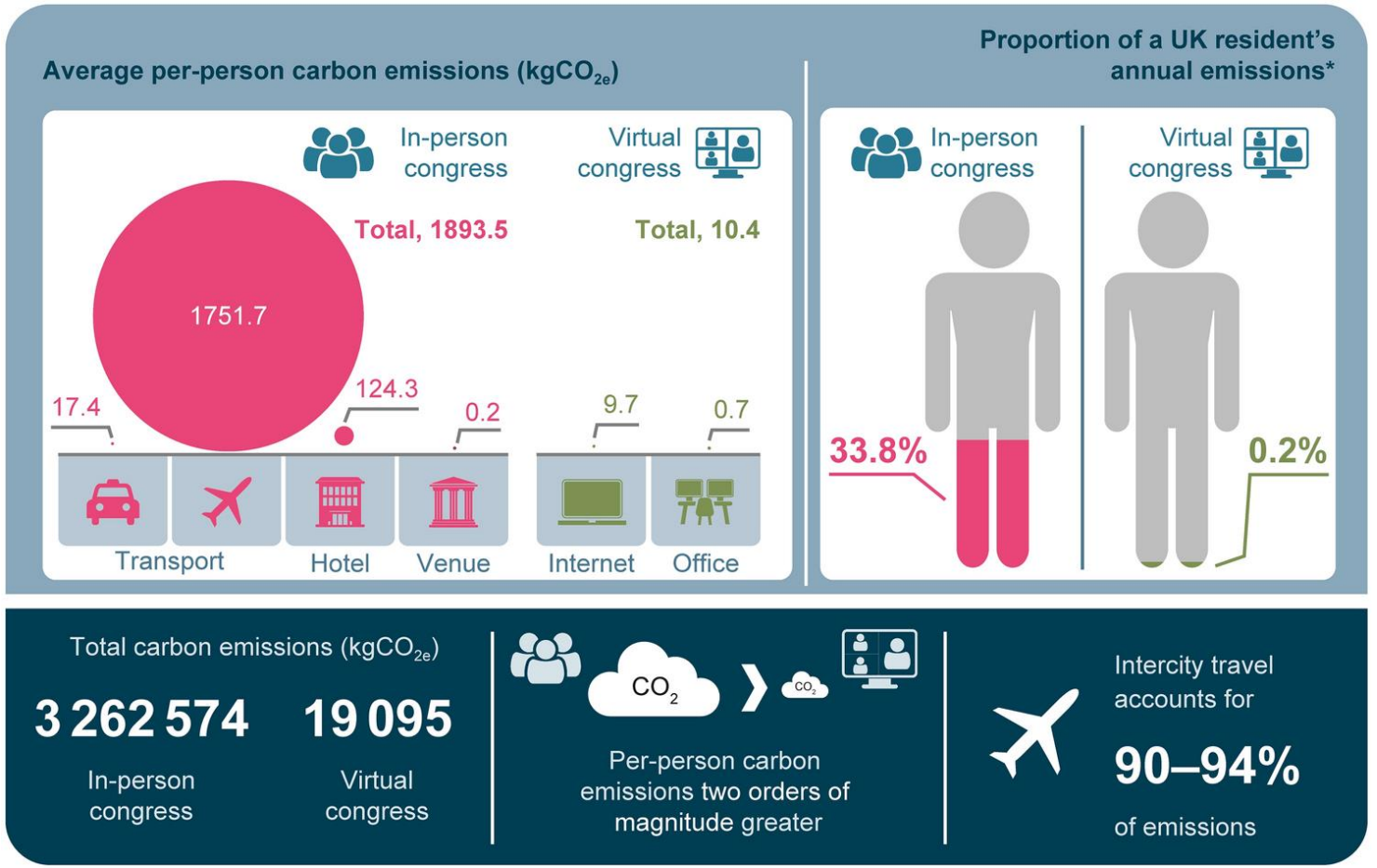
Conferences: virtual or in person?



Font size indicates frequency of mentioning.
Figure: Own illustration on basis of Elsevier 2020. https://www.elsevier.com/connect/evolving-the-academic-conference-during-covid-and-beyond

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Virtual conferences (see also Module 3.1)



Comparison of in-person and virtual congresses (average of four congresses).

Image source: William T. Gattrell, Aurélie Barraux, Sam Comley, Michael Whaley, Nicholas Lander «The Carbon Costs of In-Person Versus Virtual Medical Conferences for the Pharmaceutical Industry: Lessons from the Coronavirus Pandemic» (2022). License: CC BY-NC 4.0. https://doi.org/10.1007/s40290-022-00421-3

Virtual conferences (see also Module 3.1)

	In-person conferences		Virtual conferences	
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Best attended conferences	8.13	1.71	6.46	2.15
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Worst attended conferences	4.35	2.02	3.10	1.94

Variables were measured on a scale from 1 (extremely useless) to 10 (extremely useful).

Usefulness of best, worst and average in-person and virtual conferences participants had attended. Results from a survey among early career researchers in environmental psychology.

Image source: Jan K. Köhler et al. «The Need for Sustainability, Equity, and International Exchange: Perspectives of Early Career Environmental Psychologists on the Future of Conferences» (2022).
License: CC BY 4.0. https://doi.org/10.3389/fpsyg.2022.906108

Virtual conferences (see also Module 3.1)

Benefits and challenges of virtual conferences

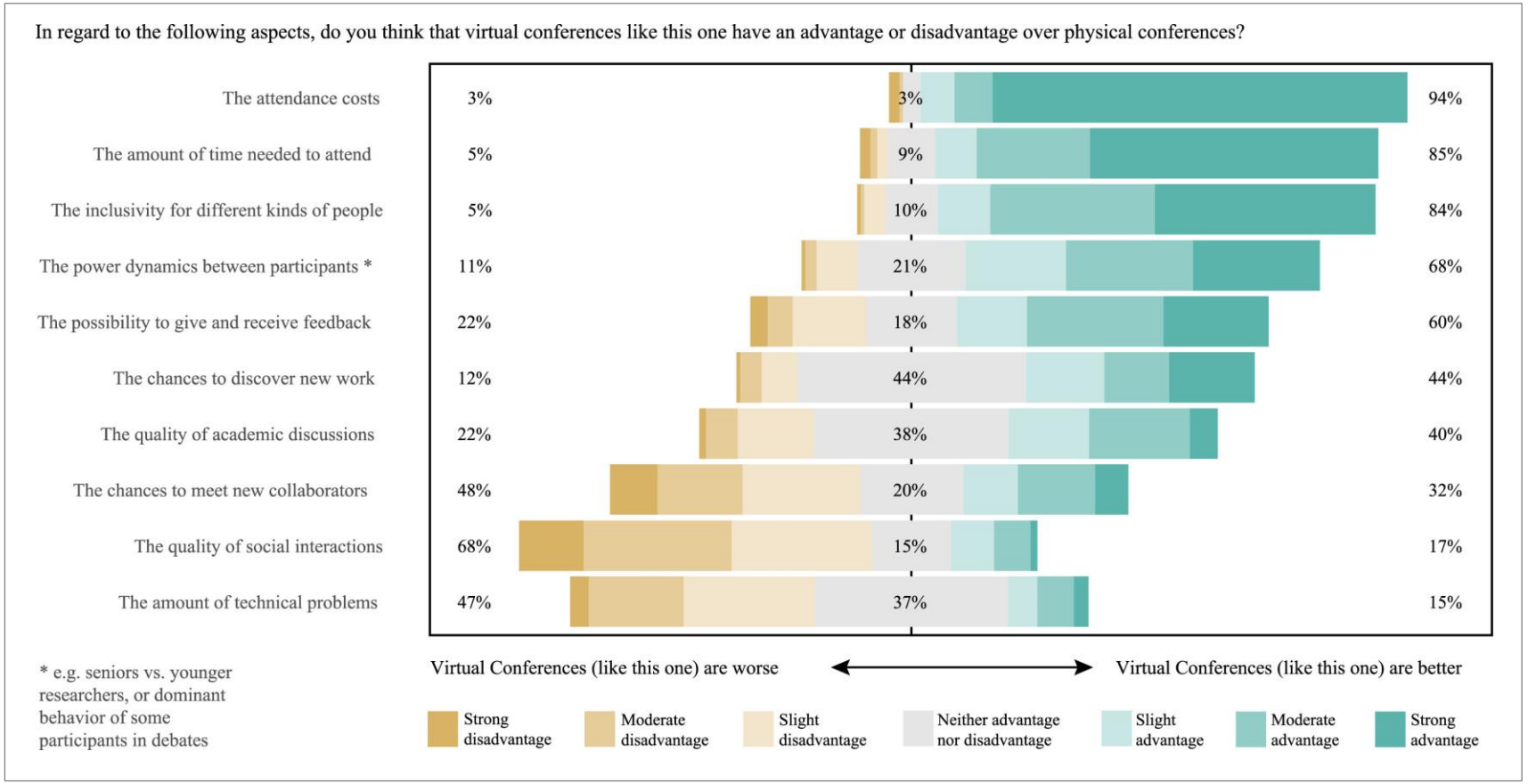


Image source: Joël Foramitti, Stefan Drews, Franziska Klein, Théo Konc. «The virtues of virtual conferences» (2021). License: CC BY 4.0. https://doi.org/10.1016/j.jclepro.2021.126287

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Food for thought
Find alternatives

- Consideration of why face-to-face meetings are needed (this might vary depending on the purpose)
- Prepare face-to-face meetings in advance via various other channels (mail, virtual meetings, etc.) so well that only a few face-to-face meetings are needed, but they are then very efficient.
- Try out new formats for virtual conferences (e.g. not on consecutive days, but spread out over several weeks, taking into account different time zones).
- Further development and expansion of good virtual tools to cover different purposes (meetings, conferences, etc.).

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Module 3
Background & arguments
"What background should I know?"

Module 3.3
Framework conditions
Internal and external framework conditions

10 slides – version September 2023

Dr. Susann Görlinger, Project Manager FlyingLess, ifeu Institute

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TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

Toolbox content

1 **Module 1** Introduction: "Why a Toolbox?"

2 **Module 2** Checklist: "Where do we stand?"

3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4 **Module 4** Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5 **Module 5** Measures: "What measures can I implement?"

6 **Module 6** Next steps: "Where do we go from here?"

Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
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Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

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On some slides, questions that can be discussed in the institution are listed in green.

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Module 3.3: Framework conditions

What do I find in this module?

- In the module, the internal and external framework conditions regarding air travel are highlighted and possible courses of action are presented via questions

What can I use the module for?

- This module supports the analysis of theinternal and external framework conditions and their adaptation

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What are the framework conditions regarding travel?

- Framework conditions influence travel decisions in academia by setting limits for them
- Framework conditions can be shaped and changed (to varying degrees)
- Framework conditions can be differentiated according to
  - Internal framework conditions: what can be influenced by the organization
  - External framework conditions: outside the direct sphere of influence of the organization, can be influenced indirectly
    - Politics
    - Funders
    - Conference organizers
    - Ranking agencies

→ See Guideline*: Measures to reduce flight emissions

*https://doi.org/10.5281/zenodo.7848954

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Internal framework conditions

- Institutional framework, e.g. travel regulations, quantitative reduction targets, carbon budgets and carbon tax

→ See Guideline* Measures to reduce flight emissions

- What framework conditions are set by your organization?
- How can these be made more sustainable?
- What scope do the framework conditions offer for sustainable individual decisions (e.g. virtual instead of physical participation, train instead of flight, ...)?

*https://doi.org/10.5281/zenodo.7848954

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External framework conditions (1/2)

- External framework conditions are determined by
  - Politics
  - Funding institutions (e.g. DFG, EU, Max Planck Society, DFG, DAAD)
  - Conference organizers
  - Ranking agencies
- External framework conditions can be influenced through joint efforts of the institutions

→ See Guideline* Measures to reduce flight emissions

*https://doi.org/10.5281/zenodo.7848954

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External framework conditions (2/2)

- Which external players influence your travel decisions (e.g., federal travel expenses law, state laws, DFG guidelines, BMBF, EU, etc.)?
- Which external framework conditions can be (indirectly) influenced by your organisations?
- Who could do this in your organisation? Who is a member of committees/ specialist societies/ advisory boards, reviewers, etc.?
- What other organisations could you partner with to do this? Who could provide support?

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Toolbox FlyingLess
Flight Reduction in Academia

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Module 3.4 Implementation **Success factors & stumbling blocks**

Important additional Information

FlyingLess Guideline about Measures
(https://doi.org/10.5281/zenodo.7848954)

Report "Reduction of flight emissions at ETH Zurich: Definitions"
(https://doi.org/10.5281/zenodo.7848978)

This document is part of a toolbox with different modules for "train-the-organisation" workshops to support academic institutions in reducing flight emissions in their organisation.

This module contains tips to help you successfully manage the change process in your institution. In particular, based on previous experience of reducing air travel in the academic sector, it contains tips on success factors and stumbling blocks that can enable or inhibit the change process. The structure of the module is based on the systematic implementation checklist from Module 5.1.

Governance

1. **Institutional/structural embedding**
   a. Where is the issue of reducing air travel embedded in the organisation?
   b. Who is in charge and responsible (see also point 6, personnel responsibility)?
   c. Who has the competences to make decisions?

➔ **Commitment and direction from the management level are essential to make the issue of air travel reduction relevant within the organisation and to enable its implementation. Responsibilities and competences need to be clearly defined and transparently communicated. Without a structural embedding, it is very difficult to sustainably pursue the topic in the organisation, because it then depends on individual, committed persons.**

2. **Strategy**
   a. Is climate neutrality or net zero part of the organisation's overall strategy?
   b. How do you deal with conflicting goals, e.g. internationalisation versus net zero?
   c. Who decides about priorities?

➔ **Embedding the topic in the organisational strategy shows its importance and gives a strong signal within the organisation.**

3. **Goals, targets and rules**

Are the reduction goals defined centrally or decentrally, top-down, bottom-up or in a combination? What targets are set? Are they mandatory or merely recommendations? Are concrete rules established (e.g. in the travel guidelines)?

➔ **There is a need for goals, targets and rules at different levels that apply to all and are binding; this shifts the discussion from "if" to "how" and thereby also supports the implementation at the different levels. Voluntary commitments rely on individuals to change their travel behaviour. However, it is often seen as unfair if not everyone participates; moreover, voluntary self-restraint has not been sufficient in the past.**

Are concrete rules established (e.g. in the travel guidelines)?

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a. Centralised (management level, department, etc.) versus decentralised (each unit, group)
b. Top-down: Goals, targets and implementation set by the management level
c. Bottom-up: goals, targets and implementation are developed in the units
d. Combination of top-down and bottom-up: general goals and targets from the management level, concretisation and implementation in the units

➔ **There are currently various models, e.g. (a) a reduction target by the management level (TU Graz), (b) a minimum target by the management level, which can be exceeded by the units (UZH), and (c) an individual bottom-up reduction target by the individual units (ETH Zurich).**

4. **Changed framework conditions that enable a transformation of science towards net zero**
(see module 2.2)

➔ **Participatory work with different actors to adjust the internal framework conditions (e.g. carbon budget) leads to constructive negotiations and broader support for the agreements reached.**

5. **Sanctionability**

a. Are the guidelines and rules such that they can be sanctioned?
b. Who is responsible for this and who controls?

➔ **If compliance with rules and regulations is not monitored and sanctioned where necessary, this can be perceived as unfair to those who do follow the rules.**

6. **Who has the personnel responsibility for implementation?**

a. Who at the management level is responsible?

➔ **For example, is there a prorector or delegate for sustainability?**

b. Who leads the process (project management), where is the project management located, how close is the exchange with the management level, what competences, budget does the project management have?
c. Are there responsible persons at different organisational levels (e.g. in the department, institute, group) who are legitimised and provided with a time and financial budget?

➔ **The topic should be in the responsibility of the management, which can delegate the implementation, but remains in charge (see Module 3.1, slides on responsibility). It further emphasizes the significance of the topic internally and externally if it is also embedded in the management level in terms of personnel and is communicated via different channels (e.g. regular communication, reporting, evaluations, embedding in the strategy, etc.). The implementation takes place in the units, where there should also be responsible persons who are equipped with the corresponding competences and resources.**

7. **What is the responsibility of the individual, what is that of the organisation?**

➔ **Both play an important role. Successful implementation requires both top-down governance and support as well as the bottom-up commitment of individuals.**

8. **How are the different groups (management level, professors, senior/junior scientists, administration, students) involved?**

➔ **It needs all levels, so all need to be involved.**

9. **Are there internal steering committees or groups at different levels (e.g. project steering group, sounding board, task force in each organisational unit, core group of pioneers)?**

➔ **Only when the topic is embedded within the organisation at all levels, a transformation of the organisation will be possible.**

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Operationalisation: data, reduction target, timeframe, reduction path, carbon budget

Suggestions on this topic can also be found in the document "Reduction of flight emissions ETH Zurich: Definitions" on the FlyingLess website).

1. **Is there a database of flight emission in your organisation? If yes, which database is used?**
   a. Which unit is used? (e.g. in t CO_2 eq)
   b. What is the system boundary? (e.g. flights of staff paid by the organisation (and therefore in the financial system), of invited guests and of students within the curriculum).
   c. What is the baseline? Is the reduction target defined relative to emissions in a given year or multi-year period?
   d. Monitoring
      - Where is information on air travel collected (on paper, digitally)?
      - How are emissions calculated (incl. emission factors, RFI, etc.)?
      - Who calculates the emissions and at what intervals (monthly, annually)?
      - Who receives information about the calculated emissions and with what frequency? Do only a few in the organisation or does every group have access to the (own) emissions?

2. **What is the reduction target?**
   a. Is there a quantitative reduction target?
   b. By when must this target be achieved?
   c. Is the reduction target per FTE or total for the whole unit?
   d. Does the reduction target take into account the annual increase in efficiency of the airlines (approx. 1-2%/year) or not?
   e. How (process), at what level (whole organisation or only individual units) and by whom (top-down vs. bottom-up, individuals vs. participatory) is the quantitative reduction target set?
   f. Is there a uniform reduction target for the whole organisation or different targets for the units (with or without a minimum target)?
   g. Do the same goals apply to all within a unit or are they differentiated (e.g. according to frequent or infrequent flyers, status groups, career level)?

➔ **A quantitative, i.e. measurable reduction target is needed, with the respective decisions about the system boundary, etc. This target must be sufficiently ambitious and operationalised to achieve the net zero target.**

3. **Is there an interim goal?**

➔ **If the target is defined over a longer period of several years (e.g. –50% by 2030), interim targets are recommended.**

4. **Is there a predefined reduction path over the reduction period? Or is it sufficient if the reduction target is achieved at the end?**

5. **Is there a carbon budget for the organisation and for the units, derived from the reduction target (to make transparent how much emissions are available to each unit over a certain period of time)? How is the carbon budget consistent with the net zero target?**

➔ **A carbon budget can be an efficient and pragmatic solution to make the quantitative reduction target manageable for each unit. It is derived from the GHG emissions of the reference period and the reduction target and quantifies the emissions available for the remaining period for the respective unit. Everyone can then decide for themselves how to use this budget, e.g. for many short-haul flights or infrequent long-haul flights, for business or economy flights, etc. In the end, what counts is how much GHG is emitted.**

Measures to achieve the reduction target

See also Module 7 and FlyingLess Guideline on Measures

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1. How are the measures selected (top-down, bottom-up)?
2. Do the same measures apply to all or are they differentiated (e.g. according to frequent vs. infrequent flyers, status group, career level)?
3. How, by whom and to whom are the adopted measures communicated?
4. How and by whom are the measures implemented, who is responsible?
5. Are there incentives for sustainable travel?
6. How can role models or multipliers be recruited and involved who, as respected and committed opinion leaders, position and promote the issue?
7. Are the measures sufficient to achieve the goal?

➔ An important aspect of reduction targets and measures is fairness. Do the same rules apply to everyone? Does it make sense to set less strict targets and measures for certain groups (e.g. young scientists, field research)?

Communication

1. Is there a communication concept?
2. Who is the target group for internal and external communication, is the communication target-group specific?
3. Who (management level, communication department, project management, sustainability office, units, etc.) communicates regarding goals, measures, successes / failures?
4. What and how often is the topic communicated?
5. How is communication carried out? (e.g. newsletter, organisation-wide events, workshops, social media)
6. How often do major events on the topic take place?

➔ Communication is an essential part of keeping everyone informed and involved. Regular communication by the management level shows the importance of the topic. Role models/multipliers are important to show that the topic is relevant and that it is possible to do excellent science in a different way, i.e. with significantly less air travel.

Reporting

Topics: internal and external reporting on emissions, progress, resistance, best practices, etc.

1. Are there reports on emissions? How often are emissions reported? (e.g. annually)
2. Is there information/report on progress, resistances and best practices
3. Are there any guidelines for the format of the reporting? (e.g. a template)
4. Who is responsible for this?
5. To whom do these reports go and where are they discussed?
6. to superordinate bodies (e.g. state government, Max Planck Society)
7. to the management level (e.g. annual talks, target agreements)
8. within the unit (e.g. regular topic at departmental or institute meetings)
9. What happens if targets are not met (sanctions)?
10. How much transparency is there inside and outside the organisation regarding emissions, targets, measures, goals achieved or missed, etc.? Are units and persons anonymised in the reports or not? Are the reports made available on the intranet / internet?

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➔ **Emotions: A fundamental change in how to do science with (almost) no flights is difficult and triggers emotions. This should be anticipated, the difficulties acknowledged, and the units supported in different ways.**

Schedule of implementation

1. **Who sets the schedule?**
2. **Who supports the implementation?**
3. **Who controls the timely and target-oriented implementation**

➔ **For the schedule, it is important that those responsible have sufficient competences and resources.**

Networks

Is there good networking with other universities (national and international)?

➔ **Networking about the flight reduction topic is very important and helpful, especially for those responsible at the universities (project leaders), so that they can advise each other and learn from each other's experiences. This can be v useful at the beginning of the process.**

Evaluation

Is there regular evaluation, assessment and possible adjustment of the goals, measures and their implementation?

➔ **Regular evaluation is important; this can be done with internal or external experts.**

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Module 3
Backgrounds & Arguments
"What backgrounds should I know?"

Module 3.5
Sufficiency

Necessity of sufficiency, implementation proposals and challenges for the "flying" field of action

17 Slides – version September 2023

Dr. Lars-Arvid Brischke, ifeu Institute

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Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
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We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



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"What background should I know?"

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Methods & Tools
"What tools are available to me?"



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Module 3.5: Sufficiency

What do I find in this module?

- The need for sufficiency as part of the sustainability strategy
- Basics of the concept and understanding of sufficiency
- Operationalisation of sufficiency in the field of action of flying in science

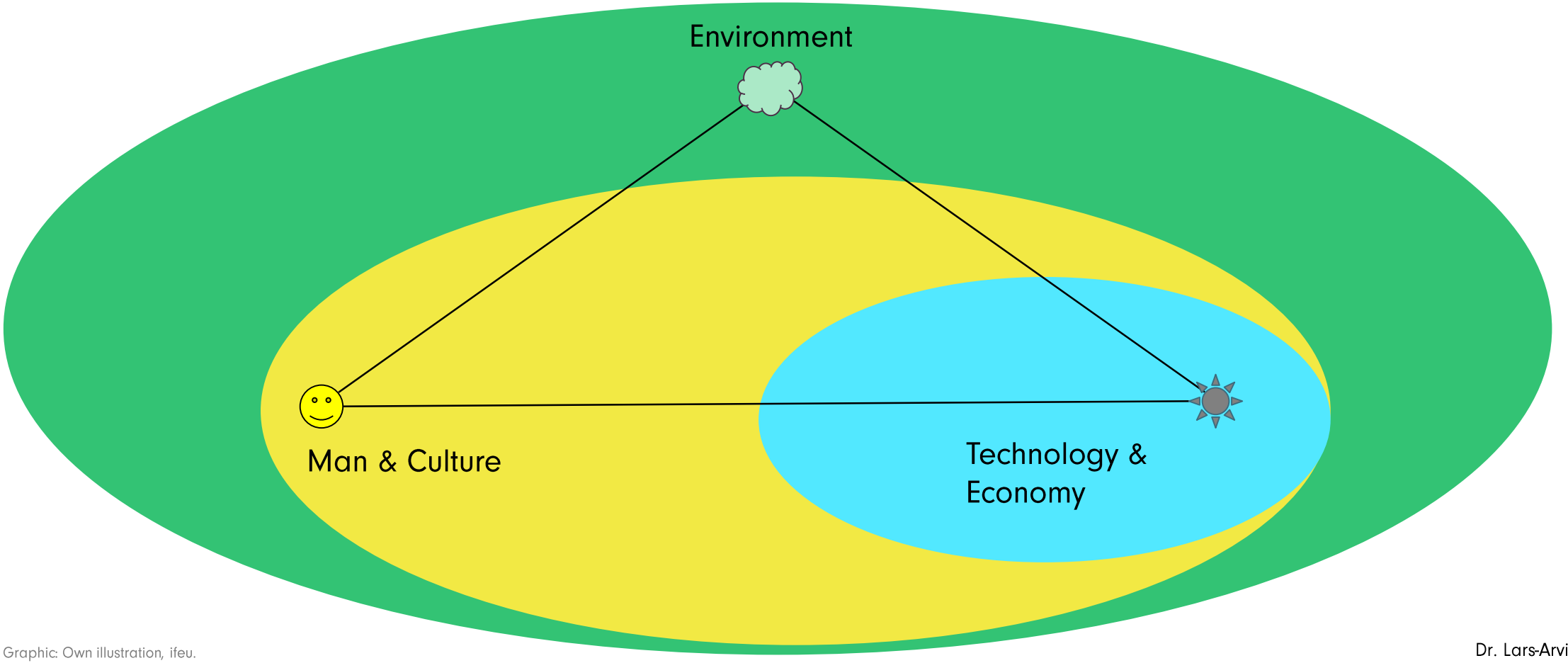
What can I use this module for?

- Get to know the concept and content of sufficiency
- Use scientific justification of the need for reduction as a basis for argumentation
- Suggestions for implementation as a source of inspiration
- Get to know how to systematically exploit reduction potentials

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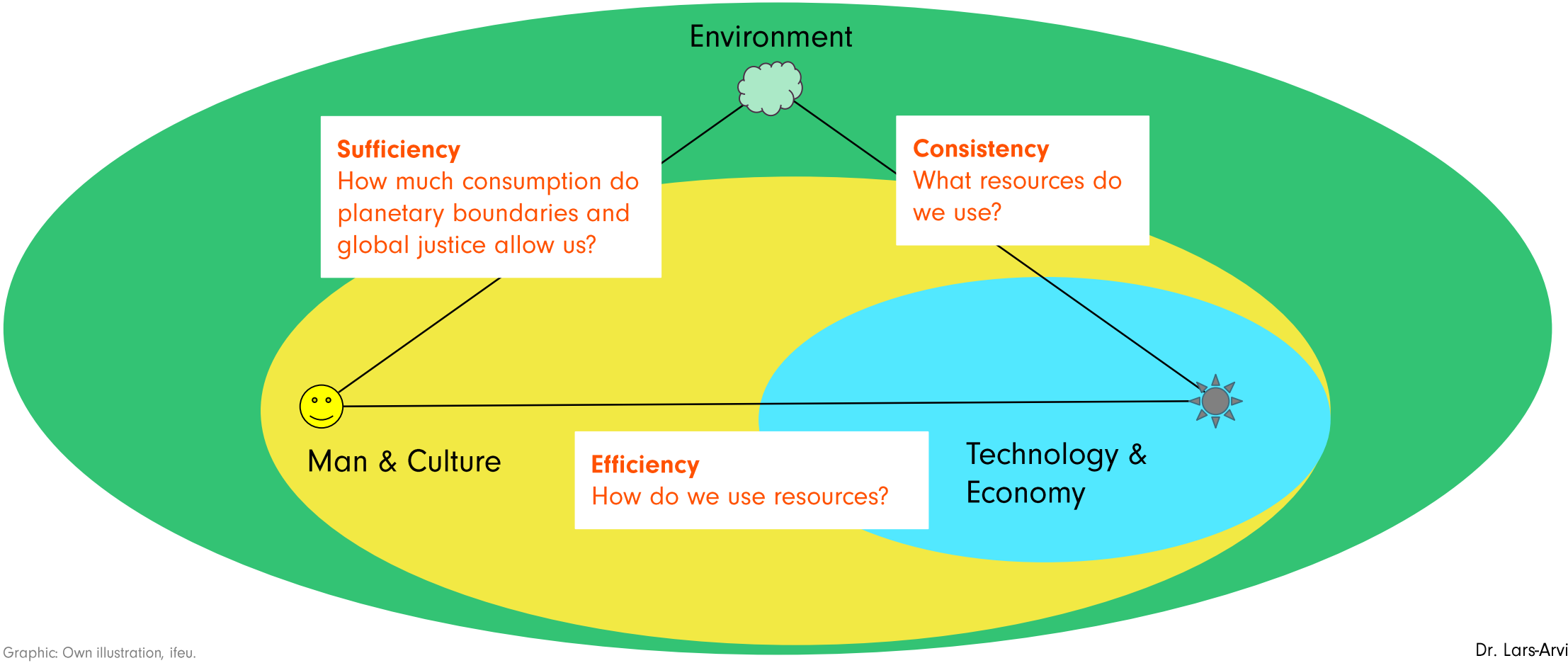
Sustainability
Three dimensions



Graphic: Own illustration, ifeu.

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Complementary sustainability strategies:
Sufficiency, efficiency, consistency



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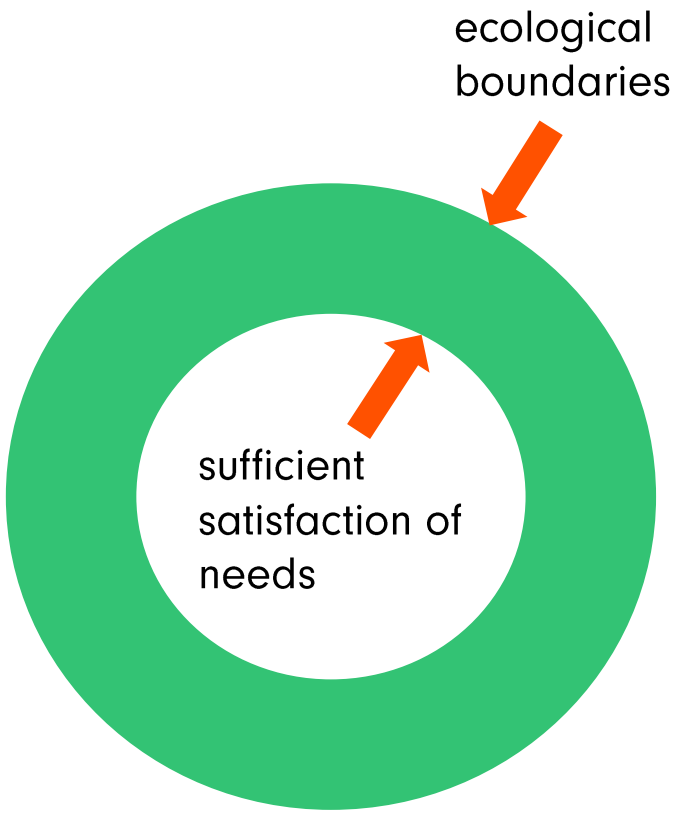
Sufficiency

Definition

- Sufficiency can be a **process** or a **state**
- Sufficiency stands for **behaviours and ways of consumption** or their modification in such a way that they enable sufficient satisfaction of needs within ecological limits (local + global)

  → Sufficiency lifestyles
- Sufficiency means a **shift in the scope of possibilities** for behaviour and satisfaction of needs

  → Change of social-symbolic valuation
- **Policy** must **enable, facilitate and encourage** sufficiency oriented lifestyles and economies through appropriate frameworks



Graphic: Own illustration, ifeu.

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Sufficiency

Neither lack nor excess

- Sufficiency addresses parameters of **absolute limits** at the local and planetary level (ecological ceiling)
- Sufficiency addresses **social goals** (social foundation)

→ Sufficiency requires **examining the cost/benefit ratio**, taking into account the total ecological and social effects as costs and their ethical weighing against the expected benefits of an action.

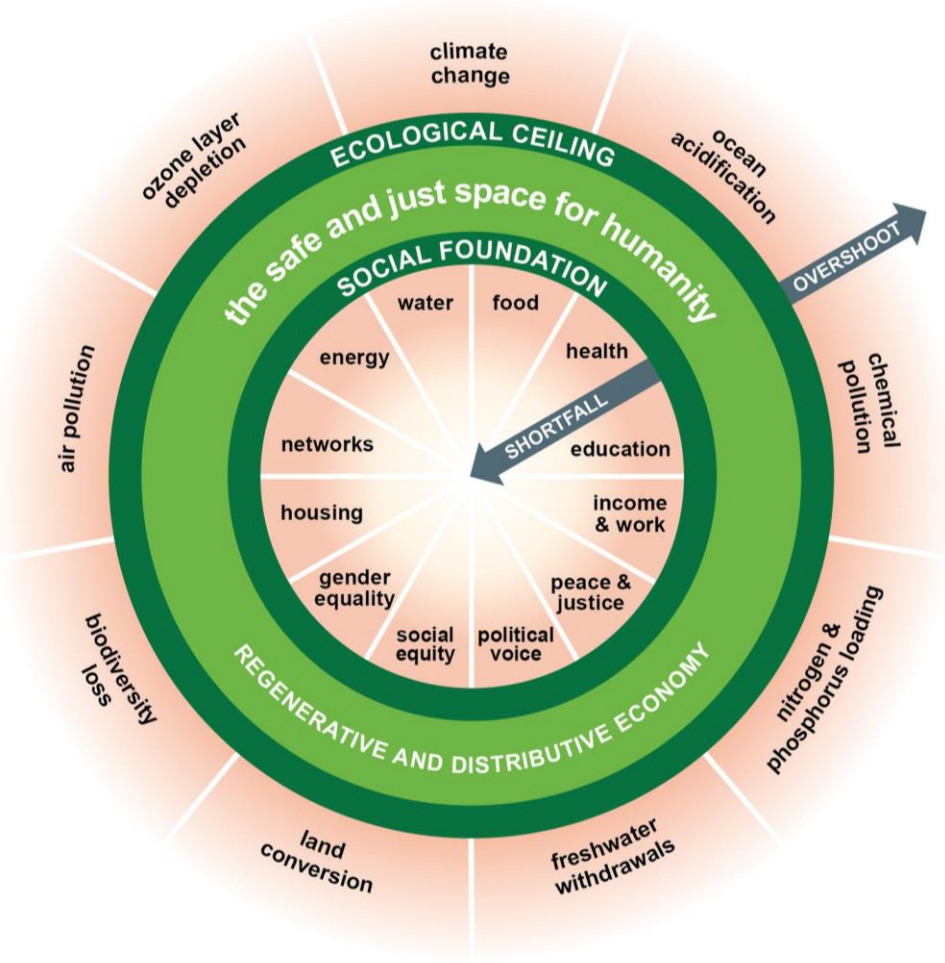


Image source: Environmental doughnut infographic based on Kate Raworth. Author: DoughnutEconomics. License CC BY-SA 4.0. https://upload.wikimedia.org/wikipedia/commons/4/4c/Donut_%C3%96konomie_-_deutsch.png

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Sufficiency content as principles guiding action in sustainable development

What does sufficiency entail?

- **Appreciation** for the environment and natural resources
- **Equity:** Sufficient coverage of needs and access for all
- **Adaptation:** Reduction of oversize and overdimensioning
- **Substitution:** meeting needs differently, satisfying needs differently
- **Reduction:** questioning needs and desires and examining whether and why their fulfilment is necessary

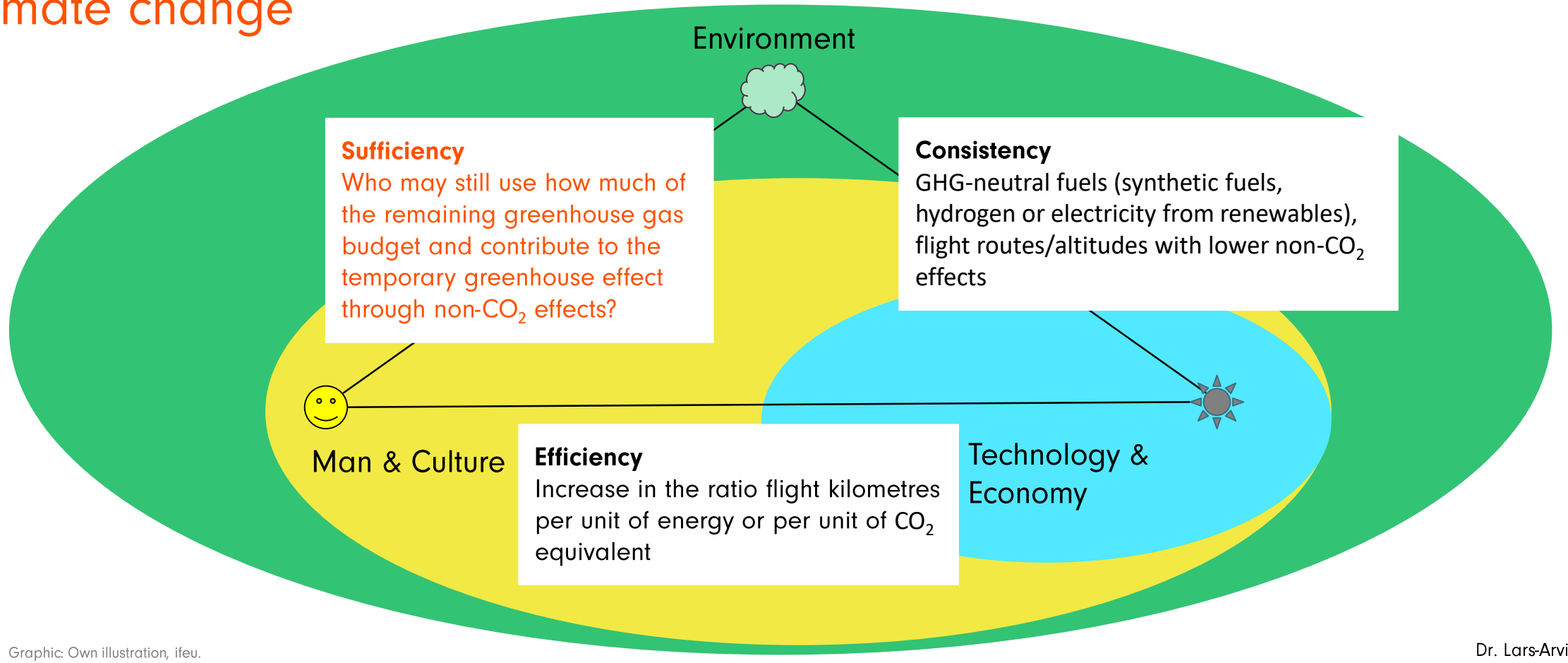
Sufficiency content should become a guiding principle for:

- **Behaviour & Action**
- **Routines**
- **Strategy, Structure & Consumption Decisions**

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Field of action "Flying"

Consistency, efficiency and sufficiency to meet the planetary boundary on climate change



Graphic: Own illustration, ifeu.

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Operationalisation sufficiency in climate protection

Allocating global GHG budgets nationally

Starting point:

› Who is still allowed to use how much of the remaining **global greenhouse gas budget** and to what extent to contribute to the greenhouse effect through **non-CO_2** effects?

→ Political negotiation process

National reduction target:

Germany aims to achieve greenhouse gas neutrality by 2045 and not exceed its national residual GHG emissions budget for the 1.5° target. Non-CO_2 effects make climate-neutral flying - even with CO_2–free fuels - impossible. However, non-CO_2 effects are not yet addressed by climate protection strategies.

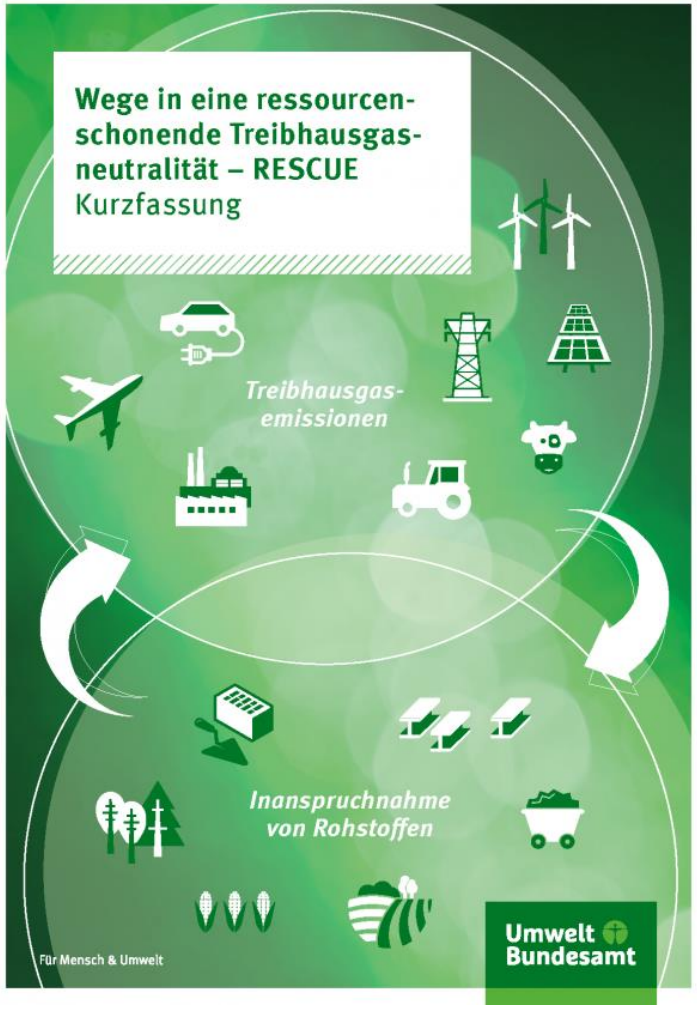
→ National energy and climate protection scenarios: Budgets for sectors and / or consumption fields

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RESCUE scenarios of the UBA:
Pathways to resource-efficient greenhouse gas neutrality in Germany by 2050

The RESCUE study of the Federal Environment Agency shows possible solutions and scope for action for paths to resource-saving greenhouse gas neutrality by 2050 in six scenarios:

- **GreenEe1+2** Energy efficiency/saving
- **GreenMe** Material efficiency
- **GreenLate** Slower implementation
- **GreenLife** Lifestyle Changes
- **GreenSupreme** Combination of the most effective measures of the scenarios



Source: Federal Environment Agency (2020)
Available at: https://www.umweltbundesamt.de/sites/default/files/medien/376/publikationen/rescue_kurzfassung_dt.pdf

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RESCUE scenarios of the UBA:

Only in the scenario GreenSupreme Germany meets its remaining GHG budget according to the 1.5°C target

Selection	Green Ee1+2	Green Late	Green Me	Green Life	Green Supreme
Sustainable consumption, total	High	Medium	High	Very high	
Nutrition, especially reducing meat	High	High	High	Very high, very fast	
Housing pP in 2050	49 m^2	53 m^2	49 m^2	41 m^2	41 m^2
Sharing, durability & repairability of products such as clothing, accessories, jewelry, furniture, ITC, toys, instruments, etc.	Medium	No change	Medium	Very high	Very high
Change in mobility Example 2050 vs. 2010	High	Medium	High	Very high	
New passenger cars in 2050	2 Mio.	3 Mio.	2 Mio.	1 Mio. incl. Carsharing	
Flights abroad, 2050 vs. 2010	+100%	+120%	+100%	Peak in 2030, +0% in 2050	

↘ Number of flights abroad as in 2010

Source: Lehmann, H., Dittrich, M. (2020): RESCUE - Wege in eine ressourcenschonende Treibhausgasneutralität. UBA, ifeu.

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Reasons why sufficiency is indispensable when it comes to flying

- Sufficiency measures are **directionally safe** with regard to compliance with absolute limits.
- Sufficiency can be implemented immediately!

  → **Wild card in the** climate protection **race** & in complying with further planetary boundaries

Sufficiency **needs**

(in contrast to efficiency and consistency)

- **No** R&D funding & **no** investment for new technologies
- **No** market ramp-up & **no** incentive for supply & demand of new technologies (CO_2-free synthetic fuels)

Sufficiency **causes**

- **No** non-CO_2 induced climate effects in the atmosphere
- **No** lock-in effects & stranded investments of technical infrastructure (esp. airports)
- **No** exacerbation of (nationally and globally) unequal access to flight opportunities through higher costs for flying with CO_2-free fuels

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Implementation proposals and challenges for sufficiency for the field of action of flying in academia

1. Determination of the remaining GHG budget incl. non-CO_2 effects for mobility in the field of science
   →Allocation or target agreement for each scientific institution
2. Plan air travel and quantify greenhouse effects ex ante
   → if budget is exceeded, apply sufficiency approaches:
   - **Adjustment:** Check the cost/benefit ratio, do not fly if the benefit cannot be sufficiently justified to justify the expense; how many people need to attend a meeting, a conference, an excursion?
   - **Substitution**: To which country(ies) or up to which distances can air travel be excluded? Is virtual participation also sufficient?
   - **Reduction:** Question the frequency, distance and number of people travelling by air and reduce if possible if it appears that the budget will be exceeded.
3. **Challenges:** Continuous monitoring and review of compliance with the budget as well as negotiation processes, enforcement control and sanctioning in case of threatened budget overruns must be newly established

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About FlyingLess

The aim of the FlyingLess project is to support universities and research organisations in reducing air travel, which causes a significant part of their total greenhouse gas emissions.

FlyingLess develops approaches to reduce air travel in the academic sector, which are implemented at different levels (research, teaching and administration).

The project is being carried out in close cooperation with four pilot institutions - EMBL (European Molecular Biology Laboratory) and MPI Astronomy in Heidelberg as non-university research institutions and the Universities of Konstanz and Potsdam as universities.

Further information can be found on the website www.flyingless.de.

The project is being led by ifeu Heidelberg in close cooperation with the TdLab Geography at the Institute of Geography at Heidelberg University.

The project is funded over 3 years as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Protection.

Content issues

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Module 4
Methods and Tools
"What tools do I have at my disposal?"

Module 4.1
Project management

18 slides – version September 2023

Dr. Maximilian Jungmann, Momentum Novum

with contributions by Hannah Büttner (Methods), Integrative Dialogues

ifeu INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

Toolbox content

1 **Module 1** Introduction: "Why a Toolbox?"

2 **Module 2** Checklist: "Where do we stand?"

3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4 **Module 4** Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5 **Module 5** Measures: "What measures can I implement?"

6 **Module 6** Next steps: "Where do we go from here?"

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Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
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- 3.5 **Sufficiency**

Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

How to use the toolbox?

The **FlyingLess Toolbox** is a modular collection of content and methods on the topic of reducing air travel.

Depending on the occasion or need, suitable modules or individual modules or individual slides can be selected and used.
The order of the modules is only a recommendation.

Depending on your level of knowledge and interest, you can start with different modules.

The FlyingLess logo and the link to the website (www.flyingless.de) should remain on the slides.

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Module 4.1: Project management

What do I find in this module?

- Structured and effective project management is necessary to transform the academic sector to net zero emissions.
- The slides in this module present the different elements of project management and related change processes so you can make this transformation.

What can I use the module for?

- Find out about project management's core elements.
- Identify the tools relevant for different aspects of project management.
- Anticipate the opportunities and risks involved in managing projects and change processes.

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Overview - Phases of project management

How do I implement projects effectively?

- **Classic project management** delineates four project phases: initiation, planning, implementation and completion.
- **Agile project management** follows an iterative approach compared to classic approaches.
- The following slides present concrete methods to help you with the respective project phases.
- The methods presented here combine these approaches.

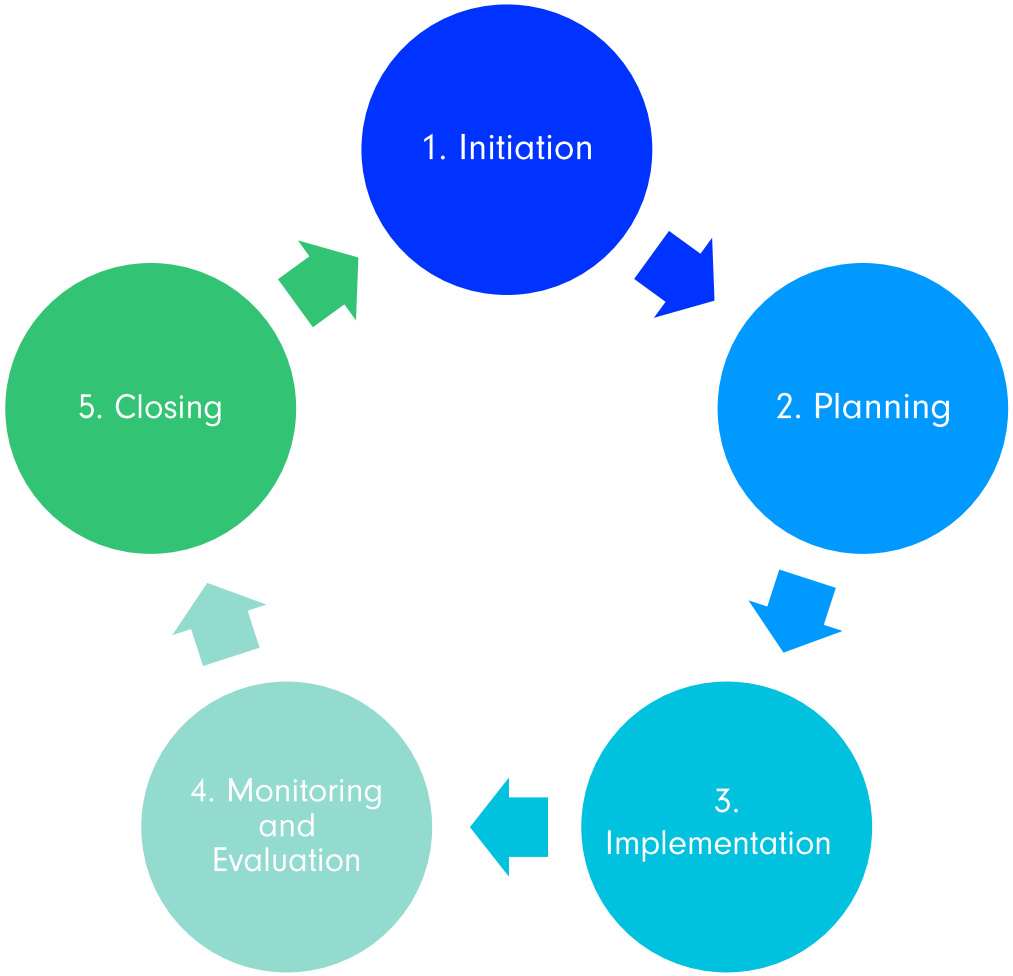


Figure: Own presentation, systematics is based on Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Development, implementation and evaluation of strategies in the portfolio of the Federal Ministry for the Environment. Developed as part of the project "Creation of a strategy development guide - analysis and evaluations of strategy understandings, processes and effects in the BMUB division and further development of the 2012 strategy guide" (FKZ 3716 11 702). FFU; Integrative Dialogues. Berlin & Munich.

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1. Project initiation
What are my conditions for success?

- Identify your goals and priorities at the beginning of the project, and the means you can use to achieve them
- Following the classic project management triangle, cost, time and quality are closely linked and mutually dependent
- Projects with a short time frame and high quality usually cost more
- Reducing costs often impacts quality or the time it takes to implement the project
- Combining higher quality and lower costs usually requires more time



Figure: ProjectSmart, https://www.projectsmart.co.uk/role-of-the-project-manager/understanding-the-project-management-triple-constraint.php
Text: Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012" (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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1. Project initiation
Who is part of the project?

- In many projects, work is started quickly without clearly defining in advance which stakeholders are involved, what interests they pursue, what perspectives they bring to the table, and what role they play in the process
- Clearly define the project process (including regular meetings), design deliverables and assign responsibilities
- A structured stakeholder analysis, for example, helps in this regard (see Module 4.2)

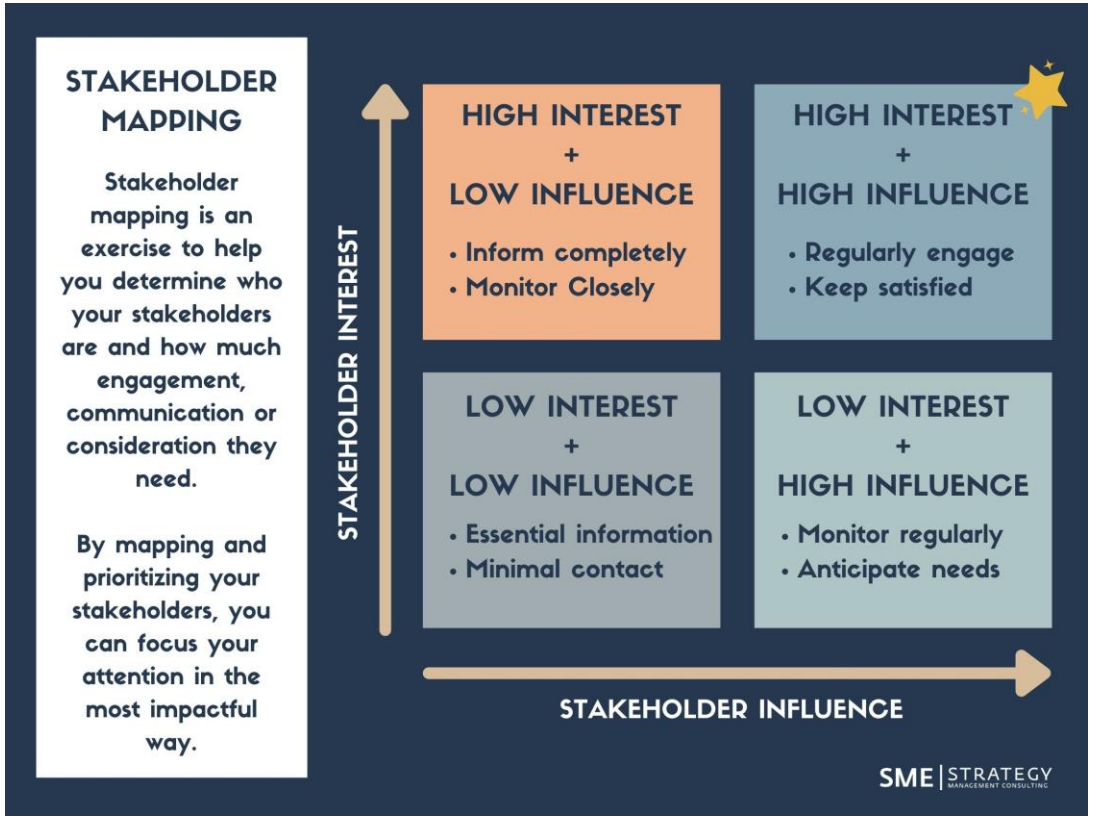


Figure: SmeStrategy, https://www.smestrategy.net/blog/stakeholder-engagement-in-your-strategic-plan-pt-1
Text: Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012" (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

2. Project planning
What will be implemented when and by whom?

- Regardless of the approach (classic or agile), clearly define at the start of project planning which work packages to implement including by when and by whom
- Many different tools are available for this purpose, ranging from classic work package descriptions and GANTT charts to SCRUM or Kanban boards (see the examples on the following slides)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012" (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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3. Implementation: GANTT charts

- **Description:** GANTT charts are tools of classic project management, such as waterfall models; however, they are also still used in agile approaches to some extent.
- **Implementation:** Usually, GANTT charts list the work phases by month on the x-axis, whereas the respective tasks are on the y-axis.
- GANTT charts make it possible to enter details for each month regarding who is responsible for each task and when in the project process. These charts also are useful for noting when milestones must be reached so that the project can be successfully completed.

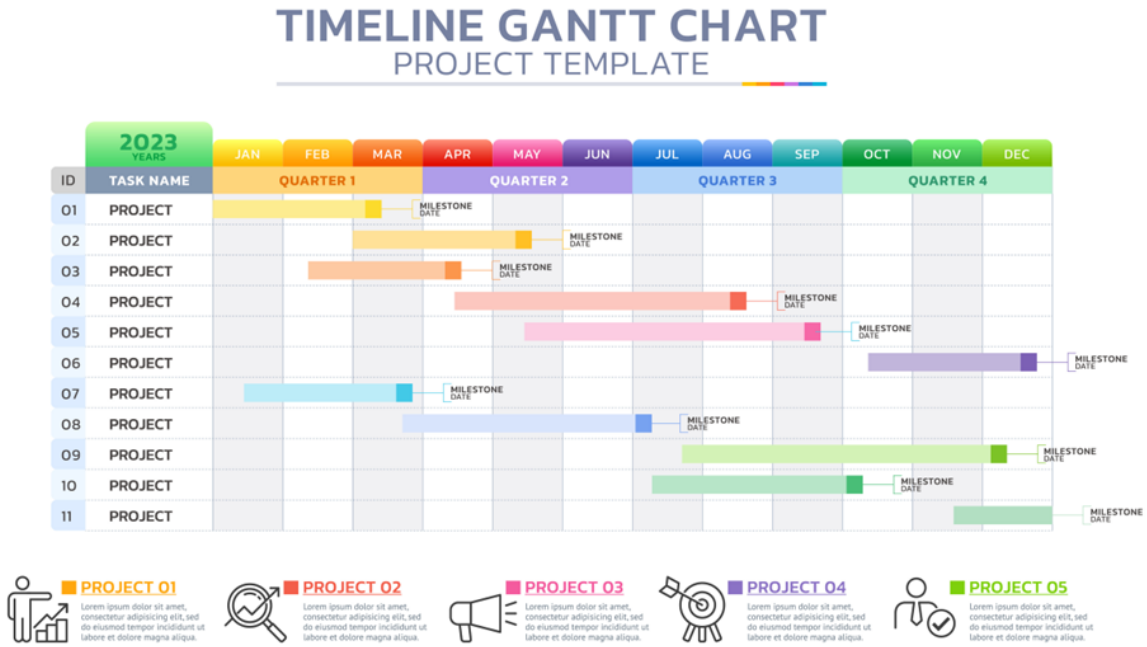


Figure: graphixmania - stock.adobe.com

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3. Implementation:
Kanban and Wall of Work, Task Board (visualisation)

- **Description:** The term "Kanban" means visual signal. A Kanban system is a tool for visualising the tasks and the work process. Team members use cards to visualise tasks and the project progress on a Kanban board. This way, a team has insight into the status of the work at any time and can organise, plan and improve more easily.
- **Implementation:** The visualisation can be attached to the wall at a common meeting point, e.g. using a poster board and PostIts. Alternatively, a digital whiteboard can be used as a common workspace, especially if the implementation teams are spread out.
- Project group members contribute to the creation and maintenance of the Wall of Work in regular "stand-up meetings" in which the progress of the implementation process is jointly monitored.

Resources

- Laloux, Frederic (2016) Reinventing Organizations visually. An Illustrated Guide to Meaningful Forms of Collaboration, Vahlen Franz GmbH
- Online tools or digital whiteboards with many templates: www.miro.com or www.mural.com

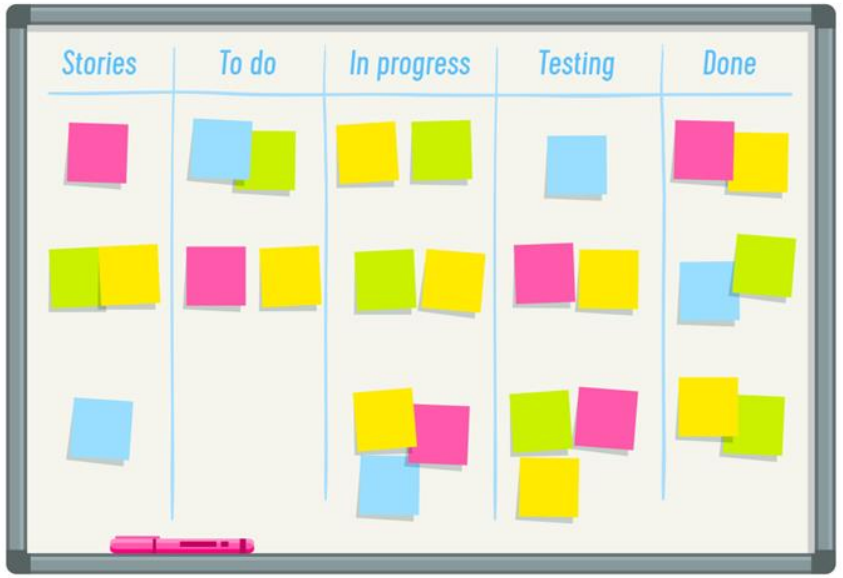


Figure: Vector Tradition – stock.adobe.com

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3. Implementation: Stand-up meetings

- **Description:** A stand-up is a short, regularly recurring appointment for a team or project group to effectively and efficiently monitor project progress and coordinate work.
- For example, stand-ups can be an effective and efficient way to facilitate stakeholder cooperation to reduce air travel in the institution.
- **Implementation:** Define a project group and schedule regular (e.g. bi-weekly) 30-minute meetings. Groups of 7-12 are ideal for this kind of self-organised work.
- During the stand-up, participants can use the Kanban method (Wall of Work) to review and distribute upcoming tasks.

Resources

- Kuster, J. et. al. (2019) Handbuch Projektmanagement: Agil - Klassisch - Hybrid. Springer Gabler
- Online tools or digital whiteboards with many templates: www.miro.com or www.mural.com



Figure: apinan – stock.adobe.com

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4. Monitoring and evaluation: Retrospectives

- **Description:** A recurring appointment for a team or project group, the retrospective serves to strengthen cooperation and the effectiveness of the project group.
- **Implementation:** The retrospective is usually carried out at certain milestones. It can also be scheduled as a regular monthly meeting, for example.
- A simple retrospective can follow the "4 L" scheme:
  - What have we done so well that we need to talk about it so that we don't forget it? (Loved)
  - What have we learned? (Learned)
  - What do we need to do differently in the future? (Lacked)
  - What would have helped me? (Longed)
- Participant outcomes are visualised, reflected on together and used for planning further tasks and meetings. Useful visualisation tools include PostIts on flipcharts or digital whiteboards such as Miro (see graphic on the right).

Resources

- Kuster, J. et. al. (2019) Handbuch Projektmanagement: Agile - Classic - Hybrid. Springer Gabler
- Online tools or digital whiteboards with many templates: www.miro.com or www.mural.com

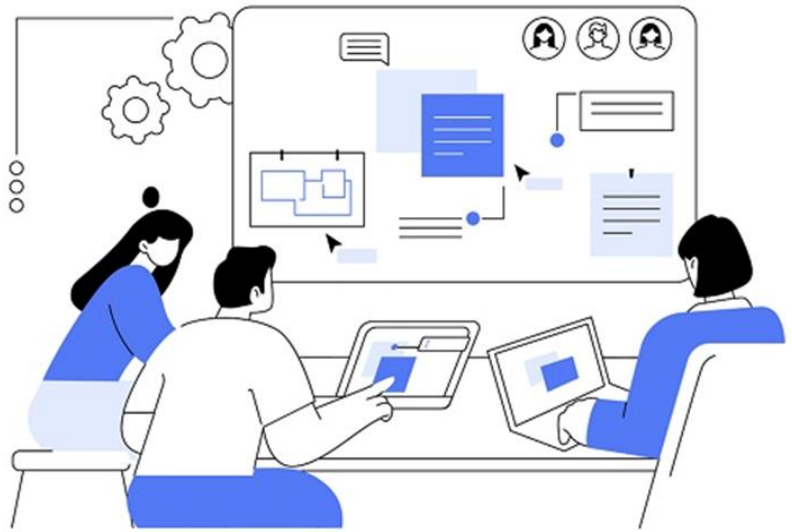


Figure: Visual Generation - stock.adobe.com

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Excursus (1/3)
Project cycle

- From first idea to project completion, the project life cycle provides a structure to ensure stakeholders are consulted.
- It defines the key decisions, information needs and responsibilities at each stage so that informed decisions can be made at each stage of the project life cycle.
- It also relies on evaluation to incorporate lessons learned into the design of future programmes and projects.

What is a Project Life Cycle?

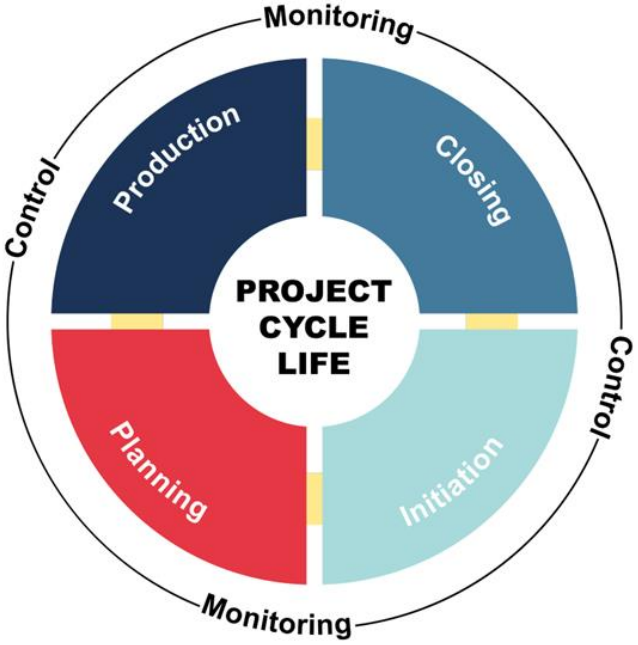


Figure: syahrir – stock.adobe.com

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Excursus (2/3)
Monitoring and evaluation with the help of digital tools

- Visualization aids such as Kanban* boards are often used to organize tasks in a project
- There are now a number of online tools with a collaboration function that take up the concept of visualizing work packages
- Here is a list of popular tools that often offer a free basic version
  - Asana: https://asana.com/
  - Basecamp: https://basecamp.com/
  - Jira Software: https://www.atlassian.com
  - Trello: https://trello.com/
  - Etc.

* Kanban comes from the Japanese and means sign/poster

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Excursus (3/3)
Leadership transformation process (1/2)

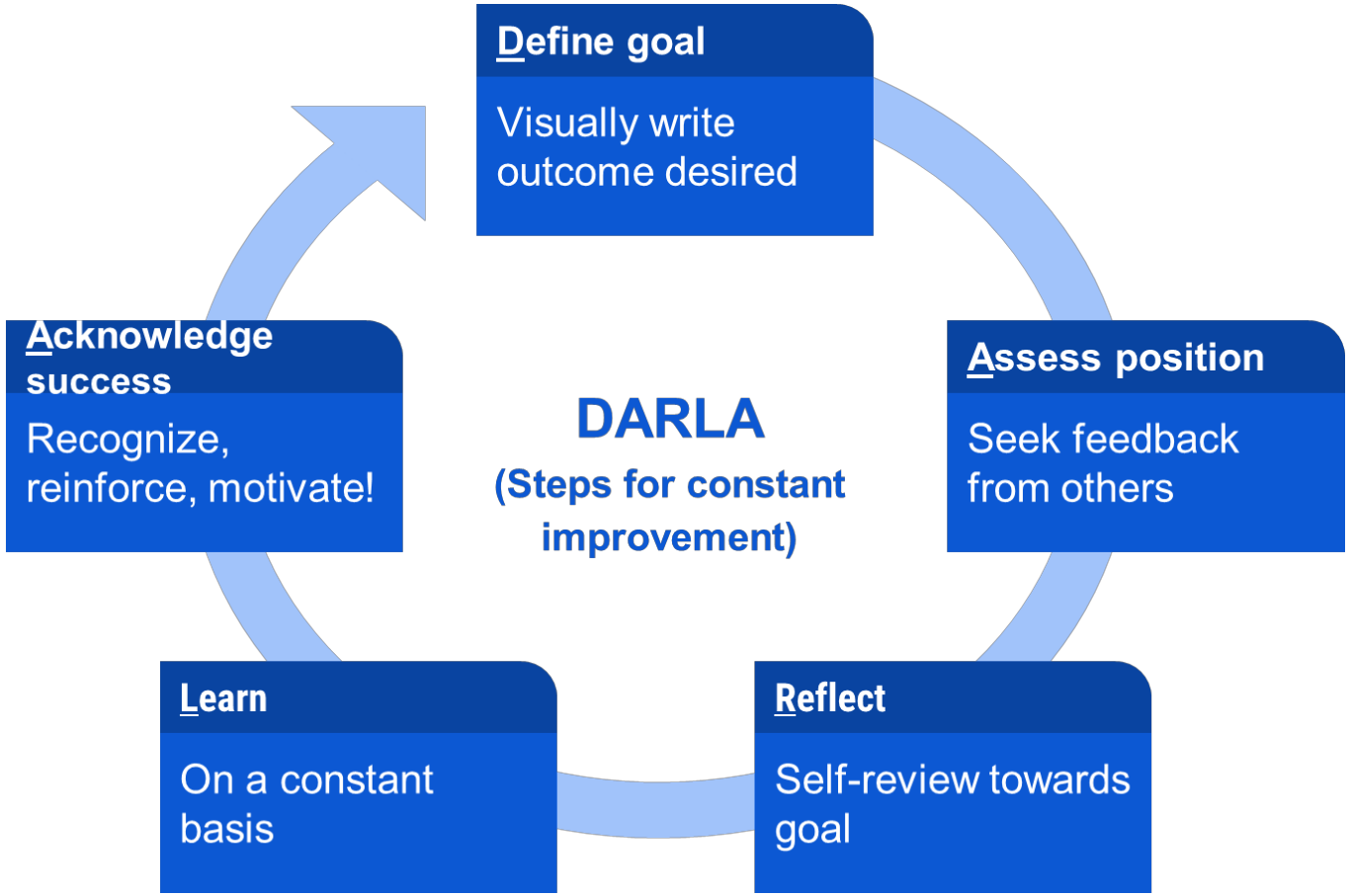


Figure: Own representation according to Agile Leadership Transformation Process

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Excursus (3/3)
Leadership transformation process (2/2)

How to become an agile leader with self-transformation process?

Five simple steps to start your leadership transformation to become a motivating, stimulating and influential leader.

- Two-pronged, for yourself and for your team (i.e. the company)
- As this is a leadership style in which leaders encourage, inspire and motivate their staff to innovate, leaders can bring about change in a way that promotes both their personal growth and that of the team.
- Through this process, leaders can work with their teams beyond their immediate personal interests to identify necessary changes. A vision emerges that guides change through influence and inspiration.

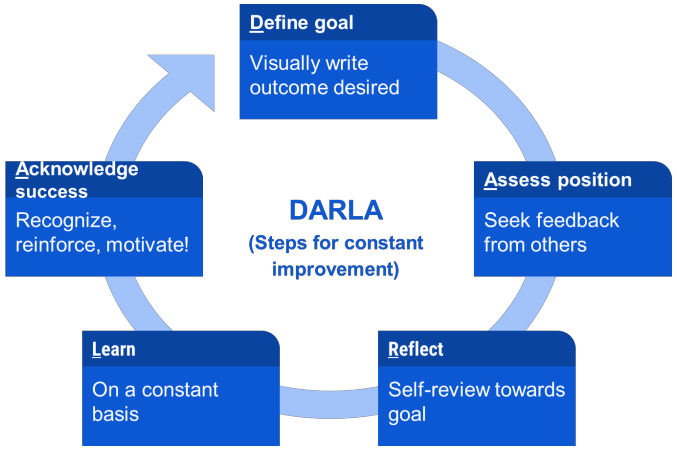


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Module 4
Methods and Tools
"What tools do I have at my disposal?"

Module 4.2
Stakeholder management

18 slides – version September 2023

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Flowchart Toolbox



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"Why a Toolbox?"

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We want to get started right away!



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"What measures can I implement?"

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Next steps
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We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

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Methods & Tools
"What tools are available to me?"



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- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

How to use the toolbox?

The **FlyingLess Toolbox** is a modular collection of content and methods on the topic of reducing air travel.

Depending on the occasion or need, suitable modules or individual modules or individual slides can be selected and used.
The order of the modules is only a recommendation.

Depending on your level of knowledge and interest, you can start with different modules.

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Module 4.2: Stakeholder management

What do I find in this module?

- Project success usually depends on a variety of different actors, which may vary according to interest, power, legitimacy and other factors. Accordingly, it is important to have an overview of relevant actors, to understand their role and to know concrete methods for interacting with them
- Stakeholder management consists of various components, such as stakeholder mapping, stakeholder analysis or concrete participation techniques
- The slides in this module offer concrete methods that can help you with taking the steps for effective stakeholder management

What can I use the module for?

- Find out about core elements of stakeholder management
- Identify relevant tools for different aspects of stakeholder management
- Anticipate opportunities and risks of dealing with different actors

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Actor analysis or stakeholder mapping

- **Description:** Stakeholder analysis is an instrument for identifying groups of actors (stakeholders) and their interests. Stakeholders are persons, organisations and institutions whose interests are affected by the planning and/or implementation of your project. They associate expectations and fears with the project, organise resistance or support and want to be able to exert influence.

- With the stakeholder **analysis** you can identify these relevant stakeholders, their interests and their possibilities to influence the project. From the analysis, you can plan and initiate measures to involve the various stakeholders, utilise any positive effects on processes and process goals, and reduce negative influences on the project.

- **Implementation:** The actor analysis can be carried out alone, in a team or participatively in a workshop and should be updated continually. The first step in the analysis is to identify all relevant stakeholders and actors. In the second step, you classify the stakeholders according to their influence (high/low) and attitude (critical/supportive) in relation to the project and to derive actions. Visualisations are a must for stakeholder analysis (e.g. see the matrix on the right).

Resources

- Hemmati, M., Dodds F., Enayti, J., McHarry J. (2002): "Multistakeholder Processes on Governance and Sustainability", London: Earthscan

- GIZ Cooperation Management in Practice, Shaping Social Change with Capacity WORKS, 2015

- Illustration of a possible representation of the stakeholder map (Power-Interest-Grid according to Freemann, 1984)

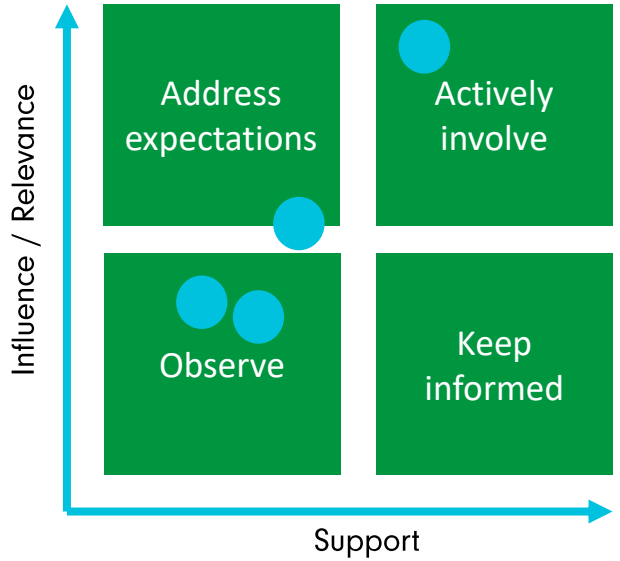


Figure: Own representation based on Freeman (1984): Power and Interest Grid

Freeman, R. E. 1984. Strategic management: A stakeholder approach. Boston: Pitman

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Audience response systems
Simple and fast interaction

- **Description:** Audience response systems (ARS) are interactive tools used to increase audience and speaker interaction in facilitated events or speaking situations.
- **Implementation:** Modern systems are based on the use of smartphones, laptops or tablets and do not require any additional hardware.
- ARSs make it possible to be surveyed even in very large groups, to ask questions to the speakers (and to "vote" if necessary), and to create quick polls.
- Some systems, such as Mentimeter include the option of using quiz games (see the box on the right).

Resources

- Berger, B. and Niedernhuber, T. (2021): Guideline. Use of digital tools in courses: Audience Response Systems. LMU Munich
- Modern audience response system that also includes quiz games: www.mentimeter.com

Berger, B. and Niedernhuber, T. (2021): Guideline. Use of digital tools in courses: Audience Response Systems. LMU Munich

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Large group formats

- **Description:** Large group formats can be used at different points in the change process: At the kick-off to inform and solicit input; in the middle to consult on selected (interim) results; or at specific milestones to bring together and celebrate results.
- The aim is participation of and dialogue within a wide range of actors and stakeholders on the topic at hand. The personal and direct exchange between many different stakeholders facilitates relevant and balanced results and generates support for the topic.
- **Implementation:** The methodological setting of a large group event often consists of parallel break-out groups, in ddition to elements such as lectures or discussions in the plenary, in order to facilitate parallel discussions and the joint development of results. Other large group formats include the World Café, bar camps, and elements from the Open Space process.
- Well-known auditorium response tools such as Mentimeter (www.mentimeter.com) can be used in large group events as well as in workshops for live surveys and quizzes.

Resources

Large group events

- Lipp U. and Will H., (2002): The big workshop book. Conception, staging and moderation of retreats, meetings and seminars. Weinheim, Beltz.
- Walter Bruck, Rudolf Müller (2007): "Wirkungsvolle Tagungen und Großgruppen - Ziele, Wirkfaktoren und Designs", Offenbach: GABAL Verlag

BarCamp

- Muuß-Merholz, J. (2019) Barcamps & Co.: Peer to Peer-Methoden für Fortbildungen, Weinheim, Beltz.

Open Space

- Owen, Harrison, Open Space Technology - A Guide for Practice, Stuttgart, Klett-Cotta, 2001
- Herzog, Isis (1999): Marketplace of Ideas: Open Space Conference. in: managerSeminare, March 99, pp. 93-100

Walter Bruck, Rudolf Müller (2007): „Wirkungsvolle Tagungen und Großgruppen – Ziele, Wirkfaktoren und Designs“, Offenbach: GABAL Verlag

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World Café or Theme Café

- **Description**: The World Café (or the themed café based on it) is an interactive format for involving as many stakeholders as possible in different constellations in the development and discussion of various topics within the framework of an event. It can be used both for large group events and for change workshops in smaller groups.

- **Implementation:** In the World Café format, participants have space to exchange openly and creatively at (standing) tables on a wide range of topics and to develop new perspectives and record them in writing on large sheets of paper.

- The concrete design depends on the number of topics and participants. Example: 5 topics are to be worked on by a total of 30 people. Then, in two hours, a total of 5 rounds of about 20-25 minutes can be held, each group consisting of about 6 people. Each group rotates through all the topics so that everyone can contribute to all the questions. In the theme café variant, the participants only go to one topic of their choice.

- **Important:** For each topic there is a host who brings together the results for each topic at the end.

Resources

- Brown, J. and Isaacs, D. (2007): The World Café. Creative future design in organisations and society. Auer Verlag.

- Lipp U. and Will H., (2002): The big workshop book. Conception, staging and moderation of retreats, meetings and seminars. Weinheim, Beltz.

- Walter Bruck, Rudolf Müller (2007): "Wirkungsvolle Tagungen und Großgruppen - Ziele, Wirkfaktoren und Designs", Offenbach: GABAL Verlag



Figure: @antoonsparis - stock.adobe.com

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Overview - Functions of participation in the change process

How do project management (Module 4.1) and stakeholder management (Module 4.2) fit together?

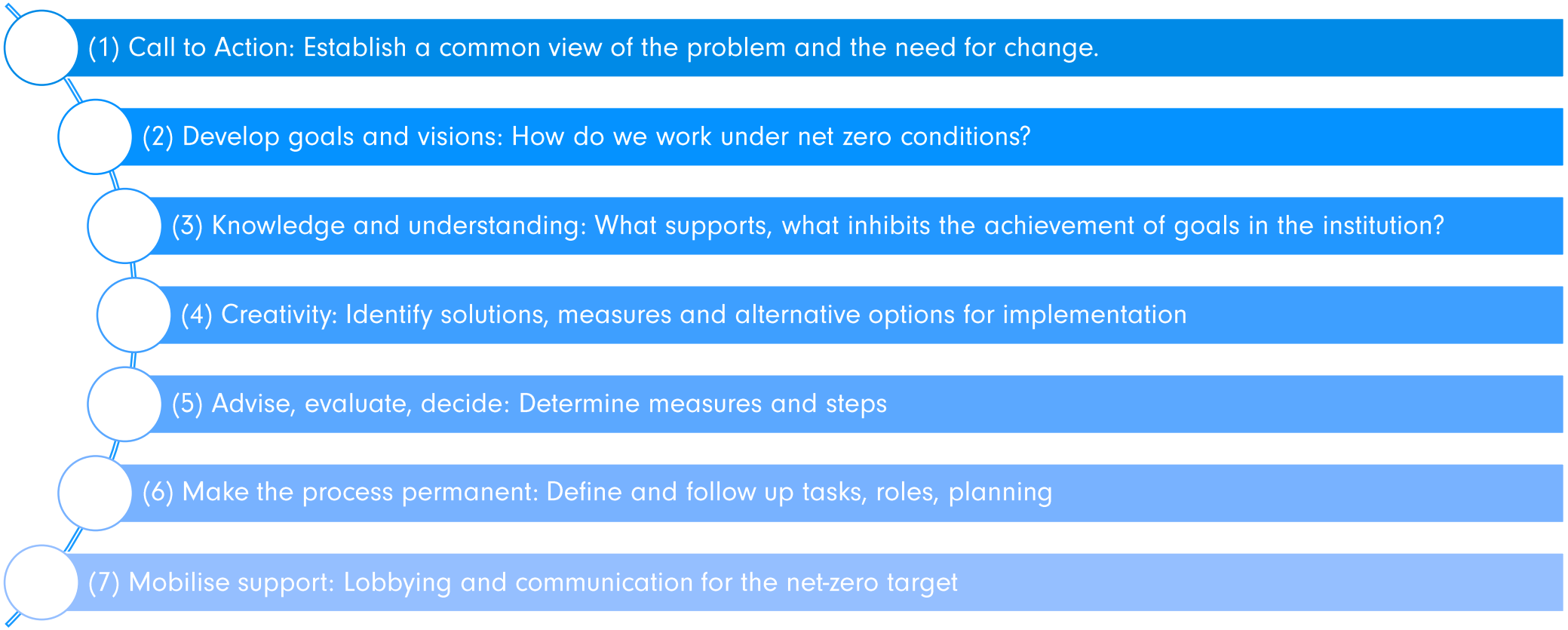


Figure: Own presentation is based on Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Development, implementation and evaluation of strategies in the portfolio of the Federal Ministry for the Environment. Developed as part of the project „Creation of a strategy development guide – analysis and evaluations of strategy understandings, processes and effects in the BMUB division and further development of the 2012 strategy guide" (FKZ 3716 11 702). FFU; Integrative Dialogues. Berlin & Munich.

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(1) Call to Action: Establish a common view of the problem and the need for change

Destination

Get support for the implementation of the change goal from the relevant stakeholders or status groups in your institution.

Approach

A joint elaboration of the topic within the framework of stakeholder workshops creates clarity at an early stage, addresses blockages and enables a common understanding of the need for action.

Methods

Change workshop according to the Metaplan method (facilitated workshop)

Input: films, video, lecture, webinar

Quiz

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(2) Develop goals and visions for a net-zero future

Destination

To get motivated for the change process to net zero, you need compelling images of the future, attractive visions and ambitious goals.

Approach

The participation of relevant actors in the development of attractive visions of the future ensures that the goals are professionally secured. In addition, you can obtain the support and cooperation of all those whose cooperation is ultimately required to achieve the goals.

Methods

Backcasting
(method for strategic future design)

Change workshop according to the Metaplan method (facilitated workshop)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(3) Knowledge and understanding: What supports, what inhibits the achievement of goals in the institution?

Destination

When implementing change processes, rarely is all the necessary knowledge available and known; it must therefore be generated as part of the preparations. This includes both technical content knowledge and knowledge about processes and actors in the field of action. Both are crucial.

Approach

In addition to studies and expert reports, you can also use dialogue formats to generate this knowledge.

Methods

Actor analysis or stakeholder mapping

Change workshop according to the Metaplan method (facilitated workshops)

Force field analysis (tool for the analysis of forces acting on the project)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(4) Creativity: Identify solutions, measures and alternative options for implementation

Destination

Good and sustainable solutions to be implemented by multiple actors require the provision of creative solution spaces where different actors can develop, discuss and evaluate ideas together.

Approach

Workshops with creative formats and minds contribute to thinking outside the usual thought patterns and struggling for solutions.

Note: Problem view and measure generation should be done separately if possible.

Methods

Brainstorming

Large group formats (conferences etc.)

World Café (interactive group discussions)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(5) Advise, evaluate, decide: Determine measures and steps

Destination

In order to arrive at good and secure decisions, it is necessary to develop participatory evaluation standards and to evaluate different options for action.

Approach

Participatory workshops in the run-up to decisions

Methods

Change workshop according to the Metaplan method (facilitated workshops)

Decision matrix (tabular visualisation of decision options)

Consensus procedure (procedure for reaching a common solution in a group)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(6) Make the process permanent: Define and follow up tasks, roles, planning

Destination

If one has been able to actively participate in the development of a plan to implement the measures, the willingness and clarity for implementation is usually significantly higher than without the possibility to participate.

Approach

A half-day planning workshop with all actors relevant for the implementation is a very effective instrument to jointly define viable work plans and binding procedures.

Methods

Change workshop according to the Metaplan method

Kanban method (visualisation of tasks and work processes)

Stand-up meetings (short structured working meetings)

Retrospectives (team reviews for learning experiences and project progress)

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.

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(7) Mobilise support: Lobbying and communication for the net-zero target

Destination

For a successful change process, planned communication with relevant stakeholders is necessary so that the process is filled with life and leads to the desired change in your institution.

Approach

Participatory tools are used here to mobilise supporters, to build up a network within and, if necessary, also outside your institution and to multiply results.

Methods

Awards for individuals, teams, organisational units

Expert: internal hearings, fireside chats

Large group formats and conferences

Marketing, PR & Communication

Jacob, Klaus; Graaf, Lisa; Büttner, Hannah (2018): Entwicklung, Umsetzung und Evaluation von Strategien im Geschäftsbereich des Bundesumweltministeriums. Erarbeitet im Rahmen des Vorhabens „Erstellung eines Strategieentwicklungsleitfadens – Analyse und Auswertungen der Strategieverständnisse, -prozesse und -effekte im Geschäftsbereich BMUB und Weiterentwicklung des Strategieleitfadens von 2012“ (FKZ 3716 11 702). FFU; Integrative Dialoge. Berlin & München.
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About FlyingLess

The aim of the FlyingLess project is to support universities and research organisations in reducing air travel, which causes a significant part of their total greenhouse gas emissions.

FlyingLess develops approaches to reduce air travel in the academic sector, which are implemented at different levels (research, teaching and administration).

The project is being carried out in close cooperation with four pilot institutions - EMBL (EuropeanMolecular Biology Laboratory) and MPI Astronomy in Heidelberg as non-university research institutions and the Universities of Konstanz and Potsdam as universities.

Further information can be found on the website www.flyingless.de.

The project is being led by ifeu Heidelberg in close cooperation with the TdLab Geography at the Institute of Geography at Heidelberg University.

The project is funded over 3 years as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Protection.

Contact

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susann.goerlinger@ifeu.de

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www.flyingless.de/en/

Twitter
@FlyingLess_de

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Module 4
Methods and Tools
"What tools do I have at my disposal?"

Module 4.3
Strategy development

22 Slides – version September 2023

Dr. Maximilian Jungmann, Momentum Novum
with contributions by Hannah Büttner (Methods), Integrative Dialogues

ifeu INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

Toolbox content

1 **Module 1** Introduction: "Why a Toolbox?"

2 **Module 2** Checklist: "Where do we stand?"

3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4 **Module 4** Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5 **Module 5** Measures: "What measures can I implement?"

6 **Module 6** Next steps: "Where do we go from here?"

Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Travel reasons**
- 3.3 **Framework conditions**
- 3.4 **Success factors & Stumbling blocks**
- 3.5 **Sufficiency**

Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

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Module 4.3: Strategy development

What do I find in this module?

- With net zero setting the tone, work in the future aims to meet climate targets while being attractive to talent
- This module addresses different methods for strategy development to reach net-zero targets while appealing to workers and helping them achieve their own goals
- In principle, strategies can be developed both individually or collaboratively in small groups or large teams
- Due to the need for transdisciplinary approaches in the context of flight travel reduction, the slides in this module focus on interactive strategy development methods.

What can I use this module for?

- Apply lessons-learned within the framework of a transformation workshop
- Develop a concrete and, if possible, attractive scenario of what science can look like under net-zero conditions in your institution / status group / organisational unit in 2030 and what co-benefits will be possible as a result of these conditions
- Jointly and creatively develop solutions and action points to achieve the desired scenario

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Knowledge and understanding:
What supports, what inhibits the achievement of goals in the institution?

Destination

When implementing change processes, all the necessary knowledge is rarely available and known; it must therefore be generated as part of the preparations. This includes both technical content knowledge and knowledge about processes and actors in the field of action. Both are crucial.

Approach

In addition to studies and expert opinions, you can also use dialogue formats to generate this knowledge

Methods

Actor analysis or stakeholder mapping

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Force field analysis (tool for the analysis of forces acting on the project)

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Creativity:
Develop solutions, measures and alternative options for implementation

Destination

Good and viable solutions to be implemented by multiple actors require the provision of creative solution spaces where different actors can develop, discuss and evaluate ideas together

Approach

Workshops with creative formats and minds help to think outside the usual thought patterns and to strive for good solutions.

Note: The problem view and the generation of measures should be carried out as separately as possible.

Methods

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Mobilise support:
Lobbying and communication for the net zero target

Destination

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Approach

Participatory tools are used here to mobilise supporters, to build up a network within and, if necessary, also outside your institution and to multiply results.

Methods

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Expert: internal hearings, fireside chats

Large group formats and conferences

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Co-creation

- **What it's all about:** Co-creation approaches aim to involve as many different stakeholders as possible in strategy development.
- **Implementation:** Engagement platforms provide a foundation for working together effectively and creatively; similar to design thinking, user perspectives should be given first priority.
- In the strategy process, different techniques can be used to move from ideas to concrete implementation, including problem analyses, goal comparisons and bottlenecks, and joint development of roadmaps.

Resources

- Meinel, C., Leifer, L. (2012). Design Thinking Research. In: Plattner, H., Meinel, C., Leifer, L. (eds) Design Thinking Research. Understanding Innovation. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-21643-5_1
- Gekeler, M., Friedrich-Ebert-Stiftung India Office (Ed.) (2019). A practical guide to design thinking A collection of methods to re-think social change. Online at: https://library.fes.de/pdf-files/bueros/indien/15404-20190508.pdf

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Scenario workshops

- **What it's about:** Scenario workshops are used to look at alternative future development paths and their implications for strategy development.
- **Implementation:** Unlike foresight, the scenario process does not start with current trends, but defines core uncertainties through an environment analysis and factor assessment, which are used to construct concrete scenarios in a future year.
- Based on core uncertainties, scenarios are drawn up and then narrated from the future year back to the present, something called backcasting.

Resources

- Meinel, C., Leifer, L. (2012). Design Thinking Research. In: Plattner, H., Meinel, C., Leifer, L. (eds) Design Thinking Research. Understanding Innovation. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-21643-5_1
- Gekeler, M., Friedrich-Ebert-Stiftung India Office (Ed.) (2019). A practical guide to design thinking A collection of methods to re-think social change. Online at: https://library.fes.de/pdf-files/bueros/indien/15404-20190508.pdf

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Backcasting and methods of future exploration

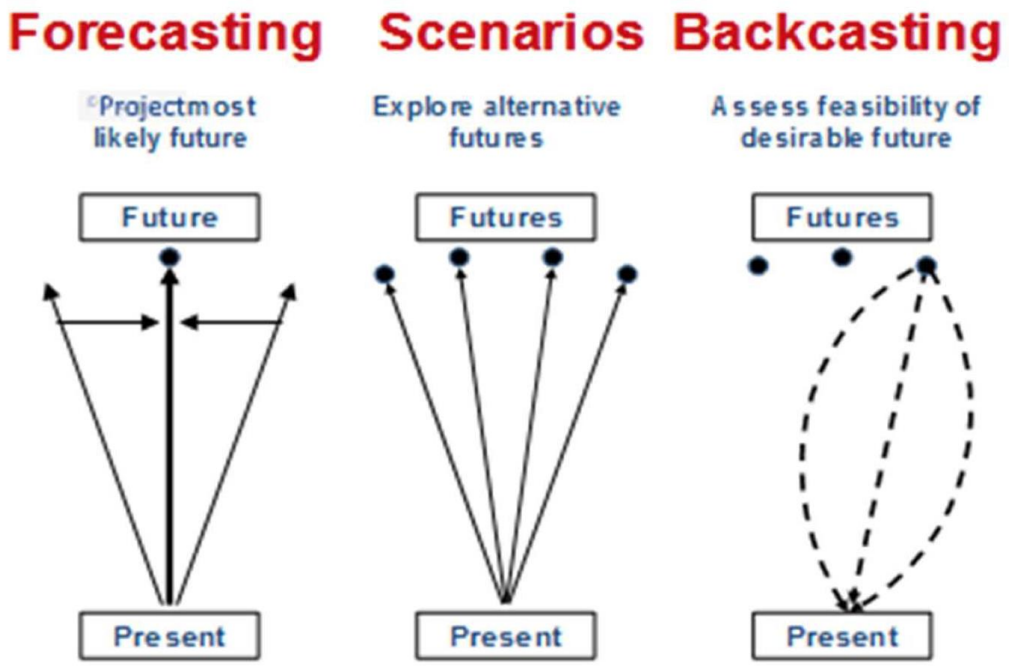


Figure 1: Main distinctive characteristics of forecasting, scenarios and backcasting (Robinson, 2011)

Method

Unlike forecasting (looking ahead) or scenario development (developing alternative futures), backcasting is about looking back from the desired future and asking: how did we manage to achieve the goal?

Further information on methods → Module 5.2

Image: Used with permission of Elsevier Science & Technology Journals, from Robinson, J., Burch, S., Talwar, S., O'Shea, M. and Walsh, M., 2011. Envisioning sustainability: Recent progress in the use of participatory backcasting approaches for sustainability research. Technological Forecasting and Social Change, 78(5); permission conveyed through Copyright Clearance Center, Inc.

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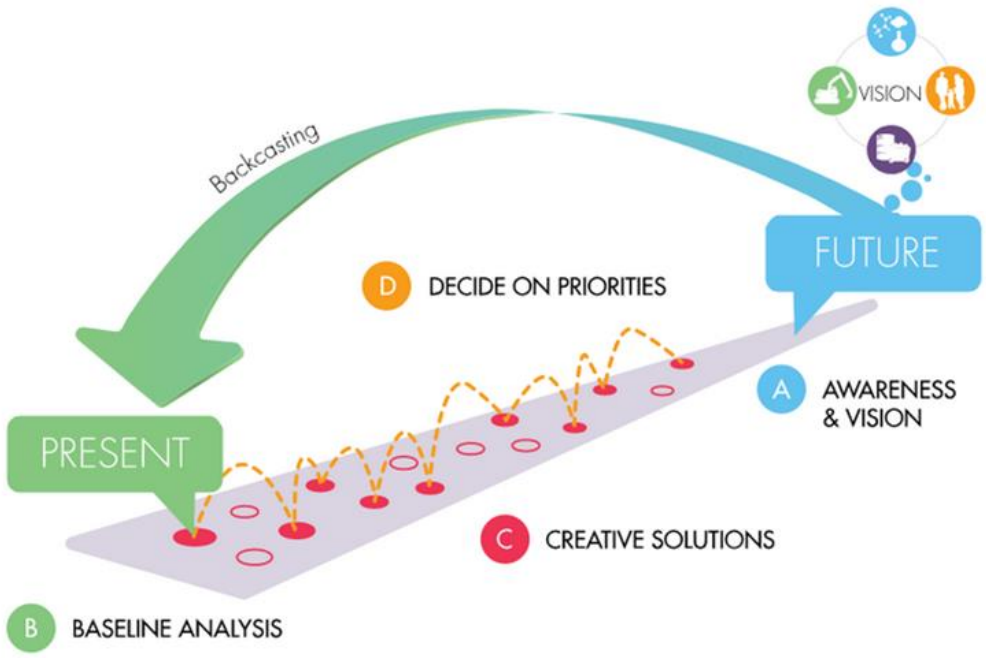
Quick Guide to Backcasting for a Stakeholder Workshop

- **What it´s all about:** attractively painting the future to be achieved (here: 2030 and net zero has been reached) and then looking back to develop creative solutions together.
- **Imagine: "It is the year 2030 and we are working under net zero conditions".**
  - What does this work look like?
  - How have we managed? How did we manage to be successful internationally and reduce our flights?
  - What steps have we taken? What helped us in the process?
  - What co-benefits have we discovered?

- **Format:** Facilitated metaplan workshop, with visualisation, approx. 2 hours
- **Step 1:** Concretise the desired future (individually, all) and communitise ("mosaic, collage") Format: individual work and sharing in small groups
- **Step 2:** Backcasting: How did we achieve the desired future? Format: Small groups (approx. 5-7 people) develop ideas
- **Step 3: P**lenary discussion: What measures and solutions have we found? Prioritise if necessary
- **Step 4:** Save results, draw conclusions and agree on next steps

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Backcasting and methods of future exploration



Resources

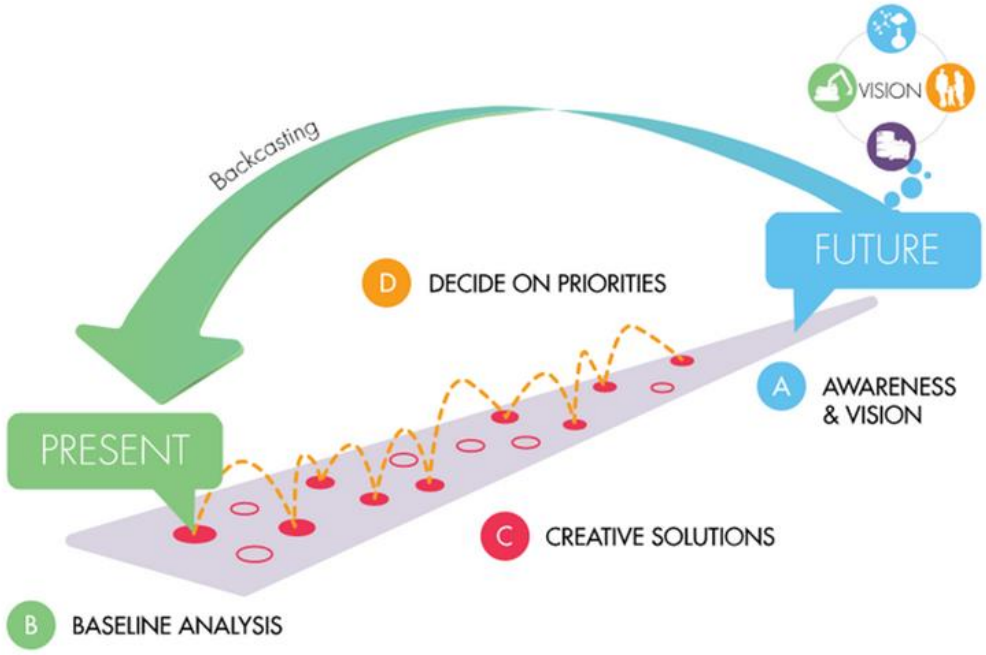
- Dreborg, Karl (1996). Essence of backcasting. Futures, 28, 813-828
- Funcke, Amelie and Havenith, Eva (2019) View from the Future. In: Facilitation Tools. Manager Seminare Verlag
- Government Office for Science (2017, November). The futures toolkit: Tools for futures thinking and foresight across UK government, 68-73.
- Kosow, Hannah, Gaßner, Robert et al. (2008) Methoden der Zukunfts- und Szenarioanalyse Überblick, Bewertung und Auswahlkriterien. Institute for Futures Studies and Technology Assessment, Workshop Report No. 103

Quick guide: See module 3.2

Figure: The Natural Step (https://www.thenaturalstep.org/), License: CC BY-NC-SA 4.0

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Visualisation of backcasting in the stakeholder workshop



Notes

Use large metaplan walls with enough space and large PostIts. Work in a room with plenty of space, also on the walls.

Steps for visualisation

- Formulate the challenge for achieving the goal: "How might we...?"
- Add contextual information and "paint" the future scenario vividly.
- Timeline from now to 2030.
- Distinguish between different fields of action or organisational units, if applicable.
- Creative discussion: Who can do what and when to achieve the goal? Writing on PostIts.
- Record the most important take-aways and next steps. Save the results!

Figure: The Natural Step (https://www.thenaturalstep.org/), License: CC BY-NC-SA 4.0
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Change Workshop with the Metaplan method

- **Description:** The Metaplan method enables all participants to actively participate and that a common result is produced and documented transparently for all. This leads to creativity, shared understanding, clarity and transparency as well as "ownership" of the results by all participants.
- **Implementation:** The core of the Metaplan method are moderated workshops in which the jointly developed results are structured, visualised and, if necessary, prioritised on moderation walls.
- Visualisations such as the decision matrix or the Wall of Work are used here.
- In contrast to pre-formulated texts, a metaplan workshop thus enables joint structuring and penetration of a topic from the very beginning and with that active participation.

Resources

- Lipp U. and Will H., (2002): Das große Workshop-Buch. Konzeption, Inszenierung und Moderation von Klausuren, Besprechungen und Seminaren. Weinheim, Beltz.
- Ovist-Sorenesen, O. and Basstrup, L. (2020) Visual Collaboration, A powerful toolkit for improving meetings, projects and processes. Wiley
- Seifert, Josef W. (2009): "Visualisieren Präsentieren Moderieren", 27th edition, Offenbach: GABAL Verlag
- Stolzenberg K. and Heberle K., (2006): Change Management Veränderungsprozesse erfolgreich gestalten – Mitarbeiter mobilisieren, Springer Verlag, Berlin.

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Decision matrix (visualisation)

- **Description:** The decision matrix supports a group to deliberate and decide together and transparently on a choice of different solution options.
- **Implementation:** The decision is divided into two parts: first, criteria are collected and, if necessary, their weighting is also defined. In the second step, all stakeholders can score the options against the criteria.
- The application takes place in change workshops with corresponding visualisation of the options and criteria.

Resources

- Lipp U. and Will H., (2002): The decision matrix. In: The big workshop book. Conception, staging and moderation of retreats, meetings and seminars. S. 120ff Weinheim, Beltz.

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Individual reflection: journaling, dialogue walk, triad exchange

- **Description:** Individual reflection either in writing (journaling) or in small dialogues (in groups of three) supports personal understanding of the topic and prepares the discussion of further steps, e.g. in the context of a change workshop.
- **Implementation:** The participants are given 5-10 minutes to take notes on a key question. Afterwards, they are asked to discuss their findings in small dialogues of about 10 minutes (depending on the target group and the task, longer if necessary and in so-called walking dialogues, i.e. two people take the question with them on a 20-30 minute walk in nature).
- **Procedure:** Person A speaks about himself, person B listens attentively. Then switch. Important: No discussion, no advice or similar.
- **Variation:** The so-called triad, i.e. exchange in threes.
- The results are always treated confidentially and are only brought to the plenary session at the participants' own request.

Resources

- Cornelia Andriof, Praxisbuch für wirksame Veränderung - mit der Theorie U arbeiten, 2021 Springer Gabler Berlin, Heidelberg
- Peter Senge, Otto C. Scharmer et. Al. Presence - Exploring Profound Change in People, Organisations and Society. 2005, Boston



Figure: 지은 이 - stock.adobe.com

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Consensus procedure - Deciding on solutions together

- **Description:** Consensus (with a "t" at the end) is a special type of decision-making in a group. Unlike other forms of decision-making (autocracy, democracy or voting), it is not based on the agreement of one or more people FOR something, but on the fact that no one has a serious argument AGAINST it.
- **Implementation:** In the process of consensus, possible solutions to a problem (tension) are considered with all participants. In this process, drafts and change requests can be introduced, which are discussed and tried out. In detail, 7 steps are required (see diagram on the right), but with a little practice they will go quickly. It is best to try it out with something simple!
- If no one in the group has a serious argument against this solution that cannot be dispelled, the solution is considered accepted, i.e. a decision has been reached. If an argument cannot be eliminated, the decision is against this solution.
- In this way, all those involved at least indirectly give their consent to a solution and decisions can - with a little practice - be brought about more quickly and inclusively.

Resources

- Robertson, Brian J. (2016) Holacracy. A revolutionary management system for a volatile world. Vahlen Franz GmbH
- www.soziokratie.org

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Force field analysis

- **Description:** The force field analysis is intended to work out the factors that can support or hinder an upcoming project. The force field analysis is used when there are problems in the implementation of a project, the causes of which are to be identified and dealt with. A change process is pending and the relevant influencing forces are to be localised in advance in order to be able to use or prevent them effectively.
- **Implementation:** The force field analysis can be developed alone or also participatively in a team. Visualisation is also important here (see example). First, the forces are identified and presented according to their strength (scale of 1 and 5).
- Based on this, approaches are developed to activate the supporting forces and reduce the opposing forces as much as possible.

Resources

- Trebesch, K. (2005): "Force Field Analysis. Toolbox for consultants and change managers." In: Organisational Development 3/2005, p. 78-81

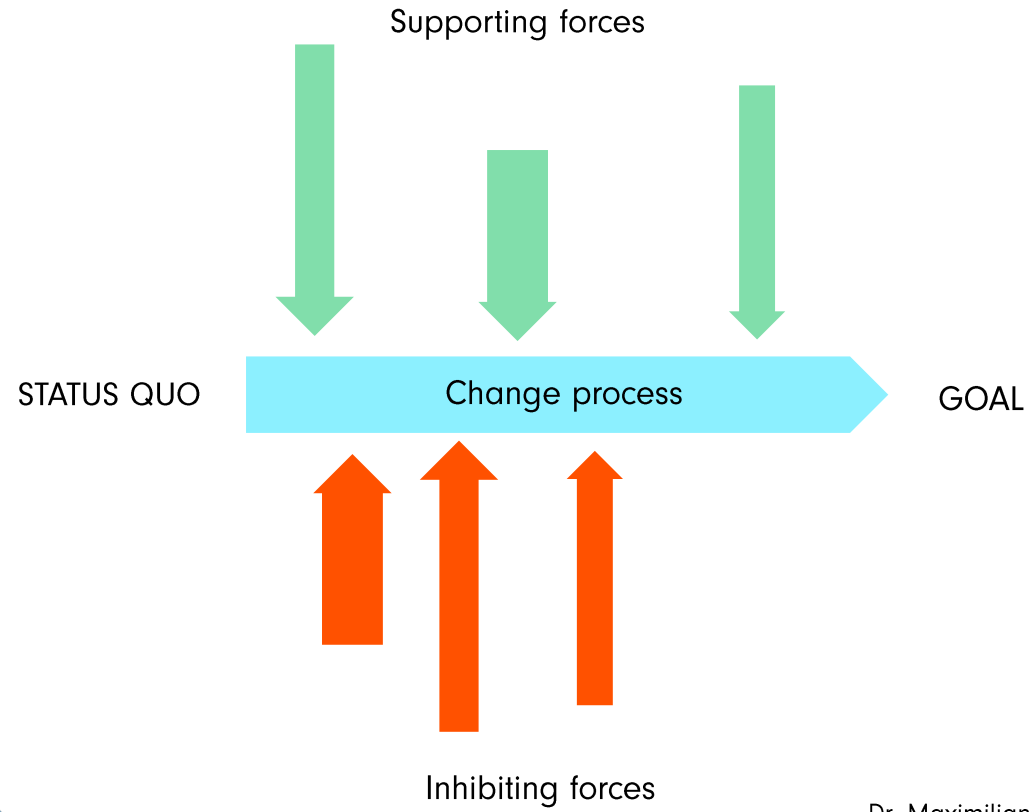


Figure: Own representation based on Trebesch, K. (2005): „Kräftefeld-Analyse. Werkzeugkiste für Berater und Change Manager." In: Organisationsentwicklung 3/2005, S. 78-81

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Make and keep agreements

What it's about: Securing results and agreements at the end of a workshop

Labour issues:

- Who does what until when?
- What or who do we need for this?
- How do we deal with it when it doesn't happen?

Reflection:

- How can we integrate the agreements into our existing work processes?

Methods

Change workshop, ½ h at the end of the event

- Kanban method: secure results and structure further teamwork, visualise project progress transparently

Ongoing:

- Stand-up meetings
- Retrospectives: monitor project progress and integrate experiences

Further information on the methods → Module 5.2

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Create demand - increase commitment - create visibility

What it´s about: Use or create a regular (e.g. annual) event where the results of the monitoring can be used and discussed and, if necessary, the goals and measures can be adjusted.

Working questions in the workshop:

- Which – already existing – occasions, formats or events in our institution can we use for the change process?
- Shall we start a new event?

Methods

- Awards of persons, work units, teams or similar that are sucessful in flying less.
- Large group events
- Surveys, if necessary live e.g. with audience response systems
- Quiz (quick and easy to implement, also for large groups with audience response systems)

Further information on the methods → Module 5.2

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About FlyingLess

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Module 5
Measures
"What measures can I implement?"

20 Slides – version September 2023

Dr. Susann Görlinger, Project Manager FlyingLess, ifeu Institute

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TdLab GEOGRAPHIE

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

NATIONALE KLIMASCHUTZ INITIATIVE

aufgrund eines Beschlusses des Deutschen Bundestages

Toolbox content

1 **Module 1** Introduction: "Why a Toolbox?"

2 **Module 2** Checklist: "Where do we stand?"

3 **Module 3** Backgrounds & Arguments: "What backgrounds should I know?"

- **3.1** Relevance
- **3.2** Travel reasons
- **3.3** Framework conditions
- **3.4** Success factors & stumbling blocks
- **3.5** Sufficiency

4 **Module 4** Methods & Tools: "What tools are available to me?

- **4.1** Project management
- **4.2** Stakeholder management
- **4.3** Strategy development

5 **Module 5** Measures: "What measures can I implement?"

6 **Module 6** Next steps: "Where do we go from here?"

Flowchart Toolbox



Module 1
Introduction
"Why a Toolbox?"

Module 2
Checklist
"Where do we stand?"

We want to get started right away!



Module 5
Measures
"What measures can I implement?"

Module 6
Next steps
„Where do we go from here?"



We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

- 3.1 **Relevance**
- 3.2 **Reasons for travelling**
- 3.3 **Framework conditions**
- 3.4 **Success factors & Stumbling blocks**
- 3.5 **Sufficiency**

Module 4
Methods & Tools
"What tools are available to me?"



- 4.1 **Project management**
- 4.2 **Stakeholder management**
- 4.3 **Strategy development**

How to use the toolbox?

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Depending on your level of knowledge and interest, you can start with different modules.

The FlyingLess logo and the link to the website (www.flyingless.de) should remain on the slides.

On some slides, questions that can be discussed in the institution are listed in green.

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Module 5: Concrete measures

What do I find in this module?

› This module presents a diverse range of measures

What can I use this module for?

› From the list of measures, the organisation can choose the ones that are suitable for them

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General

- There are a number of measures to reduce flight emissions
- These can be classified according to various criteria, e.g. the framework conditions, the target groups or the purposes of the journey
- The following slides list possible measures with regard to the internal and external framework conditions
- However, the listing can be varied and used according to any criteria

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What are the general conditions regarding travel?

- Framework conditions enable or set limits and thus influence travel decisions in the academic sector
- Framework conditions can be shaped and changed (to varying degrees)
- Framework conditions can be differentiated according to:
  - Internal framework conditions: what can be influenced by the organisation
  - External framework conditions: outside the direct sphere of influence of the organisation, can be influenced indirectly
    - Politics
    - Funders
    - Conference organisers
    - Ranking agencies

→ *see Guideline* Measures to reduce flight emissions*

*https://doi.org/10.5281/zenodo.7848954

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Measures: Changing the internal framework conditions

Overview

1. **Institution:** Institutional anchoring and support, emissions data, travel policy, carbon tax, carbon budget, tools, VC, working groups, evaluation criteria, regulations, curriculum development

2. **Individual:** considered travel decisions, virtual options, bundling of activities

Guideline Measures to reduce flight emissions, further information on the website www.flyingless.de
https://doi.org/10.5281/zenodo.7848954

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Measures: Changing the internal framework conditions

1. The following measures can be implemented within an **institution** (1/3)

- Institutional **anchoring, responsibility and support** at various levels, especially through the management
- Quantitative **reduction target**
- Introduction of a **carbon tax** (levy per tonne of CO_2) and/or a carbon budget (determination of how much CO_2 may be generated by air travel)
- Establishment of a **monitoring system** for the continuous recording of the institution's flight emission data in the form of:
  - Evaluation and graphical representation of flight emissions (emissions per unit (group, institute, department, faculty), comparison of emissions of different status groups, emissions per travel purpose, total and per full-time equivalent, etc.).
  - Decide who gets access to emissions data, when and how, and what level of transparency is required and possible.

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Measures: Changing the internal framework conditions

1. The following measures can be implemented within an **institution** (2/3)

- Provision of **information and tools** (factsheets, guidelines, travel decision tool, travel decision tree, best practices, etc.)
- Initiation of **awareness-raising measures**, activation of **multipliers** as well as identification and support of role models
- Extended options for **videoconferencing** (infrastructure, technical support and training on how to present or exchange virtually). Here it is worth distinguishing between:
  - virtual meetings in small settings (bilateral, project teams)
  - the organisation of virtual workshops and conferences (lasting several days; with up to several hundred participants)

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Measures: Changing the internal framework conditions

1. The following measures can be implemented within an **institution** (3/3)

- **Requirements in the travel guidelines for flights (see also FlyingLess Guideline*)**
- Adjustment of the **evaluation and appointment criteria** (e.g. research collaborations in the close environment should have as much weight as collaborations with overseas)
- Consideration of flight emissions in **curriculum development** (e.g. excursions to regions that can be reached without air travel).
- Review and adaptation of **regulations with regard to** ecological impact
- Quantitative analysis of **scenarios** (with the help of the monitoring system) to estimate which measures could have which reduction effect (e.g. no business flights)
- **Presentation of the topic of** reducing emissions from air travel on the institution's website (if possible with continuously updated figures)
- Formation of **think tanks** within the institution to discuss difficulties, new ideas and best practice examples

*https://doi.org/10.5281/zenodo.7848954

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Measures: Changing the internal framework conditions

2. The following measures can be implemented by **individuals**

- Doctoral examinations/speakers/examiners: preferably by **video** (alternatively: choose European co-examiners)
- **Virtual** presentations
- **Weighing** the need to travel, especially for long-haul flights
- **Bundle and combine** different travel activities
- Choice of **direct flights** and **more efficient airlines**
- Choice of (more) **local** collaboration partners and local conferences (as participants and organisers)
- Biennial (instead of annual) intercontinental conference visits
- Deciding **who (still) needs to travel** (young scientists or established scientists?)
- **Train instead of flight** for short and medium haul

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Measures at different levels

This list shows some examples that should be supplemented depending on the institution

Management level

- Quantitative reduction targets
- Introduction Carbon Tax and/or Carbon budget
- Adapt evaluation/appointment criteria
- Guidelines (e.g. travel guidelines)
- .....

Administration

- Structure monitoring system
- Provision of information and tools
- Provision of Travel Decision Tool
- Expansion of virtual and hybrid conferences
- .....

Research

- Choice of cooperation partners according to geographical proximity, among other things
- Virtual exchange formats
- Bundle travel occasions
- Use scenarios to reduce emissions
- .....

Teaching

- Sustainability in the Curriculum
- Local projects
- Excursions: choose local places, travel by train
- Consideration of flight emissions in curriculum development
- .....

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Measures to change the internal framework conditions

- Where are the reduction levers in your organisation, where do most emissions occur?
- Which existing framework conditions could be changed in the short term, which in the medium term?
- What new measures need to be introduced?
- How do you motivate individuals to reduce their flights? What incentives, what disincentives are there?
- Are the measures differentiated according to, for example, status group, research area, frequent flyer or do all measures apply equally to everyone?

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Measures to change the external framework conditions
Overview

1. **Funding organisations:** adaptation of evaluation criteria, estimation of emissions in applications and final report, specifications (carbon tax, carbon budget), limitation of flights, (additional) costs of train, VC, equivalence of **virtual and face-to-face meetings**
2. **Conference organisers:** virtual and hybrid formats, multi-hub conferences, multi-year conferences, central venues
3. **Ranking agencies:** GHG emissions as a ranking factor
4. **Politics:** guidelines (changes discussion from "if" to "how")

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Measures to change the external framework conditions

1. Funding organisations

Who in your organisation can influence funders to change the requirements for project proposals (comparable to existing requirements such as open source, number of publications listed, gender aspects, etc.):

- Estimate GHG emissions in proposals and final report, at least for trips that have the greatest impact
- Limitation (based on CO_2 emissions or number of flights) of intercontinental flights
- Limiting flights in general or introducing a CO_2 budget
- Number of proposed conference visits should not be taken into account in the evaluation, possibly limit the listing of conference contributions (e.g. top 5).
- Include sustainability aspects in evaluation criteria (especially flight emissions)
- Special contributions for additional costs of train journeys
- Funding of virtual infrastructure possible (also for partner organisations)
- Requirements that some of the project meetings must be accessible by train and/or virtual; hybrid meetings as an alternative
- Equivalence of the reputation of virtual and face-to-face presentations

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Measures to change the external framework conditions

2. Conference organisers

If you are involved in organising conferences, which of these aspects can you influence or set new standards?

- Hybrid formats as standard
- Multi Hub Conferences
- Purely virtual conferences (possibly alternating with presence or hybrid conferences)
- Biennial conferences
- Choose resourceful, centrally located conference venues

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Measures to change the external framework conditions

3. Ranking agencies

Influence ranking agencies to make institutions' greenhouse gas emissions (including aviation emissions) one of the ranking factors

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Measures to change the external framework conditions

4. Politics

Who in your organisation can influence governments to introduce rules and targets such as quantitative reduction targets, carbon budget, carbon tax and reporting?

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Contact

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Module 6
Next steps
"Where do we go from here?"

13 slides – version September 2023

Dr. Maximilian Jungmann, Momentum Novum

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Flowchart Toolbox



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We want to get started right away!



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We want to know more!



Module 3
Backgrounds & Arguments
"What background should I know?"

Module 4
Methods & Tools
"What tools are available to me?"



- 3.1 **Relevance**
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Module 6: Next steps

What do I find in this module?

- The module provides an overview of further possible steps to drive the transformation process forward and implement changes permanently.

What can I use the module for?

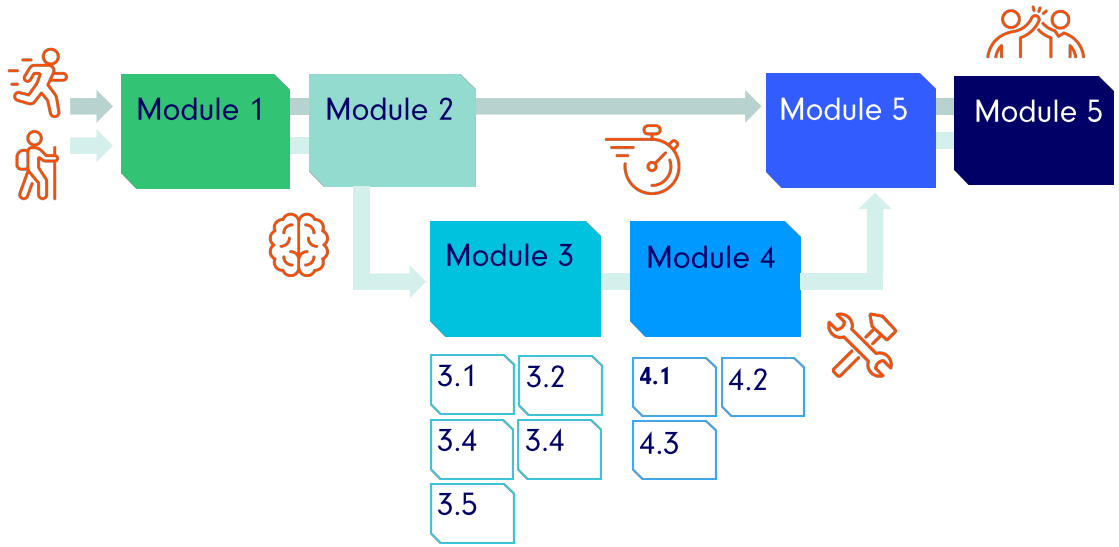
- Move from talk to action in workshops and meetings.
- Mobilise momentum and support for the change process.
- Increase commitment and create visibility for the issue.

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Evaluation

Step back: Flowchart - Where do we stand?



Check critically again using the flowchart:

- Where do we currently stand?
- Which steps have we already completed? Which measures have been implemented?
- Which steps may have to be repeated / processed again?
- Where are the actors involved?
- Which steps cause difficulties?
- Where do we need further support?

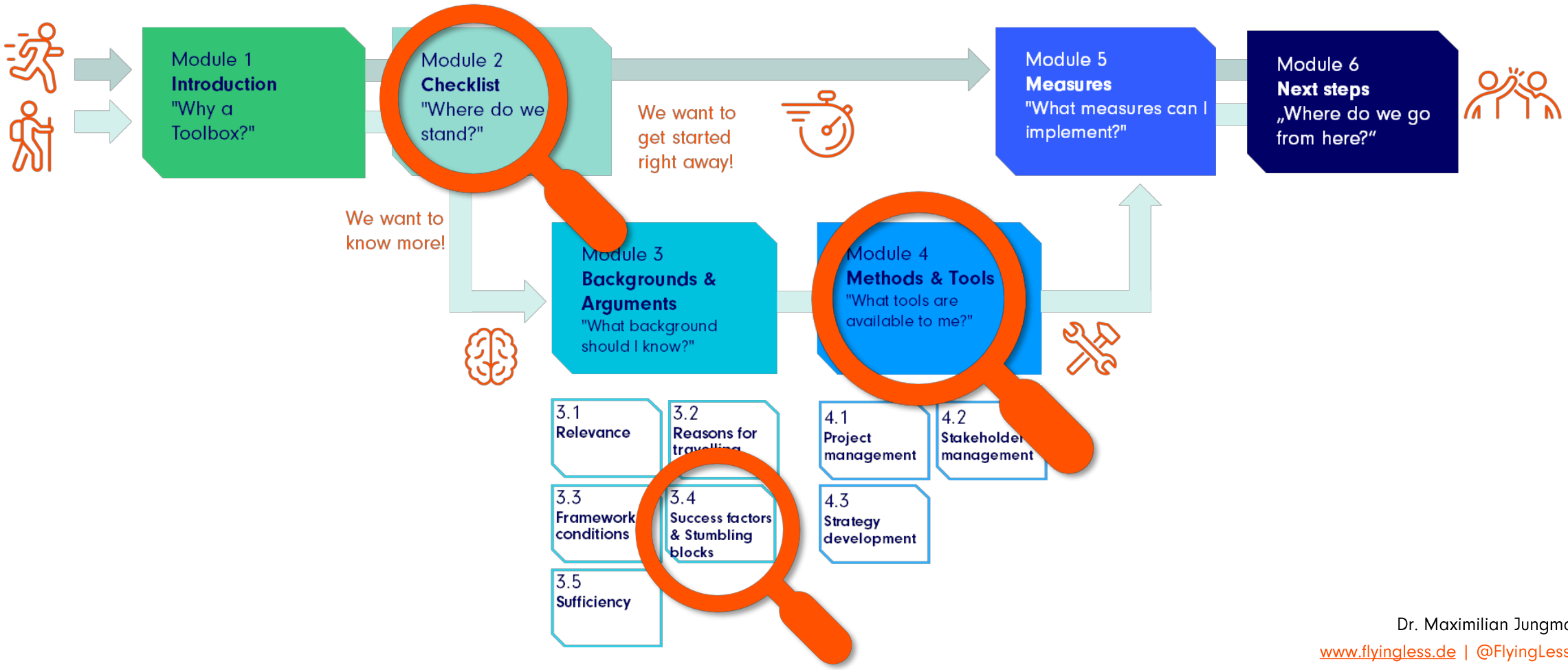
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Evaluation

Step back: Flowchart - Where do we stand? Zoom in again!

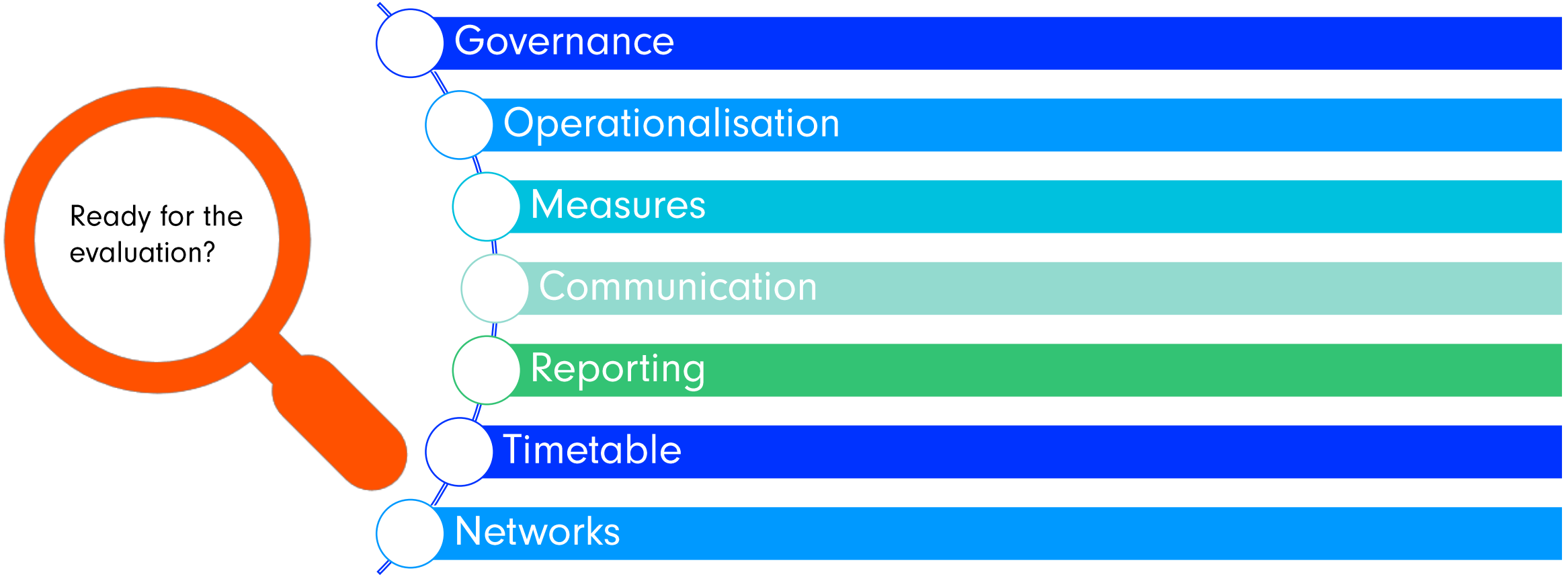


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Evaluation

Step back: Flowchart - Where do we stand? Zoom in again!



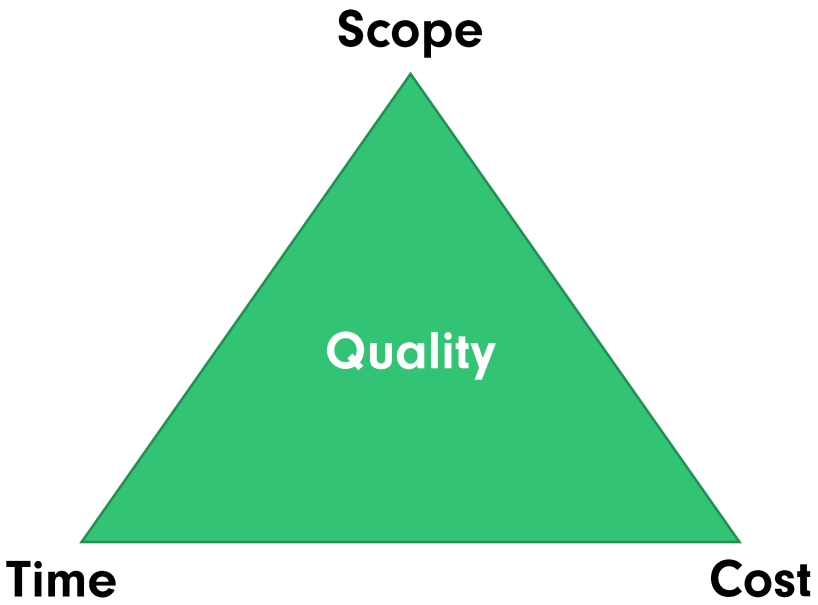
Graphic: Own illustration, Momentum Novum.

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Evaluation

Step back - Take a step back and evaluate the project process



Projects are implemented within the following 3 framework conditions and in terms of quality:

1. **Costs**
2. **Time**
3. **Purpose**

These are followed by the allocation of resources.

› Is it still suitable? What adjustments need to be made?

Graphic: Own illustration based on „The Traditional Project Management Triangle" by Cobb, C. G., (2011): Making sense of Agile Project Management: Balancing Control and Agility. Jhon Wiley & Sons, Inc., Hoboken, New Jersey.

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Evaluation

Evaluation and review (1/2)

- Monitor progress (create / review milestone plan; Gantt chart)
- Monitor costs
- Respond to risks and problems in the process (adjust milestones?)
- Consider abandoning tasks
- How do you track progress? (Interim evaluation? Reporting?)



Graphic: Own illustration based on Cobb, C. G., (2011): Making sense of Agile Project Management: Balancing Control and Agility. Jhon Wiley & Sons, Inc., Hoboken, New Jersey.

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Evaluation

Evaluation and review (2/2)

- Have we fulfilled the plan?
- What was good? → Repeat.
- What was bad? → Avoid/improve
- What could be done differently? → What might not have happened.

This is a must! → Avoid excuses

- No time for implementation
- Too many other to-dos
- Process too costly
- …



Graphic: Own illustration based on Cobb, C. G., (2011): Making sense of Agile Project Management: Balancing Control and Agility. Jhon Wiley & Sons, Inc., Hoboken, New Jersey.

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Evaluation

Wrap up! Line underneath!

Conclusion

- What have we learned?
- What do we (still) need for effective project management and implementation?
- Which tools, if any, will we use in other projects?
- What are the success factors that have brought us forward?
- What potential obstacles remain and need to be addressed?

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About FlyingLess

The aim of the FlyingLess project is to support universities and research organisations in reducing air travel, which causes a significant part of their total greenhouse gas emissions.

FlyingLess develops approaches to reduce air travel in the academic sector, which are implemented at different levels (research, teaching and administration).

The project is being carried out in close cooperation with four pilot institutions - EMBL (European Molecular Biology Laboratory) and MPI Astronomy in Heidelberg as non-university research institutions and the Universities of Konstanz and Potsdam as universities.

Further information can be found on the website www.flyingless.de.

The project is being led by ifeu Heidelberg in close cooperation with the TdLab Geography at the Institute of Geography at Heidelberg University.

The project is funded over 3 years as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Protection.

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