

Energy transition Sibelco:

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Sibelco Global

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Content:

1. Short introduction to Sibelco
2. Scope 1,2 and 3
3. Baseline carbon foot print Sibelco Global
4. Targets carbon foot print reduction
5. How to reduce the carbon foot print
6. Examples of ongoing achievements

Our Business at a Glance

Founded in 1872, Sibelco has grown into a multinational business with operations in 31 countries and an extensive multi-mineral portfolio.



PEOPLE
5,100



REVENUE
€1.7 BN



COUNTRIES
31



EBITDA
€270M



TECHNICAL CENTRES
6



FOCF
€81M



PRODUCTION SITES
120



ROCE
7.3%



Material Solutions

We offer a broad range of high-specification products, derived from a core group of minerals divided into five main categories:



EVERYTHING WE DO IS GUIDED BY OUR PURPOSE:

Material Solutions Advancing Life

We create materials that power progress. Our products help to build homes, cities and vehicles; to support the supply of renewable energy, food and clean water; to create technologies such as smartphone display screens, printed circuit boards and semiconductors.

We do this within a robust sustainability framework, always balancing economic performance with environmental stewardship and social responsibility.

Our Vision

“We will become:

- **the global leader** in the mining, processing & selling of silica sand
- **a regional leader** in clays, feldspathics, olivine & glass recycling

Sustainability, including a relentless focus on safety & CO₂ emissions reduction, is a fundamental part of our vision.”

Our Values



Integrity



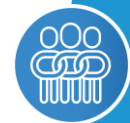
Respect



Ownership



Excellence



Teamwork

Our Targets 2023



Reduce reportable incident rate (RIR) to 2.5



Increase free operating cash flow (FOCF) to €120m per year

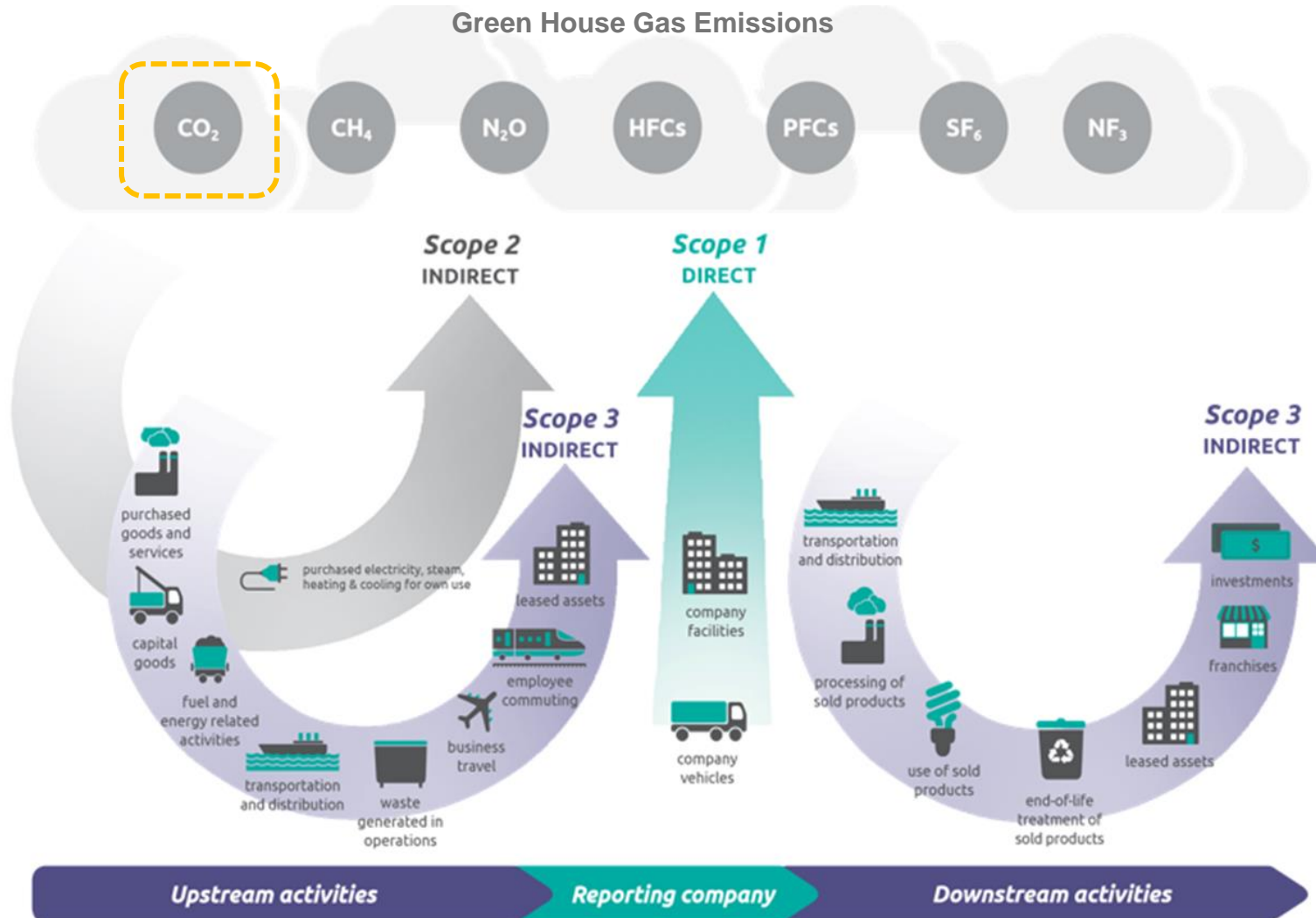


Improve return on capital employed (ROCE) to 11%



Reduce CO₂ emissions intensity by 5% a year between 2021 & 2030

2. Scope 1-2 & 3



3. Scope 1 and 2 emissions calculation

Power Purchased
Natural Gas
Diesel Fuel

$$\text{Energy [kWh]} \cdot \text{Emission Factor} \left[\frac{\text{kgCO}_2}{\text{kWh}} \right] = \text{Carbon Emission [kgCO}_2\text{]}$$

Defra, Scope 1 EF

Research and analysis
Greenhouse gas reporting: conversion factors 2021

These emission conversion factors are for use by UK and international organisations to report on 2021 greenhouse gas emissions.

From: [Department for Business, Energy & Industrial Strategy](#)
Published 2 June 2021

Documents



[Conversion factors 2021: condensed set \(for most users\)](#)

XLSM, 776KB

This file may not be suitable for users of assistive technology.

[Request an accessible format.](#)

Related content

[Greenhouse gas reporting: conversion factors 2018](#)

[Government conversion factors for company reporting of greenhouse gas emissions](#)

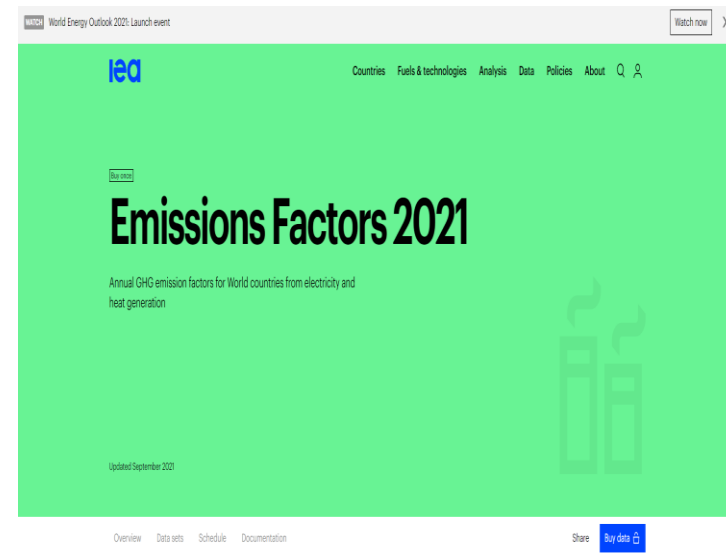
[Greenhouse gas reporting: conversion factors 2019](#)

<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021>

For free!

Updated in
Corp PEER!

IEA, Scope 2 EF

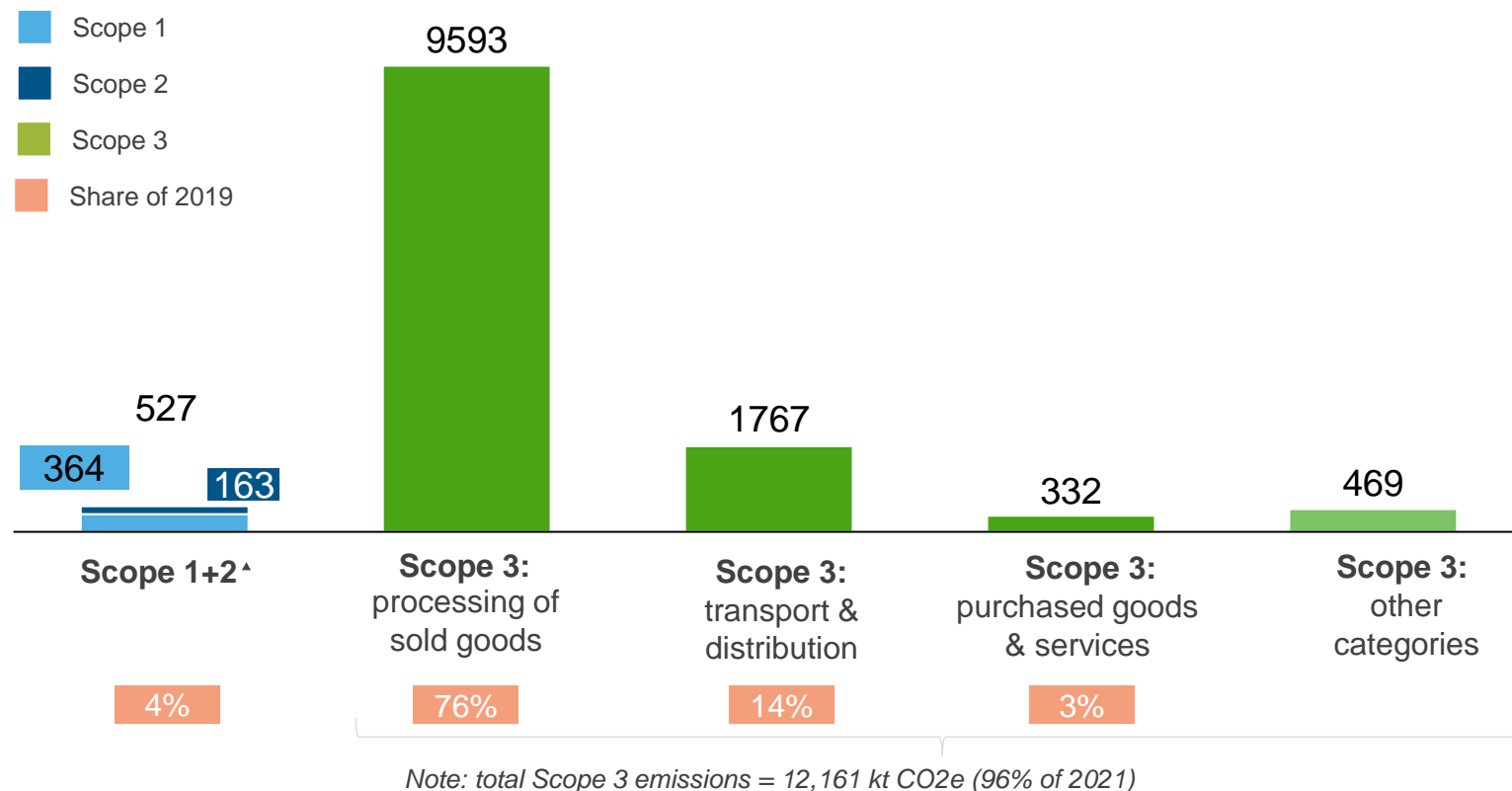


Yearly subscription!

3. Baseline Sibelco Global scope 1-2 & 3



Emissions 2021 (base year): kt CO2e



- For **Scope 1-2 emissions**, decarbonization can be driven by Sibelco directly.
- For **Scope 3 emissions**, decarbonization is only partially driven by Sibelco and hinges on suppliers' and customers' decarbonization efforts and willingness to collaborate with us.

[^] Scope 2 is electricity only

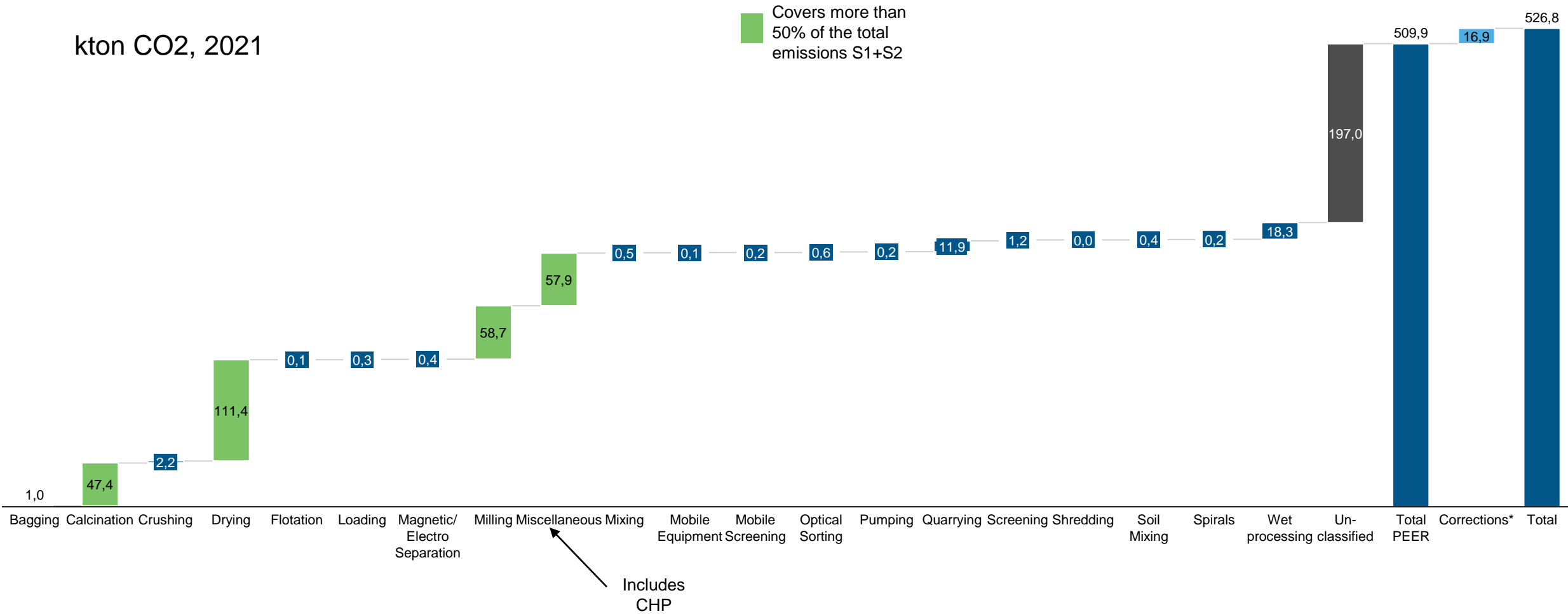
Source: Sibelco climate support - GHG Footprint Tool - 2021 - ERM4;

Our reference to evaluate CO2 Emissions is the GHG Protocol. Have a look at: <https://ghgprotocol.org>

3. CO2 Emissions by Activities



kton CO2, 2021



*Corrections refer to renewable energy, other emissions scope 1 (eg explosives), warehouses and company cars, sites into accounted in PEER

Data Source: PEER based on workcenter code

4. Scope 1-2: CO₂ emissions reduction target



**5% annual
reduction from
2021 to 2030**

**37% reduction
in 9 years**

- Scope 1-2 emissions **intensity reduction target** from 2021 to 2030 of **5% p.a. of kg CO₂_e / € ex-works revenue**
- This intensity target represents a reduction of **37% in absolute emissions** in the 9 years from 2021 to 2030 if Sibelco maintains the same scope of activity
- This target is in line with best practices promoted by the **Science Based Target Initiative** (SBTi – Well below 2° C scenario)
- Sibelco will **invest** approximately **€ 90 million** in new technologies and operational excellence initiatives over next 9 years to support its goal.

4. Some definitions:



GHG Protocol

Most widely used green house gas accounting standard.

Sibelco uses GHG protocol to calculate and measure its footprint in scope 1-2 &3

Science Based Target initiative

SBTi provides companies with a clearly defined path to reduce emissions in line with the Paris Agreement goals.

Targets are considered “science based” if they are in line with what latest climate science deems necessary to meet the Paris goals. Two scenarios can be chosen : Well below 2°C scenario (linear reduction of 2.5 %) and 1.5°C scenario (linear reduction of 4,2%)

If scope 3 of the company >40% of the footprint, scope 3 targets have to be set (covering 67% of scope 3) in order to be SBTi compliant

Absolute emissions reduction target versus intensity target

An absolute emissions reduction target refers to the total quantity of GHG emissions emitted.

Intensity targets express CO2 emitted per unit or economic output e.g. CO2/tonne sold, CO2/€ of revenue.

SBTi requires absolute emission calculations, but the reduction can be expressed via an intensity KPI.

Carbon offsetting

An activity (such as planting of trees or carbon sequestration) that compensates for the emissions made elsewhere.

There are two types of markets for carbon offsets : compliance (e.g. European ETS) and voluntary.

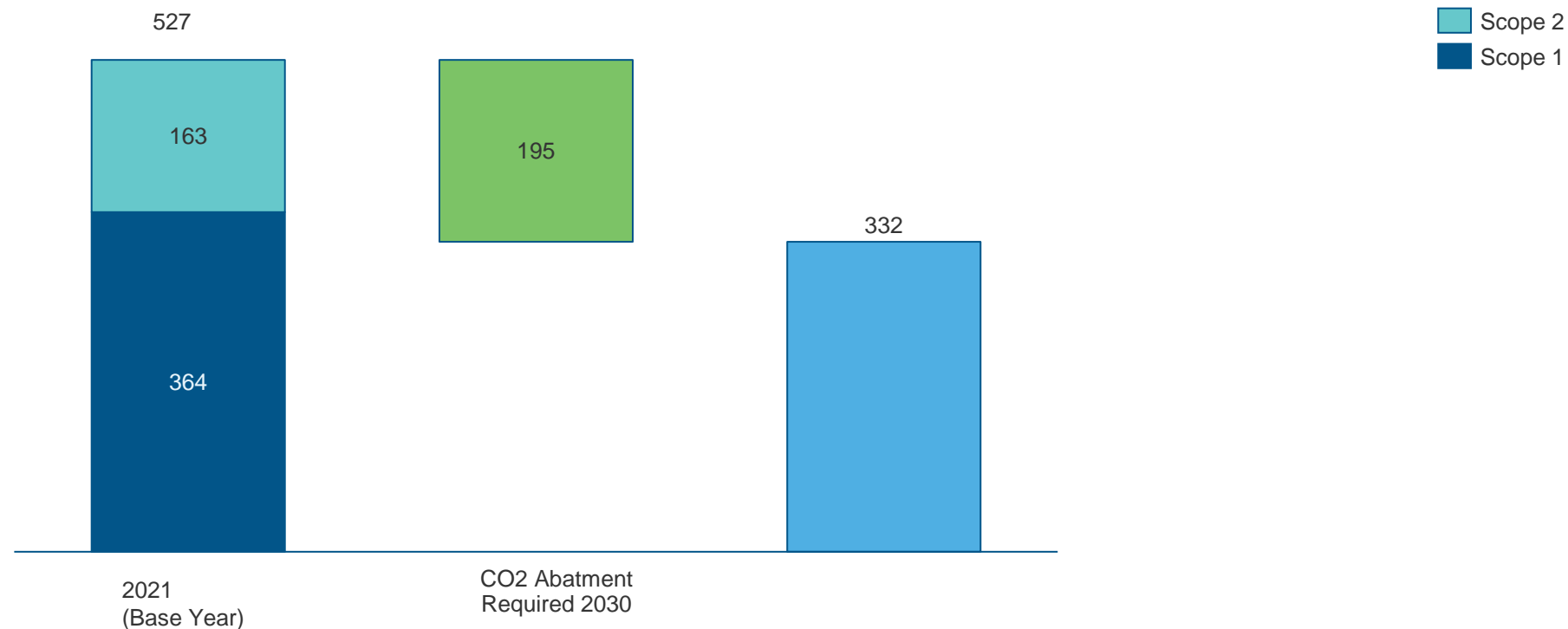
The voluntary market is facilitated by certification programs (e.g. Gold Standard).

Voluntary carbon offsets or carbon credits cannot be counted as emissions reduction in the GHG protocol or SBTi.

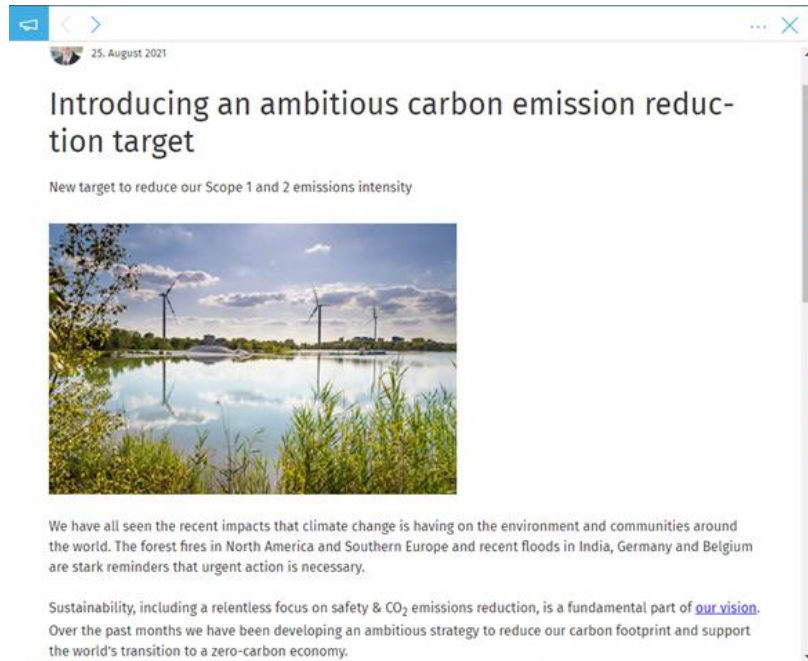
4.Scope 1 and 2 Target

KPI Scope 1 and 2		Baseline 2021	Target 2030	Reduction 2021-2030	Objective 2021-2030
Intensity Target	kgCO2e/€-exw	0.40	0.25	-37%	-5% yoy
Absolute Target*	ktCO2e	527	332		

* with same scope



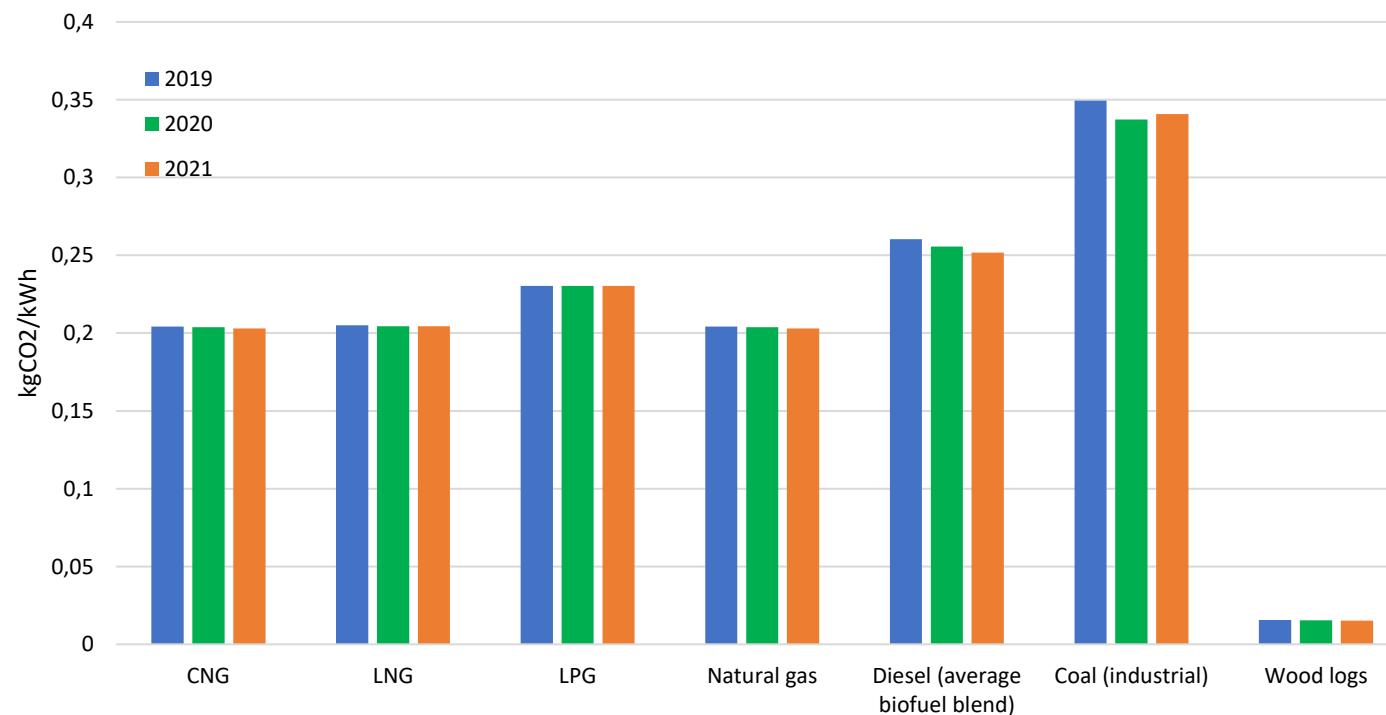
5. How to Reduce CO2 Emissions on Scope 1 and 2



$$\text{Energy [kWh]} \cdot \text{Emission Factor} \left[\frac{\text{kgCO}_2}{\text{kWh}} \right] = \text{Carbon Emission [kgCO}_2\text{]}$$

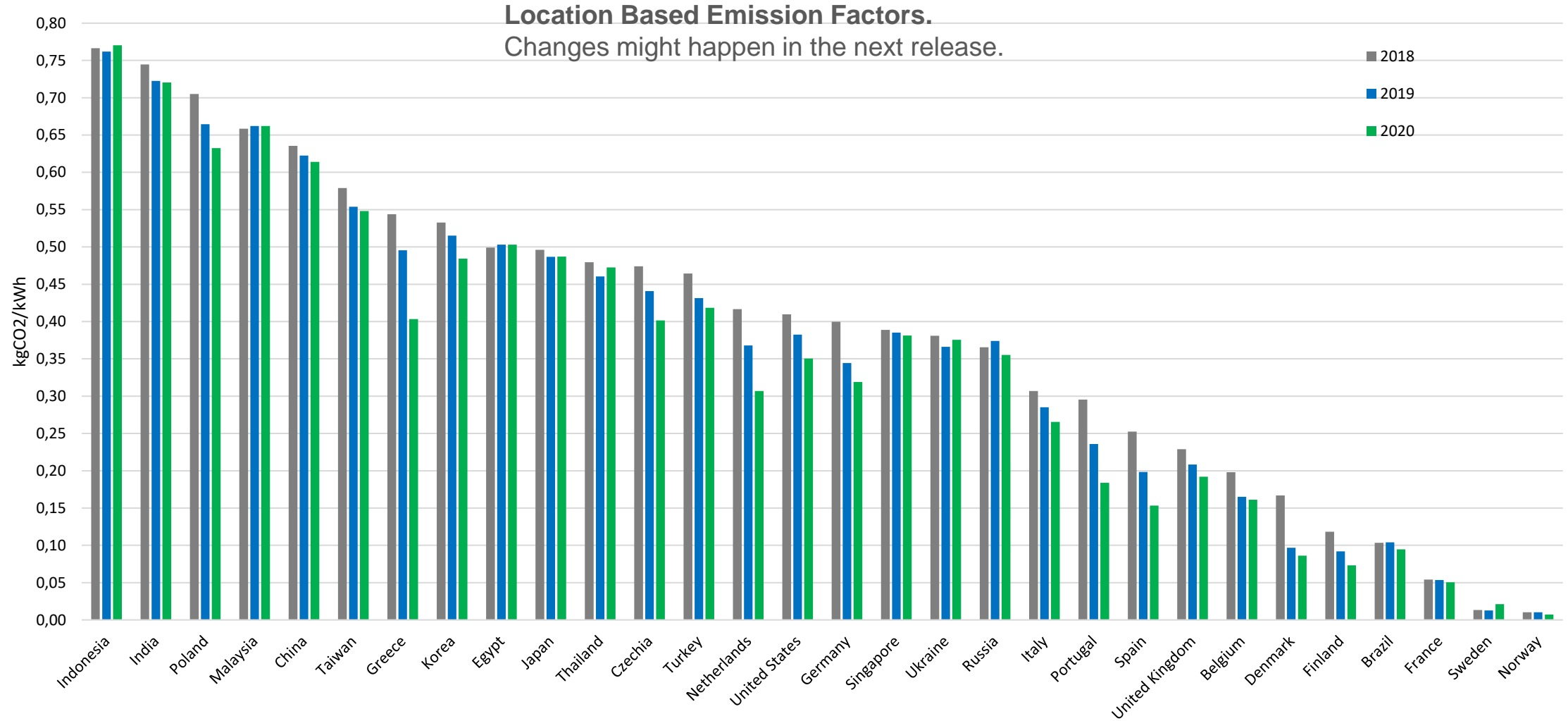
- Energy efficiency
 - Energy saving
 - Process change
 - Heat recovery
- Coal-to-gas
 - Fuel-to-gas/LPG
 - Electrification (! Be careful on your power **emission factor and price difference gas/power**)
 - Hydrogen/Ammonia
 - Renewables
 - Green Energy Purchase

5.Scope 1 Emission Factors



Source: Defra Database, released Oct 2021

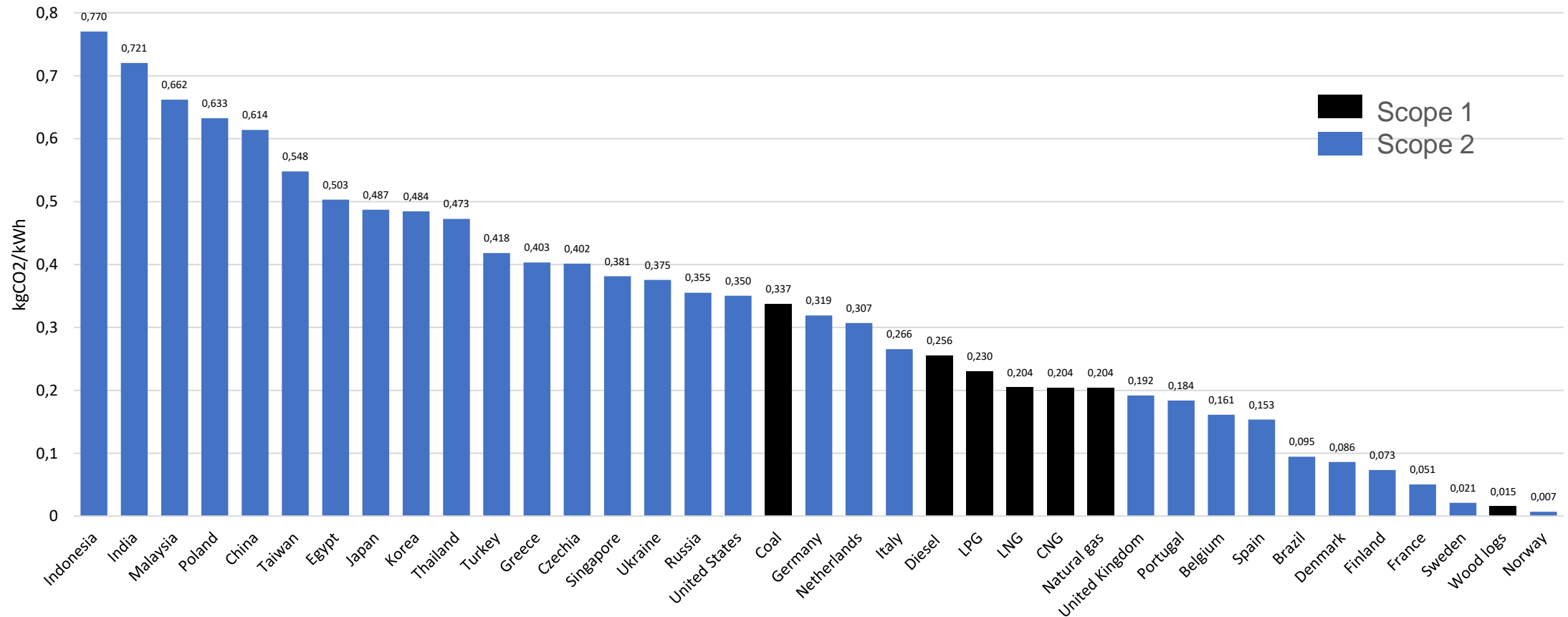
5. Scope 2 Emission Factors



Source: IEA Database, released Sep 2021.

5. Emission Factors: a full overview for 2020

(to evaluate if a potential switch from scope-1- to scope-2)



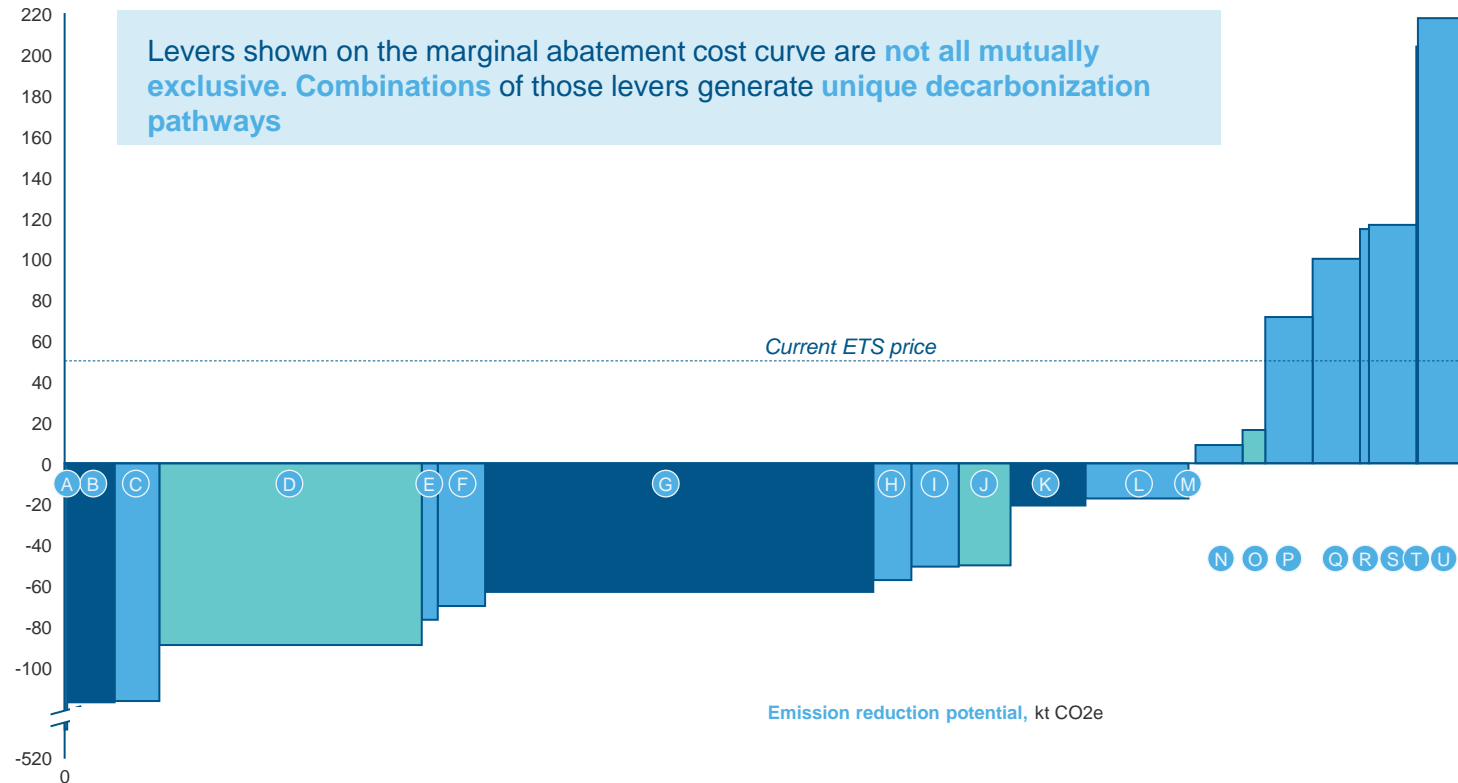
Key Insights

- Between Scope 1 and Scope 2 conversion efficiency should be accounted!

Marginal Abatement Curve of CO2 Initiatives: financial feasibility check

Marginal abatement cost curve

Scope 1 Scope 2 Scope 1 new technologies



- A Dryer replacement by gas-powered unit (from coal)
- B Milling burner replacement by heat separation unit¹
- C Dryer output sand heat recovery
- D Power purchase agreements
- E Calciner cooler upgrade to high efficiency unit
- F Milling burner replacement by heat storage unit²
- G Dryer redesign (electrification and heat recovery)
- H Milling classifier upgrade to high efficiency unit³
- I Milling burner replacement by waste woods-fueled burner
- J Electricity consumption reduction⁴
- K Calciner redesign (electrification and heat recovery)
- L Dryer exhaust air heat recovery
- M Power self-generation (already or soon in place)
- N Milling burner replacement by geothermal heating unit
- O Green energy procurement
- P Milling burner fuel switch to biogas
- Q Milling burner replacement by electrical heat pump
- R Milling classifier addition of second standard unit
- S Milling burner replacement by woodchips-fueled burner
- T Mining equipment (e.g., drill, bulldozer) fuel switch to biofuel (HVO)
- U Milling burner replacement by hydrogen burner

5. Roadmap Scope 1 & 2 Emissions based on MAC-curve:



#	Project ID	Project	NPV incl carbon price (€)*	CO2 abated (tCO2e)
3	7535	"CO2_2022" Energy cost reduction sand drying - hot gas generator	-9221829	3.261
2	7164	New boiler with cogenerator CO2_2022	-6112493	752
9	9298	CO2 - New electrical burner and chamber for dryer drum CO2_2022	-5913769	3.170
6	8060	WIN-CO2 Replacement lignite burners by gas burners CO2_2022	-1427848	1.390
19	10049	New solar panels plant of 1 MW roof mounted CO2_2022	-799287	302
17	10006	Installation of roof top solar plant for 500KW CO2_2022	-583652	432
22	10071	Drying plant - Convert from Gasoil to LPG. ~122 tonnes/annum CO2e reduction. CO2_2022	-532554	128
23	10075	Voltage optimisation CO2_2022	-470922	57
5	7904	UTI. Energy Efficiency Improvement of Milling Plant CO2_2022	-433505	84
14	9670	MTO - CO2 - Replace overcapacity gasburner PE21 by lower capacity high efficiency burner CO2_2022	-405338	266
16	9677	CO2_Dryer : creation of by-pass CO2_2022	-367037	148
21	10070	Replacement of old fixed speed compressor for new VSD compressor. ~46 Tonnes/annum of CO2e reduction. CO2_2022	-340744	46
7	8835	HRL CO2 PRJ Replace exhaust dryer 1 & Replace Burner Control Dryer 1+2 CO2_2022	-332279	22
8	8974	Energy efficiency improvement in carbonation Blowers - CO2_2022	-254482	33
1	5617	DES Renew burner installation Calciner C2 (incl. energy feed) C003715 - CO2_2022	-245701	169
13	9667	HL22/82 CO2 - heat exchanger kaolin dryer CO2_2022	-237396	142
26	10171	CO2_2022_Nilsia_replace_oil_heating_with_heat_pump	-197058	90
15	9676	Dryer : improvement of regulation Co2_2022	-173518	74
12	9666	CB22/81 CO2 - FMR - replacement burner mill 2 white CO2_2022	-167386	93
11	9513	Installation of Solar panels 250 KW CO2_2022	-145848	104
24	10076	Install new solar panels on warehouse CO2_2022	-131553	30
4	7786	GTB-CO2 Tent cover of raw materials CO2_2022	-125012	26
20	10066	~114kW of roof mounted solar panels. ~20 Tonnes/annum of CO2e reduction. CO2_2022	-81817	19
10	9324	CO2 - Upgrade of high voltage distribution CO2_2022	-	-
18	10022	Change Y-delta type compressor to Inverter type compresso CO2_2022	-	-
25	10223	CO2_2022 Installation of Meters (Global)	-	-
27	10187	"CO2_2022" electric meters for Ronne, Denmark	-	-
			-28701029	10.838

5. How to sustain and improve the energy performance and reduce the CFP:

- **Quick Wins:**
 - **Reduce** the temperature **setpoints dryers** with 3-5 degrees.
 - Investigate a **start/stop regime** for the burner versus a continuous regime
 - Reduce **idle run** process lines and mobile equipment
 - Install **timers** on light switches
 - **Cover stockpiles** as much as possible
 - **Peak shaving**
- **Actions which are a bit more difficult:**
 - Improve the OEE by improving the **Availability** (less downtime), **Performance** (better throughput) and **Quality** (prevent re-work)
 - Introduce **SPC (statistical process control)** to produce with the most efficient settings instead of the most convenient
 - **Create energy awareness** at the shop floor and middle management by **using energy KPI's** in the performance meetings and shift reviews
 - Improve the **planning** with less change overs and longer runs
 - **Improve mining/quarry plan** in order to reduce movements and idle run of mobile equipment
 - **Review the product specs.** with sales-customers (grainsize, moisture, mixtures ,)

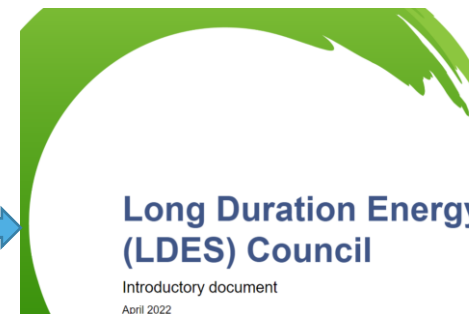
5. How to sustain and improve the energy performance:

- **Actions which need more CAPEX but already proven technology:**

- Replace **out dated burners** and burner control units
- Investigated **heat recovery** by heat exchangers or direct use of recycled hot air
- Install **LED lights** in the process facilities
- Install **drainage** system under stockpiles
- Continuously monitor **the compressed air network** for both leakages and pressure setpoints
- In case of replacement **energy efficient spare parts**, new machines and process lines

- **Future actions, breakthrough technology, not yet fully proven technology: FOR THE BIGGER STEPS FORWARD:**

- **Industrial heatpumps** using the “lower waste heat”
- **Electrification** of the dryer lines with green power
- **Hybrid Electrification** (electrification + fossil fuel support burner)
- **Green Hydrogen** via Electrolysers as a replacement for fossil fuels
- **Storage renewable power** by batteries, sand-batteries, hydrogen ,LDES
- Increase on site consumption of green power via **PPA's or VPPA's**,
- **Use the potential energy** (overflow watersilo's washingplants and others) to generate power
- New smart ideas in the external and internal innovation pipelines.....



McKinsey
& Company



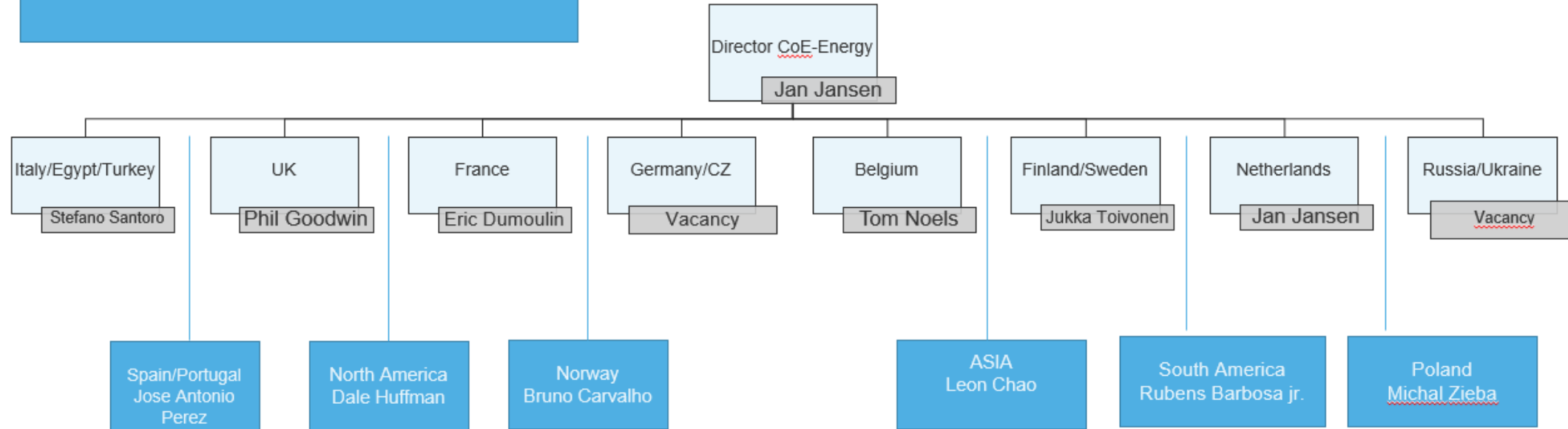
Long Duration Energy Storage (LDES) Council

Introductory document
April 2022

5. Global energy management team:

Main topics Volta team:

- Supports the sites in his area with energy topics
- Communicates guidelines/objectives
- Sets the planning of improvement initiatives together with the sites
- Shares best practices from other areas
- Follow up of legal obligations
- Assists procurement team in the energy procurement process.



5. ISO-50.001, MJA-3 and Energy Handbook

Sibelco
2025



Current issue date: 17 June 2022
Expiry date: 16 June 2025
Certificate identity number: 10442192

Original approval(s):
ISO 50001 - 17 June 2016

Certificate of Approval

This is to certify that the Management System of:

Ankersmit Maalbedrijven B

Op de Bos 300, 6223 EP Maastricht, The Netherlands

has been approved by LRQA to the following standards:

ISO 50001:2018

Approval number(s): ISO 50001 – 00026566



Rijksdienst voor Ondernemend
Nederland

Betref: MJA3/MEE-bedrijfsrapport: uw energie-efficiëntie resultaten 2020.

Sector: MJA Overige Industrie - Deelnemersnummer: 154

Sibelco Winterswijk B.V.
Steengroeveweg 50
7101 PH WINTERSWIJK

Geachte heer ten Dolle,

Uw MJA3/MEE-bedrijfsrapport 2020 staat klaar, download uw rapport uit het e-MJV.

Gebruik hiervoor de handleiding onder aan deze mail.

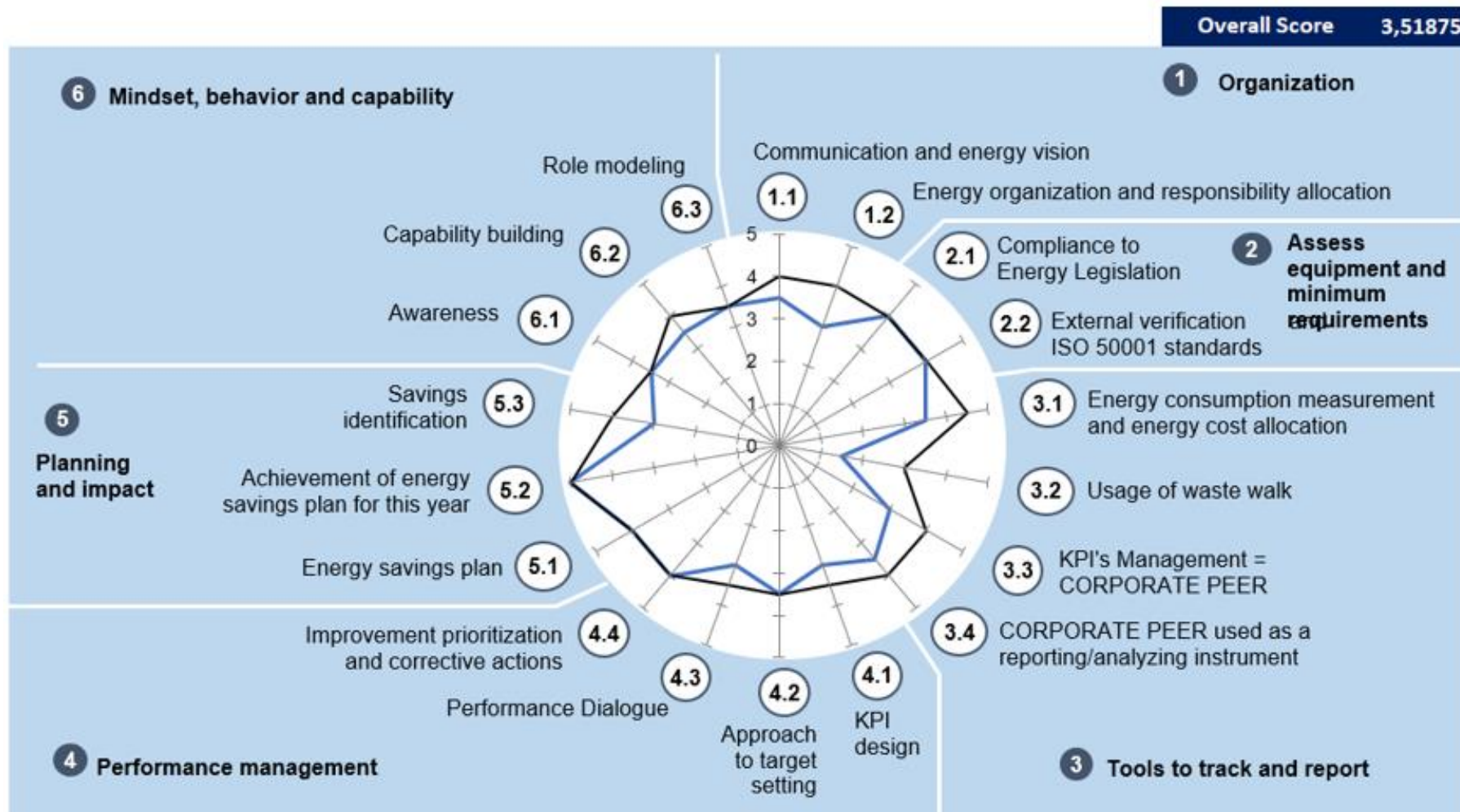


Sibelco

Energy handbook

A set of tools and guidelines for continuous improvement.

5. Internal energy audit:



1 Organization: 15%; Assess equipment and Minimum requirements: 10%; Tools to track and report: 15%; Performance management: 20%; Planning and impact: 25%; Mindset, behavior and capability: 15%
SOURCE: BSP Project team

5. Energy and CFP Monitoring system

ourSibelco Power BI Operations - CorporatePEER - Consumer OPS_002_PEER | Data updated 6/2/22

File Export Chat in Teams Get insights Subscribe

Reset to default Approval WE View

DATA KNOWLEDGE ACTION

Info

Name: Corporate Performance Energy Efficiency Report (PEER)
Version: 4.15- 2022.05
Data Source: Mendix App - PEER
Data Refresh Rate: 3 times per day
Owner: Jan Jansen

Content

Corporate PEER reporting, allowing insights into the Energy consumption of our sites. Data is uploaded in the CorporatePEER application.

Summary PEER: In this tab you can start your navigation and set your filters.
PEER: Details on product and workcenter level
KEY figures & Finance: Aggregated overview per country/site with the key numbers in energy units and Euro + P&L
Approval status PEER input: Progress of the approval status for the reporting due date of the 15th calendar day. For more detail on calculations and acronyms see Info Formulas page

Support

To access our Report Model documentation click on this [link](#)
Issues concerning this report can be logged via Service Now.

In house build Energy Management reporting tool

Performance Dial
To access our Perform

OPS_002_PEER Summary Performance Energy Efficiency Report

YEAR: 2018 2019 2020 2021 2022 | MONTH: Jan Feb Mar Apr May Jun

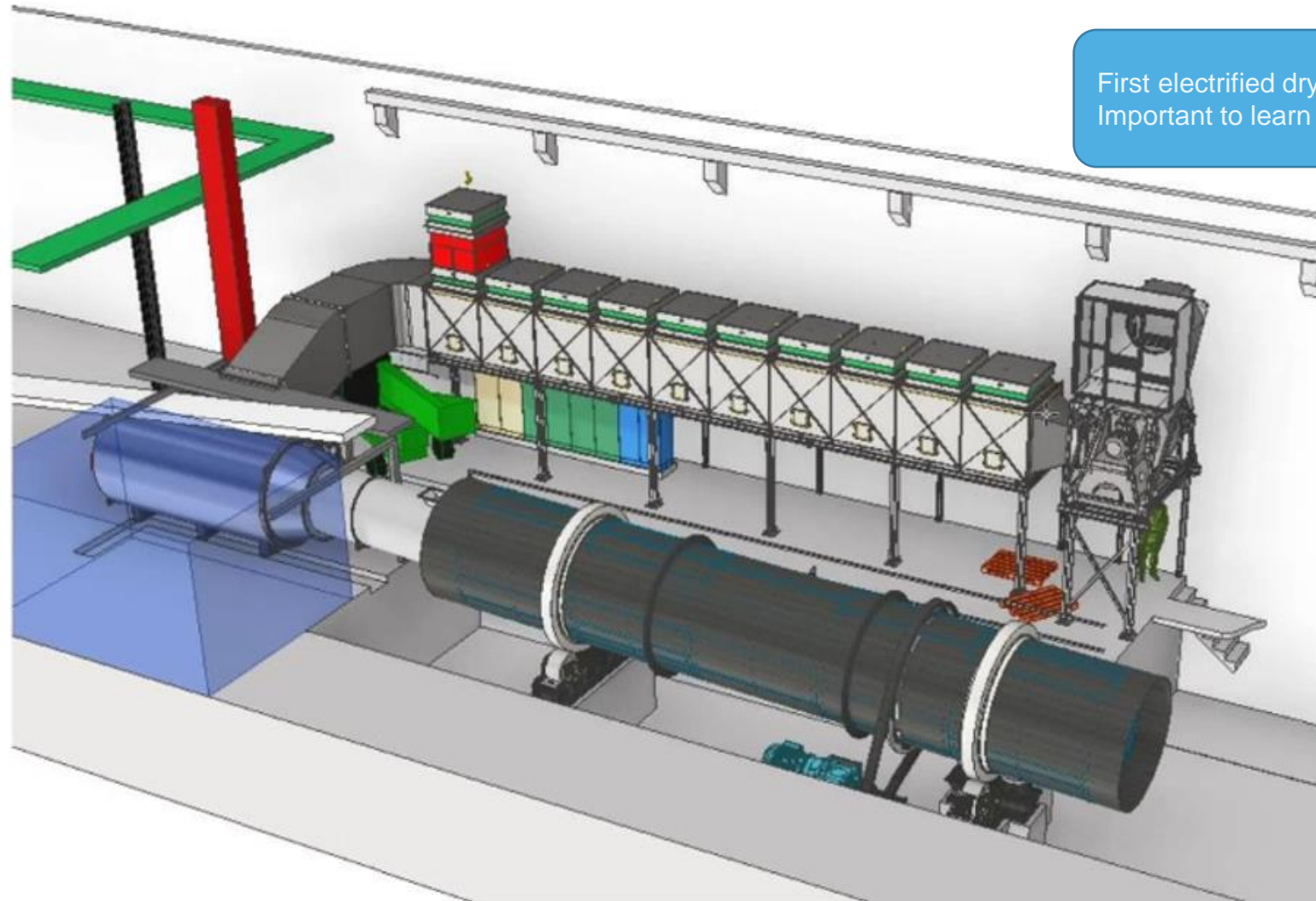
Energy Type	Total QD (kWh)	ED (kWh)	MD (kWh)	TD (kWh)	Energy Type	Total QD (€)	ED (€)	MD (€)	PD (€)	TD (€)
Electricity	3,183,022	10,697,308	298,948	14,169,278	Gas	€ 486,164	-€ 43,254	€ 224,157	-€ 5,454,650	-€ 4,787,592
Coal	-5,897,558	9,657,394	0	3,759,836	Fuel	-€ 351,885	€ 115,347	€ 275,948	-€ 2,597,798	-€ 2,558,388
Fuel	-5,682,325	1,862,652	4,456,080	636,407	Electricity	€ 262,930	€ 882,813	€ 24,694	-€ 5,834,328	-€ 4,663,892
Gas	17,895,630	-1,592,158	8,251,201	24,554,673	Coal	-€ 45,991	€ 75,312	€ 0	-€ 505,966	-€ 476,645
Total	9,498,768	20,615,195	13,006,230	43,120,193	Total	€ 351,217	€ 1,030,218	€ 524,800	-€ 14,392,742	-€ 12,486,507

Energy LY vs CY (kWh)

Energy LY vs CY (€)

Energy Type	Energy LYTD (kWh)	Unit Price LYTD (€/MWh)	Cost LYTD (€)	Energy YTD (kWh)	Unit Price YTD (€/MWh)	Cost YTD (€)
Gas	378,948,965	€ 27.17	€ 10,294,763	354,394,292	€ 42.56	€ 15,082,346
Fuel	70,837,663	€ 61.93	€ 4,386,709	70,201,257	€ 98.93	€ 6,945,097
Electricity	202,025,343	€ 82.60	€ 16,688,072	187,856,065	€ 113.66	€ 21,351,963
Coal	140,522,684	€ 7.80	€ 1,095,851	136,762,848	€ 11.50	€ 1,572,496
Total	792,334,655	€ 40.97	€ 32,465,395	749,214,462	€ 60.00	€ 44,951,902

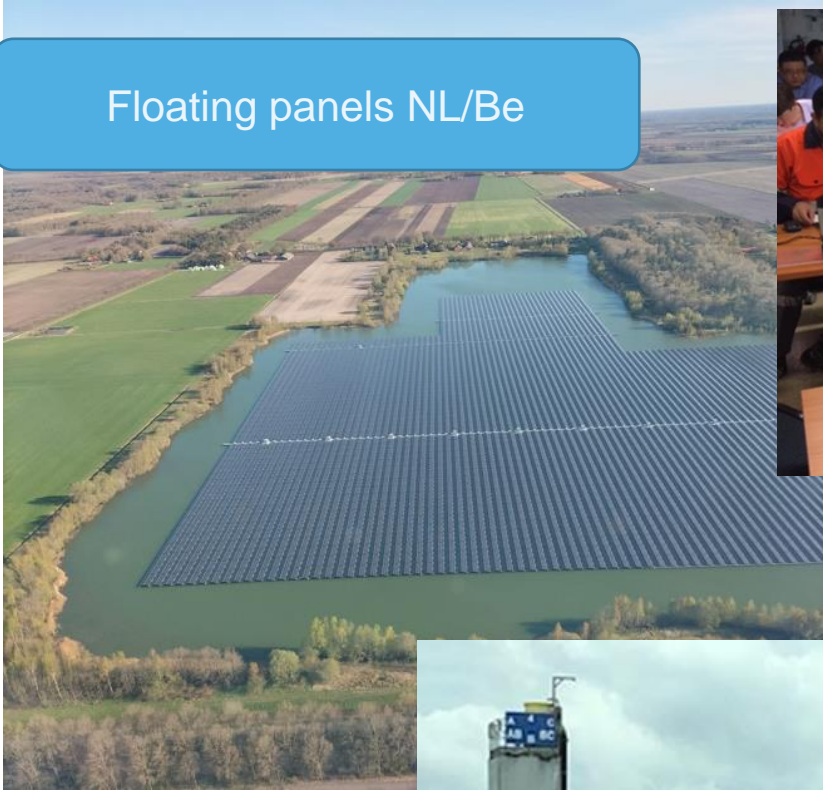
6. Example: electrification dryer in Norway (green power from grid):



First electrified dryer within Sibelco to be installed soon.
Important to learn about the new process.

6. Renewables and employee involvement

Floating panels NL/Be



Training session internal employees
(Awareness and behavioural change)



Solar panels NL/Be



Thanks for the attention.

Q&A