How can built environment use data to tackle carbon dioxide emissions – A Finnish example

14 September 2022

#gaiaxforfinland

gaia-x Hub Finland

SITRA

HOUSEKEEPING

Welcome!

- The event is recorded.
- **Please, write to the chat** if you have a comment or a question, they will be addressed in the Q&A.
- You can also **share your comments** via chat.
- Sit back and **enjoy** – lovely to have you here!

gaia-x Hub Finland SITRA

Programme 14–15:30 EEST (13–14:30 CEST)

14:00	**Welcome and agenda** *ANSSI KOMULAINEN*, Project Director, Gaia-X, Sitra
14:10	**Big picture on industry data and looking into industry practices** *TOMMI AROLA,* Research Director, Digital Built environment, Building Information Foundation RTS
14:25	**CO2 DataHub project and how the (PoT) platform helps to solve the business problems** *ROOPE PAJASMAA,* Project Director, CO2 DataHub, Vastuu Group *ILKKA ANTTONEN,* CTO, Vastuu Group
14:50	**Why CO2 DataHub Project** *ANNE KAISER*, Sustainability Manager, Saint-Gobain Finland
15:00	**Q&A** *ILKKA LAKANIEMI*, Director, CKIR, Aalto University School of Business
15:30	End of the event

gaia-x Hub Finland SITRA

In case there are first timers in the call - what is Gaia-X?

gaia-x Hub Finland

Gaia-X is a European project to **create a federated and secure data infrastructure**. Trust.
It is working towards digital sovereignty and ensuring **interoperability.** Choices.
It is aiming at **unleashing business potential** enabled by **of data spaces**. New value.
It is in line with the European data strategy published in 2020. Soon a must have.

SITRA

Gaia-X Finland Hub – 8 Working Groups

gaia-x Hub Finland

Agriculture	**Marko Turpeinen,** CEO, 1001 Lakes / Adj Professor, Aalto University
Circular Economy	**Päivi Kivikytö-Reponen,** Research Team Leader, VTT
Geoinformation	TBA
Health	**Christian Sundell,** Head of Strategy and Business development, TietoEVRY
Industry Data	**Kari Muranen,** Senior Ecosystem Lead, DIMECC **Ilkka Lakaniemi,** Director, CKIR, Aalto University School of Business
Mobility	**Janne Lautanala,** Chief Ecosystem and Technology Officer, Fintraffic
Skills	**Anu Passi-Rauste,** Head of Business Development, HeadAI **Mikko Sierla,** International Affairs, Vastuu Group
Smart Cities	**Ilkka Lakaniemi,** Director, CKIR, Aalto University School of Business

SITRA

Sitra Funding call for Data Space pilots (2022-2024)

gaia-x Hub Finland

- Up to 1M€ for learning by experimenting with design & development
- Looking for business ecosystems with 6-9 month pilots on
    1. business value creation through data sharing
    2. Understanding the value of Gaia-X and how to build compliance
- Co-funding of 50 000 € - 150 000€ per pilot, can cover up to 70% of the total pilot budget
- Open for proposals from 1.9.2022 to 30.9.2023

More information at sitra.fi/gaia-x

SITRA

Big picture on industry data and looking into industry practices

Tommi Arola
Research director, digital built environment
Buidling information foundation RTS sr.

Agenda

- Cross sector interoperability - setting the scenery
- Discussion about the challenges
- How to solve?
- Food for thought

Purpose

The purpose of the Building Information Group is to promote good planning, construction and facilities management.

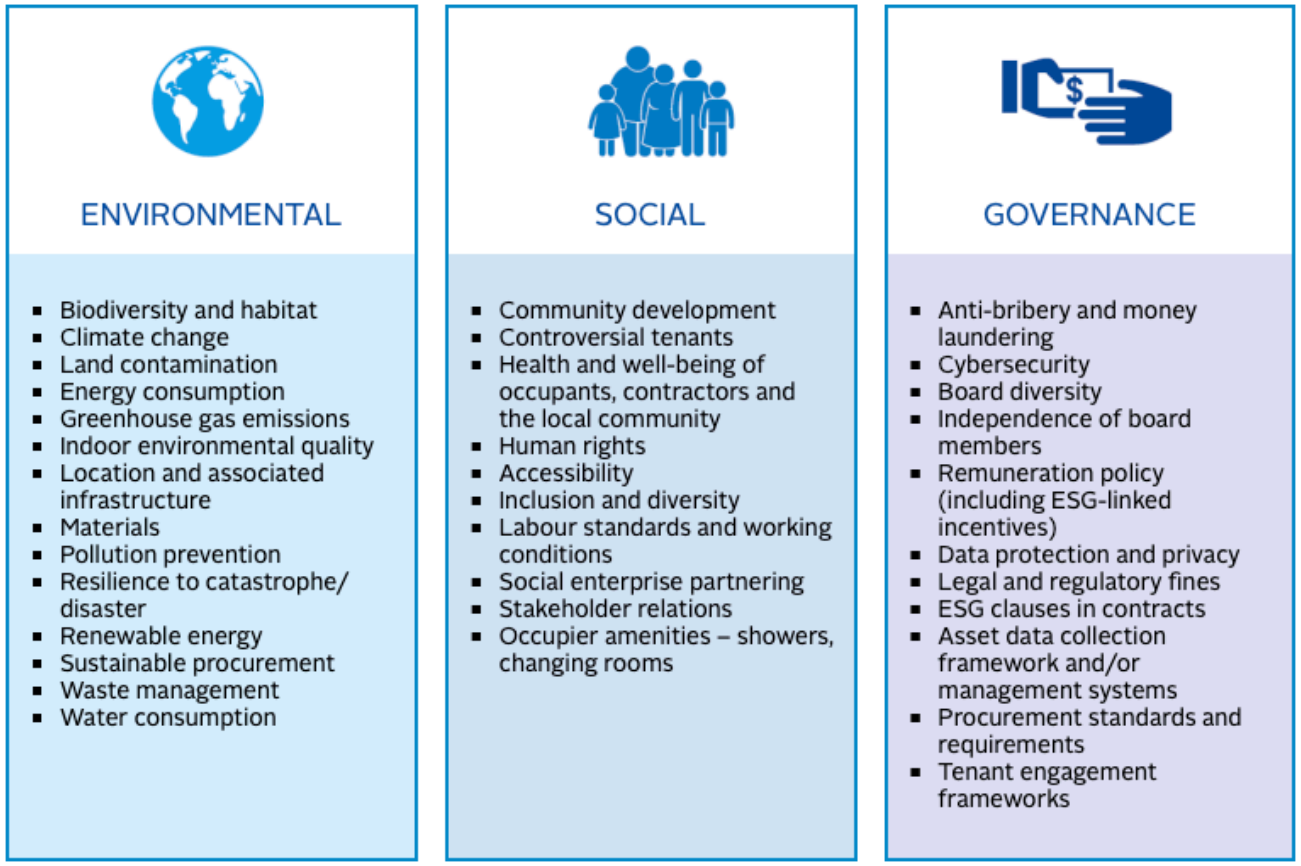
NON-PROFIT INDEPENDENT PROFESSIONAL

COOPERATION PLATFORM

We are under data pressure!

ESG increases the data demand and data verticals from finance side.

Common ESG issues to investigate during due diligence:



Source: https://www.unpri.org/an-introduction-to-responsible-investment/an-introduction-to-responsible-investment-real-estate/5628.article

RTS

Setting the data scenery for built environment

- The built environment use cases are getting more cross industry specific (built environment – transport – energy):
  - *Green financing*
  - *Decarbonized city planning*
  - *Buildling energy consumption optimation using EV battery*
  - *How optimal is the available roof area for solar power system in my home destrict?*
- The business processes needs x10 more data because of the higher demand for system optimation
- The new technology (e.g AI) is industry agnostic which means dataflow should be too

Two folded challenge 1/2

digitalization and data standardization happens in sector silos despite the fact sustainability goals are a cross sector issue

RTS

Two folded challenge 2/2
+-50% of data is unused in construction

TABLE 38

What percent of the project data that your organization has access to would you describe as "usable" (readily accessible, consumable, understandable, and actionable) or something you can act on?

	Belgium	Denmark	Finland	France	Germany	Ireland	Luxembourg	Netherlands	Norway	Sweden	U.K.
More than 75% usable	12%	14%	11%	31%	27%	20%	5%	11%	11%	18%	16%
51% to 75% usable	40%	41%	46%	41%	37%	56%	45%	51%	51%	43%	39%
26% to 50% usable	40%	39%	39%	21%	35%	23%	46%	29%	29%	35%	29%
11% to 25% usable	6%	6%	2%	6%	2%	2%	5%	9%	9%	4%	9%
Less than 10% usable	2%	0%	2%	1%	0%	0%	0%	0%	0%	0%	7%

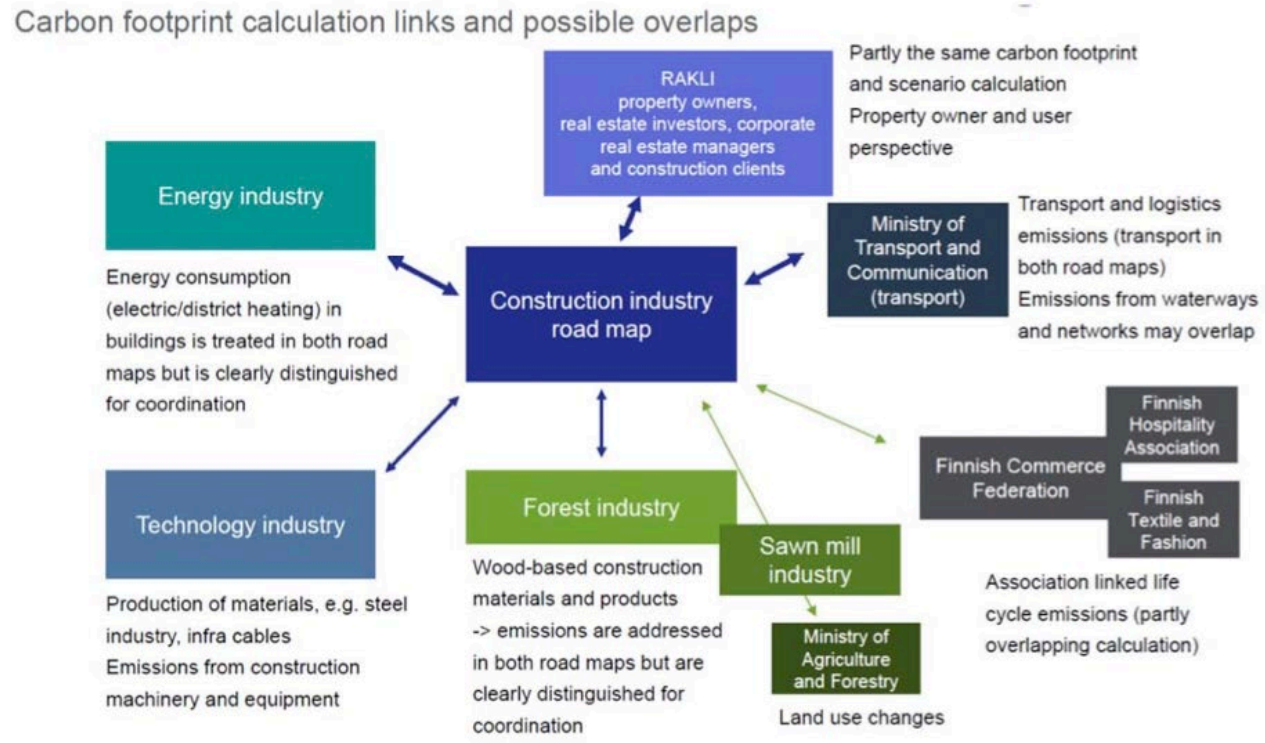
Lähde: Harnessing the data advantage in construction (Autodesk/FMI 2021)

01
02
03
04
Construction Data—Quantity Does Not Equal Quality

Our discussions with industry leaders suggest that the largest cause of "bad" data is from data entry inconsistencies. For example, several interviewees noted multiple spellings and punctuations for the same person, company, or address in common data sources like spreadsheets, customer relationship management (CRM) systems, and email communication. Discovering and correcting problems with a specific designer, contractor, or supplier is difficult when consistent data standards have not been implemented across an organization.

Industry and cross industry practices?

Carbon footprint is a cross industry application



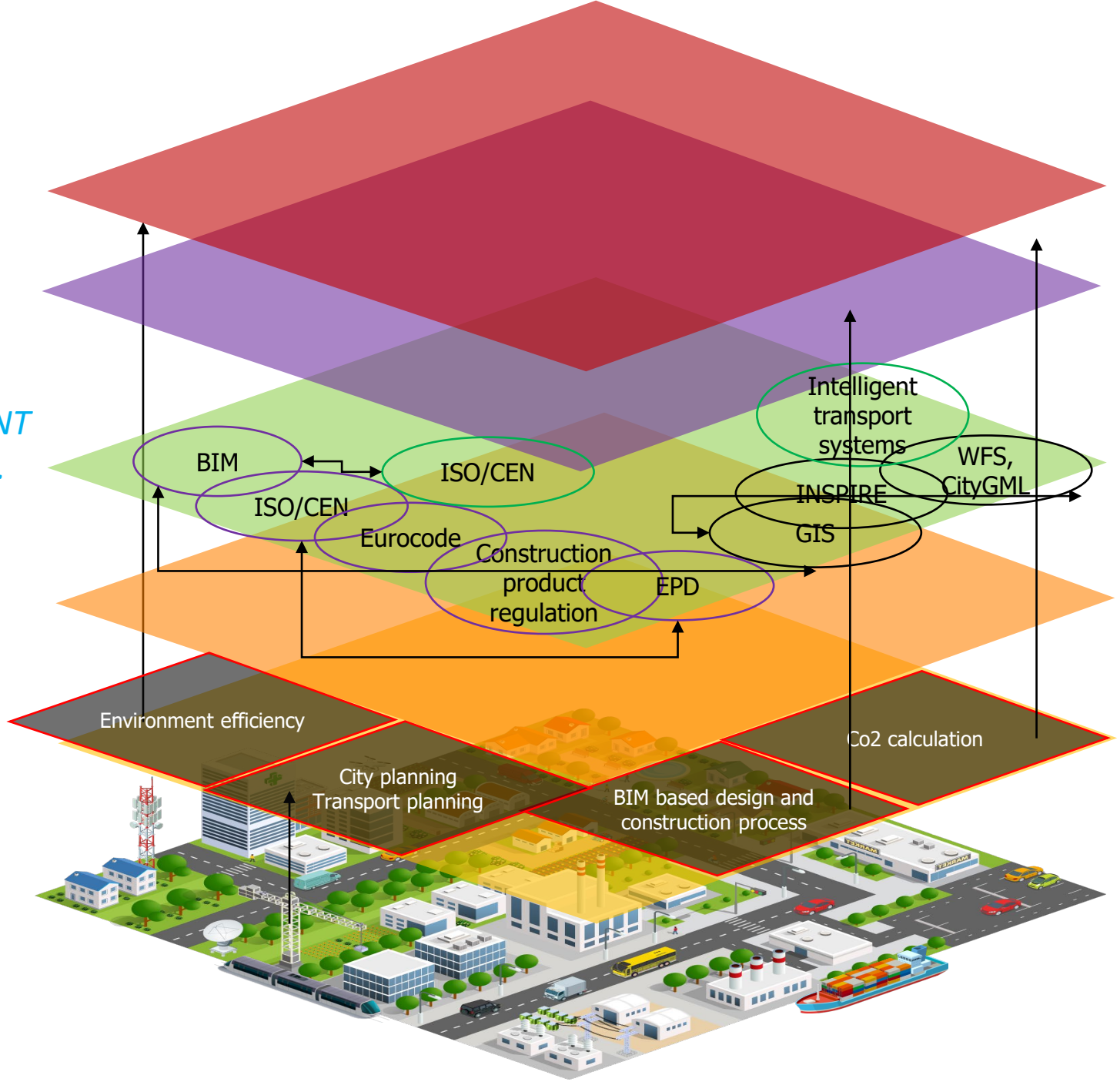
Sector connections of construction industry's roadmap.

Source: Finnish Construction industries RT Low carbon road map of construction industry (https://www.rakennusteollisuus.fi/globalassets/ymparisto-ja-energia/vahahiilisyys_uudet/rt-low-carbon-roadmap-summary-2020-08-20.pdf)

RTS

Yes, but where to start?

We need interoperability framework where layers are CONSISTENT with other industries.



Business

Regulation

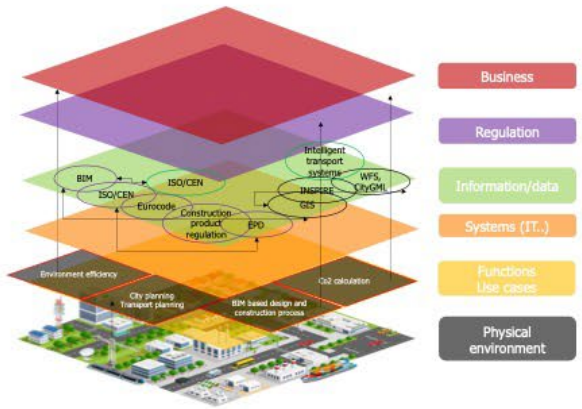
Information/data

Systems (IT..)

Functions
Use cases

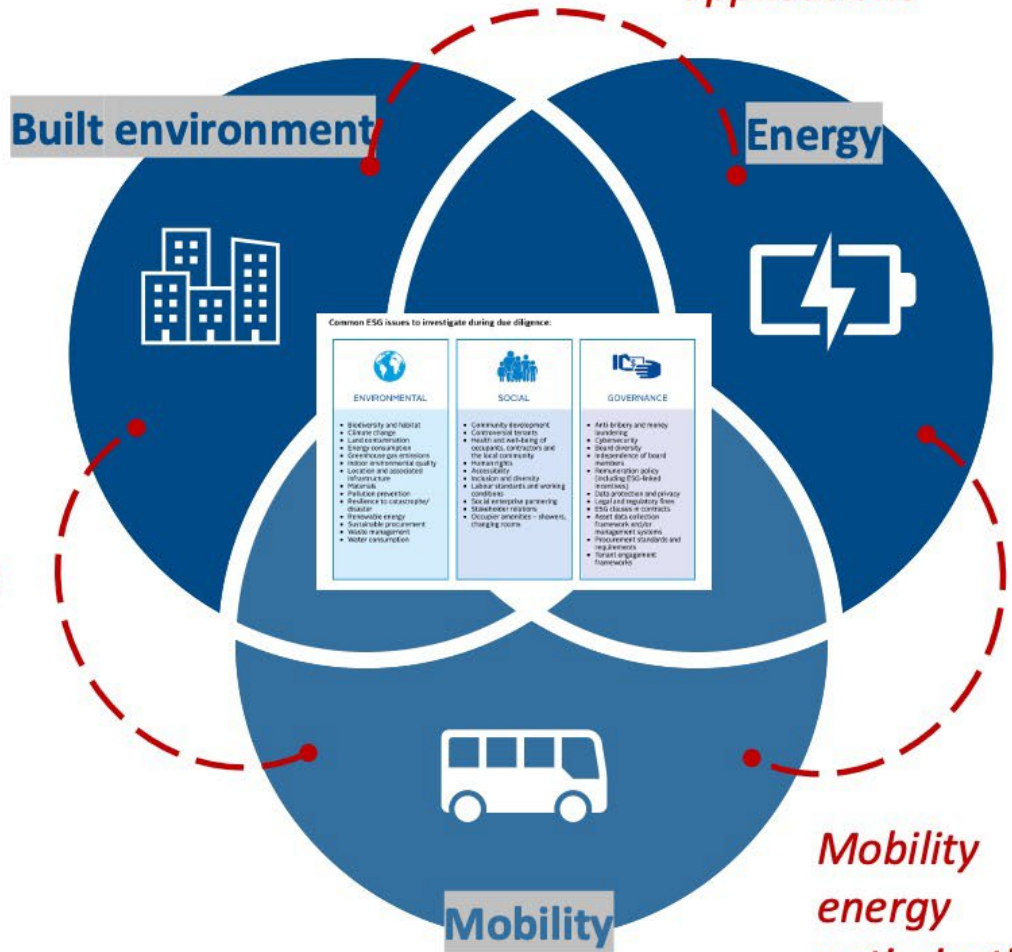
Physical environment

Architecture(s) needs to be connected to make interoperable Co2 data

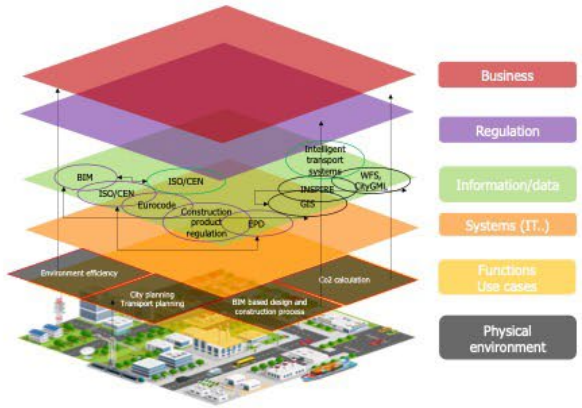


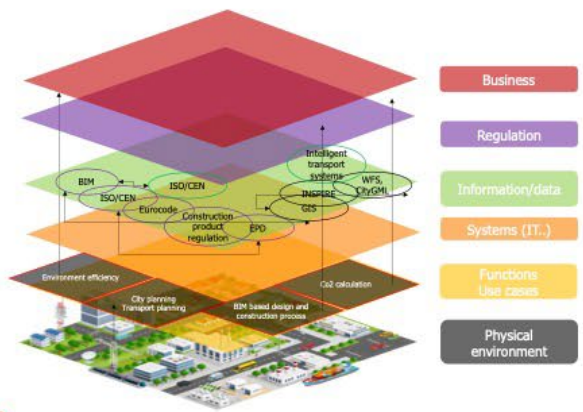
How accessible is my apartment (co2 footprint)?

Solar energy applications



Mobility energy optimization





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Food for thought

- We need to increase sector interoperability to avoid double work, especially in data
- We need to draw industry specific digitalization **situation picture** in a consistent way – *to know what friends are doing*
- Continue industry specific **data interoperability**
- **Connect architectures** e.g built environment – transport - energy
- Define [Co2 related] **cross sector use-cases** and connect [Co2 related] **business processes**

RTS

For further information

Tommi Arola

Research director, digital built environment

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+358 40 8299789

CO2 DataHub

A Finnish example

How can built environment use data to tackle carbon dioxide emissions

Roope Pajasmaa, Chief Growth Officer

Ilkka Anttonen, CTP

Euroopan unionin rahoittama – NextGenerationEU

platform of trust

vastuu group

Vastuu Group

- Vastuu Group
  - Our brand is “Responsibility”
  - Nordic leader in built-in environment
  - ICT and data services
  - Enterprise and solution focus
  - Revenue +20M€, +100 employees

- Platform of Trust
  - Expert and Solution Company with a strong focus on Built Environment
  - Data Exchange as a Service

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CO2 DataHub Project Objective

Our R&D question

- **How to create data-based automatic CO2 calculation and reporting tools and common information standards for the entire ecosystem of the built environment**

How do we do it?

- The research focuses on determining both **direct and indirect emissions** with reliable data using platform economy methods
- We research and develop methods for measuring, evaluating and managing carbon dioxide emissions **throughout the supply chain of companies and cities**
- The research is carried out **in the form of case studies, expert workshops and teamwork** (ecosystem).

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CO2 DataHub Project Facts

- The DataHub part of the NextGeneration EU entity funded by the European Union. The project budget is €1.7M.
- R&D Schedule 1.4.22-30.6.23

- More than 20 key national players are involved in the project
  - Cities, property owners, construction and maintenance companies, material suppliers and unions
  - Stakeholders from the energy, logistics and waste management sectors as well as the building materials industry are involved.

- A **ecosystem steering group has been** formed from the stakeholders participating in the project

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R&D co-operation model

Ecosystem Steering Group	• Contributes to and the vision of the ecosystem • Defines the necessary rulebooks • Steers growth of the ecosystem
Pilot customers and pilot cities	• Market insight • Understanding the supply chain of CO2 data • Data product trials
CO2 DataHub Project Team (Vastuu Group, Aalto University, VTT Technical Research Centre of Finland and Sitowise)	• Core R&D work

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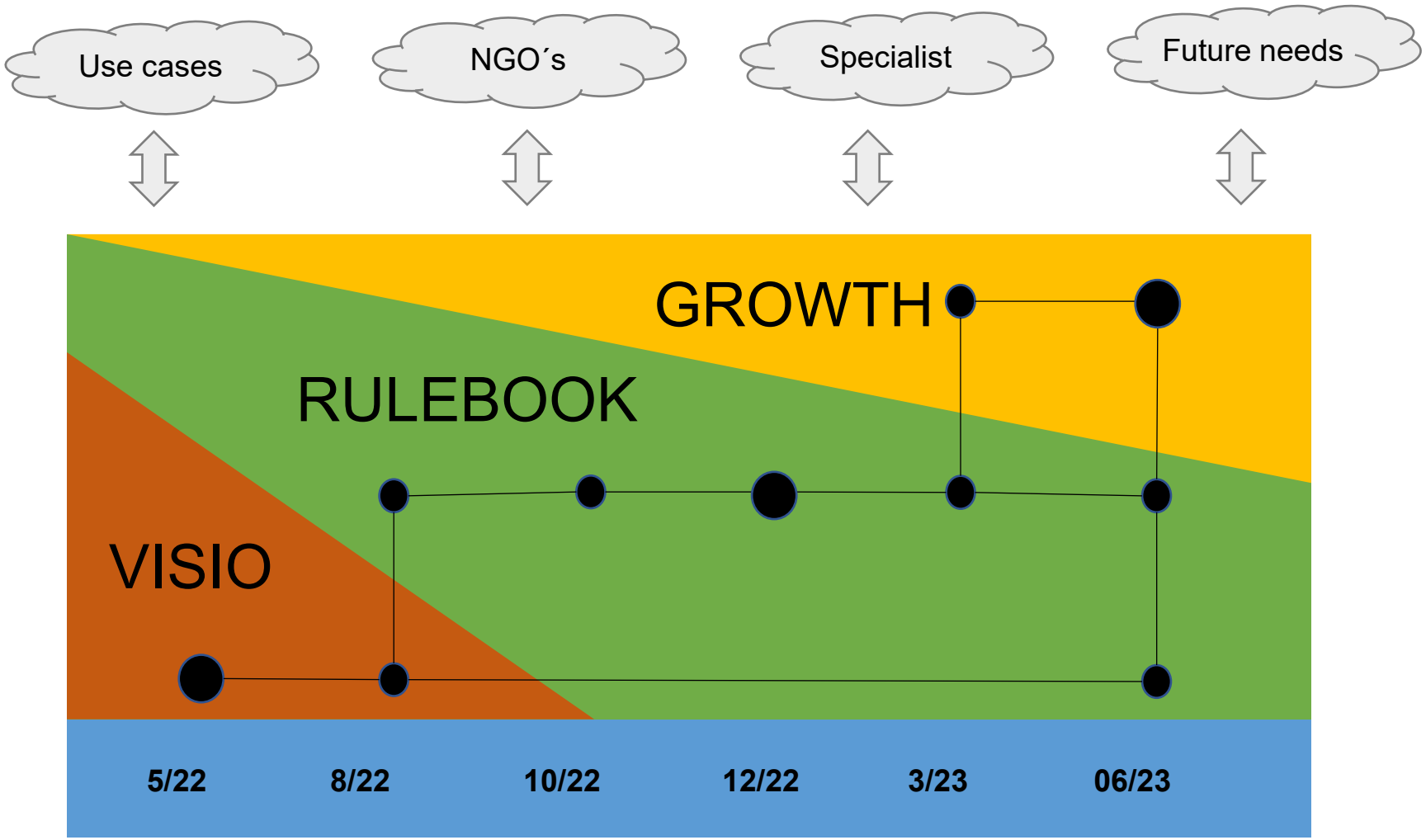
The value proposition is guided by the Ecosystem Steering Group



- Cities, property owners, construction and maintenance companies, material suppliers and unions
- Stakeholders from the energy, logistics and waste management sectors as well as the building materials industry are involved.

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The characteristics of a functional ecosystem

"The difference between the ecosystem and the network is, among other things, that the ecosystem involves actors that you do not know. The key to success is trust."

(Ilkka Lakaniemi, Aalto University School of Business)

- The right actors and the commitment of the actors
- Clear objectives
- The right actors are involved from the start
- A clear ecosystem operating model
- Open and smooth communication
- Clear rules for R&D development

Excerpts from Aalto University School of Business's extensive research

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Our Business Vision

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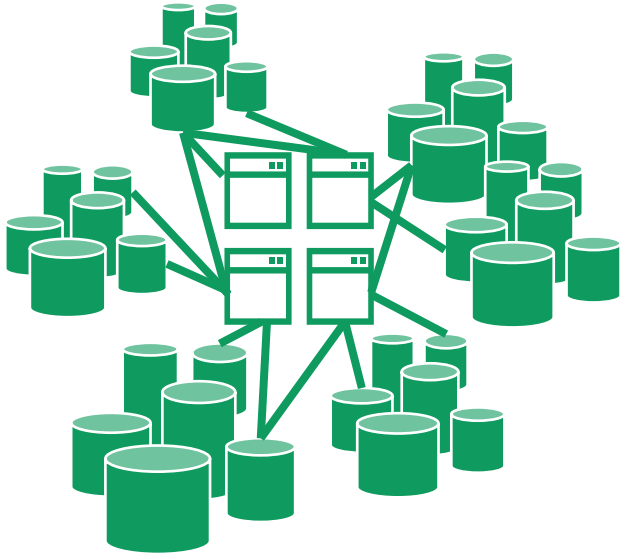
Business-oriented CO2 situation rooms: key components

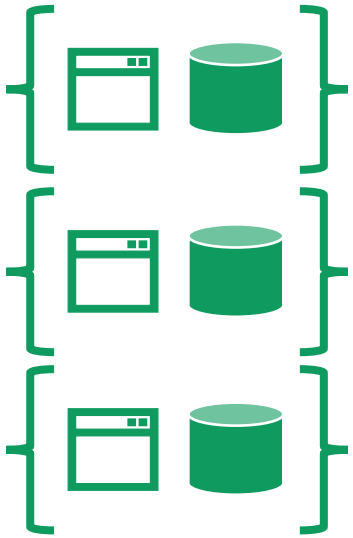
Ecosystem Steering Group
Ecosystem Partners
Data Exchange as a Service Platform

Efficiently compiling data from different sources
Utilising data in a supplier-independent manner in different applications
Manage ownership of data to be shared and aggregated
Improving data usability through harmonisation

Removing the barriers of data flows



Business applications based on more real time scope 1-3 data



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The CO2 Datahub vision 2024 set by the Ecosystem Steering Group

01. In 2024, CO2 Datahub **is a data network designed for the needs of organizations in the real estate and construction industry**, intended for the **collection and reliable sharing of real emission data.**

02. The goal of the data network is to:

- *Help to understand the overall picture of the emission situation of the built environment*
- *Use information to lead the implementation of solutions that reduce the carbon footprint*
- *Produce a financially significant responsibility advantage for the participating organizations*

03. In 2024, the CO2 Datahub will be **an attractive example formed by pioneering organizations,** which not only attracts new industry organizations, but also **leads the entire real estate and construction industry to lighten its carbon footprint and improve its overall sustainability**

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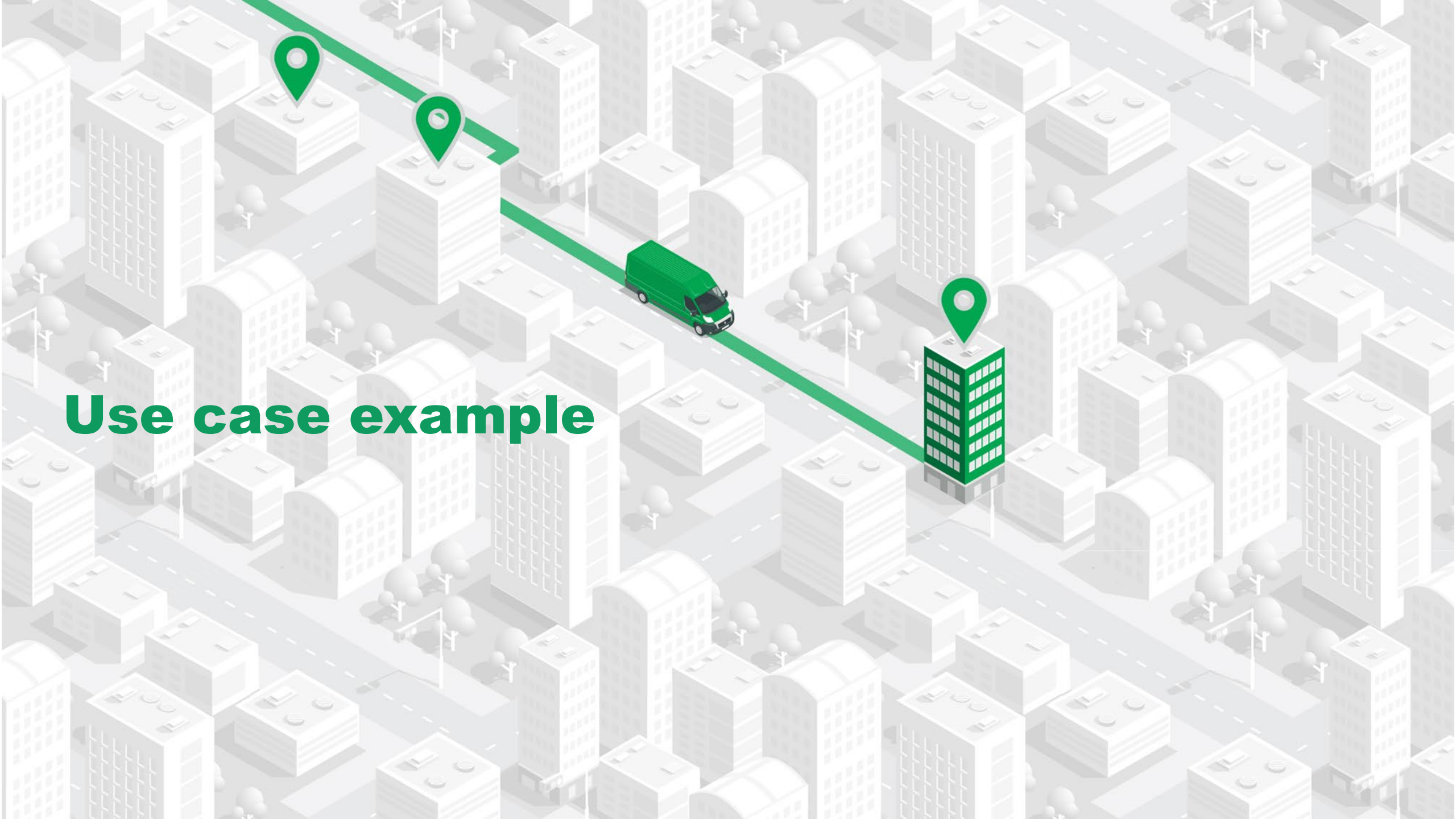
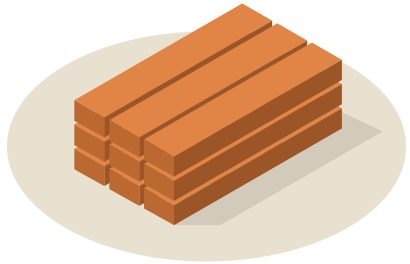
Use case example



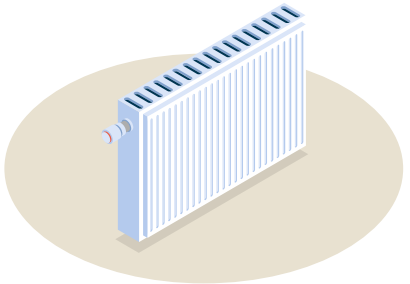
How to capture emissions from building maintenance?

Selected emission sources

Transports of building maintenance



Materials of building maintenance



Heating

Data providers

1. Building maintenance companies (several)
2. Elevator maintenance company
3. Local district heating company

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CASE: How to capture, calculate and report actual emissions

CO_2 emissions of maintenance transport vehicles for a building

Maintenance log

- Building C
- Location
- Maintenance task X
- Timestamp

Vehicle data

- Model “Van e1200s”
- CO2 emissions “137 g/km”

Emission factor

- for “95 octane gasoline”

Data platform

Connect, harmonise, quality-control, and provide legal rights and contract management of data

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Calculation engine(s)

Emission calculation engine & rules

Emission report

- for a building
- by maintenance task
- for given date range
- in chosen data/file/UI format

Platform of Trust and GAIA-X

Ilkka Anttonen

Euroopan unionin rahoittama – NextGenerationEU

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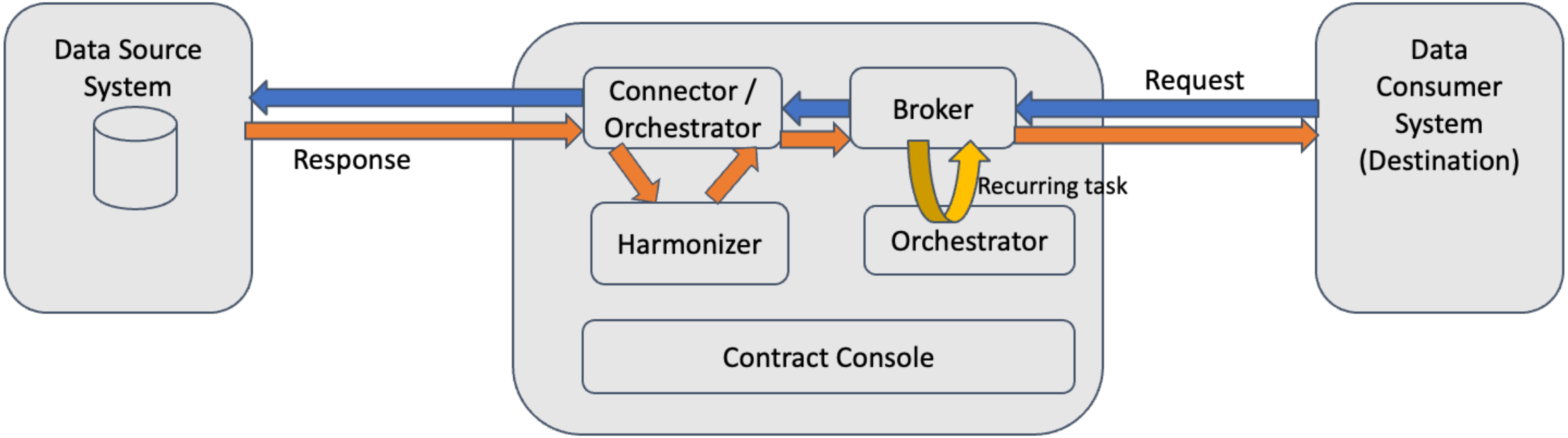
Platform of Trust Architecture



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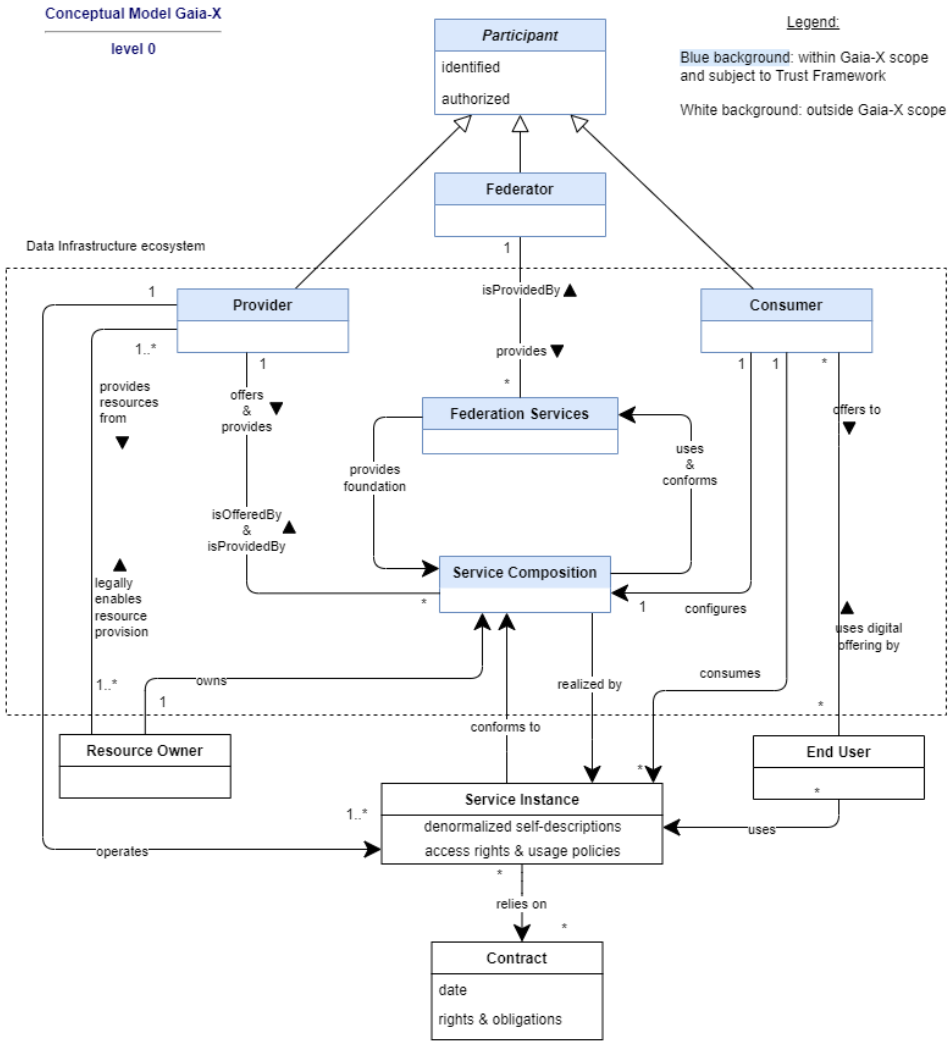
Mapping Platform of Trust to GAIA-X Core Values



- Open - Utilize GAIA-X components as they mature
- Transparent - Prepare to demostrate and verify services
- Sovereign - Utilize GAIA-X provided framework
- Fair - Embrace GAIA-X FAIR principles
- Independent - Support independence of GAIA-X
- Inclusive - Zero tolerance for abuse or discrimination
- Free - Support development as resources allow
- Federated - Be a part of federated model
- Innovative - Explore and adapt new ideas and tech
- Evolutionary - Evolve together

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Next Steps

- Move towards implementation with an agile mindset and be ready to quickly adapt to maintain compability with GAIA-X core values, principles and technologies
- Establish and maintain active communication and collaboration with GAIA-X Architecture group
- When GAIA-X Lab releases elements and components be ready to explore and try them out
- Aim for GAIA-X Compliance
  - Trust framework
  - Labelling framework

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Thank you!

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WHY CO2 DATAHUB PROJECT?

Anne Kaiser
Sustainability manager
Saint-Gobain Finland Oy

ABOUT SAINT-GOBAIN

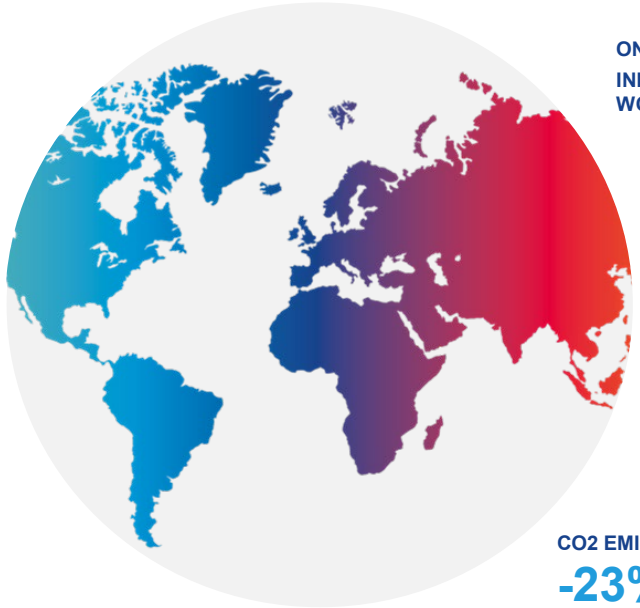
TURNOVER 2021
44.2 MRD. €

ACTIVITIES IN
75 COUNTRIES

MORE THAN
166,000
EMPLOYEES

MORE THAN
100 NATIONALITIES

OVER
80 %
OF TURNOVER COMES FROM BUILT ENVIRONMENT



ONE OF THE TOP **100**
INDUSTRIAL GROUPS IN THE WORLD.

APPROXIMATELY
800
MANUFACTURING FACILITIES

FOUNDED OVER
350 YEARS AGO

CO2 EMISSIONS
-23%
REDUCTION FROM 2017 TO 2021 (SCOPE 1 & 2)

MAKING THE WORLD A BETTER HOME

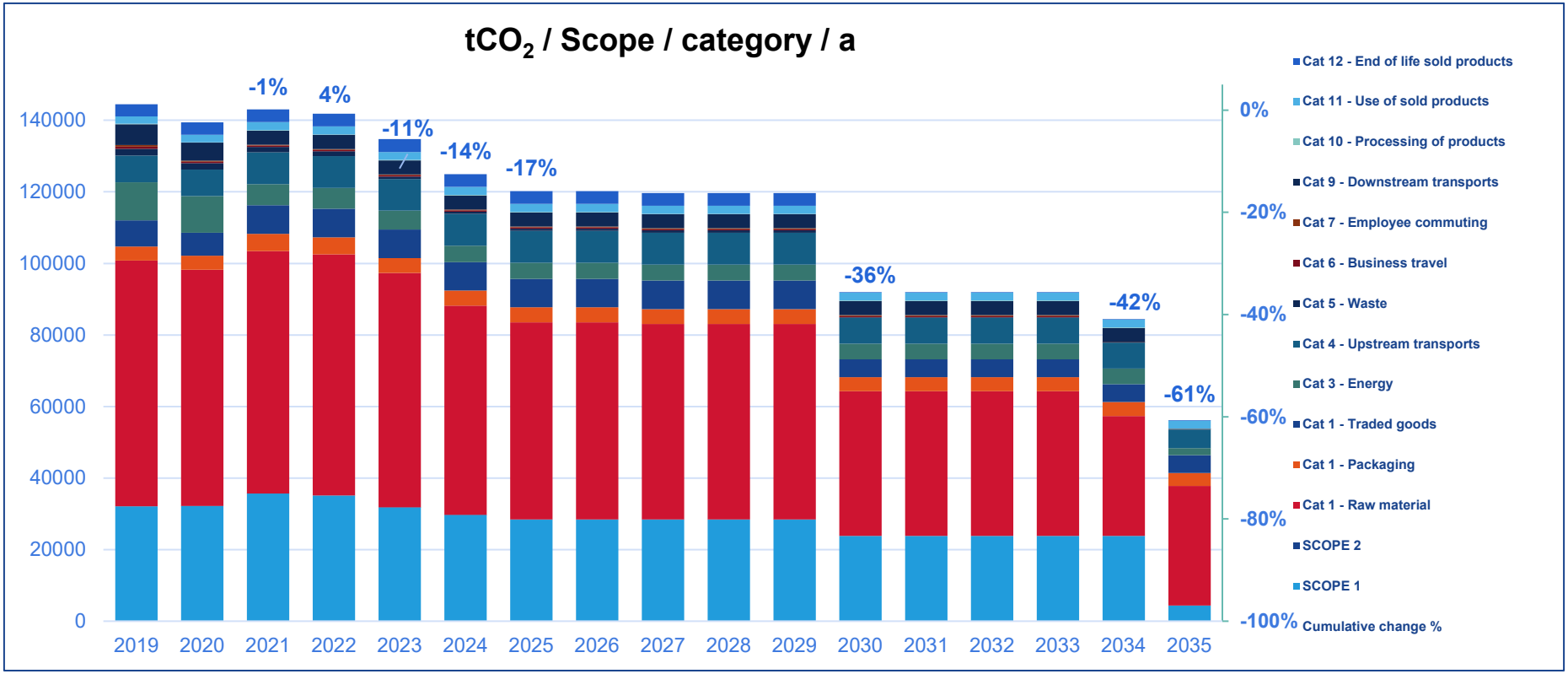
SAINT-GOBAIN

SAINT-GOBAIN

Saint-Gobain, committed to achieving carbon neutrality by 2050, announces that the Science Based Targets initiative1 has approved its greenhouse gas emission reduction targets as consistent with the organization's new net zero standard and the Paris Climate Agreement. Saint-Gobain is the first company in its sector worldwide to receive this approval since the introduction of the new standard at the end of last year…

SAINT-GOBAIN

SAINT-GOBAIN FINLAND NETZERO ROADMAP 2019-2035 (03/2022)



CARBON FOOTPRINT ORGANIZATIONS AND PRODUCTS

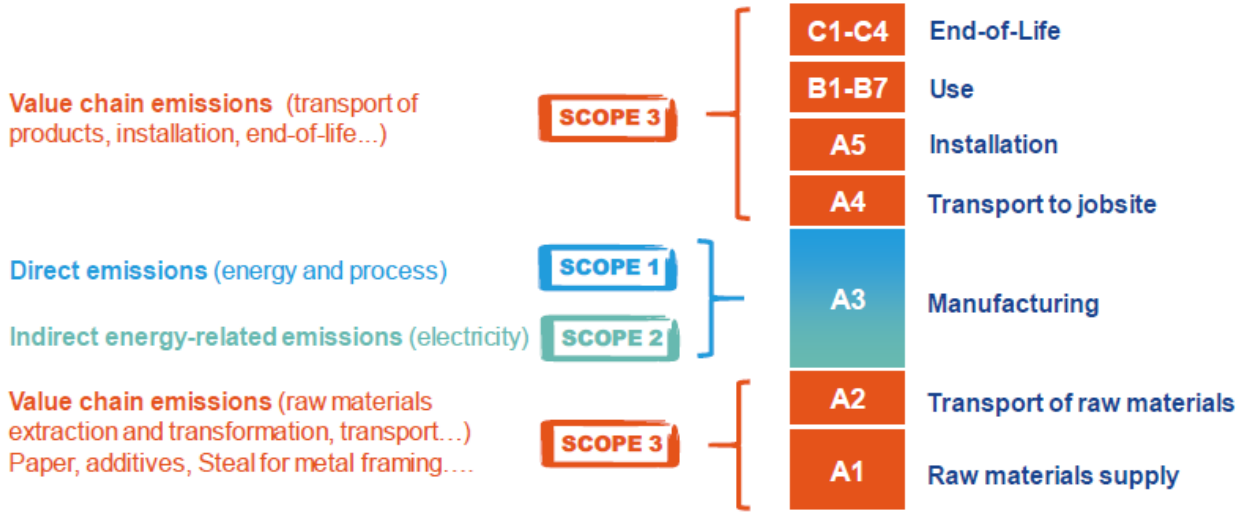
CARBON FOOTPRINT OF ORGANISATIONS

Standard: GHG protocol

CARBON FOOTPRINT OF PRODUCTS

Standard: EN 15804

Based on Life Cycle Assessment and Environmental Product Declaration



SAINT-GOBAIN

OUR MISSION IS TO ENABLE OUR CUSTOMERS TO DECARBONIZE

1. Saint-Gobain has published over 1500 EPDs in 31 countries – **more than any other company in the world?**
2. In Nordics we have published **over 400 EPDs.** And we need to publish more & **update existing ones**…
3. Our EPDs are published on different EPD platforms:

EPD® THE INTERNATIONAL EPD® SYSTEM

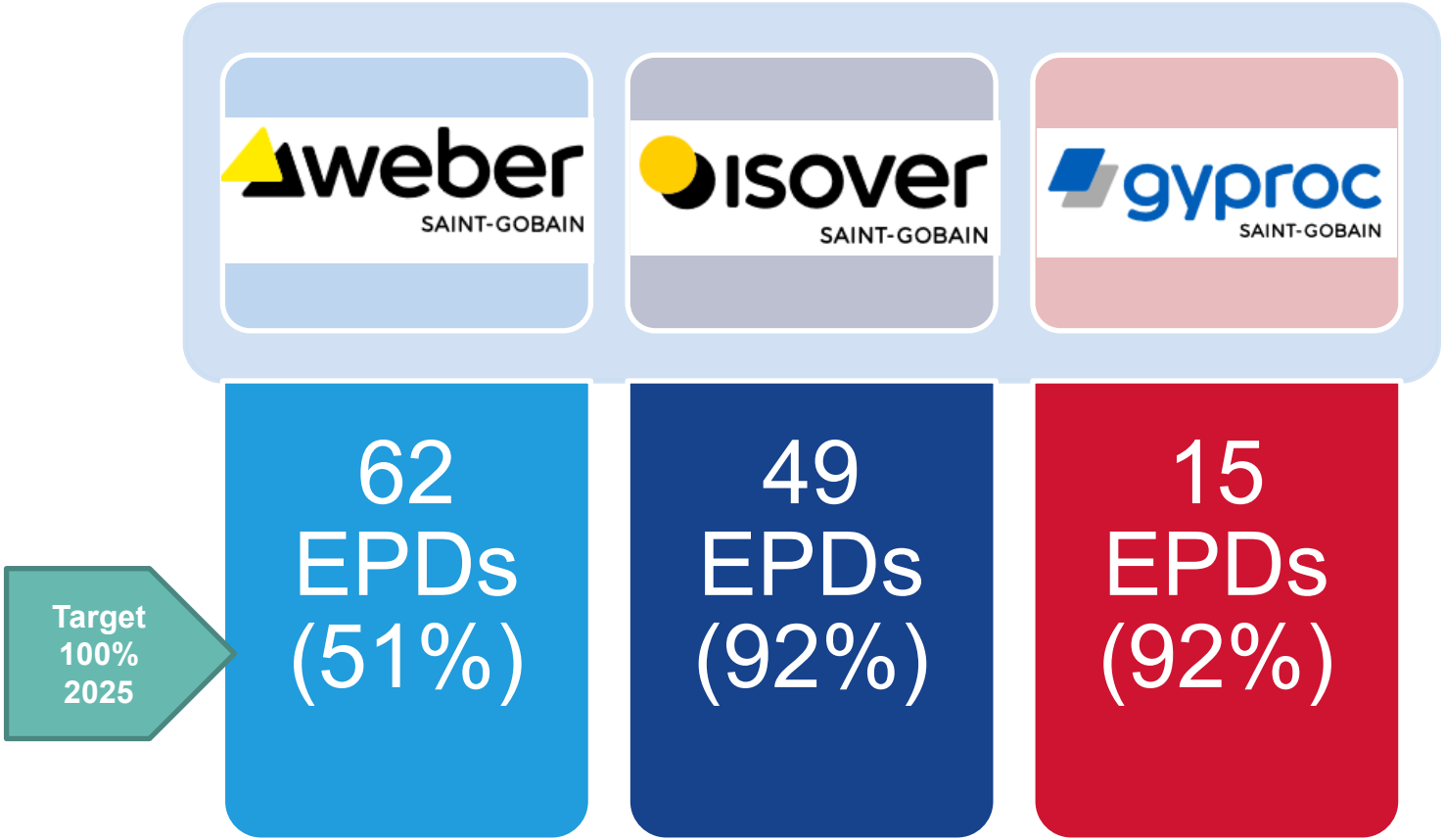
epd-norge.no The Norwegian EPD Foundation

EPD THE BUILDING INFORMATION FOUNDATION

- **EN 15804 standard (+A1 / +A2)**
- **3rd party verification**
- **Published on EPD operator platform**
- **Whole lifecycle - end-of-life!**
- **Product specific**

SAINT-GOBAIN

NEW OBJECTIVES, NEW KPI'S



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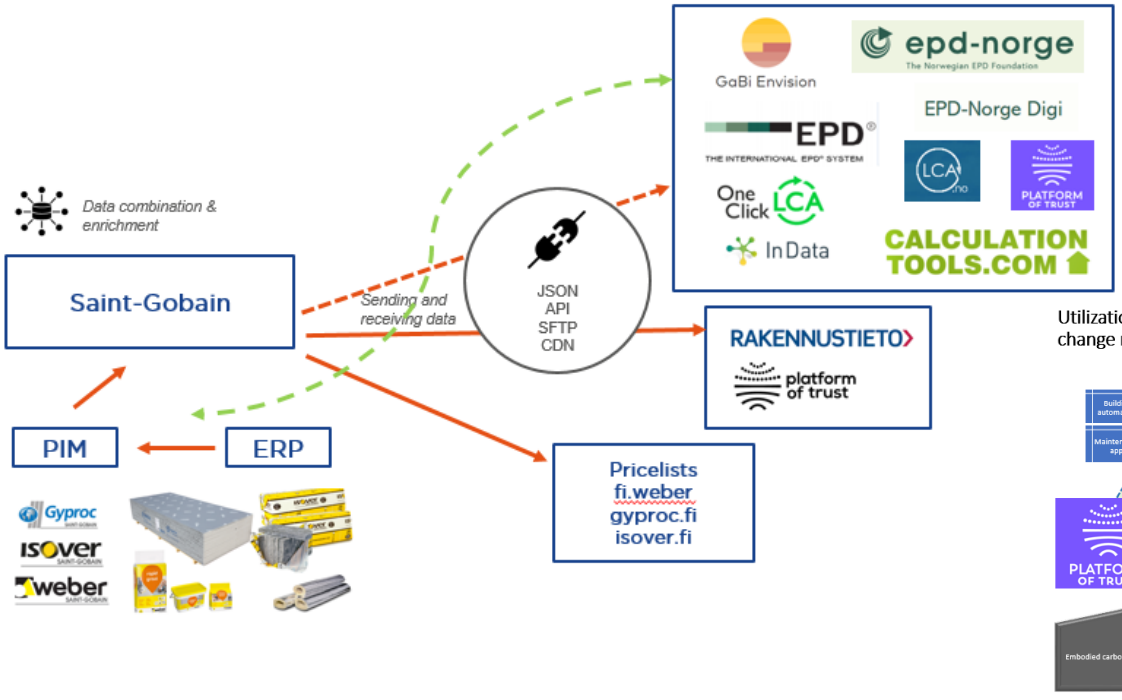
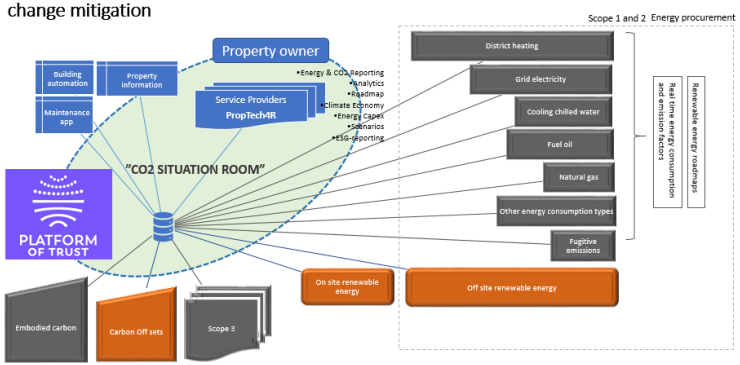


Utilization of CO_2 emission data in the real estate and energy sectors for the climate change mitigation



SAINT-GOBAIN

Wilma Siitonen, Saint-Gobain Finland / Petri Suutarinen, Platform of Trust

MAYBE THERE ARE SIMPLE SOLUTIONS?

UUID

ILCD+

GTIN

SAINT-GOBAIN

WHY CO2 DATAHUB PROJECT?

- Nothing comes for free – money, time, nerves..?
  - We want our data to be used!
  - How to share (up-to-date) data in the smoothest way to maximum number of stakeholders?
    - Including ourselves as stakeholder…
- Do we really know what data and in which format is needed?
  - CO2 is one thing itself – enriched product and quantity data flows?
  - Is some “no-brainer” explanatory data missing?
    - Even if we always know better than others ☺
- We don’t have the means and tools only by ourselves!
  - Co-operation over the value chain & ecosystems & industries is the key!

SAINT-GOBAIN

A STEP FURTHER…

CALCULATION TOOLS.COM

About | Project | Filter

Filter

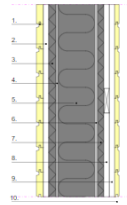
Name	U-value	REI (E)	REI (I)	id
US 1108 30-9-148-13-25	0.17	60	30	82
US 1108 30-9-148-18-25	0.17	60	60	85
US 1108 50-9-148-13-25	0.15	60	30	83
US 1108 50-9-148-18-25	0.15	60	60	86
US 1108 50-9-198-13-25	0.13	60	30	84
US 1108 50-9-198-18-25	0.13	60	60	87
US1101 100-9-173-173-2xGEK13	0.08	60	30	34
US1101 100-9-173-173-GEK13	0.08	60	30	25
US1101 100-9-173-173-GFL18	0.08	60	60	31
US1101 100-9-173-173-CH13	0.08	60	30	28
	0.17	60	-	10
	0.17	60	-	1
	0.17	60	-	7
	0.17	60	-	4
	0.14	60	-	11
	0.14	60	-	2
	0.14	60	-	8
	0.14	60	-	5
	0.13	60	-	12
	0.13	60	-	3

Results | Figure | Help

Open U value calculation

System products

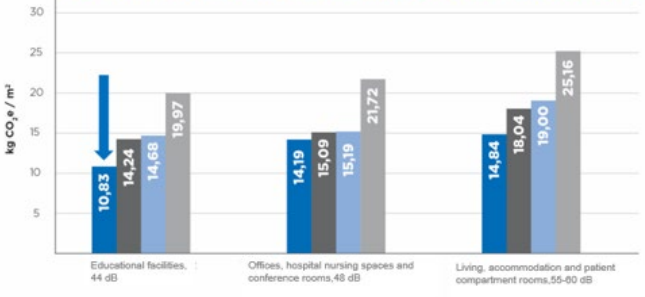
Kerros	Product name	Paksuus	www
1.	Ulkoverhous	28	
2.	Tuuletusrako ja pystykoolaus 22x100 k600	22	
3.	ISOVER Facade	30	lisätietoja
4.	Glasroc GTX 9	9	lisätietoja
5.	Runko 48x148 k600	148	
	+ Isover Premium 33	150	lisätietoja
6.	Gyproc GEK 13	13	lisätietoja
7.	Isover Sauna 25	25	lisätietoja
8.	Vaakakoolaus 22x100 k600	22	
9.	Tuuletusrako ja pystykoolaus 22x45 k600	22	
10.	Vaakapaneeli esim. 18x95	18	
	+ pintakäsittely huoneselosteen mukaan		



Technical data

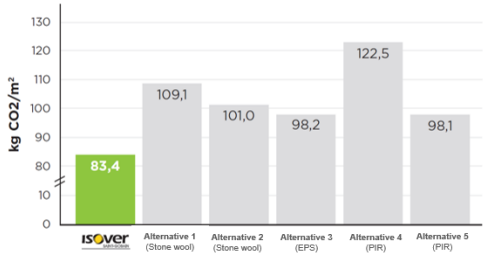
System features	Value	www
Nimi	US 1108 30-9-148-13-25	
U-arvo	0.17 W/m²K	
Paloluokka, palo ulkopäin	REI60 (maksimi seinänkorkeus 3000mm)	
Paloluokka, palo sisältäpäin	REI30 (maksimi seinänkorkeus 3000mm)	
Eristeiden sisältämä palokuorma	16 MJ/m2 (seinäneliötä kohden)	
GWP valmistus (A1-A3)	17.45 kg CO2e/m² (Hiilijalanjäljen laskentaan)	lisätietoja
²,hiilivarasto (D4)	-49.27 kg CO2e/m² (Hiilikädenjäljen laskentaan)	lisätietoja
Javerhousluokka	K2 10 (ulkoapäin)	

LIGHT WEIGHT PARTITION WALLS BY SOUND CLASSES

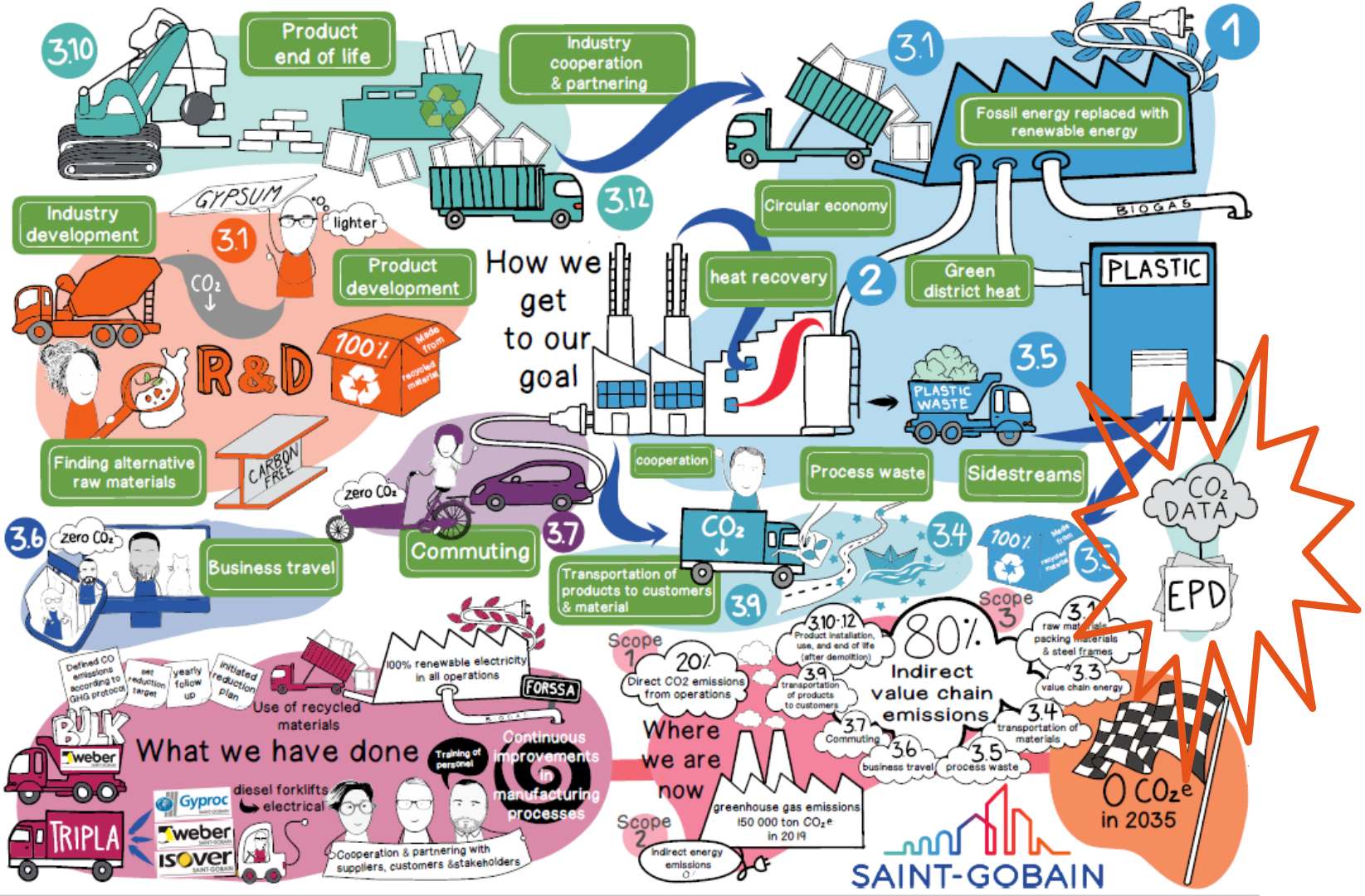


Structure 1	44 dB, Gypsteel XR 95/95 H-H M50 / 48 dB, Gypsteel XR 66/66 HN-NH MR / 55-60 dB, Gypwood GT 66/66x2 NN-NN M140
Structure 2	44 dB, Gypsteel GS 66/66 KN-NK M50 / 48 dB, Gypsteel GS 95/95 KN-NK M70 / 55-60 dB, GS 66/66x2 NN-NN M100
Structure 3	44 dB, Gypsteel XR 66/66 KN-NK MR / 48 dB, Gypsteel XR 66/66 KN-NK M50 / 55-60 dB, SLIM 45/45x2 HH-HH M90
Structure 4	44 dB, Galvanoitu teräsrankaseinä 66/66 K'N'-N'K' M50 / 48 dB, Galvanoitu teräsrankaseinä 95/95 K'N'-N'K' M70 / 55-60 dB, Galvanoitu teräsrankaseinä 66/66x2 N'N'-N'N' M100

Low slope roofs – Sheet metal profile, U-value 0,09



SAINT-GOBAIN


3.10
Product end of life
Industry cooperation & partnering
3.1
1
Fossil energy replaced with renewable energy
BIOGAS
3.12
Circular economy
Industry development
GYPSUM
3.1
lighter
Product development
CO2
R&D
100%
Made from recycled materials
How we get to our goal
heat recovery
2
Green district heat
PLASTIC
3.5
PLASTIC WASTE
Finding alternative raw materials
CARBON FREE
zero CO2
Commuting
3.7
cooperation
Process waste
Sidestreams
CO2 DATA
EPD
3.6
zero CO2
Business travel
CO2
3.4
Transportation of products to customers & material
3.9
Scope 3
80%
Indirect value chain emissions
3.10-12
Product installation, use, and end of life (after demolition)
3.9
transportation of products to customers
3.7
Commuting
3.6
business travel
3.5
process waste
3.4
transportation of materials
3.3
value chain energy
3.1
raw materials packing materials & steel frames
Scope 1
20%
Direct CO2 emissions from operations
Where we are now
Scope 2
Indirect energy emissions
greenhouse gas emissions
150 000 ton CO2e in 2019
0 CO2e in 2035
Defined CO emissions according to GHG protocol
set reduction targets
yearly follow up
initiated reduction plan
100% renewable electricity in all operations
FORSSA
Use of recycled materials
What we have done
BULK
weber
TRIPLA
Gyproc
weber
isover
diesel forklifts
electrical
Training of personel
Continuous improvements in manufacturing processes
Cooperation & partnering with suppliers, customers &stakeholders
SAINT-GOBAIN

THANK YOU

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RISE TO SHINE!

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