



**waves**

**SCALE UP SUSTAINABILITY**

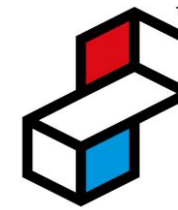
# Sustainability in transport from an economic perspective

## The Sustainability Management Platform (SMP)

Florian Bender  
WAVES S.à r.l.

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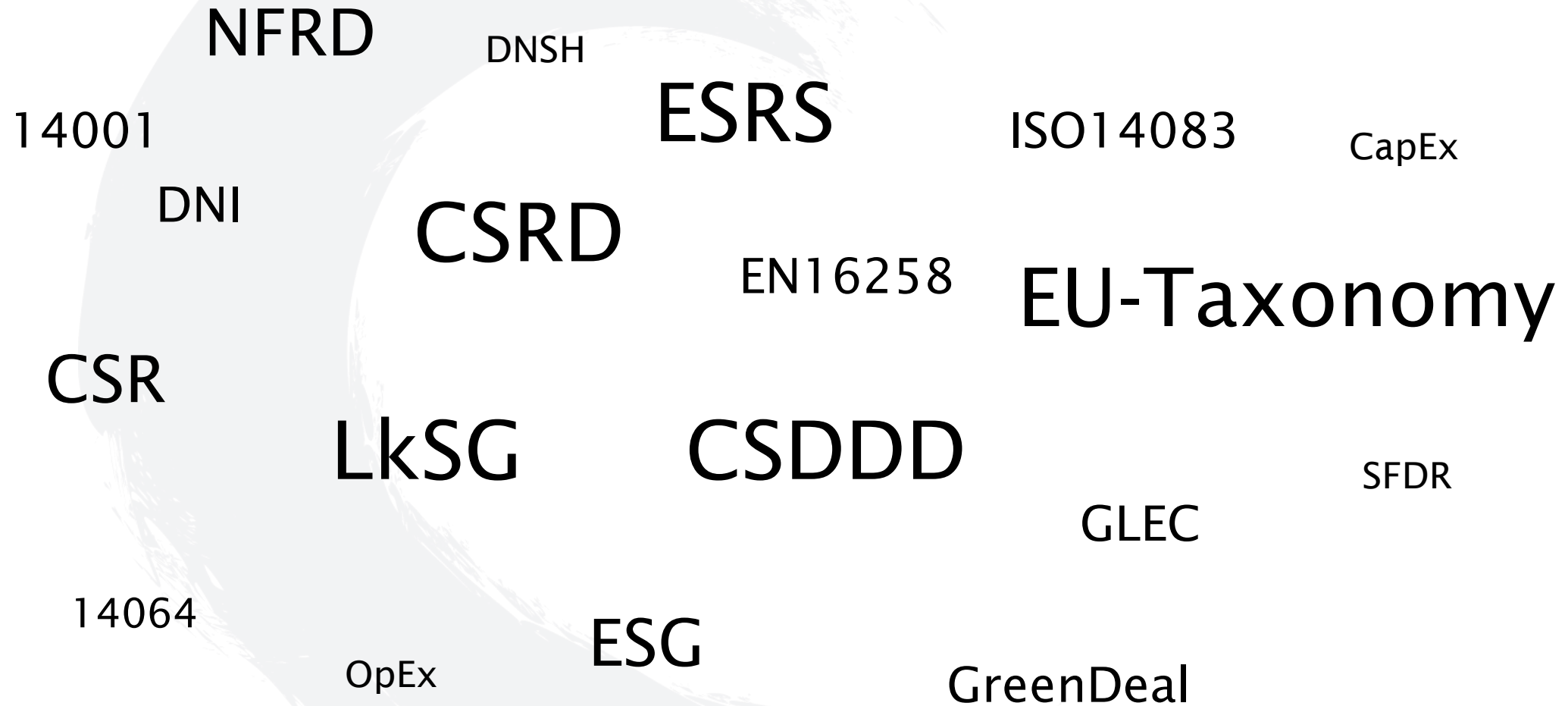


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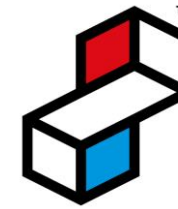


# Regulatory

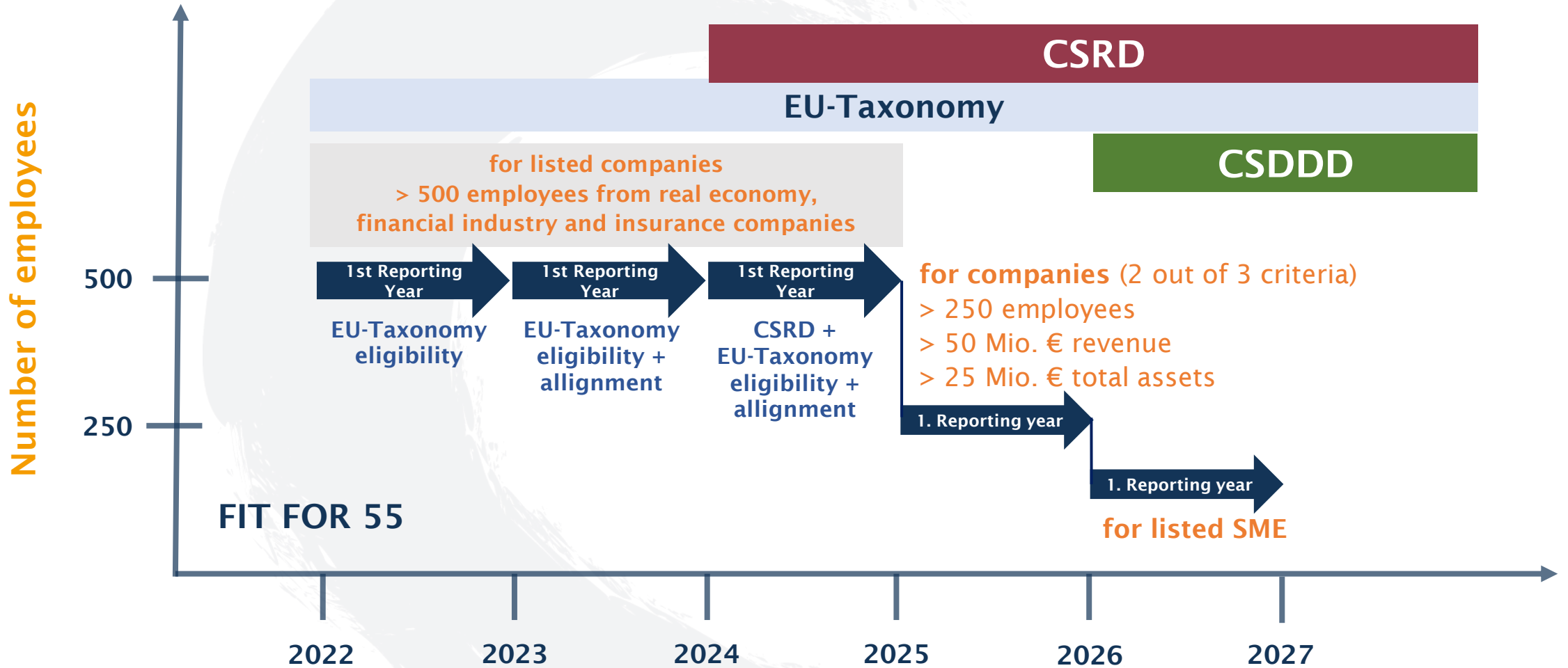
Multitude of standards & regulations

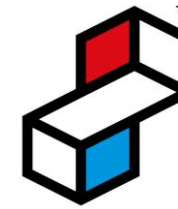


# Who is affected by the EU requirements?



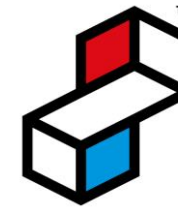
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- Is an EU directive on sustainability reporting for companies and organizations above a certain size and/or turnover and profit
- Sustainability report as part of annual financial reporting aims to improve transparency and comparability of sustainability information and encourage organizations to adopt sustainable practises
- means that companies must ensure that their published information is verified by an independent body to prove the credibility and reliability of the reports and to meet the requirements of the directive




# Regulatory



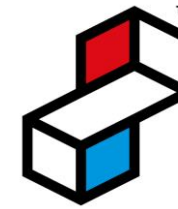
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## CSRD – Structure of the ESRS

↔ Cross Cutting Standards		 Environment	 Social	 Governance
ESRS 1	General Requirements 0 Datapoints	ESRS E1 Climate Change 220 Datapoints	ESRS S1 Own Workforce 199 Datapoints	ESRS G1 Business Conduct 51 Datapoints
ESRS 2	General Disclosure 193 Datapoints	ESRS E2 Pollution 68 Datapoints	ESRS S2 Workers in the value chain 67 Datapoints	
		ESRS E3 Water + Marine Resources 48 Datapoints	ESRS S3 Affected Communities 65 Datapoints	
		ESRS E4 Biodiversity + Ecosystems 119 Datapoints	ESRS S4 Consumers + end users 64 Datapoints	
		ESRS E5 Resource Use + Circular Economy 84 Datapoints		

1178  
Data points



Regulation (EU) 2020/852 became effective in July 2020

- is an EU classification system to help investors and companies identify sustainable economic activities
- defines criteria to assess economic activities in terms of their taxonomy eligibility and compliance
- provides a standardized framework for assessing and disclosing the sustainability efforts of companies and investments
- aims to support the transition to a low-carbon and sustainable economy and helps investors and companies align their activities with the goals of the Paris Agreement

**→ EU-Taxonomy assessment is a mandatory part of the CSRD**

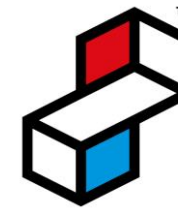


# GHG-accounting

# Regulatory

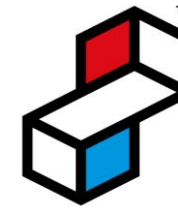
## GHG Protocol

- **GHG Protocol** is an internationally recognized standard
- Includes recording, accounting and reporting of greenhouse gas emissions at a company level
- Classification of emission sources and carbon - clustered into three different scopes



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The origin is the life cycle assessment of products according to ISO 14040/44 (so-called LCA = Life Cycle Assessment).

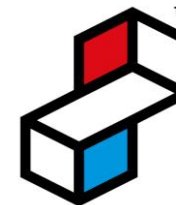
Here, the CO<sub>2</sub> assessment is a component of the estimation of environmental impacts for the analyzed system (so-called impact estimation).

Based on LCA, procedures have been developed specifically for CO<sub>2</sub> balancing for:

- Products: ISO 14067
- Business Units & Sites: ISO 14064 & GHG Protocol
- Transportation: ISO 14083 & GLEC Framework

# Regulatory

## Overview of GHG Protocol Categories



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### SCOPE 3 - upstream (indirect emissions)

- 3.1 Goods & Services
- 3.2 Capital Goods
- 3.3 Fuel & Energy
- 3.4 Transp. & Distribution
- 3.5 Waste
- 3.6 Business Travel
- 3.7 Employee Commuting
- 3.8 Leased Assets

Upstream Activities

### SCOPE 2 (indirect emissions)

- 2.1 Electricity
- 2.2 Heating/Cooling
- 2.3 Steam

### SCOPE 1 (direct emissions)

- 1.1 Stationary Combustion
- 1.2 Phys./ Chem. Process.
- 1.3 Mobile Combustion
- 1.4 Fugitive Emissions

On-site Activities

### SCOPE 3 - downstream (indirect emissions)

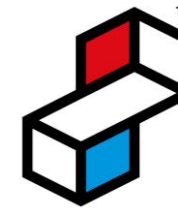
- 3.9 Transp. & Distribution
- 3.10 Processing Products
- 3.11 Use of Products
- 3.12 EoL of Products
- 3.13 Leased Assets
- 3.14 Franchises
- 3.15 Investments

Downstream Activities

# Toll in Luxembourg and Germany

# Toll

## Toll in Luxembourg



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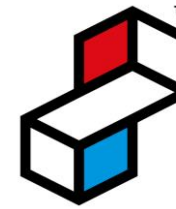
- In Luxembourg, trucks with 12 tons or more require an e-vignette for freeways and toll expressways. The e-vignette is also valid in the Netherlands, Denmark and Sweden.
- If you drive through several of these countries in one day, you only need one e-vignette.
- The e-vignette is vehicle-related and is valid for one day, one week, one month or a whole year, depending on your preference.

### Yearly Costs

Emission category	1–3 Axes	4 or more Axes
Euro 0	1.407,00	2.359,00
Euro 1	1.223,00	2.042,00
Euro 2	1.065,00	1.776,00
Euro 3	926,00	1.543,00
Euro 4	842,00	1.404,00
Euro 5	796,00	1.327,00
Euro 6	750,00	1.250,00

# Toll

## Toll in Germany - How to be calculated



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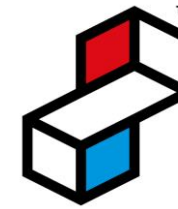
### The toll rate in Germany depends on three factors:

1. Number of axes
2. Emission class
3. Permissible total weight of the vehicle combination

→ All vehicles with a technically permissible total mass of over 7.5 tons, a partial toll rate for CO<sub>2</sub> emissions will be added to the existing toll.

### The toll rate per km is calculated from a toll rate for each of the following:

- The infrastructure costs
- The air pollution costs incurred
- The noise pollution costs incurred
- The costs of traffic-related CO<sub>2</sub> emissions (new from 1.12.2023)



From Dec. 1, 2023, vehicles will be classified into 5 emission classes to differentiate the CO<sub>2</sub> toll. The lower the CO<sub>2</sub> emissions, the higher and better the emission class.

### Overview of Emission Classes:

#### **Class 1**

Worst class with the highest costs for CO<sub>2</sub> emissions. All vehicles with combustion engines are automatically assigned to class 1. Vehicles built until 07/2019 cannot be categorized better than class 1.

#### **Classes 2, 3**

Emission classes 2 and 3 are determined based on specific CO<sub>2</sub> emissions.

#### **Class 4**

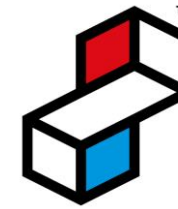
Low-emission vehicles, e.g. natural gas-powered vehicles until 31.12.2023

#### **Class 5**

Emission-free vehicles, e.g. electric battery or hydrogen-powered vehicles, are exempt from tolls until 31.12.2025.



# Toll



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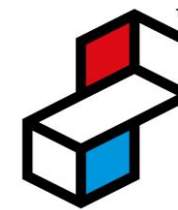
## Toll in Germany - Important to know

- Natural gas-powered vehicles will probably receive a better CO<sub>2</sub> emission class.
- Subsequent modifications and optimizations in terms of CO<sub>2</sub> savings do not mean a better emissions class.
- From December 1, 2023, vehicles with particle filters will no longer be classified in a better emission class.
- Electric and hydrogen-powered vehicles and trucks with hydrogen fuel cell drives will be exempt from the new CO<sub>2</sub> toll until the end of 2025. After that, these vehicles will have to pay 25% of the partial toll rate for infrastructure costs, plus the partial toll rates for noise and air pollution.
- The allocation to a weight class changes with the introduction of the CO<sub>2</sub> emission classes. The technically permissible total mass of the truck and, if applicable, the trailer will now be used. Previously, the maximum permissible gross weight was used. **This means that vehicles can now be assigned to a higher weight class than before.**
- From July 1, 2024, all vehicles with a technically permissible total mass of more than 3.5 tons will have to pay a toll.

# Toll

## Toll in Germany

Toll from 1.12.2023 to 30.6.2024 for vehicles with emission class 1  
 Calculated in cent per km



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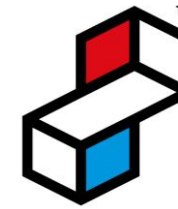
Truck	7,5 up to <11,99 t		12 t up to 18 t		>18 t up to 3 axes		>18 t with 4 axes		>18 t with 5 or more axes	
	From 01.12.23	old	From 01.12.23	old	From 01.12.23	old	From 01.12.23	old	From 01.12.23	old
<b>Euro VI</b>	17,8	9,8	24,0	14,0	30,5	18,1	32,4	19,0	34,8	19,0
<b>Euro V/EEV</b>	20,6	12,6	27,7	17,7	35,5	22,1	36,3	22,9	38,9	22,9
<b>Euro IV</b>	22,2	14,2	28,8	18,8	37,3	23,9	38,8	25,4	41,4	25,4
<b>Euro III</b>	25,1	17,1	33,0	22,6	43,1	29,3	45,4	31,6	47,8	31,6
<b>Euro II</b>	27,6	19,6	35,0	24,6	46,1	32,3	48,7	34,9	51,1	34,9
<b>Euro I/O</b>	27,7	19,7	35,2	24,8	48,6	32,8	51,2	35,4	51,6	35,4
<b>Emission-free until 12.2025</b>	0		0		0		0		0	

# Costs

## Fuels

Electricity	€ 0,24 / kWh
CNG	€ 1,12 / KG
LNG	€ 1,69 / KG
Diesel	€ 1,72 / L
Bio-Diesel	€ 1,72 / L
Bio-LNG	€ 1,83 / KG
R33 Diesel	€ 1,83 / L
HVO 100	€ 1,92 / L (Germany) - € 2,80 / L (Luxembourg)

Fuel prices vary by country and day. An average price over the last few months was assumed here.



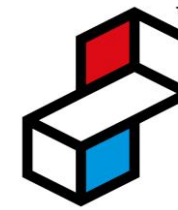
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# Different Fuels and Cost Variations

# Costs

## Fuels



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### Scenario:

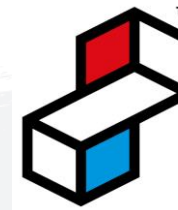
- 40t Truck with different fuels (LNG, CNG, R33, Electricity, Bio-LNG, HVO 100, Diesel, Bio-Diesel)
- EURO 6
- Route from 8380 Kleinbettingen to 20457 Hamburg – Distance 618 km
- Shipment with transport weight: 18t

What Truck / Fuel in combination with the toll will have the lowest costs for this shipment?

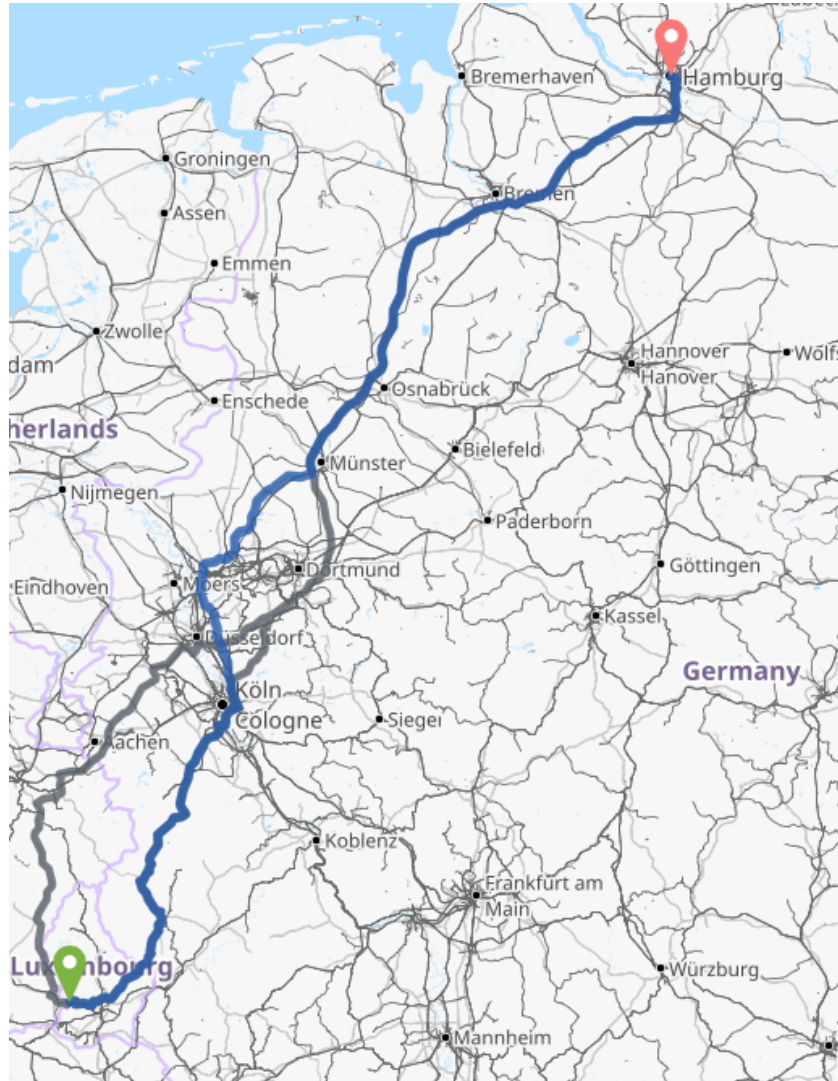
- LNG
- CNG
- R33
- Electricity
- Bio-LNG
- HVO 100
- Diesel
- Bio-Diesel

# Costs

## Fuels



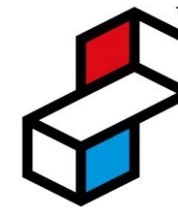
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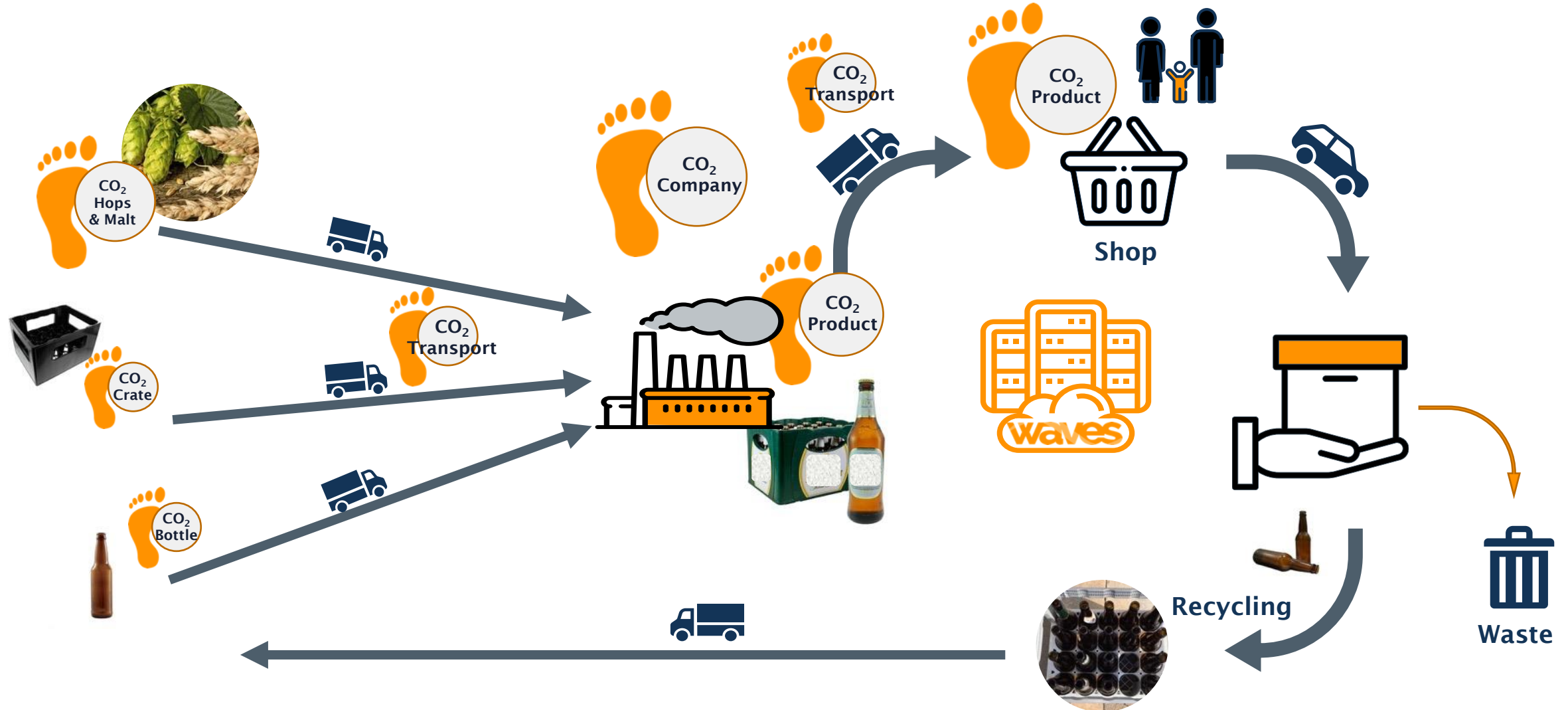
	Toll complete	Average Consumption 100 KM	Total Costs Fuel	Toll + Fuel
40t Elektro	3,42 €	130	192,82 €	196,24 €
40t CNG	199,34 €	22	152,28 €	351,62 €
40 t LNG	199,34 €	25	261,11 €	460,45 €
40t Diesel	199,34 €	28	297,63 €	496,97 €
40 t Bio-Diesel	199,34 €	28	297,63 €	496,97 €
40 t Bio-LNG	199,34 €	28	316,66 €	516,01 €
40 t R33 Diesel	199,34 €	28	316,66 €	516,01 €
40 t HVO100	199,34 €	28	332,24 €	531,58 €

# Scenario Analysis with the WAVES SMP

# Providing transparency across transport- and supply chains

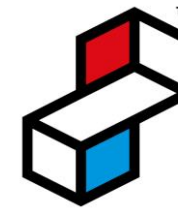


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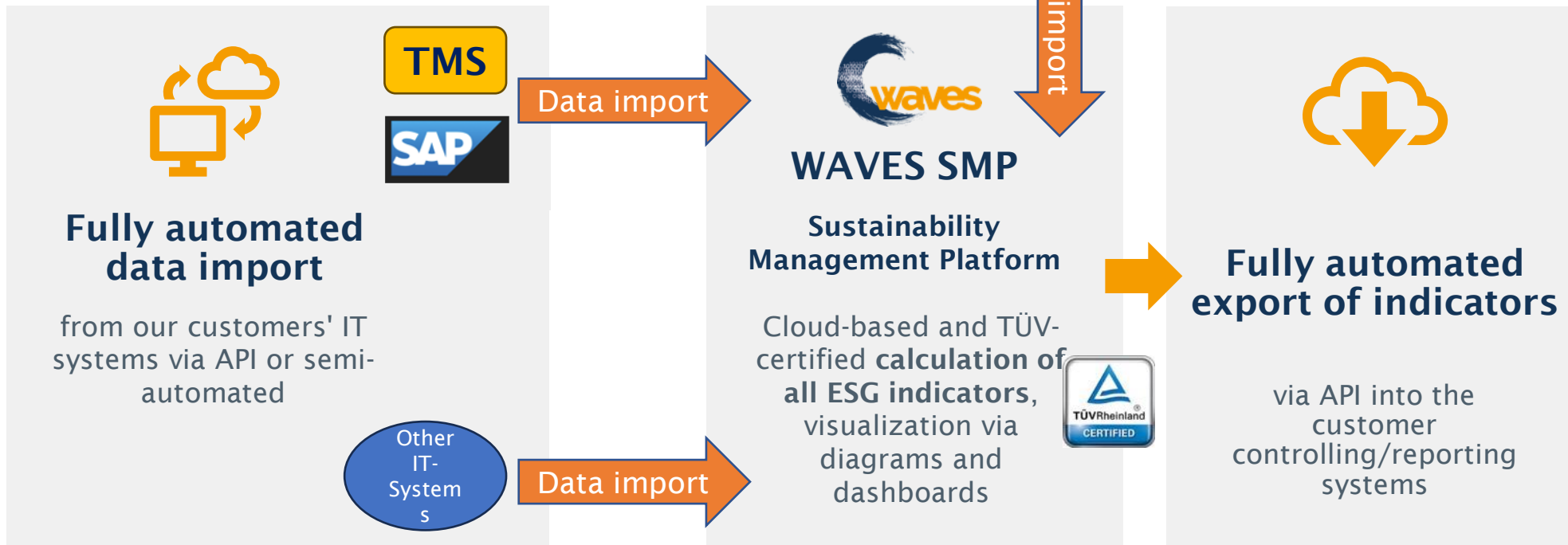




# SMP uses latest cloud technology



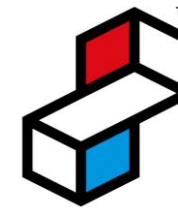
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As an independent, certified platform, WAVES converts customer data into valuable, manageable sustainability indicators

# Emissions

## CO2 Calculations



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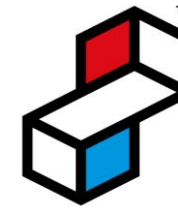


Fuel types	Transport weight [kg]	Distance [km]	Transport activity [tkm]	GHG total, Own values [kg CO <sub>2</sub> e]
Biodiesel 100%	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>400.04</b>
Diesel	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>675.07</b>
HVO 100	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>80.72</b>
Bio LNG	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>216.69</b>
Electricity	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>469.17</b>
Diesel R33	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>515.18</b>
CNG	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>502.58</b>
LNG	<b>18,000</b>	<b>618</b>	<b>11,117</b>	<b>673.43</b>

1. HVO 100
2. Bio LNG
3. Bio Diesel
4. Electricity
5. CNG
6. R33 Diesel
7. LNG
8. Diesel

Emissions

Parameters



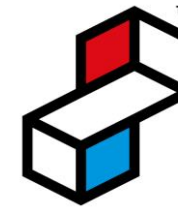
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Live Demo  
CO<sub>2</sub> calculations with different fuels  
in the WAVES SMP

# Solution

## Parameters



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Since the influence on toll costs is almost non-existent, you have other options:

- Differentiate in fuels
- Use Fuels that emit fewer emissions
- This allows you to address more customers for which low-emission transportation is important
- If you are responsible for reporting yourself, you can stand out from the crowd with reduced emissions as this information is integrated into your annual report and is transparent

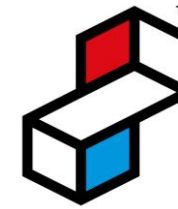
# Financial aids in Luxembourg

# Financial Aids

## Fit4Sustainability



**FIT4  
SUSTAINABILITY**



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**Fit 4 Sustainability** helps companies assess and reduce their impact on the environment and to reduce their ecological footprint by optimizing energy consumption and switching to renewable energies.

This reduces costs, raises awareness, improves the company's corporate image and attracts new customers who appreciate an environmentally-friendly approach. This effort is not only good for the environment, but also for your company's profitability.

### **Assistance includes:**

- 6 months of analysis of your business,
- 1 environmental study to assess the impact of your business,
- 1 action plan with recommendations on investments and improvements,
- 70% co-financing (small companies), 60% (medium-sized companies) or (medium-sized companies) or 50% (large companies).

### **Who can benefit?**

The Fit 4 Sustainability program is open to all Luxembourg companies, regardless of their size and sector of activity. To be eligible for Fit 4 Sustainability, companies must:

- ✓ - have their head office in Luxembourg,
- ✓ - carry out an economic activity on a principal basis.

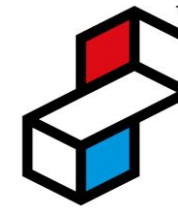
 [\*\*FIND OUT MORE ABOUT THE PROGRAMM HERE!\*\*](#)

# Financial Aids

## SME Packages Sustainability



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With the SME Packages Sustainability, you can combine economy and ecology in a first concrete project with a positive impact in the following areas:

- Energy: implementation of energy-saving tools
- Water: implementing tools to reduce water consumption
- Waste: implementation of tools to manage or reduce waste
- Carbon footprint: carbon assessment and action plan

The "SME Packages Sustainability" also enable us to support you individually in the process of identifying a concrete solution that will help you reduce your impact on the environment:

- Savings will be targeted by reducing your energy or water consumption
- Optimize your waste management or
- Reduce your carbon footprint.

### Target group

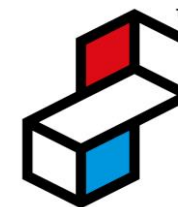
- ✓ Has an establishment permit issued by the Direction Générale des Classes moyennes
- ✓ Meets the conditions imposed on SMEs in terms of staff, annual sales and balance sheet
- ✓ Has its registered office in Luxembourg.

 [\*\*FIND OUT MORE ABOUT THE SME PACKAGES SUSTAINABILITY HERE!\*\*](#)

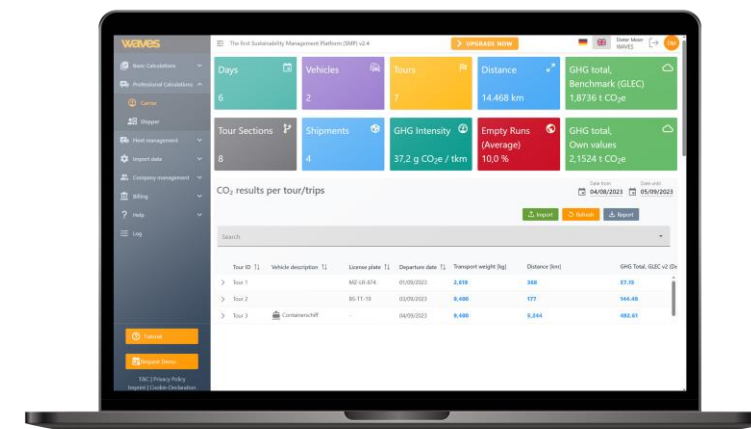
# Who we are

## WAVES

- Founded in **2019**, based in **Luxembourg**
- Supported by the Luxembourgish **Ministry of the Economy**
- Dedicated team of computer scientists, sustainability experts, marketing and sales
- Combined experience of **+90 years**
- Certified by German audit authority **TÜV**
- 3 international registrations (Intellectual Property, Trademark, Industrial Design)
- Build up the **SMP – Sustainability Management Platform** with Modules for:
  - Transport emissions
  - Corporate Carbon Footprints and
  - Reporting tool for the EU-Taxonomy within the CSRD



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# TIME TO ACT IS NOW

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With WAVES you are  
one footstep ahead

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