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Exploring CO₂-Budgeting to Meet KTH Climate Target for Aviation

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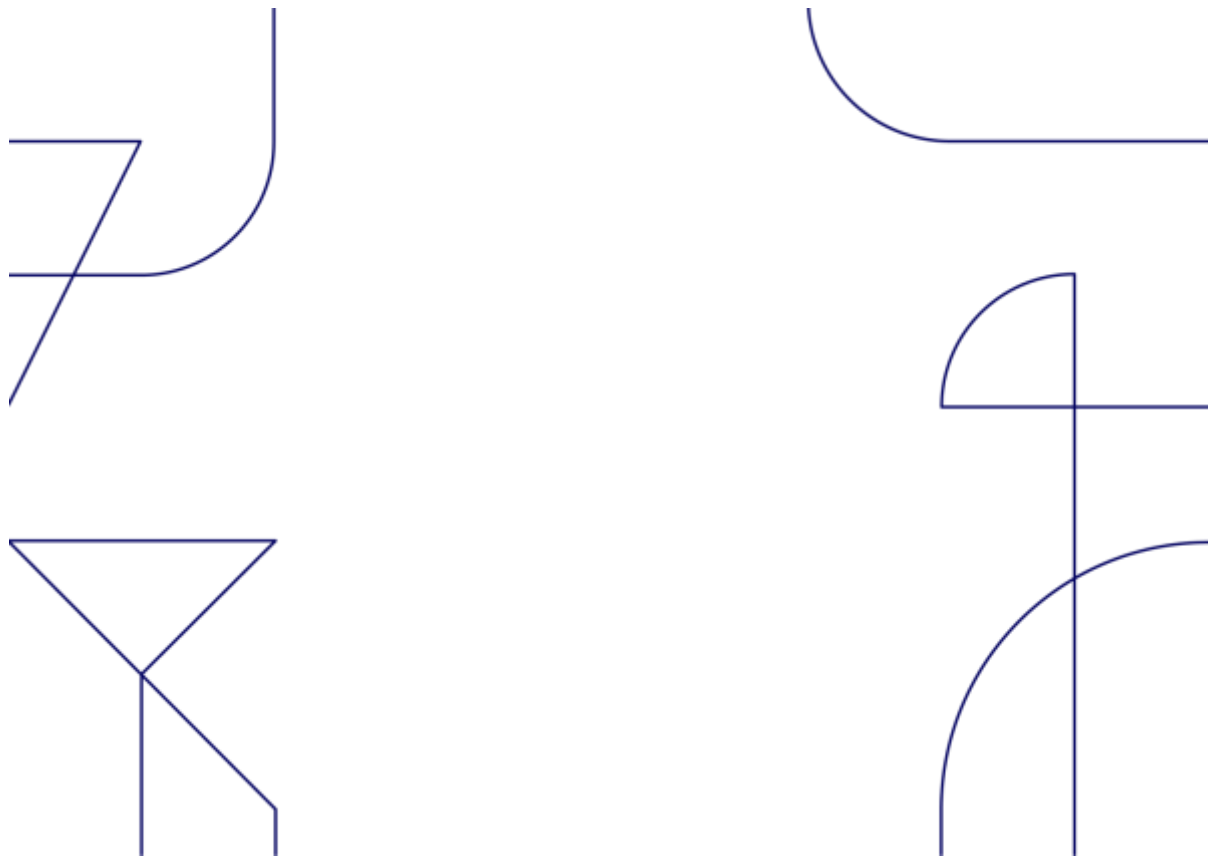




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Executive Summary

This report outlines how KTH Royal Institute of Technology could endeavor to align its business travel practices with its sustainability goal of reducing the climate impact of travel by 40% between 2015 and 2025. The core of the study involved participatory workshops with KTH's division of Real Estate Business and Financial Systems (AIE) to devise a CO₂ budgeting and governance model tailored to the university's operations. This model aimed at establishing rules, practices, and strategies to mitigate challenges related to the reduction of CO₂ emissions from flying, utilizing detailed flight data from 2019 as a basis for developing speculative CO₂ budgets for 2025. The approach taken underscores the importance of granular data in understanding and managing travel emissions at the institutional level.

Our conclusions suggest a decentralized approach to managing carbon budgets at the divisional level, allowing for flexibility and autonomy in travel planning within predefined CO₂ limits. It emphasizes the need for transparency in travel data within divisions to ensure equitable and effective participation in the carbon management process. The report calls for the development of systems to support data collection and integration into travel management processes, alongside a central oversight mechanism to ensure fair budget allocation and manage budget overruns. We propose an operational planning mechanism called "KTH Carbon Cycle" that -after further refinement - could enable KTH to meet its climate goals without significantly disrupting its operations or research activities.

Introduction

KTH aims to be a leading technical university in sustainability education, research and climate action (KTH 2023b). While KTH excel in teaching sustainable development to students and conducts a plurality of research on sustainable technologies and their use, it is clear from a debate in the spring of 2023 that KTH has more work to do in order to become a truly sustainable university (KTH 2023c). In particular, there is a gap between the climate goals set by the university and its daily operations. In a report to the Swedish Environmental Protection Agency, KTH do report achievements in reducing energy use from buildings and introducing sustainability requirements in procurement processes, yet greenhouse gas emissions (GHG) from business travel increased by 11% per annual workforce (2,3 to 2,6 tonnes CO₂e) between 2015 and 2022, regardless of the Covid-19 pandemic (Fernström 2023). In 2019, business travel stood for 60% of the emissions generated by KTH (Erselius et al. 2021). Flying stands for a majority of these emissions.

In the research literature, academic flying, its role in academia and possible policy interventions have long been discussed. Flying is a practice both deeply embedded within academia, but also increasingly contested (J. E. S. Higham, Hopkins, and Orchiston 2019; Parker and Weik 2014; Storme et al. 2017; Baer 2019). In the wake of the Covid-19 pandemic, the "necessity" of flying has been increasingly scrutinized (Klöwer et al. 2020; Jäckle 2021) and generally through increased attention to how emissions from flying contribute to climate change (Lee et al. 2021; Le Quéré et al. 2015; Glover, Strengers, and Lewis 2017; J. Higham and Font 2020). The relationship between academic excellence and flying has also been put into question, with a quantitative study reporting no link between amount of flights taken and academic performance measured in number of citations (Wynes et al. 2019). There are also large inequalities when it comes to commercial aviation, with estimates stipulating that only 2-4% of the global population flew by air in 2018 (Gössling and Humpe 2020). In academia,



this unequal distribution in who gets to fly is also strongly present. From a study of academic flying at KTH it is estimated that around 20% of all employees stand for 80% of emissions and that 60% of all KTH employees are non-flyers (Pargman et al. 2022).

The sustainability goals of KTH states that we should decrease the climate impact of business travel by 40% between 2015 and 2025 (KTH 2023a), contrary to current developments. If KTH is going to walk the talk and reduce its climate impact in accordance with its goals, the university needs to put in place more effective measures limiting emissions generated by flying. There are several reports that provide excellent advice on policy and intervention measures that KTH could draw upon, such as the 2022 report on sustainability in the academic system by ALLEA (Allea 2022) and the widely shared catalogue of measures for academic air travel reduction (Agnes Kreil 2020). These two reports offer a large menu of measures fitting individual researchers, teams, institutions or funding agencies that cover both monitoring, more efficient travel, attitude change, and harder regulation that limit travel. In the project described in this report, we have focused on one of these measures, namely Carbon budgets.

Carbon budgets and emission trading systems have been part of policy in the EU and individual nation states for many years, such as the legally binding carbon budgets in the UK (UK Government 2021) or the EU Emissions trading system (European Commission n.d.). The basic principle of such budgets is that there is a limit to how much greenhouse gas (GHG) emissions we can emit globally (i.e. global carbon budget) and that such a limit can be placed on human activity to curtail and reduce emissions through regularly shrinking the available budget over time.

In this report, we will propose a model for how to regulate and reduce the CO₂ emissions from business travel at KTH through the introduction of a carbon budget in the organization, limiting the amount of CO₂ emissions that KTH can emit per budget period. This budget, together with auxiliary systems and policies provides the organization with the tools needed to become a truly sustainable university. To ground the proposal, we have conducted several workshops together with a division at KTH to explore this issue and together formulated key principles for how this carbon budget should work. The activities were carried out in a collaborative project supported by KTH Sustainability Office during 2023, carried out by the authors of this report. We have focused on a division level as it is “where the action happens”, in the context where travel takes place and decisions are made on a daily basis. We will argue that it is at the division level that the everyday management of this carbon budget should take place. This will support a sense of ownership over the budget and foster autonomy further down in the organisation. In what follows, we describe our process and the outcome before presenting our proposal which we name the KTH carbon cycle.

Design Principles for Managing Commons

This project and the model we propose is inspired by Elinor Ostrom’s design principles for managing commons, originating from common-pool resource (CPR) theory (Ostrom 2009), , for which she was awarded the Nobel Laureate in Economics. This theory and the principles come from a perspective of managing commons, such as water, forests, fish etc. A CPR is typically *non-excludable* (it is costly or impossible to exclude someone from the use of the resource) as well as *subtractable* (one person's use diminishes other persons' use of the same resource). The planet atmosphere's function as a recipient for CO₂ of fossil origin, is thus a

good example of a common resource. Managing this resource sustainably means keeping the atmospheric concentration of CO₂ within acceptable and agreed limits, which is precisely what the KTH climate goals are designed to contribute to.

It is therefore logical that also the KTH emissions to the atmosphere are managed within a CPR framework, according to Ostrom's design principles. In a simplified way, we can say that our total emissions from our university are a common good which have to be managed by us as employees. The design principles are as follows:

1. Well-defined boundaries
Commons need to be managed with clearly defined boundaries, dictating who is entitled to access said commons.
2. Proportional equivalence between benefits and costs
To sustain a system in the long run, there needs to be an equitable distribution between costs and benefits of partaking in a commons. If rules benefit a selected few, compliance to said rules will crumble.
3. Collective choice arrangements
Participatory decision making is vital, involving the people impacted by a resource regime in decisions in order to fit local circumstances and considered fair by participants.
4. Monitoring
When the rules of a commons has been implemented, it is necessary to be able to monitor and check that the rules are being followed. Commons does not run on goodwill, but on accountability.
5. Graduate sanctions
There needs to be graduate sanctions for breaking the rules of a common resource regime, providing mechanisms for signalling that the value of breaking a rule is higher than the benefit of circumventing it, and increasing that cost for repeated violations.
6. Conflict-resolution mechanisms
To resolve conflicts, a resource regime should have simple, local mechanism to quickly handle and resolve conflicts using resolutions know in the community.
7. Minimal recognition of rights to organize
Local rules for a commons should be respected and be seen as legitimate by higher local or outside authority.
8. Nested enterprises
Commons work best when nested within larger networks – i.e. building responsibility for governing the common resource in nested tiers from the lowest level up to the entire system or organization.

Method

To develop a proposal of a CO₂ budgeting and governance model for business at KTH, three participatory workshops with the division of Real Estate Business and Financial Systems (AIE) at KTH were conducted during the summer and autumn of 2023. The aim with these workshops were to explore how such a governance model could look like and what rules as well as sanctions it could operate under. Additionally, we were interested in learning about possible challenges that the introduction of a CO₂ budget at KTH could pose at individual or divisional level, in pursuing the goal of reducing emissions from flying at KTH. The three workshops and the methods used are described further below.

Data about flying at KTH

An important material we have used in this project is data on how employees fly at KTH. The data has been used as a discussion material and has also functioned as a basis for creating a speculative CO₂ budget for 2025 used in the workshops. Due to difficulties in getting access to updated, granular data for 2023 (detailed data on the flying of individual employees), it was decided that the project would make use of a data set on how employees flew at KTH during 2019. This data set was made available to us through the FLIGHT research project (KTH n.d.) and had a high level of granularity. The granularity was important as it allowed us and the participants in the workshop to get a better understanding of how flying was distributed amongst employees at AIE. Given that flying at KTH is back at similar or higher levels of flying in 2022 than before the Covid-19 pandemic (see Figure 1), we also assessed the data set as comparable and representative of the flying patterns at KTH and at this division in particular.

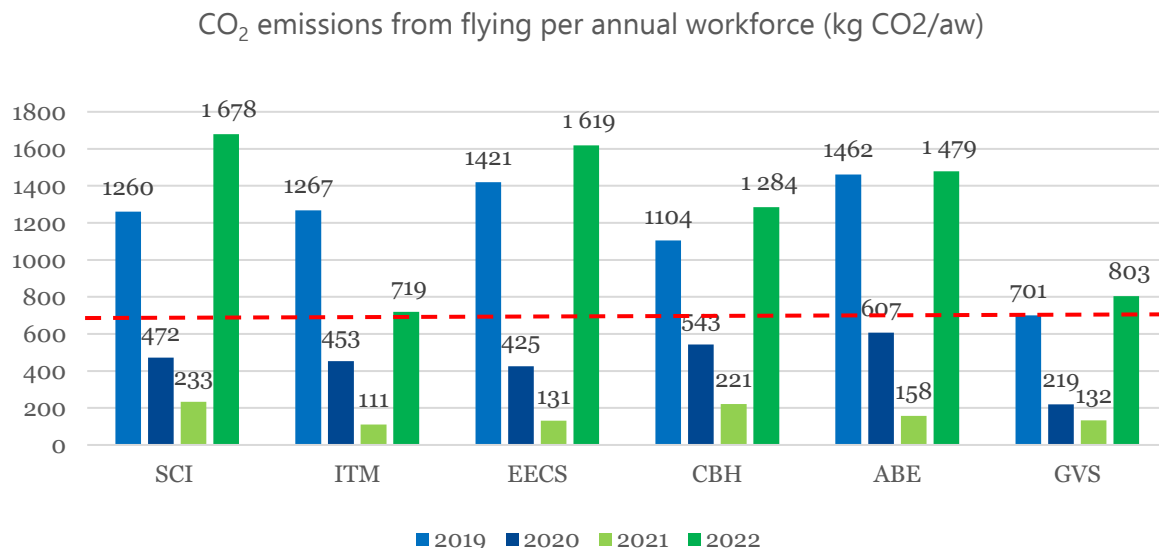


Figure 1. Overview of CO₂ emissions from flying at KTH between 2019-2022. The chart presents CO₂ emissions per annual workforce. The red line shows the KTH goal of 2025, aiming at 700 kg per annual workforce.

Data Representation

During project activities we have visualized the data using traditional graphs (WS1), but also through a physical data representation using poker chips (see Figure 2). It consists of two boards placed on a table with several squares laid out on each board representing employees at the division. The employees at AIE decided that it was okay to show their names and so each square had a name attached.



Figure 2a

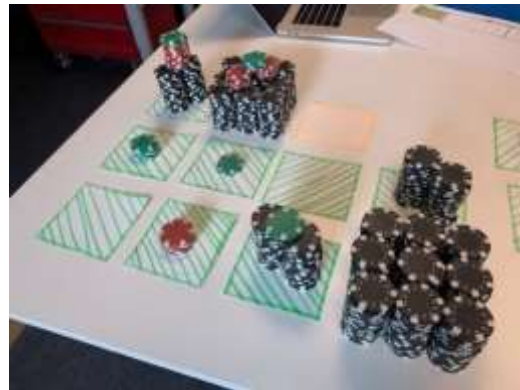


Figure 2b

Figure 2. Physical data representation of CO₂ emissions from flying at the division of AIE during 2019. On the left (2a), number of flights per employee are represented and, on the right, (2b), amount of CO₂ emissions per employee. The coloured squares represent junior (orange) and senior researchers (green). The poker chips represent long- (black), medium- (red) and short-haul (green), one-way flights.

The two boards visualize data from the same dataset. On one board (left), the number of flights made by each employee at the department is displayed, with each poker chip representing one one-way trip. The other board (right) shows a conversion of the flights into the total amount of CO₂ emissions per employee. The number of flights and the amount of CO₂ emissions are materialised using poker chips of three different colours with green representing short-haul flights, red representing medium-haul flights and black representing intercontinental flights. Each poker chip in Figure 2a represent one one-way flight. In Figure 2b, these flights have been converted into amount of CO₂ emissions per person. For details about the travel data and emissions at this specific division, please contact the authors.

Workshops

We facilitated three workshops during the project. The first was an introduction of the pilot to the division (WS1), the second and main workshop (WS2) explored the core principles of a CO₂ budget. The final workshop was a feedback session on the proposed model.

Workshop #1

The workshop was a one-hour introduction of the pilot project to employees at AIE, and included a discussion of data management and how transparent we in the project team could be with the results generated in the project. It also included a presentation of aggregated data on KTH's flying in 2022 as well as aggregated data on how the division flew in 2019. 16 people participated, almost all employees from the division, in addition to some senior faculty from a neighbouring division.

Workshop #2

The second workshop was a two-hour, hands-on workshop in which employees at the division got to interact with their own flying data as well as prototype a CO₂ budgeting system. The workshop was divided into i) an introduction of the divisions flying in 2019 using a physical data representation (see Figure 2), ii) a core activity aimed at generating ideas of principles that a CO₂ governance model could be based upon, and iii) a debrief session afterwards. 14 people attended, all employees at AIE.

During the core activity, the participants were divided into groups and asked to distribute a limited CO₂ budget amongst the employees at the division. This activity was framed using a speculative scenario which described how KTH had introduced a CO₂ budget in the organization and allocated the division with a limited budget for one year. The CO₂ budget used 2019 as its reference point and in accordance with current KTH policy, been reduced with 40%. To make it easier for the participants, this budget was converted into number of trips available.

In the speculative scenario, the division consisted of 17 employees (mix of junior and senior researchers). To their disposal, the participants had a pile of 41 poker chips (20 long-haul, 9 medium-haul, and 13 short-haul flights) and a table with a physical representation of their division in 2025 with squares representing each employee (see Figure 3). The participants got 30-40 minutes to work in three smaller groups. Following this exercise, a discussion of how the groups distributed the CO₂ allowance at the division took place. The participants also got to individually reflect on possible challenges with introducing a CO₂ budget at the division, as well as rank different categories of travel using dot voting.



Figure 3. Picture of each group's speculative distribution of travel rights amongst future employees at AIE in 2025, with a limited carbon budget.



Workshop #3

The last workshop was organized as a feedback session in which we presented a first draft of the governance model that we propose to employees at the pilot department, AIE. After a shorter presentation of the model, we engaged in discussion in plenum about benefits and drawbacks.

Data collection and analysis

At all workshops, field notes were taken. Materials and notes created by participants, as well as their prototypes were saved in text or photographed. This material was later summarized (see Results) and used to ground the development of the suggested CO₂ budgeting and governance model.

Results

In this section, the results from the workshops are briefly summarised.

Workshop #1

This first workshop functioned mainly as an introduction to the pilot project, with a presentation and a short discussion on data management. That said, it did bring some insights into the use of data in this project as well as for work on this topic at KTH in general. One key insight was that the employees at the division wanted as much transparency about their own flying data as possible within the pilot project and the boundaries of the division. This included being able to view personal details such as full name and role of each employee in the data paired with data on where they had flown and how much CO₂ emissions they had generated. The rationale for this was that a transparent approach where individual employees are identified is critical in order to reach the kind of deep analysis and discussion needed to address the challenge of reducing emissions, including why we travel and what types of travel that should be prioritised under different stages of an academic career. This came as a surprise to us workshop organisers. However, it was agreed amongst the participants that the data would stay anonymized in reports and in communication outside the project/division walls. In summary, they opted for full openness within their own division but more restricted information sharing towards the rest of the organisation.

Workshop #2

This second workshop went beyond expectations and together with the participants, we were able to get an initial understanding of the possibilities and limitations of introducing a CO₂ budget at a divisional level.

In the first part of the workshop, participants shared stories of recent business trips and the struggle to choose sustainable travel options. The participants also got to see their own travel data from 2019 through the physical data (see Figure 2), which resulted in surprised reactions and a detailed analysis of why the division flew as they did that year. Given that the participants could see the names of individual employees, the analysis became very concrete and included both explanations and justifications for why some travelled more than others (i.e. the names helped give context and making sense of the data).



The participants found the core activity - the collective planning for a flying that meets the 2025 target - interesting and engaging. During the core activity, we made several important observations:

- The first relates to trading of emissions. Two groups had the impulse to trade and asked if they could trade poker chips either in-between groups or preferably with “the bank”. We agreed to act as a bank and allowed both groups to exchange black poker chips (long-haul) for green (short-haul) or red (medium-haul) chips. For example, one group exchanged 6 black poker chips for 48 red chips, which led to the outburst “we are rich!”. The main reason for exchanging chips was to promote more close-by conferences and meetings.
- The second observation relates to the creation of buffers and banking of emissions at the division. All groups ended the exercise with many poker chips (all types) left in their buffer. There were mainly two possible reasons for this:
 - They did not want to fly at maximum capacity for the sake of the environment.
 - They wanted to save a surplus or create a buffer for ad hoc travel.
- The third observation was that the travelling conducted by faculty part of central assignments at KTH, e.g. international collaboration, internationalization, partnership meetings etc, were to be accounted for on a separate CO₂ account not part of the CO₂ budget for the division.
- The three groups distributed travel allocations quite equally across all employees, allowing each employee to do 1-4 flights a year, although two groups prioritized PhD students and key partnerships. One group distributed black chips (long-haul) mostly to PhD students.

Regarding the goal to save emissions, all groups stated that at the end of the year or budget period, if their CO₂ allocation was not used up, they did not want to sell or give the remaining allocation away to another division or unit at KTH. Instead, they wanted their surplus allocation to be cancelled completely. The main reason for this was that the participants wanted to be in control, but it was also argued that “we would not be cutting emissions if we gave them away”. Buying and selling CO₂ emission rights was also mentioned as a complication as it could give rise to problems of fairness and power relations.

Concerning the behaviour of saving a surplus for later use, it was noted by the participants that they might have underestimated the need to travel and wanted to save part of their budget for next year. One participant explicitly said that she would prefer a two- or three-year planning period rather than one year as it gives a longer-term perspective on the planning of travel.

What was interesting during the core activity was also that the three groups did not distribute all their black chips amongst the employees. Only 6-12 chips (of 22 in total) were distributed on each table. We, the workshop facilitators, reflected on the fact that the visibility or transparency of the other players’ actions were crucial for this distribution. No one seemed



willing to take an unfair share of the common pool resource when everyone could see what everyone else were doing.

The participants also got the chance to vote on what they thought was the most prioritized types of travel using dot voting. The top four categories were “Conference” (16), “Meeting” (4), “Field work” (3) and “Workshop” (3). The reminding categories received either 1 or 0 votes (“Disputation”, “Educational visit”, “Study trip”, “Lecture”, “Certificate Committee”, “Course”, “Fair”, “Representation”, “Seminar”, and “Supervision”).

Workshop #3

At this last workshop, we asked for feedback and engaged in discussion with the participants about e.g. how much top- versus bottom-up management the model should rely on, benefits and drawbacks of self-organization and if the governance model should have sanctions built into it. It was quite clear that this division wanted as much control over their own organisation and CO2 budget as possible, with the whole group arguing that there should be no outside, top-down management of the CO2 budget at all. Instead, the group proposed that they themselves would set their own budget (maybe in line with KTH guidelines) based on their needs. Too strong management from the outside was seen as bad as it would be a forced policy intervention, providing divisions with little independence and result in decreased motivation to implement and limit travel.

KTH Carbon Cycle

Drawing on the results from the workshops, as well as taking inspiration from Elinor Ostrom's eight design principles for managing commons (see p. 4), we here propose a model for how to regulate and reduce the CO₂ emissions from business travel at KTH. A key part of this proposal is the introduction of a carbon budget in the organization, limiting the amount of CO₂ emissions that KTH can emit per year, which together with auxiliary systems and policies provides the organization with the tools needed to become a truly sustainable university. Our proposal argues for a strong, local governance of this budget at the division level, providing employees with the mandate to create rules, manage, monitor and follow-up their own travel in accordance with a carbon budget set by KTH centrally. In what follows, we describe the proposed model, including core principles, rules for budget allocation and the identification of key stakeholders. We call this proposal the KTH Carbon Cycle.

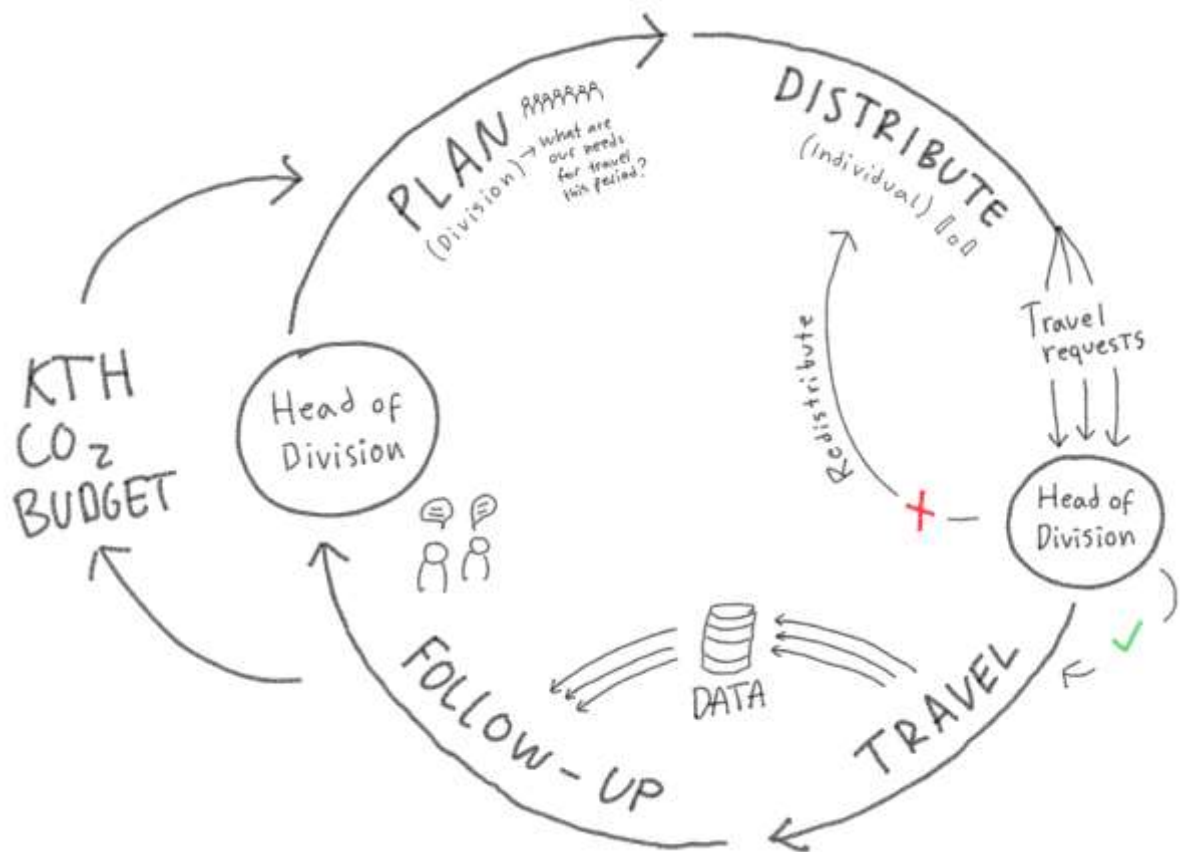


Figure 3. Illustration of KTH Carbon Cycle



Core principles and policies

The proposed model builds on as set of core principles and policies.

- *A carbon budget is introduced at KTH, limiting how much CO₂ emissions KTH can emit from business travel (includes all travel modes).*

The budget is defined in tonnes of CO₂ emissions emitted per budget period, similar to the global carbon budget, and a reduction of the budget each budget period should be made in order to reduce emissions in line with the commitments of the Paris agreement. Given the lack of data and sustainability reports about business travel at KTH before 2019, we suggest setting the baseline for the budget to 2019. This is likely to mean a larger total accumulated emission envelope between 2015 and 2045 (when KTH reaches net zero). This may however be a necessary trade off, as there is a minimum requirement of data reliability to make the system credible and legitimate in the eyes of KTH employees. A key indicator for the budget is “kilograms of CO₂ per annual workforce”, which can also operate as the main principle for distribution of the budget across the organization.

- *The carbon budget period is set to 2 years*

The budget is set biannually, meaning that every second year, the size of the budget is reduced according to the climate goals of KTH, and new allocations are distributed in the organization. This enables employees to make longer-term plans for travel.

- *The carbon budget is created and revised by KTH Sustainability Office*

KTH Sustainability Office is responsible for the creation, distribution and revision of the carbon budget on a biannual basis, setting the budget in line with the climate goals of KTH. The budget is every period distributed amongst each school, department, and division at KTH. There are two main principles possible for guiding distribution of the carbon budget across KTH organisational units.

1) Fairness principle (all units have the same allocation)

- C = Emission per annual workforce at KTH in 2019 (minus emissions from special assignments from KTH central admin, such as international partner collaboration)
- R_i = reduction factor for the planning period (i). This follows KTH target curve, e.g. for 2025 the reduction factor will be 0.6.
- N = number of employees at division/org. unit
- T = Total budget for organizational unit
- $T = C * R_i * N + \text{any special assignments to individuals at the unit}$

2) Grandfathering principle (allocation based on the unit's previous emissions)

- C = Emission per annual workforce at division in 2019 (minus emissions from special assignments from KTH central admin, such as international partner collaboration)
- R_i = reduction factor for the planning period (i). This follows KTH target curve, e.g. for 2025 the reduction factor will be 0.6.
- N = number of employees at division/org. unit
- T = Total budget for organizational unit
- $T = C * R_i * N + \text{any special assignments to individuals at the unit}$
- *The budget is managed by divisions (or the smallest organizational unit within a branch of the organisation)*

The everyday management of the carbon budget is delegated to divisions, the smallest organizational unit at KTH with mandate through head of divisions. The head of division together with the employees plan and distribute the budget amongst its employees through a transparent and participatory process (described below, see Figure). The main reason for giving divisions the responsibility of management is that it is at this level in the organization that the travel happens (i.e. trips booked, travel requests accepted, money spent) and where it is possible to follow up the travel of individual employees. Additionally, divisions will hopefully gain ownership over the process and avoids heavy-handed top-management.

- *Meeting the CPR design principles*

By establishing clear rules for allocation, we meet design principles 1 and 2. The decision-making within the allocations is done independently at division level which meets design principles 3 and 7, while the monitoring (principle 4) is helped by the full data transparency. Sanctions for non-compliance (principle 5) and conflict resolution (principle 6) needs to be developed at central level at KTH (KTH-S or possibly by Schools). Once implemented, the Carbon Cycle will need to be nested into both the KTH travel policy and the sustainability policy, hence will provide a wider regulatory framework within KTH which satisfies design principle 8.

Process description

The carbon cycle is illustrated above (Figure 3) and describes the suggested process of managing the distributed CO₂ budget within a division. It is divided into four main phases, “Plan”, “Distribute”, “Travel” and “Follow-up”.

1. Briefly explained, KTH Sustainability office defines a carbon budget which is broken down onto smaller organizational units. (Step 1).
2. The division then plans how they want to spend the budget, e.g. distribute the budget equally/unequally amongst employees, save some for later etc (Step 2).



3. The budget is then distributed amongst employees and employees can now spend their emissions rights through the creation of travel requests (Step 3).
4. The head of division then assess these requests in comparison to the budget and accepts or denies such requests (Step 4).
 - a. If the request is denied (e.g. said employee has spent all emission rights), the request is sent back for review to the head of division (or the management team / depending on division structure) (Step 4.5).
5. Employees travel and spend their emission rights over time, generating data about who flew where and when, as well as the amount of CO₂ emissions generated (Step 5).
6. At the end of the budget period, there is a university-wide follow-up and revision of the CO₂ budget (Step 6). Within divisions, there is also a follow-up of individual employees as part of their development talks.

Requirements

For this model to work, there are some key requirements that needs to be fulfilled, mostly related to monitoring the use of the carbon budget. These are i) the ability to collect travel data, ii) the ability access and inspect travel data (possible to see and break down travel data onto individual employees), and iii) that travel booking systems includes carbon accounting information and restrictions.

i) *Travel data shall be collected to enable monitoring of travel at KTH*

In order to manage business travel in any organization, it is crucial to collect data in order to monitor and quantify travel both in terms of destinations and mode of travel, but also kilograms of CO₂ emissions generated. This can be done through either internal KTH systems or via the procured travel agency of KTH. At a minimum, the following data should be included:

- a. Time and date of travel
- b. Destination
- c. Distance
- d. Number of legs / connections
- e. Kilogram of CO₂ emissions generated
- f. Employee identifiers (ID, name, role, affiliation, etc)

ii) *KTH employees shall be able to inspect travel data depending on role*

It should be possible for employees to inspect travel data through a system accessible online as well as its relation to the KTH CO₂ budget. We are not prescribing a specific design, but KTH employees should be able to see data with high granularity in order to assess their own and their institution's travel



behaviour. Access to data should be restricted based on role and needs.

In other words, individual employees should be able to (only) see their own data, head of divisions should be able to see the travel for all their employees and head of school should be able to see the travel of all employees at said school, etc.

- iii) *The travel booking system shall include carbon accounting information when booking travel / reviewing travel requests*

The travel data collected needs to be available in travel booking systems at KTH in order to provide feedback to individual employees when booking travel and to head of divisions when reviewing travel requests submitted by individual employees. Head of division should have the option to either accept or deny travel requests based on information about compliance with the carbon budget.

Guidelines for distribution amongst employees at a division

In our workshop material and in the research literature, there is a clear call for equitable distribution of who gets to fly. The participants in workshop #2 were quite clear that junior researchers should be prioritized and be allowed to travel further than senior faculty at a division. While each division can themselves decide, KTH should develop a guideline / recommendation that takes this into account, similar to the decision tree developed by Tyndall Center for Climate Change Research to evaluate what a necessary trip is (Le Quéré et al. 2015).



Conclusion

Together with a division at KTH, we have explored how a carbon budget can be designed to reduce CO₂ emissions from business travel at KTH. The outcomes of this process shows that it is possible to reach KTHs climate goals without severe disruption of daily operations and research activities.

A key take-away is that the management of the carbon budget should be made at a local level, at divisions, providing employees with the autonomy to manage and prioritise travel according to their own needs within the limits of the carbon budget.

A necessary condition for this to work is full data transparency on travel within divisions – i.e. all employees should be able to see and get an overview of how their division travels to facilitate an equitable process that includes everyone. This enables a sustainable management of travel aimed at reaching KTH climate goals while minimising possible negative effects on operations.

To collect and present this kind of data, as well as incorporate data into the decision tree of travel requests and booking, current and new systems need to be developed.

The implementation of a carbon budget also requires a central mechanism (through e.g. KTH Sustainability Office) for a) the allocation of the budget on the level of divisions that is just and fair, and b) a plan for what happens when a division overshoots their carbon budget.

We urge KTH Sustainability Office to promptly investigate this proposal further and hopefully implement this model university-wide in 2025.

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