Avoided emissions – the missing link in climate accounting

Andrea Voigt, Danfoss Climate Solutions, August 2025

Danfoss in brief

We engineer solutions that increase machine productivity, reduce emissions, lower energy consumption, and enable electrification.

Employees worldwide

39,360

Global sales

EUR 9.7b

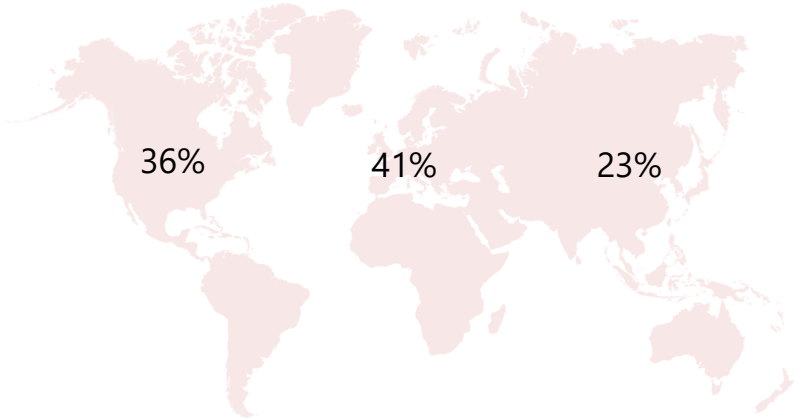
Business segments

Danfoss Power Solutions

Danfoss Climate Solutions

Danfoss Power Electronics and Drives

Global footprint



As per annual report 2024

Three business segments geared for growth

Danfoss Power Solutions

- EUR 4.1b annual sales
- 16,101 employees

43%
of Group sales

Danfoss Climate Solutions

- EUR 3.1b annual sales
- 11,039 employees

32%
of Group sales

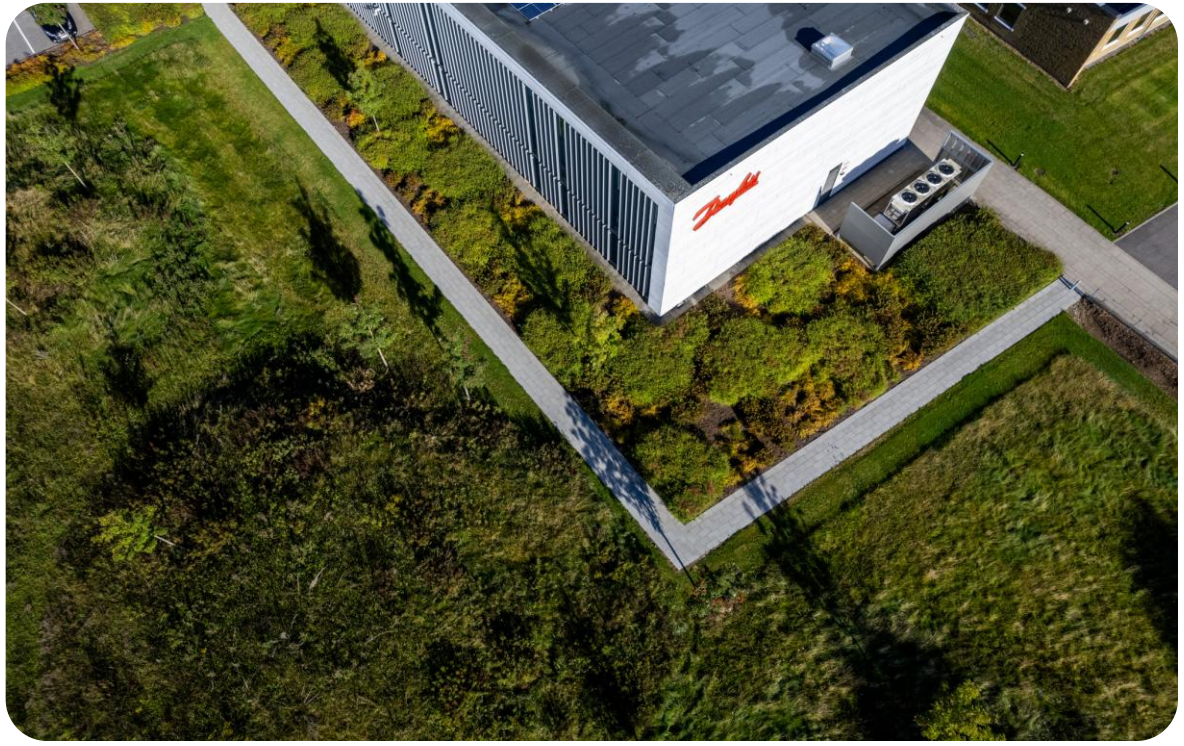
Danfoss Power Electronics and Drives

- EUR 2.4b annual sales
- 7,868 employees

25%
of Group sales

As per annual report 2024

Decarbonization:
At the heat of what we do



In decarbonizing our own operations globally, we apply the same approach that we bring to our customers

At Danfoss we have a clear plan to fully decarbonize our own operations by 2030.

Our three-step approach

Step 1

Reduce
Improving energy efficiency

Step 2

Reuse
Utilizing energy recovery

Step 3

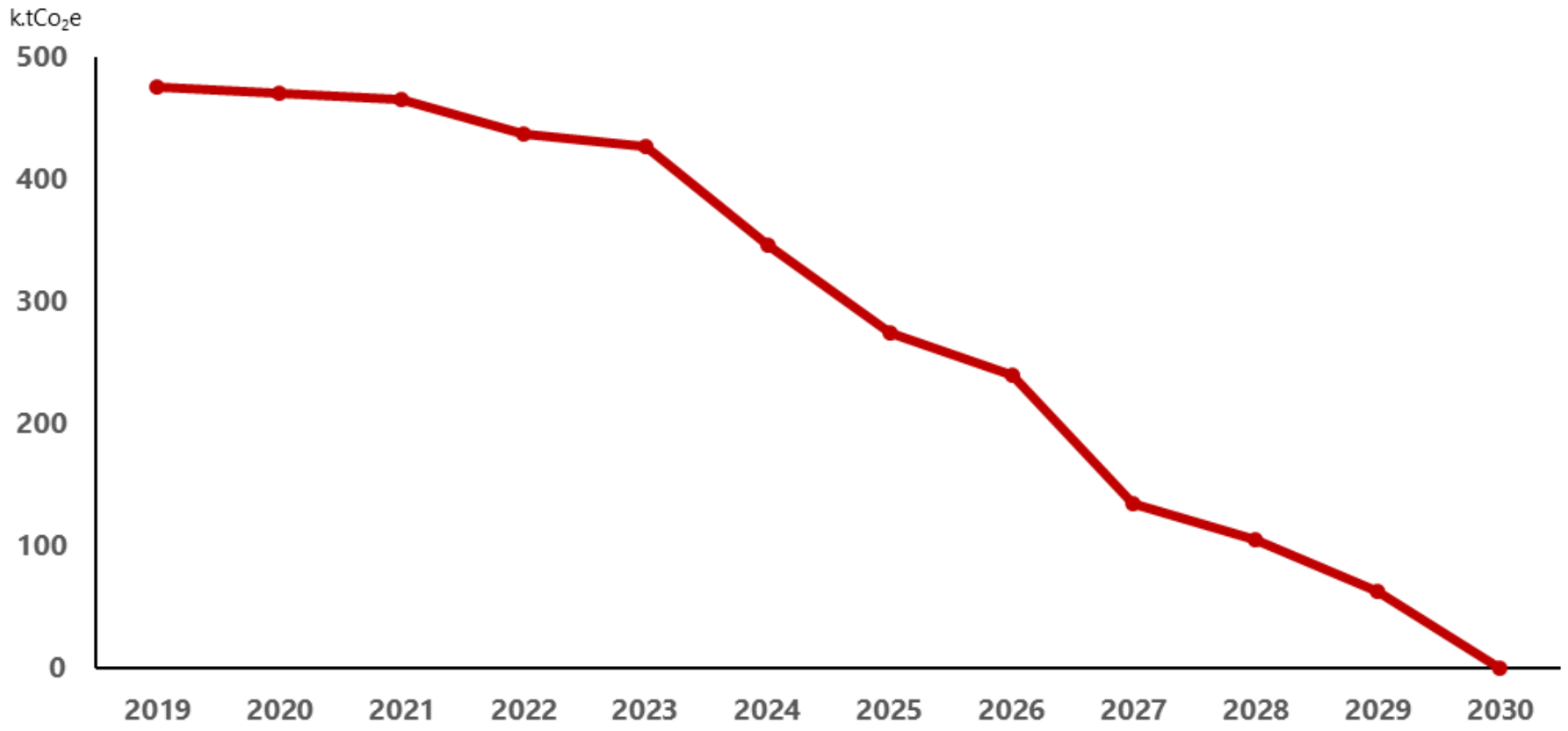
Re-source
Sourcing renewable energy

Danfoss on track for CO_2 neutrality in own operations by 2030

Danfoss scope 1 and 2 including recent acquistions.

(Eaton's hydraulics business, SEMIKRON and BOCK® Compressors)

Danfoss' SBTi target of 46%, excl. M&A achieved in 2024, 6 years ahead of time.



Nordborg campus reached CO_2 neutrality in 2022

Heat savings

2007-2023

Reduce

79%

Reuse

6%

Resource

15%

Power savings

2007-2023

Reduce

41%

Resource

59%

Corporate Climate Accounting

Scope 1, 2, 3 and the missing link

Why environmental disclosure:
Transparency based on mandatory and voluntary commitments

Mandatory Reporting in the EU

- EU Taxonomy
- EU Corporate Sustainability Reporting Directive (CSRD)
- EU Corporate Sustainable Due Diligence Directive (CSDDD)
- European Green Bond Regulation (EGBR)
- EU Carbon Border Adjustment Mechanism (CBAM) …

Voluntary ESG Scoring / Rating

CDP

ecovadis

MORNINGSTAR | SUSTAINALYTICS

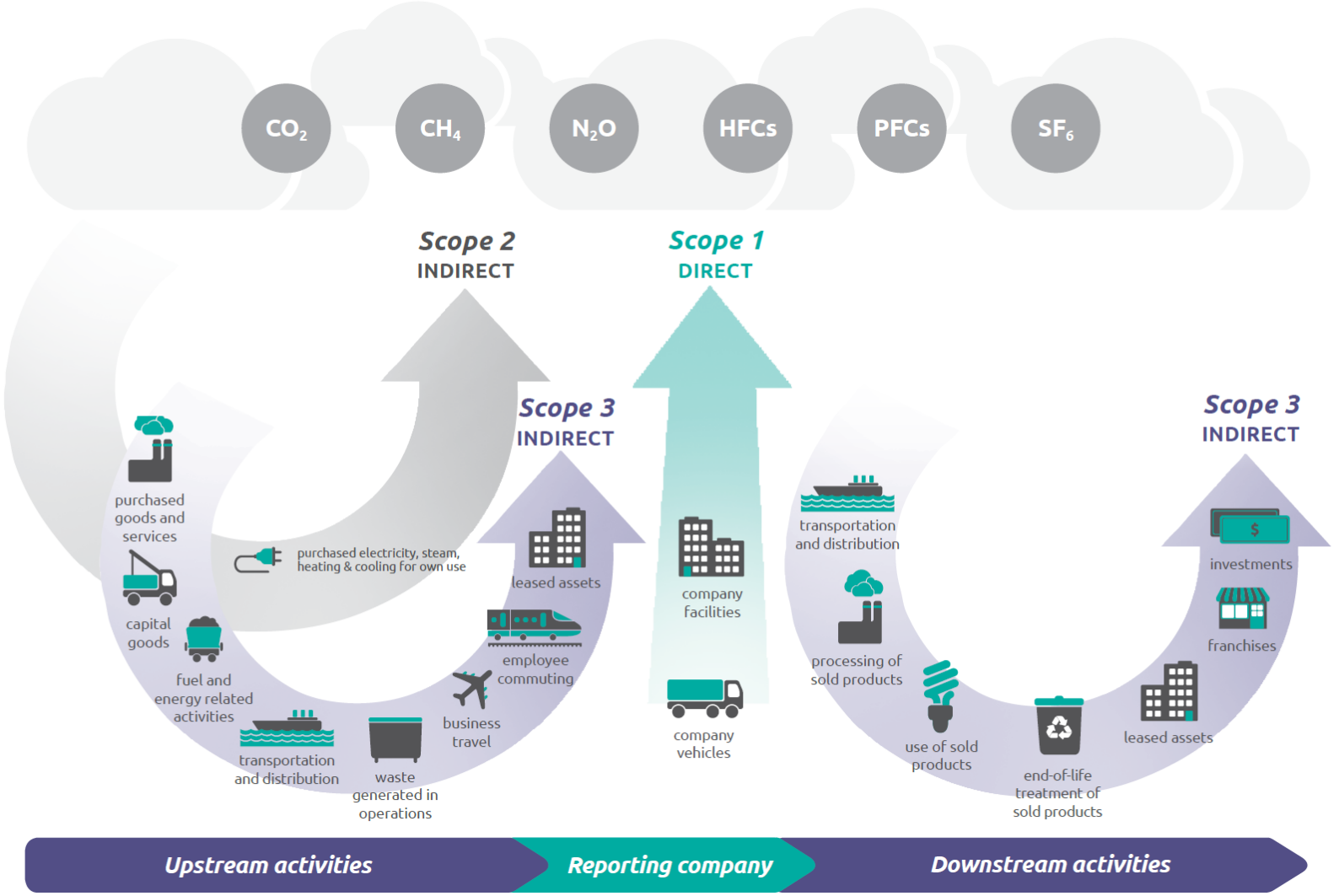
MOODY'S

Voluntary Commitments

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

A global standard for corporate climate accounting



The Greenhouse Gas Protocol is the leading corporate climate accounting framework

Corporate Standard | Greenhouse Gas Protocol (ghgprotocol.org)

Scope 3 Emissions dominate: A short reminder

Emission reductions and SBTi

- Scope 3 emissions are by far the biggest challenge for most companies – no matter in what field they are operating.
- All scopes are inter-related: E.g. Danfoss products impact our customers' scope 3 upstream and downstream emissions.
- The Science Based Targets Initiative (SBTi) assesses and validates corporate climate targets, consistent with global transition scenarios – medium and long-term.

The cold chain

- Refrigerants and Energy are crucial for Scopes 1 and 2
- Scope 3 is also here the biggest contributor, encompassing emissions from production, transportation, packaging, food loss and waste, etc.

Sustainability is a chain reaction where everything is interlinked
Finance can be a powerful driver

Raw material

Product

Equipment

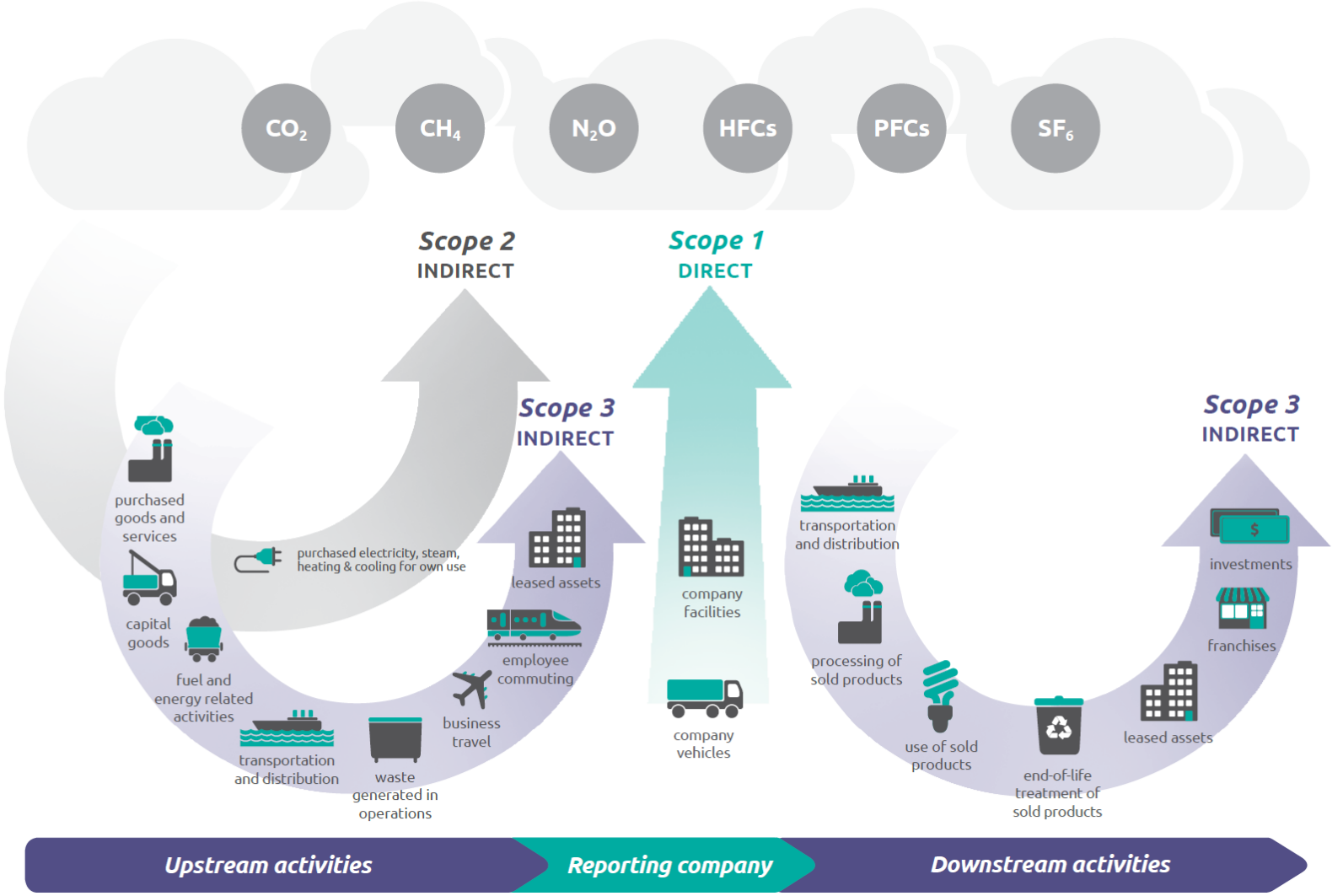
Supermarket

Finance
Shareholders
Consumers

Lots of interactions between all actors

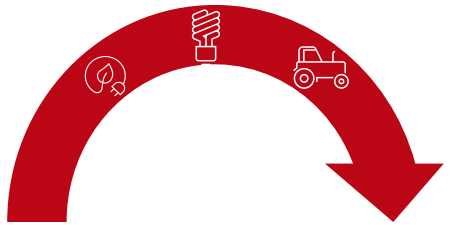
**Scope 1: Direct emissions from owned or controlled sources l Scope 2: Indirect emissions from purchased energy l Scope 3: Other indirect emissions from value chain*

There is a missing link in Corporate Climate Accounting



Avoided Emissions - Scope 4

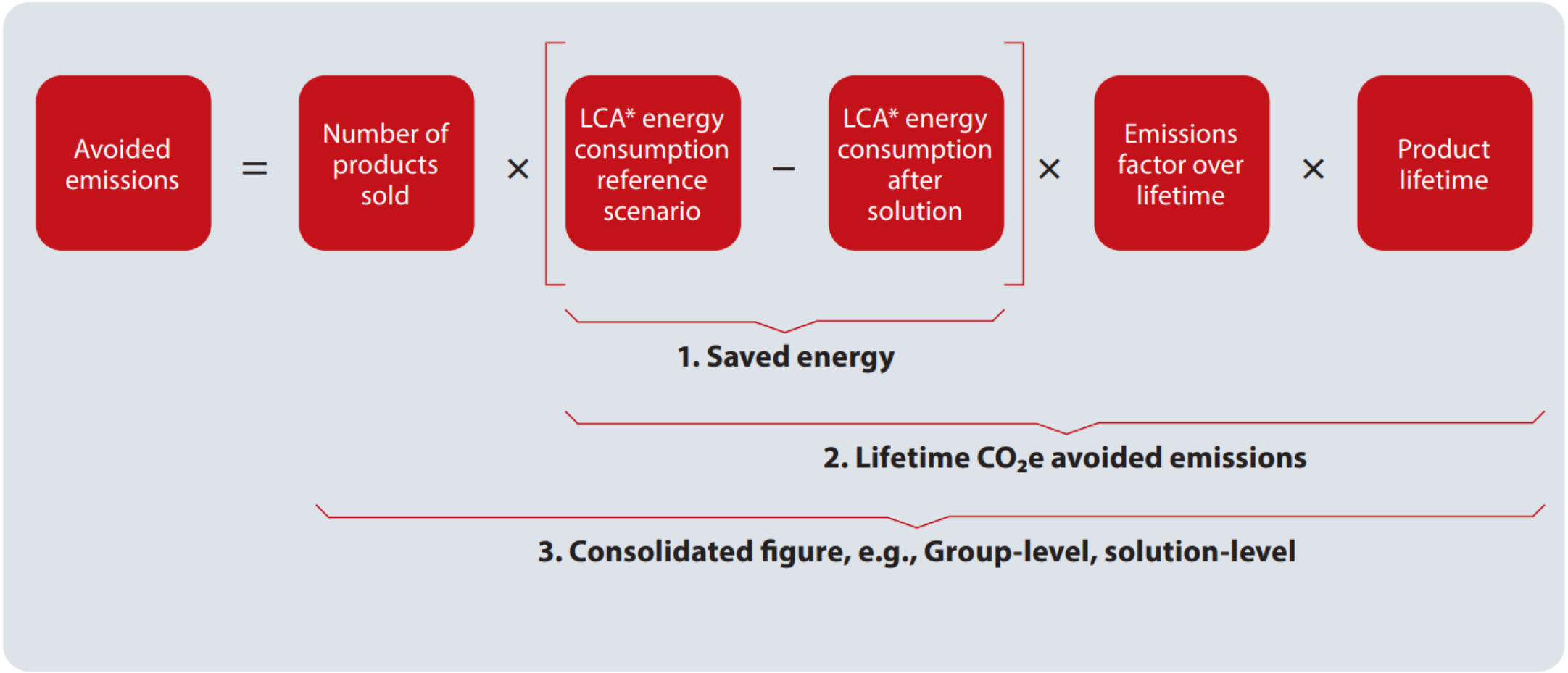
INDIRECT



Avoided emissions compared to reference scenario

Beyond value-chain

Greenhouse Gas Protocol and SBTi do not formally recognize avoided emissions. Yet that's what RACHP tech does!



Example of Heat pumps and their compressors: Avoided emissions are not valorised by the framework

VS

Avoided Emissions
(validated by Force Technology)

01.

Scope 1 and Scope 2 Emissions from benchmarking on declared EPD:

Boiler wins

02.

Scope 3 based on grid emission factor calculation (IEA) and sCOP values:

HP compensates scope 1 & 2 in 3 months

03.

A VZN175 based AWHP allows 477tCO2eq of avoided emissions*

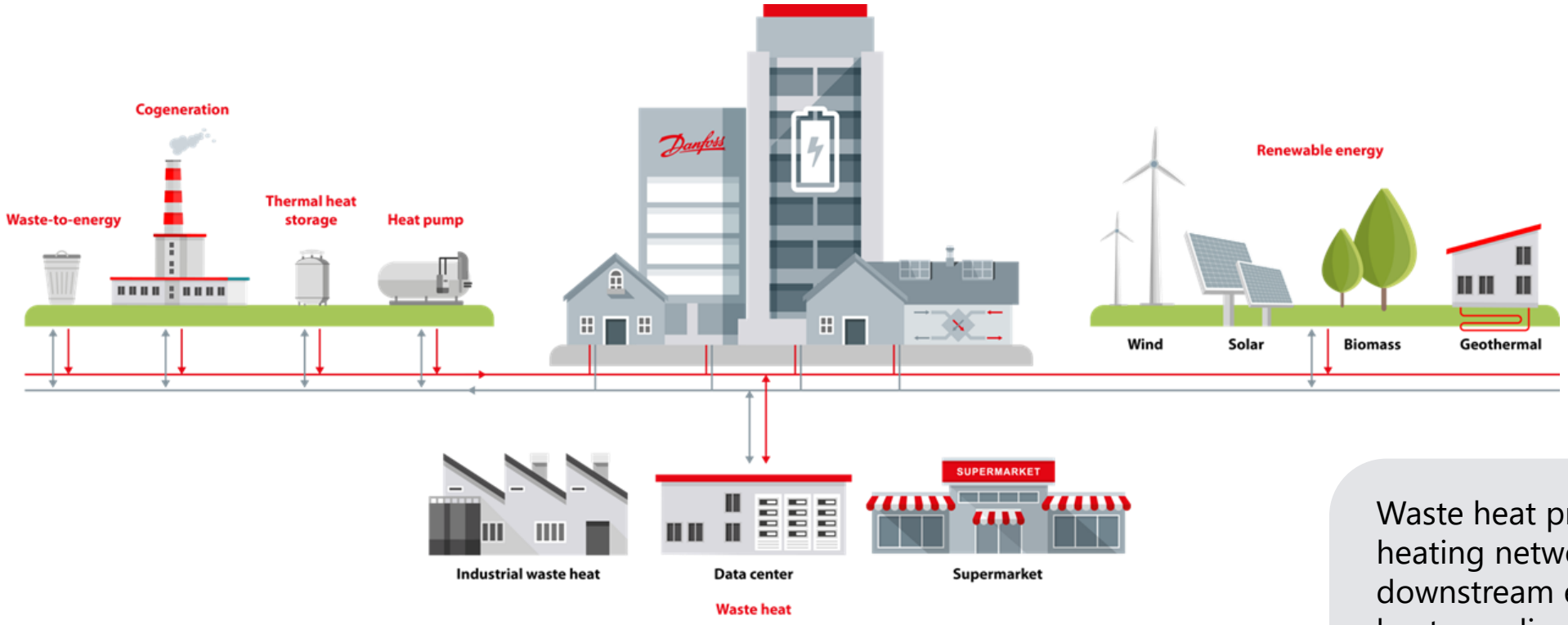
04.

This is ~15 electrical vehicules** over 200 000km, or almost 50 years of emissions for a single individual in Europe

Avoided emissions impact per country in Europe

** weighted over annual heating requirement in each country, for 15 years duration, compared to a conventional gas boiler*
*** source Carbone 4, assuming 32,4tCO2 saving over 200 000km from thermal to electrical in a Tesla3 type car*

Example of waste heat:
Suppliers of waste heat cannot account for emission reductions



Waste heat provided to a district heating network increases scope 3 downstream emissions of the waste heat supplier.

There is no incentive from a corporate climate accounting perspective.

Conclusions

- Sustainability remains a major global trend, driven by regulatory, financial and consumer pressures.
- Thousands of companies, e.g. ~ 500 food & beverage companies have committed to science-based targets.
- Emission reduction commitments and pathways impact sustainability rankings and access to finance.
- Scope 3 emissions are by far the biggest challenge across sectors and applications.
- Refrigeration, Air-Conditioning and Heat Pumps Technologies can make a massive contribution to avoided emissions. But these reductions cannot be accounted for from a corporate climate accounting perspective.
- Avoided emissions do not only relate to tech. They also relate to context, as in avoided emissions from food loss and waste thanks to the cold chain.

How can we, collectively as a sector, raise awareness on the importance of avoided emissions to support the uptake of sustainable heating, cooling and refrigeration technologies?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