4.A.1 & 4.B.1 Value Chain Analysis

Employee Commuting

2023

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Value Chain Analysis
Version: 2.0

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1. Introduction

ICT Group aspires to achieve level 5 of the CO_2-Performance ladder. This report contains the results of the chain analysis required to comply with requirement 4.A.1 from the Manual CO_2-Performance Ladder 3.1:

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

And 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 accompanying 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 specified time frame.*

This report contains the qualitative and quantitative chain analysis of Employee Commuting (chapter 2). CO_2-reduction targets are formulated on the basis of the analysis (chapter 3).

1.1. Topic of this analysis: Employee Commuting

Employee commuting was selected as the topic of analysis for the following reasons:

- Employee commuting is an integral part of ICT Group and therefore relates to all Product Market Combinations (PMC).
- Employee commuting was chosen due to the notion that it is a materiality (>5%) and relevant Scope 3 emission in the total carbon footprint of ICT Group. Therefore it is an activity with significant CO_2 reduction potential.
- Employee commuting was chosen due to the fact that the level of influence of ICT Group is high.

Employee Commuting

ICT Group hosts over 2000 employees that all, to a greater or lesser extent, commute between home and ICT offices. Since the corona pandemic working on distance has been an increasingly common practice. However, there is still, and probably always will be, a need to meet with colleagues and work on projects together on location. Commuting is likely to rise as ICT Group aspires to grow in the amount of FTE in the coming years.

Work-related mobility is a recurring topic on the sustainability agenda with many solutions ranging from establishing a fully electric car fleet to nudging workers into using public means of transportation. The call for green work-related mobility is strengthened by the 'CO2 Reduction Work-related Personal Mobility Decree' [6] which obliges employers with 100 or more employees to provide data on work-

related personal mobility annually. This obligation takes effect on January 1st, 2024 and provides insight into and control over CO_2 emissions.

As a software developer, without using extensive amounts of raw materials nor deployment of large scale production activities, work-related mobility is an interesting topic to investigate when it comes to reducing the carbon footprint of ICT Group. As an employer, ICT Group has a major influence on the reduction of these emissions. For this value chain analysis the scope will be solely on employee commuting, while its interrelatedness with business travel and private use of vehicles is recognized and taken into consideration whenever applicable. Based on an Scope 3 inventory in 2019 and 2022, the emissions from employee commuting are relevant.

1.2. Value chain analysis approach

1.2.1. Data collection

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. 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."

Data about employee commuting will be gathered directly from ICT Group and available carbon emission data in the Carbon Manager. When possible, primary data were collected and where necessary supplemented with secondary data. Data used for the analysis will be updated in the future through an employee survey that is representative for ICT Group's entire Dutch workforce.

Overview of data source(s)

- ICT Group
- Carbon Manager (www.carbonmanager.nl)
- RWS (2022)[3]
- CBS (2023)[4]
- MJ Hudson (2022)[5]
- Survey (future)

1.2.2. Emission factors

For this analysis, the CO_2 emission factors of CO2emissiefactoren.nl are used, as indicated in SKAO manual version 3.1.

2. Value Chain Analysis – Employee commuting

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. Description of 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 1).

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. The following system boundaries are set:

- This analysis focusses on employee commuting of the Dutch workforce within ICT Group.
- Employee commuting is an ongoing activity with temporary fluctuations depending on the time of year and business events. Therefore, the analysis is performed over the course of one year. The year 2019 will serve as the base year, as it is representative due to the notion that corona measures were not in place yet and are therefore not significantly influencing employee commuting.
- For this analysis the chain of employee commuting is considered, with an emphasis on the transportation movements (use phase of vehicles), because this stage of the chain falls directly under ICT Group's scope of influence and represents therefore the biggest potential for CO_2 reduction.
- For this analysis, the full life cycles of other technologies and infrastructure necessary to make employee commuting function - such as roads, charging stations, cars, public transport, bikes, fuel, spare parts etc. - are outside the scope of this analysis. They are an essential part of the chain of employee commuting, but ICT Group has little influence over the development of these assets. Instead, only the CO_2 eq emissions resulting from the use of fuel and energy related to transportation movements will be taken into account.

Value chain

The chain is shown in simplified form in Figure 1. At each step, energy, materials and labor are added and emissions to the air, soil and water are released. Potentially, transport takes place between the steps. To describe the chain, the names of the life cycle phases have been used as defined in "Greenhouse Gas Protocol Product Life Cycle Accounting and Reporting Standard" (WRI & WBCSD, 2011). For the analysis only CO_2 equivalent (CO_2e) emissions are considered, in accordance with the requirements of the CO_2 Performance Ladder.

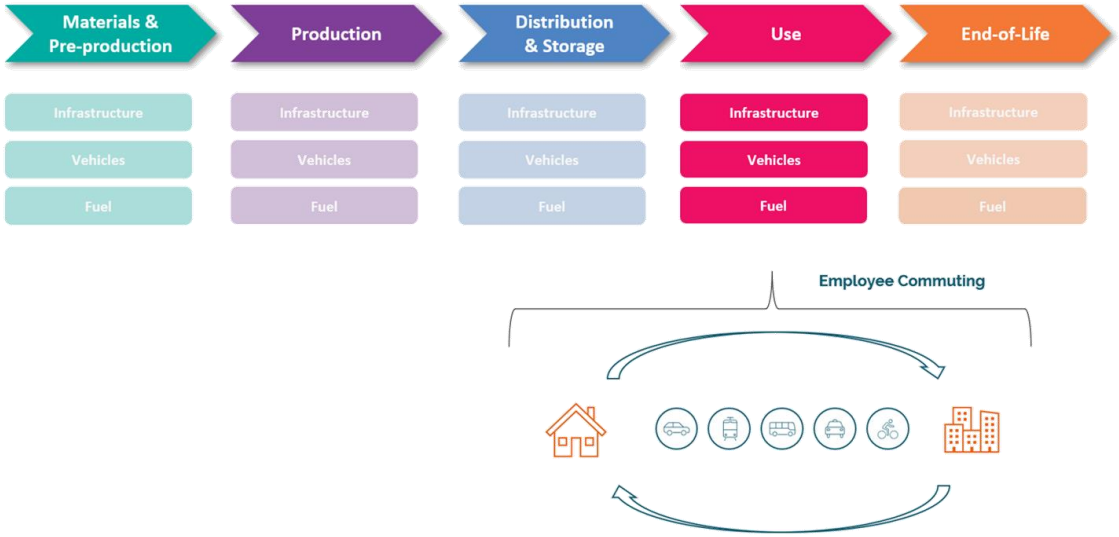

Figure 1: Simplified version of the employee commuting chain

Employee commuting depends on a range of infrastructural assets, vehicles and fuels that ultimately facilitate transportation movements. Mobility products and infrastructure require material inputs and production processes to be created, after which they are distributed and installed for use. Vehicles and infrastructure, such as public transport, are then utilized by employees for the purpose of commuting. After they are used up, they reach their end-of-life and will be processed for the purpose of resource recovery or demolition. Fuels are often used up and rarely have an end-of-life scenario.

Employee commuting can be seen as a utility chain. This means that the scope of the analysis is not set for an actual product or service, but rather for the collective of activities taking place when employees travel between home and the workplace. To conduct a meaningful analysis that generates actionable results, the analysis will focus on the use phase of the generic value chain (visualized in figure 1). The upstream and downstream life cycle stages will be taken into account for those elements within employee commuting that can be directly influenced by ICT Group.

2.2. Relevant scope 3 categories

Table 1 lists the relevant scope 3 categories per step in the chain, in accordance with the GHG Protocol (WRI & WBCSD, 2011). GHG Protocol develops guidelines to provide clarity on how specific industries can apply GHG Protocol standards. We used GHG Protocol, ICT sector guidance (2017) to determine which scope 3 categories are relevant and what we should include in this.

Table 1: Relevant scope 3 categories

Stage	Relevant scope 3 categories	Relevant
1. Material acquisition & Pre-production	1. Purchased goods and services	No
2. Production	1. Purchased goods and services 2. Capital goods	No
3. Distribution & Storage	4. Upstream transportation and distribution 8. Upstream leased assets	No
4. Use	3. Fuel- and energy-related activities (not included in scope 1 or scope 2) 7. Employee commuting 8. Upstream leased assets	Yes
5. End-of-life	8. Upstream leased assets 12. End-of-life treatment of sold products	No

2.3. Identification of value chain partners

In Table 2 the most relevant value chain partners are listed.

Table 2: Value chain partners Employee Commuting

Stap	Partners
1. Material acquisition & Pre-production	Suppliers
2. Production	Manufacturers
3. Distribution & Storage	Leasing companies Fuel and energy suppliers Manufacturers
4. Use	ICT Group employees (Netherlands) ICT Group (Netherlands) Leasing companies Public transport providers
5. End-of-Life	Leasing companies

2.4. Quantification of scope 3 emissions

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

Table 3: Analysis of employee commuting

Carbon Footprint Employee Commuting (2019)										
Landelijk reizigersonderzoek 2022 - RWS (2022)		Mobiliteit; per verplaatsing, vervoerwijzen, motieven, regio's - CBS (2023)			ICT Group	Calculated	ICT Group	Calculated	CO2emissiefactoren.nl (2019)	Calculated
Modality	**Division** (unimodal)	**Travel distance one way** (km p.p.p. day)	**Travel distance retour** (km p.p.p. day)	**Travel distance average** (km p.p.p. day)	**Commuting days** (p.p.p.y.)	**Travel distance** (km p.p.p.y.)	**FTE**	**Travel distance total** (km)	**CO2 emission factor** (kg / km)	**CO2 emission 2019** (ton)
Car	60%	25,22	50,44	30,264	178,6	5405,1504	1224	6615904,09	0,22	1455,50
Bicycle	21%	4,85	9,7	2,037	178,6	363,8082	1224	445301,2368	0	0,00
Train	7%	41,16	82,32	5,7624	178,6	1029,16464	1224	1259697,519	0,006	7,56
Walking	3%	2,91	5,82	0,1746	178,6	31,18356	1224	38168,67744	0	0,00
Bus/tram/metro	5%	15,21	30,42	1,521	178,6	271,6506	1224	332500,3344	0,140	46,55
Car passenger	2%	25,41	50,82	1,0164	178,6	181,52904	1224	222191,545	0,158	35,17
Other (incl. mopad/scooter)	2%	21,58	43,16	0,8632	178,6	154,16752	1224	188701,0445	0,036	6,79
Total	**100%**	**136,34**	**272,68**	**41,64**	**N/A**	**7436,65396**	**N/A**	**9102464,45**	**N/A**	**1551,57**

Results

The total emissions of ICT Group in 2019 are 1551,57 ton CO_2e. The biggest contributor to the carbon footprint comes from commuting by car (94%). This can be explained by the majority of employees travelling by car as well as its relatively high emission compared to other means of transportation. Travelling by car as a passenger accounts for only 2%. Other significant contributors are means of public transport such as bus, tram, metro (3%) and in lesser extend the train (1%). Commuting by bicycle or by foot do not cast out any emissions.

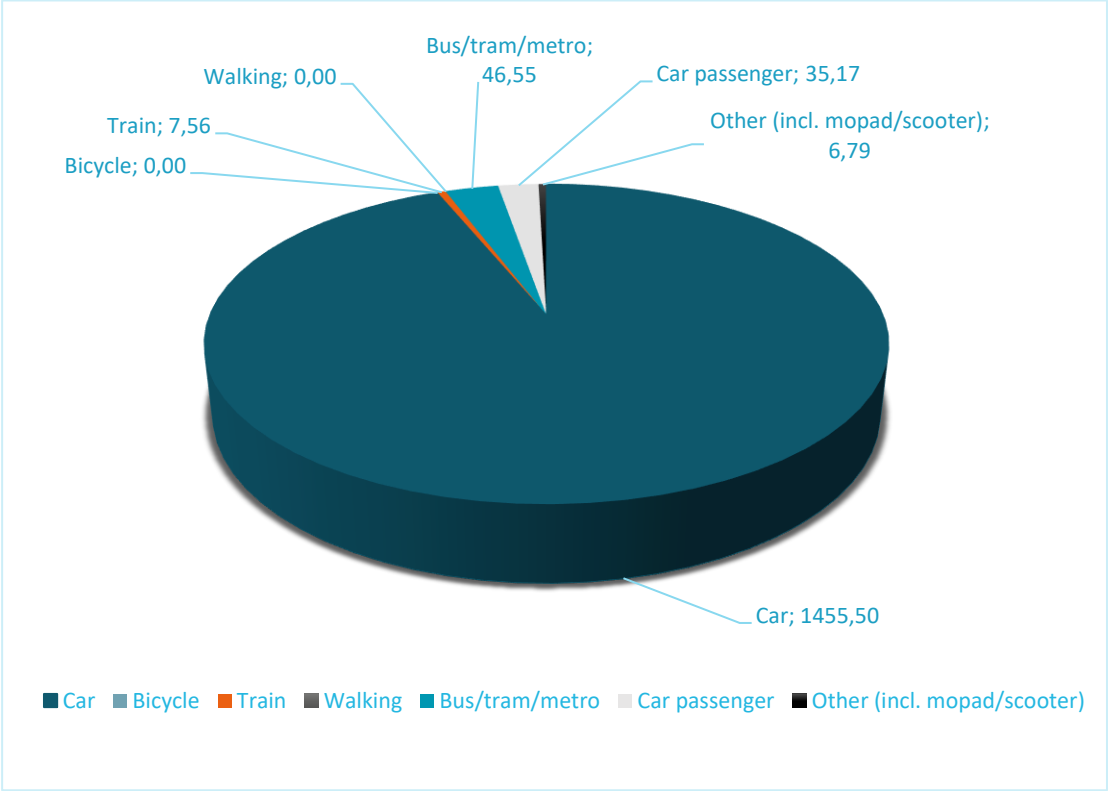

Figure 2: Overview results Employee Commuting 2019 in ton CO_2e

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

Four targets are identified that would achieve significant CO_2 reductions in employee commuting by 2030. Findings are supported by a worksheet that contains the calculations and assumptions made.

1. **One day less commuting per week | -408,31 ton CO_2e**
   Reducing the amount of kilometers in commuting can contribute greatly to improving the carbon footprint. This can be accomplished by limiting travel between home and office to a minimum, without compromising the quality of work and cohesion of the workforce. Commuting one day less per week (from 3,8 days to 2,8 days on average) will result in a carbon footprint reduction of 408,41 ton CO_2e (26,3% reduction). It is likely that this target is already realized since 2019 due to the fact that working on distance has become more common since the corona pandemic.

2. **Fully electric car fleet (renewable energy powered) | -672 ton CO_2e**
   Commuting by car is the biggest contributor to the footprint and therefore this category represents the largest potential for footprint reduction. ICT Group will realize a full electric car fleet that is, when charged at ICT office sites, powered by renewable energy. In 2019 a share of the car fleet (14,5%) was already electric. Meaning that 85,5% of the car fleet can still be swapped for electric models. In total, the potential CO_2 reduction of switching to fully electric car fleet account for a reduction of 672 ton CO_2e (43,3% reduction).

3. **10% more use of public transport instead of car | -190,63 ton CO_2e**
   A target to decrease commuting by car is to switch to other means of transportation such as public transport. When 10% of employees will travel by train (+5%) or bus/tram/metro (+5%) instead of their car then this would result in a footprint reduction of 190,63 ton CO_2e (12,3% reduction).

4. **10% more carpooling instead of using own car | -66,75 ton CO_2e**
   Another way to reduce the amount of kilometers by car in commuting is to simply share a vehicle among employees. An increase in ride sharing of 10%, instead of using their own car, will have a reduction potential of 66,75 ton CO_2e (4,3% reduction).

3.2. Measures

These measures help ICT Group to reach their targets.

Measure 1 **Support working on distance**

- Set a directive on the amount of office days available for employees.
- Provide a personal budget for decorating a home office.
- Additionally, services such as heating/cooling/lighting of office space can be provided selectively based on the amount of employees coming into the office.

Measure 2 **Drive fully electric (powered by renewable energy)**

- Only introduce electric vehicles when renewing the car fleet.
- Provide sufficient charging stations to supply the car fleet with electricity from renewable sources.
- Make charging stations available for privately owned electric vehicles.

Measure 3 **Support public transport**

- Provide OV business cards for employees.
- When moving offices ensure accessibility through public transport.
- Reward people to come once per week with another form of transport (public transport, carpooling, bike, etc.)
- Introduce shuttle bus at peak hours to cover the distance from local public transport stations to the office

Measure 4 **Support carpooling**

- Allow car passengers to also receive a kilometer allowance.
- Providing insight into information about colleagues' routes so that a more targeted search for a carpool partner can be made. Potentially utilize applications such as Blablacar.
- Reserved parking spaces for carpool cars close to the entrance.
- Research and tackle barriers among employees with reasons for not wanting to carpool or cycle to work.
- Research and tackle employee uncertainty of not having direct control over travel times. Providing homecoming guarantees through a public transport card, use of

a company car, a declaration of travel expenses, or the option to easily arrange another lift, can help them overcome this hurdle.

Measure 5 **Make biking more attractive**

- Supply (electric) bikes for employees
- Provide parking spots for bicycles close to the office entrance
- Reward for biking through an extra allowance
- Provide showers and lockers
- Emphasize the benefits of biking

3.3. Approach

ICT Group can improve the value chain analysis and realize CO_2 reduction when engaging in the following activities

- Conduct a survey to gather more accurate data about present day commuting behavior in 2023 among the Dutch workforce.
- Engage with mobility related NGOs and initiatives to optimize the sustainability within employee commuting.
- Continue the process of switching all leased vehicles to electric
- Select the most promising measures from the last paragraph and implement these.

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