ICT GROUP

Value chain Analysis Turnn

Requirement 4.A.1 & 4.B.1 of the CO2 Performance Ladder

on behalf of ICT Group N.V.

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Authors	Merel Segers (LuTz consulting)
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ICT Group N.V.
Weena 788
3014 DA Rotterdam
The Netherlands

info@ict.nl
+31 (0)88 908 2000

1.   Introduction

ICT Group N.V. ("ICT Group") aspires to maintain level 4 of the CO_2 Performance Ladder. This report contains the results of one of the two supply chain analyses required to comply with requirement 4.A.1 of the CO_2 Performance Ladder Handbook 3.1:

> *"The organization has demonstrable insight into the most material emissions from scope 3, and can submit at least 2* analyses of GHG-generating (chains of) activities from these scope 3 emissions."*

This report also contributes to requirement 4.B.1:

> *"The organization has formulated CO_2 reduction targets for scope 3, based on 2* analyses from 4.A.1. Or the organization has formulated CO_2 reduction targets for scope 3, based on 2 material GHG-generating (chains of) activities. An associated action plan has been drawn up, including the measures to be taken. Objectives are expressed in absolute numbers or percentages in relation to a reference year and within a defined period"*

For more information about ICT Group and the qualitative assessment of ICT Group's most material CO_2 emissions, see report '4.A.1. Most material scope 3 emissions'. For the other supply chain analysis, see report '4A1 & 4B1 Troef'.

1.1.   Topic of this analysis: Turnn

Turnn is chosen for the following reasons:

- Turnn is one of the products within the Product Market Combination (PMC) 'Infra & Mobility'. This PMC is ranked first in the materiality table (see report '4.A.1. Most material scope 3 emissions'). By choosing this product, we comply to the requirement that at least one of the value chain analyses should be chosen from the two most material emissions (SKAO, 2020).
- Turnn has a great potential to reduce CO_2 emissions of our mobility system. It enables users to easily find and use all sorts of shared mobility, such as public transport, a (shared) car, (shared) bicycle, ferry and taxi, and by linking transport choices to a carbon footprint. Thereby it enables users to opt for a low carbon option.
- We also chose Turnn because of its innovative nature. Through Turnn, a whole range of Mobility-as-a-Service (MaaS) options are made readily available to users from one convenient application. MaaS is an emerging type of service that enables users to plan, book, and pay for multiple types of mobility services through a joint digital channel. The concept contributes to a shift away from personally-owned modes of transportation such as private cars and towards mobility provided as a service. This is enabled by combining

transportation services from public and private transportation providers through a unified application that can be used to plan and manage door-to-door trips that rely on different modes of shared transport, and for which users can pay with a single account. Users can pay per trip or a pay monthly fee for a limited distance. The key concept behind Turnn is to offer travellers mobility solutions based on their travel needs.

Turnn

Turnn helps to reduce mobility emissions. It is mainly used by companies, public transport organizations and (local) governments to achieve their mobility goals. As the organizations that use Turnn increase rapidly, Turnn is growing from a start-up that started two years ago to a scale-up. Turnn consists of a user app, company portal, and administrative portal. It has three use cases:

Companies

Companies use Turnn to achieve mobility goals by influencing the travel behaviour of their employees. Companies can try out mobility measures and monitor their results using the data collected by the app. For example, a company can provide employees (financial) compensation for using particular modes of transport or for working from home. The app enables employees to conveniently keep track of their mobility behaviour, while at the same time enabling companies to monitor the effectiveness of such schemes. A different example is a company that has limited parking available at their offices. They can set up a mobility hub away from their office where Turnn enables employees to choose alternative transport modes, such as an electric bike for their last mile to their workplace. This helps to lower emissions and reduce the amount of parking spaces needed at the company office. A third example is that companies can give employees a carbon budget for their work-related mobility. By monitoring the data generated by Turnn, companies can easily monitor which measures work well and which don't. The app also allows for gamification, where end-users can win badges for challenges such as taking the train instead of car to work.

Public Transport

Turnn can solve problems of public transport companies. For instance, in sparsely populated areas a problem can be that buses drive without any passengers. This causes unnecessary emissions and is very costly. Trough Turnn, mobility on demand can be made possible. If a public transport company knows when somebody needs transport, they can choose their vehicle and time to fit the demand.

Municipalities / government

Turn can also solve problems of municipalities and the government. Mobility is one of the five sectors for which targets have been set in the Dutch Climate Agreement (Dutch Government, 2019). The following vision has been developed for mobility:

> *"In the future mobility system, all modalities will eventually be clean. The approach in the sector focuses both on replacing fossil fuels with sustainable energy carriers, and on changing mobility behaviour among the various target groups for passenger and freight transport." Climate Policy Monitor, 2020.*

Turnn contributes to the change in mobility behaviour. Turnn is selected to play a role in multiple pilots by the Dutch government to solve a diverse range of mobility problems. Municipalities can use Turnn to give their citizens insight into the modes of shared transport available, thereby leading to an increase in use. Moreover, municipalities can also use Turnn to provide financial incentives to citizens who opt for low carbon modes of transport.
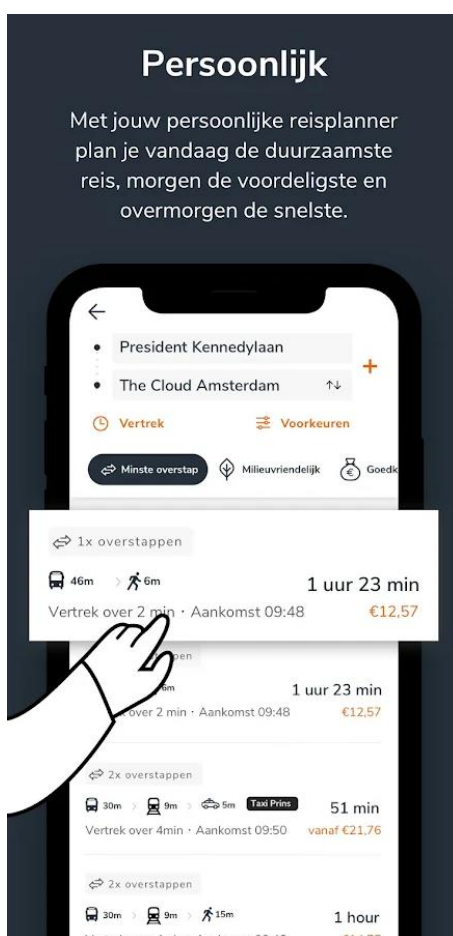

Figure 1: Screenshot of the Turnn app.

1.2. Value chain analysis approach

The approach as described in the SKAO manual version 3.1; requirement 4.A.1. was followed to arrive at the value chain analysis of emissions.

Data collection

The handbook 3.1 says the following about data collection:

"For a chain analysis it is not necessary to immediately request extensive data from all kinds of suppliers. It usually has clear added value to request some crucial data from one or a few suppliers, so selectively. That is often sufficient for a good first version of a chain analysis."

We collected data through interviews with ICT Group Remi Tops and Peter Lamers. Additional sources and studies were used to substantiate the supply chain analysis, for references go to the Sources chapter below.

Pilot Eindhoven municipality

To collect data, we will monitor the effect of Turnn on employees of the municipality of Eindhoven. This pilot starts mid-August. We will collect data on the different measures taken by the municipality of Eindhoven and the effect on their mobility use. In this way we can see whether the measures have effect.

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2.   Value chain analysis Turnn app (4.A.1)

As indicated in Handbook 3.1 of the CO_2 Performance Ladder, the chain analysis follows the structure described in chapter 4 of "A Corporate Accounting and Reporting Standard" (WBCSD, 2004). The analysis consists of the following parts:

- Describe the value chain (section 2.1)
- Determine which scope 3 categories are relevant (section 2.2)
- Identify partners along the value chain (section 2.3)
- Quantify scope 3 emissions (section 2.4).

2.1.   Describe the value chain

To start the analysis, a general description of the value chain is provided. We start by identifying the system boundaries. Then we describe the value chain and the process map (figure 2).

System boundaries

The system boundaries determine which processes and activities are included in the overall analysis. This to define where to stop tracking energy and material uses of processes: otherwise, the analysis would be infinite.

This analysis focusses on Turnn and its functioning within an organization. The following system boundaries are set:

- For this analysis the full life cycle of software provided by ICT Group is considered.
- For this analysis the full life cycle analysis of other technologies needed to make the mobility system function, such as cars, bikes, scooters, public transport etc. are outside the scope of this analysis. The digital infrastructure of transport companies, such as public transport or private car sharing companies, are also outside the scope. They are an essential part of the functioning of the mobility system, but ICT Group has little influence over the development and deployment of these technologies. Instead, only the reduced CO_2 eq emissions due to a reduction of energy use will be taken into account.

Value chain

A simplified version of the value chain is depicted in figure 2. In every phase of the value chain energy and materials are added, and emissions to air, soil and water are released. Transport takes place between the phases. For this analysis only CO_2 equivalent (CO_2 eq) emissions are considered, in accordance with the requirements of the CO_2 Performance Ladder.
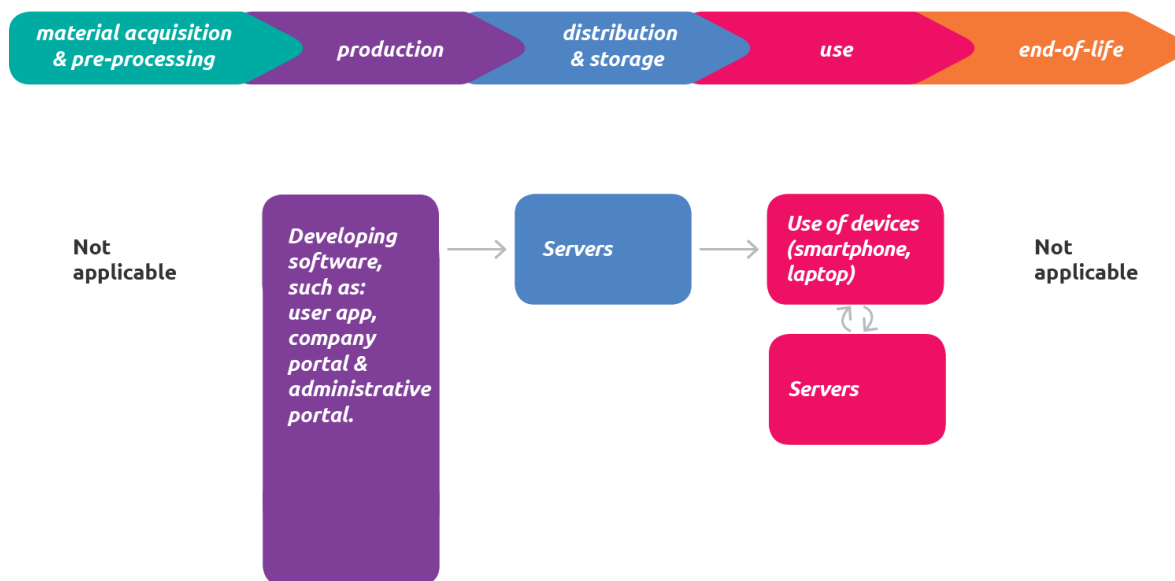
Figure 2: Process map Turnn app

Material acquisition and pre-processing

Not applicable due to the immaterial nature of software.

Production

The production phase is the software development and testing process. Turnn is developed by ICT Group. Some of its development has been outsourced to an external software company. This will also be taken into account in the production phase. The main source of emissions is the developers' activities, which include:

- Heating, lighting and air conditioning used for buildings used by developers and testers
- Energy used by equipment used for development and testing
- Consumables used during the development and testing process (e.g., office supplies)
- Business trips related to the development and testing process

Distribution & Storage

Turnn is distributed digitally. According to "GHG Protocol, ICT sector guidance, ch 6 p. 8", the following distribution steps need to be included:

- Storage and hosting of the software by servers (including mirror servers, if relevant)
- Network usage for transferring and downloading the software
- Using the end user's computer or smartphones to download the software

Use

Turnn can save CO_2 by enabling users to choose low carbon transport modes. But the software also uses electricity to function. This will be calculated in the Use paragraph of this supply chain analysis.

CO_2 costs:
- Electricity use of servers
- The energy use of the devices on which Turnn is accessed, such as laptops and smartphones.

CO_2 savings:
- Behaviour change of end-users due to:
  - Measures by organizations to stimulate users to use low carbon transport modes.
  - Insight into low carbon transport modes
  - Gamification – users can win badges for challenges such as taking the train instead of car to work.

The greatest potential CO_2 savings are situations in which car users switch to low CO_2 mobility, such as public transport, bikes or working from home.

End-of-Life

Not applicable due to the immaterial nature of software.

2.2. Relevant scope 3 categories

Table 1 shows the relevant scope 3 categories per step in the chain, in accordance with the GHG Protocol (WRI & WBCSD, 2011). GHG Protocol has developed guidelines to provide clarity on how specific industries can apply GHG Protocol standards. GHG Protocol, ICT sector guidance (2017) was used to determine which scope 3 categories are relevant.

Table 1: Relevant scope 3 categories

Life cycle stage	Relevant scope 3 categories	Relevant life cycle stage
1. Material acquisition & pre-processing	1. Purchased goods and services	No
2. Production	1. Purchased goods and services 2. Capital goods 5. Waste generated in operations 6. Business travel	Yes
3. Distribution & Storage	9. Transportation and distribution of sold products	Yes
4. Use	11. Use of sold products	Yes

5. End-of-life	12. End-of-life treatment of sold products	No

2.3. Identify partners along the value chain

Table 2 lists the partners involved in the value chain.

Table 2: Partners

Value chain phase	Partners
1. Material acquisition & pre-processing	N/A
2. Production	Software company in Bali.
3. Distribution & Storage	Servers at Microsoft, Amazon & Cloud VPS
4. Use	• Clients, such as ASML, Brainport Eindhoven, Municipality of Eindhoven, KEOLIS, Qbuzz and Travel electric. • Users of the app. • Data providers, such as InTraffic for public transport data.
5. End-of-Life	N/A

2.4. Quantify scope 3 emissions

The analysis of Turnn is detailed in table 3. A calculation sheet is also available in Excel, which can be requested for additional information.

Results

We are analysing Turnn in a new pilot project. Because of this, we don't have concrete results on changes of mobility behaviour due to Turnn (4b. Use mobility phase). This is why for the use phase we made a very conservative estimate of 5% of mobility changes to low carbon options in 2022. It is expected for Turnn to have a greater effect. Even with this low change to low carbon mobility modes, the CO_2 savings by Turnn outweigh the CO_2 impact of making Turnn.

Table 3: CO_2e emissions of Turnn

Levenscyclusfase	Ton CO_2e Turnn
2. Production	57
3. Distribution & Storage	0.03
4a. Use devices	0.003
4b. Use mobility	-245
Total	**-188**

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The greatest savings in CO_2 can be found in CO_2 savings due to changing mobility mode (phase 4b). This is almost 5 times more than the CO_2 emissions released during the development of the application (phase 1, 2, 3, 4a).

3. Reduction targets (4.B.1)

For requirement 4.B.1 we have drawn up the following reduction targets. The requirements for this are as follows:

"The organization has formulated CO_2 reduction targets for scope 3 on the basis of 2 analyses from 4.A.1. Or the organization has formulated CO_2 reduction targets for scope 3, based on 2 material GHG-generating (chains of) activities. An associated action plan has been drawn up, including the measures to be taken. Objectives are expressed in absolute numbers or percentages in relation to a reference year and within a defined period." (CO2 performance ladder manual 3.1)

3.1. Targets

As ICT Group we set ourselves two goals with regard to Turnn.

Grow users by 5% annually
We aim for an annual user growth of 5%[1].

This saves 12 tons of CO_2 annually.

Increase in mobility changes to low carbon options due to optimal design of Turnn
We continue to work on Turnn to maximize mobility changes to low carbon options. We expect that by optimizing our design, we can increase changes to low carbon options by 1% annually.

This saves 61 tons of CO_2 annually.

3.2. Measures

These measures help us to reach our targets:

Measure 1: Scaling up
Measure 2: Additional options to help clients to achieve mobility targets
Measure 3: Add CO_2 lowering features to Turnn
Measure 4: Increase ease of use
Measure 5: Improve data quality using results of the pilot

Measure 1: Scaling up
We have been developing Turnn since 2010. We are past the start-up phase and are really entering the scale-up phase. We will use the results of this supply chain analysis to strengthen our business

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[1] Not validated yet by Turnn

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case to clients that want to decrease their mobility emissions, while ensuring a high level of user-friendliness.

Measure 2: Additional options to help clients to achieve mobility targets
Turnn can be used by employers as a tool to lower mobility emissions. For instance, by limiting mobility modes users can use, for instance you only have access to electric mobility / public transport. Or stimulate cycling by offering declarative measures for bicycle kilometres. In the pilot we want to work closely with our clients to test these measures and monitor their effects. We give them a monthly report of their CO_2 results.

Measure 3: Add CO_2 lowering features to Turnn
We keep on exploring features for Turnn that decrease CO_2 emissions. For instance, we developed badges to stimulate users in a playful way to try low CO_2 mobility options. They can for instance receive a badge for using public transport for the first time to get to work. Organisations can even increase the award by giving the employee a financial gift, of treat him/her to cake.

Other features we are exploring are carbon budgets. Users can be assigned a carbon budget for their mobility. These CO_2 allowances can even represent an economic value. This is a shift from a mobility budget to a CO_2 budget.

Another option is to seduce users, just before selecting a high CO_2 mobility mode, to choose a lower CO_2 mobility mode. "You are selecting a car, but did you know there is an electric scooter parked 20 meters from your door? This reduces the CO_2 footprint of your trip by …".

Measure 4: Increase ease of use
Turnn's value proposition is that with one app you can select and purchase multiple modes of mobility. The better we are in unburdening users and our clients, the higher the chance they will choose Turnn as their mobility solution, allowing us to lower their CO_2 emissions.

Turnn is already very user friendly, but we are always looking for ways to increase ease of use. For instance, we are exploring collaborations with gas stations. Gas stations are potentially interesting hubs where users can select multiple mobility options. We also want to include paying for parking in the app and booking air travel.

Measure 5: Improve data quality using results of the pilot
We are just starting a very important pilot in which we want to test & monitor the effects of Turnn. Part of this pilot are monthly reports to the client in which the CO_2 effects Turnn combined with their mobility measures are monitored. We want to use these results to update this value chain analysis with direct data.

Sources

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