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Survey FlyingLess 2023
Detailed report of the aggregated survey results on the topic of flight reduction in academia

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Abstract of the 2023 FlyingLess survey on air travel at ten academic institutions in Germany

The survey results from 2023 provide information about business air travel from scientists, students and employees in research institutions working in management, administration, and technology. The key findings for scientists are the following: The average number of annual business-related flights per capita before the COVID-19 pandemic for professors & group leaders (4.49, N=582) is about 3.9 times higher than that of scientists without professorship or group lead (1.16, N=1223). In 2022 the average number of business flights per capita was lower than pre-COVID-19 (professors & group leaders: 2.01 and scientists without professorship/group lead: 0.87). But still, senior scientists flew more than twice as often than junior scientists. Conference participation with a scientific contribution were by far the most important reason for air travel (88 %; scientists, N=1805). At the same time scientists stated their willingness to reduce their business air travel in the future by choosing another mode of transport for business travel less than 1,000 km (71 % of consent), by making greater use of video-/teleconferencing instead of physical travel (49 %) or by not attending events that they consider not that relevant (54 %). 68 % of the scientists surveyed (N=1805) rated climate protection measures to reduce aviation emissions at their institution as very or rather important. On top of that the respondents approved to different extents to potential flight reduction measures at their institution.

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Outline

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About FlyingLess

With the internationalization of science and research, air travel by university staff has also increased - scientists are among the frequent flyers.

The goal of the FlyingLess project is to support universities and research organizations in reducing flight emissions, which account for a significant share of their total greenhouse gas emissions. FlyingLess develops approaches to reduce air travel in academia that are implemented at different levels (research, teaching and administration). Successful reduction of flight emissions requires broad participation and support, both from the management level and from staff and students. The project is carried out in close collaboration with four partners as well as further academic institutions collaborating with the project as so called «Satellites». FlyingLess is led by the ifeu Institute Heidelberg in close collaboration with Dr. Nicole Aeschbach, TdLab Geography, Heidelberg University. The project is funded over 3 years (October 2021– September 2024) by the National Climate Initiative (NKI) of the German Federal Ministry for Economic Affairs and Climate Action.

1. Methodological Approach

To get an understanding of the challenges and opportunities of air travel reduction at academic institutions, an online survey was conducted in 2022 and 2023 by C. Merrem, together with S. Görlinger and N. Aeschbach. In 2022, scientists and students of the four FlyingLess partner institutions (two universities and two research institutions) and four other higher education institutions, (FlyingLess satellites), participated. In 2023, the survey was repeated in a slightly adapted version with the four FlyingLess partner institutions and six further higher education institutions (FlyingLess satellites). Additionally, the status group of employees working in research management, technology or administration was added. A subset of institutions already participated in 2022. The quantitative survey provides information about the opinions and behavioural patterns regarding academic air travel. The collected data serves as a reference and basis for developing further approaches to reduce air travel at the respective institutions. The open source tool Limesurvey was used to conduct the online survey.

The status groups of the survey 2023 were divided into:

Survey A

- Scientists
  - Professors & group leaders
  - Scientists without professorships/group leaders (incl. PhD students)
- Research management/technology/administration

Survey B

- Students (Bachelor's/Master's degree or similar)

Since the mobility behavior of PhD students is closer to that of scientific staff than of bachelor or master students, they were asked the same questions as scientists.

2. Response rate of the survey

The raw data were cleaned and led to a sample size of 2282 employees in total at ten scientific institutions - of which 1805 were scientists (582 professors & group leaders and 1223 scientists without professorship/group lead) and 477 respondents in the group of research management/technology/admin - as well as 1561 students from eight different higher education institutes.

Since not every institution could provide exact and up to date numbers on the institutional members within the targeted status groups the response rates are rough estimates: 19 % for professors and group leaders, 4 % for scientists without professorship/group lead, 2 % for research management/technology/admin[1] and 1 % for students.

3. Limitations

To assess the significance of the survey results the following limitations need to be taken into account: Even though different types of academic institutions were included in the survey, the distribution of disciplinary affiliation is influenced by core fields of research, especially in non-university research institutions. At some institutes there may have been committed members who promoted the survey within their department. Furthermore, the student response rate was quite low, which questions the results' significance. On top, it needs to be considered that the survey links had no individual key restriction, which holds the option that one could have answered the survey more than once.

The survey used free text fields as answer options for some questions. The answers to these free text fields are listed under the corresponding question in the figure. The text was left in its original form. Therefore, neither spelling nor grammar were corrected and no translation of the original language was made.

4. Structure of the report

Chapter 5 shows the aggregated results of scientists across all participating institutions. Chapter 6 compares the status groups of professors and group leaders as well as scientists without professorships/group leaders individually. Chapter 7 shows the average mobility (flight, train/bus) and use of virtual format per year prior to the COVID-19 pandemic and in 2022 by scientists. In chapter 8 the survey results from 2022 and 2023 are compared. In the following chapter (9) the results of the status group research management/technology/administration are summarized. Subsequently, the survey results of the student participants are presented in chapter 10, which are based on different questions than those of the status group of scientists in accordance with the target group.

[1] Nine institutions addressed the status group of research management/technology/admin with the survey. Nevertheless at the institution, where the survey link was not shared with this group, 24 respondents filled in the survey (see Chapter 4: Scope) and were taken into account. Regarding the response rate this subset of answers had not been taken into account (response rate given refers to the sample size from 9 academic institutions).

5. Results Scientists (N=1805)

In this chapter, the results of the scientists are presented in aggregated form. The status group consists of the survey results from professors & group leaders, N=582 and scientists without professorship / group leadership, N=1223.

5.1. Structuring the respondent group

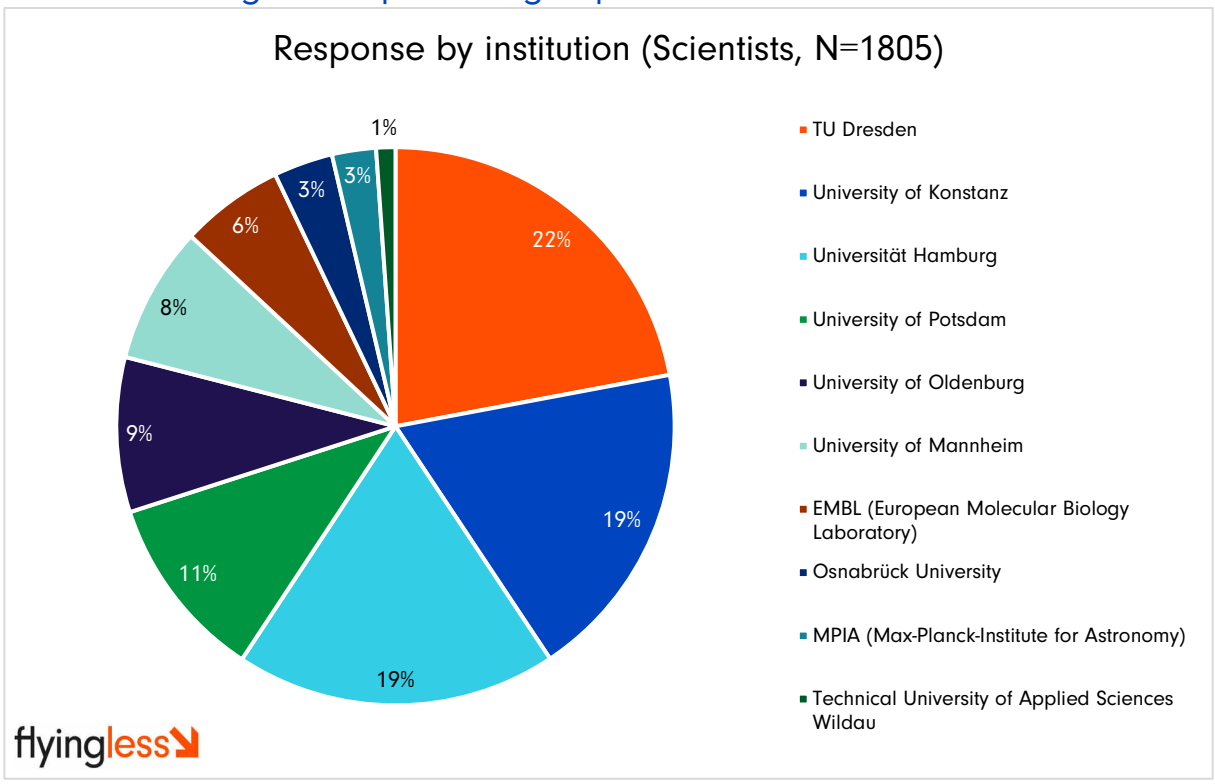

Figure 1: Response by institution. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223). Relative frequency of institutional affiliation.

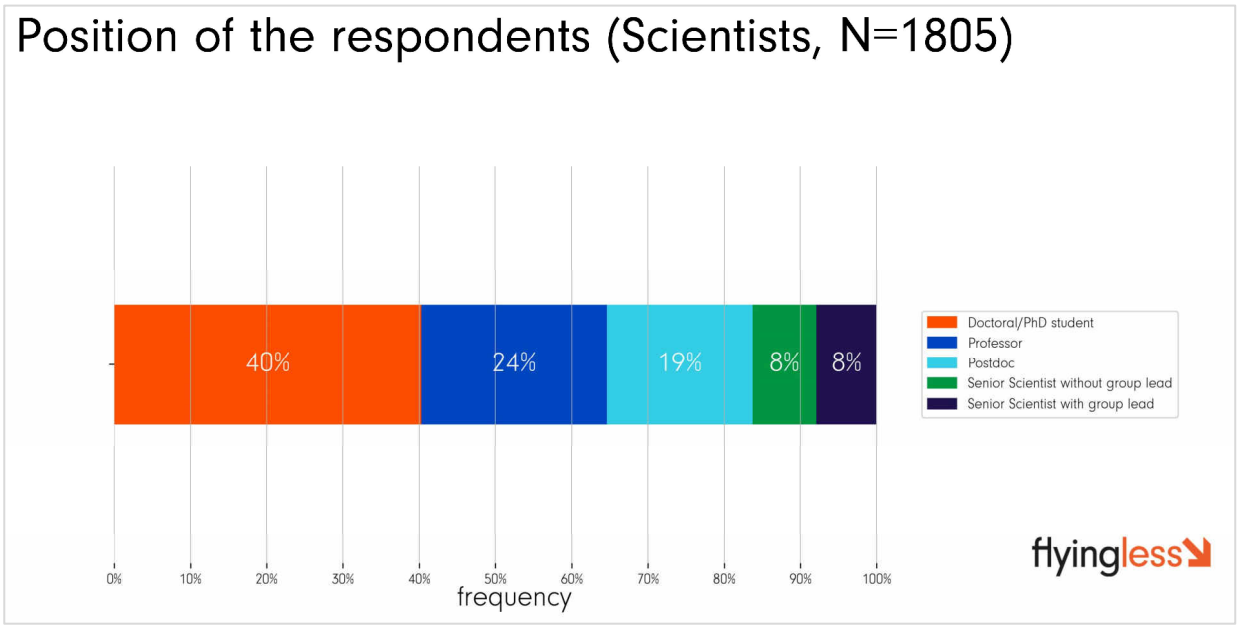

Figure 2: Position of the respondents. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223). Relative frequency (Y-axis) of the position indicated (X-axis).

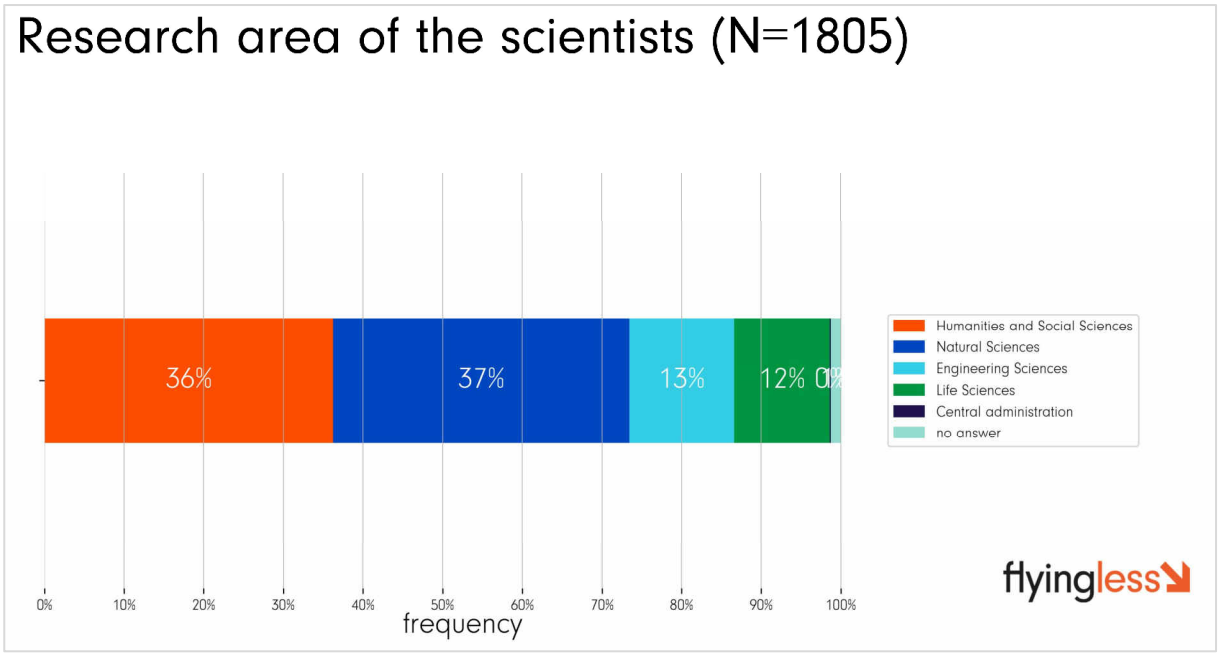

Figure 3: Research area of the scientists. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223). Relative frequency (Y-axis) of the research area indicated (X-axis). Categories correspond to the DFG structure.

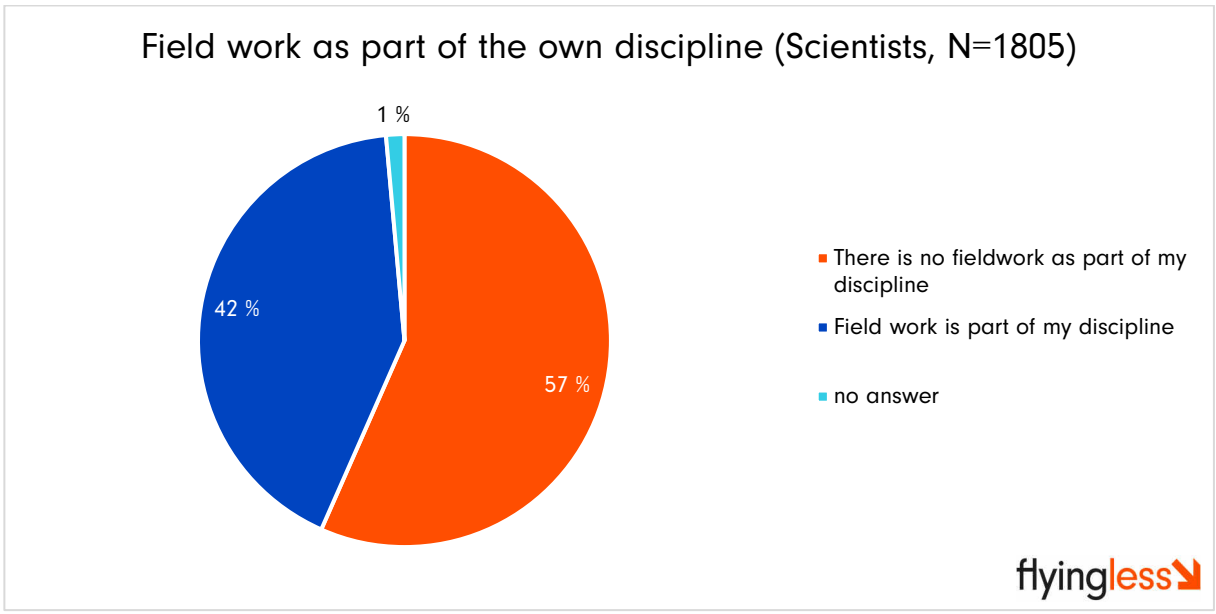

Figure 4: Field work as part of the own research. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223). Relative frequency of field research in one's field of activity. Field research defined as collecting raw data outside of a laboratory, library, or workplace (including instrument maintenance/installation, etc.).

5.2. (Communication on) the topic of academic flight reduction

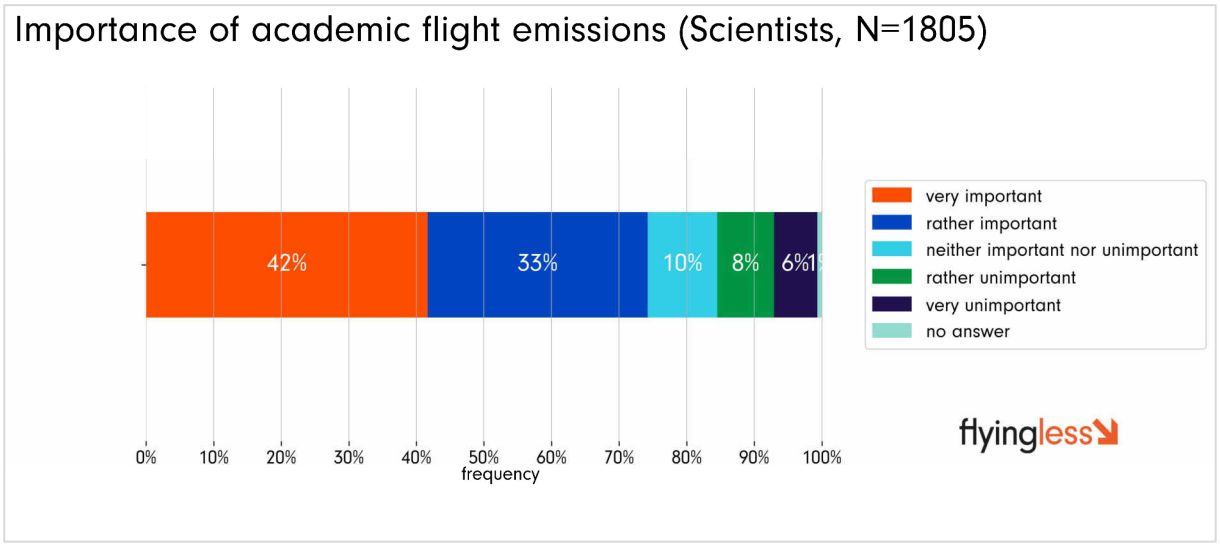

Figure 5: Evaluation of the topic of flight emissions at universities and research institutions. Relative frequency of mentions (X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

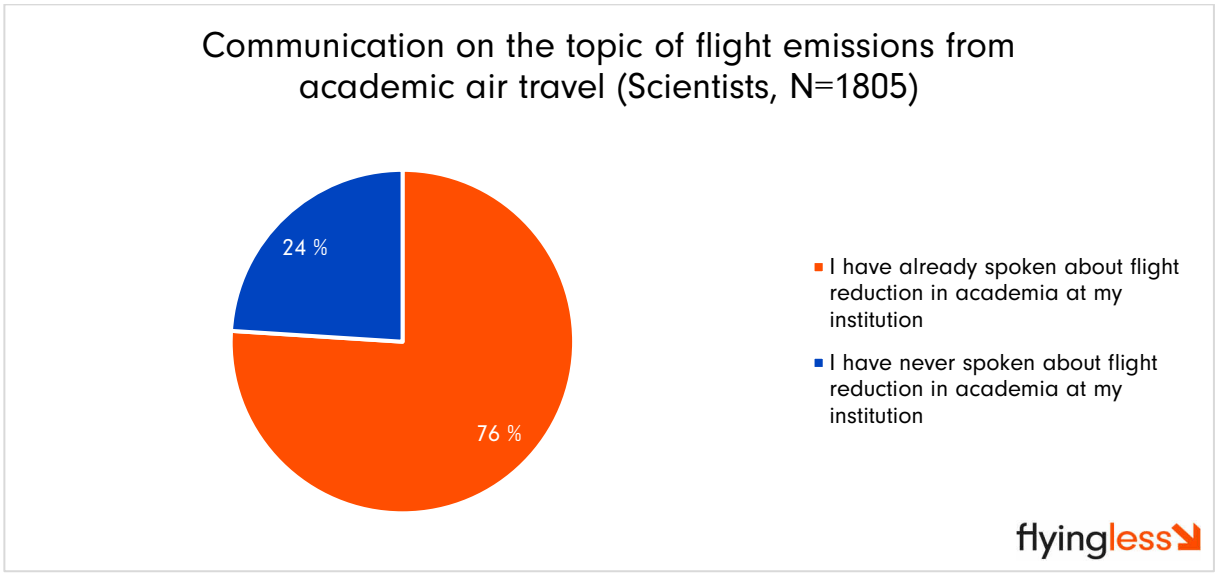

Figure 6: Communication on the topic of flight emissions from academic air travel. Relative frequency of mentions. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

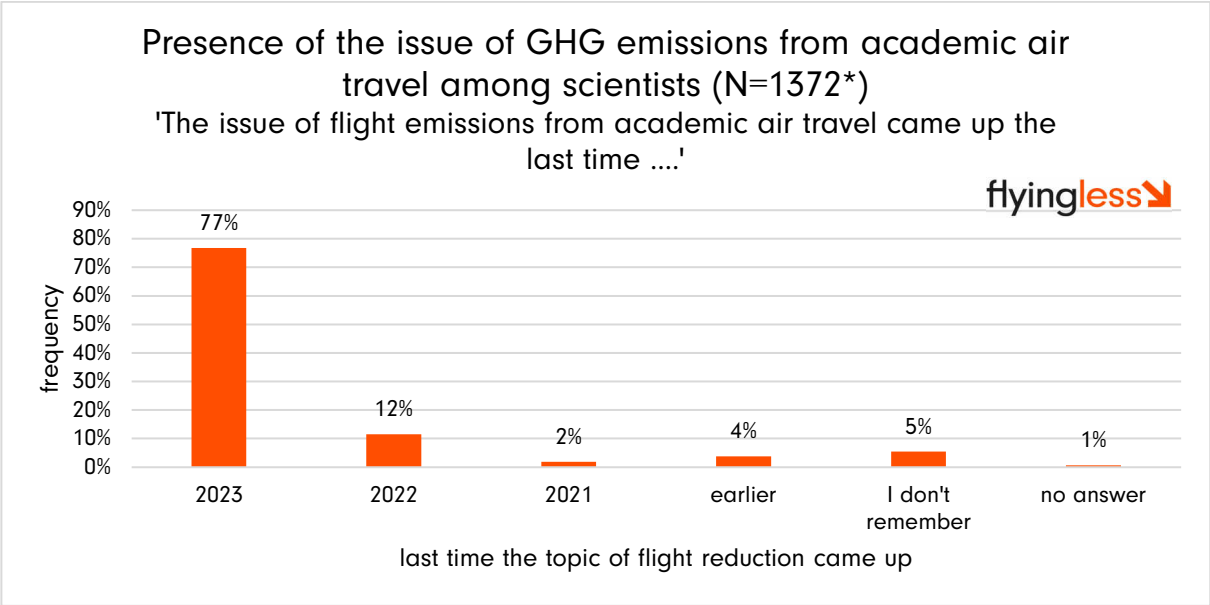

Figure 7: Presence of the issue of GHG emissions from academic air travel among scientists. Indication of the date of the last communication on the subject of flight emissions from academic air travel. Relative frequency of mentions. Status group: Scientists, N=1372 (aggregated from professors & group leaders, N=472 & Scientists without professorship/group lead, N=900). *Scientists who indicated that they had already spoken about the topic of flight emissions in academia were asked about the timing of the last communication about it.*

5.3. Average mobility (flight, train/bus) and use of virtual format per year prior to the COVID-19 pandemic and in 2022

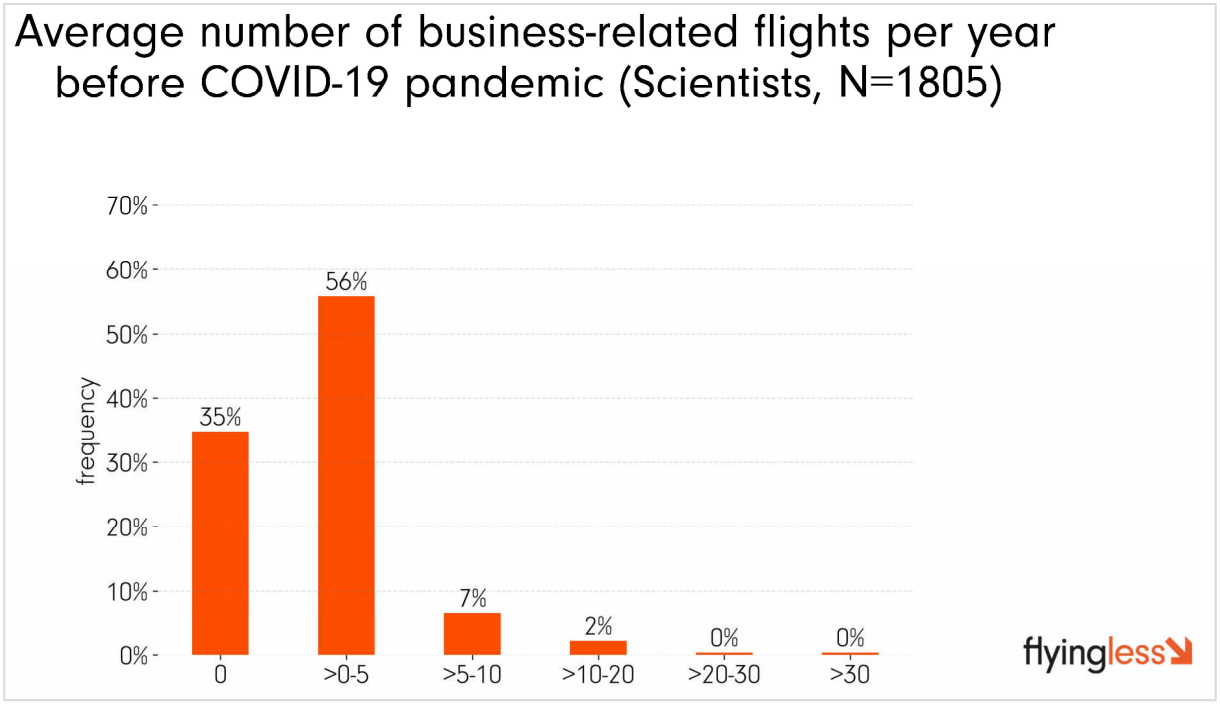

Figure 8: Average number of business-related flights per year before COVID-19 pandemic (respondents' estimate). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223). Relative frequency of mentions (Y-axis) per aggregated number of trips per year (X-axis).

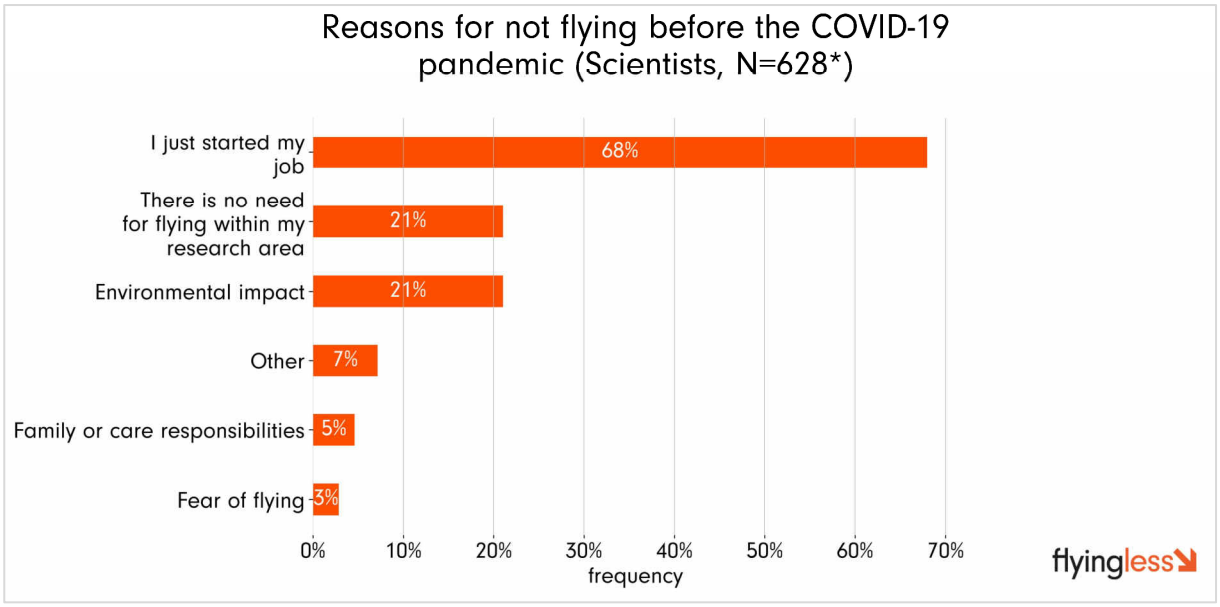

*Figure 9: Reasons for not flying before the COVID-19 pandemic. Status group: Scientists, N=628 (aggregated from professors & group leaders, N=53 & Scientists without professorship/group lead, N=575). *Scientists who indicated that they did not fly prior to the COVID-19 pandemic were asked why.*

Other reasons for not flying before COVID-19, that were mentioned (examples)

- «ich bin immer innerdeutsch gereist, sodass die Bahn einfacher und günstiger war.»
- «There was no reason for flying (conferences were national and then the Covid-19 pandemic started»
- «Keine bis wenig Konferenzbesuche»
- «generelles Vermeiden von Reisen»
- «Keine Finanzierung»

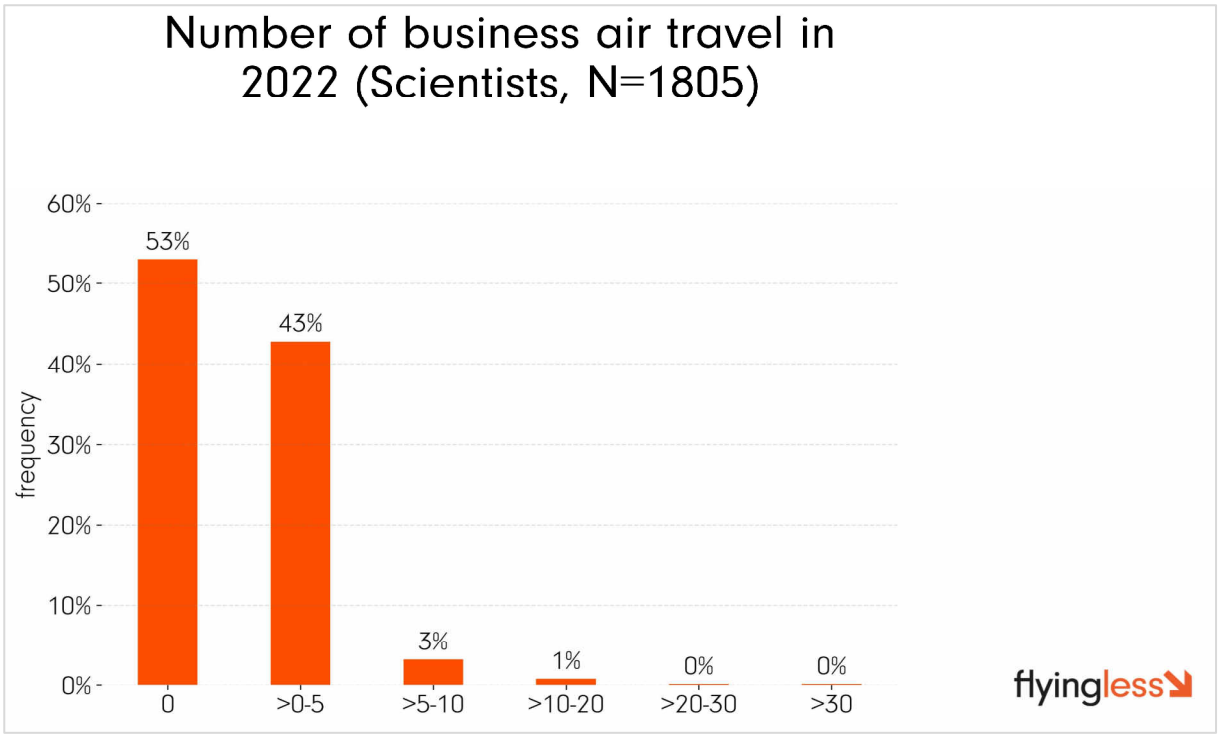

Figure 10: Number of business-related flights in 2022. Relative frequency of mentions (Y-axis) per aggregated number of flights (X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

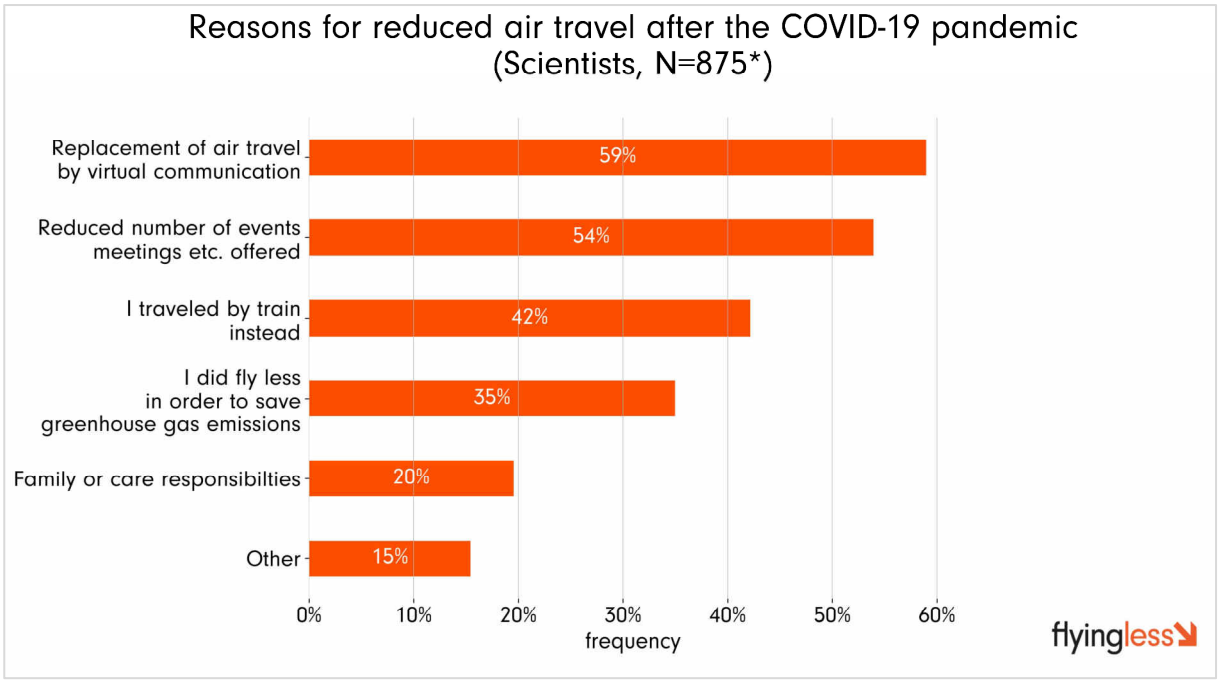

Figure 11: Reasons for reduced air travel after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a lower flight volume (Y-axis). Status group: Scientists, N=875 (aggregated from professors & group leaders, N=429 & Scientists without professorship/group lead, N=446). *Scientists who indicated they flew less frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

Other reasons for reduced air travel after the COVID-19 pandemic, that were mentioned (examples):

- «Zufall: wichtige Veranstaltungen relativ nahe»
- «politische Lage im Zielland»
- «Aufbau regionaler Projektkonsortien»
- «events hadn't yet recovered to pre-covid levels»
- «Got less interested in events»

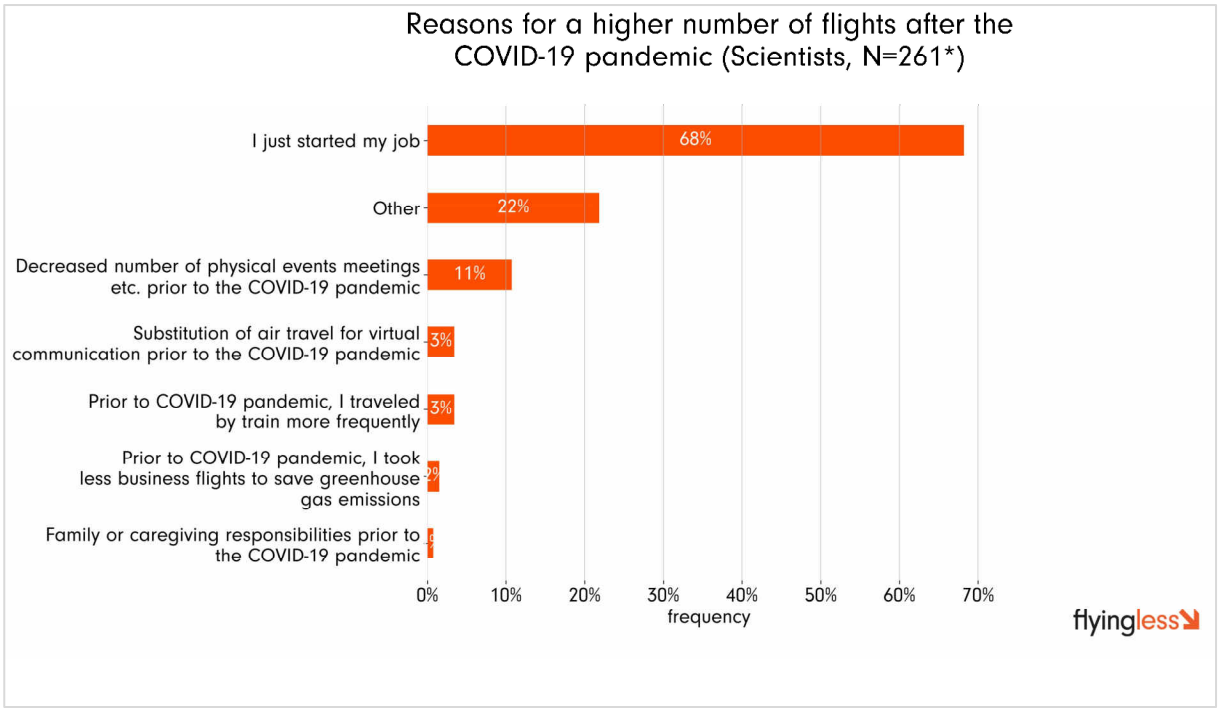

Figure 12: Reasons for a higher number of flights after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a higher flight volume (Y-axis). Status group: Scientists, N=261 (aggregated from professors & group leaders, N=27 & Scientists without professorship/group lead, N=236). *Scientists who indicated they flew more frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

Other reasons for a higher number of flights after the COVID-19 pandemic, that were mentioned (examples):

- «größerer persönlicher Fokus auf internationale Konferenzen und Vernetzung»
- «Feldforschung musste nachgeholt werden»
- «random fluctuation»
- «I moved to Germany but most of my research material is in the UK»

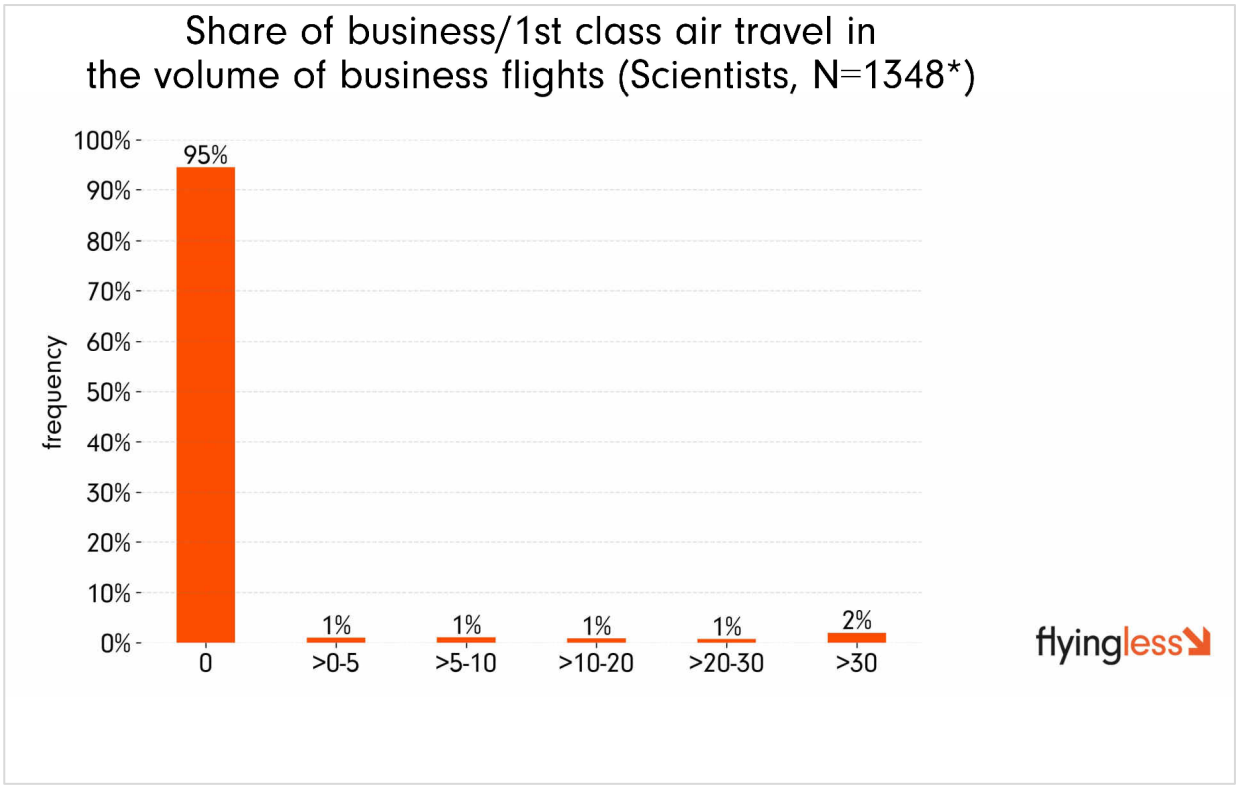

Figure 13: Share of business/1st class air travel in the volume of business flights. Relative frequency of mentions (Y-axis) per percentage of business class flights in the person's total flight volume (X-axis). Status group: Scientists, N=1348 (aggregated from professors & group leaders, N=531 & Scientists without professorship/group lead, N=817). *Scientists who indicated that they had flown at least once prior to the COVID-19 pandemic or in 2022 were asked.*

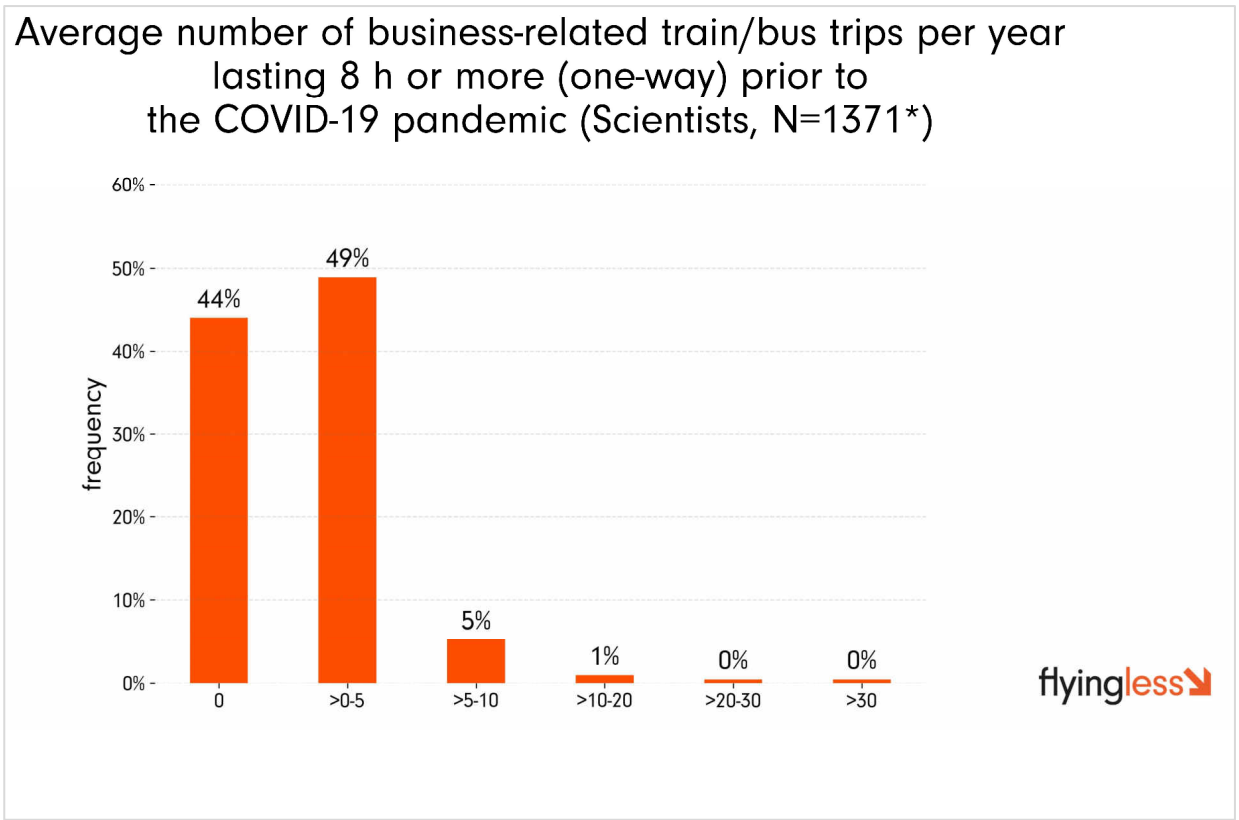

Figure 14: Average number of business-related train/bus trips per year (duration > 8 h one way) prior to the COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of train/bus trips per year (X-axis). Status group: Scientists, N=1371 (aggregated from professors & group leaders, N=577 & Scientists without*

*professorship/group lead, N=794). *Scientists who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

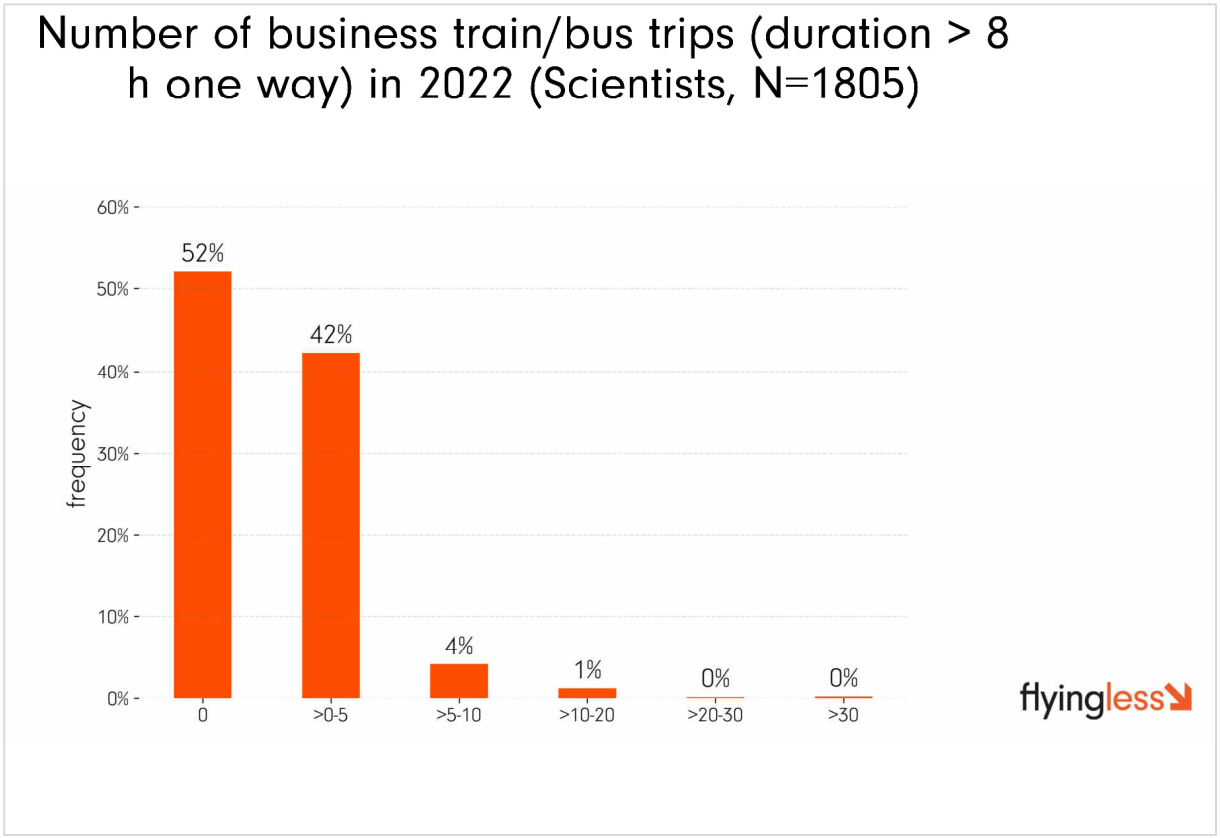

Figure 15: Number of business train/bus trips (duration > 8 h one way) in 2022. Relative frequency of mentions (Y-axis) per number of train/bus trips in 2022 (X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

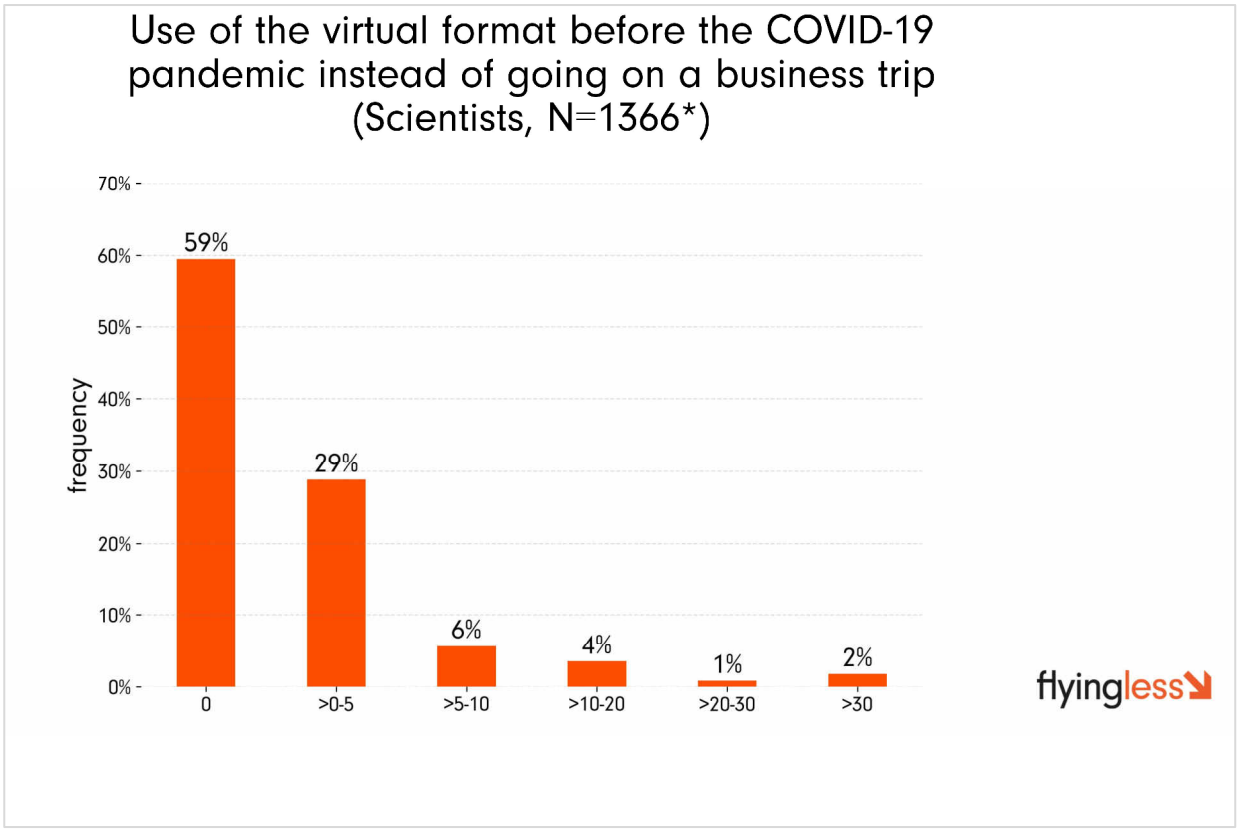

Figure 16: Use of the virtual format before the COVID-19 pandemic instead of taking a business trip. Relative frequency of mentions (Y-axis) per number of virtual events/meetings per year (X-axis). Status group: Scientists, N=1366 (aggregated from professors & group leaders, N=572 & Scientists without professorship/group lead, N=794). *Scientists who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

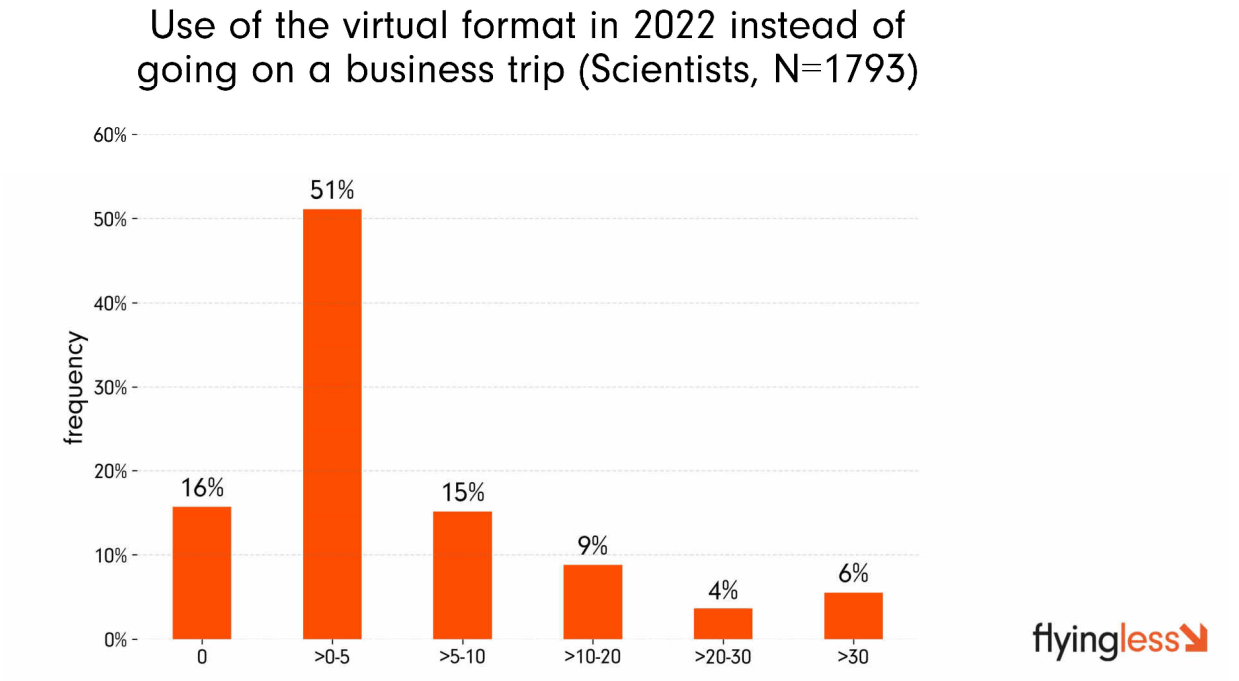

Figure 17: Use of the virtual format in 2022 instead of taking a business trip. Relative frequency of mentions (Y-axis) per virtual event/meeting in 2022 (X-axis). Status group: Scientists, N=1793 (aggregated from professors & group leaders, N=576 & Scientists without professorship/group lead, N=1217).

5.4. Relevance of different reasons for business air travel

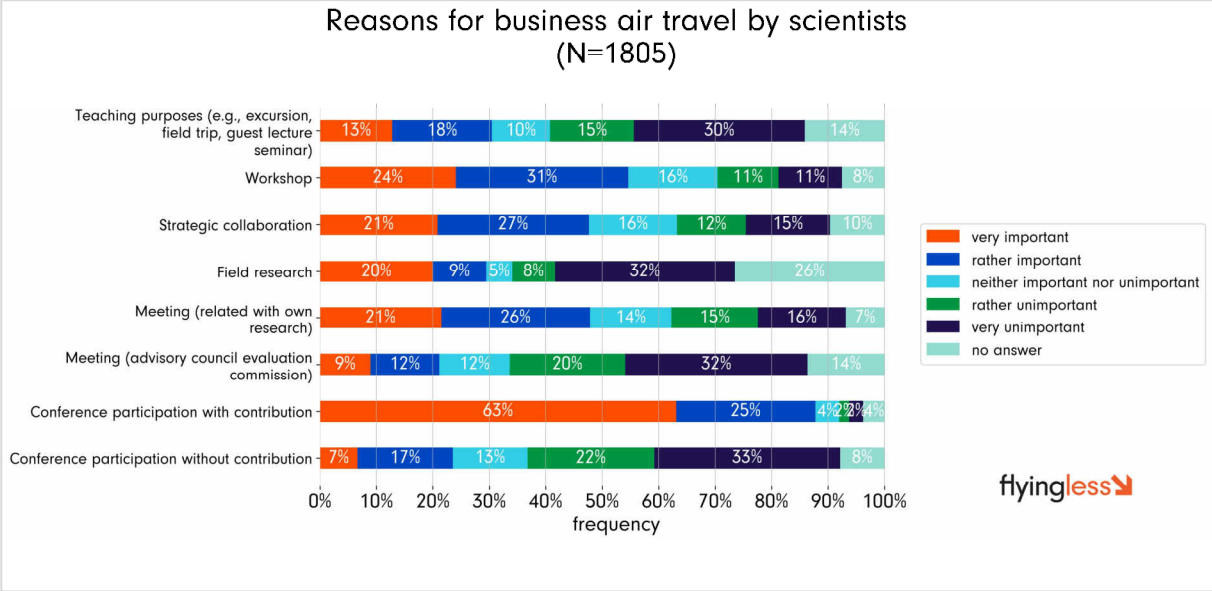

Figure 18: Reasons for business air travel by scientists. Relative frequency of mentions (Y-axis) per subanswer (reason for business-related air travel in the academic sector; X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

Other reasons for business-related air travel within academia, that were mentioned (examples):

- «Netzwerk, Forschungskooperationen aufrechterhalten / anbahnen»
- «Archiv- bzw. Forschungsaufenthalte, Recherche»
- «Longer stays at partner insititution, to conduct research together»
- «Interviews for next positions/potential fellowships»
- «Group retreats»
- «Kick-Off Meeintg / Zwischenbericht / Abschlussbericht mit Projekt- / Geldgeber»
- «Symposium zu Ehren verdienter Kollegen»
- «Giving seminars in other universities»
- «collaborative events (joint seminars, joint works, etc.)»
- «Austausch mit Industrie»
- «Treffen mit befreundeten Fachkollegen»

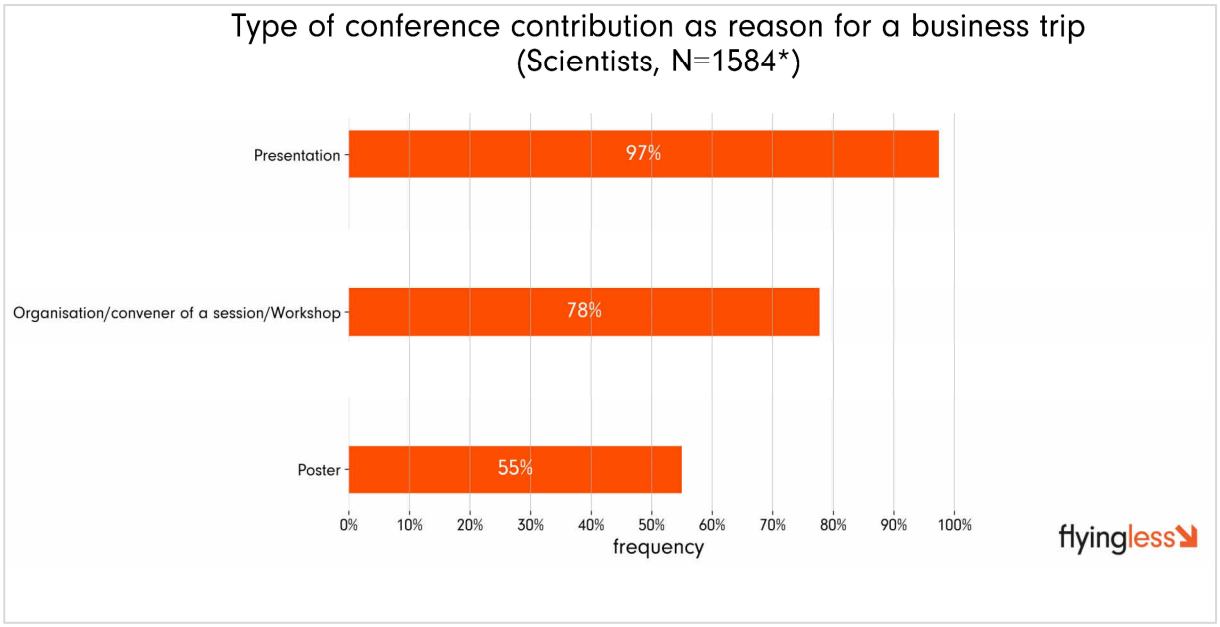

Figure 19: Type of conference contribution as reason for a business trip. Relative frequency of mentions (X-axis) per subanswer (type of conference contribution; Y-axis). Status group: Scientists, N=1584 (aggregated from professors & group leaders, N=527 & Scientists without professorship/group lead, N=1057). *Scientists who considered conference participation with a contribution as an important reason for business air travel were asked about the type of contribution.*

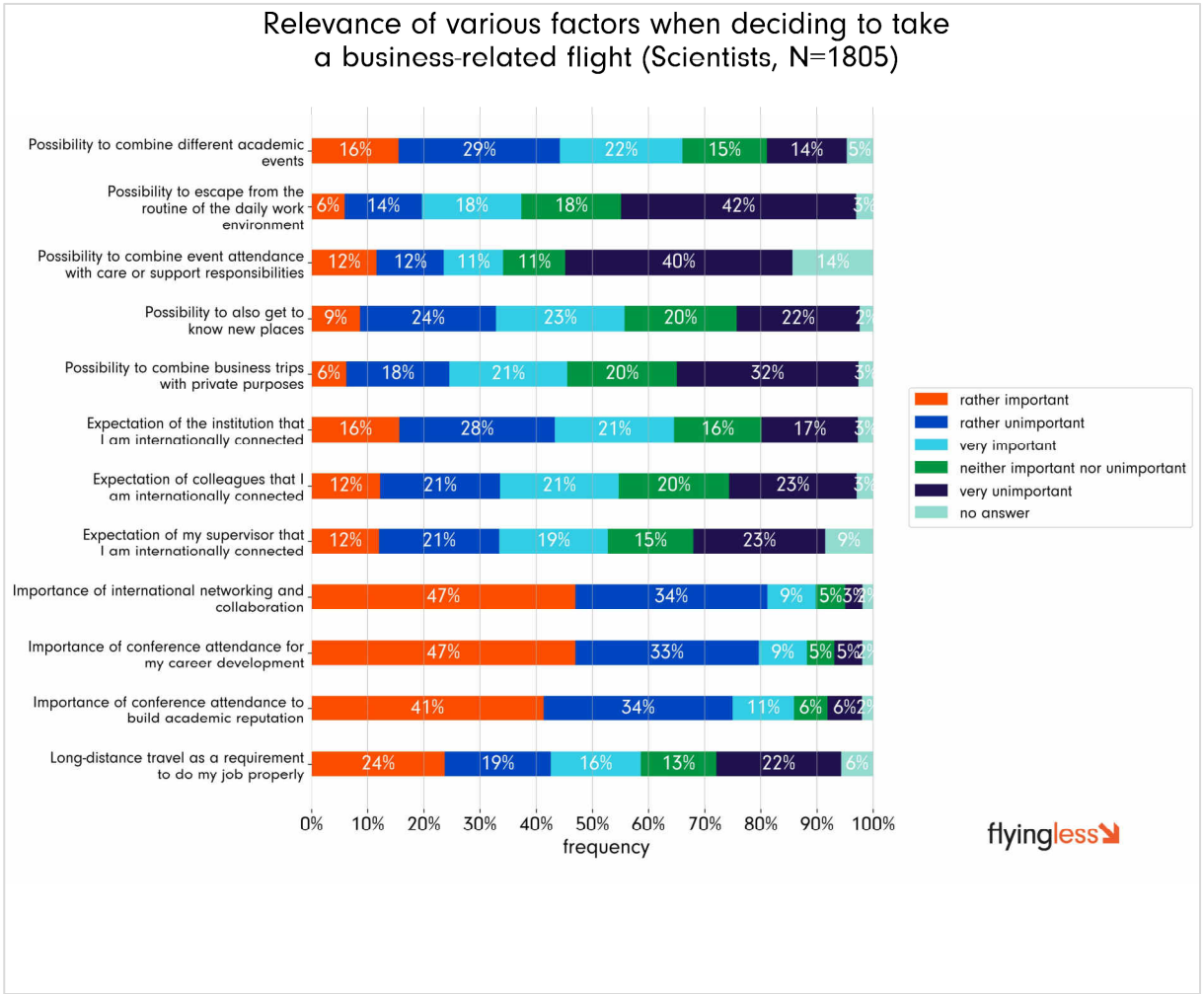

Figure 20: Relevance of various factors when deciding to take a business-related flight. Relative frequency of mentions (Y-axis) per subanswer (Factor for weighing a business-related flight in the academic sector.; X-axis). Status group:

Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

Other important factors influencing the decision to take a business related flight or to book a business trip (examples):

- «Einladung von Seiten des Konferenzveranstalters»
- «Ausübung einer Vorbildfunktion.»
- «Persönlicher Kontakt ist unersetzlich, wenn gegenseitiges Vertrauen aufgebaut oder vertieft werden soll (insbesondere bei engeren Kooperationen).»
- «"Gruppendruck" wie die Kolleg*innen reisen. Ein Mal war ich der Einzige, der mit dem Zug angereist ist, alle anderen sind geflogen.»
- «Participation in the global academic debate is critical for the success of the university. The current industry standard includes in-person conferences. So the decision in favor of taking a flight to a conference is due to my own preference, but by the global community.»

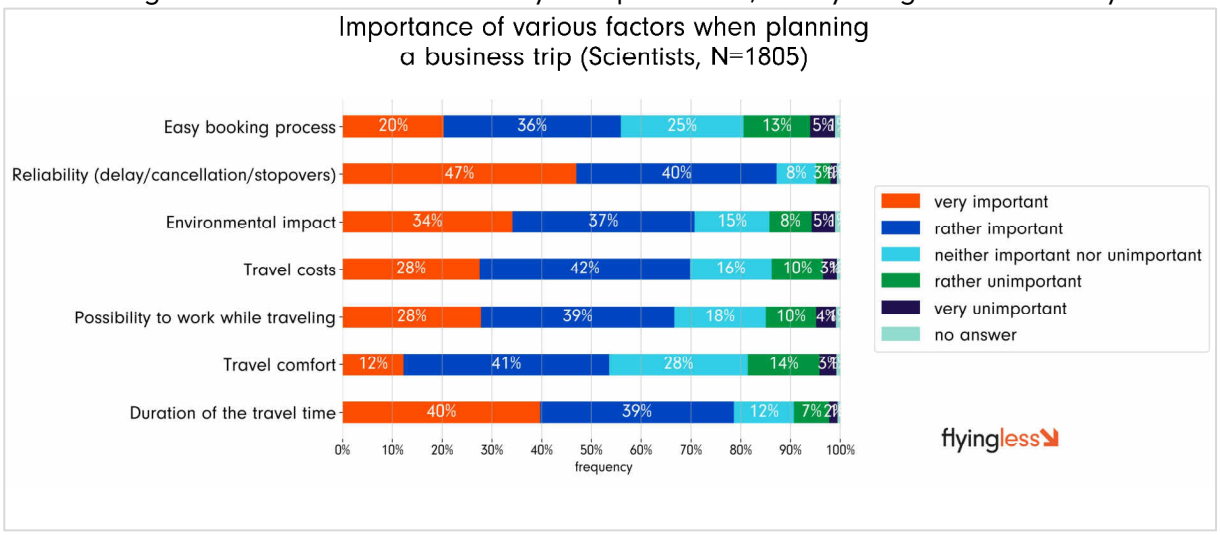

Figure 21: Importance of various factors when planning a business trip. Relative frequency of mentions (Y-axis) per subanswer (Factor of choice in the process of travel booking; X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

5.5. Approval of business trips

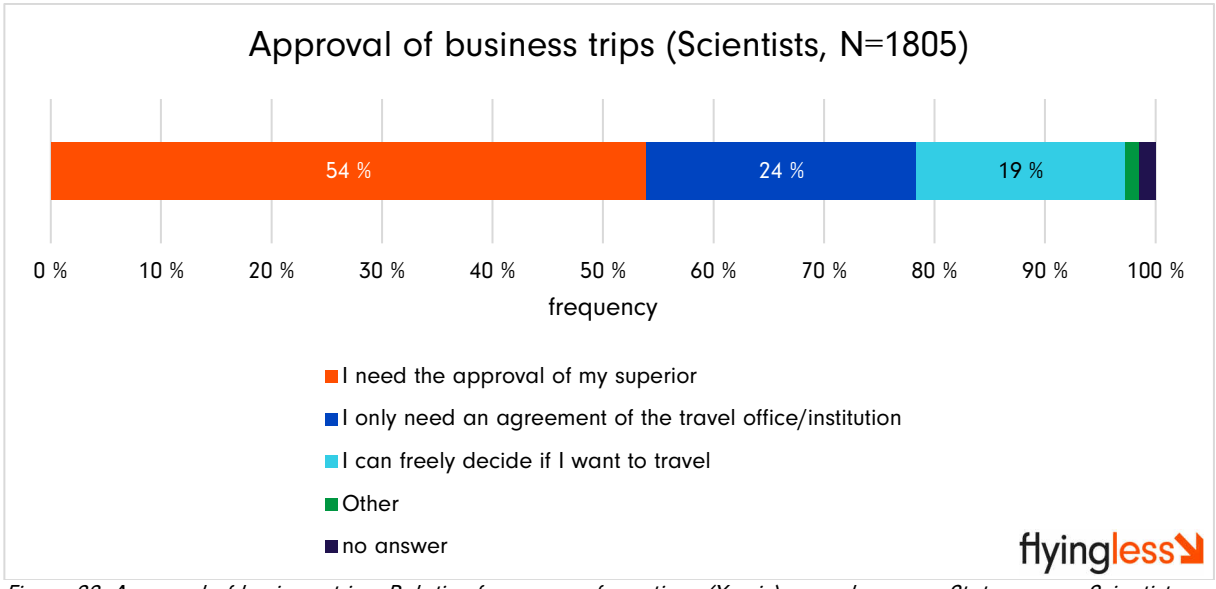

Figure 22: Approval of business trips. Relative frequency of mentions (X-axis) per subanswer. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

Other forms of business trip approval, that were mentioned (examples):

- «freie Entscheidung während der vorlesungsfreien Zeit, Genehmigung bei längeren Reisen während des Semesters»
- «all the first 3 options apply, it depends on the trip and the budget funding it»

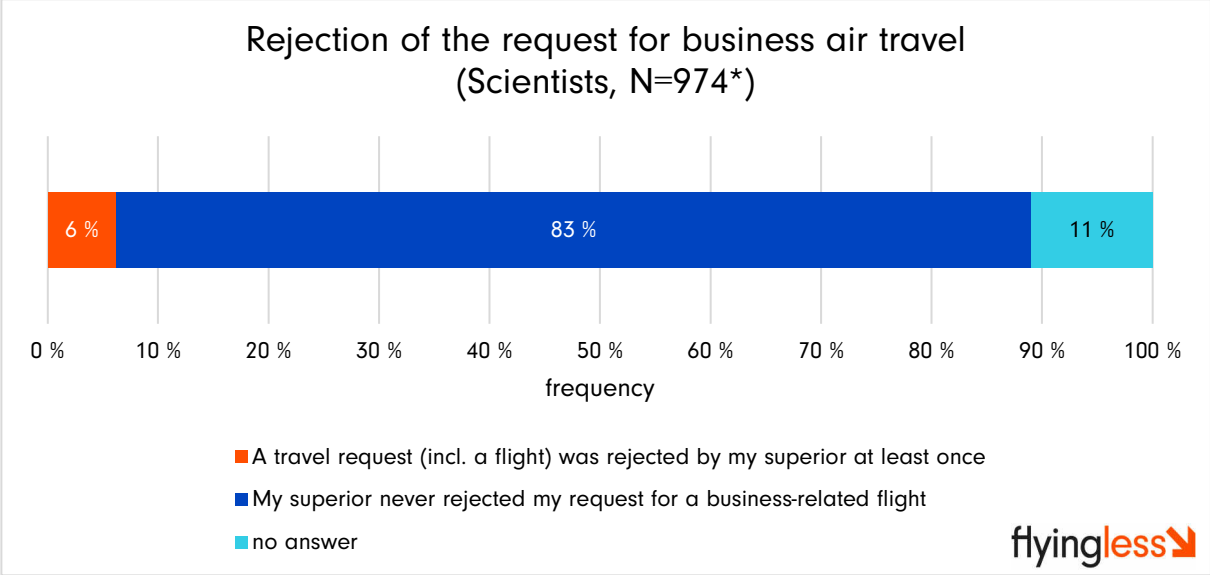

Figure 23: Rejection of the request for business air travel. Relative frequency of mentions of a rejection of a request for business air travel. Status group: Scientists, N=974 (aggregated from professors & group leaders, N=69 & Scientists without professorship/group lead, N=905). *Scientists who indicated that they needed approval from their supervisor(s) to approve a business trip were asked about the occurrence of a rejection.*

Reasons for the rejection of the travel request (examples):

- «when a flight was clearly cheaper than the train ticket»
- «I was not presenting in that very conference»
- «lack of funds»
- «Zu viele "private" Tage am Reiseziel (Ich wollte die sehr lange Anreise für mich "rechtfertigen können" und später zurückreisen als die Konferenz endete)»
- «Emissionen standen nicht im Verhältnis zum Nutzen»

5.6. Behaviour changes and measures

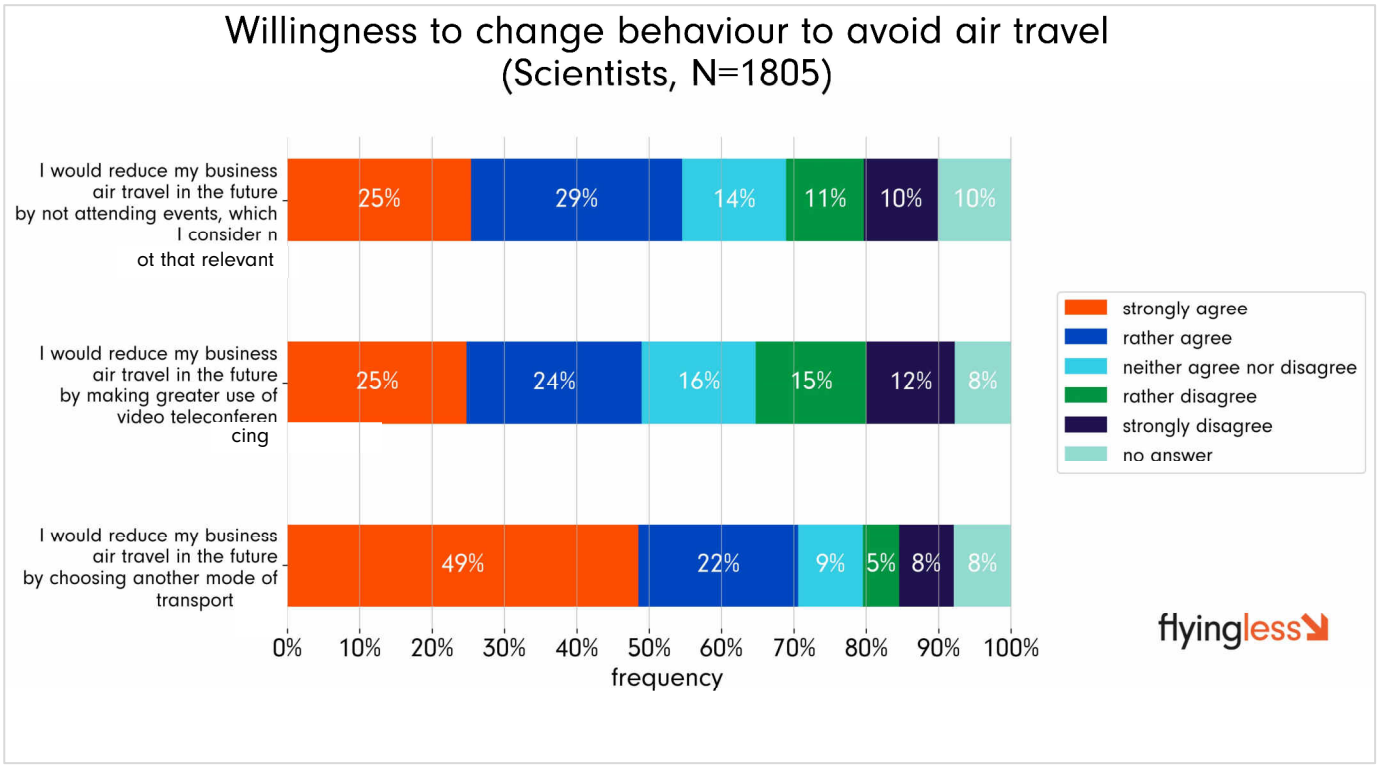

Figure 24: Willingness to change behaviour to avoid air travel. Relative frequency of mentions (Y-axis) per subanswer (agreement with statements about future mobility behaviour to avoid official air travel; X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

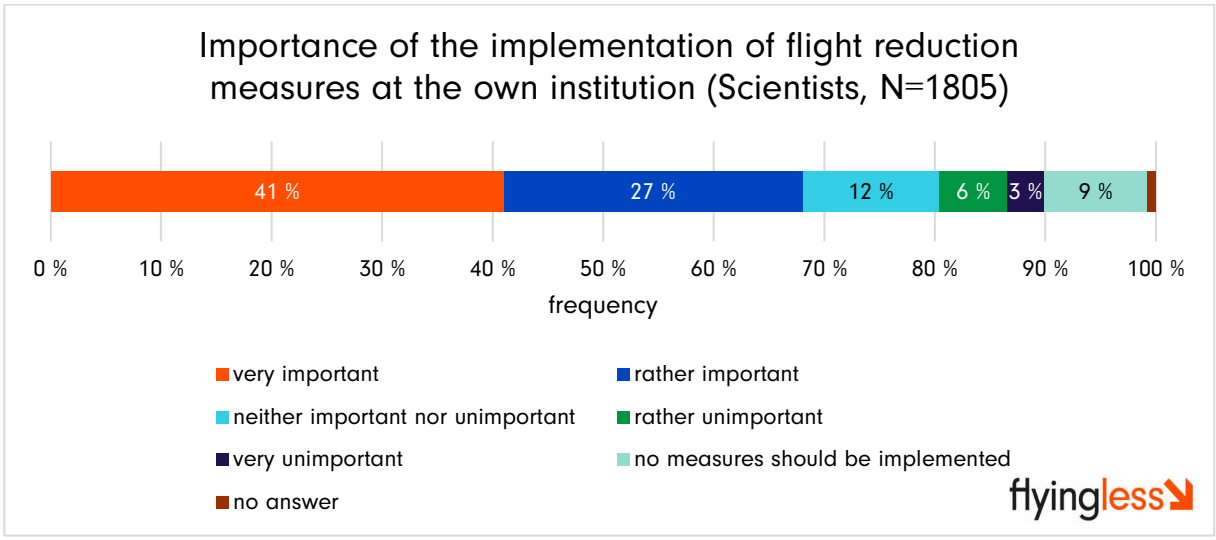

Figure 25: Importance of the implementation of flight reduction measures at the own institution. Relative frequency of mentions (X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

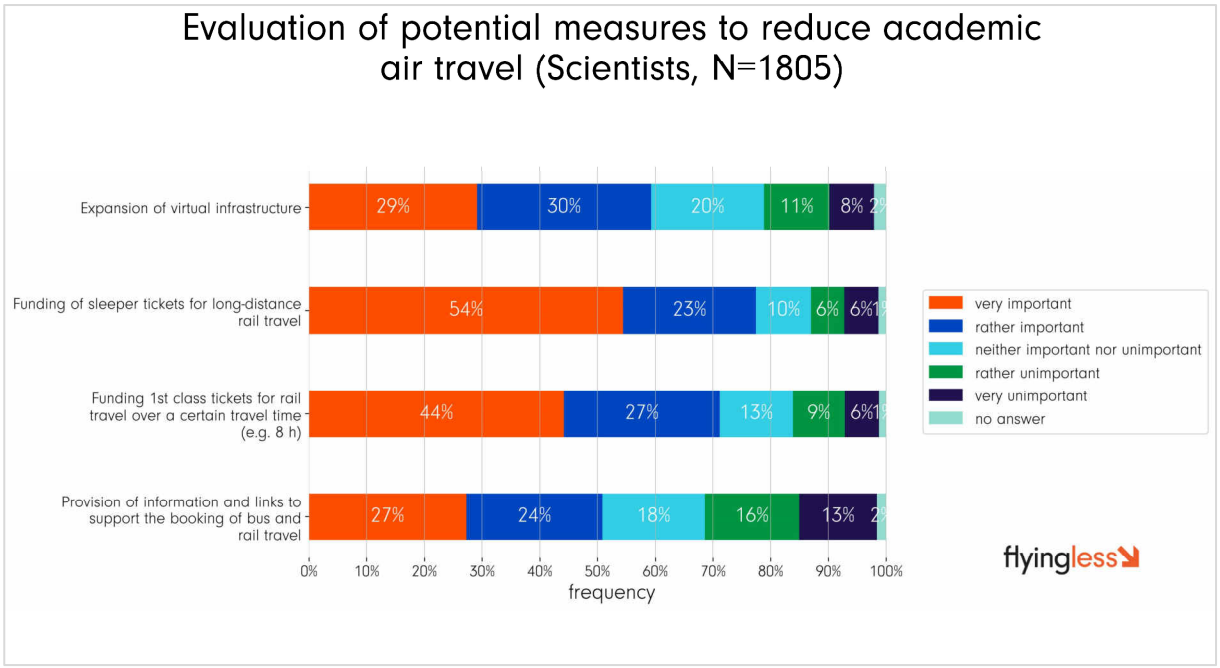

Figure 26: Evaluation of potential measures to reduce academic air travel. Relative frequency of mentions (Y-axis) per subanswer (Measures/incentives to reduce academic air travel; X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

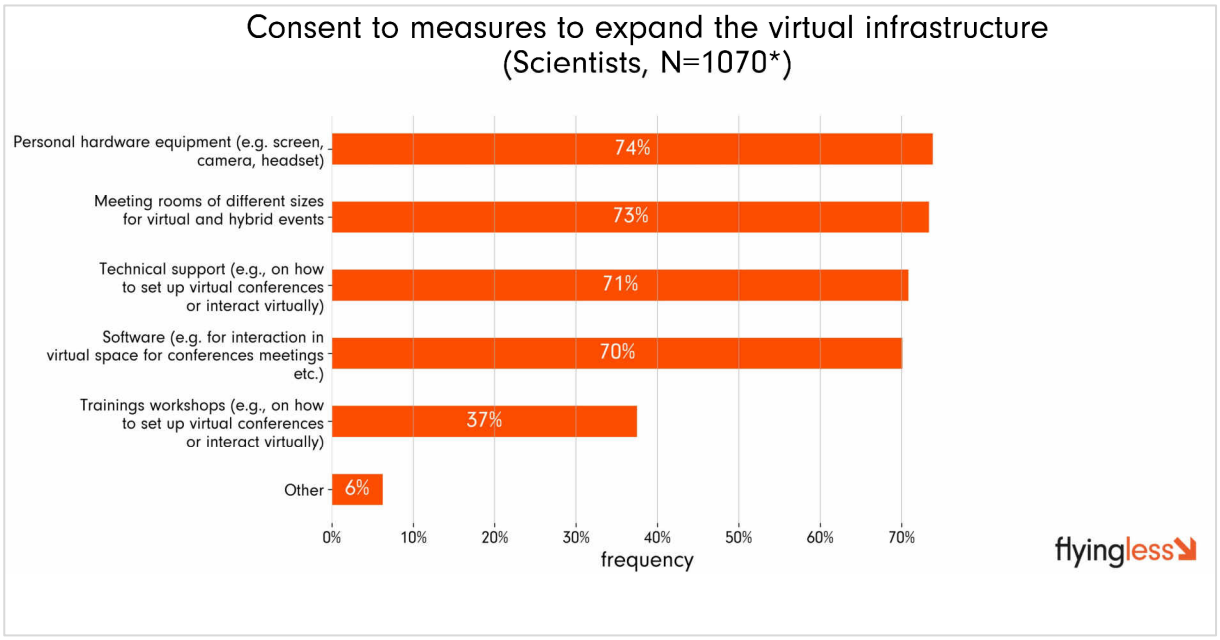

Figure 27: Consent to measures to expand the virtual infrastructure. Relative frequency of mentions (X-axis) on certain measures for the expansion of the virtual infrastructure (Y-axis). Status group: Scientists, N=1070 (aggregated from professors & group leaders, N=333 & Scientists without professorship/group lead, N=737). *Scientists who indicated they supported an expansion of virtual infrastructure were asked about their opinions on specific measures.*

Other measures that were mentioned to expand the virtual infrastructure (examples):

- «nicht-persönlich Hardware, wie Tischmikro und Kamera für hybride Veranstaltungen»
- «no hybrid events, otherwise the people in the physical location will have better networking chances and better outcomes»
- «Individual office spaces for virtual meetings so that people who share an office can attend different virtual events at the same time or without disturbing others.»
- «Das auf physische Präsenz getrimmte Mindset muss sich ändern. Obwohl während der Pandemie die meisten Konferenzen virtuell erfolgreich stattfanden, ist von dieser Option heute kaum etwas vorhanden. Konferenzen, Meetings, Networking etc. sollten

grundsätzlich als digitales Angebot in erster Linie zur Verfügung stehen und erst bei Bedarf (z.B. Herstellung der Barrierefreiheit) eine tatsächliche physische Dienstreise in Erwägung gezogen werden.»

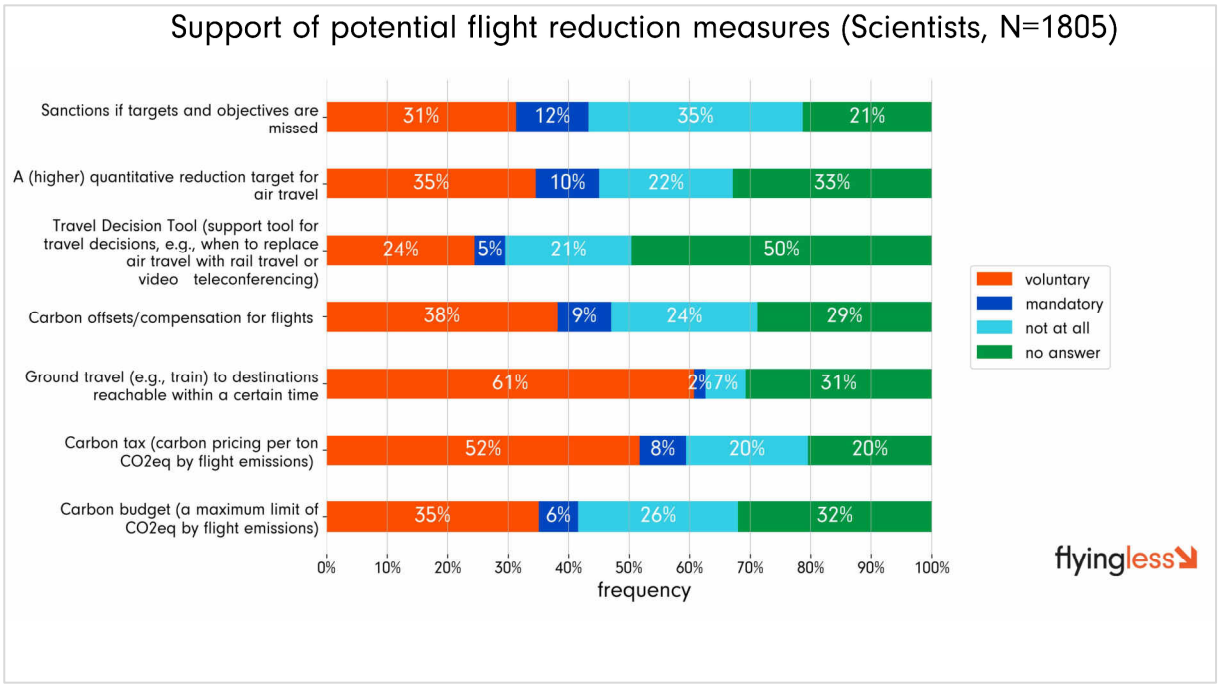

Figure 28: Support of potential flight reduction measures. Relative frequency of mentions (Y-axis) per subanswer (flight reduction measures; X-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

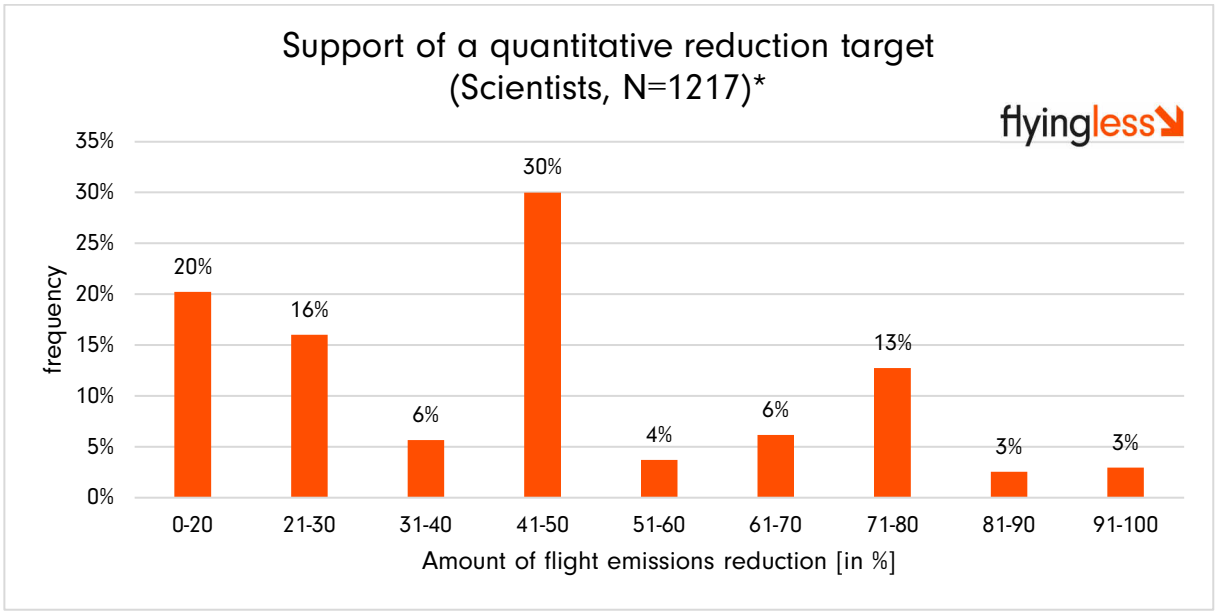

*Figure 29: Support a quantitative reduction target by 2030 relative to pre-COVID-19 air traffic levels (respondent's estimate). Relative frequency of mentions (Y-axis) per aggregated amount of reduction of flight emissions in % (X-axis). Status group: Scientists, N=1217 (aggregated from professors & group leaders, N=349 & Scientists without professorship/group lead, N=868). *Scientists who indicated they supported a (higher) quantitative reduction target were asked about this.*

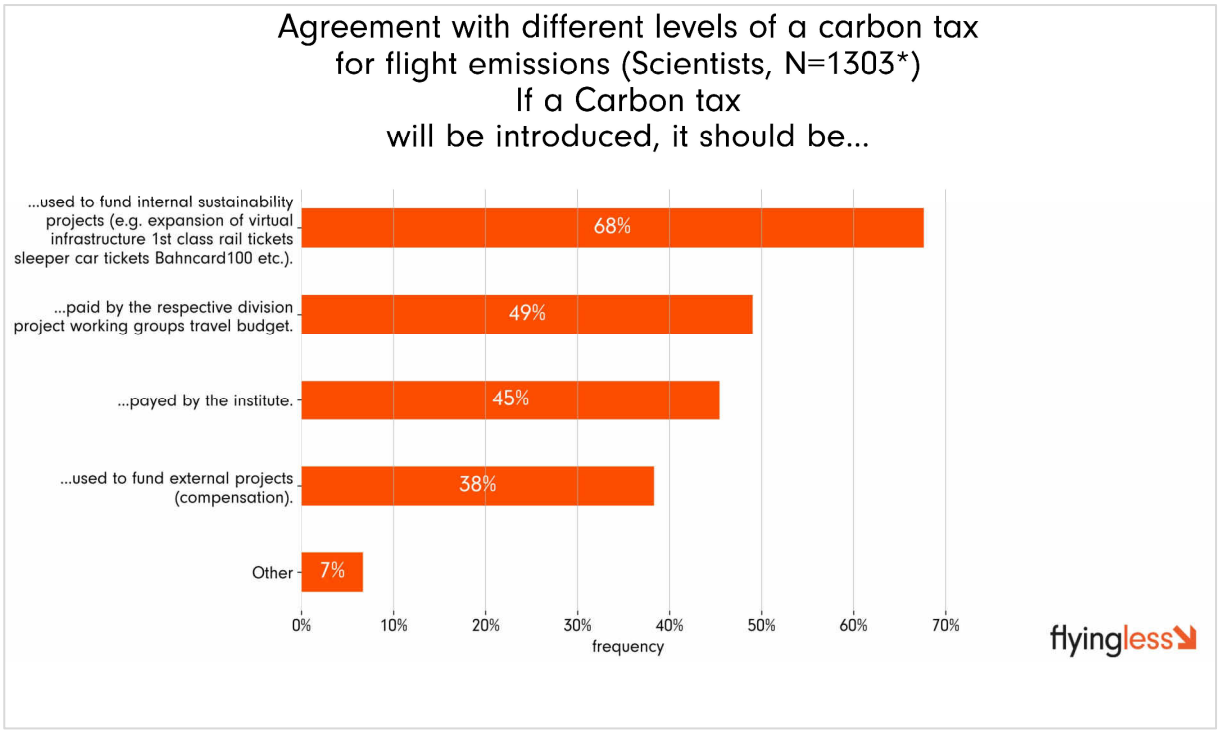

Figure 30: Agreement with different levels of a carbon tax for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status group: Scientists, N=1303 (aggregated from professors & group leaders, N=413 & Scientists without professorship/group lead, N=890). *Scientists who indicated they supported a carbon tax were asked for their opinions on the options given.*

Other options for designing a carbon tax, that were mentioned (examples):

- «Wenn eine Maßnahme verpflichtend ist, muss die Sanktion auf der kleinsten Ebene angesetzt werden, andernfalls wird man in Mithaftung für nicht-konformes Verhalten anderer Lehrstühle genommen...»
- *Die Carbon tax sollte...* «von der Wirtschaft gezahlt werden (die DB sollte die Preise drastisch verringern und das Bahnnetz weiter ausbauen)»
- «... in staatlich gesteuerte Projekte zum Klimaschutz einfließen»
- ... «durch die Ministerien/DFG etc.» *gezahlt werden*
- «Statt CO2-Steuer, Bonus für Nachhaltigkeit»

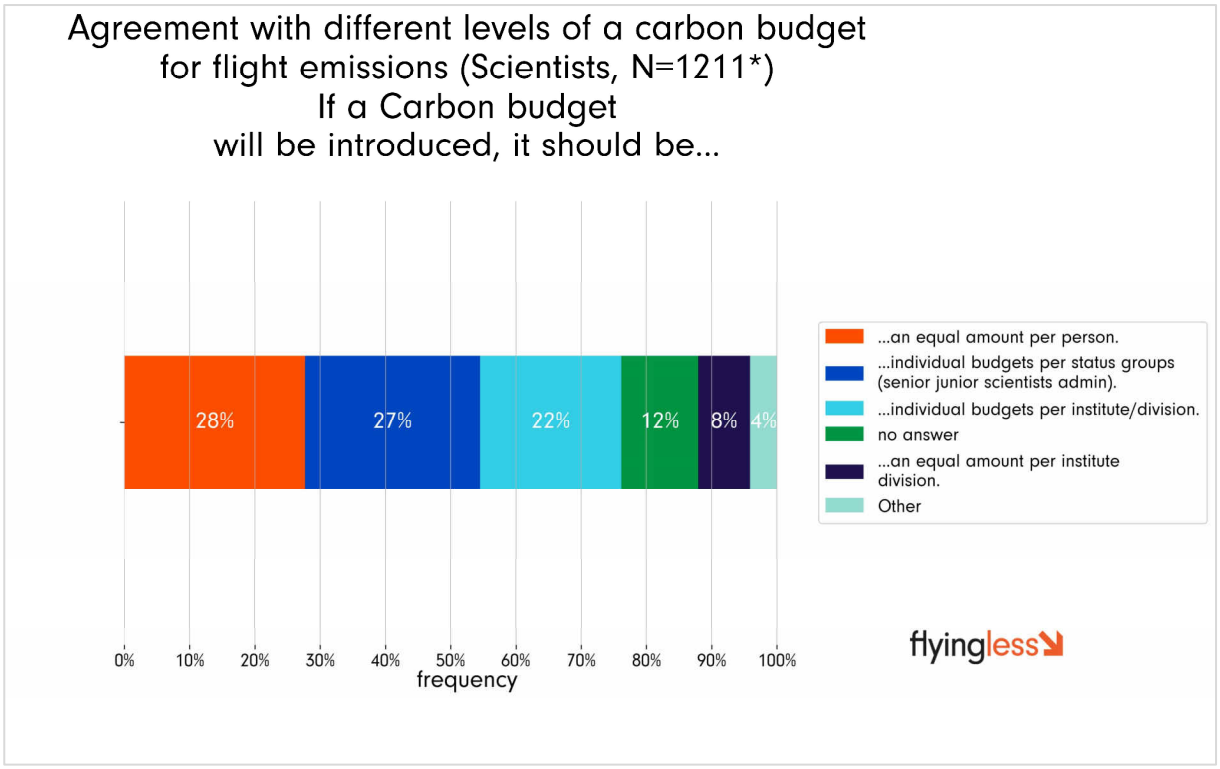

Figure 31: Agreement with different levels of a carbon budget for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status group: Scientists, N=1211 (aggregated from professors & group leaders, N=360 & Scientists without professorship/group lead, N=851). Scientists who indicated they supported a carbon budget were asked for their opinions on the options given.*

Other options for designing a carbon budget, that were mentioned (examples):

- «Gleiche Menge C02 pro Person mit der Möglichkeit die Budgets abzugeben/zu handeln.»
- «abhängig sein von der fachspezifischen Notwendigkeit von Flugreisen»
- «Es sollte ein Pro-Kopf-Gesamtbudget für einzelne Professuren geben. Eine Staffelung ist sicher sinnvoll, sollte aber eher zwischen WiMis und Verwaltung bzw. technischen Mitarbeitenden, da sich hier die Anforderungen stark unterscheiden. Bei ProfessorInnen sollte die "Notwendigkeit" besonders mit Blick auf Beförderungsalternativen besonders geprüft werden, da hier Status häufig auch über Privilegien definiert wird.»
- «individuelle Budgets je nach Arbeitsbereich: Feldarbeit und Konferenzen sind wichtig, zusätzlich je nach Bedarf: Individuelle Mobilität beachten, z.B. durch Alter und Behinderungen eingeschränkt»
- «So lange die akademischen Zielvorgaben von der Institution gemacht werden, sollten die Auflagen nicht den Zielvereinbarungen widersprechen.»

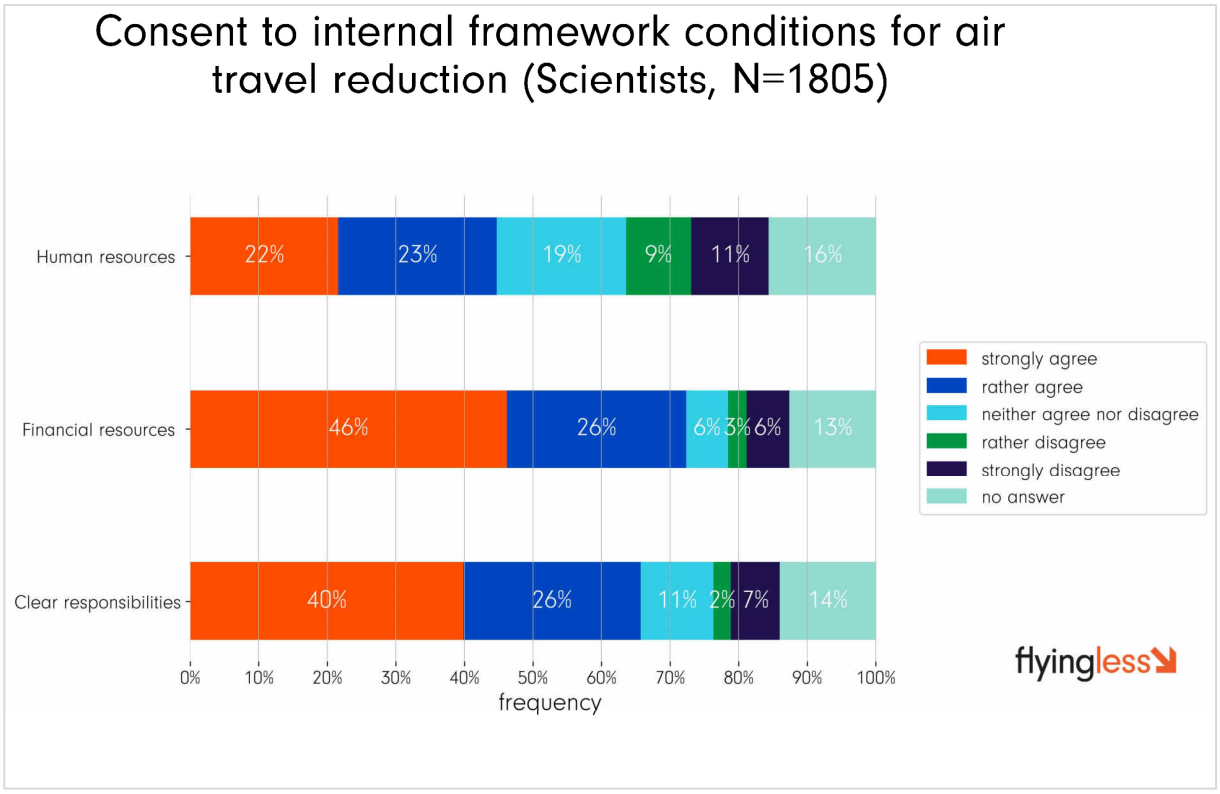

Figure 32: Consent to internal framework conditions for air travel reduction. Relative frequency of mentions (X-axis) of different framework conditions given (Y-axis). Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

Comments on other measures/incentives/etc. that could help to reduce academic air travel (examples):

- «Anreizsystem - MItarbeitende haben etwas davon CO2 arm zu reisen»
- «Eigentlich nur geeignete Verkehrsinfrastruktur. Wenn ich auf einer Konferenz in Europa präsentiere nehme ich wenn möglich immer den Zug. Bei meinem letzten Flug hätte die Zugreise allerdings über 20 Stunden gedauert - das ist als Hindernis viel relevanter als alles universitätsinterne.»
- «InterrailTicket und Erstattung Reservierungen für Geschäftsreisen»
- «Konferenzlocations müssen so gelegt werden, dass sie im Aggregat Anfahrtswege minimieren»
- «Mehr Konferenzen, die virtuell abgehalten werden»
- «education of emploeey and students»
- «The University tracking and publishing its staff's academic travel emissions in its newsletter»
- «Wenn sich andere Wissenschaftler:innen auf die digitale Präsenz DEUTLICH mehr einlassen würden.»
- «Support for carers and essential companions when train travel might take longer or not be suitable for everyone ie disability needs etc»
- «"Strafgebühr" für das Budget, wenn mit dem Flugzeug gereist wird»
- «Easier and clearer way to book international train tickets.»
- «Erstattung von Zwischenstop (Hotelübernachtung) bei sehr langen Zugverbindungen mit Umstiegen»
- «Longer period of travel allowed before and after the conference»

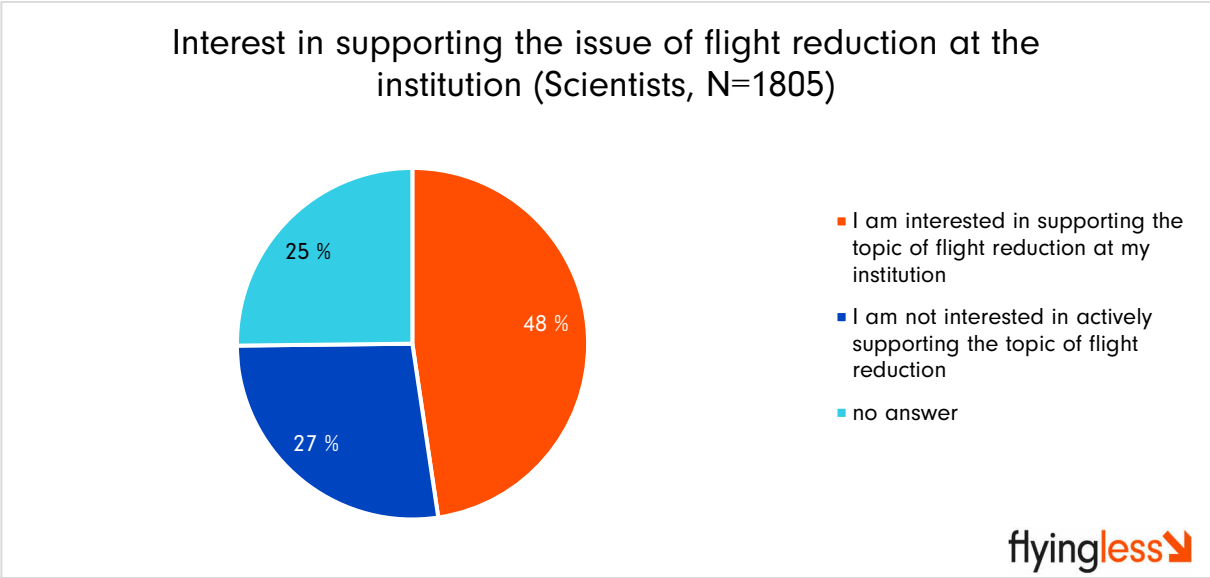

Figure 33: Interest in supporting the issue of flight reduction at the institution. Relative frequency of mentions regarding the interest on supporting the topic of flight reduction at the own institution. Status group: Scientists, N=1805 (aggregated from professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

6. Status groups compared

In this chapter, the results for professors & group leaders (N=582) are compared / contrasted with those of scientists without professorships / group leaders (N=1223).

6.1. Structuring the respondents groups

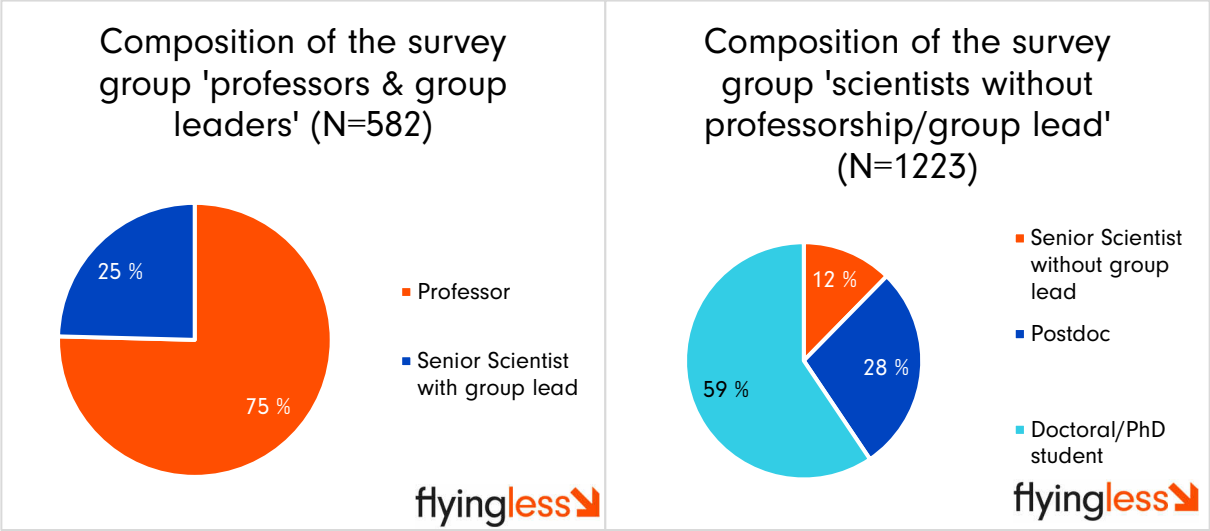

Figure 34: Position of the respondents. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223. Relative frequency of the position indicated.

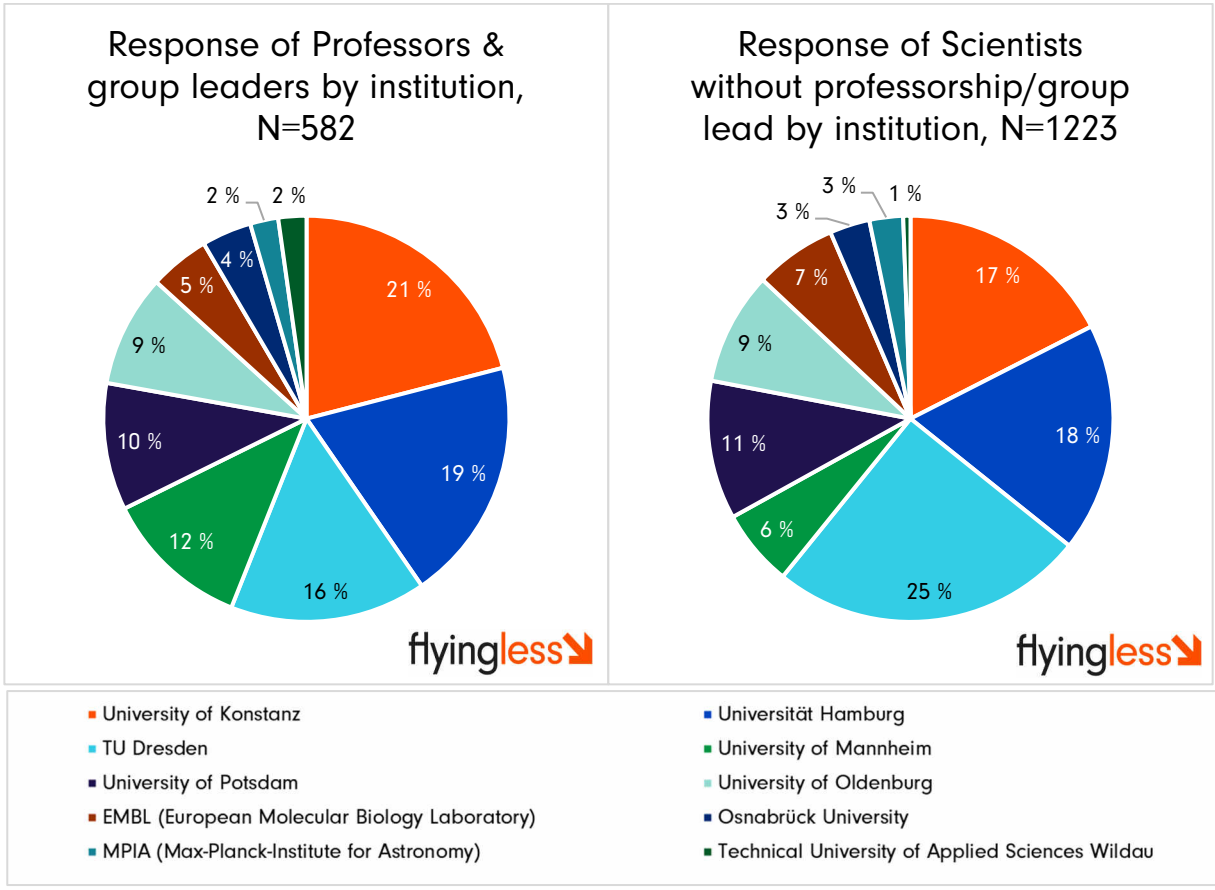

Figure 35: Response by institution. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223. Relative frequency (Y-axis) of institutional affiliation (X-axis).

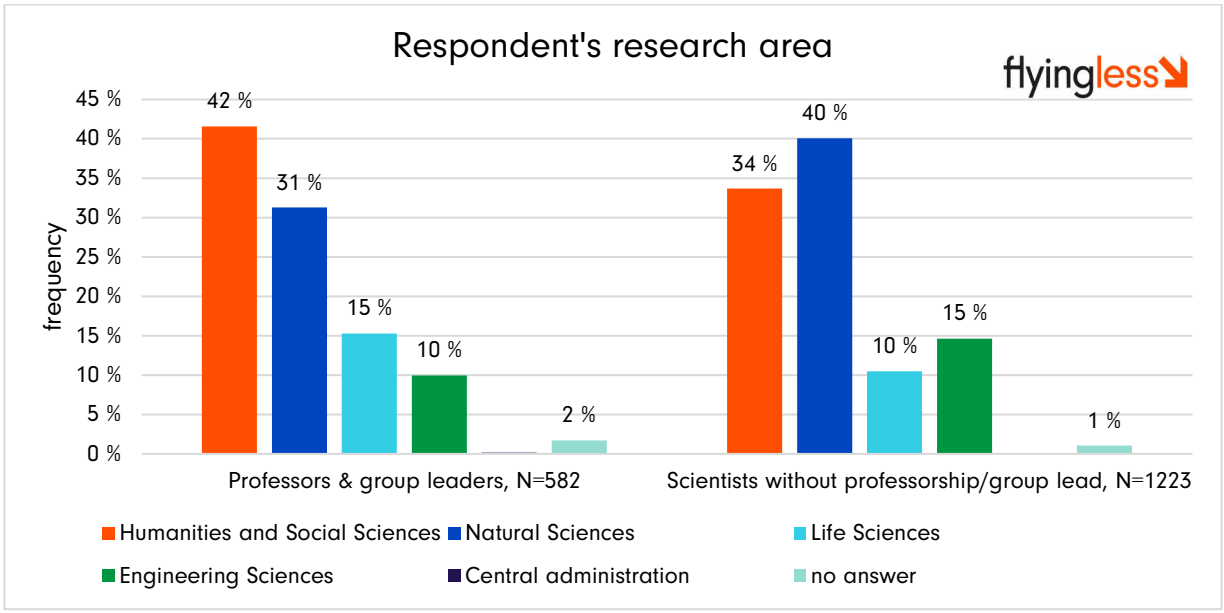

Figure 36: Research area of the scientists. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223. Relative frequency (Y-axis) of the research area indicated (X-axis). Categories correspond to the DFG structure.

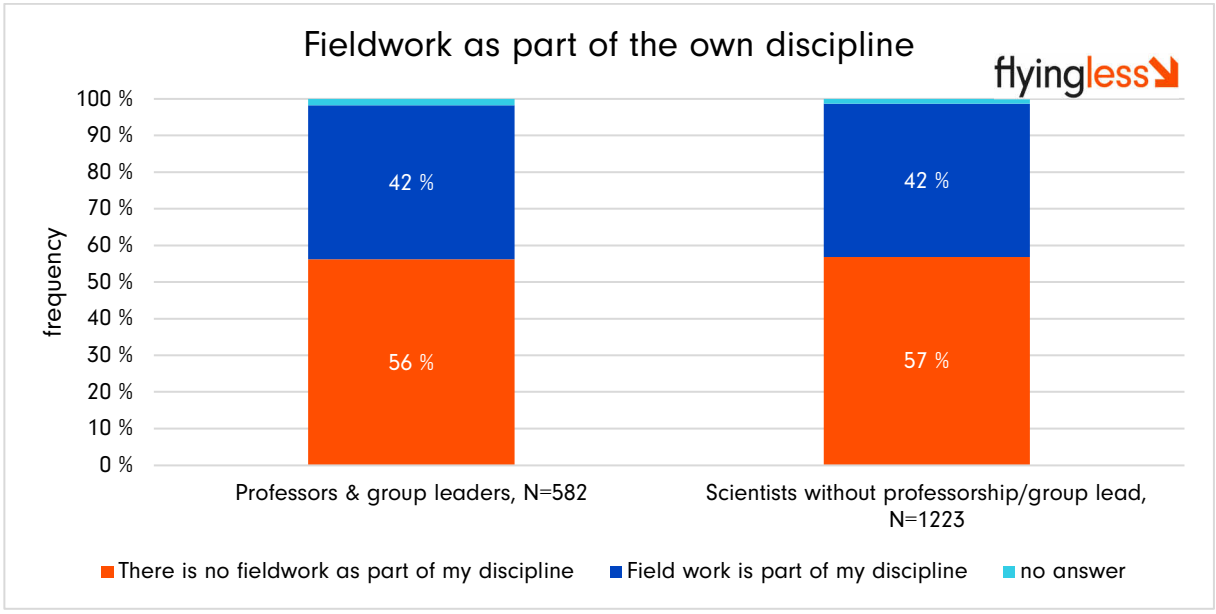

Figure 37: Field work as part of the own research. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223. Relative frequency (Y-axis) of field research in one's field of activity. Field research defined as collecting raw data outside of a laboratory, library, or workplace (including instrument maintenance/installation, etc.).

6.2. The topic of flight reduction and communication about it in academia

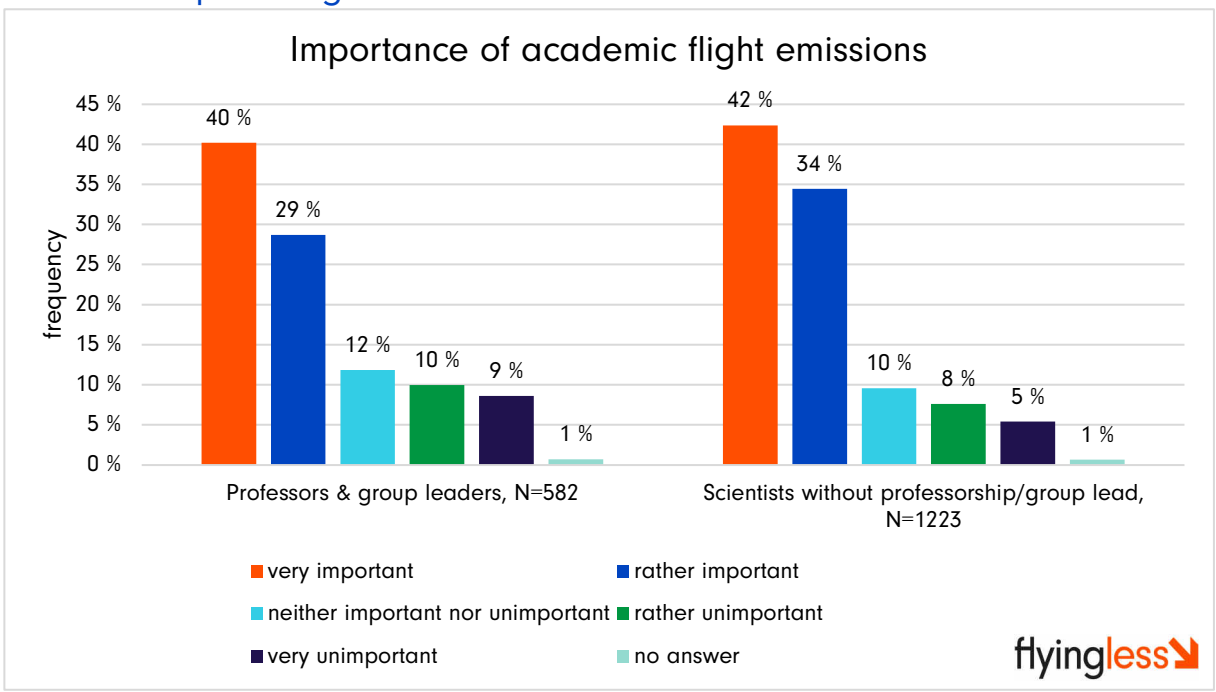

Figure 38: Importance of academic flight emissions. Relative frequency (Y-axis) of the evaluation of the topic of flight reduction in academia (X-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

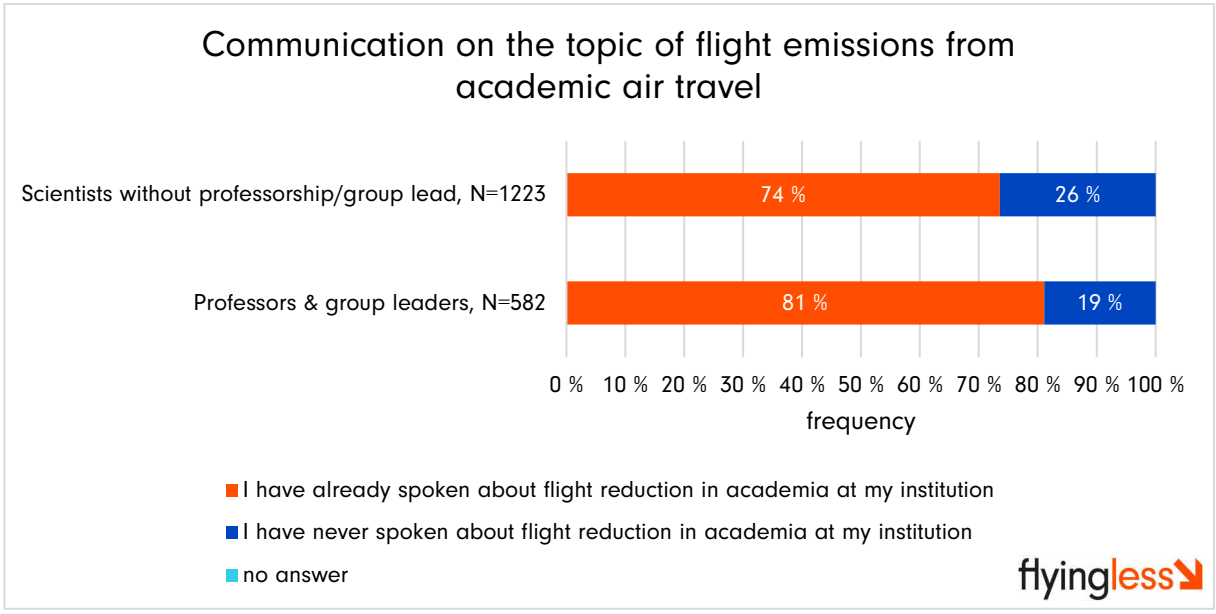

Figure 39: Communication on the topic of flight emissions from academic air travel. Relative frequency of mentions (X-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

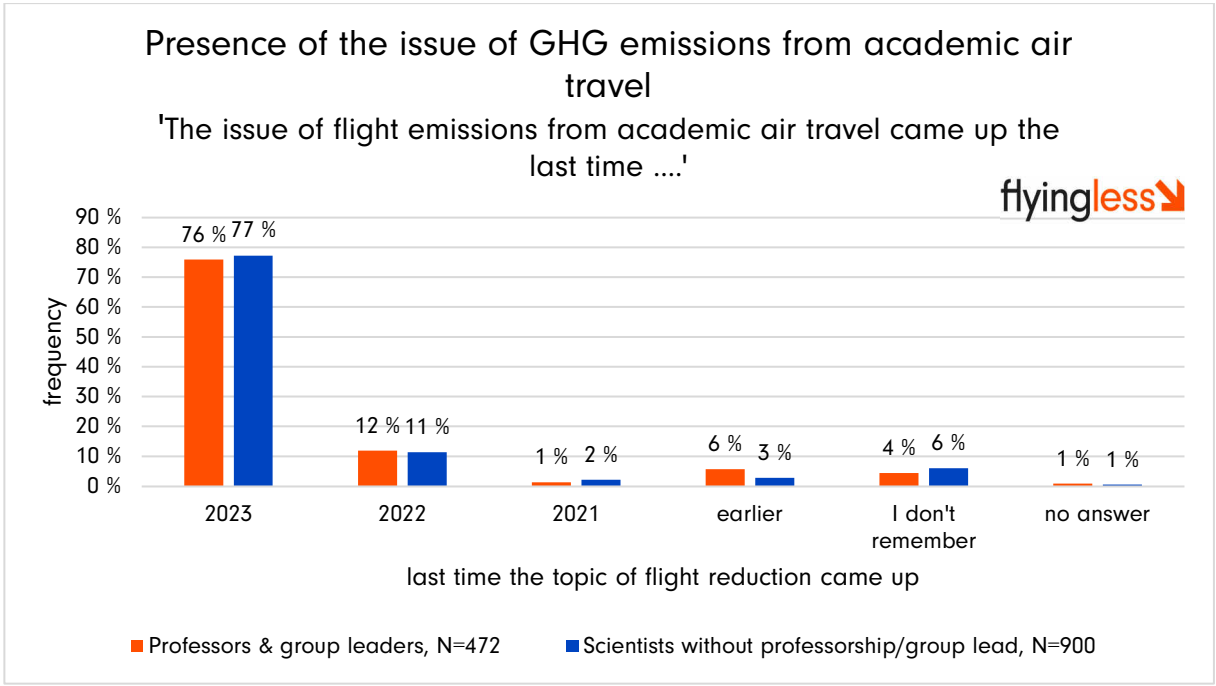

Figure 40: Presence of the issue of GHG emissions from academic air travel among scientists. Indication of the date of the last communication on the subject of flight emissions from academic air travel (X-axis). Relative frequency of mentions (Y-axis). Status groups compared: Professors & group leaders, N=472 & Scientists without professorship/group lead, N=900*. *Scientists who indicated that they had already spoken about the topic of flight emissions in academia were asked about the timing of the last communication about it.*

6.3. Average mobility (flight, train/bus) and use of virtual format per year prior to the COVID-19 pandemic and in 2022

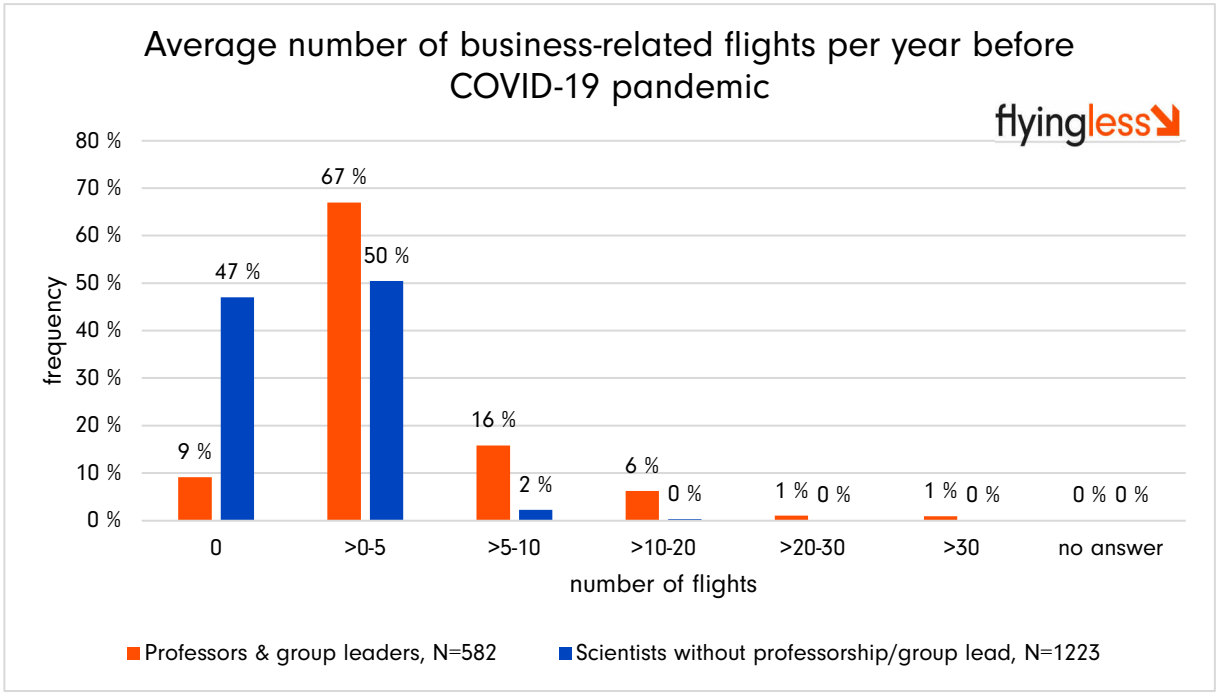

Figure 41: Average number of business-related flights per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated number of trips per year (X-axis). Status groups compared: Professors & group leaders, N=582 vs. Scientists without professorship/group lead, N=1223.

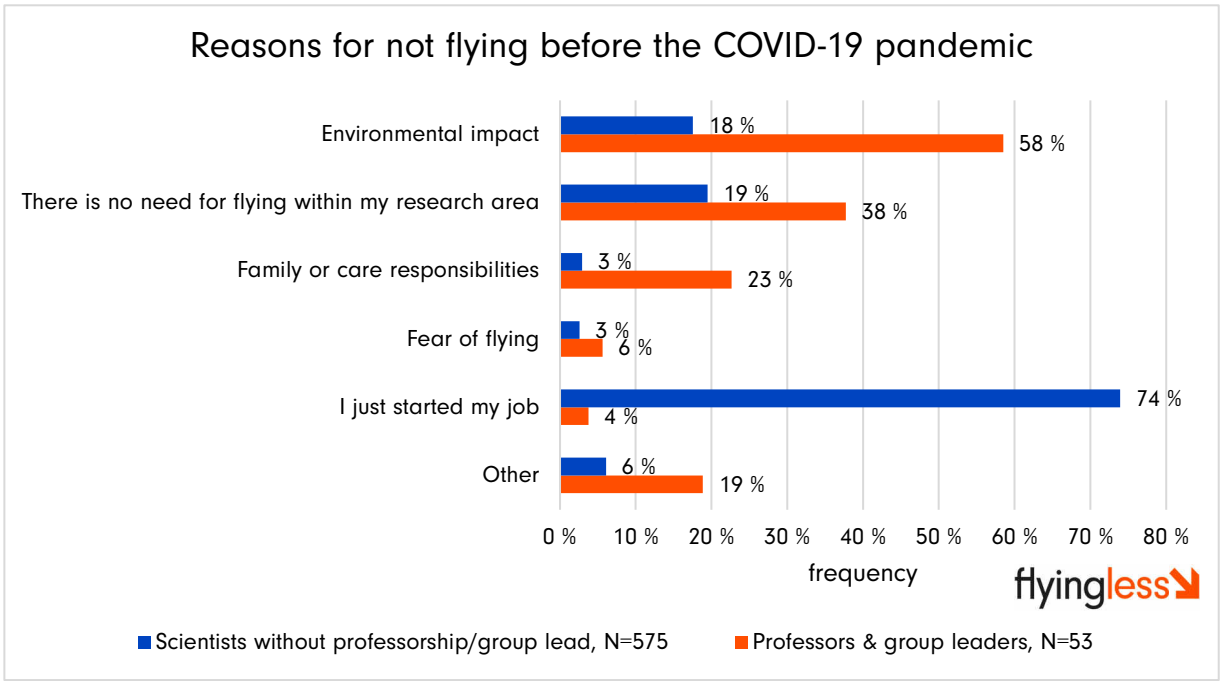

*Figure 42: Reasons for not flying before the COVID-19 pandemic. Status groups compared: Professors & group leaders, N=53 & Scientists without professorship/group lead, N=575). *Scientists who indicated that they did not fly prior to the COVID-19 pandemic were asked why.*

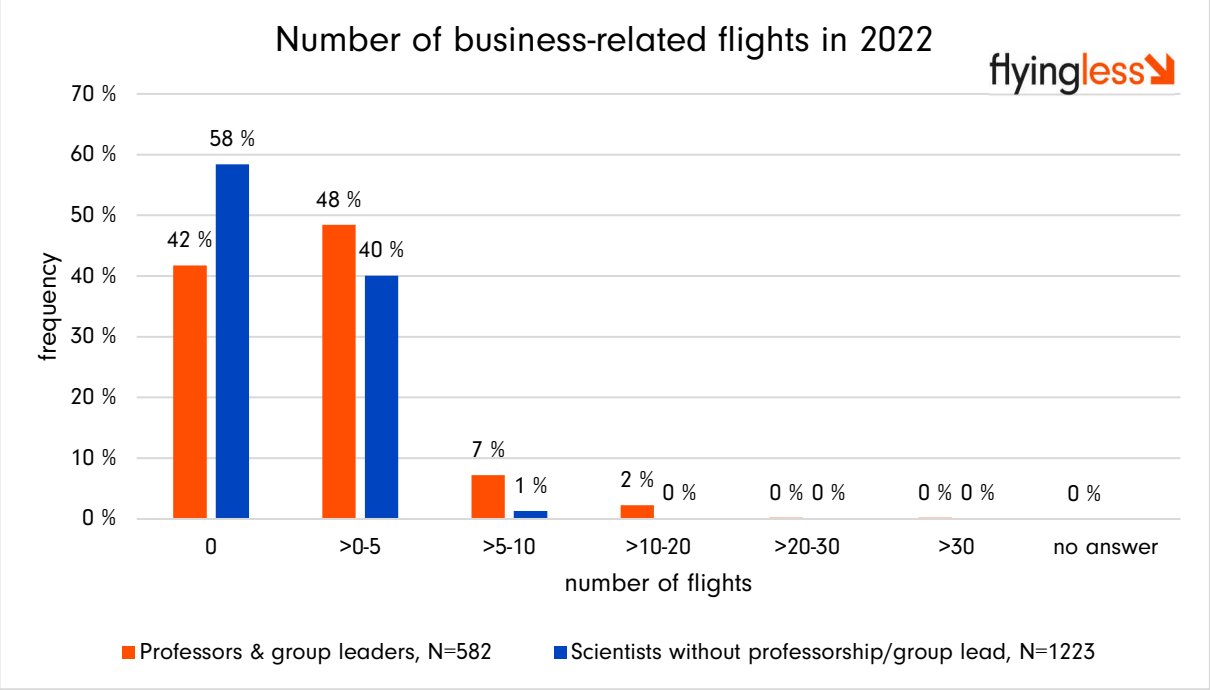

Figure 43: Number of business-related flights in 2022. Relative frequency of mentions (Y-axis) per aggregated number of flights (X-axis). Status groups compared: Professors & group leaders, N=582 vs. Scientists without professorship/group lead, N=1223.

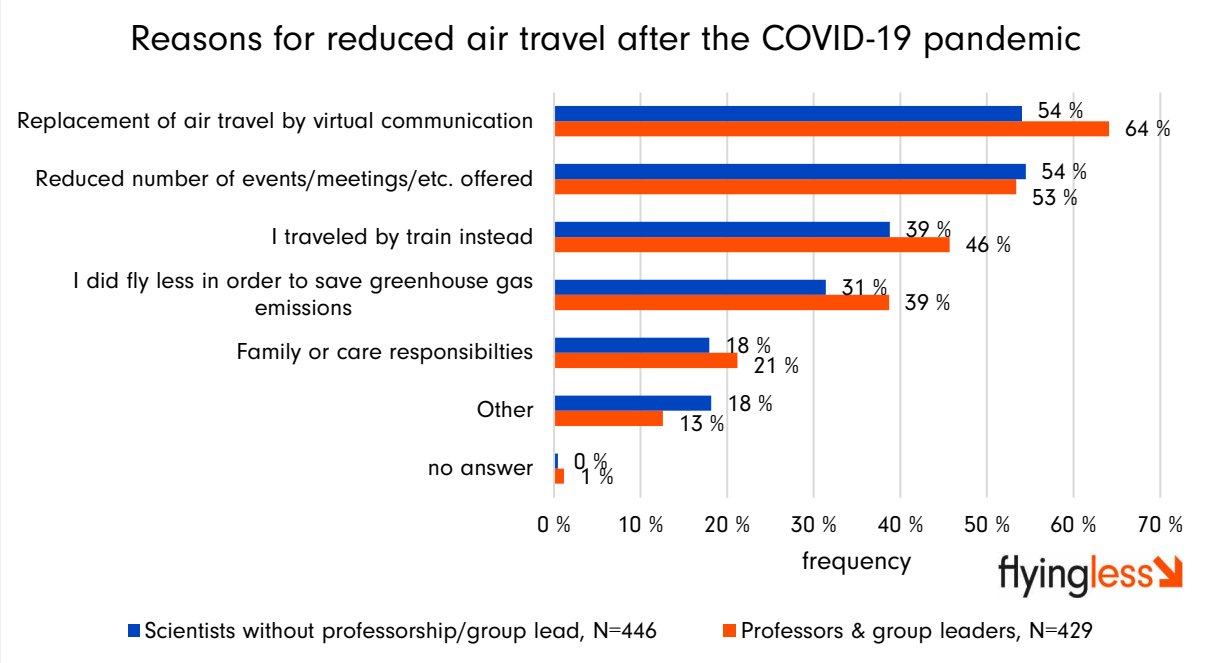

*Figure 44: Reasons for reduced air travel after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a lower flight volume (Y-axis). Status groups compared: Professors & group leaders, N=429 & Scientists without professorship/group lead, N=446). *Scientists who indicated they flew less frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

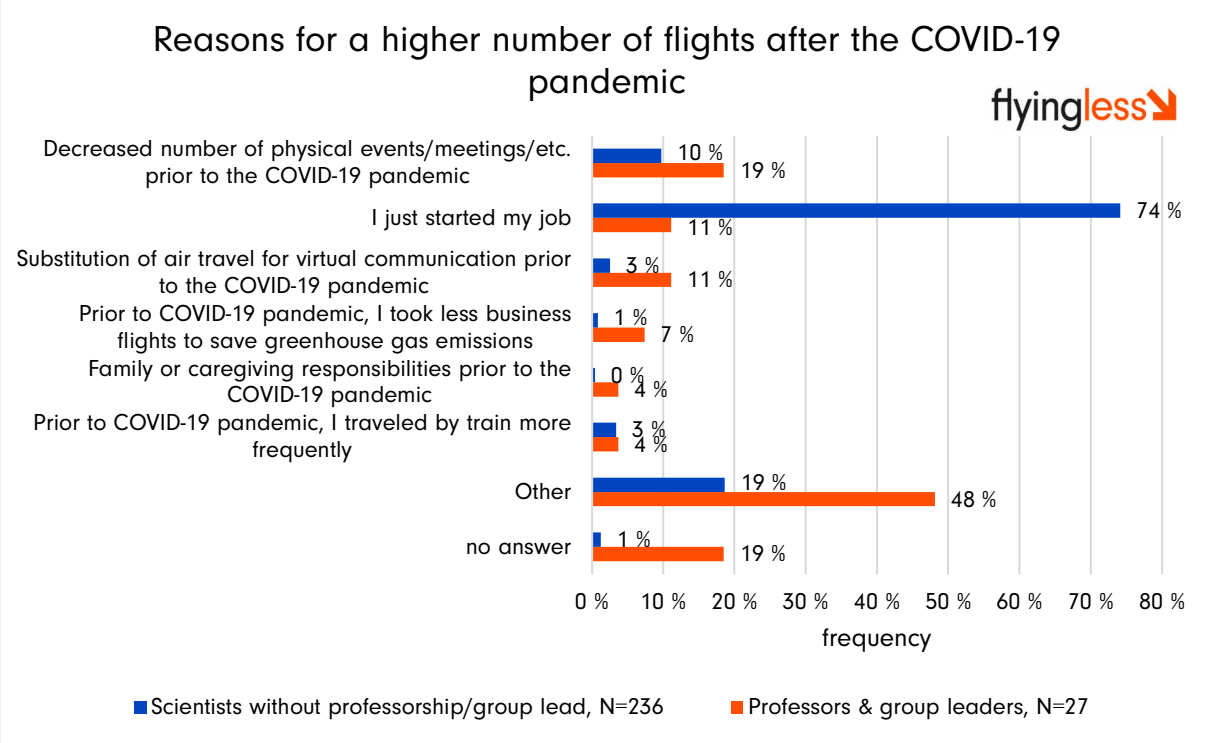

*Figure 45: Reasons for a higher number of flights after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a higher flight volume (Y-axis). Status groups compared: Professors & group leaders, N=27 & Scientists without professorship/group lead, N=236). *Scientists who indicated they flew more frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

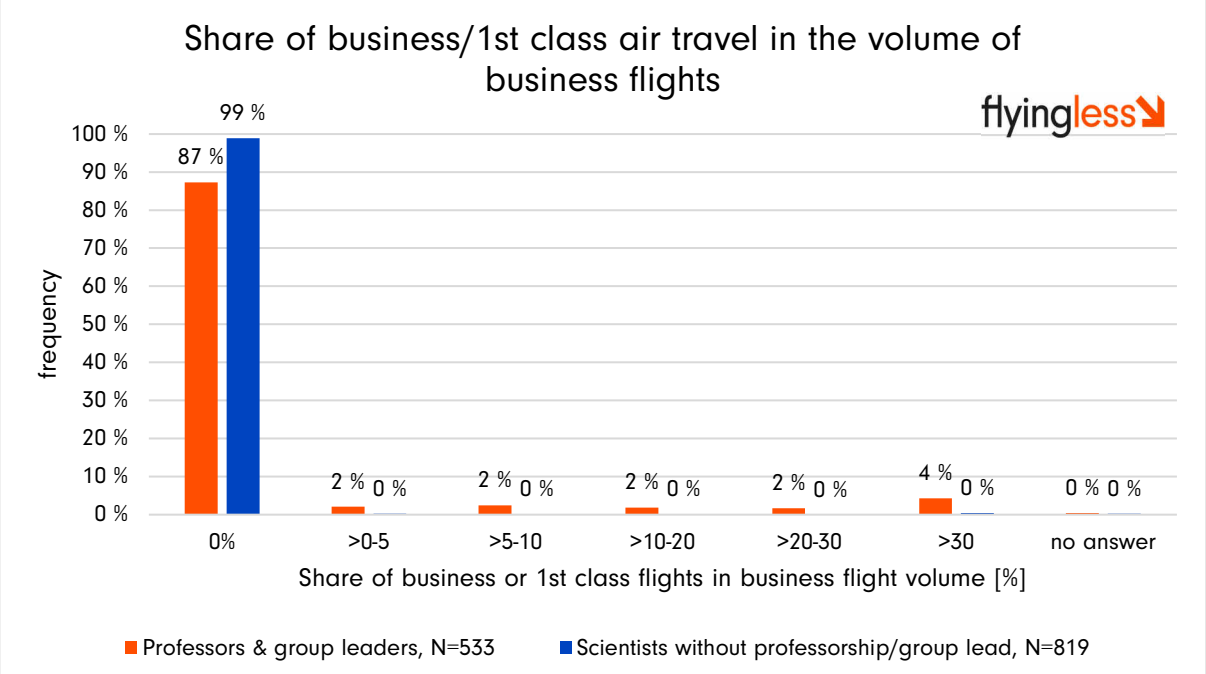

Figure 46: Share of business/1st class air travel in the volume of business flights. Relative frequency of mentions (Y-axis) per percentage of business class flights in the person's total flight volume (X-axis). Status group: Scientists, N=1352 (aggregated from professors & group leaders, N=533 & Scientists without professorship/group lead, N=819). *Scientists who indicated that they had flown at least once prior to the COVID-19 pandemic or in 2022 were asked.*

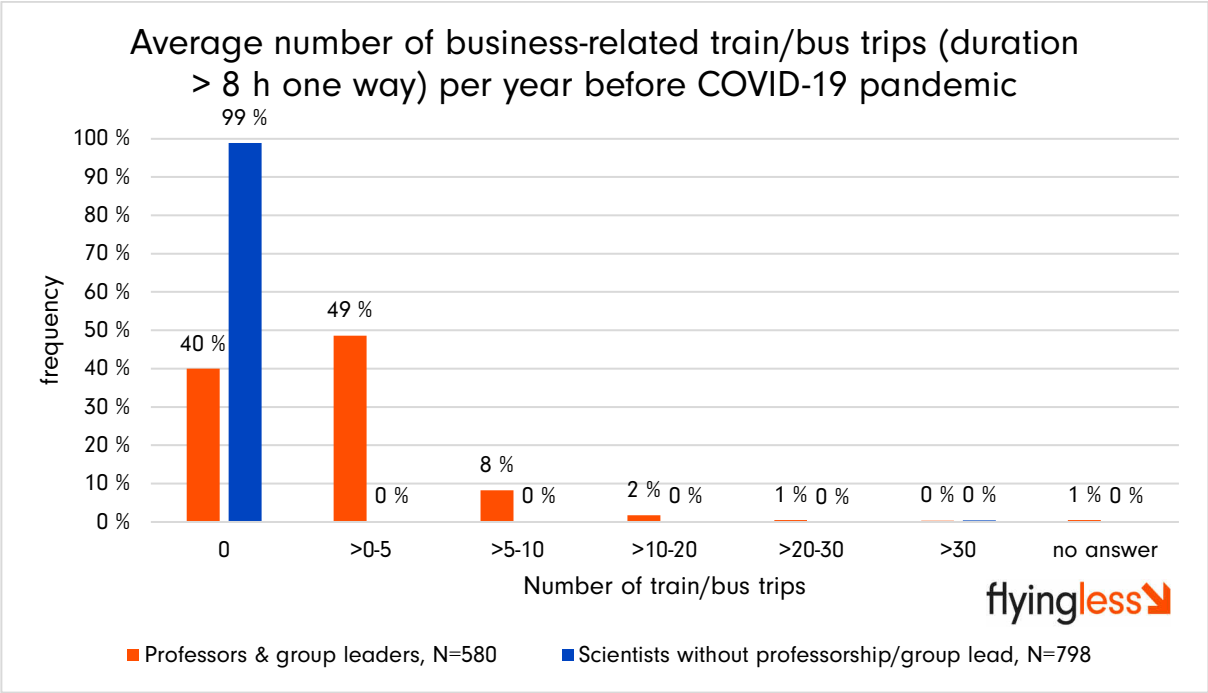

*Figure 47: Average number of business-related train/bus trips per year lasting 8 h or more (one-way) prior to the COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of train/bus trips per year (X-axis). Status groups compared: Professors & group leaders, N=580 & Scientists without professorship/group lead, N=798). *Scientists who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

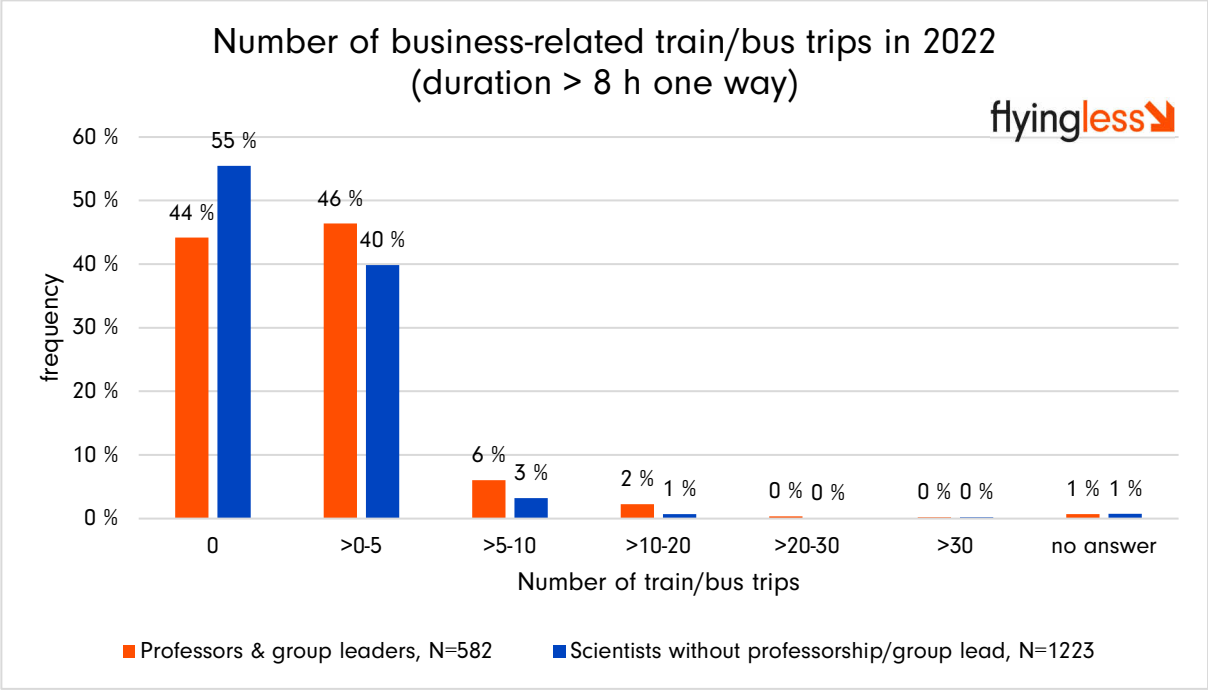

Figure 48: Number of business train/bus trips (duration > 8 h one way) in 2022. Relative frequency of mentions (Y-axis) per number of train/bus trips in 2022 (X-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223).

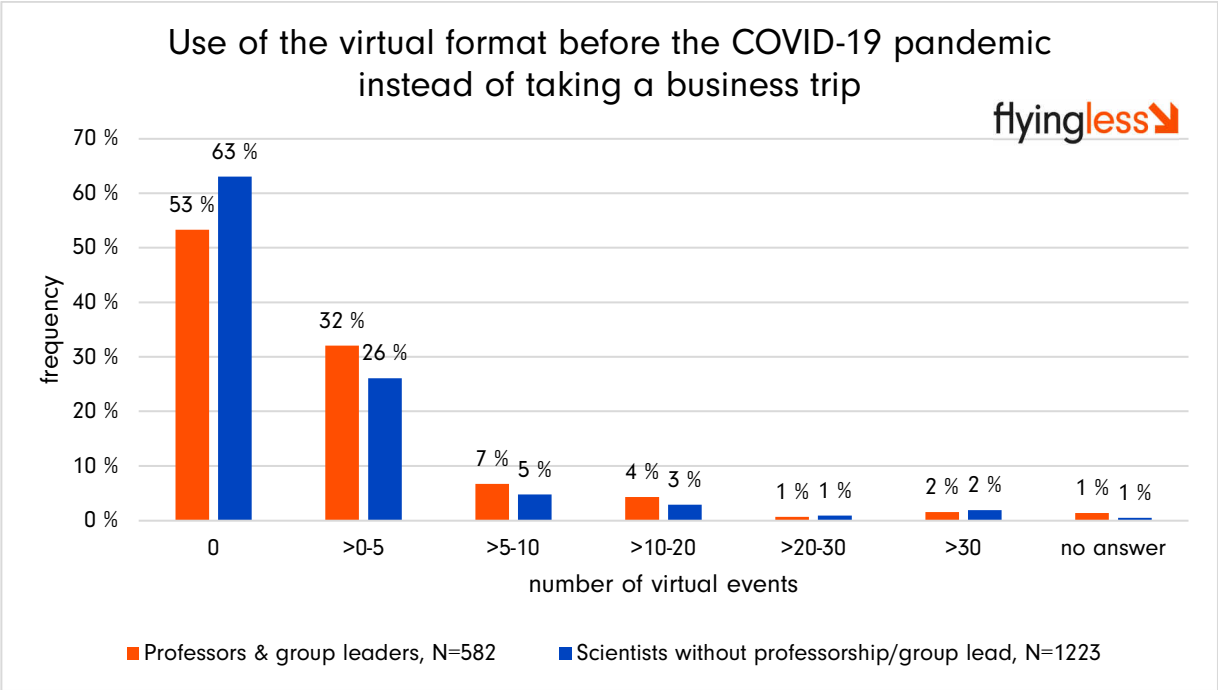

*Figure 49: Using the virtual format before the COVID-19 pandemic instead of going on a business trip. Relative frequency of mentions (Y-axis) per number of virtual events/meetings per year (X-axis). Status groups compared: Professors & group leaders, N=580 & Scientists without professorship/group lead, N=798. *Scientists who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

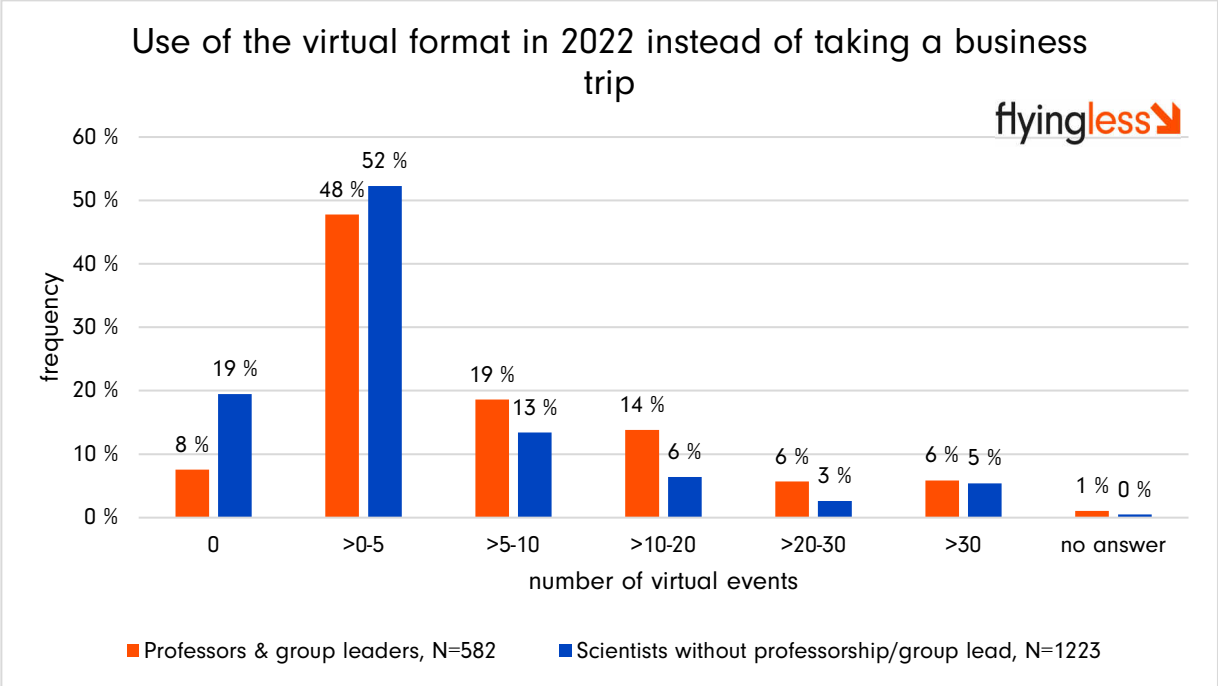

Figure 50: Use of the virtual format in 2022 instead of going on a business trip. Relative frequency of mentions (Y-axis) per virtual event/meeting in 2022 (X-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223.

6.4. Relevance of different reasons for business air travel

Both status groups (speaking of all scientists) rated 'conferences with a contribution' most often as an ('very' or 'rather') important reason for a business-related flight (Professors & group leaders: 91 % and Scientists without professorship/group lead: 86 %).

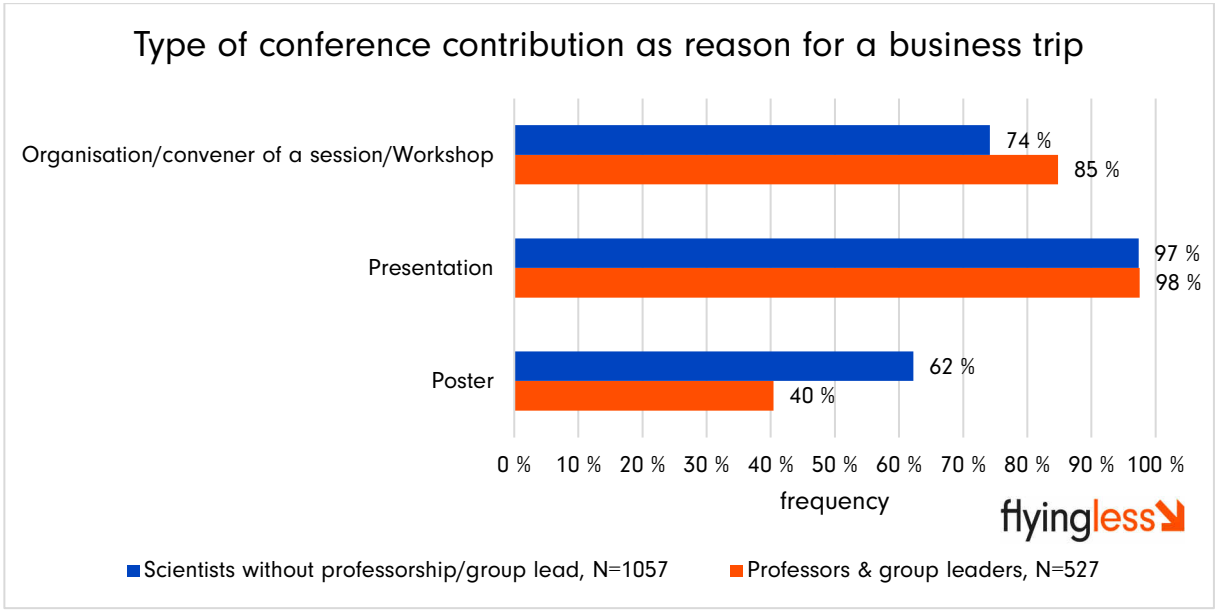

*Figure 51: Type of conference contribution as reason for a business trip. Relative frequency of mentions (X-axis) per subanswer (type of conference contribution; Y-axis). Status groups compared: Professors & group leaders, N=527 & Scientists without professorship/group lead, N=1057. *Scientists who considered conference participation with a contribution as an important reason for business air travel were asked about the type of contribution.*

6.5. Approval of business trips

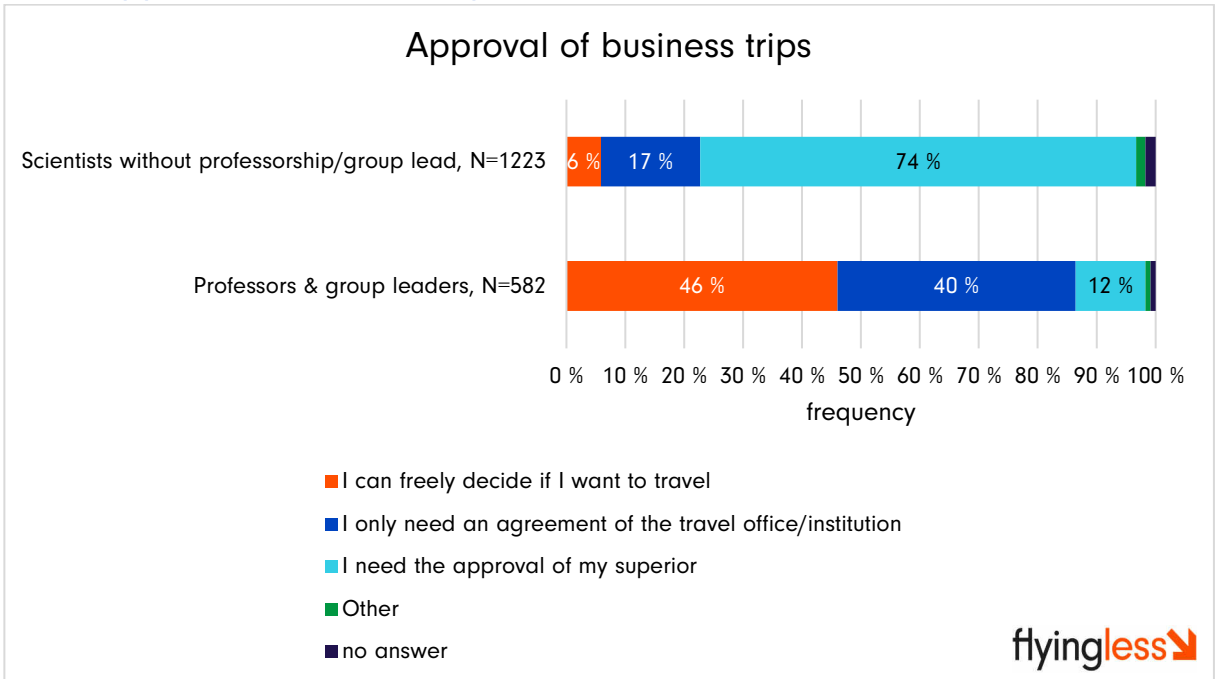

Figure 52: Approval of business trips. Relative frequency of mentions (X-axis) per subanswer. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223.

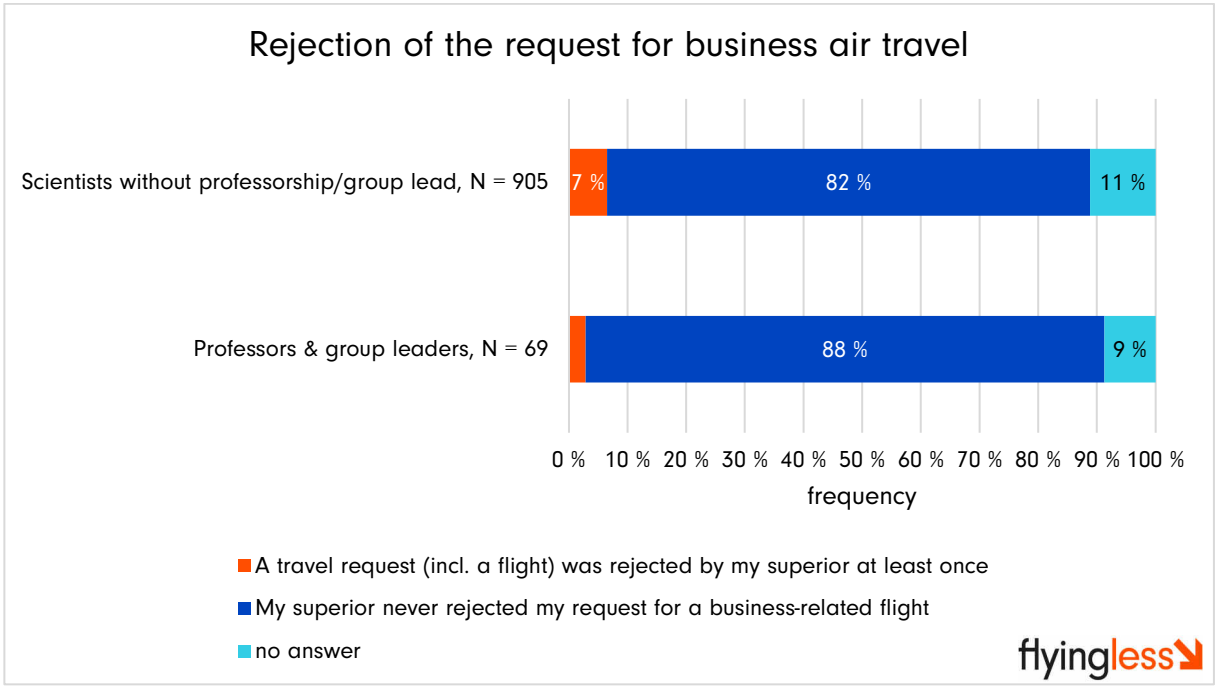

*Figure 53: Rejection of the request for business air travel. Relative frequency of mentions of a rejection of a request for business air travel. Status groups compared: Professors & group leaders, N=69 & Scientists without professorship/group lead, N=905. *Scientists who indicated that they needed approval from their supervisor(s) to approve a business trip were asked about the occurrence of a rejection.*

6.6. Behaviour changes and measures

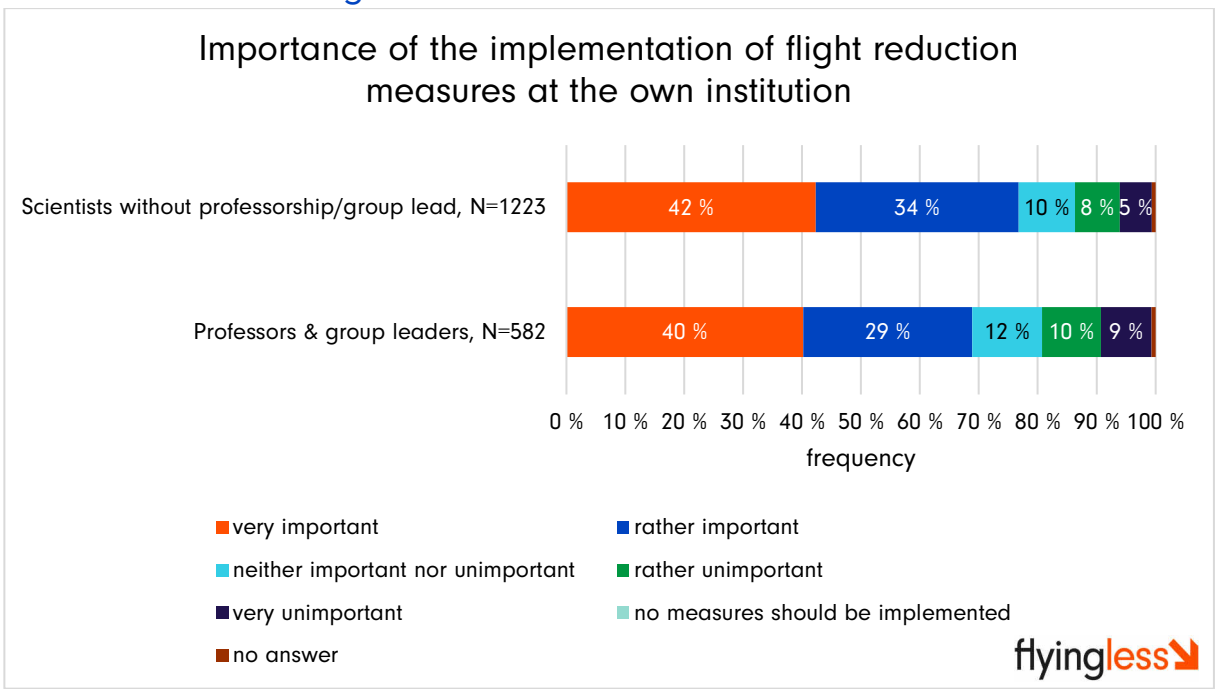

Figure 54: Importance of the implementation of flight reduction measures at the own institution. Relative frequency of mentions (X-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group, N=1223.

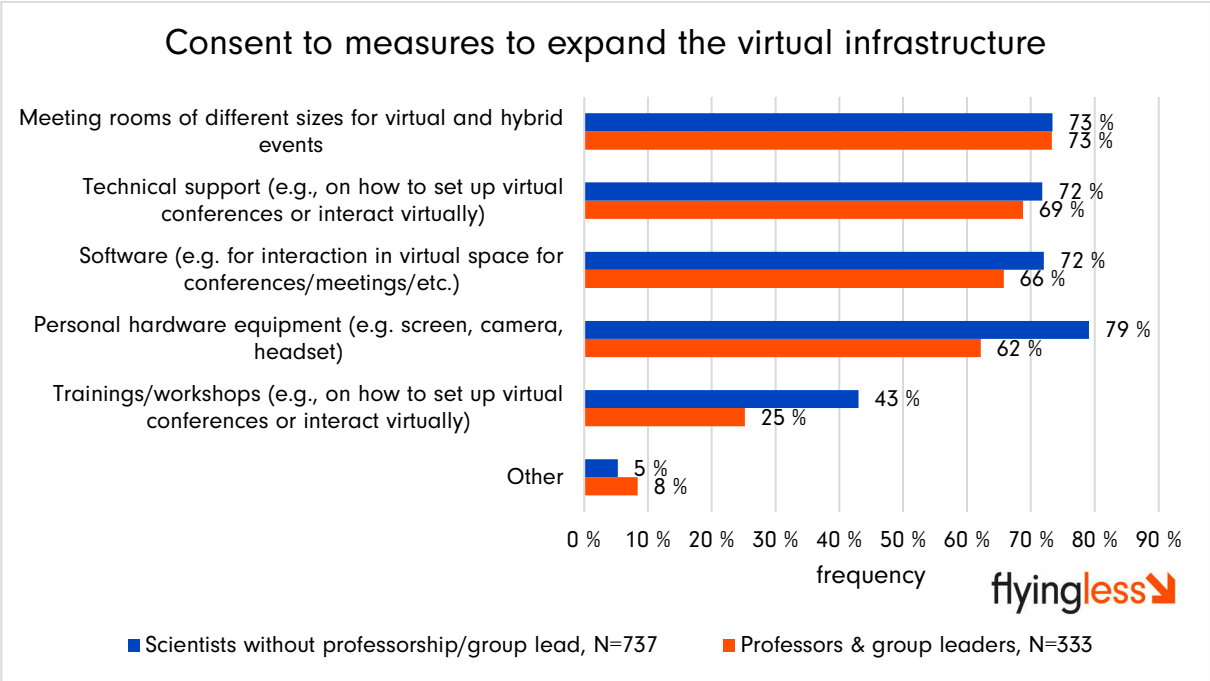

*Figure 55: Consent to measures to expand the virtual infrastructure. Relative frequency of mentions (X-axis) on certain measures for the expansion of the virtual infrastructure (Y-axis). Status groups compared: Professors & group leaders, N=333 & Scientists without professorship/group lead, N=737. *Scientists who indicated they supported an expansion of virtual infrastructure were asked about their opinions on specific measures.*

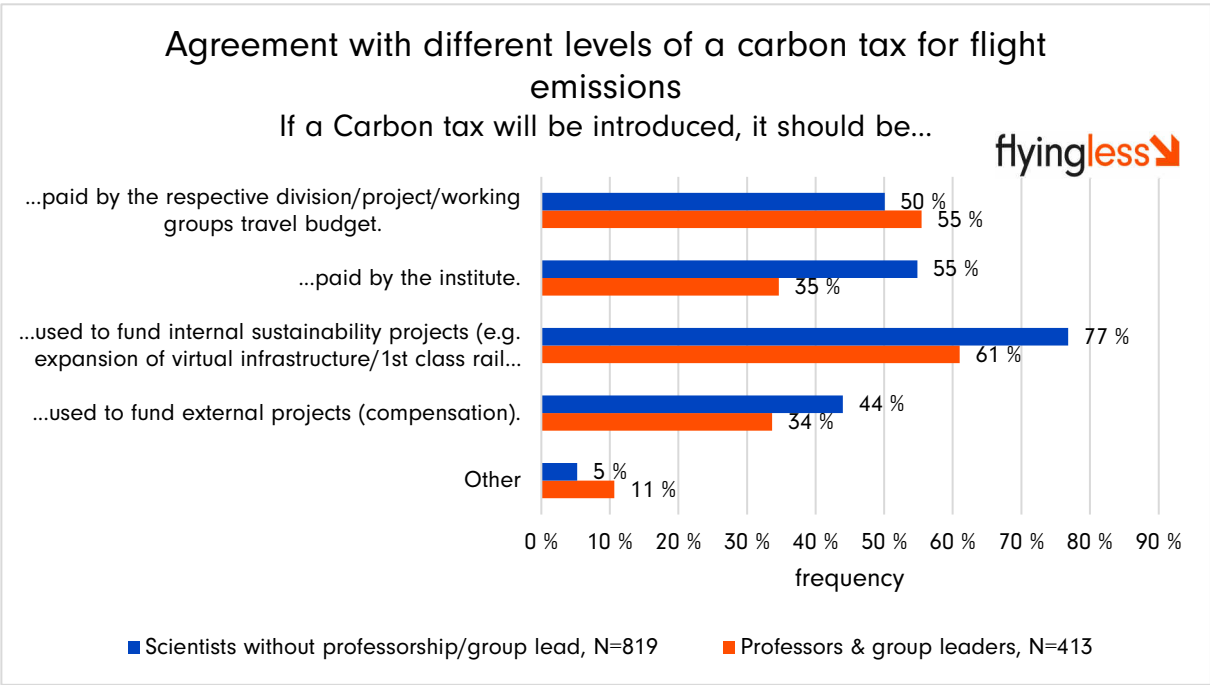

*Figure 56: Agreement with different levels of a carbon tax for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status groups compared: Professors & group leaders, N=413 & Scientists without professorship/group lead, N=890. *Scientists who indicated they supported a carbon tax were asked for their opinions on the options given.*

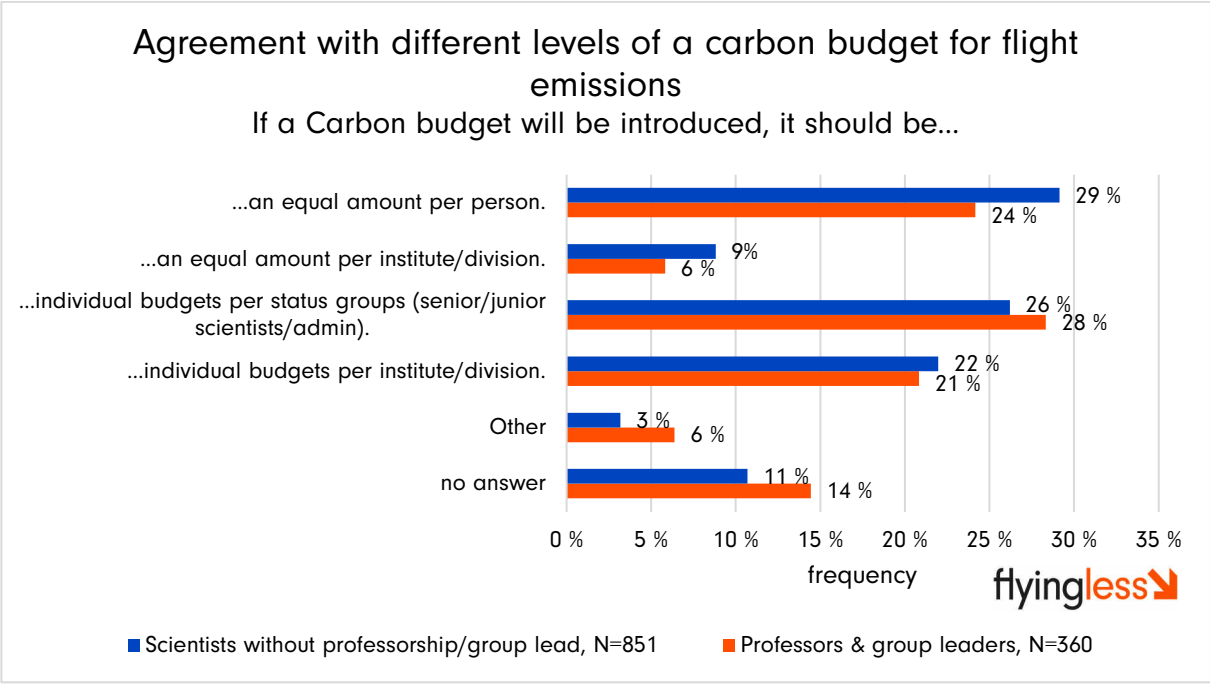

*Figure 57: Agreement with different levels of a carbon tax for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status groups compared: Professors & group leaders, N=413 & Scientists without professorship/group lead, N=890. *Scientists who indicated they supported a carbon tax were asked for their opinions on the options given.*

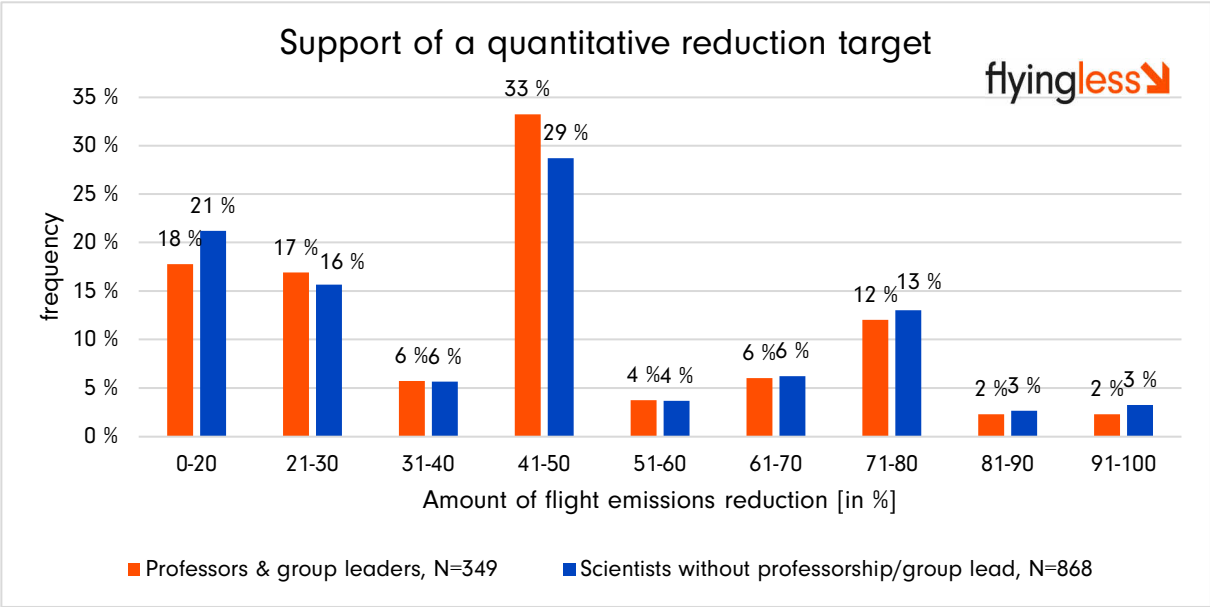

*Figure 58: Support a quantitative reduction target by 2030 relative to pre-COVID-19 air traffic levels (respondent's estimate). Relative frequency of mentions (Y-axis) per aggregated amount of reduction of flight emissions in % (X-axis). Status groups compared: Professors & group leaders, N=349 & Scientists without professorship/group lead, N=868. *Scientists who indicated they supported a (higher) quantitative reduction target were asked about this.*

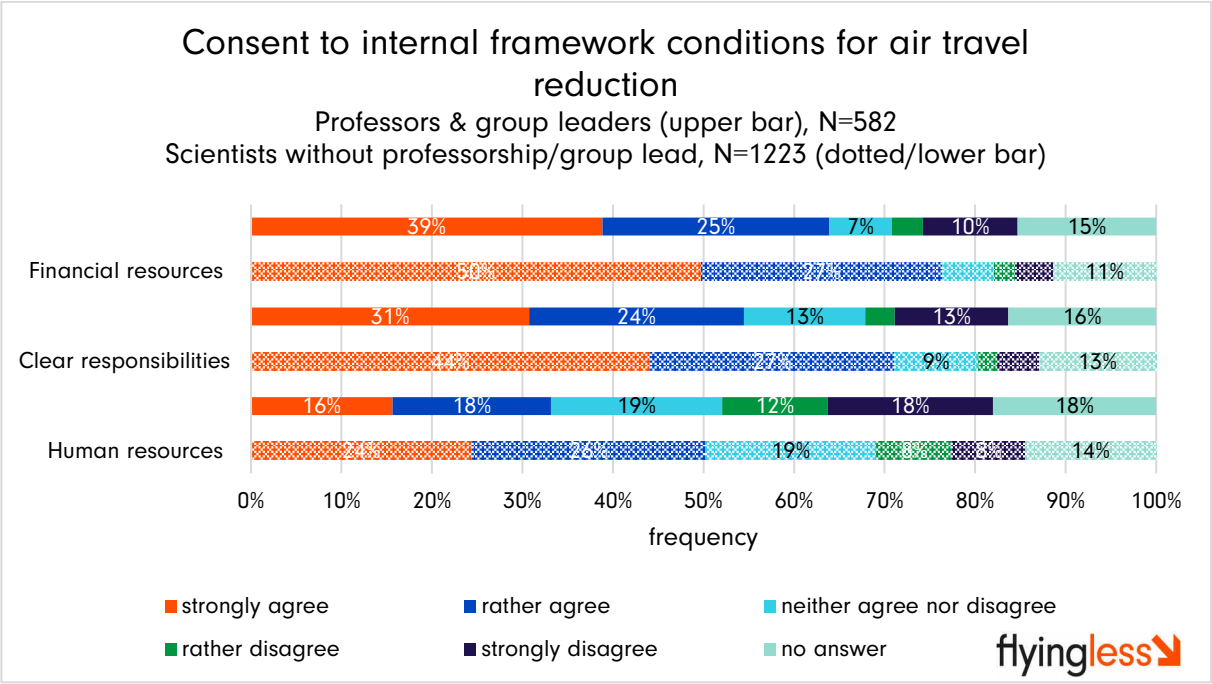

Figure 59: Consent to internal framework conditions for air travel reduction. Relative frequency of mentions (X-axis) of different framework conditions given (Y-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223.

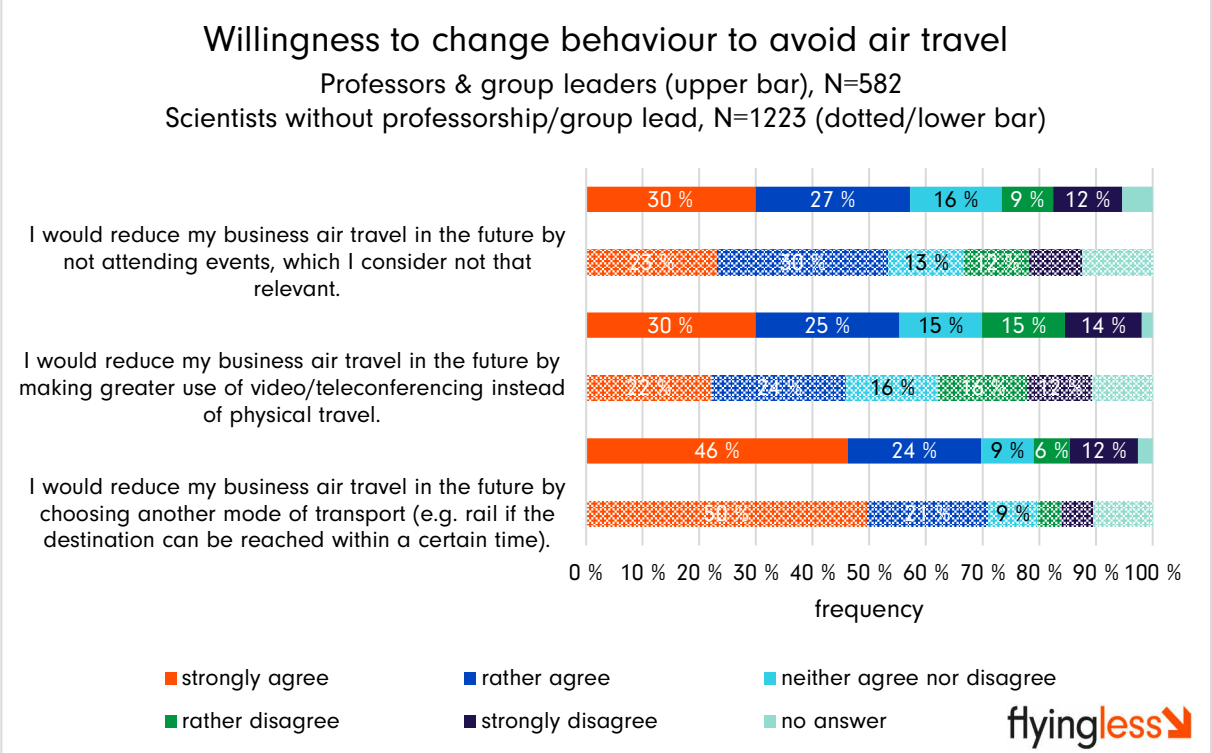

Figure 60: Willingness to change behaviour to avoid air travel. Relative frequency of mentions (X-axis) per subanswer (agreement with statements about future mobility behaviour to avoid official air travel; Y-axis). Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223.

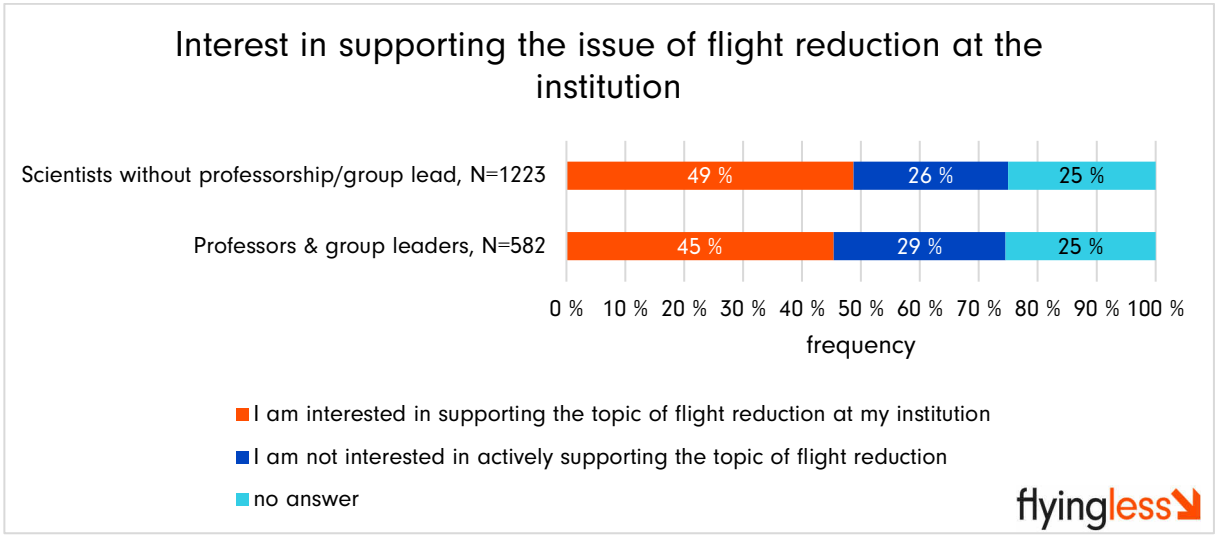

Figure 61: Interest in supporting the issue of flight reduction at the institution. Relative frequency of mentions regarding the interest on supporting the topic of flight reduction at the own institution. Status groups compared: Professors & group leaders, N=582 & Scientists without professorship/group lead, N=1223.

7. Average mobility (flight, train/bus) and use of virtual format per year prior to the COVID-19 pandemic and in 2022

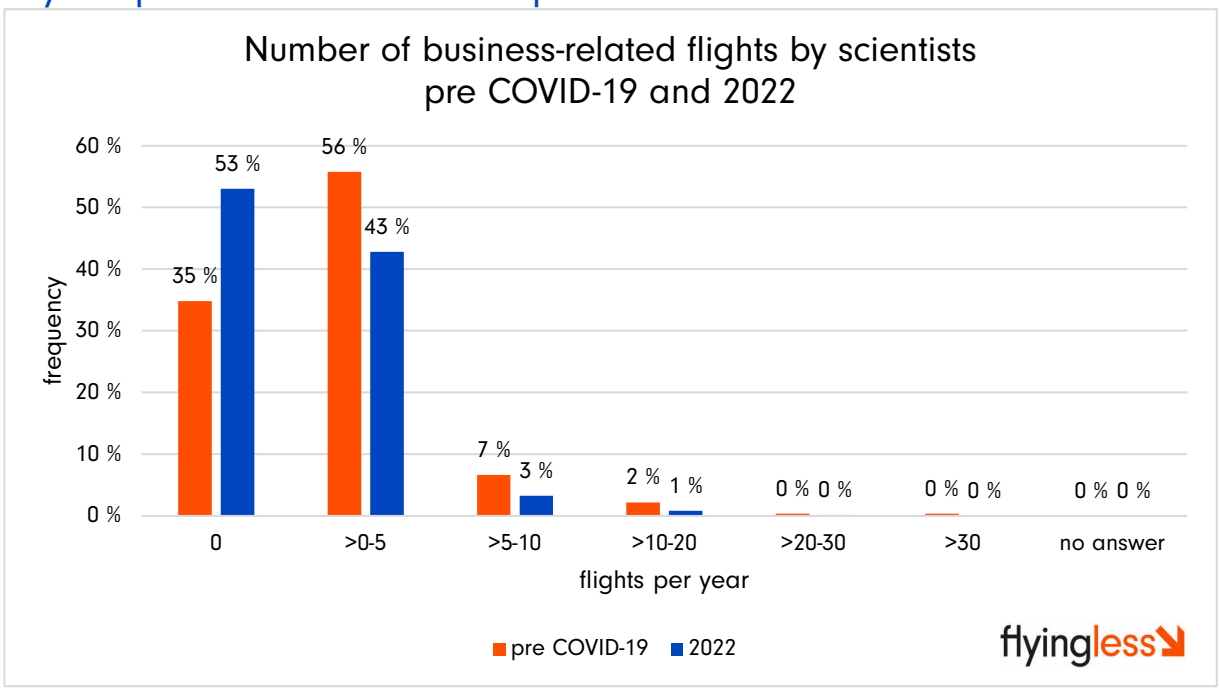

Figure 62: Number of business-related flights by scientists pre-COVID-19 and 2022. Comparison of the results from 2023 FlyingLess survey. Status group: scientists, N=1805 (aggregated from professors, N=582 & group leaders & scientists without professorship/group lead, N=1223).

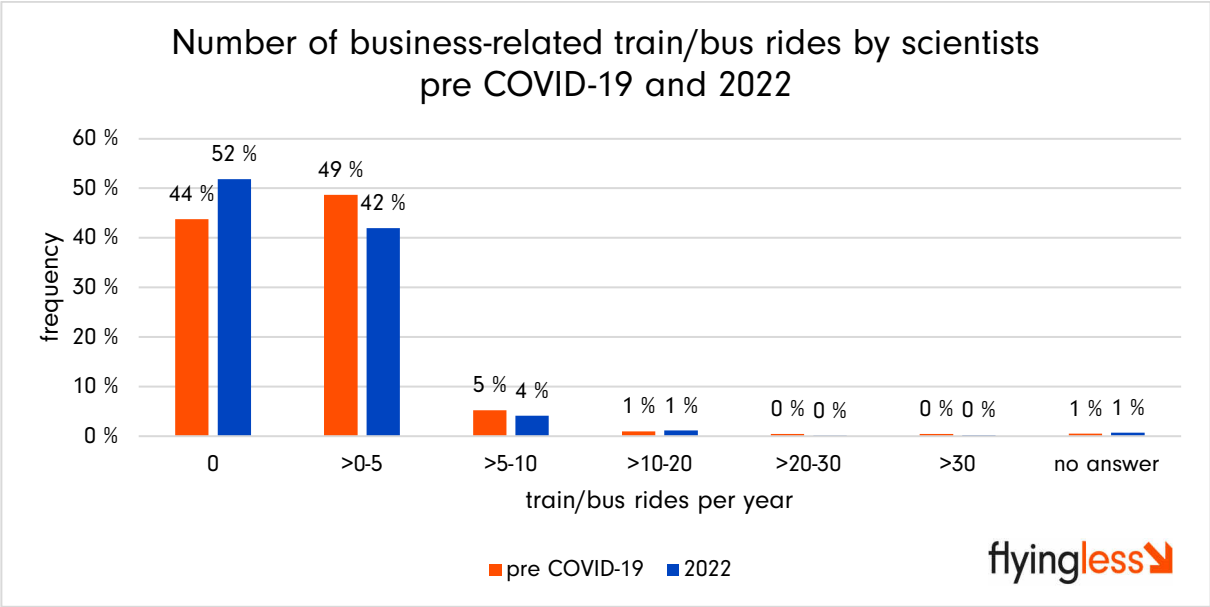

Figure 63: Number of business-related train/bus rides by scientists pre-COVID-19 (N=1378) and 2022 (N=1805). Comparison of the results from 2023 FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

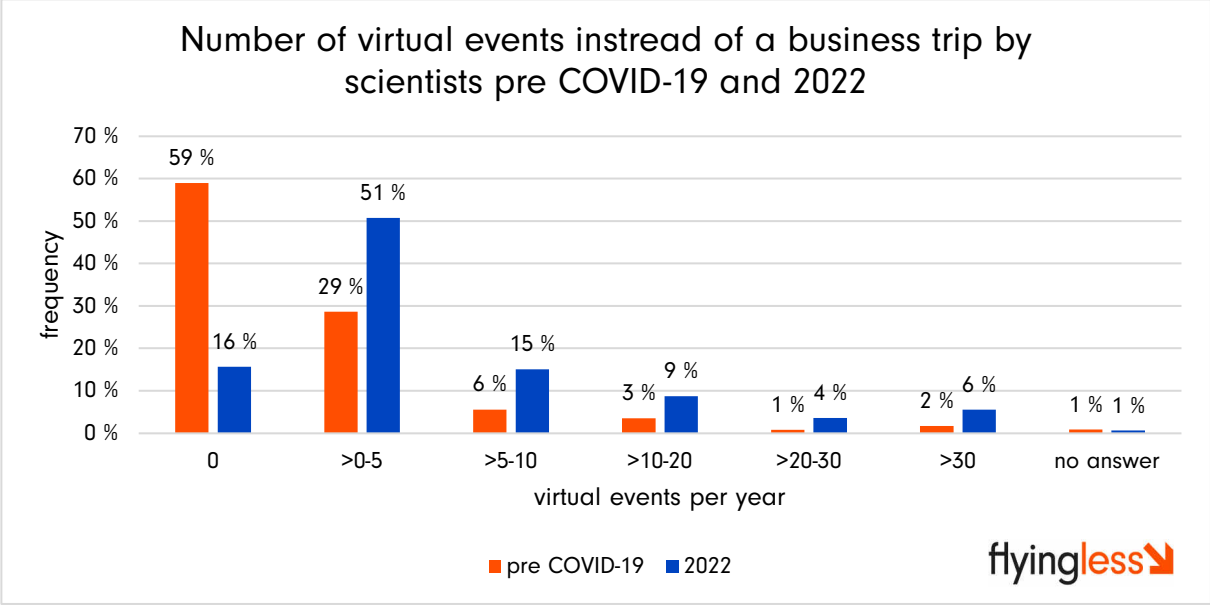

Figure 64: Number of virtual events instead of a business trip by scientists pre-COVID-19 (N=1378) and 2022 (N=1805). Comparison of the results from 2023 FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

8. Results from 2022 and 2023 compared (Scientists)

In this chapter, the results from the FlyingLess survey 2022 and 2023 for scientists are compared. In case of the comparison of the travel behaviour pre-COVID-19 and in 2022 the results are both taken from the survey results in 2023.

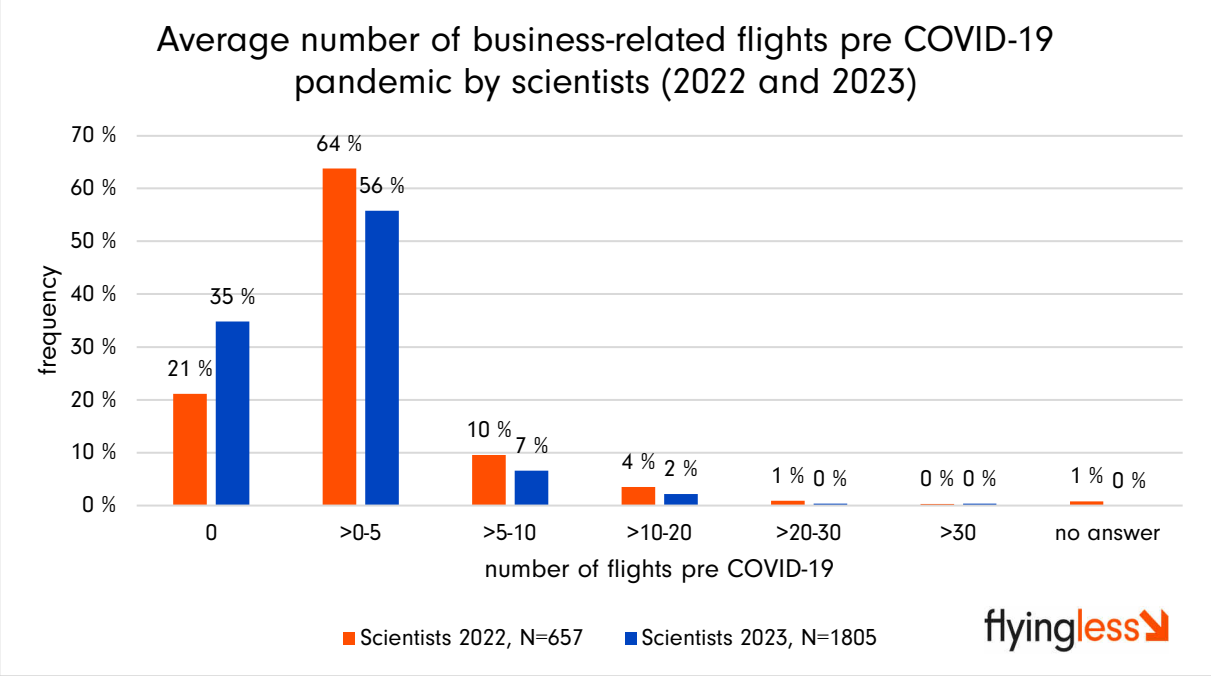

Figure 6562: Average number of business-related flights pre COVID-19 pandemic by scientists. Comparison of the results from 2022 and 2023 FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

8.1. Behaviour changes and measures

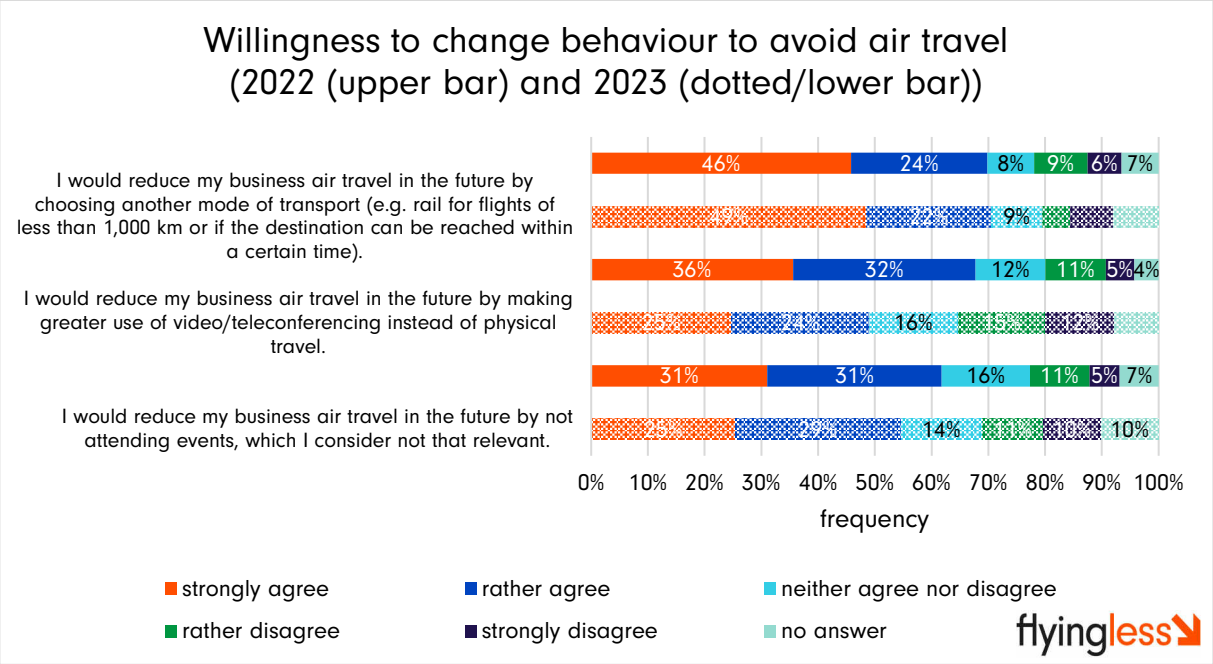

Figure 63: Willingness to change behaviour to avoid air travel. Comparison of the results from 2022 (N=657) and 2023 (N=1805; dotted) FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

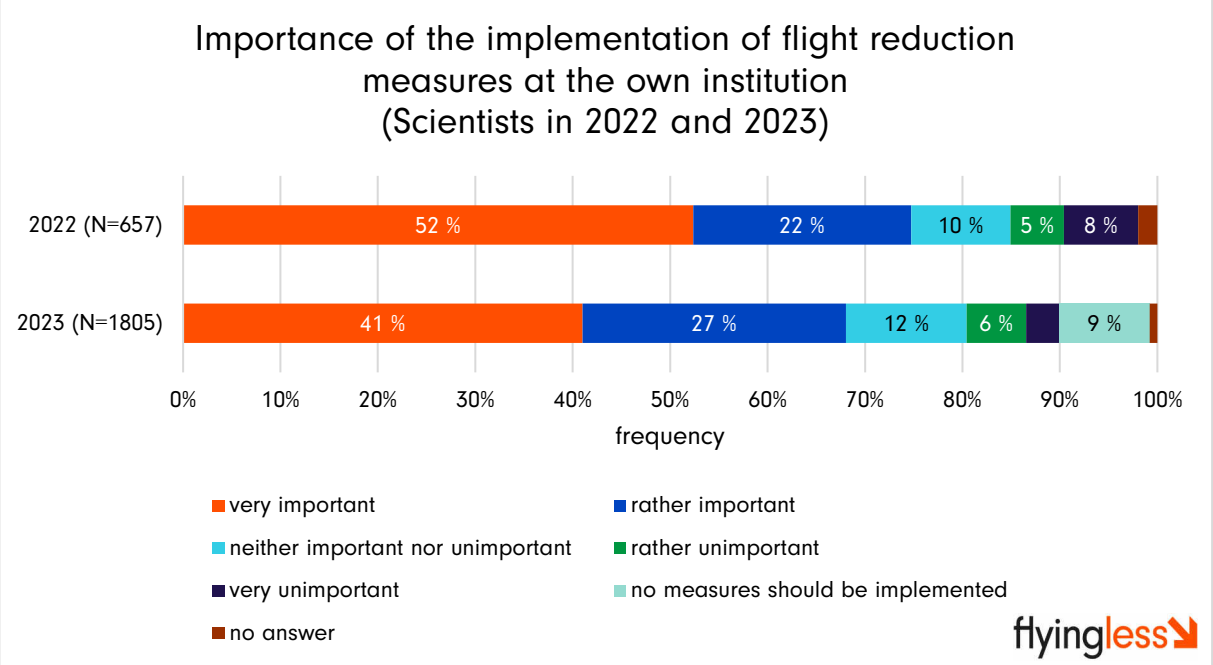

Figure 64: Importance of the implementation off light reduction measures at the own institution. Comparison of the results from 2022 (N=657) and 2023 (N=1805) FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

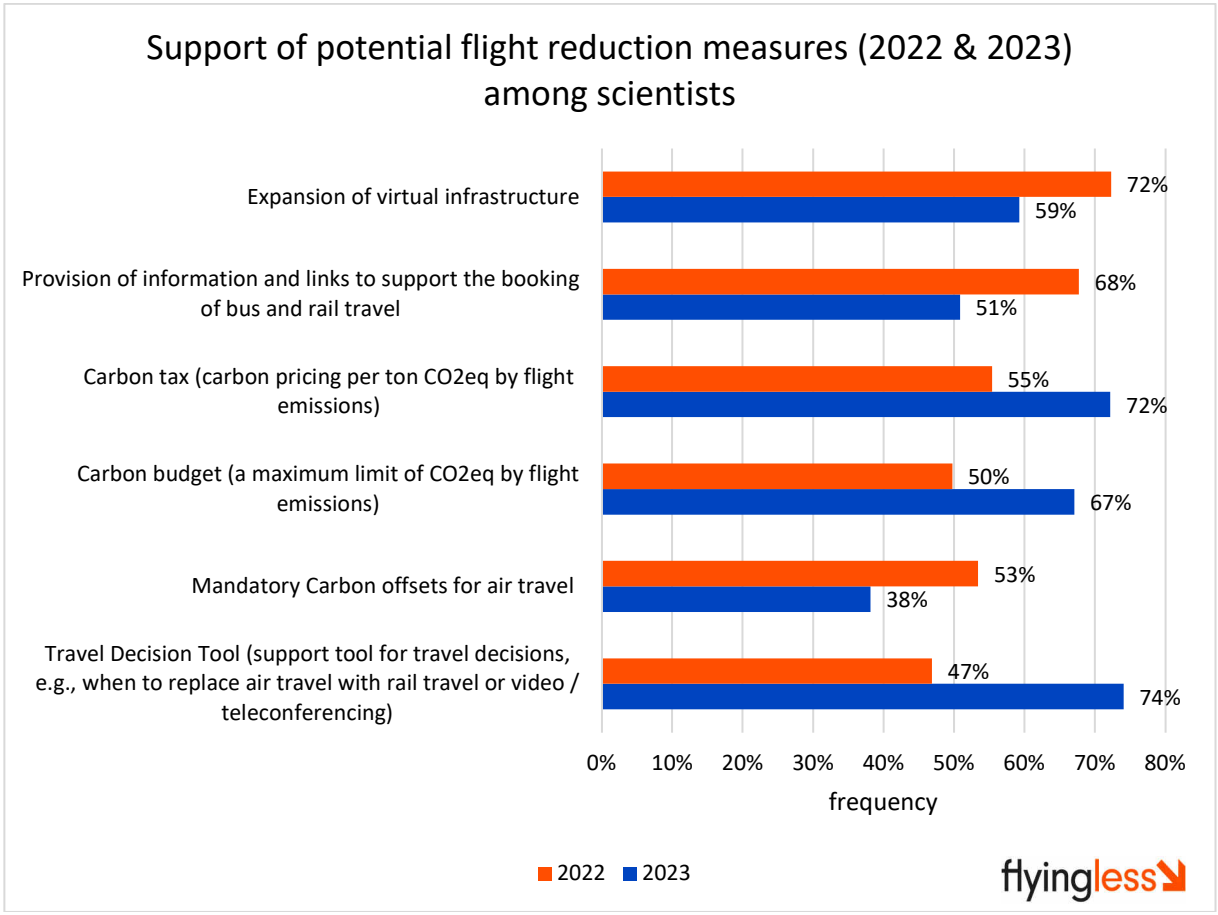

Figure 65: Support of potential flight reduction measures among scientists. Comparison of the results from 2022 (N=657) and 2023 (N=1805) FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead). Since the questionnaire was structured differently, the individual items can only be compared with each other to a limited extent.

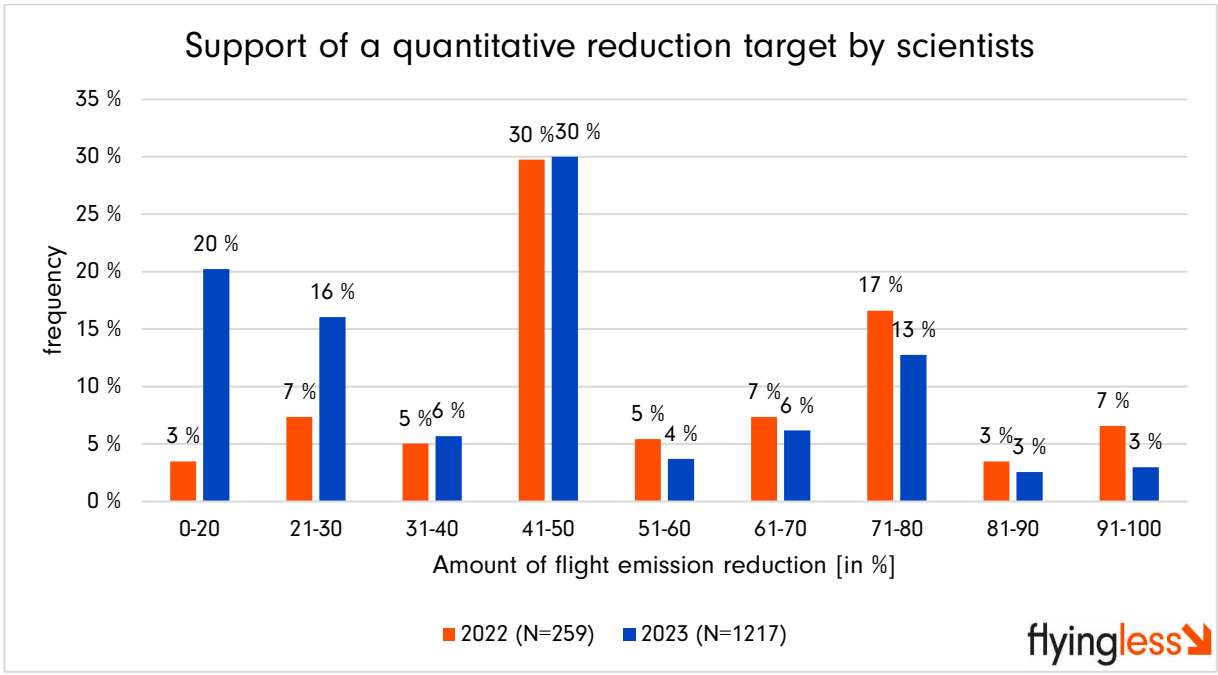

Figure 66: Support of a potential reduciton target by scientists. Comparison of the results from 2022 (N=657) and 2023 (N=1805) FlyingLess survey. Status group: scientists (aggregated from professors & group leaders & scientists without professorship/group lead).

9. Research management/technology/administration (N=477)

In this chapter, the results of the status group management/technoglogy/administration are presented.

9.1. Structuring the respondents groups

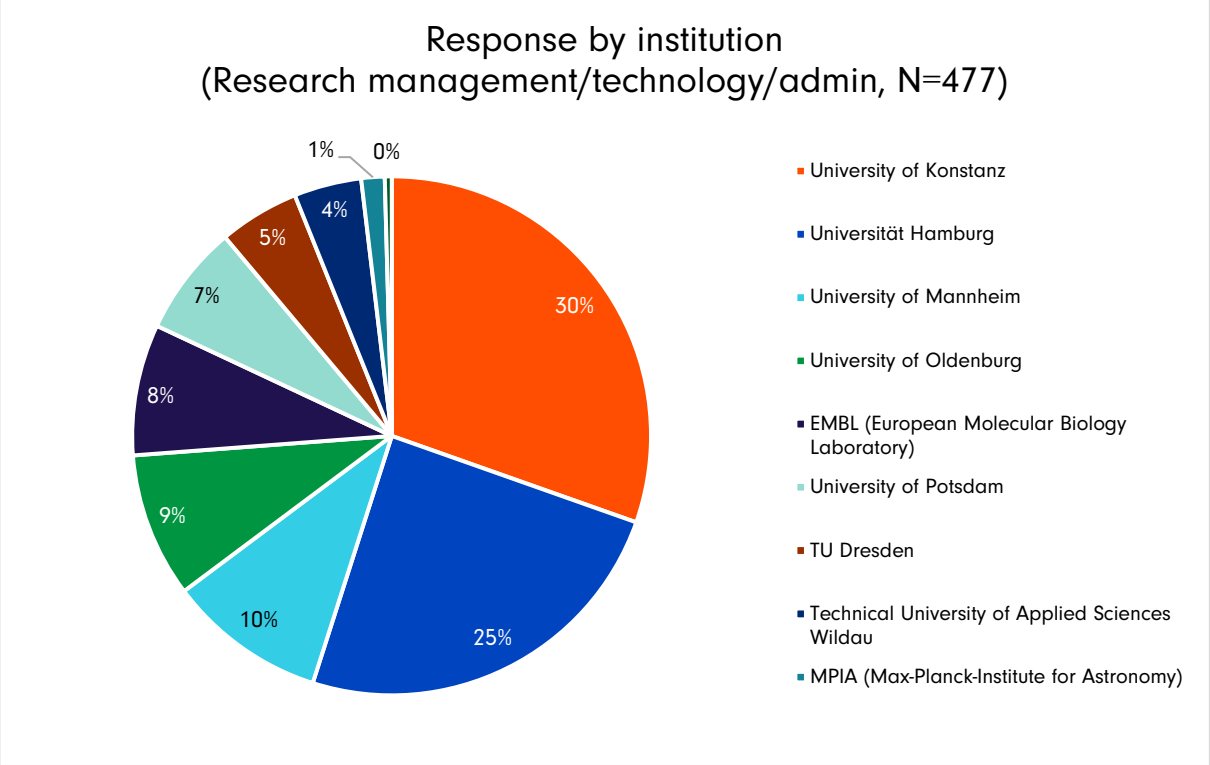

Figure 67: Response by institution. Status group: Research management/technology/admin, N=477. Relative frequency (Y-axis) of institutional affiliation (X-axis).

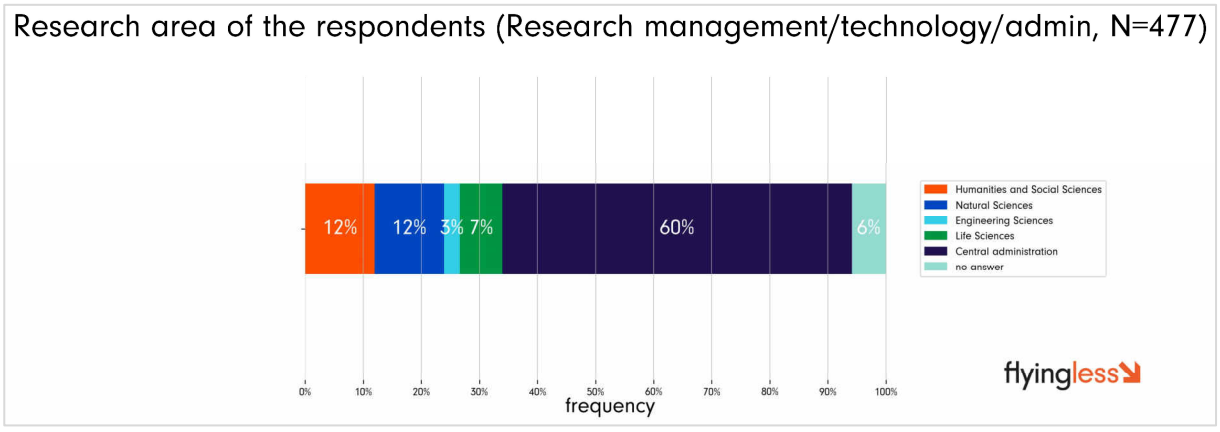

Figure 68: Research area of the respondents. Status group: Research management/technology/admin, N=1807. Relative frequency (Y-axis) of the research area indicated (X-axis). Categories correspond to the DFG structure.

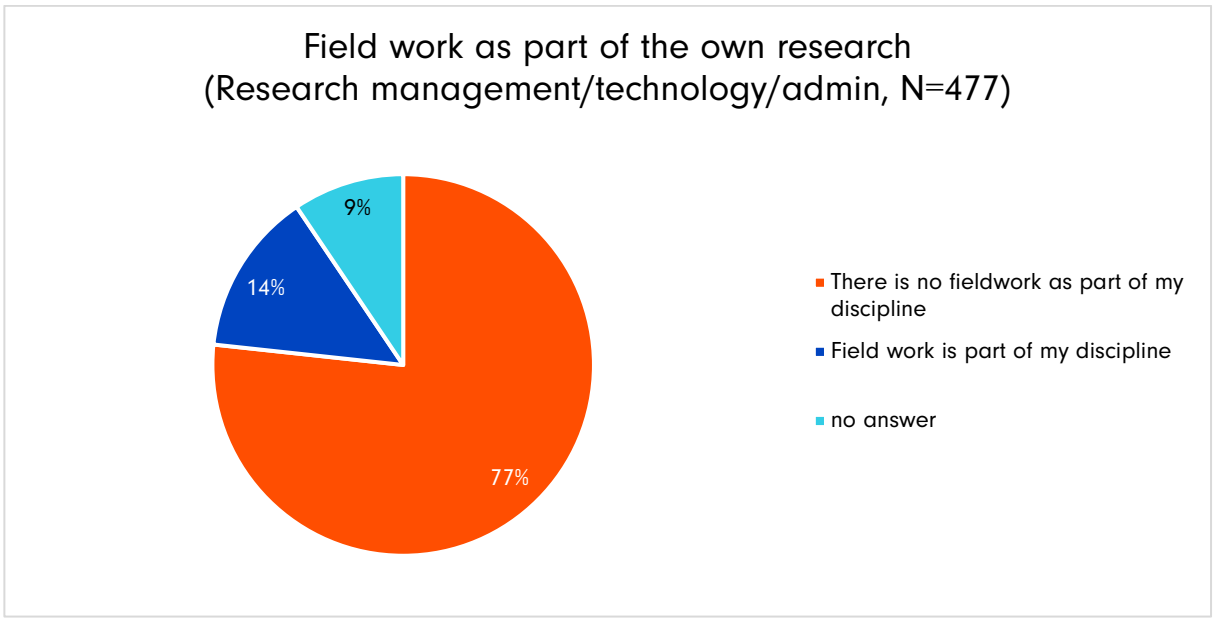

Figure 69: Field work as part of the own research. Status group: Research management/technology/admin, N=477. Relative frequency of field research in one's field of activity. Field research defined as collecting raw data outside of a laboratory, library, or workplace (including instrument maintenance/installation, etc.).

9.2. The topic of flight reduction and communication about it in academia

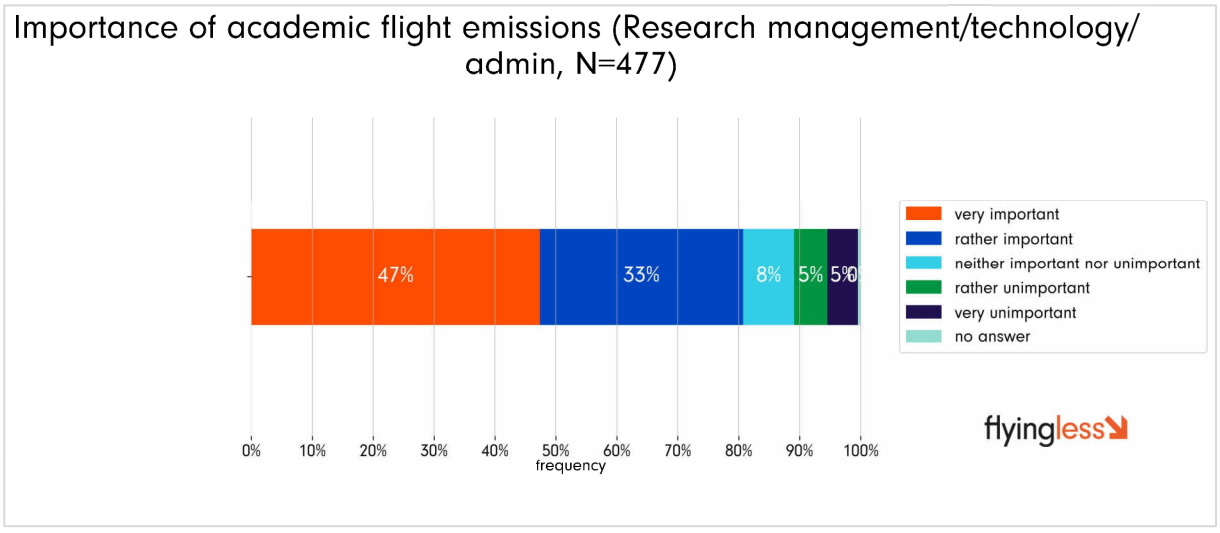

Figure 70: Importance of academic flight emissions. Relative frequency of the evaluation of the topic of flight reduction at universities and research institutions (X-axis). Status group: Research management/technology/admin, N=477.

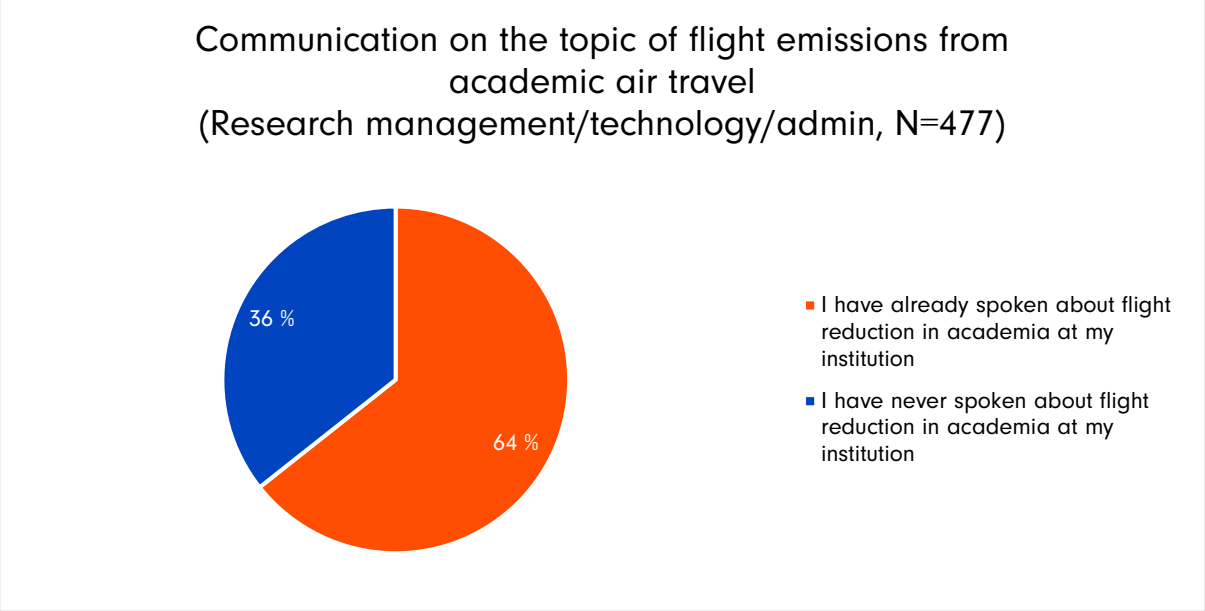

Figure 71: Communication on the topic of flight emissions from academic air travel. Relative frequency of mentions. Status group: Research management/technology/admin, N=477.

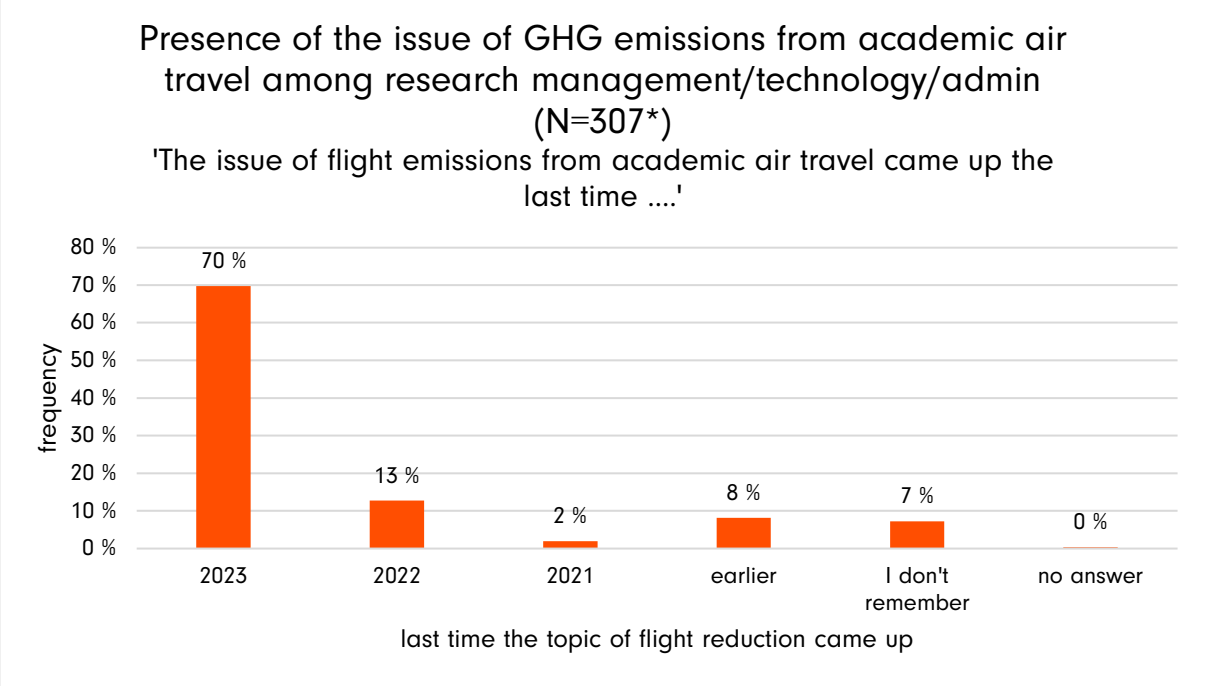

Figure 72: Presence of the issue of GHG emissions from academic air travel among research management/technology/admin. Indication of the date of the last communication on the subject of flight emissions from academic air travel. Relative frequency of mentions. Status group: Research management/technology/admin, N=307. *Respondents who indicated that they had already spoken about the topic of flight emissions in academia were asked about the timing of the last communication about it.*

9.3. Average mobility (flight, train/bus) and use of virtual format per year prior to the COVID-19 pandemic and in 2022

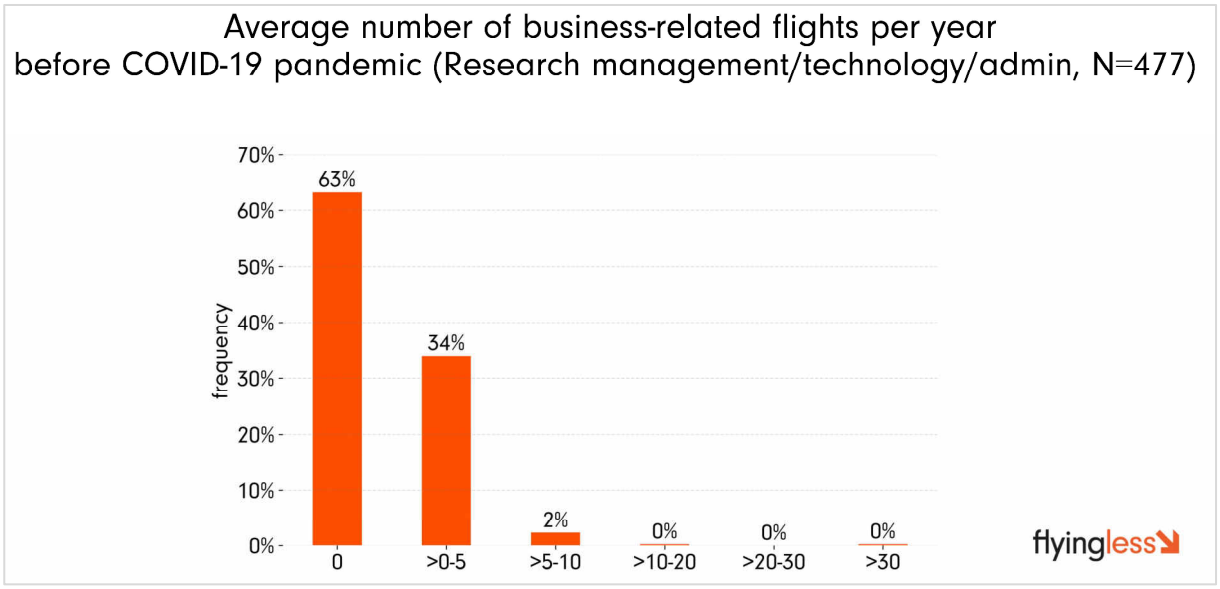

Figure 73: Average number of business-related flights per year before COVID-19 pandemic (respondent's estimate). Status group: Research management/technology/admin, N=477. Relative frequency of mentions (Y-axis) per aggregated number of trips per year (X-axis).

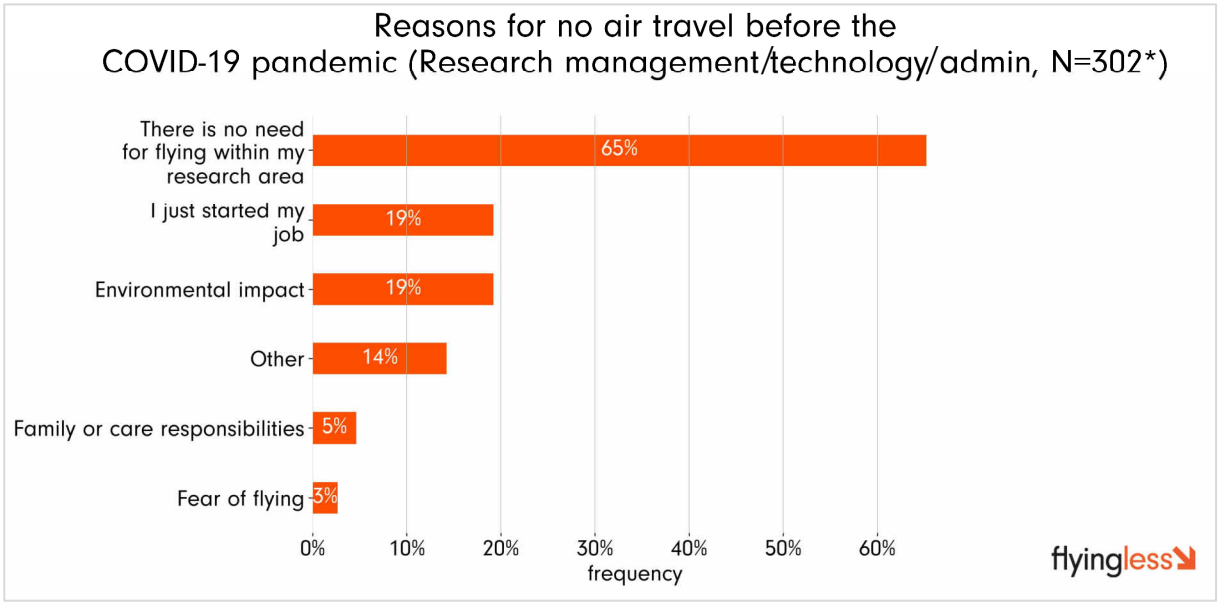

*Figure 74: Reasons for not flying before the COVID-19 pandemic. Status group: Research management/technology/admin, N=302. *Respondents who indicated that they did not fly prior to the COVID-19 pandemic were asked why.*

Other reasons for not flying before COVID-19, that were mentioned (examples)

- «Ich fliege grundsätzlich nicht (mehr)»
- «Keine Notwendigkeit»
- «Fahre lieber Bahn»
- «Keine Treffen/Schulungen über 500 km»

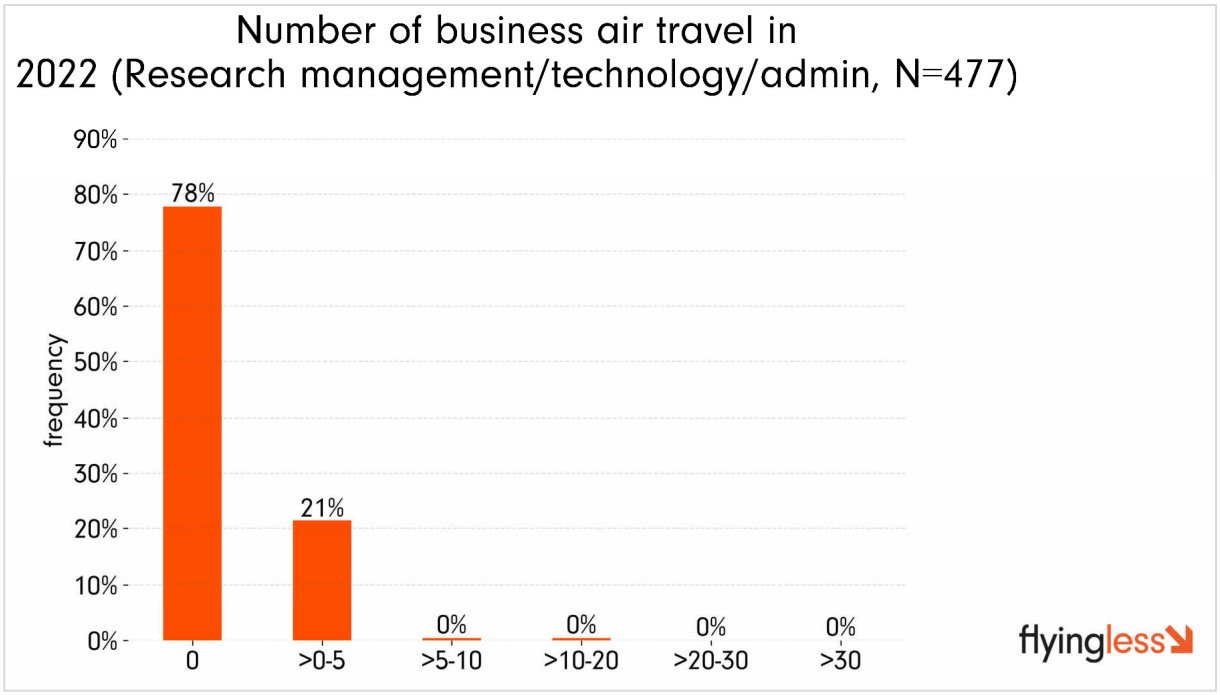

Figure 75: Number of business air travel in 2022. Relative frequency of mentions (Y-axis) per aggregated number of flights per year (X-axis). Status group: Research management/technology/admin, N=477.

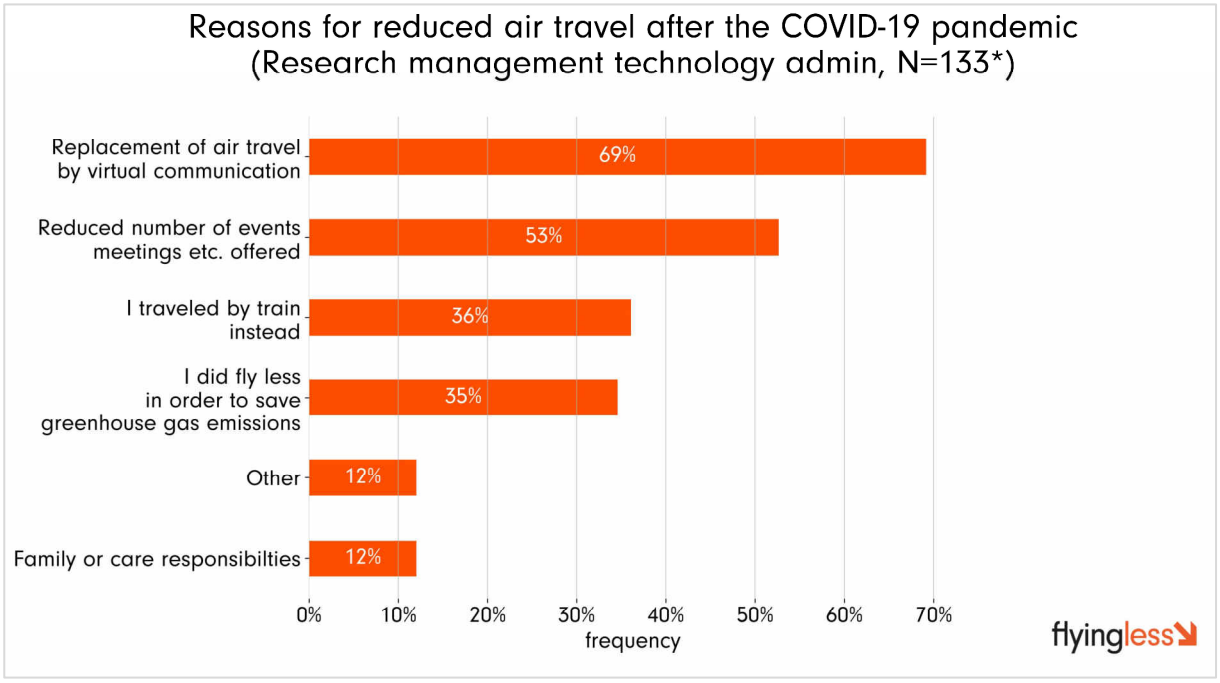

*Figure 76: Reasons for reduced air travel after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a lower flight volume (Y-axis). Status group: Research management/technology/admin, N=133. *Respondents who indicated they flew less frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

Other reasons for reduced air travel after the COVID-19 pandemic, that were mentioned (examples):

- «budget restrictions»
- «Konferenzen waren örtlich näher»
- «Fahrt mit Auto»

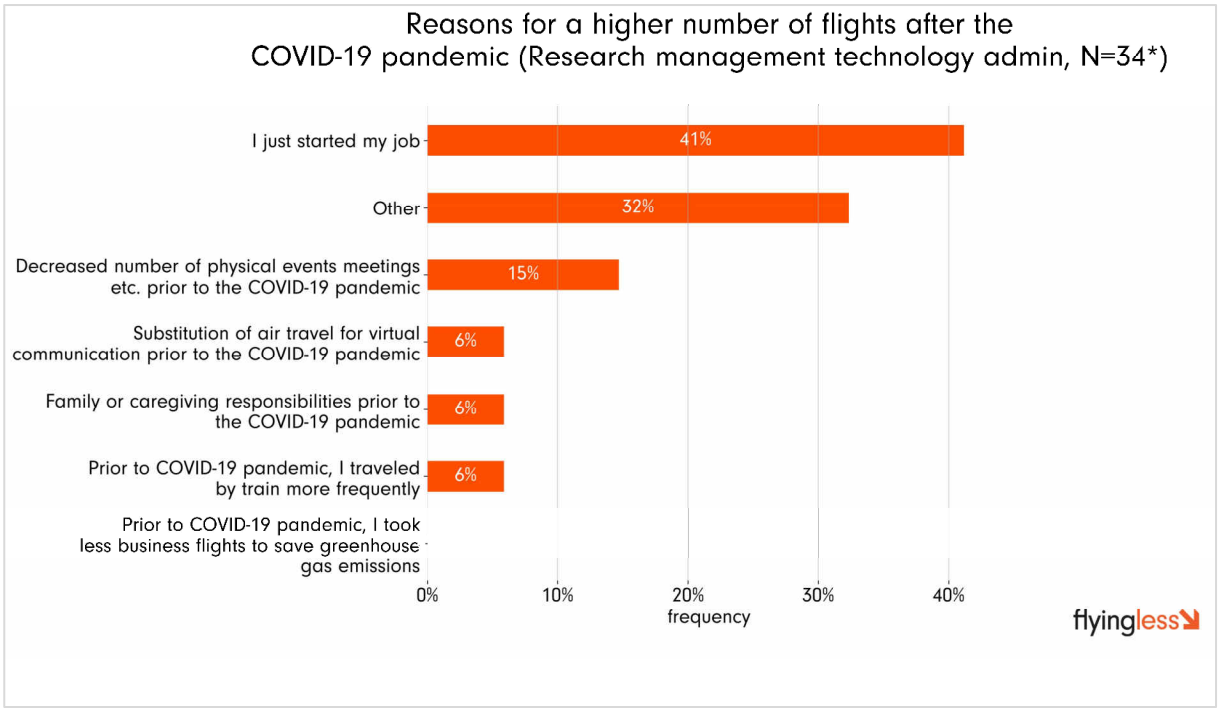

Figure 77: Reasons for a higher number of flights after the COVID-19 pandemic. Relative frequency of mentions (X-axis) of reasons for a higher flight volume (Y-axis). Status group: Research management/technology/admin, N=34. *Respondents who indicated they flew more frequently in 2022 than the stated average per year before the COVID-19 pandemic were asked why.*

Other reasons for a higher number of flights after the COVID-19 pandemic, that were mentioned (examples):

- «Ich fliege mehr, weil mir die Spritpreise zu hoch sind und die Uni dafür keinen gescheiten Ersatz leistet.»
- «Nachholung fernerer anders nicht erreichbarer Meetings nach COVID19-Pause»
- «Einmaliger Termin im Ausland»

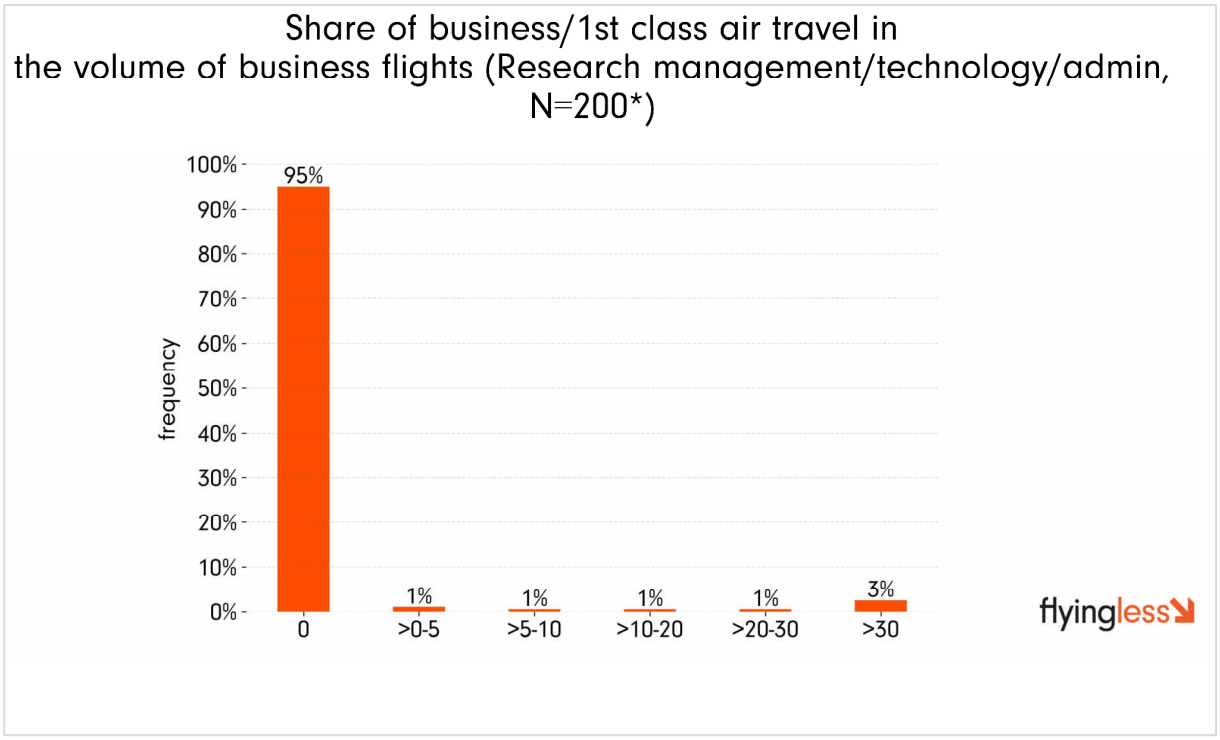

Figure 78: Share of business/1st class air travel in the volume of business flights. Relative frequency of mentions (Y-axis) per percentage of business class flights in the person's total flight volume (X-axis). Status group: Research management/technology/admin, N=200. *Respondents who indicated that they had flown at least once prior to the COVID-19 pandemic or in 2022 were asked.*

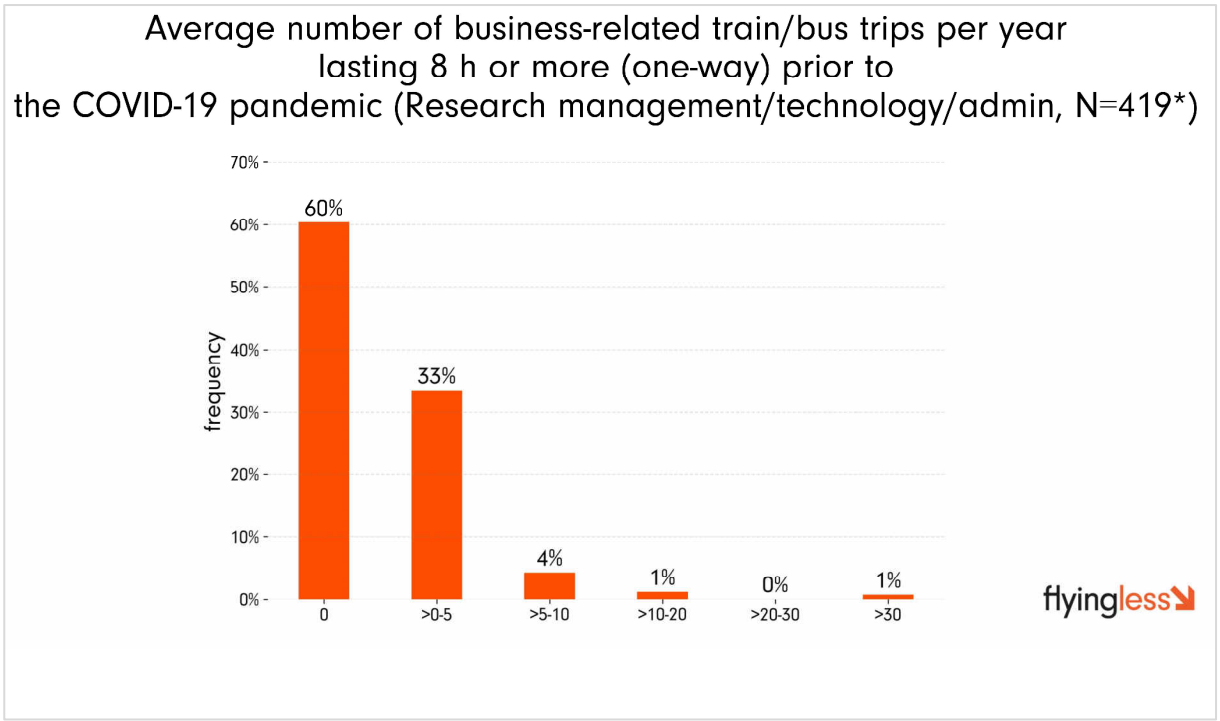

*Figure 79: Average number of business-related train/bus trips per year lasting 8 h or more (one-way) prior to the COVID-19 pandemic (respondent's estimate). Relative frequency of mentions (Y-axis) per number of train/bus trips per year (X-axis). Status group: Research management/technology/admin, N=419. *Respondents who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

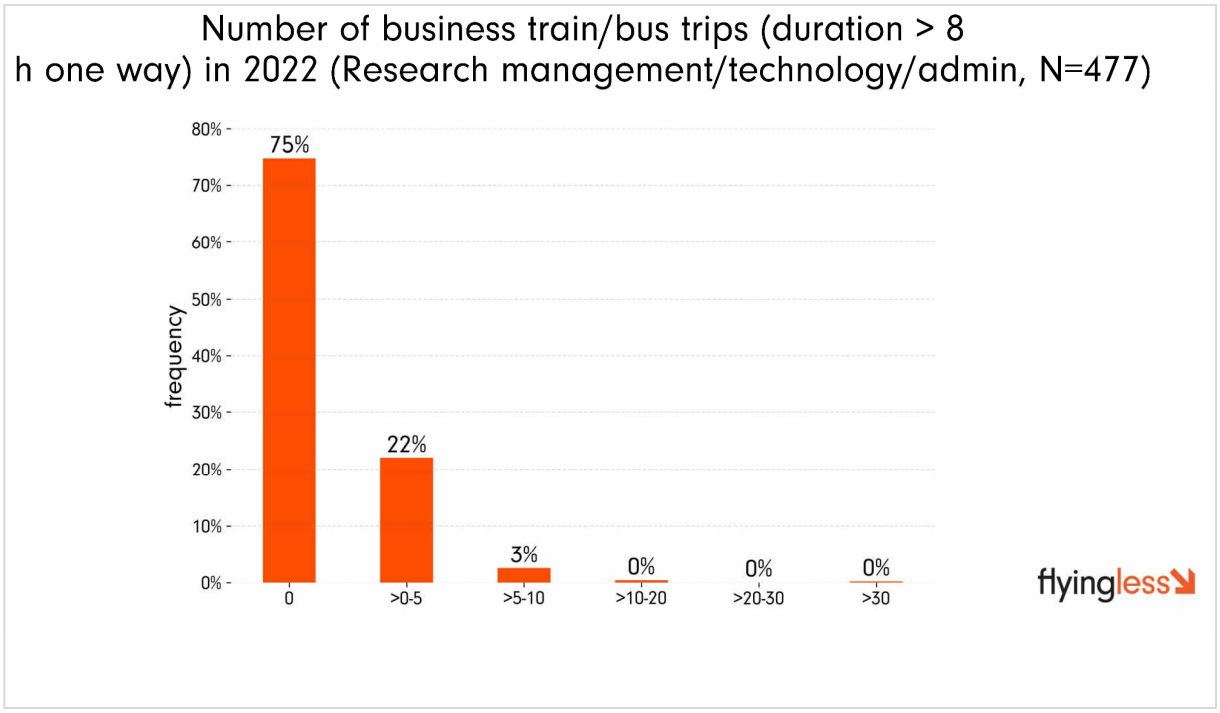

Figure 80: Number of business train/bus trips (duration > 8 h one way) in 2022. Status group: Research management/technology/admin, N=477. Relative frequency of mentions (Y-axis) per number of train/bus trips in 2022 (X-axis).

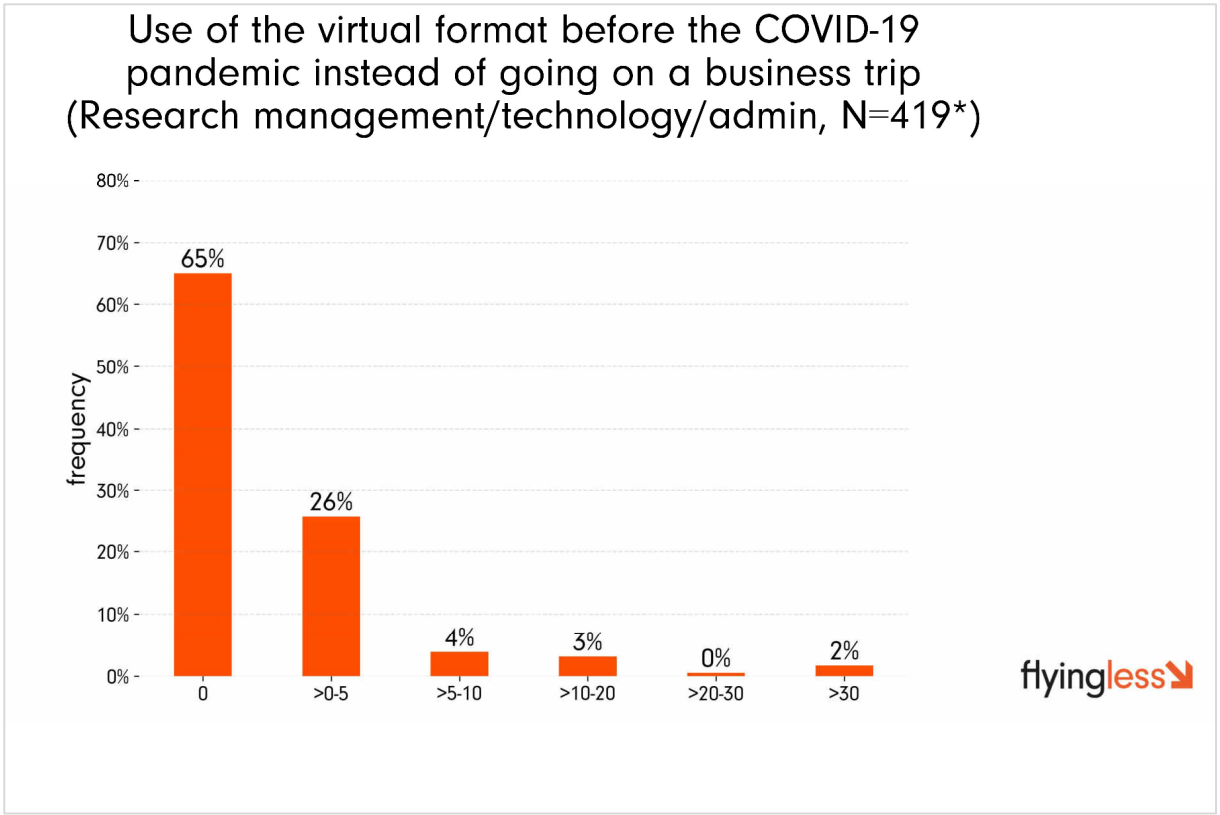

*Figure 81: Use of the virtual format before the COVID-19 pandemic instead of going on a business trip. Relative frequency of mentions (Y-axis) per number of virtual events/meetings per year (X-axis). Status group: Research management/technology/admin, N=419. *Respondents who reported not having worked in their jobs prior to COVID-19 were not surveyed.*

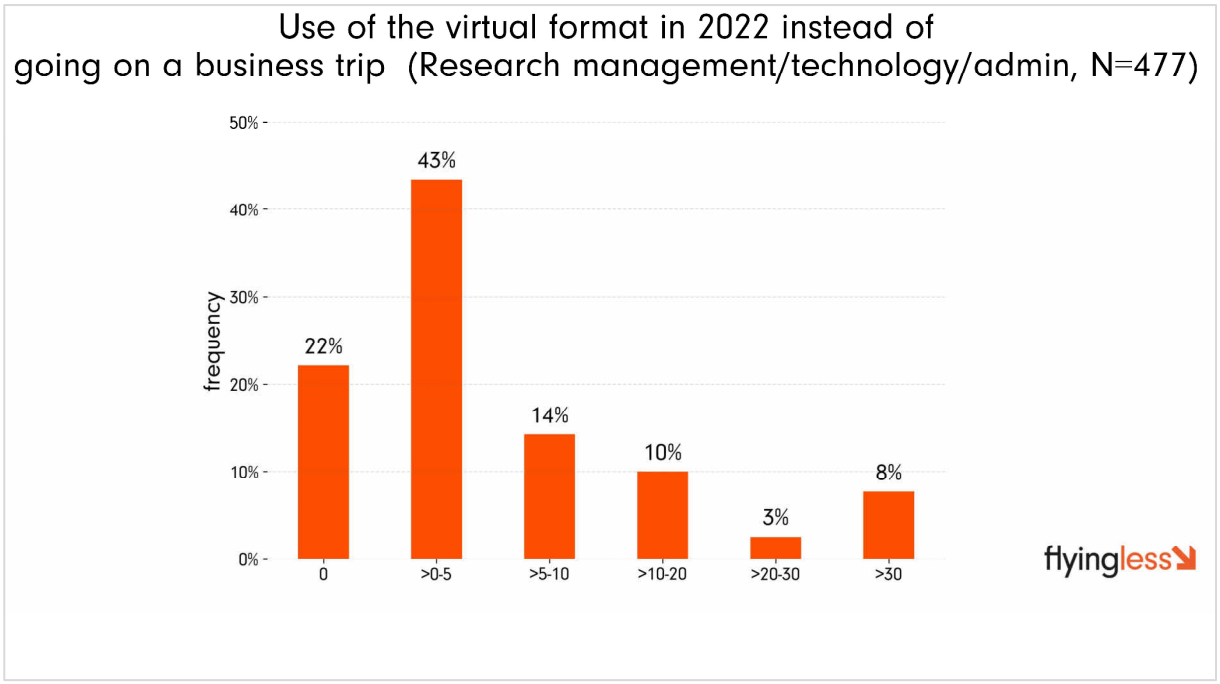

Figure 82: Use of the virtual format in 2022 instead of going on a business trip. Relative frequency of mentions (Y-axis) per virtual event/meeting in 2022 (X-axis). Status group: Research management/technology/admin, N=477.

9.4. Relevance of different reasons for business air travel

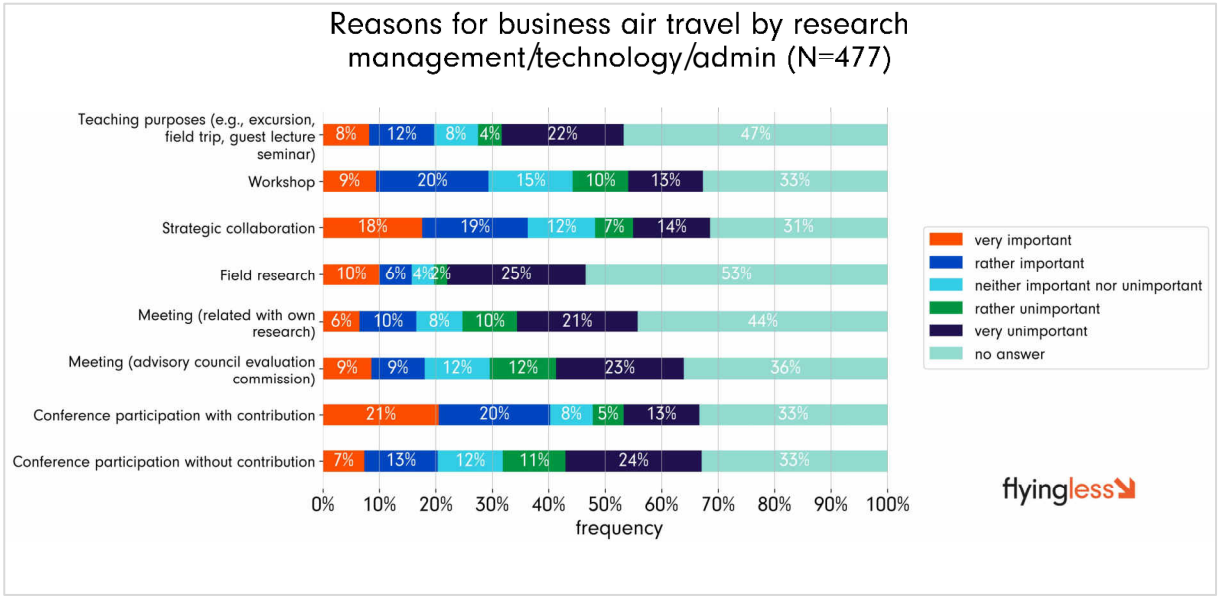

Figure 83: Reasons for business air travel by research management/technology/admin. Relative frequency of mentions (Y-axis) per subanswer (reason for business-related air travel in the academic sector; X-axis). Status group: Research management/technology/admin, N=477.

Other reasons for business-related air travel within academia, that were mentioned (examples):

- „Netzwerken mit Counterparts von Partneruniversitäten“
- „Aufbau neuer Netzwerke“
- „Kick-Off / Projektanbahnung“
- „Weiterbildung“
- „Annahme eine Forschungspreises“
- „Erfahrungsaustausch mit Personen mit ähnlichen Arbeitsschwerpunkten an anderen Hochschulen“

- „Vorstellen der Serviceangebote bei den Kontakten der Partnerunis, die die Studierenden zu einem Auslandsaufenthalt beraten“
- „Interkulturelle Verständigung“

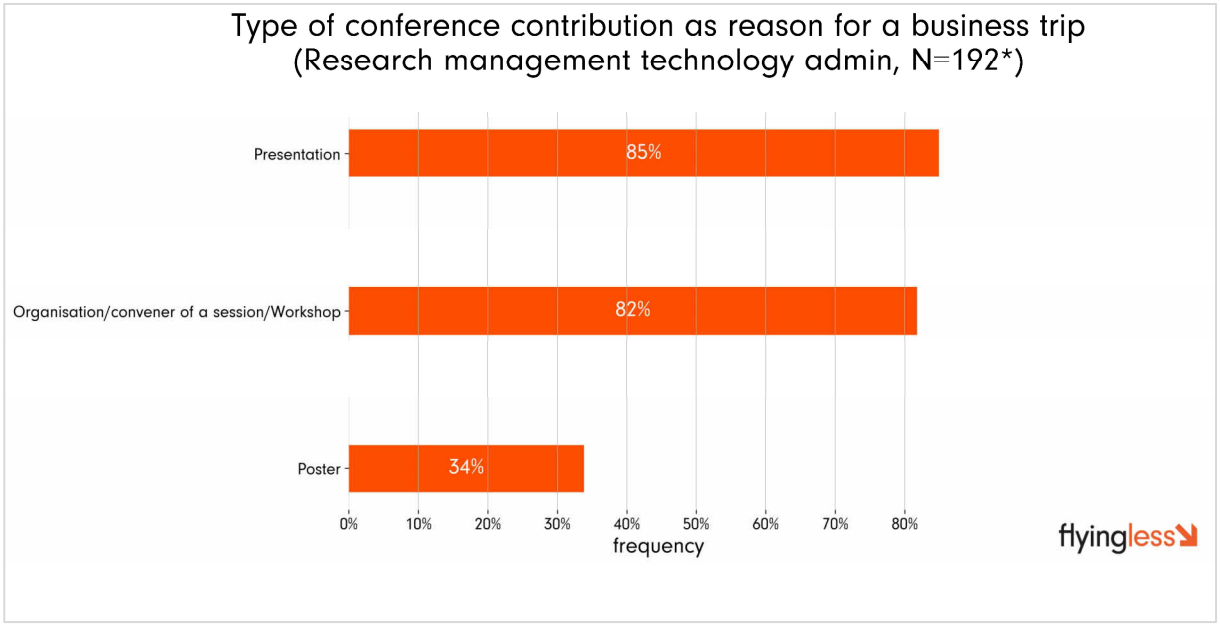

Figure 84: Type of conference contribution as reason for a business trip. Relative frequency of mentions (X-axis) per subanswer (type of conference contribution; Y-axis). Status group: Research management/technology/admin, N=192. *Respondents who considered conference participation with a contribution as an important reason for business air travel were asked about the type of contribution.*

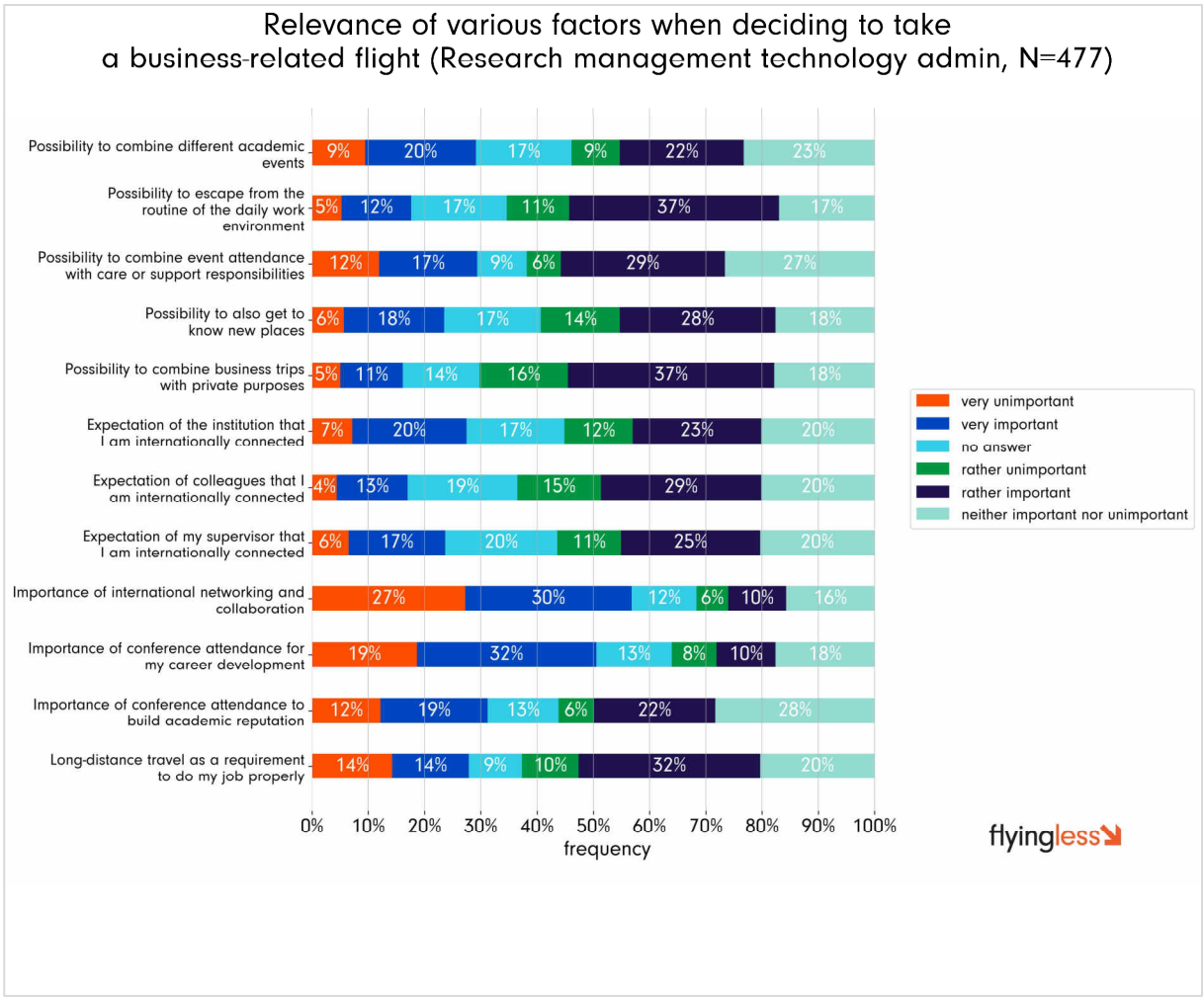

Figure 85: Relevance of various factors when deciding to take a business-related flight. Relative frequency of mentions (Y-axis) per subanswer (Factor for weighing a business-related flight in the academic sector.; X-axis). Status group: Research management/technology/admin, N=477.

Other important factors influencing the decision to take a business related flight or to book a business trip (examples):

- «Unzuverlässigkeit der Deutschen Bahn, Zugausfälle, etc»
- «personal safety at destination city / country»
- «Seekrankheit»
- «Reisekostenbudget»

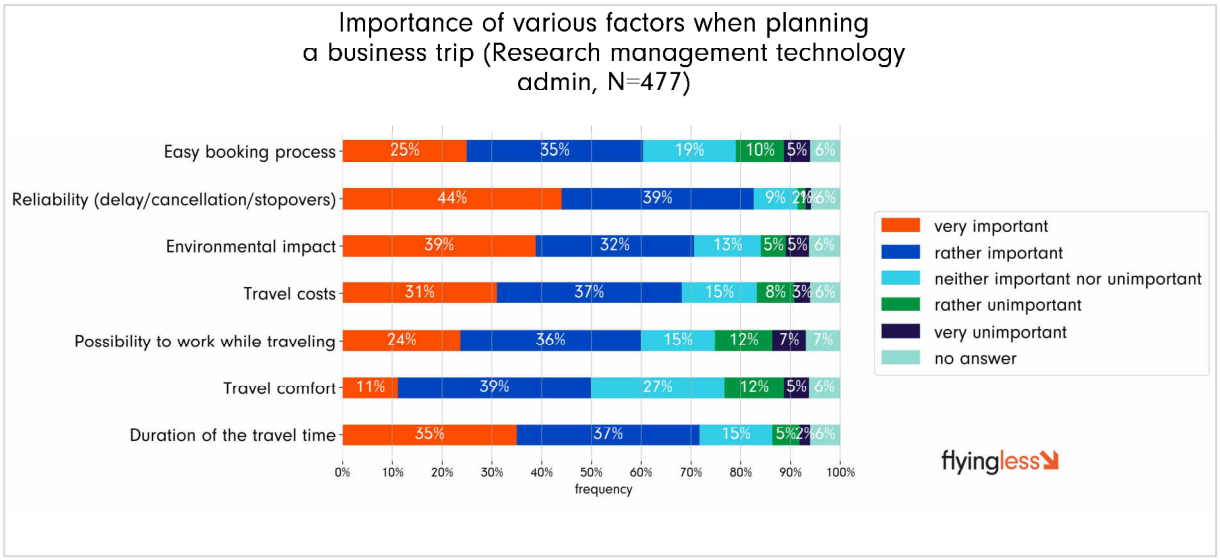

Figure 86: Importance of various factors when planning a business trip.Relative frequency of mentions (Y-axis) per subanswer (Factor of choice in the process of travel booking; X-axis). Status group: Research management/technology/admin, N=477.

9.5. Approval of business trips

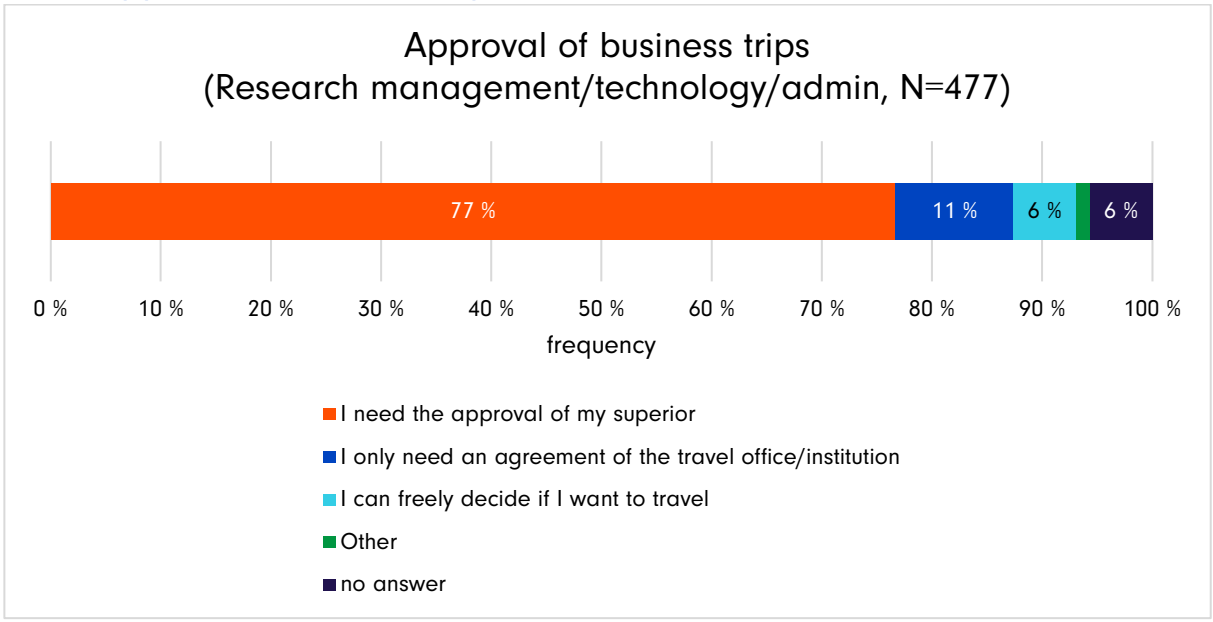

Figure 87: Approval of business trips. Relative frequency of mentions (X-axis) per subanswer. Status group: Research management/technology/admin, N=477.

Other forms of business trip approval, that were mentioned (examples):

- «Approval by both the supervisor AND the institution»
- «als Verwaltungsangestellte buche ich Dienstreisen nur für andere»

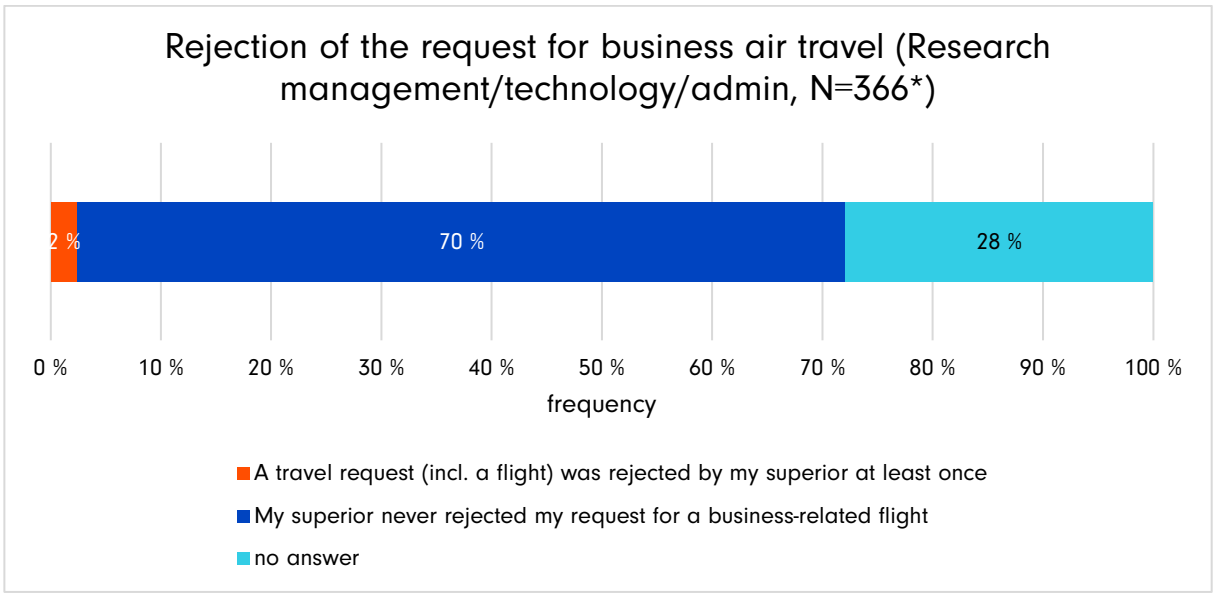

*Figure 88: Rejection of the request for business air travel. Relative frequency of mentions of a rejection of a request for business air travel. Status group: Research management/technology/admin, N=366.*Respondents who indicated that they needed approval from their supervisor(s) to approve a business trip were asked about the occurrence of a rejection.*

Reasons for the rejection of the travel request (examples):

- «Budget; strategische Entscheidung; manchmal ohne Grund»
- «Personalmangel, fehlende Vertretung»

9.6. Behaviour changes and measures

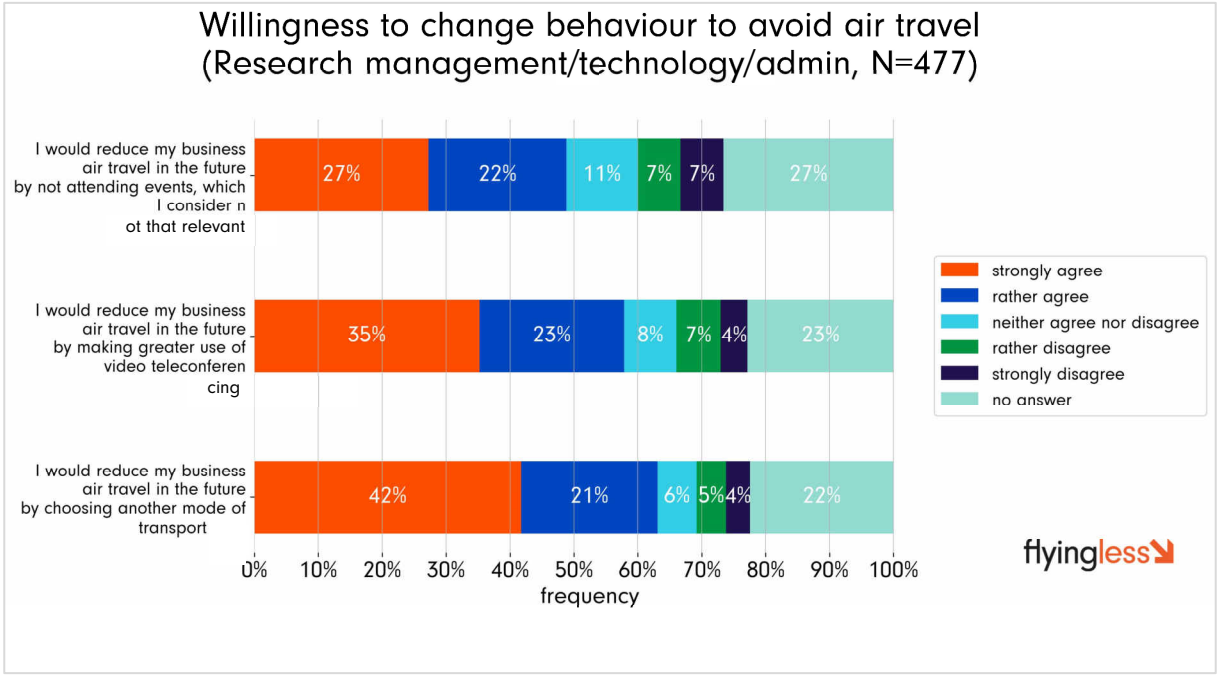

Figure 89: Willingness to change behaviour to avoid air travel. Relative frequency of mentions (Y-axis) per subanswer (agreement with statements about future mobility behaviour to avoid official air travel; X-axis). Status group: Research management/technology/admin, N=477.

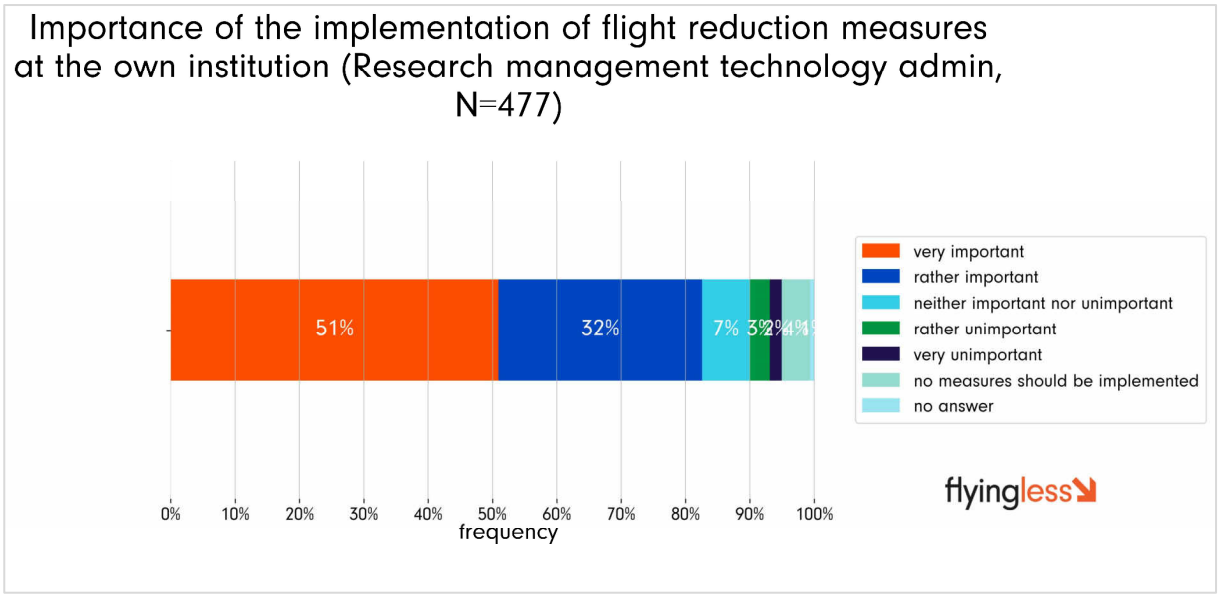

Figure 90: Importance of the implementation of flight reduction measures at the own institution. Relative frequency of mentions (X-axis). Status group: Research management/technology/admin, N=477.

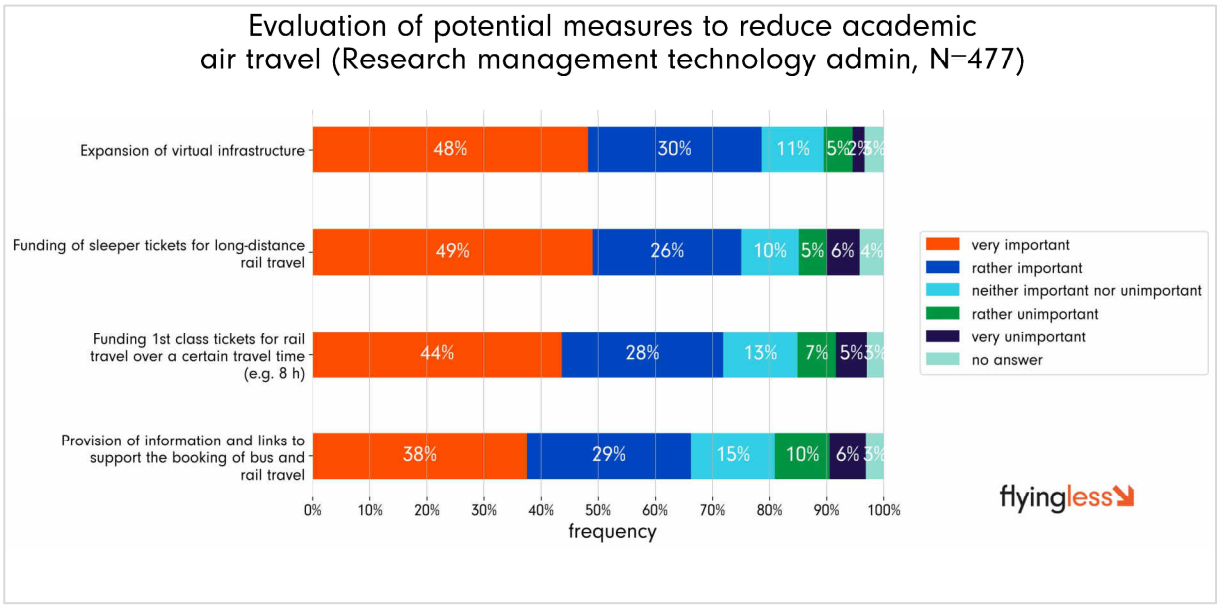

Figure 91: Evaluation of potential measures to reduce academic air travel. Relative frequency of mentions (Y-axis) per subanswer (Measures/incentives to reduce academic air travel; X-axis). Status group: Research management/technology/admin, N=477.

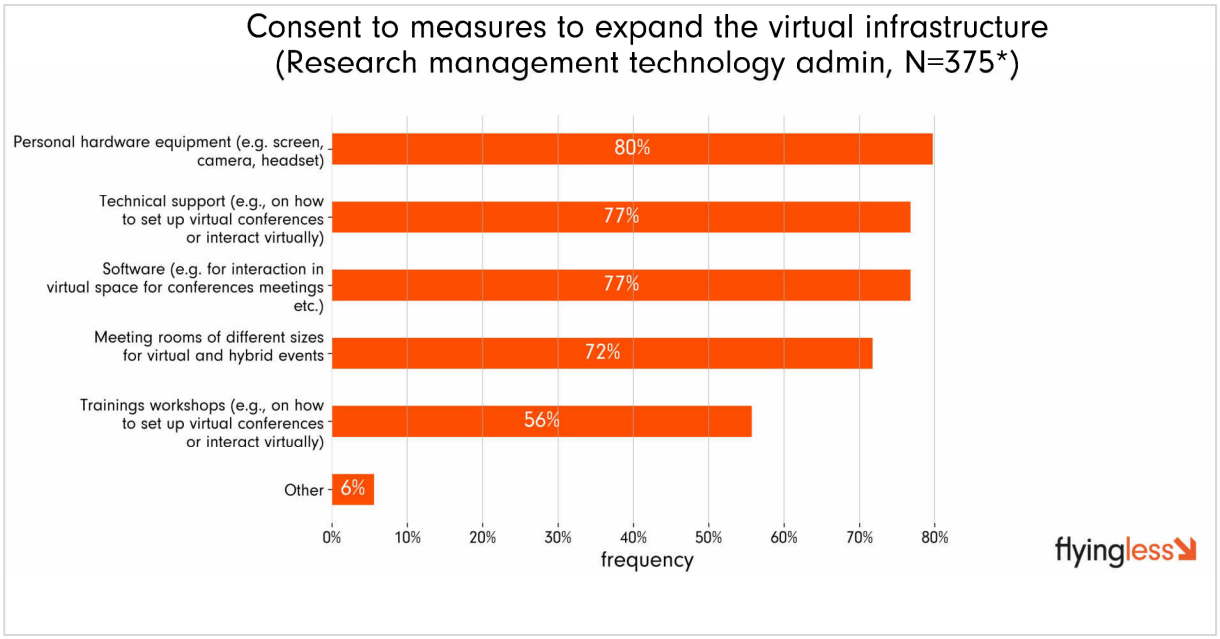

Figure 92: Consent to measures to expand the virtual infrastructure. Relative frequency of mentions (X-axis) on certain measures for the expansion of the virtual infrastructure (Y-axis). Status group: Research management/technology/admin, N=375. *Respondents who indicated they supported an expansion of virtual infrastructure were asked about their opinions on specific measures.*

Other measures that were mentioned to expand the virtual infrastructure (examples):

- «noise-cancelling headphones»
- «Vorbilder, die dieses Verhalten leben»
- «Generell Ausbau eines schnellen Internets, insbesondere des sonst wenig beachteten Uploads!»
- «Vergrößerung des Medienteams für Aufzeichnungen»
- «auch Personal, das die virtuelle Infrastruktur mittelbar unterstützt, braucht es für den Technischen Support»

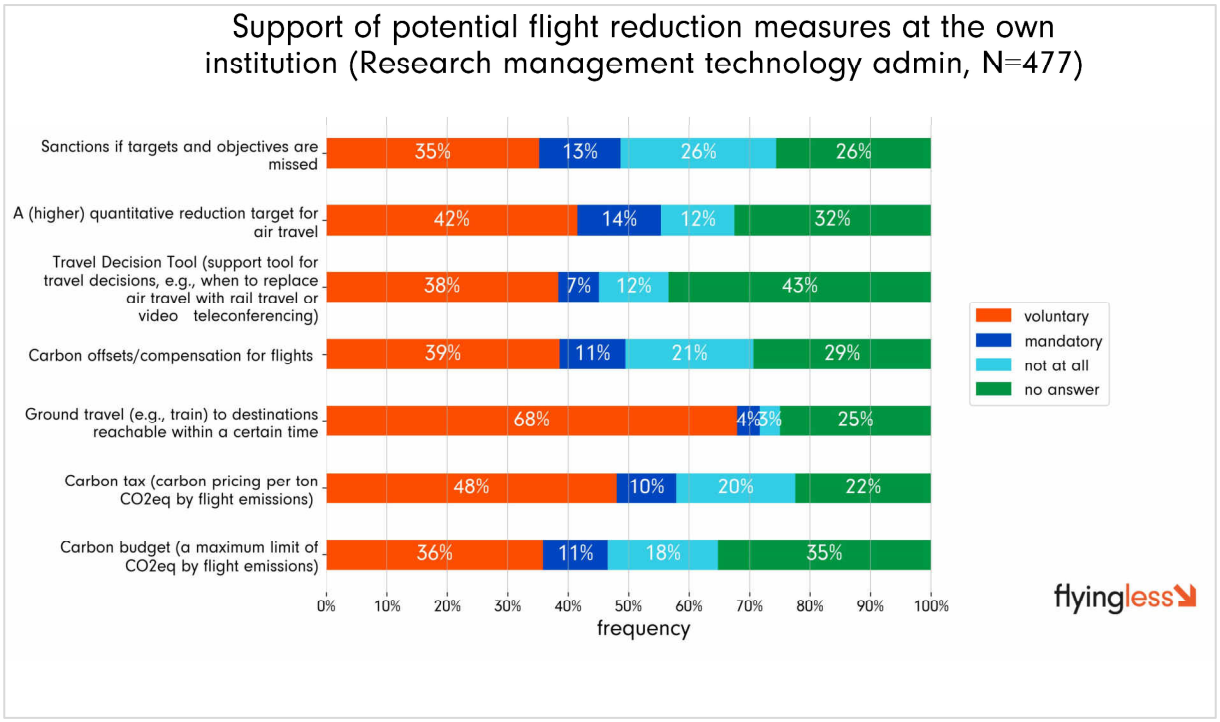

Figure 93: Support of potential flight reduction measures at the own institution. Relative frequency of mentions (Y-axis) per subanswer (flight reduction measures; X-axis). Status group: Research management/technology/admin, N=477.

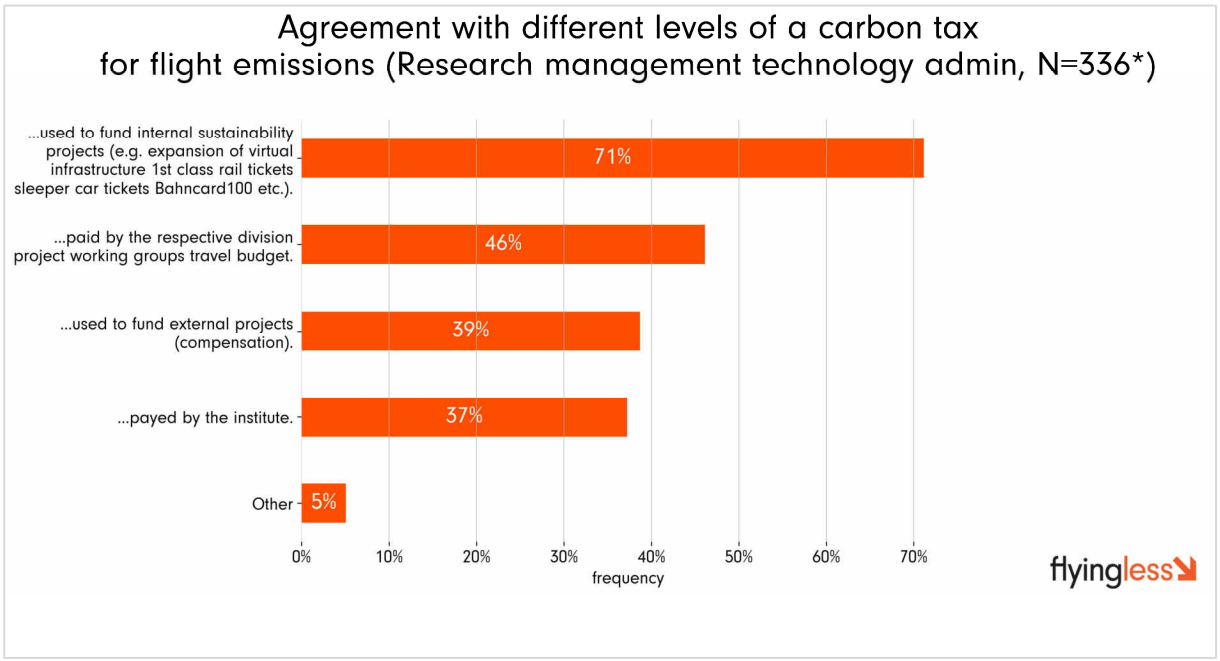

*Figure 94: Agreement with different levels of a carbon tax for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status group: Research management/technology/admin, N=336. *Respondents who indicated they supported a carbon tax were asked for their opinions on the options given.*

Other options for designing a carbon tax, that were mentioned (examples):

- «von zentraler Stelle bezahlt werden, da Drittmittelgeber dies sicherlich nicht finanzieren werden.»
- «Payment of carbon tax should depend on reimbursment options (train tickets can be 2x as expensive as train tickets.»
- «vom Geldgeber finanziert werden (Land, DFG o.ä.)»

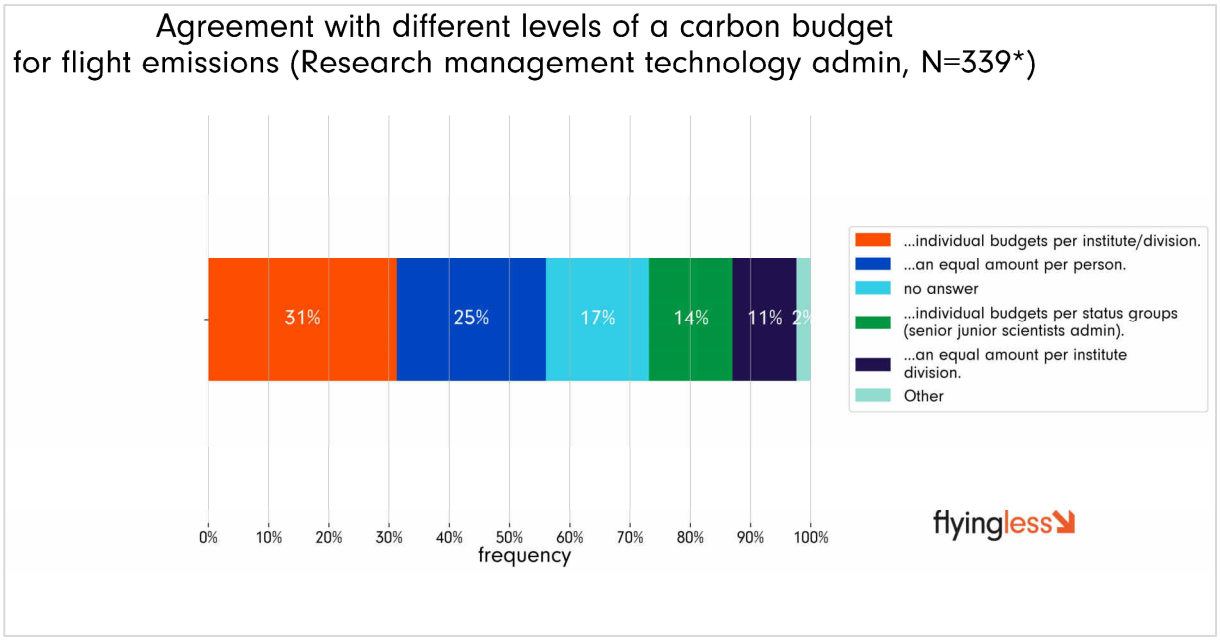

*Figure 95: Agreement with different levels of a carbon budget for flight emissions. Relative frequency of mentions (X-axis) of specified options (Y-axis). Status group: Research management/technology/admin, N=339. *Respondents who indicated they supported a carbon budget were asked for their opinions on the options given.*

Other options for designing a carbon budget, that were mentioned (examples):

- «Proportional to the size of the division/department»
- «Nach Forschungs- und Arbeitsgebiet sowie Erfordernis für Leistungsstärke differenzieren»
- «Das Budget muss sich auch an der Tätigkeit und damit einhergehenden Notwendigkeit von Flugreisen bemessen.»

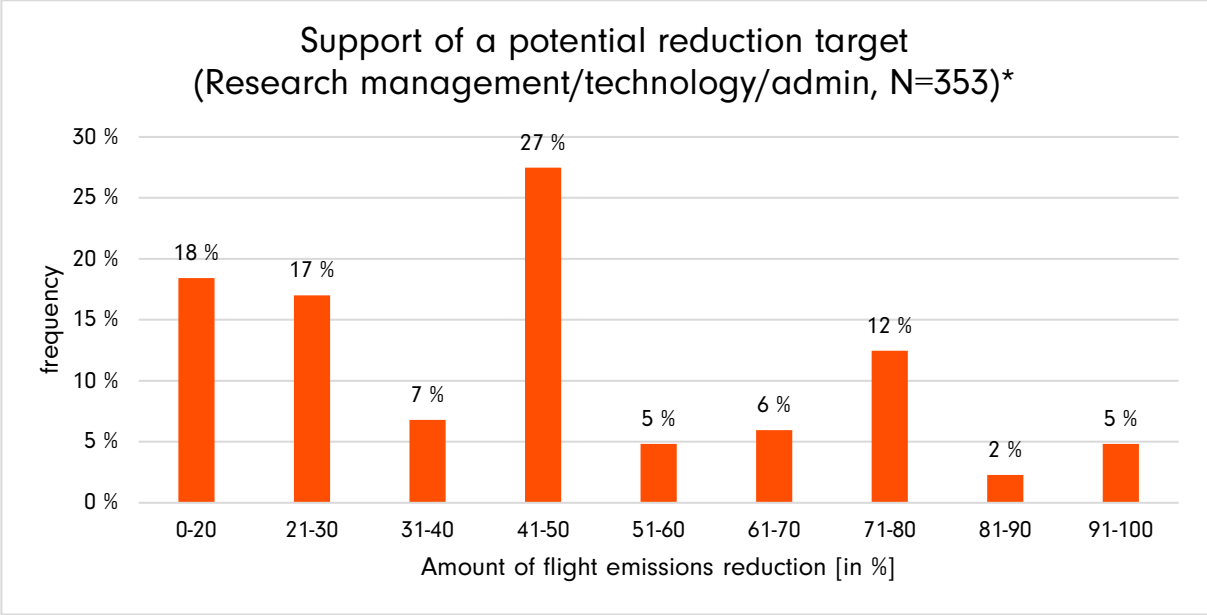

*Figure 96: Support of potential flight reduction measures at the own institution. Relative frequency of mentions (Y-axis) per subanswer (flight reduction measures; X-axis). Status group: Research management/technology/admin, N=353. *Respondents who indicated they supported a (higher) quantitative reduction target were asked about this.*

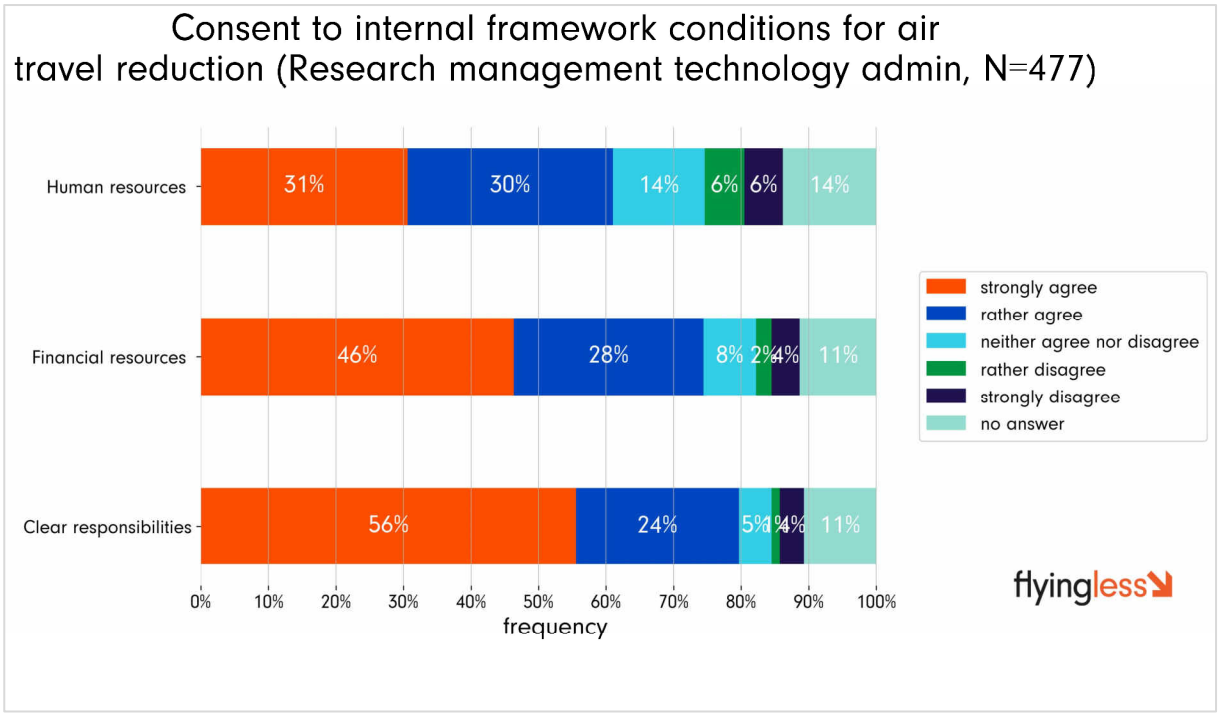

Figure 97: Consent to internal framework conditions for air travel reduction. Relative frequency of mentions (X-axis) of different framework conditions given (Y-axis). Status group: Research management/technology/admin, N=477.

Comments on other measures/incentives/etc. that could help to reduce academic air travel (examples):

- «Awareness Kampagne (der eigene Fußabdruck und die Verantwortung bewusst machen)»
- «Einfachere Buchungsprozesse»
- «Prämien/Goodies/Anreize bei Nutzung alternativer Transportmittel»
- «Druck auf die Politik, mehr und komfortablere Nachtzugverbindungen zu schaffen»
- «Klare Unterstützung, dass jedwede Reise auf den Prüfstand zu stellen ist»
- «Änderung der Wissenschaftskultur»
- «Studierende animieren: diese prägen die Wissenschaftskultur von morgen»
- «Make sure any changes also Affect High Level management, since Higher positions tend to travel a lot more»

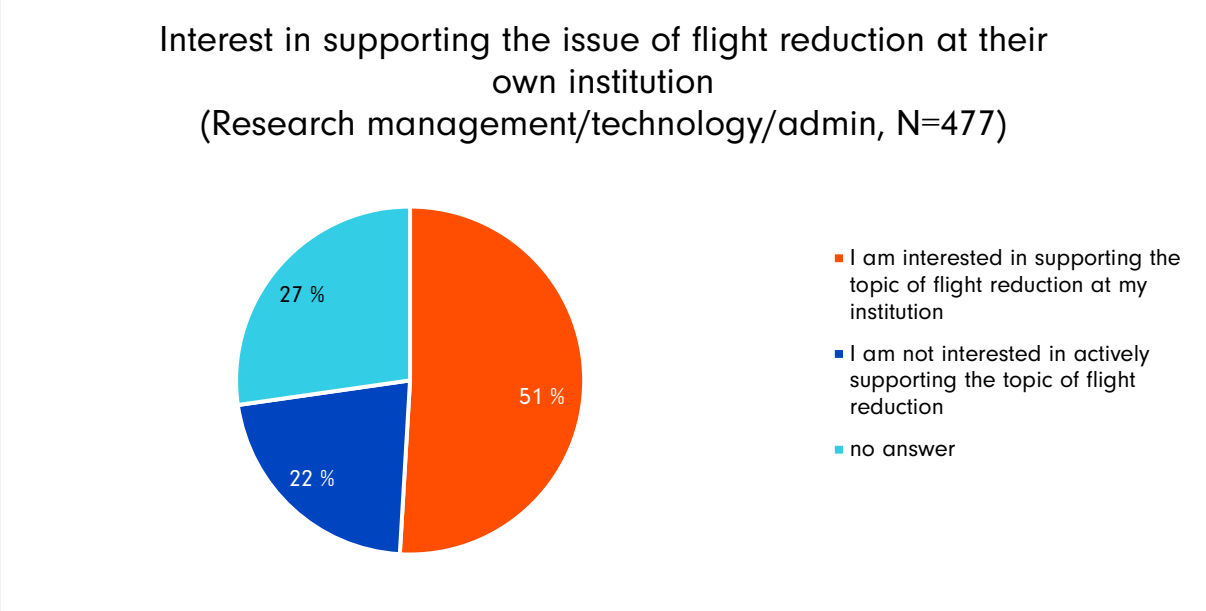

Figure 98: Interest in supporting the issue of flight reduction at their own institution. Relative frequency of mentions regarding the interest on supporting the topic of flight reduction at the own institution. Status group: Research management/technology/admin, N=477.

10. Results students (N=1561)

In this chapter, the results of the students are presented. According to the mobility behavior the students were asked different questions than scientists where necessary.

10.1. Structuring the respondents group

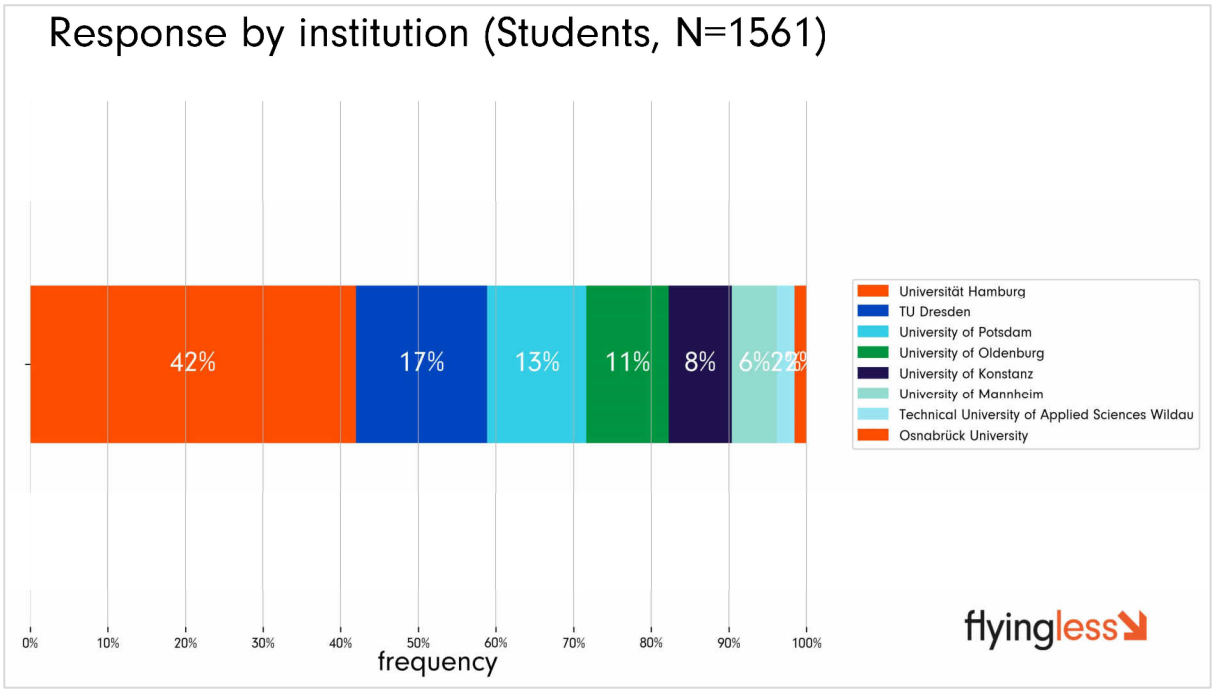

Figure 99: Response by institution. Status group: Students, N=1561. Relative frequency (Y-axis) of institutional affiliation (X-axis).

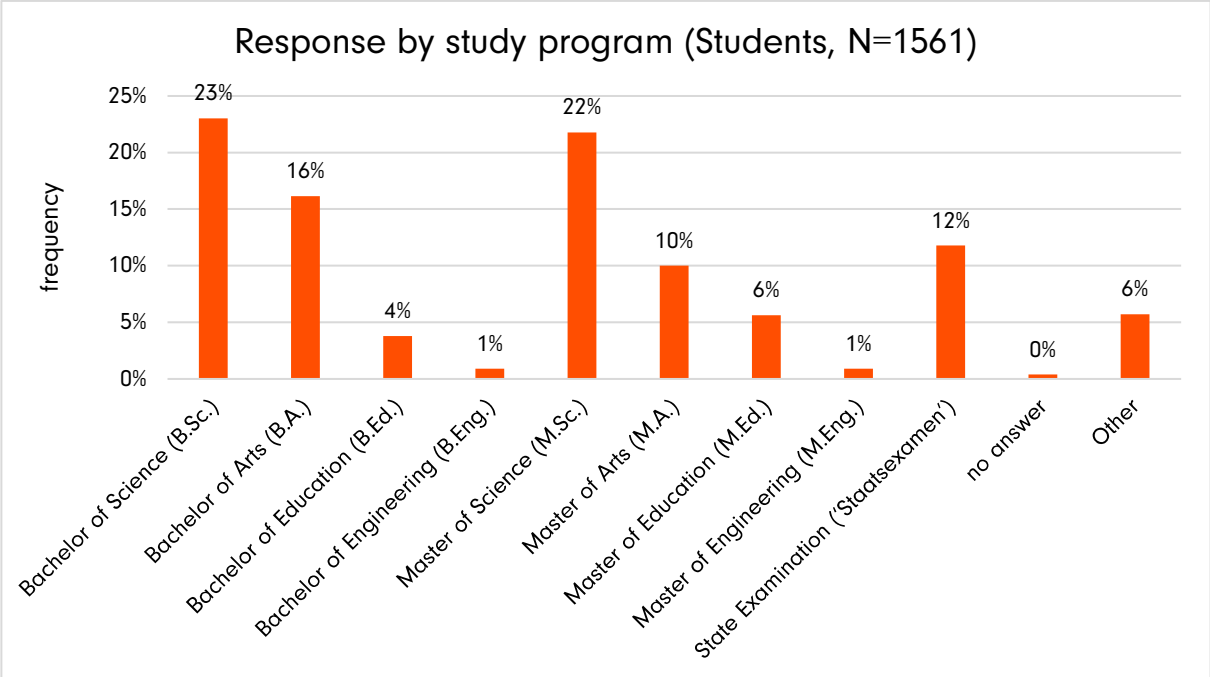

Figure 100: Response by study program. Status group: Students, N=1561. Relative frequency (Y-axis) of different study programs (X-axis).

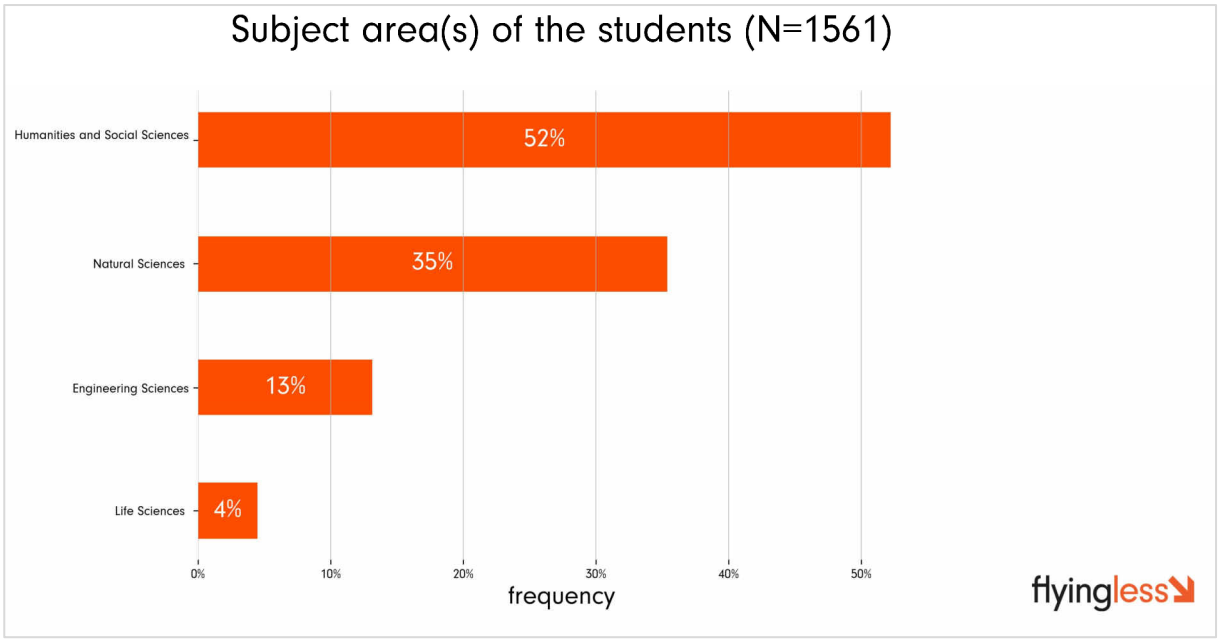

Figure 101: Subject area(s) of the students. Status group: Students, N=1561. Relative frequency (Y-axis) of different subject areas (X-axis). Categories correspond to the DFG structure.

10.2. The topic of flight reduction and communication about it in academia

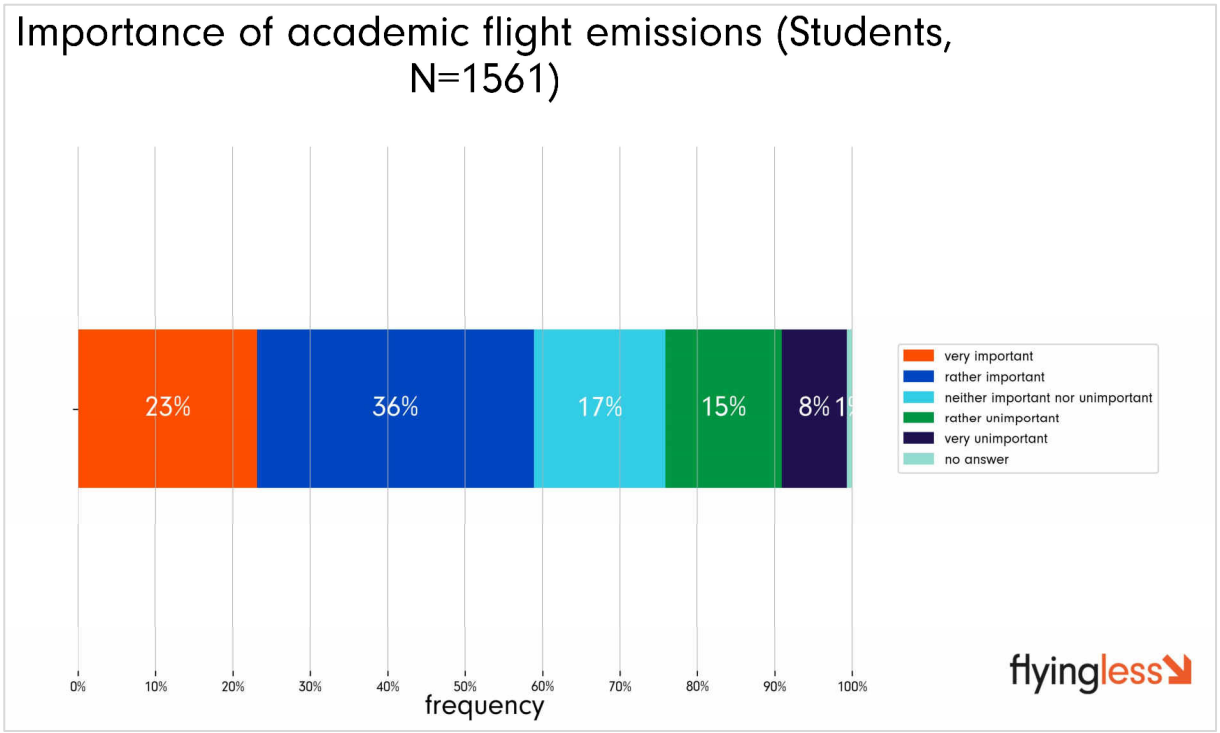

Figure 102: Importance of academic flight emissions. Status group: Students, N=1561. Relative frequency of the evaluation of the topic of flight reduction at universities and research institutions (X-axis).

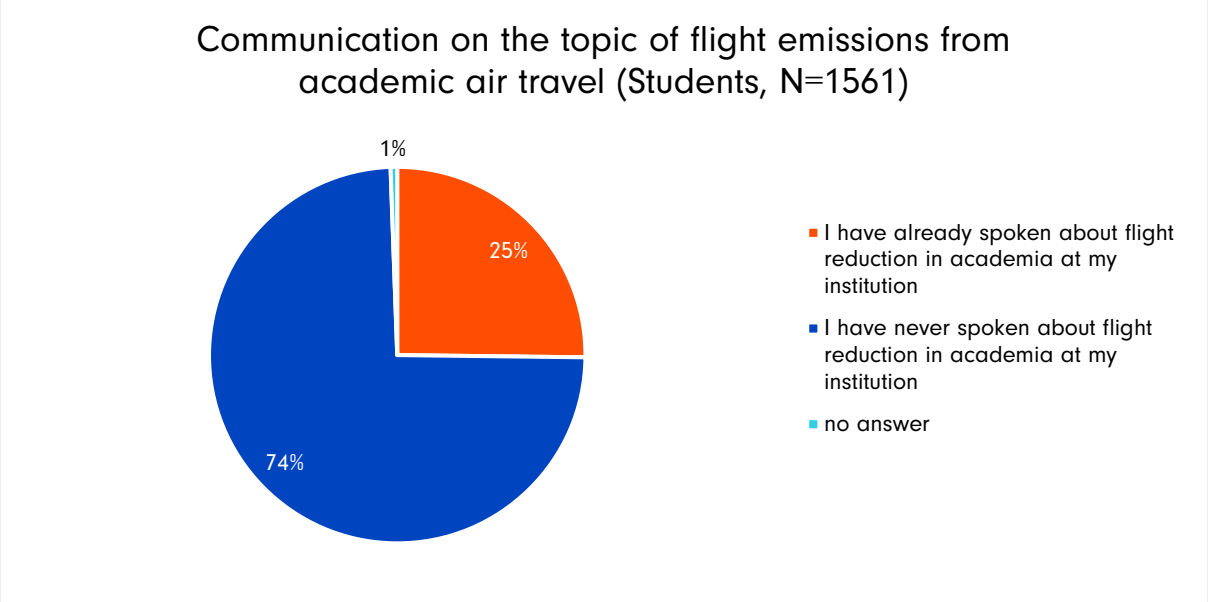

Figure 103: Communication on the topic of flight emissions from academic air travel. Status group: Students, N=1561. Relative frequency of mentions.

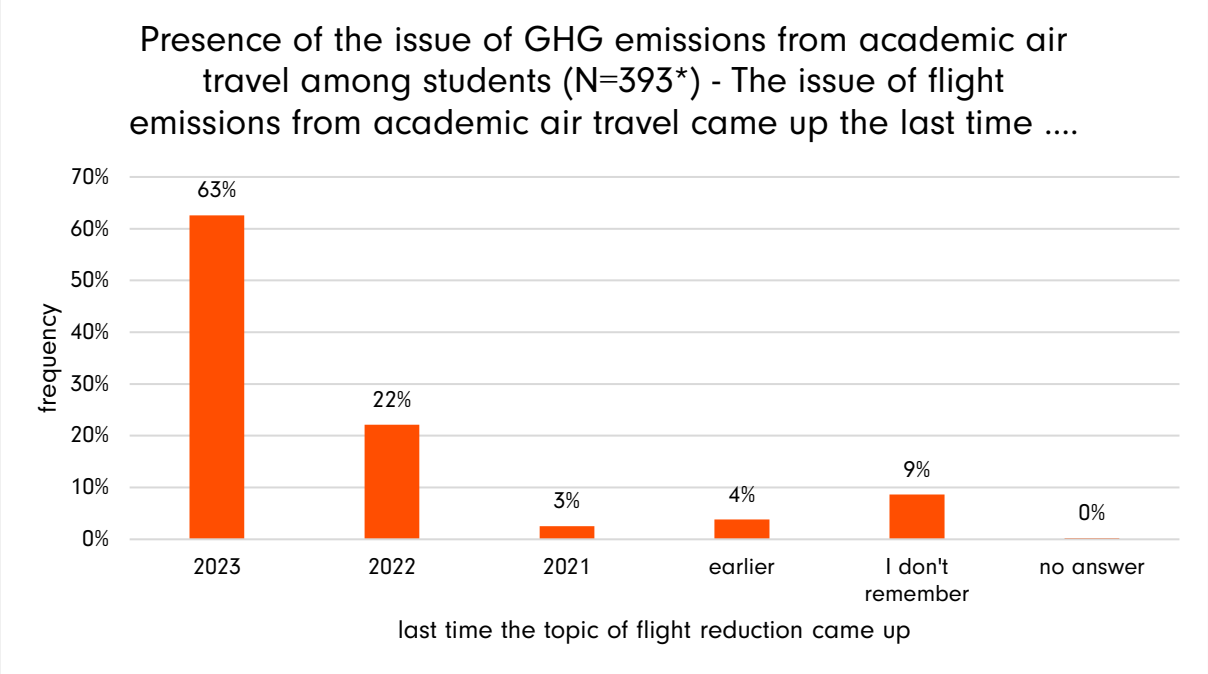

*Figure 104: Presence of the issue of GHG emissions from academic air travel among students. Indication of the date of the last communication on the subject of flight emissions from academic air travel. Status group: Students, N=393. Relative frequency of mentions. *Students who stated that they had already spoken about the topic of flight emissions in academia were asked about the timing of the last communication about it.*

10.3. Student mobility behaviour

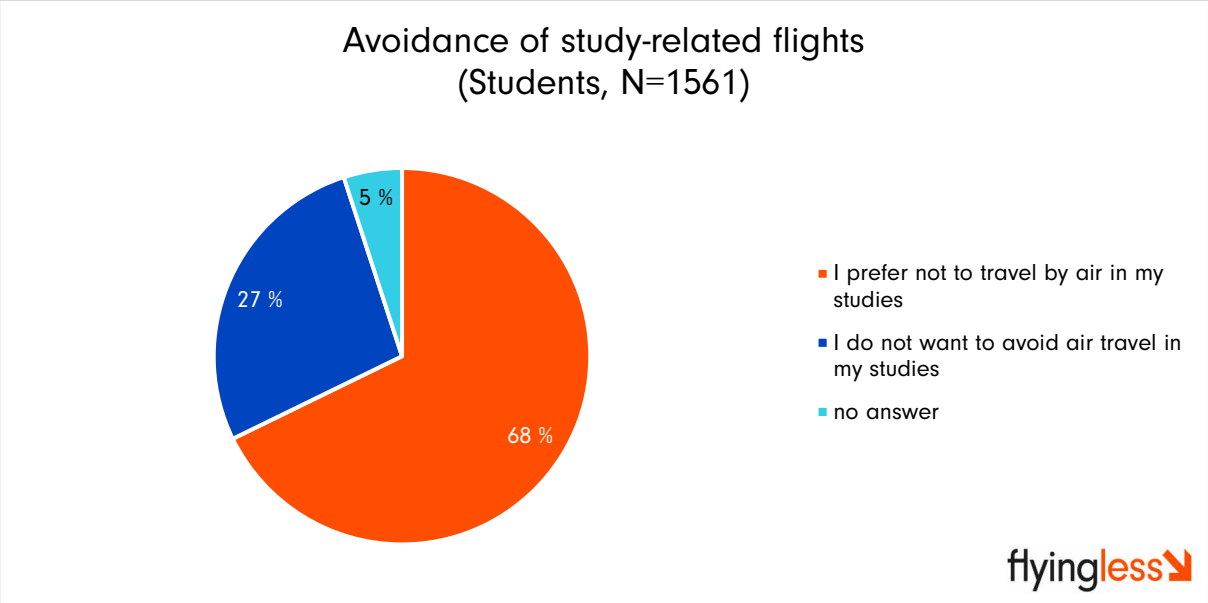

Figure 105: Avoidance of study-related flights. Status group: Students, N=1561. Relative frequency of mentions.

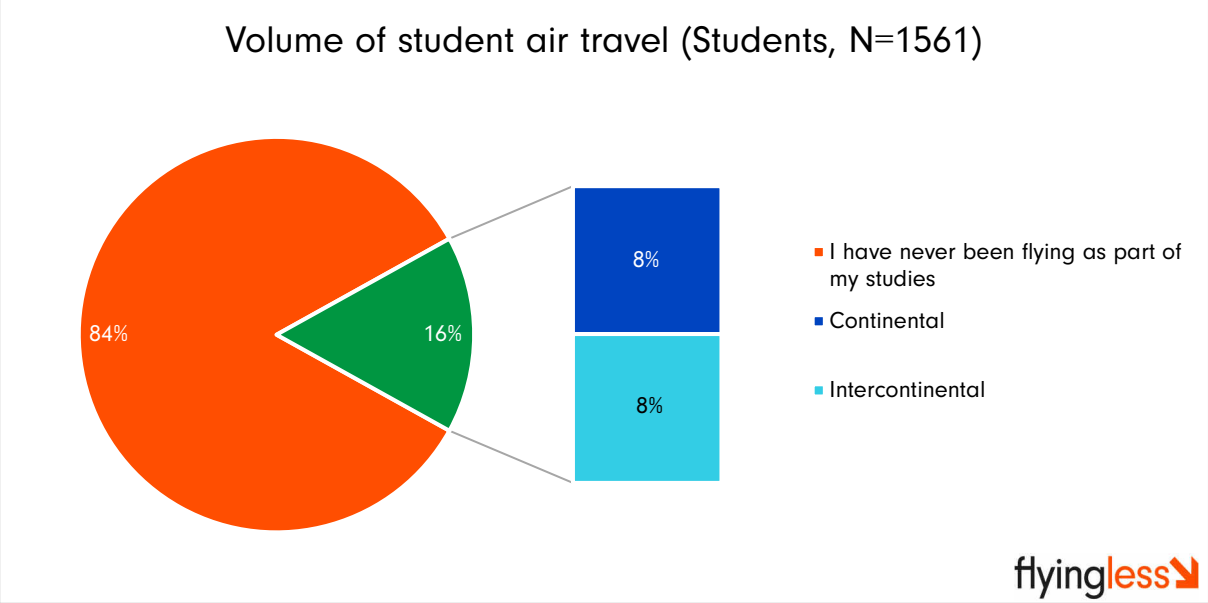

Figure 106: Volume of student air travel. Status group: Students, N = 1561. Relative frequency of no or at least one air trip in study & split between continental and intercontinental destinations.

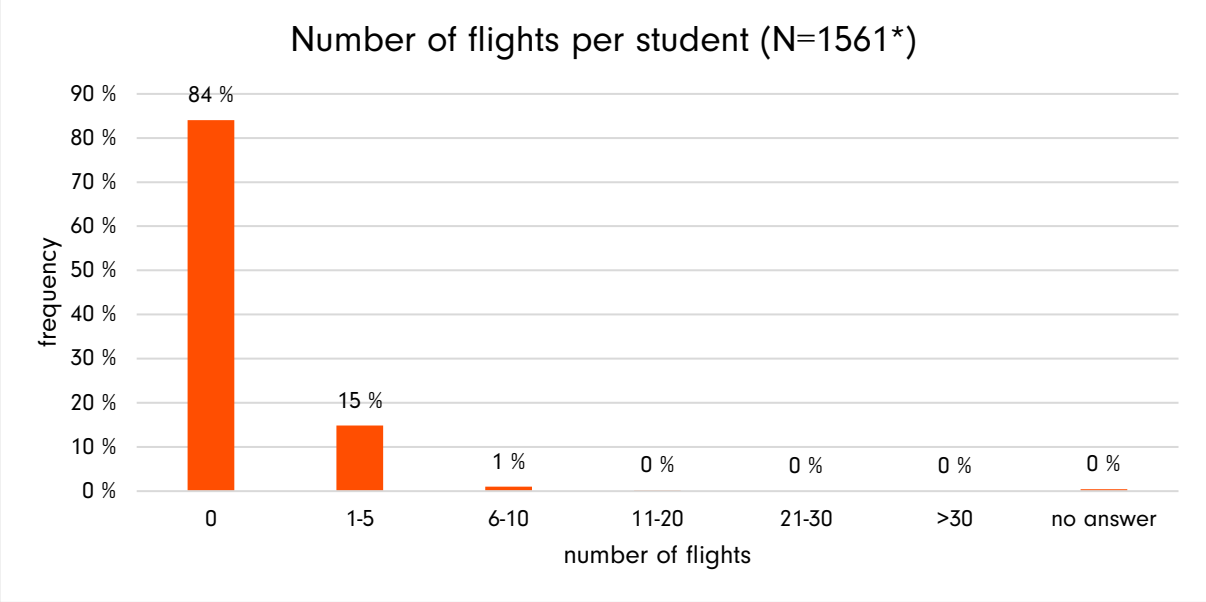

*Figure 107: Number of flights per student. Status group: Students, N=1561. Relative frequency (Y-axis) of study-related flights (X-axis). *Students who stated that they had already flown as part of their studies were asked about the number of times they had flown.*

10.4. Characteristics of the most recent flight

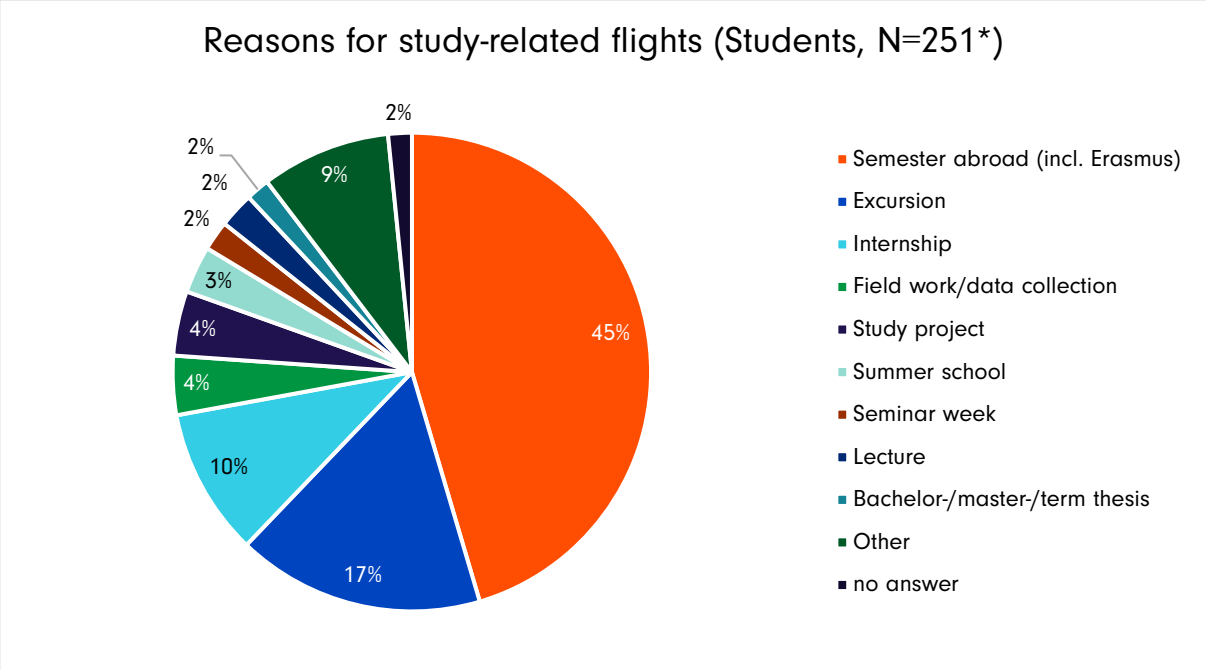

*Figure 108: Reasons for study-related flights. Status group: Students, N=251. Relative frequency of reasons for study-related flights. *Students who stated that they had flown at least once as part of their studies were asked about the reason for their last flight.*

Other reasons for study-related air travel, that was commented (examples):

- «Anforderung des Landes Niedersachsen: mind. 3 Monate Aufenthalt im englisch sprachigen Ausland»
- «gemeinsame Durchführung eines Versuchs mit den dortigen Studierenden»
- «Pflichtauslandsaufenthalt»

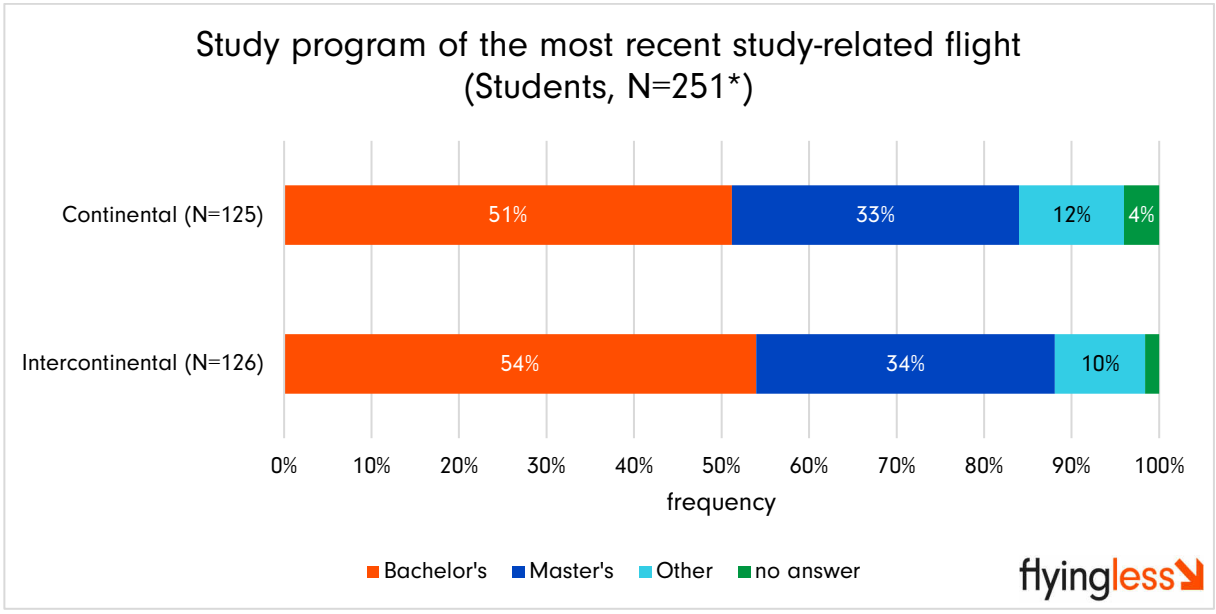

*Figure 109: Study program of the most recent study-related flight. Status group: Students, N=251. Relative frequency of air travel by study program (X-axis) for continental and intercontinental air travel (Y-axis). *Students who stated they had taken a flight during their studies were asked about their most recent flight.*

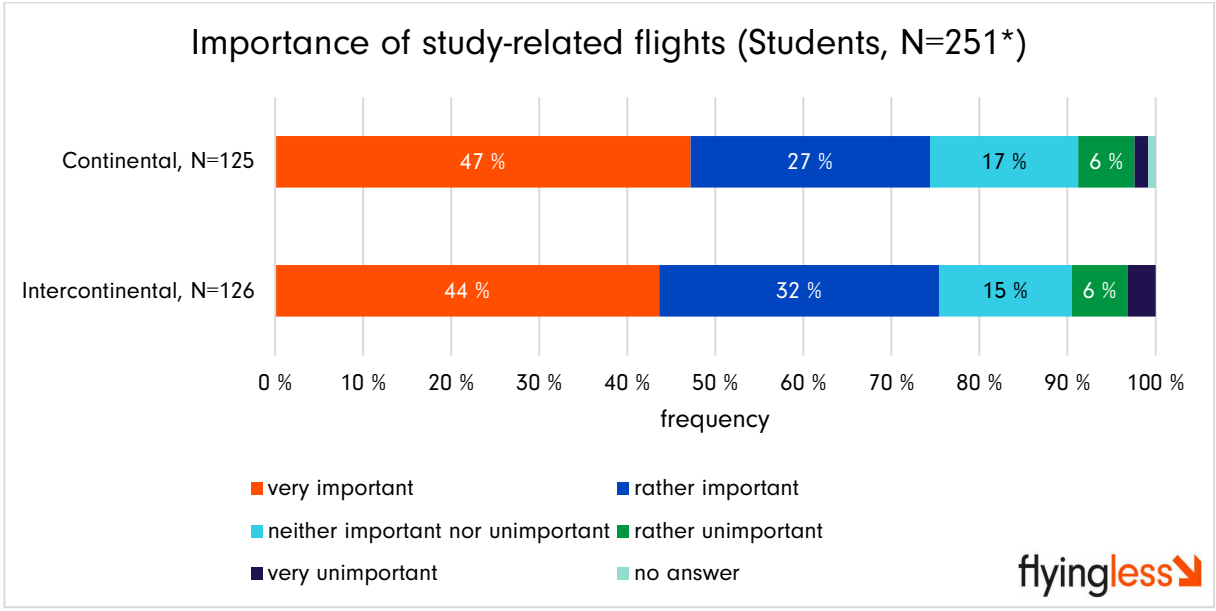

*Figure 110: Relevance of study-related flights. Status group: Students, N=251. Relative frequency of mentions for importance (X-axis) of continental and intercontinental air travel. *Students who stated that they had taken a flight during their studies were asked about their most recent flight.*

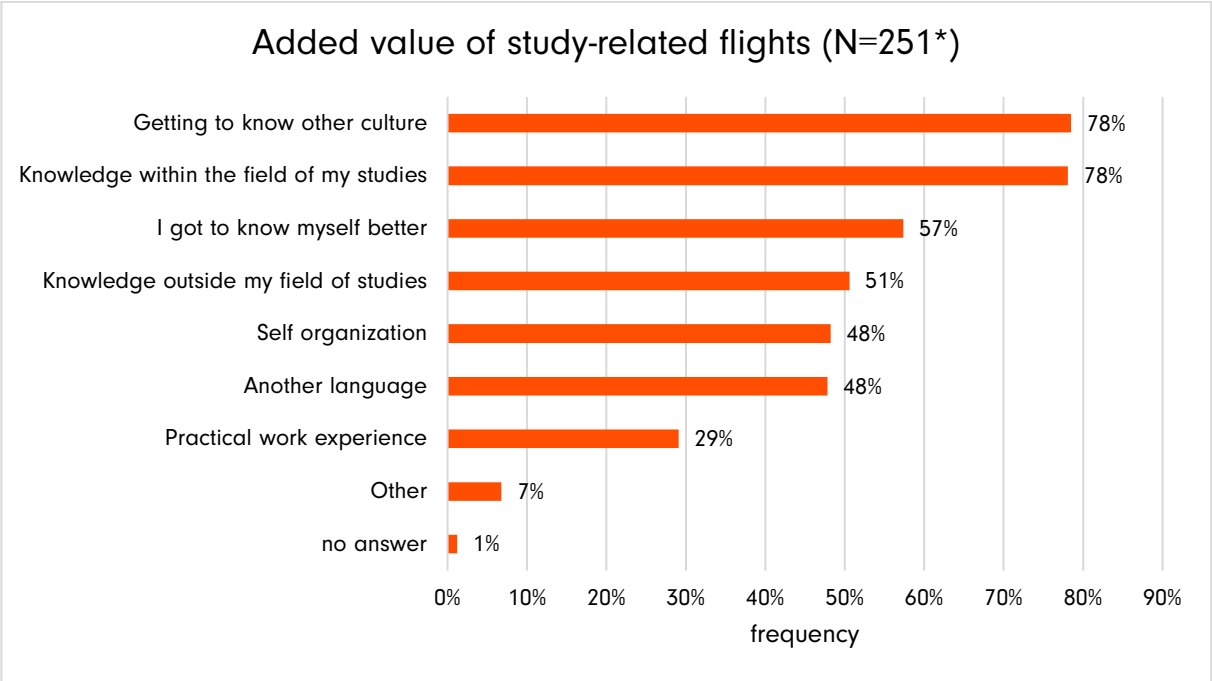

*Figure 111: Added value of study-related flights. Status group: Students, N=251. Relative frequency (X-axis) of the added value (Y-axis) of the moste recent study-related flight. *Students who stated they had taken a flight during their studies were asked about their most recent flight.*

Other learning effects that were mentioned as a comment (examples):

- «Unterdrückung von Minderheiten in China»
- «Skill außerhalb des Studienfachs (Tauchen)»
- «Städte & Länder kennengelernt, die ich sonst nicht gesehen hätte»

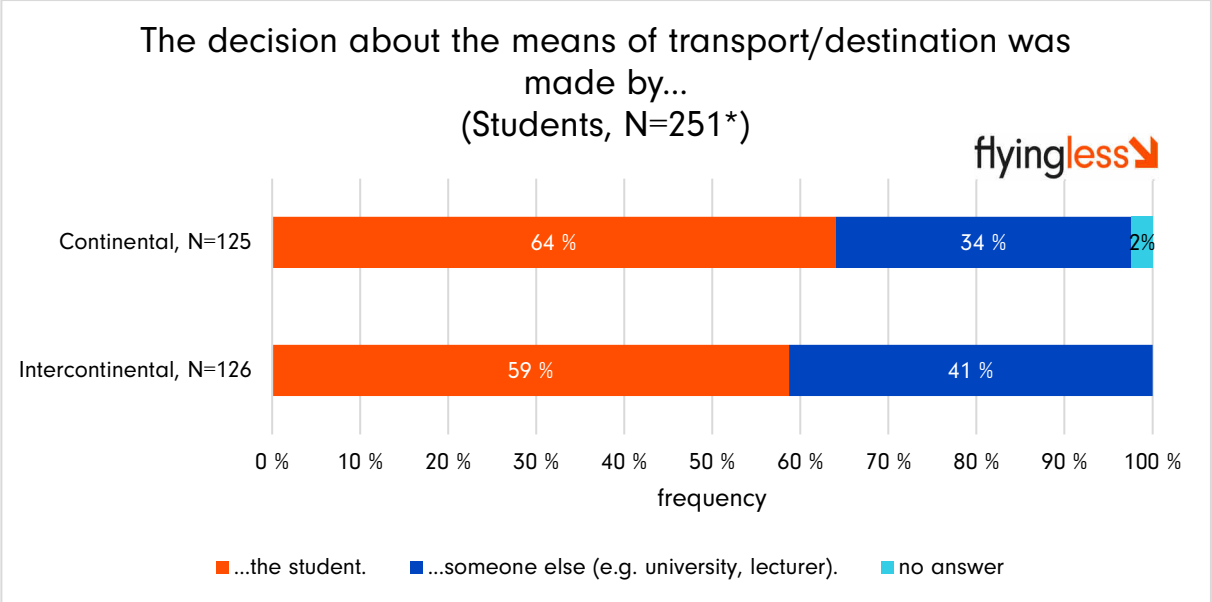

*Figure 112: Person who decided on the destination/means of transportation. Status group: Students, N=251. Relative frequency of decision maker mentioned (X-axis) for continental and intercontinental flights. *Students who stated they had taken a flight during their studies were asked about their most recent flight.*

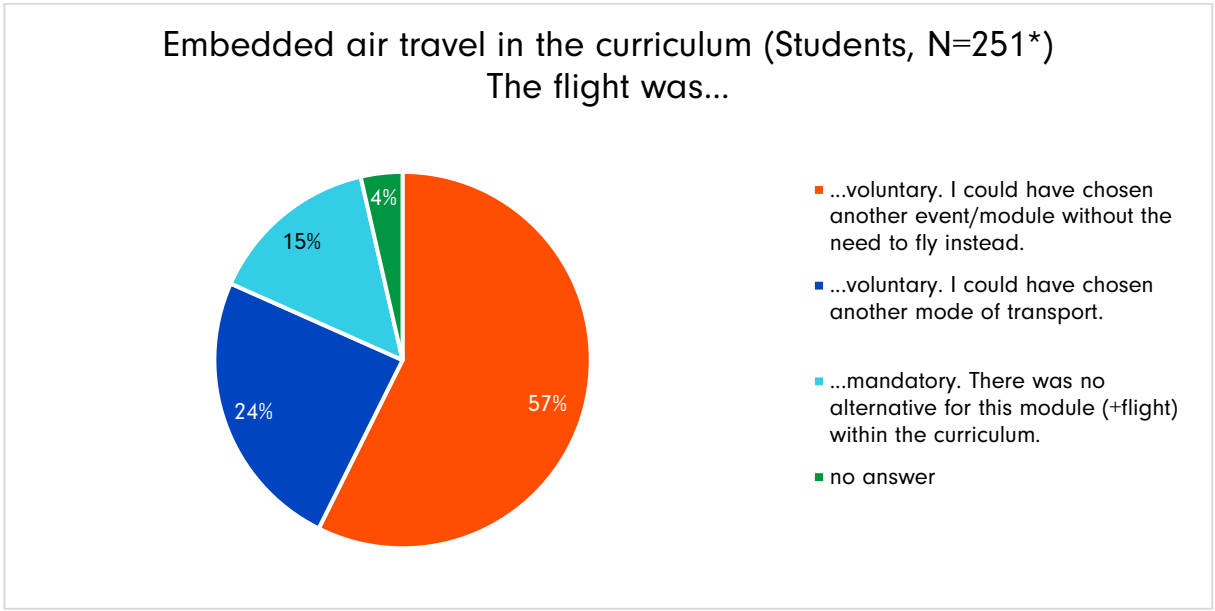

*Figure 113: Embedded air travel in the curriculum. Status group: Students, N=251. Relative frequency (X-axis) of mentions (legend) and study program (Y-axis). *Students who stated they had taken a flight during their studies were asked about their most recent flight.*

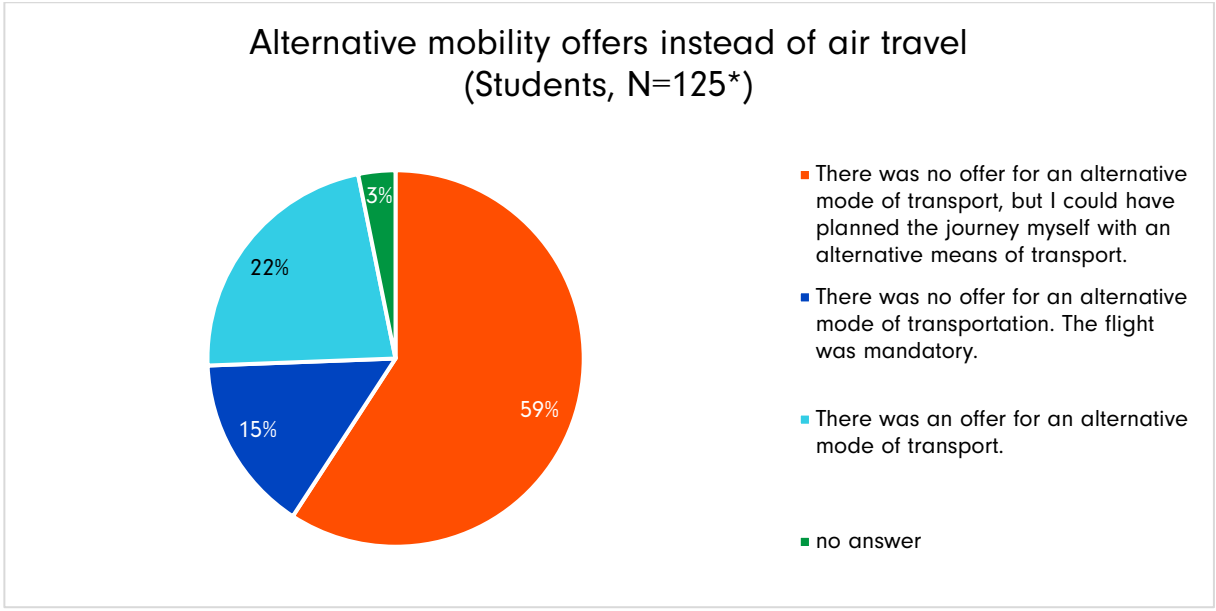

*Figure 114: Alternative mobility offers instead of air travel. Status group: Students, N=125. Relative frequency of mentions per subanswer. *Students who stated that they had flown within Europe as part of their studies were asked about the option of an alternative mode of transport.*

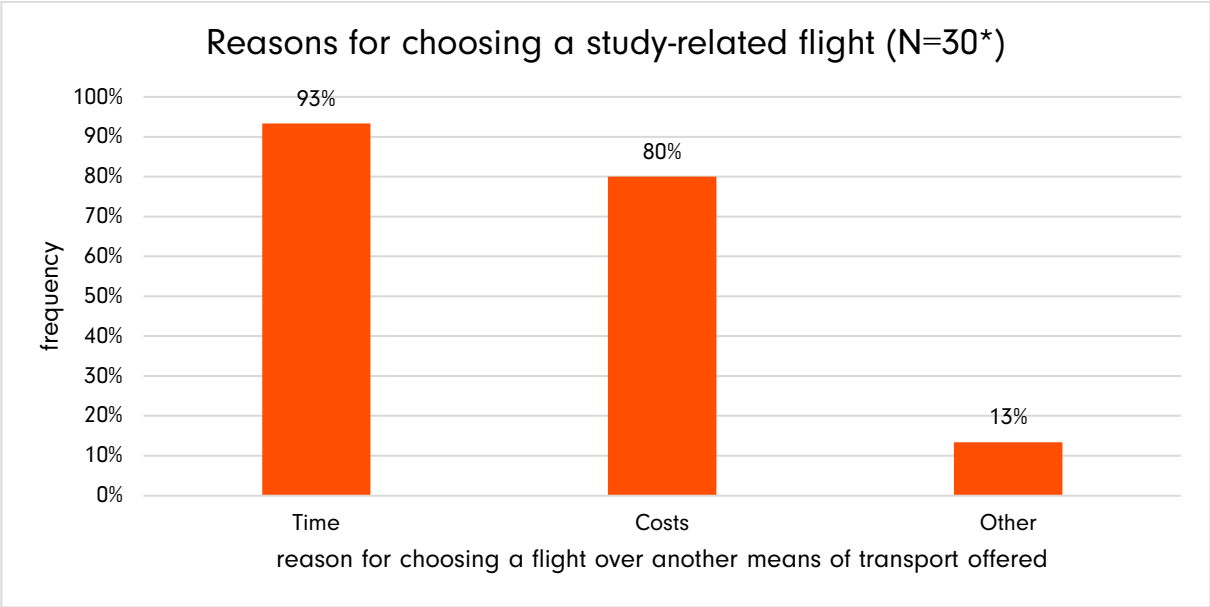

*Figure 115: Reasons for choosing a study-related flight. Status group: Students, N=30. Relative frequency of mentions per subanswer (Reasons for choosing a flight over another mode of transportation). *Students who stated that they last took a continental flight as part of their studies while being offered an alternative mode of transportation for that purpose were asked about their decision.*

Other reasons for taking the flight (examples):

- «Freunde flogen auch»
- «Ich mag fliegen»
- «Deutsche Bahn»

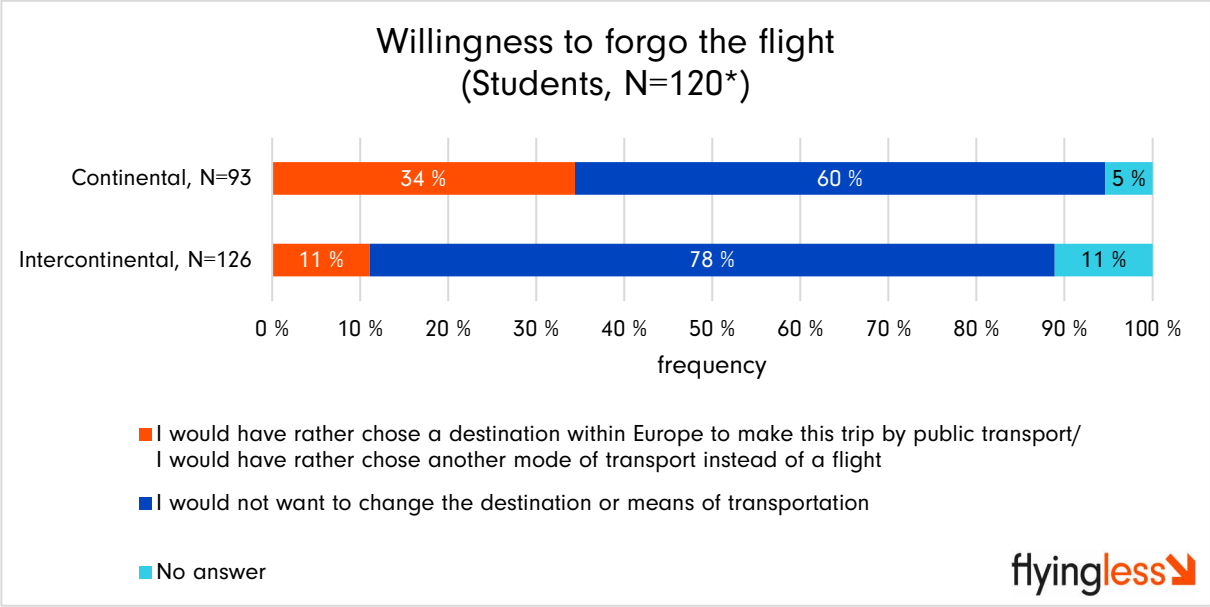

*Figure 116: Willingness to forgo the flight. Status group: Students, N=93 (continental) & N=126 (intercontinental). Relative frequency of willingness (X-axis) to forgo the (inter-)continental flight (Y-axis). *Students who stated they had taken an intercontinental flight or continental flight without the offer of an alternative travel option during their studies were asked about their most recent flight.*

10.5. Planned air travel

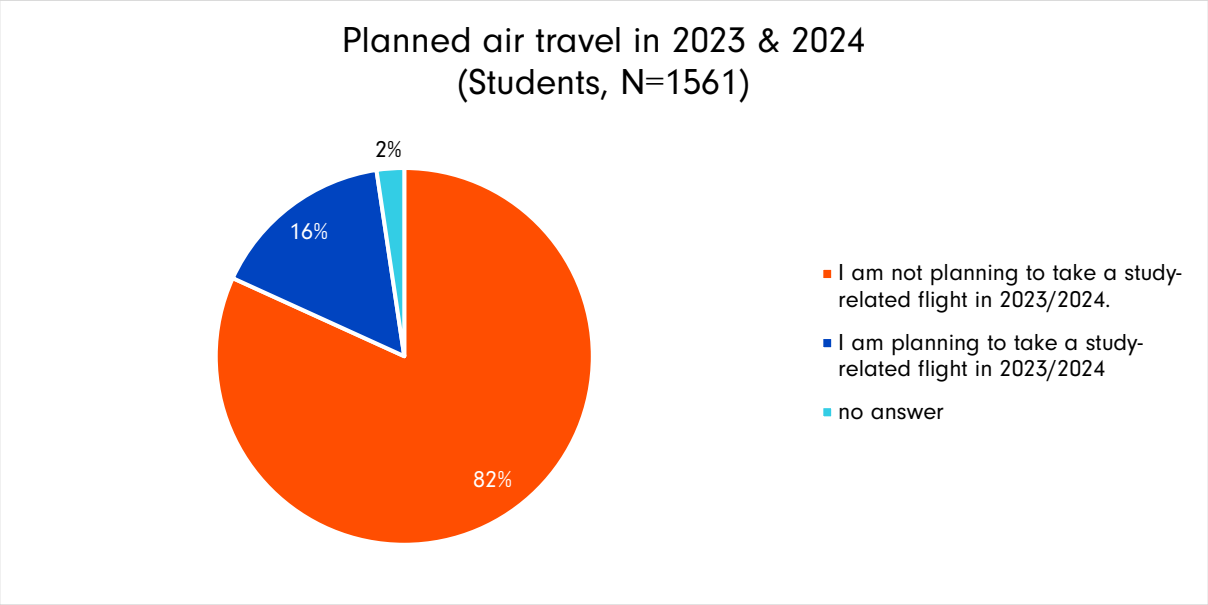

Figure 117: Planned air travel in 2023 & 2024. Status group: Students, N=1561. Relative frequency of mentions.

10.6. Students studying without flying

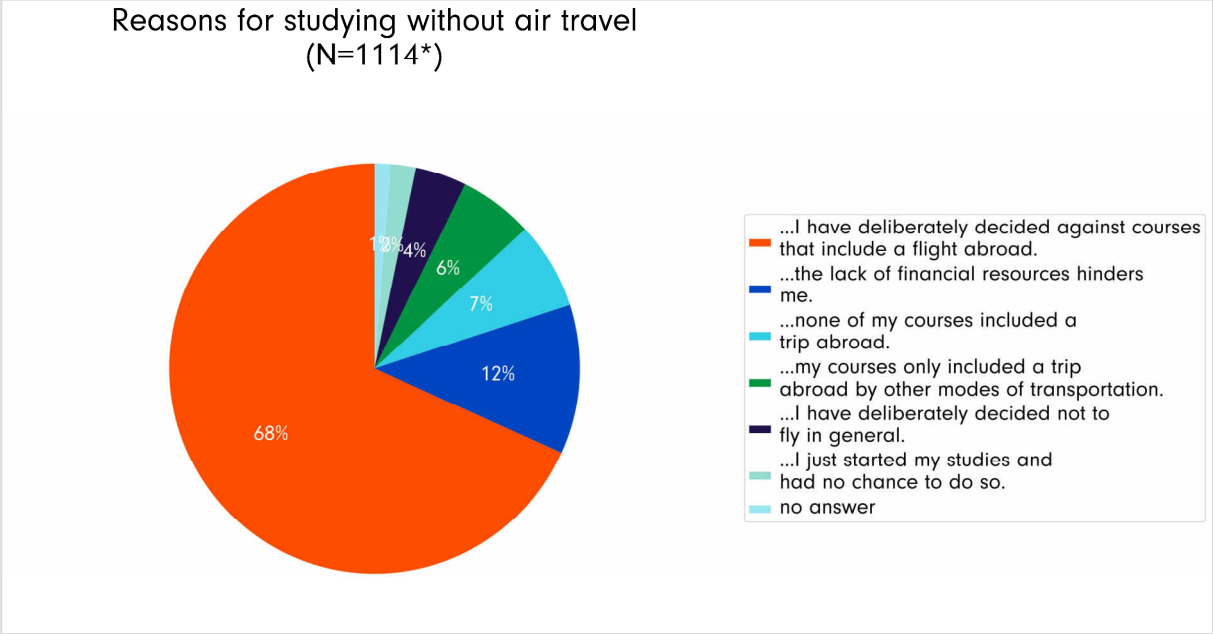

*Figure 118: Reasons for studying without air travel. Status group: Students, N=1114. Relative frequency of reasons for studying without air travel. *Students who stated that they had not taken or planned to take any air travel as part of their studies were asked why.*

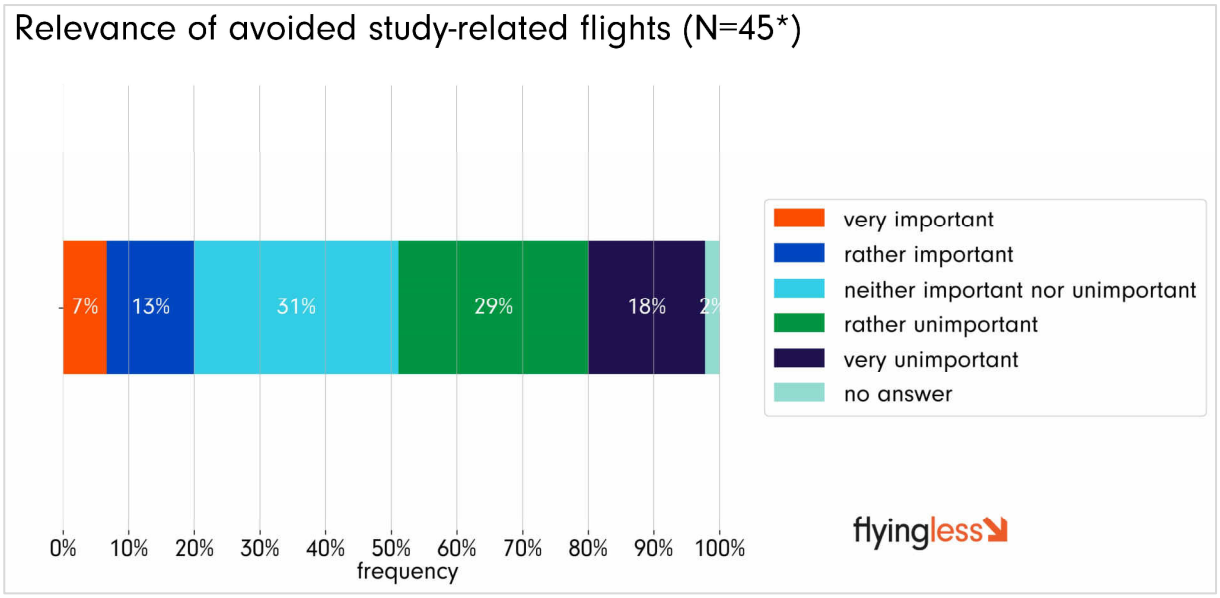

*Figure 119: Relevance of avoided study-related flights. Status group: Students, N=45. Relative frequency (X-axis) of mentions for relevance of deliberately avoided air travel in studies. *Students who indicated that they deliberately decided against courses that involved air travel were asked about the relevance of this to their studies.*

10.7. Flight reduction measures

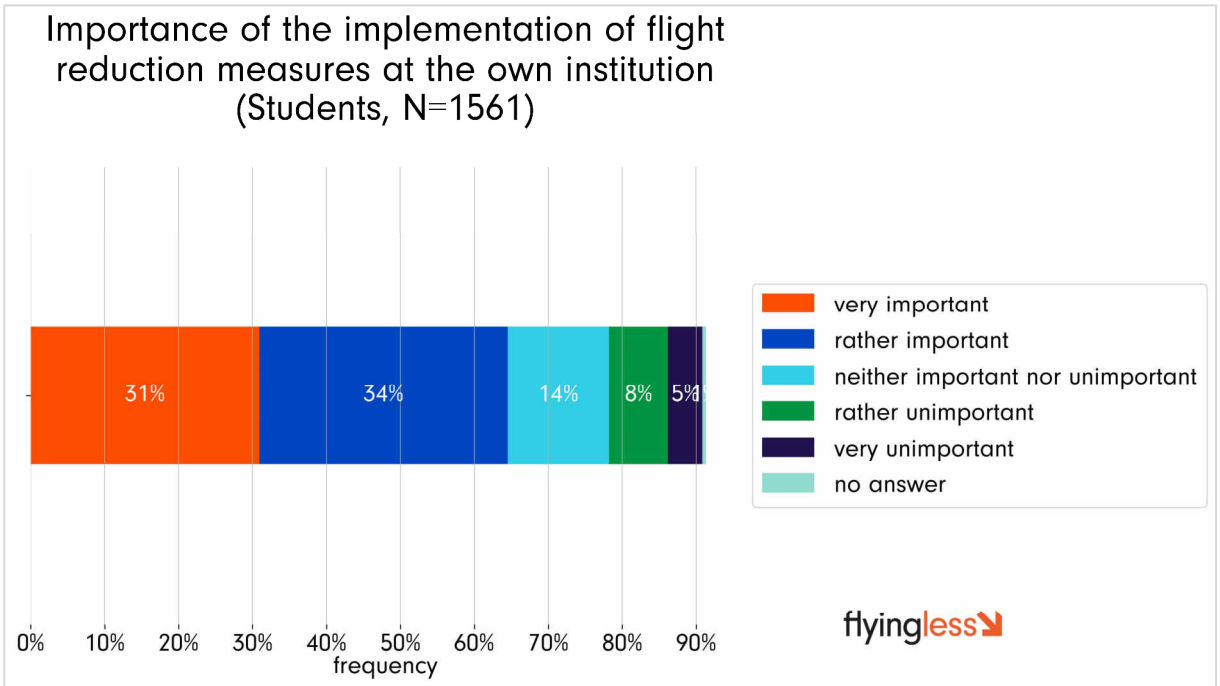

Figure 120: Importance of the implementation of flight reduction measures at the own institution. Status group: Students, N=1561. Relative frequency of mentions (X-axis).

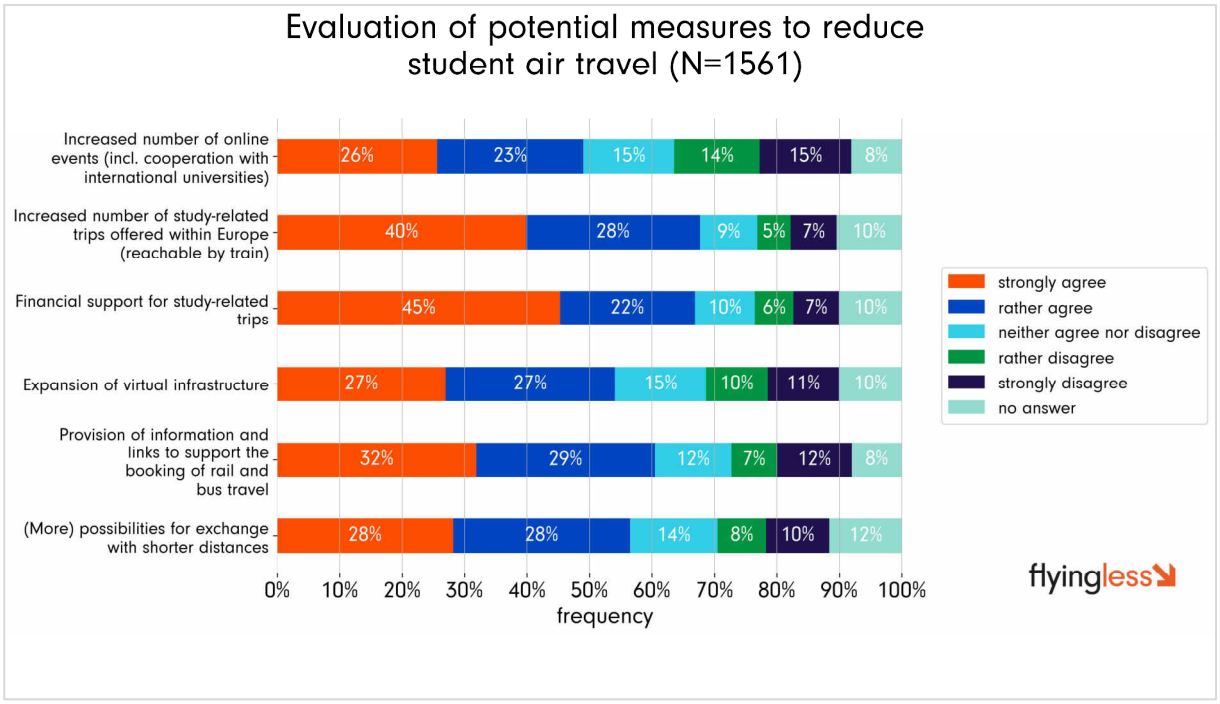

Figure 121: Evaluation of potential measures to reduce student air travel. Status group: Students, N=1561. Relative frequency of mentions (Y-axis) per subanswer (measures/incentives to reduce study-related air travel; X-axis).

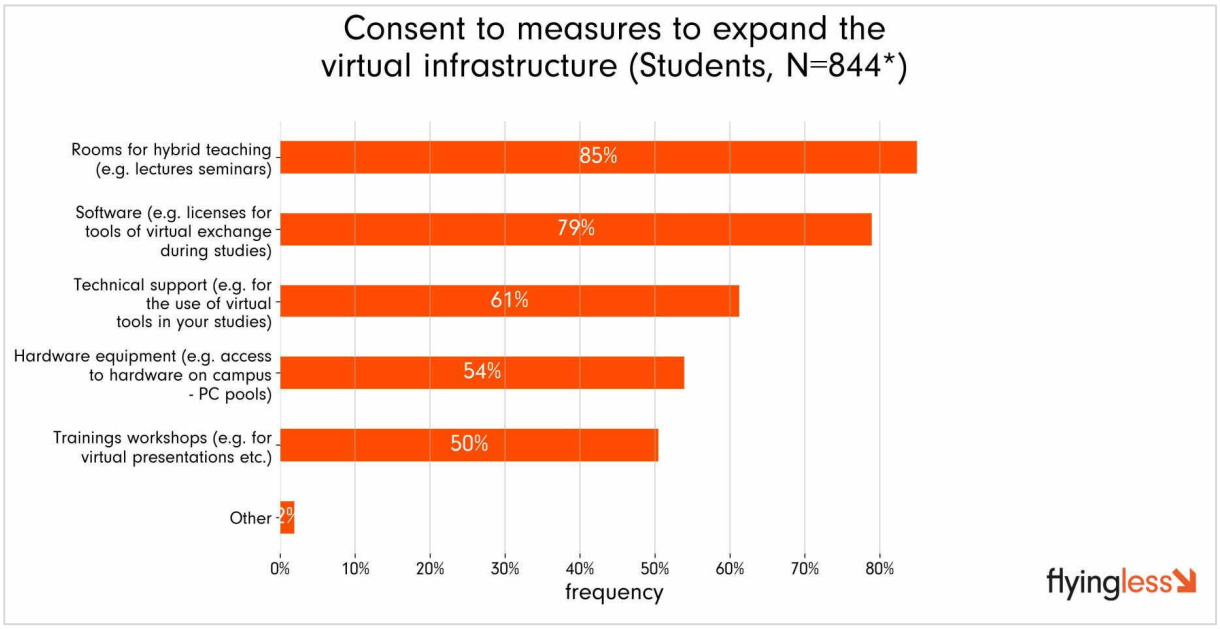

*Figure 122: Consent to measures to expand the virtual infrastructure. Status group: Students, N=844. Relative frequency of mentions (X-axis) on certain measures for the expansion of the virtual infrastructure (Y-axis). *Students who indicated they supported an expansion of virtual infrastructure were asked about their opinions on specific measures.*

Other measures that were mentioned to expand the virtual infrastructure (examples):

- «Zuschuss für Hardware wie Notebooks/Tablets»
- «JEDE Vorlesung auch online abhalten»
- «Ausreichend WLAN und Steckdosen in Seminarräumen u.ä.»
- «besser funktionierendes Eduoroam»

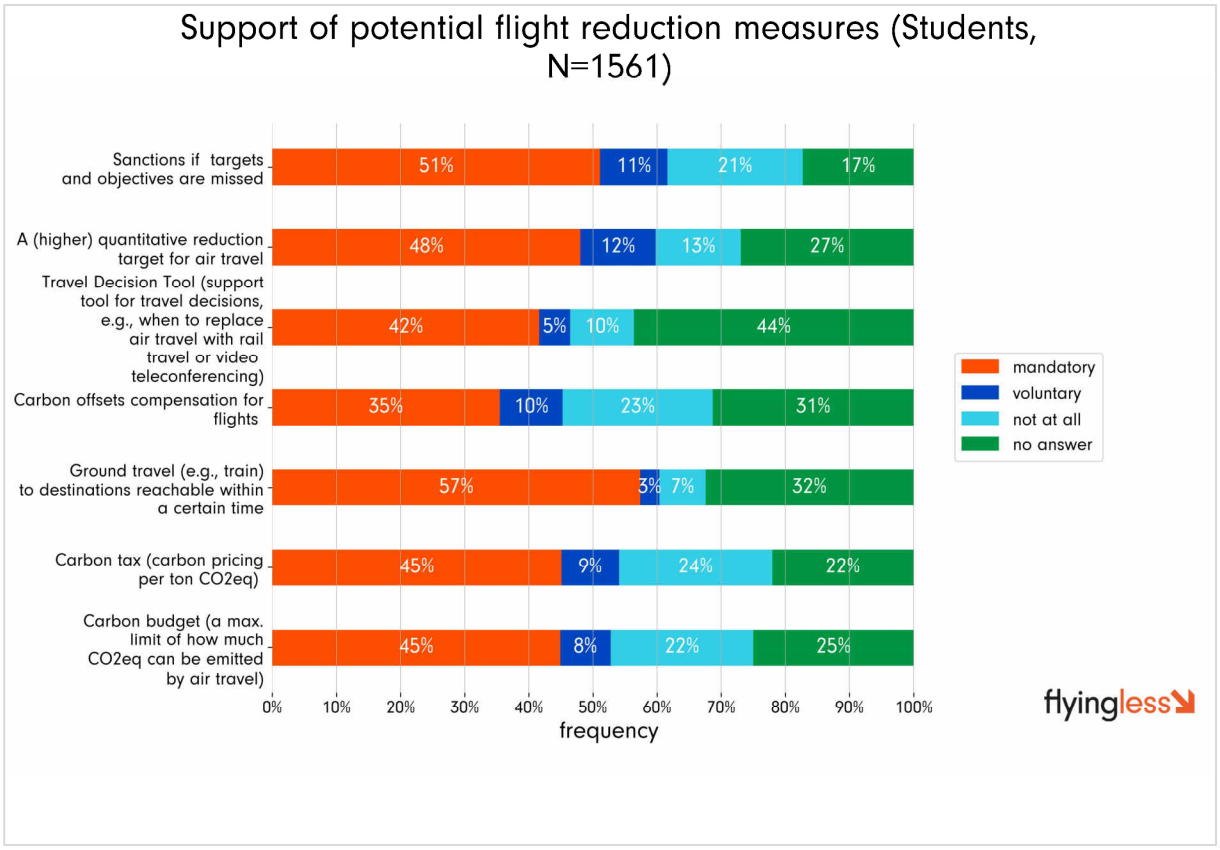

Figure 123: Support of potential flight reduction measures. Status group: Students, N=1561. Relative frequency of mentions (Y-axis) per subanswer (flight reduction measures; X-axis).

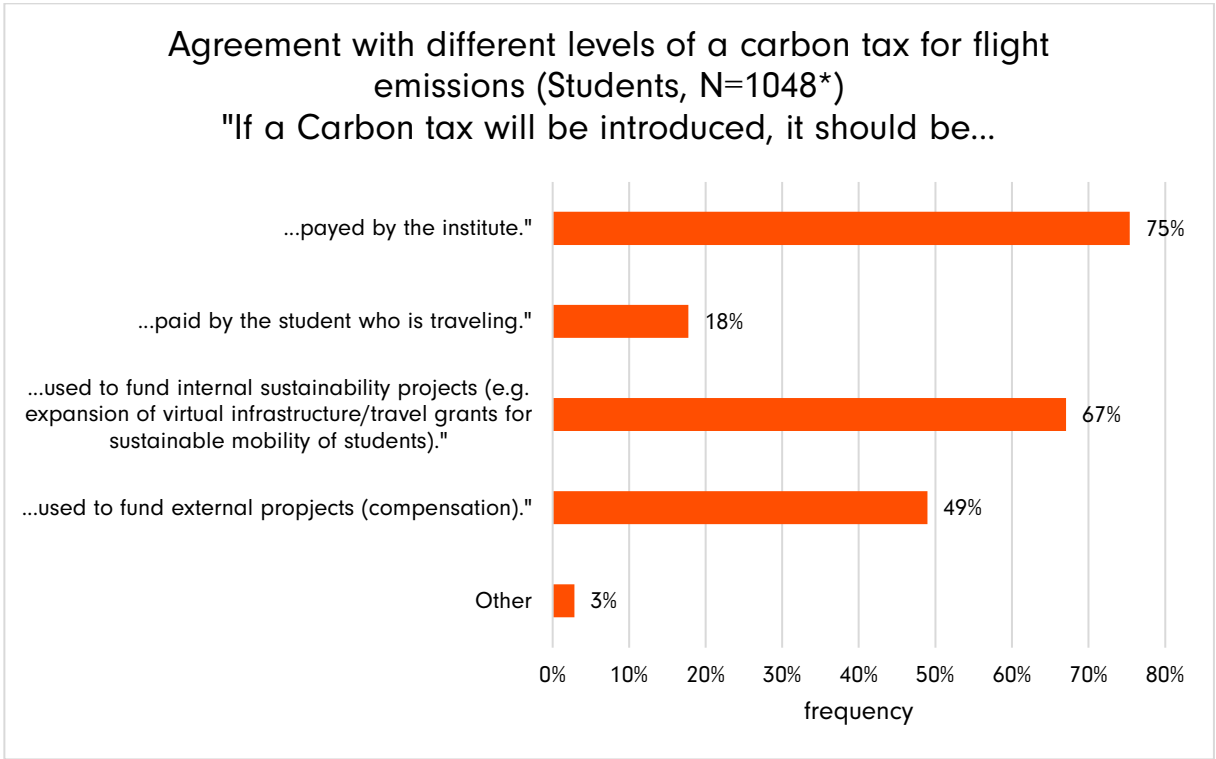

*Figure 124: Agreement with different levels of a carbon tax for flight emissions. Status group Students, N=1048. Relative frequency of mentions (X-axis) of specified options (Y-axis). *Students who indicated they supported a carbon tax were asked for their opinions on the options given.*

Other options for designing a carbon tax, that were mentioned (examples):

- «50/50 vom Studierenden und Institut»
- «abhängig vom Einkommen des jeweiligen Reisenden sein»
- «Für die BAföG Erhöhung genutzt werden»
- «Sollte diese vor allem für Tätige in der Lehre (bsp.: Konferenzen etc.) zählen und NICHT für Studierende»

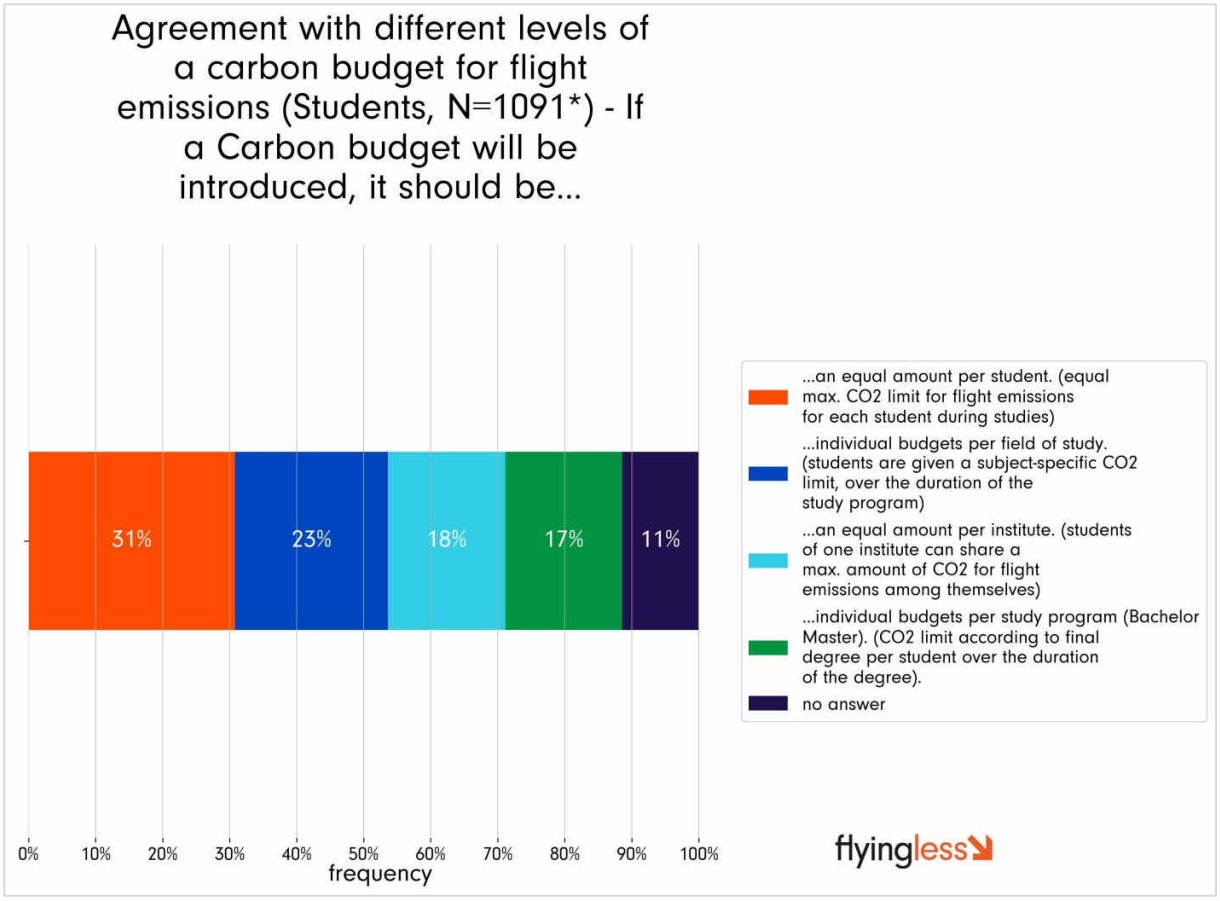

*Figure 125: Agreement with different levels of a carbon budget for flight emissions. Status group Students, N=1091. Relative frequency of mentions (X-axis) of specified options (Y-axis). *Students who indicated they supported a carbon budget were asked for their opinions on the options given.*

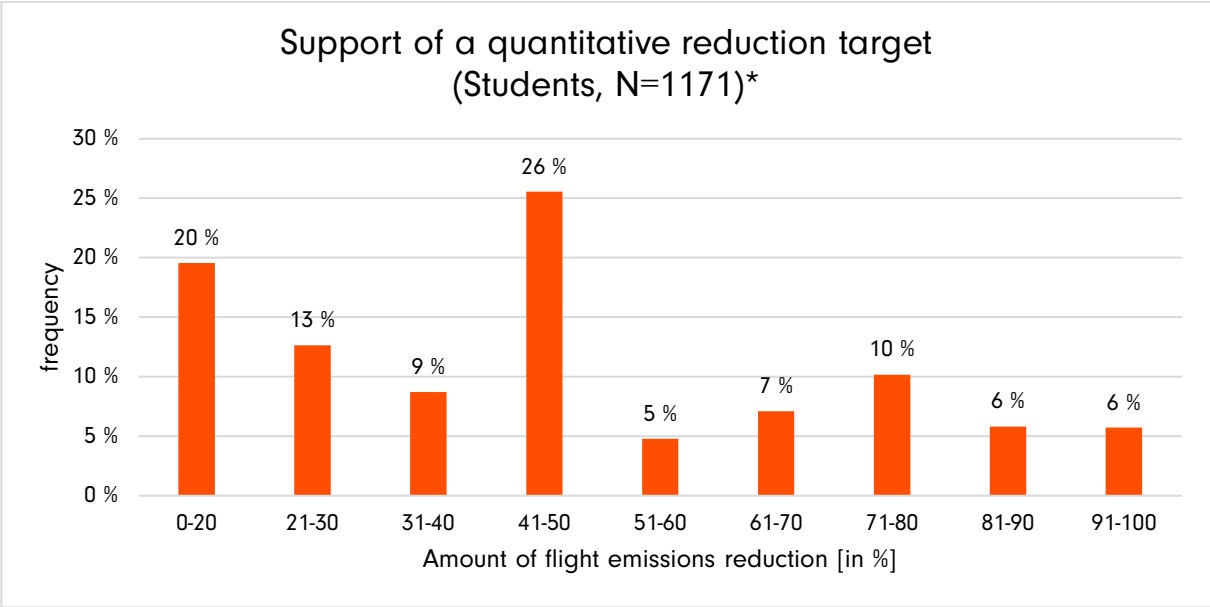

*Figure 126: Support a quantitative reduction target by 2030 relative to pre-COVID-19 air traffic levels (respondent's estimate). Status group Students, N=1171. Relative frequency of mentions (Y-axis) per aggregated amount of reduction of flight emissions in % (X-axis). *Students who indicated they supported a (higher) quantitative reduction target were asked about this.*

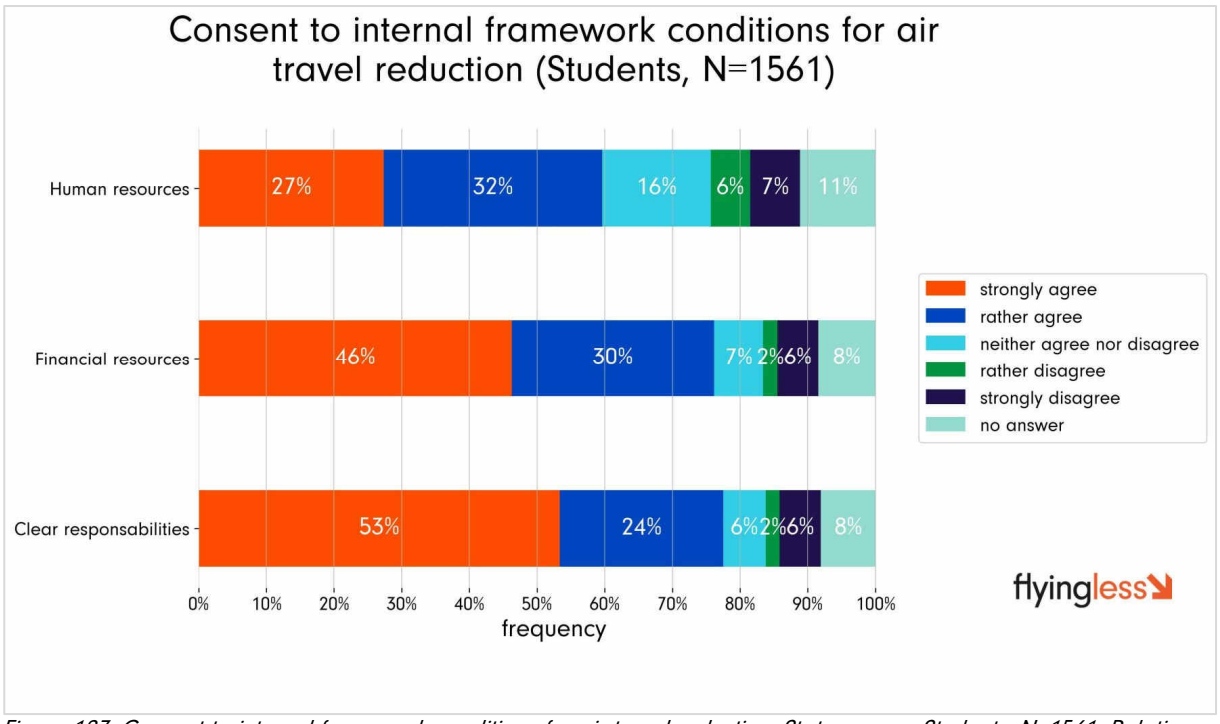

Figure 127: Consent to internal framework conditions for air travel reduction. Status group: Students, N=1561. Relative frequency of mentions (X-axis) of different framework conditions given (Y-axis).

Other supporting measures for reducing study-related air travel (examples):

- «mehr verfügbare Zeit für Zugreisen und finanzielle Unterstützung dieser»
- «Klimabildung, die allen verständlich macht, warum das notwendig ist»
- «Komprimierung von Austauschprogrammen auf einen großen gemeinsamen Zeitblock»
- «Komprimierung von Austauschprogrammen auf einen großen gemeinsamen Zeitblock»
- «Dozierende sollten Fliegen selbst nicht als selbstverständlich verstehen, sondern die Anreise mit dem Zug vorschlagen»

10.8. Flying as part of the future job

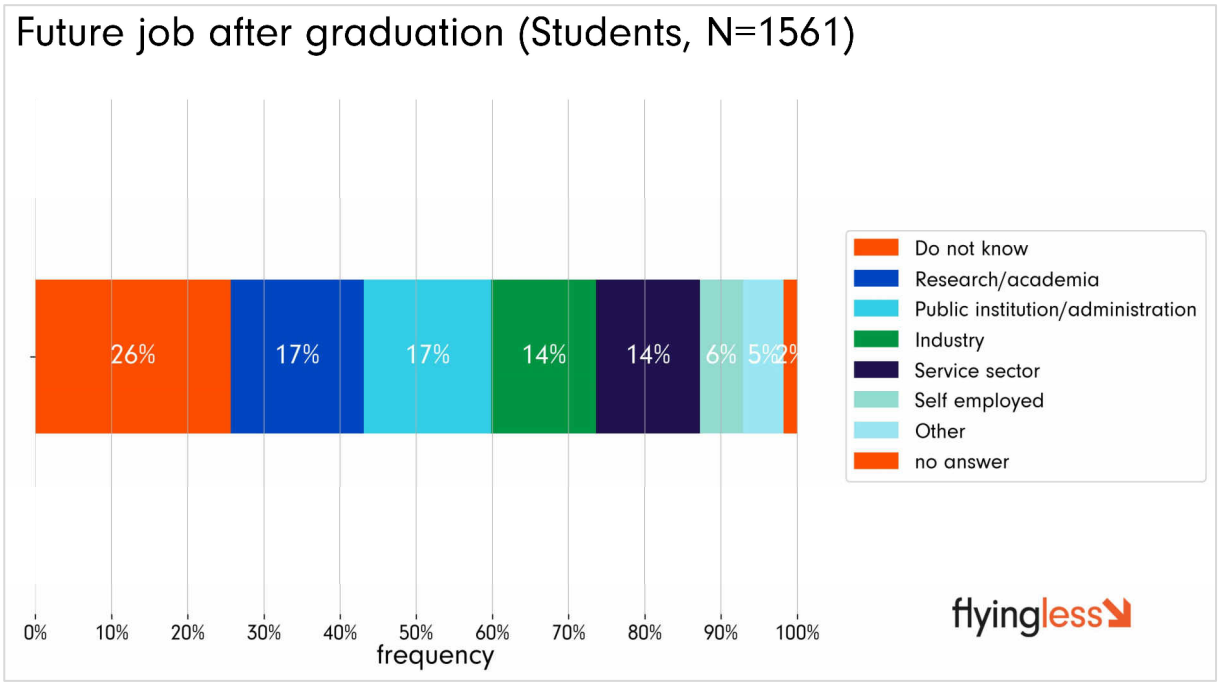

Figure 128: Future job after graduation. Status group: Students, N=1561. Relative frequency of given employment areas.

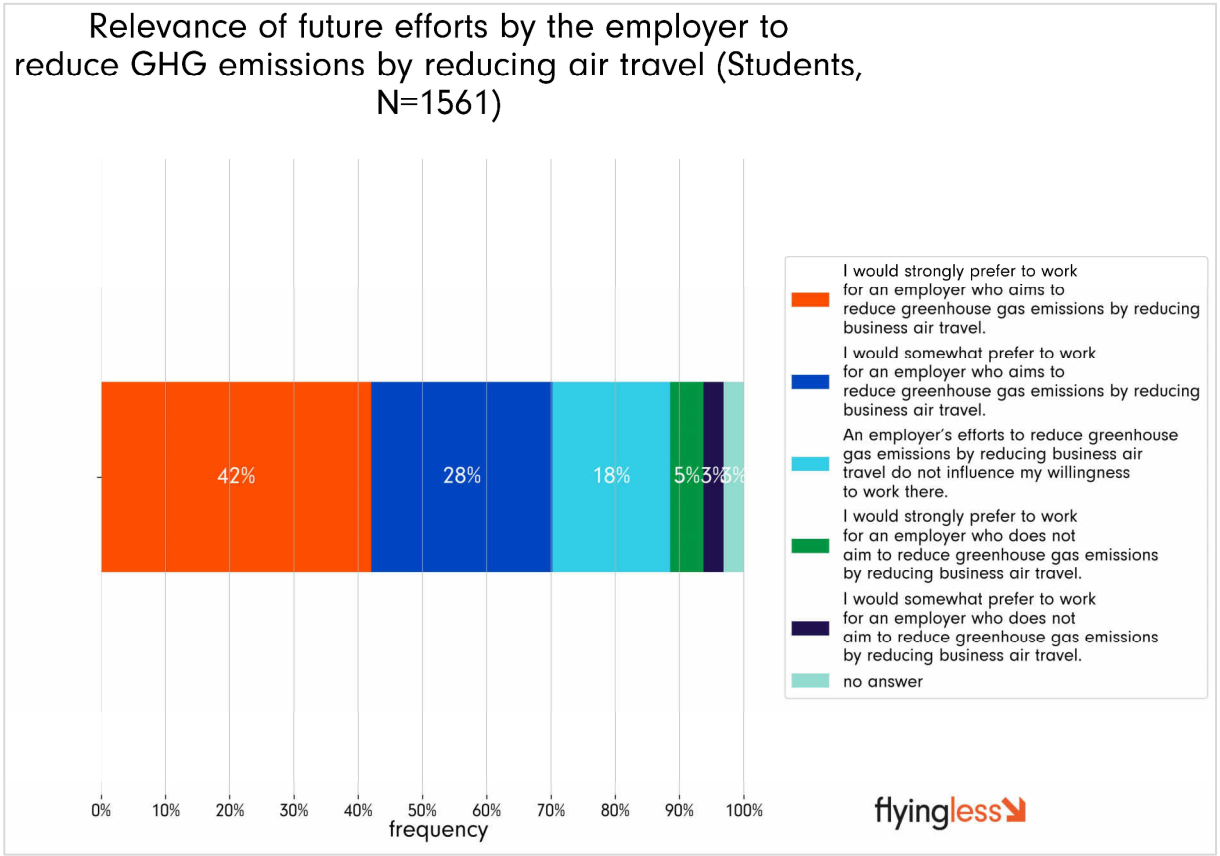

Figure 129: Relevance of future efforts by the employer to reduce GHG emissions by reducing air travel. Status group: Students, N=1561. Relative frequency of given options regarding the future employer.

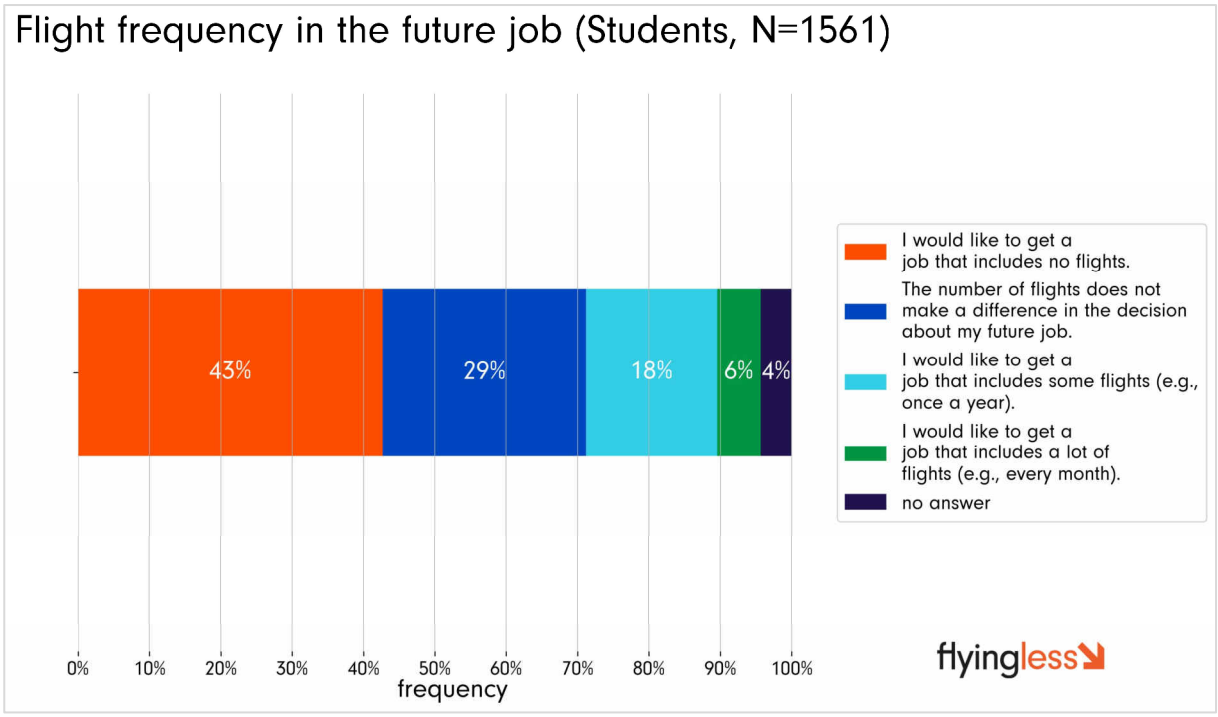

Figure 130: Flight frequency in the future job. Status group: Students, N=1561. Relative frequency of mentions for the amount of flights in the future job.

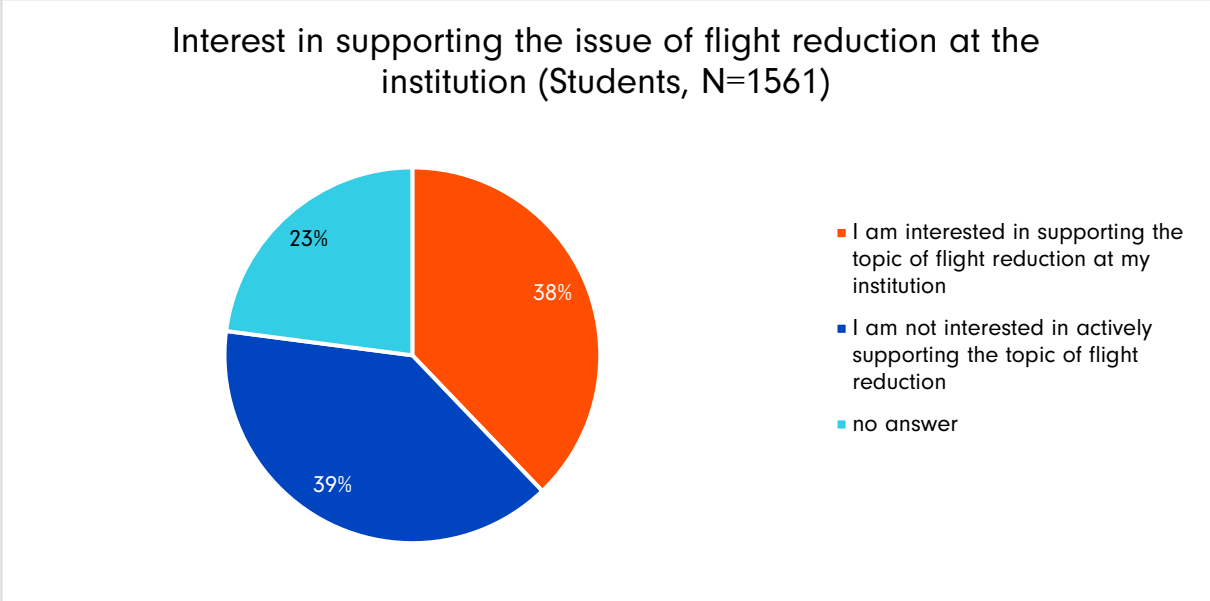

Figure 131: Interest in supporting the issue of flight reduction at the institution. Status group: Students, N=1561. Relative frequency of mentions regarding the interest on supporting the topic of flight reduction at the own institution.

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