



Climate Strategy Day – 16 November 2021





Introduction

with Guy Sidos,
Chairman & CEO of Vicat



Vicat's Climate strategy...

is part of the Group's larger sustainability agenda



Our agenda today

- Introduction
- Context & Regulations
- Where Vicat stands today
- Our Climate strategy
- Our roadmap
 - 2030 objectives & 2050 ambition
 - Action plan & technologies
 - Costs & Financing
- Conclusion



Presenting today



Guy SIDOS
Chairman & CEO



Eric BOURDON
Deputy CEO,
Head of Industry
Chief Climate Officer



Lukas EPPLE
COO & Chief Strategy
Officer



Marie GODARD-PITHON
Investment & Performance
Director



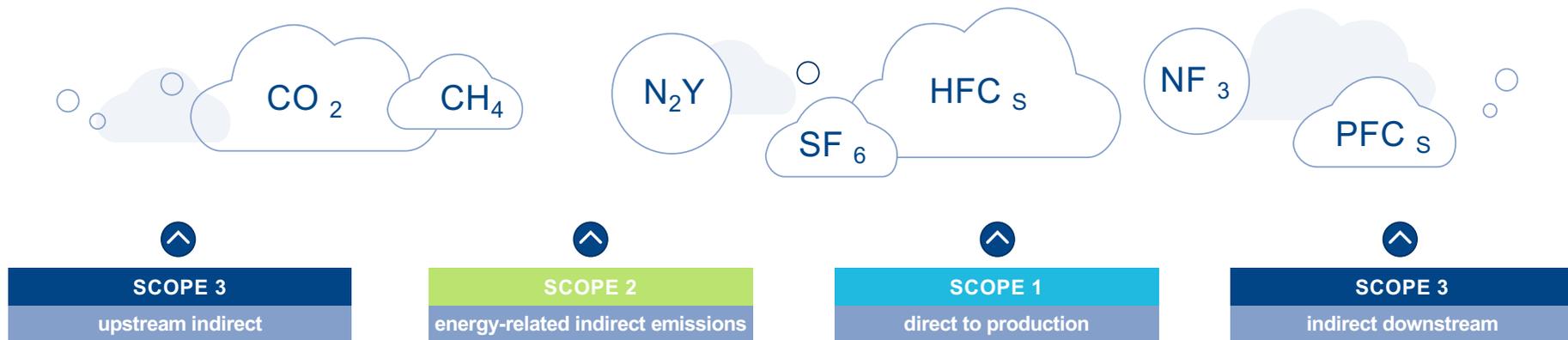
Laury BARNES-DAVIN
Scientific Director & Head
of R&D



Hugues CHOMEL
Deputy CEO & CFO

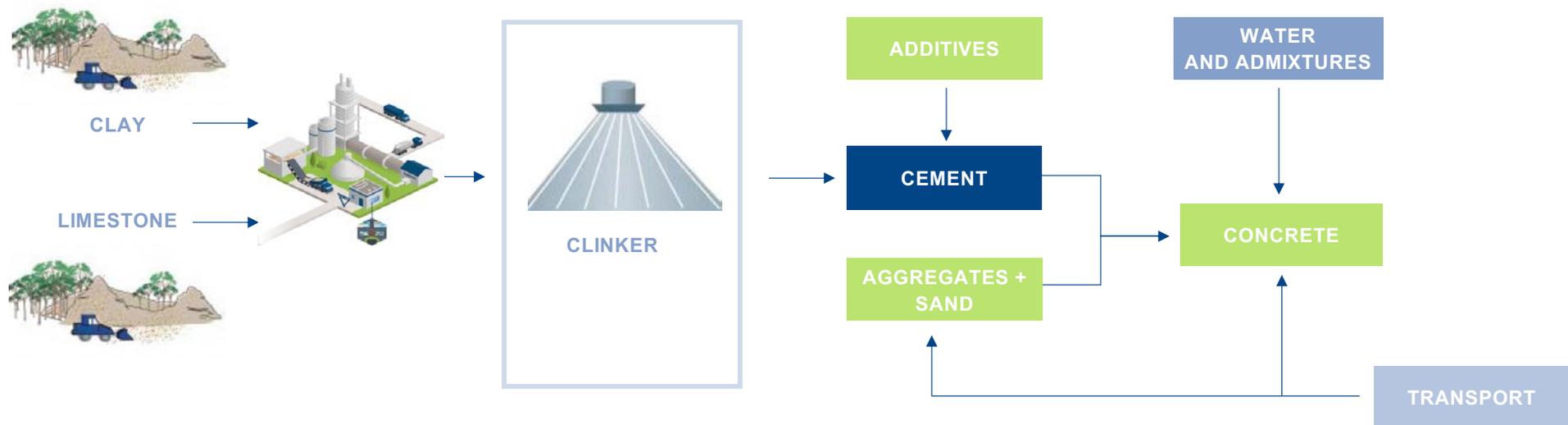
Context & Regulations

Scopes 1, 2 and 3



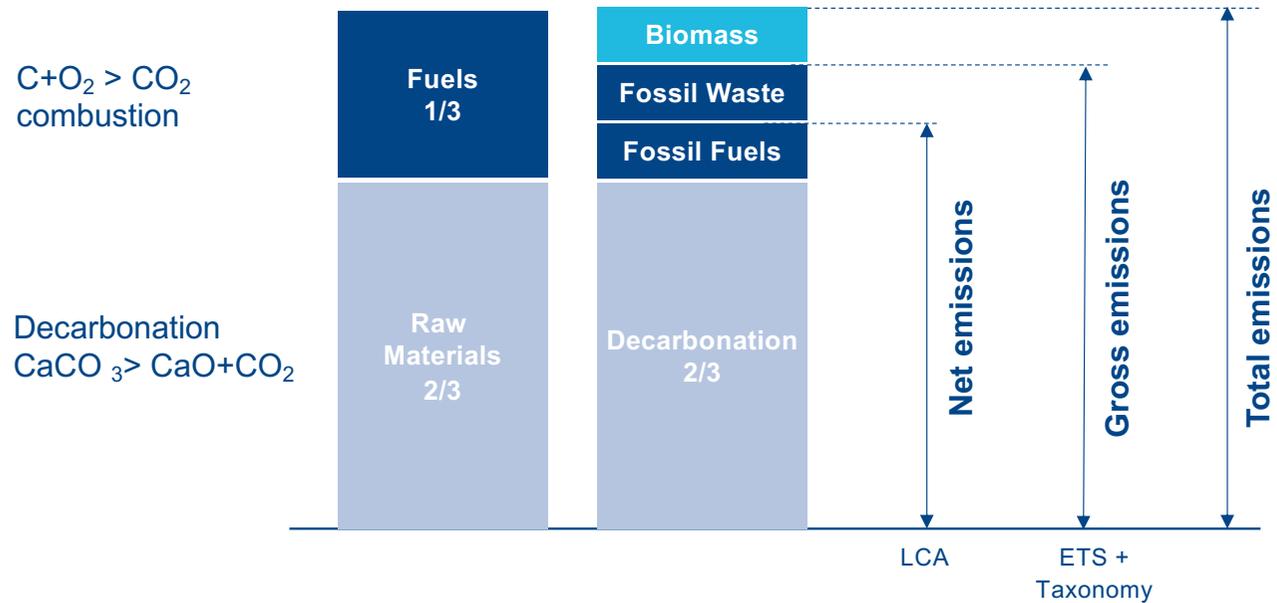
Scope 1, scope 2 or scope 3 are used in the context of a product or organization's greenhouse gas (GHG) emissions balance. The GHG balance is used to determine how many greenhouse gases are emitted during the manufacture of a product, or during the activities of an organization over a given period.

Production processes



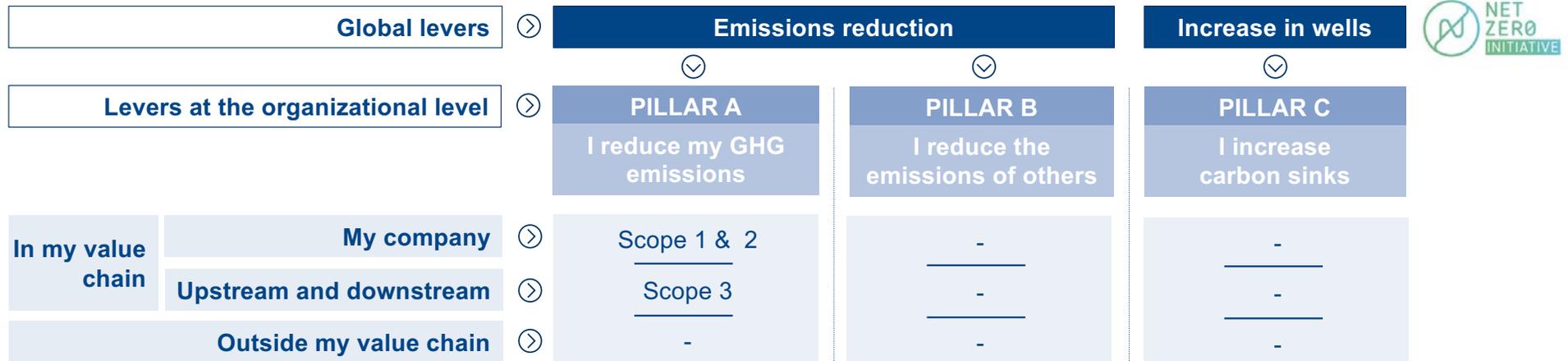
Total emissions, gross and net

CLINKER



What does carbon neutrality mean?

IT'S A ZERO-SUM OPERATION

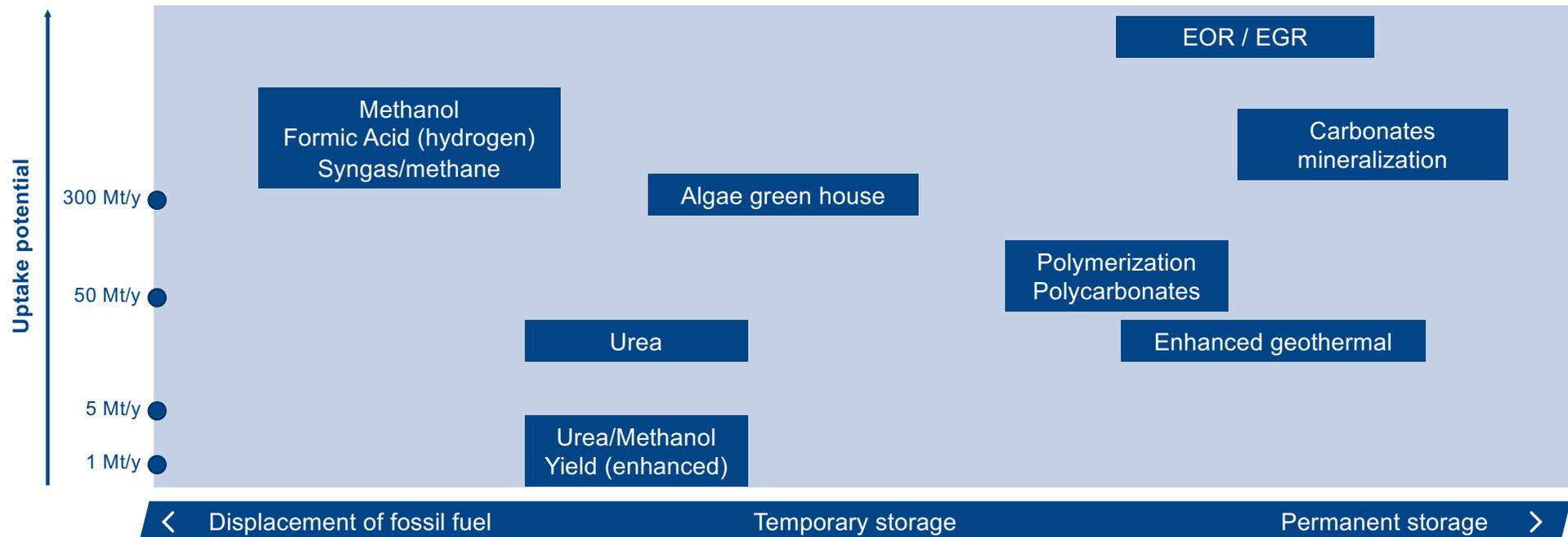


Source: carbone 4



Clinker / CCU (Carbon Capture and Usage)

UPTAKE POTENTIAL (MT/AN) VERSUS LENGTH OF CO₂ STORAGE



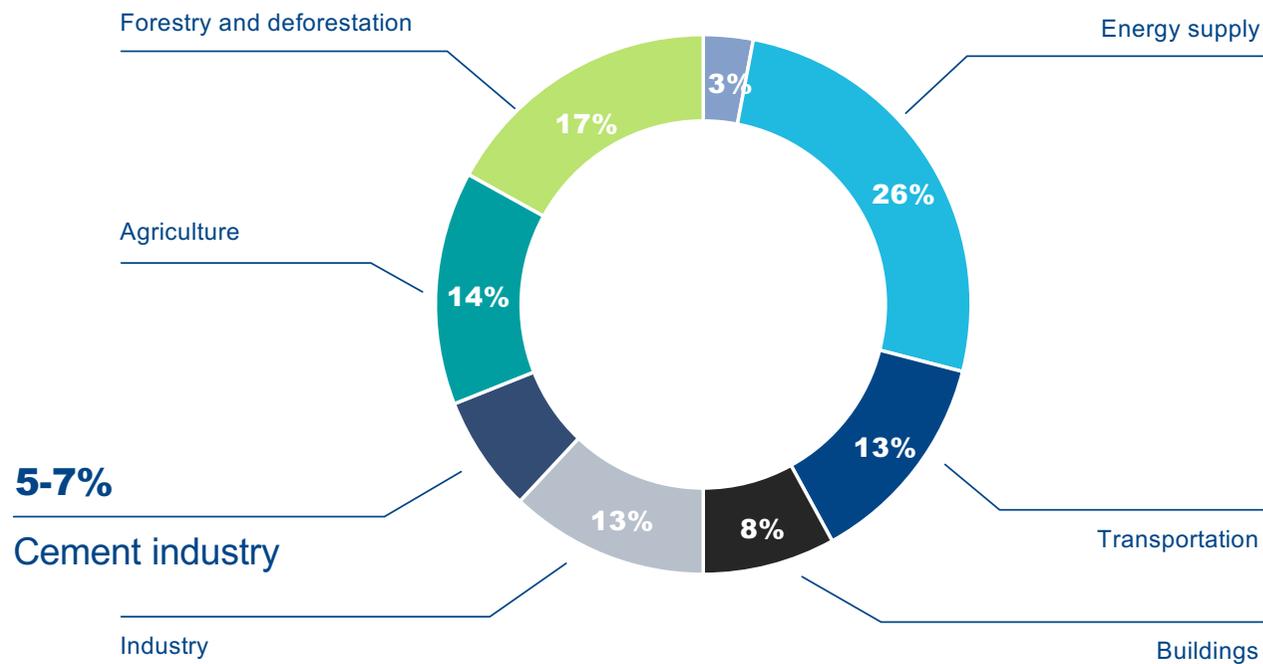
Storage, fossil fuel displacement and uptake potential (long term)

Source ZEP report (European Technology Platform for Zero Emission Fossil Fuel Power Plants)



Our industry's share

ESTIMATED CONTRIBUTIONS OF THE DIFFERENT SECTORS TO GLOBAL MAN-MADE GREENHOUSE GAS EMISSIONS (IN CO₂ EQUIVALENT)



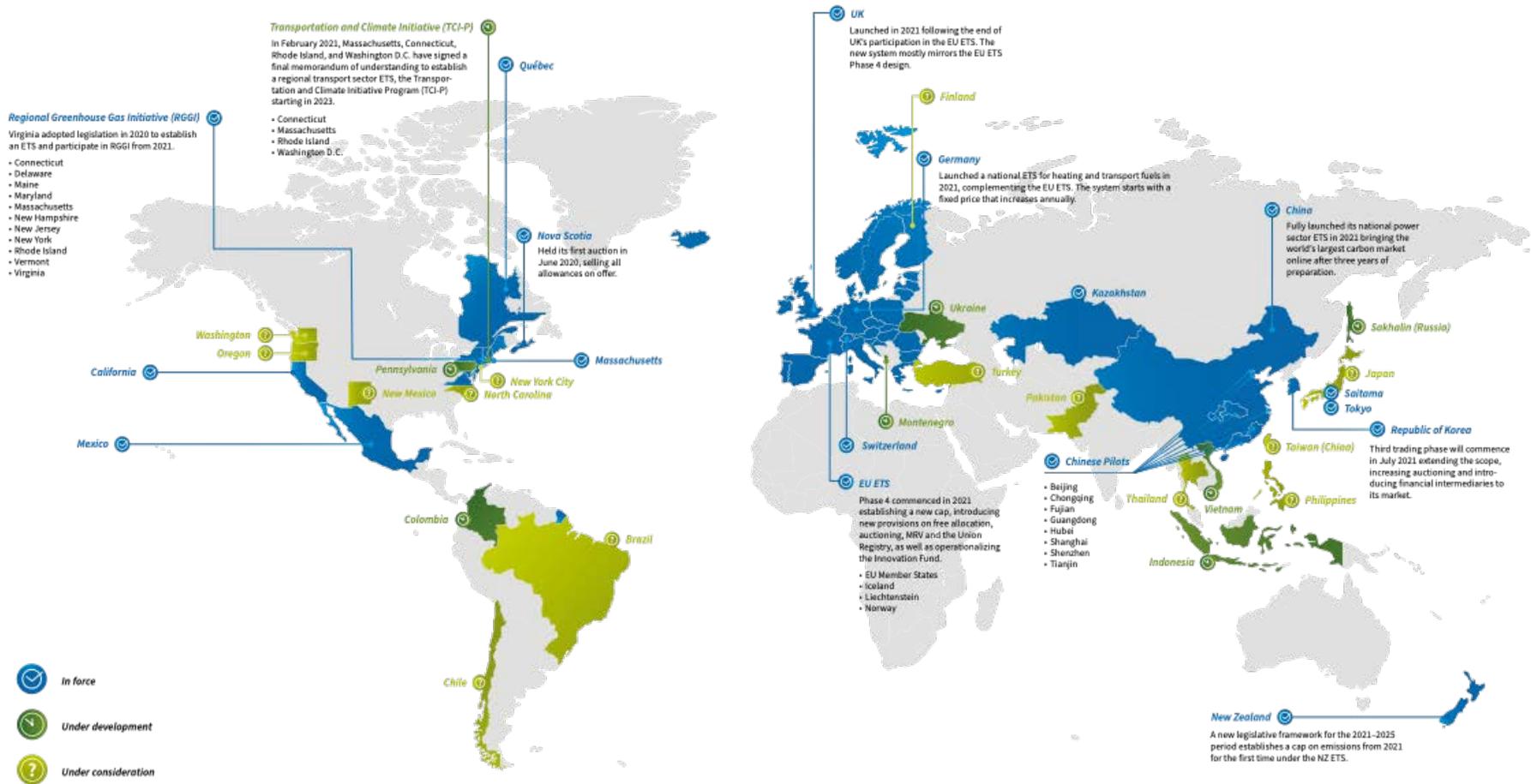
Share of cement industry in GHG emissions: 4% in Europe and 1.8% France

Source IPCC & SFIC



Different type of regulations

EMISSIONS TRADING WORLDWIDE THE STATE OF PLAY OF CAP-AND-TRADE IN 2021



Fit for 55 Package & 2030 emissions reduction targets

“FIT FOR 55” PACKAGE

The **2050 climate neutrality** target agreed in the European Green Pact is broken down into an intermediate target set by the EU of **-55% of net GHG emissions by 2030 (vs. 1990)**, compared to the previous target of -40%.



Legislative architecture for this purpose = "Fit for 55%" package

This is **14 main texts** (3247 pages) presented by the EC on 14th July 2021 and which will be the subject of exchanges and negotiations in the coming months.



A strong commitment on the part of the EU to create a fair market with equal footing for all

Two levers for a fair-level playing field

ETS

- EU ETS 2030 strengthened to -61% from -43% from 2005
 - First part of phase 4 (2021-2025) unchanged
 - Second part of phase 4 (2026 – 2030) tougher linear reduction Factor: 4.2% per annum
 - End of free allocations by 2035

CBAM

- Non-EU importers, as of 2023, will be asked to declare products exported to the EU
- The reporting mechanisms of CBAM will be imposed on importers, but no CBAM certificates will have to be surrendered
- From 2026, after 3 years of test, non-EU importers will have to pay the difference between the EU ETS price and any carbon price paid in the production country
 - In practice, any importer will need to contact the competent national authority to get an import authorization
 - It should then submit a yearly declaration on 31st May, containing the quantities of goods exported to the EU; their total embedded emissions, and the number of corresponding CBAM certificates to be surrendered
- Cement is included in its scope, alongside steel, aluminium, fertilizers and electricity

European sustainable taxonomy

- The EU has defined a scientifically enforceable common language (taxonomy) for the sustainability of activities and investments. This taxonomy has been established by focusing on the following 6 objectives:



Climate change mitigation



Climate change adaptation



Sustainable use and protection of water and marine biodiversity



Transition to a circular economy with waste prevention and recycling



Pollution prevention and mitigation



Protection of healthy ecosystems

- An activity eligible for the taxonomy must meet the following criteria:

- Make a significant contribution to one of the above 6 objectives
- Not undermine any of the other 5 objectives
- Comply with OECD social regulations

- For the 2 first objectives, revenues, CAPEX and OPEX from eligible activities must correspond to specific technical criteria to be considered as aligned :

- Example for cement: must contain less than 469 kg of CO₂ per ton
- Clinker : CO₂ emissions 722 kg / ton

Where Vicat stands on the first 2 objectives required for 2022:



Vicat will publish the share of its KPI-eligible activities in 2022 and aligned value in 2023



As of today, the Group prioritises CAPEX and OPEX towards products that satisfy alignment





Vicat today



A strategic priority for the Group



The Climate Strategy Department is in direct link with

- the industrial strategy
- the operational teams, within the daily management
- and with the Board of Directors



The operational departments, in collaboration with the Group's Innovation division, provide ideas and resources to develop products, services and future technologies



The Climate Committee is composed of

- The Chairman and CEO,
- The Climate Strategy Director
- The Group Strategy Director
- The CFO
- The Chief Legal Affairs Officer
- The Climate Actions Control Director
- The Financial Communication and Investors Relationship Director

The Climate Issues Committee defines the strategy, validates the climate roadmap and monitors country level objectives

- ⊙ The Board of Directors has created a 'CSR (Corporate Social Responsibility) committee' that reports directly to the Board on CSR and climate related issues.

A long-standing commitment



A long-lasting quest for best performance and reduction in cash-costs

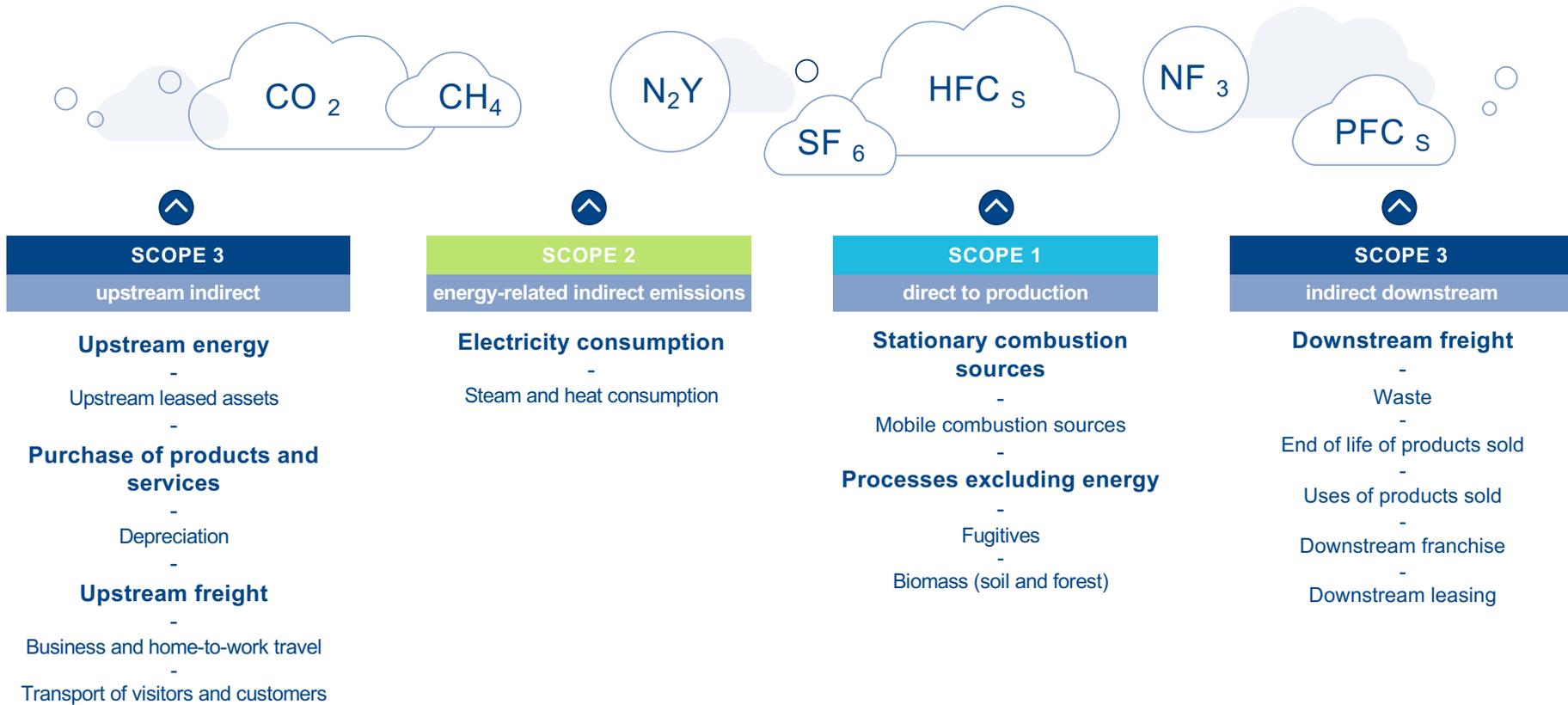


The development of secondary fuels began over 40 years ago



A major player in the circular economy

What are our areas of action?

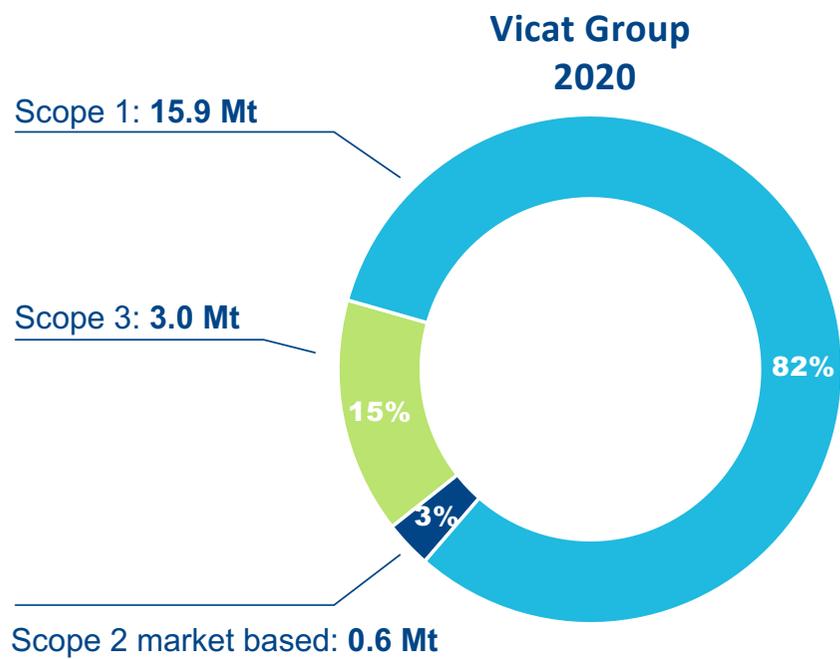


CO₂ Emissions - Scopes 1 & 2 in 2020

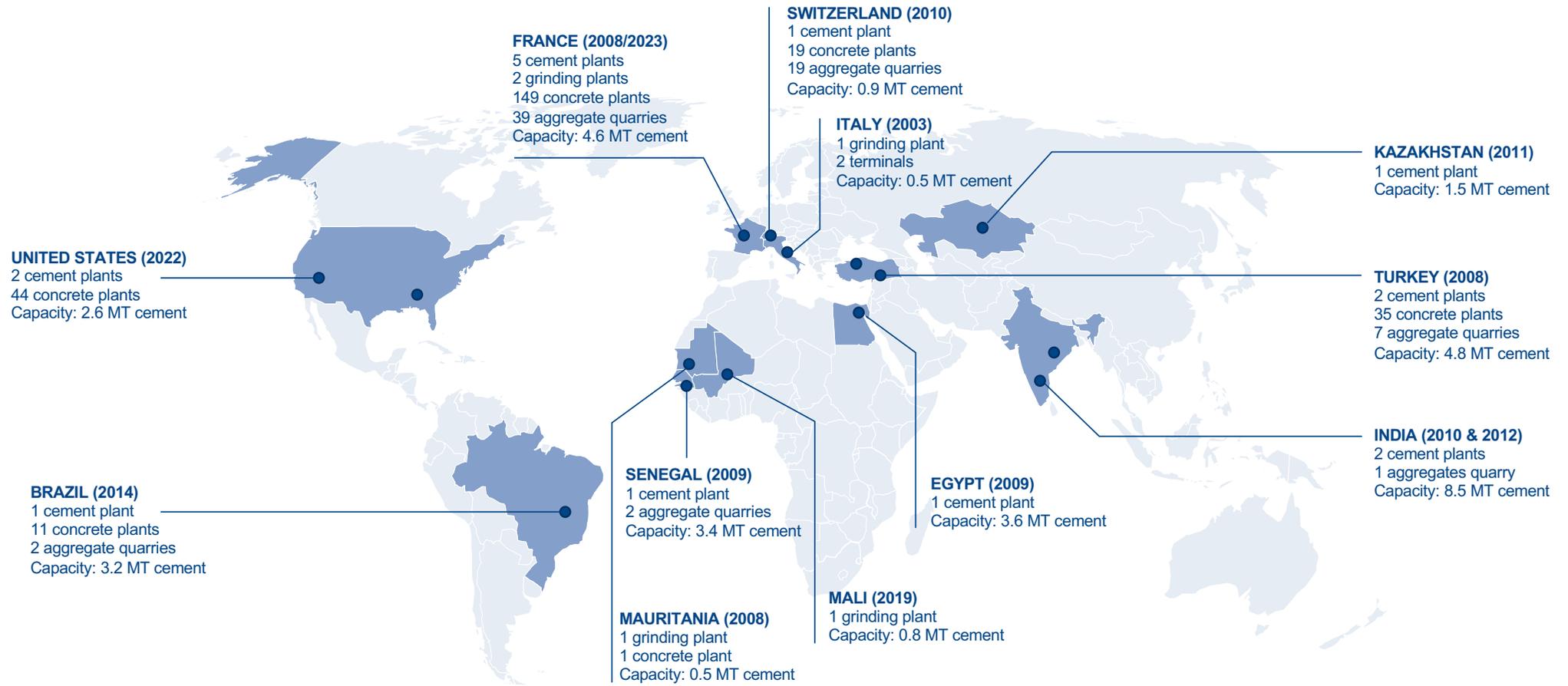
VICAT GROUP EMISSIONS

(in thousands of tons)	Total direct and indirect CO ₂
Cement	16 449
Concrete & Aggregates	98
Other products and services	10
TOTAL	16 557

Scope 3 : 3.0 Mt – 15%



A modern industrial base

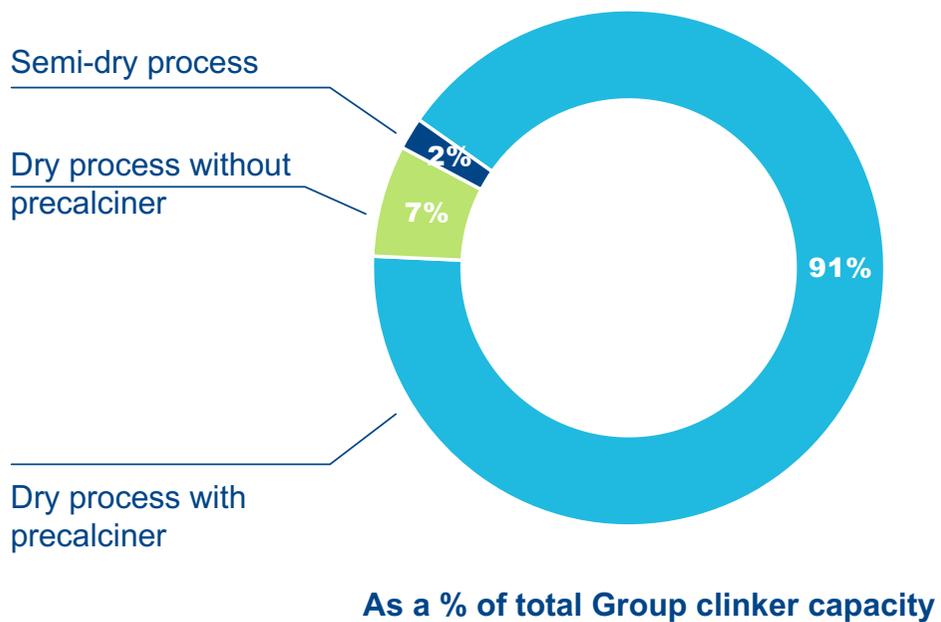


➤ **Dates indicate last major and structural modernisations**
Group Cement Capacity in 2020: 35 million tons



Ultra-modern technology

100% DRY PROCESSES WITH PRECALCINER IN EMERGING MARKETS



3 types of regulatory situations

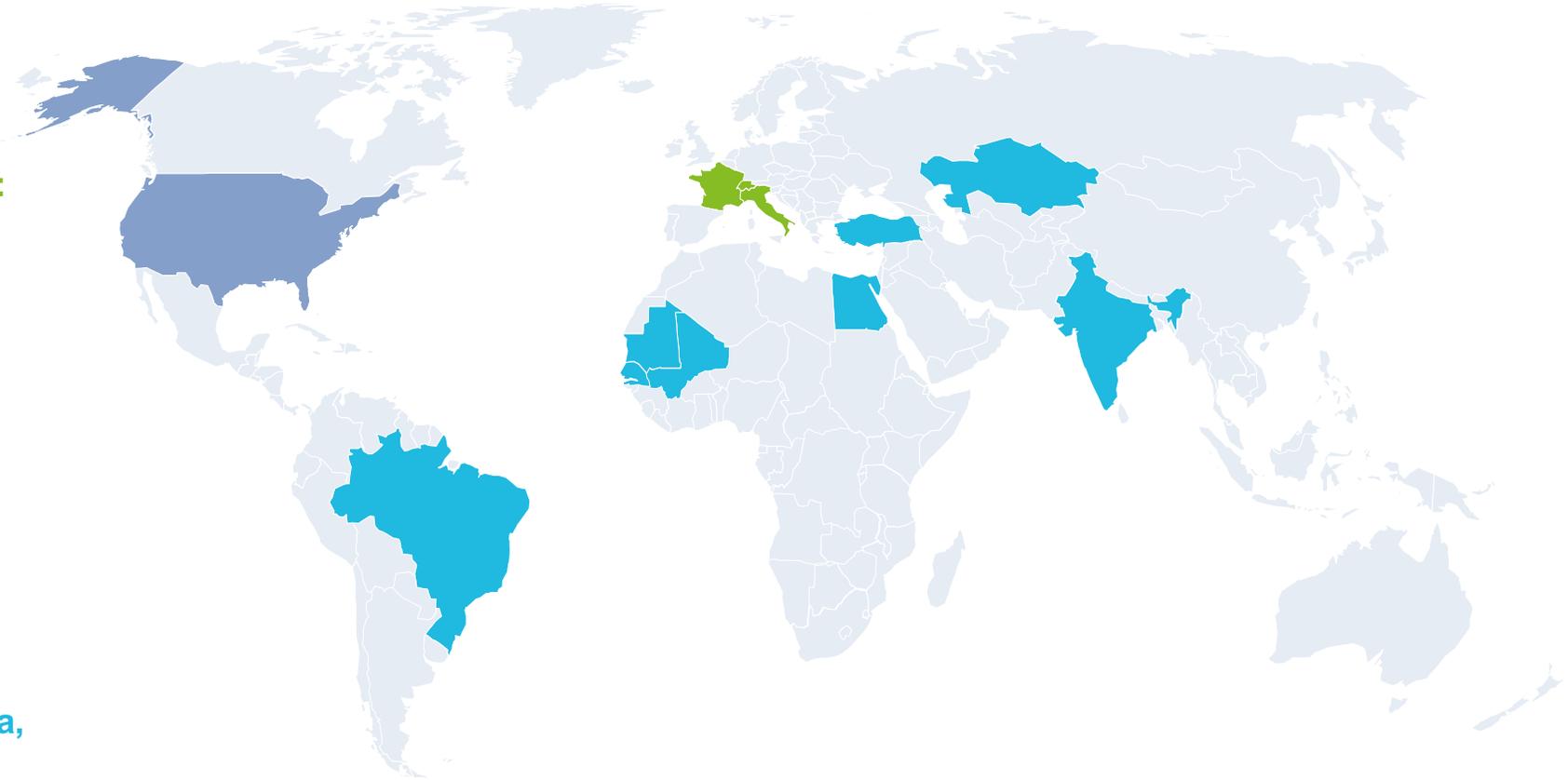
Europe (France, Switzerland, Italy):

Strongly enforced ETS system, the “Laboratory” for the Group

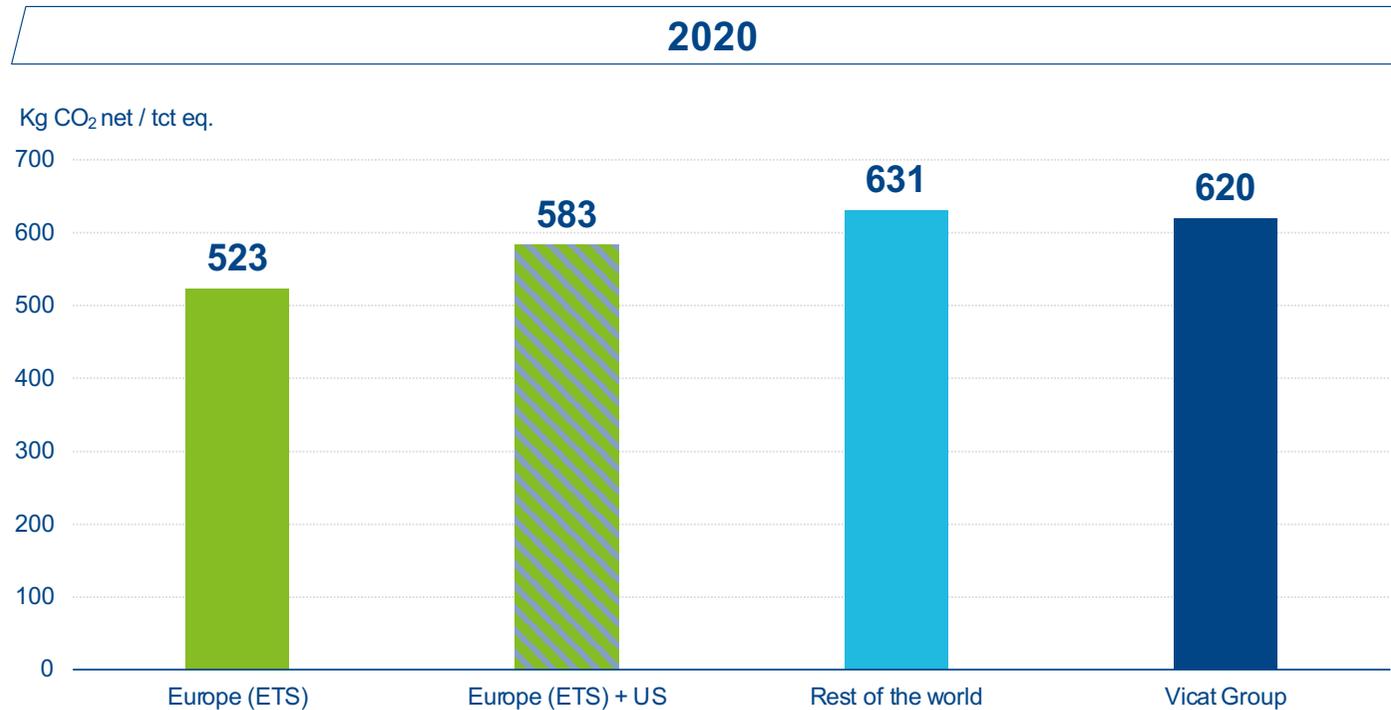
United States:
Regulation trend is strengthening

Rest of the World (Brazil, Africa, Asia, Mediterranean):

Regulation is in the making



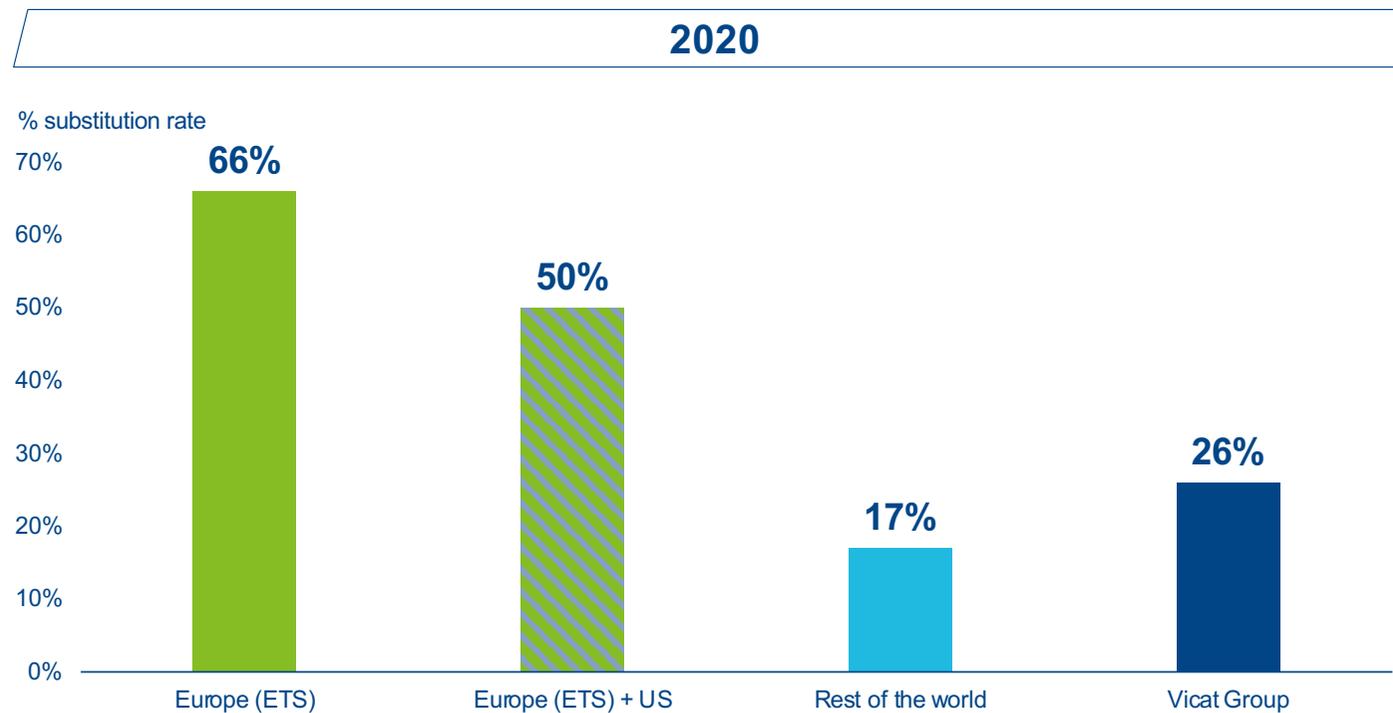
Net CO₂ direct emissions*



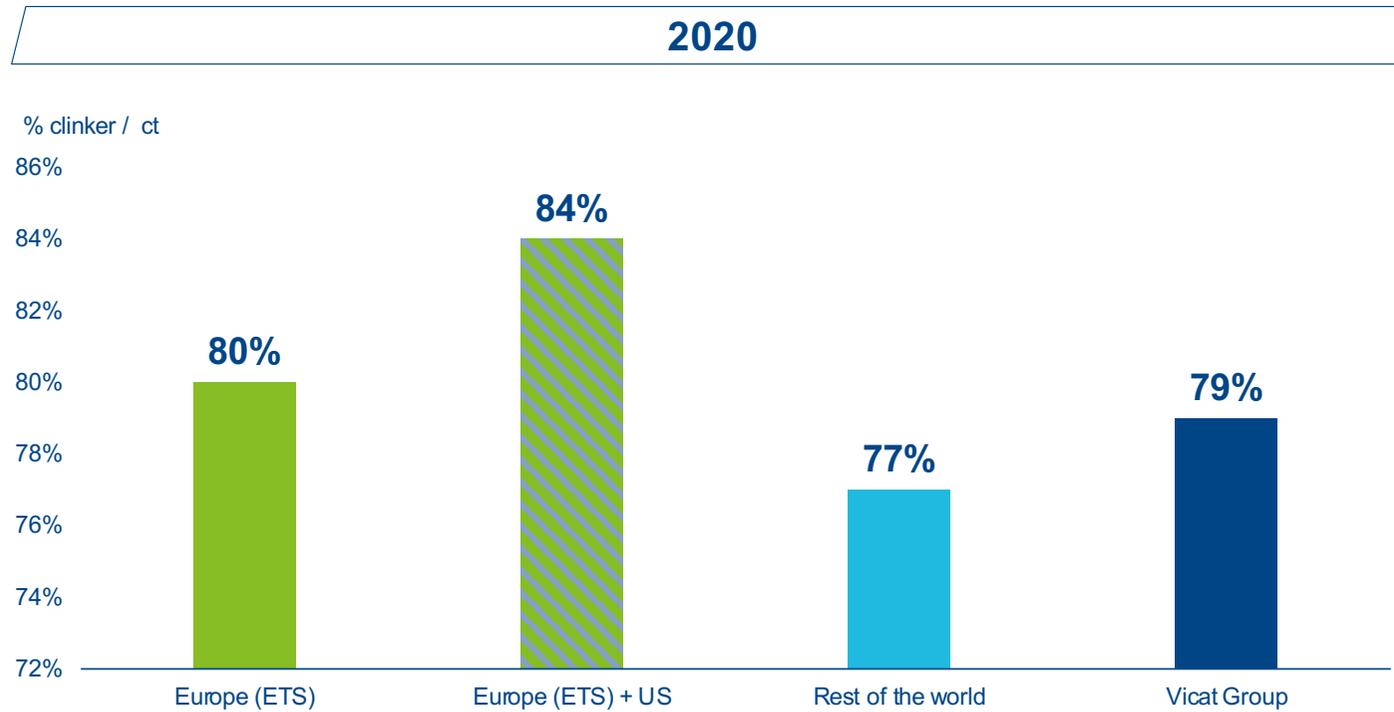
*Definition of net CO₂: direct emissions including the physico-chemical transformation of raw materials at high temperatures and the use of fossil fuels, excluding all alternative fuels.



Substitution rate



Clinker factor



Vicat climate strategy

Our firm belief

- ① Concrete is irreplaceable and will remain the preferred solution for the circular and sustainable economy
- ② Concrete must become carbon neutral, decarbonization is the challenge for the entire concrete value chain of which cement is a key component
- ③ Cement production will evolve towards decarbonized methods and certain solutions exist today



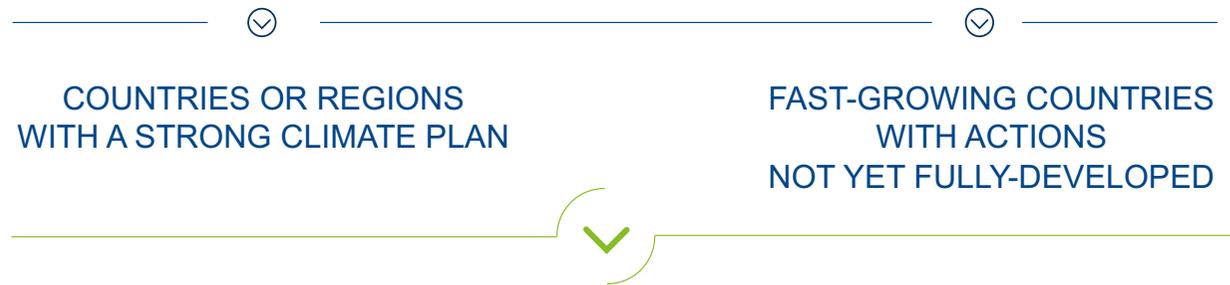
One goal - Two realities – Two strategies

■ Decarbonization is technically possible but economically feasible if and only if:

- environmental regulations are adapted
- governments support this approach

■ The Vicat Group is in favour of the establishment of a market environment conducive to carbon neutrality, through regulation, standardisation and financial support

TWO REALITIES EXIST TODAY



Vicat's strategy is to act in a way that is adapted to the pace of change in each situation, knowing that these two types of situation will converge over time benefiting from its strong asset base.

Expected trends in highly-regulated markets

Environmental regulations are highly developed already or we expect them to be tighter in the near future

The willingness of governments to decarbonize the economy and support the process is strong

Measures to guarantee a level playing field via e.g. watertight CBAM and or financial support to finance the environmental transition will be put in place



Significant investments will be required by 2050 in technologies supported by regulation (e.g. alternative fuels, reduction of clinker factor) and technologies not yet available on an industrial scale (CCU/CCS)

These investments will generate a significant increase in costs

Expected trends in highly-regulated markets

IN THE SHORT TERM :

an increase in costs due to the acquisition of CO₂ emissions certificates

IN THE LONG TERM :

increased costs due to direct and indirect costs of CO₂ reduction



In this context of strong regulation, the increase in "carbon-linked costs" will translate into price increases, as clients will be asking, and will be ready to pay, for decarbonized concrete.

The price increase will be gradual and be absorbed by the market as the final impact remains low on the cost of housing (<0.6% according to a study by the French Environmental agency ADEME)

Action levers in highly regulated markets



Replacing fossil fuels by alternative fuels and develop waste treatment as a new business



Example: Reuchenette



Example: Altola



Reducing the clinker factor by using locally available materials such as clay, limestone or pozzolans



Example: Xeulilly



Developing new low-carbon concrete solutions and making bolt-on acquisitions in Concrete.



Example: 3D Printing



Example: Geneva



Preparing the future and benefitting from concentrated production of CO₂ as an economic opportunity for new products

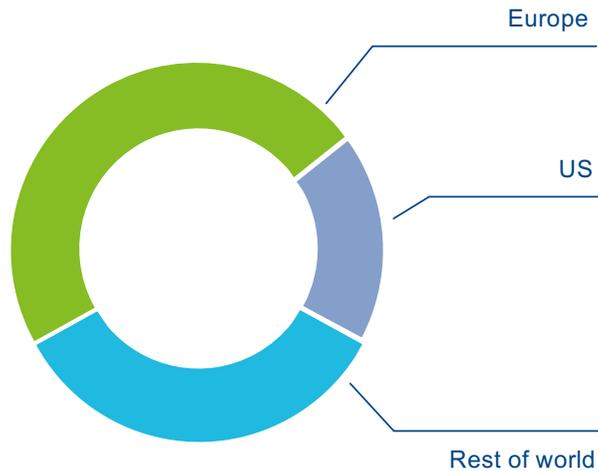


Example: Montaleiu



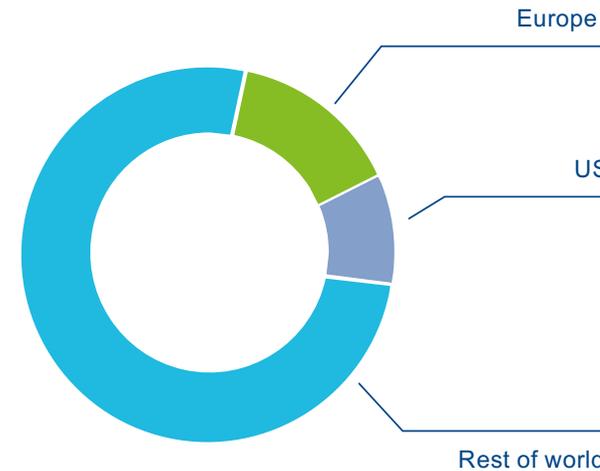
Unmatched footprint in highly-regulated markets

EBITDA in 2020



Strong EBITDA generation in markets with clear or upcoming environmental regulations

SHARE OF CO₂ EMISSIONS CEMENT SCOPE 1 in 2020

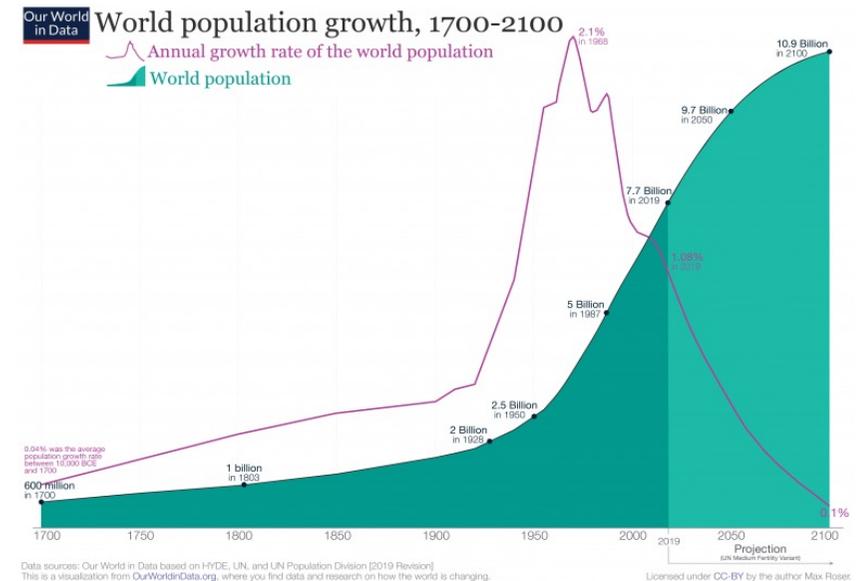


Sound CO₂ performance in these markets

➤ In highly-regulated markets, we generated 66% of our 2020 EBITDA from 8 cement plants only, among them flagship plants in France, Switzerland and the US

Markets with CO₂ regulation in the making

- ⊗ Overall strong potential for growth due to population increase
- ⊗ Markets characterised by an absence or weak application of CO₂ regulation
- ⊗ **As it stands, "profitable" investments for CO₂ reduction per ton of cement are mostly those that use the classic levers :**
 - **reduce the clinker factor and**
 - **replace fossil fuels with alternative ones**



Markets with CO2 regulation in the making: the need for strict regulation

In absence of strict regulation, there is no pricing of carbon

Only a strong and enforceable regulatory framework will create the economic conditions to change the rules of the games.

This is why Vicat is in favour of regulatory changes towards carbon neutrality in all the countries in which we operate.

- **As soon as the regulations are applied, each entity will benefit from the successful experiences of the Group's "European Laboratory"**

Markets with CO2 regulation in the making: action levers

In this context, Vicat continues to invest in these markets by applying the Best Available Technologies



Investing Best Available Technologies in our cement plants



Example: Rufisque (Senegal)



Replacing fossil fuels by alternative fuels and develop waste treatment and recovery as a new business



Example: Cozum (Turkey)



Reducing the clinker factor by using locally available materials such as clay, limestone or pozzolans



Example: Sobradinho (Brazil)



Example: Senegal



Decarbonising energy production



Example: Bharati (India)

Secured EBITDA generation capacity

Vicat has invested **4,9 billion euros over the past 15 years** and has therefore proven its capacity to generate the cash flows necessary to finance the upcoming industrial conversion and growth challenges.

Our strategy of banking EU ETS CO₂ allowances will provide us additional flexibility to finance upcoming investments in new technologies.

- Our current industrial footprint and cash generation potential is a strong platform to transform our business into the decarbonized concrete world.
- Our EBITDA generation capacity will remain strong and secure
- We act responsibly and tailor our climate actions to local circumstances

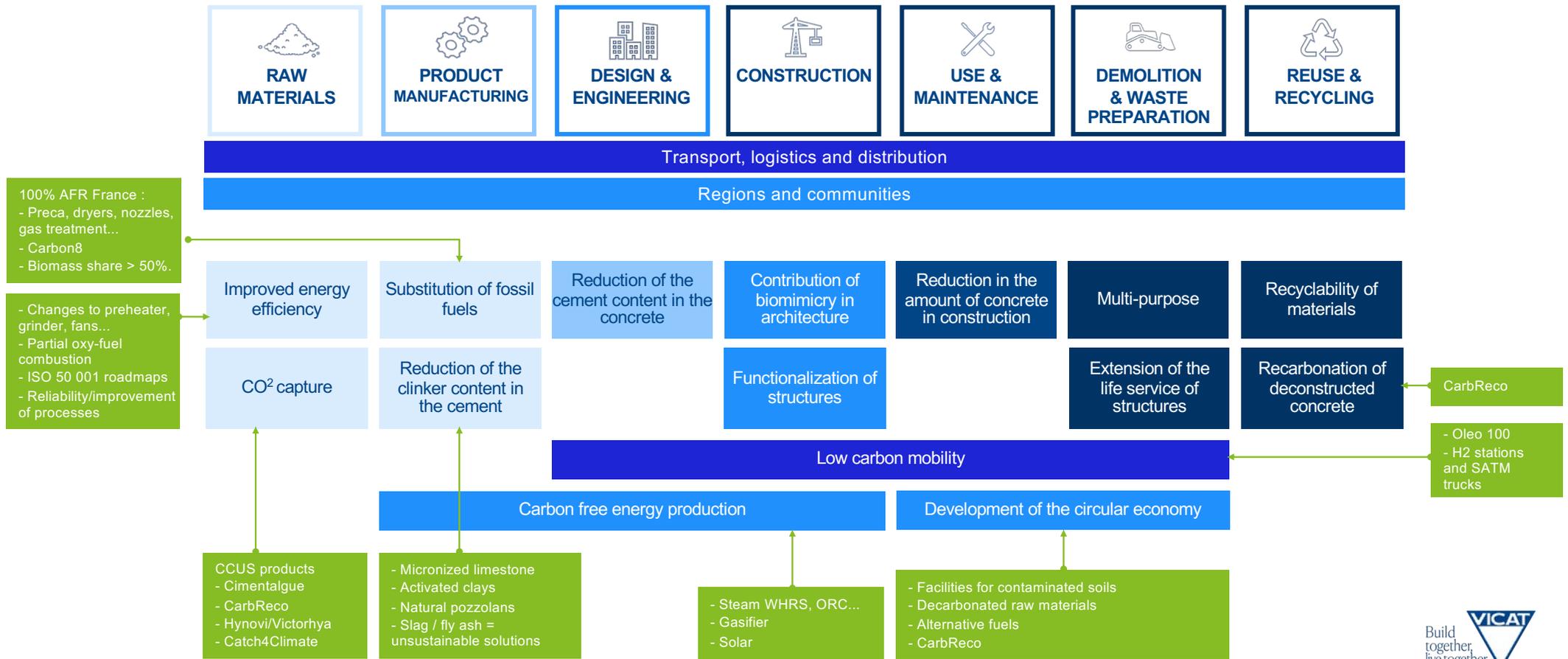
Our roadmap

Our stated objectives & ambition



Vicat's Value Chain

ACTIONS ACROSS THE WHOLE VALUE CHAIN IN ORDER TO ACHIEVE CARBON NEUTRALITY





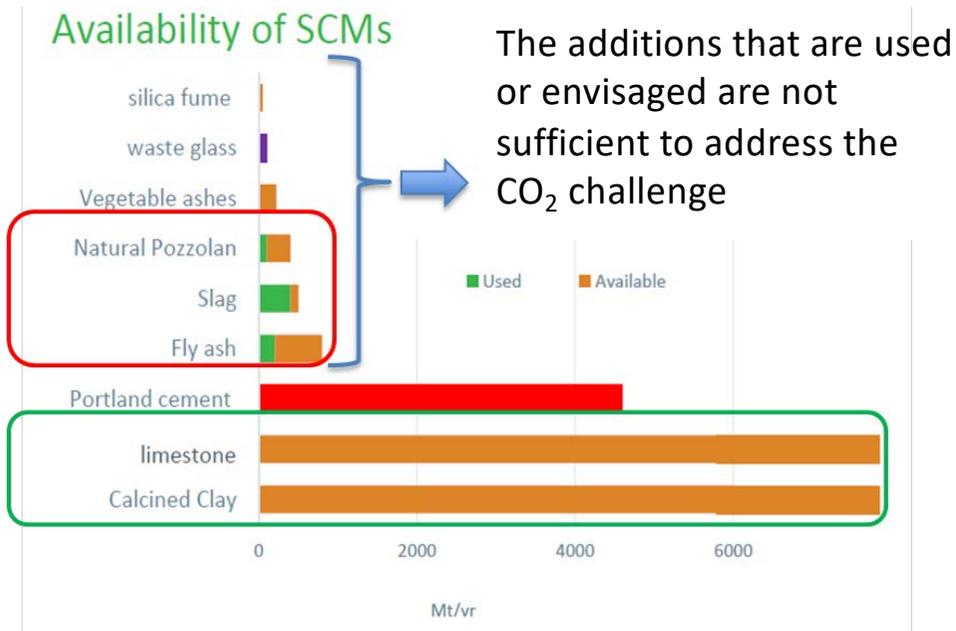
2030 Objectives

Action levers to 2030

- Reduction of clinker content
- Substitution of fossil fuels
- Energy efficiency and renewable energy production
- Low carbon product offering
- New construction methods



Clinker factor reduction



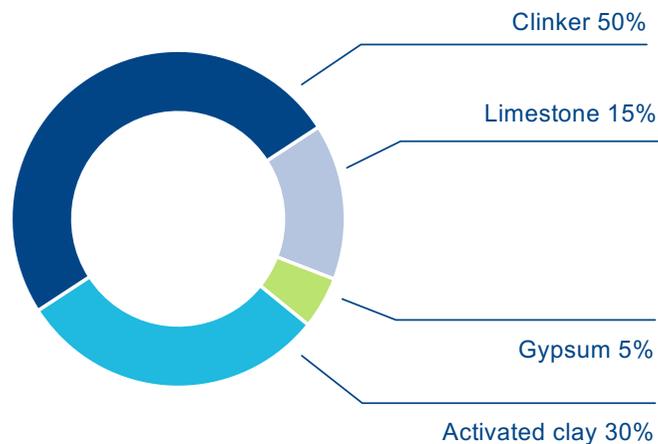
- Objective: To develop binders with a lower clinker factor
- Uncertain carbon weight and scarcity for the following additions:
 - Blast furnace slag,
 - Fly ash from coal-fired power stations,
 - Silica fume,
- Preferred additions:
 - Natural pozzolans (volcanic rocks,...)
 - Limestone Filler
 - Thermally activated clays

Clinker factor - Limestone filler

- Limestone is an abundant raw material
- Up to 35% substitution rate
- The start-up 2170, in which Vicat acquired a stake in 2019, is a pioneer in limestone micronization.



Clinker factor - Activated Clays



Cements combining activated clay and limestone

- Activated clays acts as pozzolanic material.
- Temperature of clay calcination much lower than clinker firing and emitting only water vapor
- Pozzolanic properties are amplified by combining activated clay with limestone filler (synergetic effect) enabling the substitution of up to 50% of clinker as per EPFL publications
- Ternary cements have these key properties :
 - Strong mechanical performance
 - Good durability (improvement of resistance against chloride, sulfate and alkali silica reaction)

Argilor project – Xeuilley France

- 10 years of R&D
- Clay with satisfactory quality at the quarry of the plant
- Innovative project for minimum CO₂ emissions: Flash calciner technology using very high level of alternative fuels (85%)
- 40 M€ investment including more than 13 M€ financial support from ADEME
- Contract signed with EPC contractor in March 2021
- Start up Q1 2023

Financé par



KEY FIGURES (PLANT SCOPE AT CONSTANT CEMENT PRODUCTION)

14 points
of clinker / factor

48500 t
CO₂ / year

87 kg CO₂ / t
cement

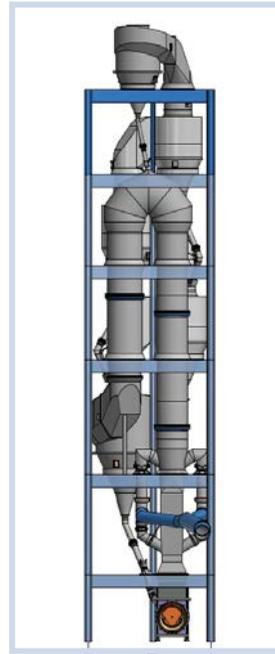
16% of CO₂
emissions



Alternative Fuel Recovery technologies



AFR preparation:
Cozum (TR), Bioval-ALTèreNATIVE CSR (FR), Altola (CH)



New preheater design:
Ragland Kiln 2 (US), future
Rufisque Kiln 6 (SN)



AFR conveyor: Rufisque (SN), Bastas, Konya (TR)

CarbRecoCl: Carbonation of kiln dust

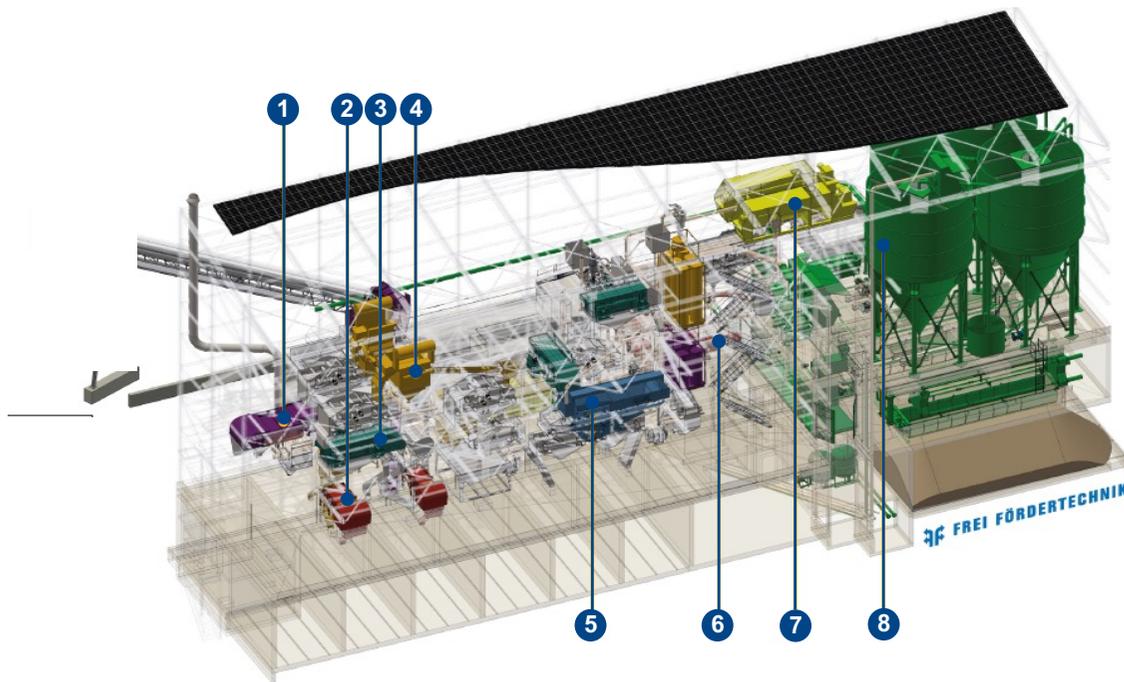
- Usage of excess kiln dust through mineralisation
- Use of technology developed by Carbon 8
- Production of aggregates that are light, insulating and carbon negative



*RDF = Refuse-derived fuel



Recycling Model (VITO - Terenvie)



- 1) Metal separation
- 2) Glass sorting
- 3) Gravel classification
- 4) Sorting of light materials
- 5) Washing and classification of sands
- 6) Crushing
- 7) Material washing
- 8) Water treatment & filtration

Energy efficiency and production of decarbonated energy

■ Investment in the best cement technologies in terms of energy efficiency:

- Senegal: Roller press Rufisque -25% specific electricity consumption
- Turkey: Replacement of existing coolers with latest generation Konya +20% heat recovery efficiency
- Switzerland and France: Digitalisation of plant data underway for better management of performance and energy consumption



■ Investment in renewable energy production facilities:

- Photovoltaic plants in India (x3) and Senegal (x1): covering around 10% of the plants' energy needs.
- Waste Heat Recovery System for electricity generation in India (x2) and Turkey (to come), up to 30% of plant's energy needs
- Hydroelectric production of 45 GWh at the Group level

Low carbon product offering

LOW CARBON OFFERING BY VICAT FRANCE : DECA



A COMMON LABEL FOR ALL ACTIVITIES:



Products



Services

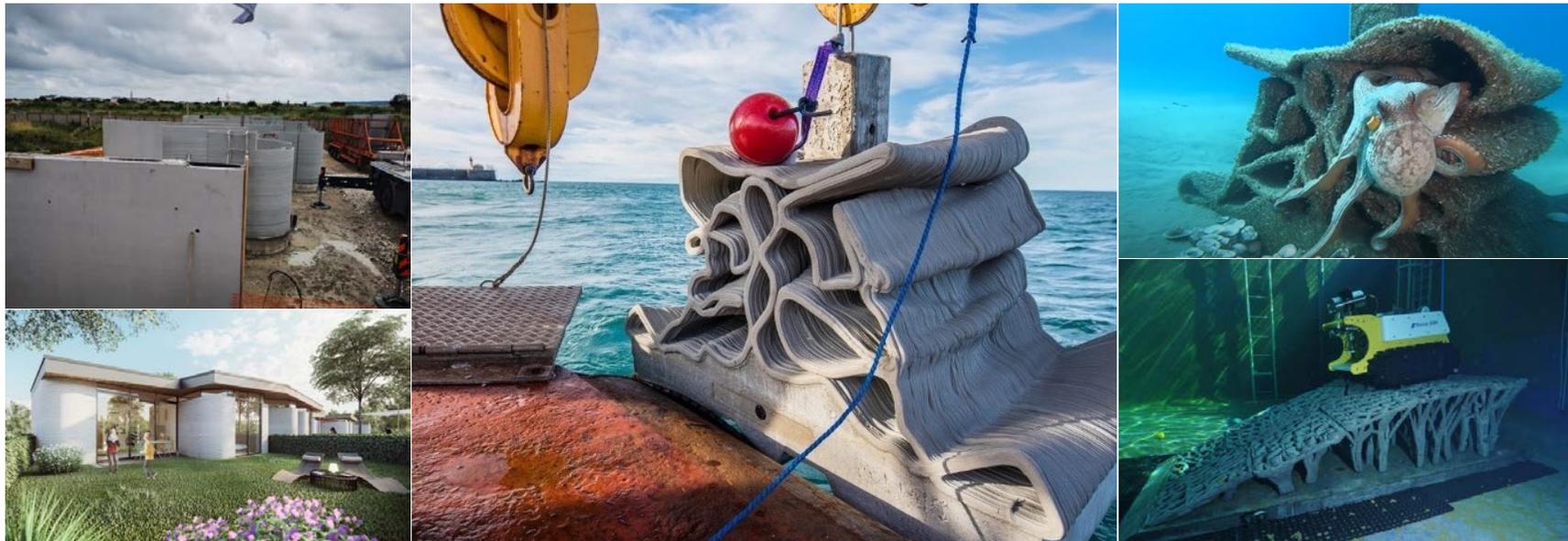


Construction systems (biosourcing..)



New construction methods: 3D printing

- Saving of material which allows a reduction of CO₂ between 20 and 40%
- Development of a range of products adapted to 3D printing and associated services
- First plant opened in Chambéry with in-house technology





Ambition 2050

Build
together.
live together



- CO₂ capture, storage and usage
- New associated businesses



CCUS = Carbon Capture Usage & Storage

CCS: Technical and economic study in progress on several sites. No real technological challenges (known technologies). Very high CAPEX required. **No opportunity for business creation.**



CCU: Multiple CO₂ usage routes possible. Need to invest in industrial demonstrators to develop new technologies and create new markets. **Strong opportunities for new business**



FIGURE 5: REPRÉSENTATION DES PRODUITS ISSUS DE LA VALORISATION DU CO₂ ET DE LEURS NIVEAUX DE MATURITÉ TECHNOLOGIQUE (IEA, 2019)



CO₂ Capture

- CO₂ Capture is a technology brick needed for CCS as well as for CCU routes
- CO₂ capture in diluted flue gas using conventional solvent requires high operating costs
- Oxyfuel technology is based on pure oxygen use, instead of natural air, in the combustion process that generates the high temperatures necessary inside the kiln for the production of clinker
 - As a result, the CO₂ content of the exhaust gas is very high, making its capture much easier
- Towards the end of 2019, four European cement manufacturers (Buzzi, HeidelbergCement, Schwenk, and Vicat) joined forces to help bring about a substantial reduction in their CO₂ emissions due to the cement-making process.
 - The multi-year Catch4Climate project will study the possibility of generalising deployment of this Oxyfuel technology in cement plants



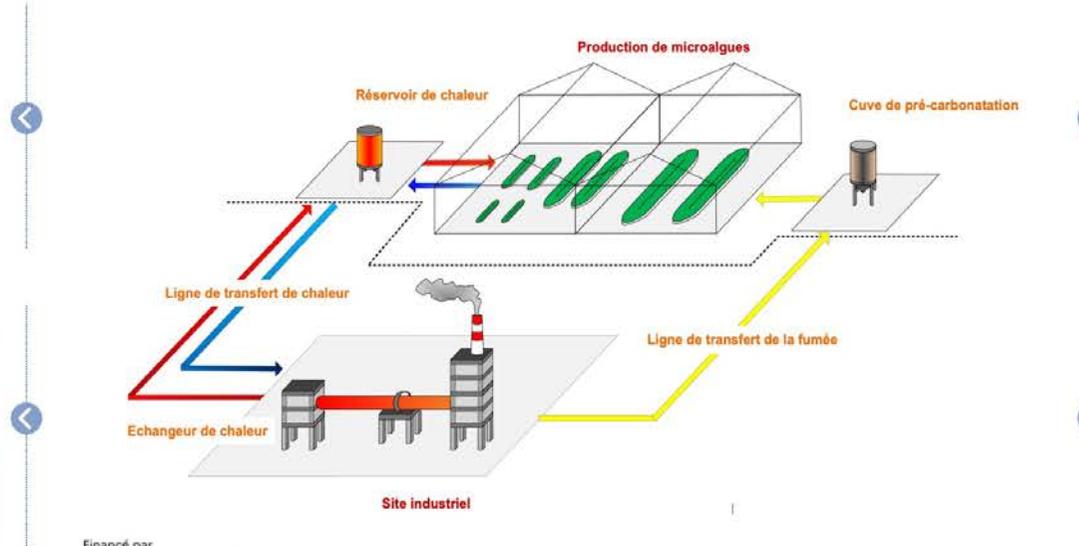
By photosynthesis

PRODUCTION OF PHOTOSYNTHETIC MICROALGAE IN NATURAL LIGHT



Objectives :

- recovering CO₂ and waste heat from the cement plant through the cultivation of micro-algae
- Increase the yield of microalgae cultivation, without using external energy.



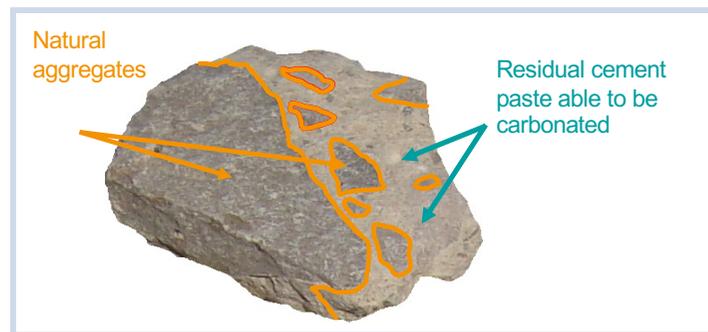
Financé par



By mineralization

CarbRecoGBR (FASTCARB)

- Carbonation of recycled aggregates and concrete sand
- CO₂ is mineralised: capture is irreversible
- Maturation:
 - A demonstrator that allows to store and avoid 2720 t CO₂ / year
 - 3 patents registered (1 process and 2 products)
 - 1 new business model



By chemical conversion with hydrogen

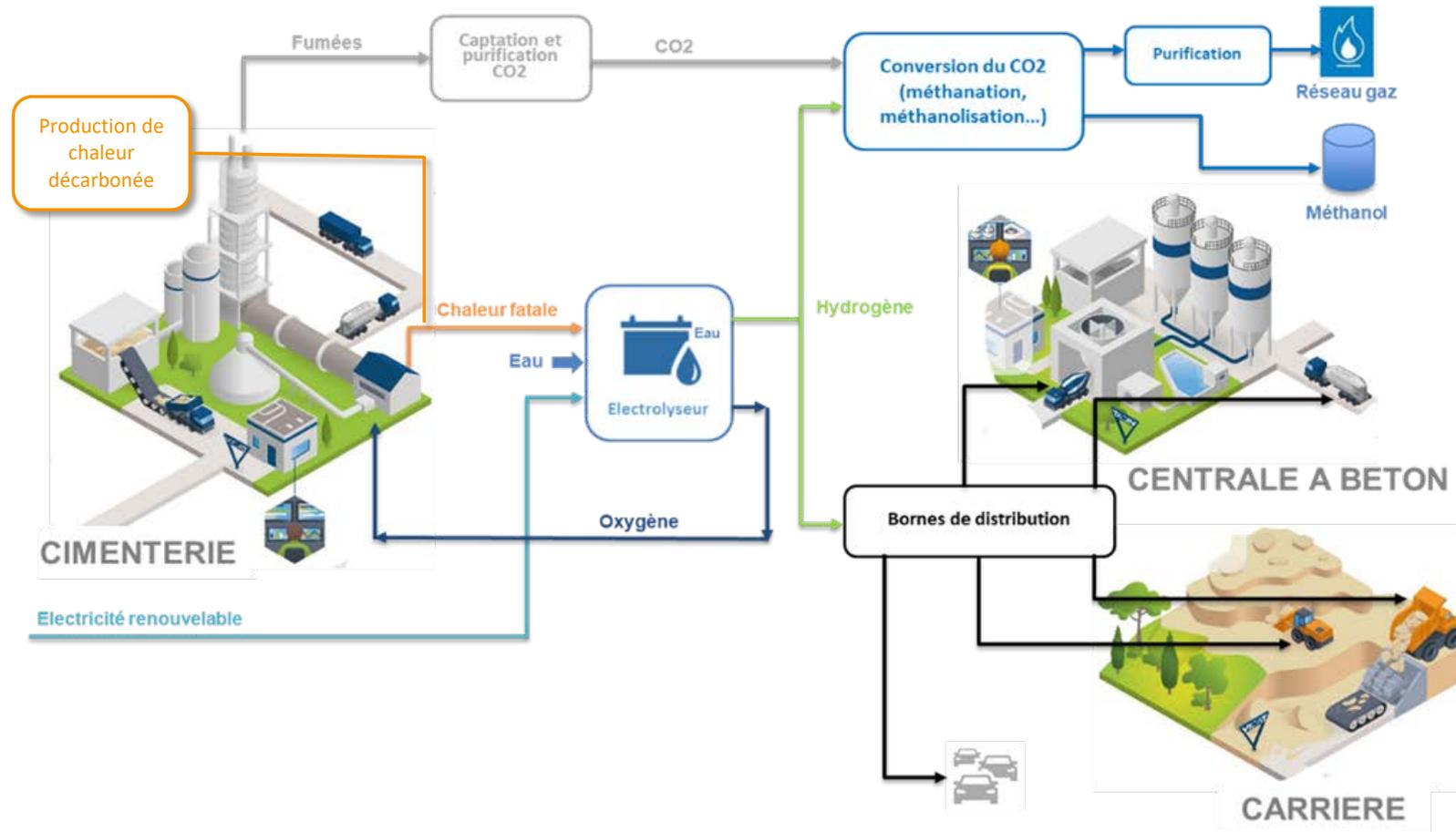
A long-standing commitment to the hydrogen sector

Guy Sidos is a member of the CNH,
Conseil National de l'Hydrogène, representing the construction business

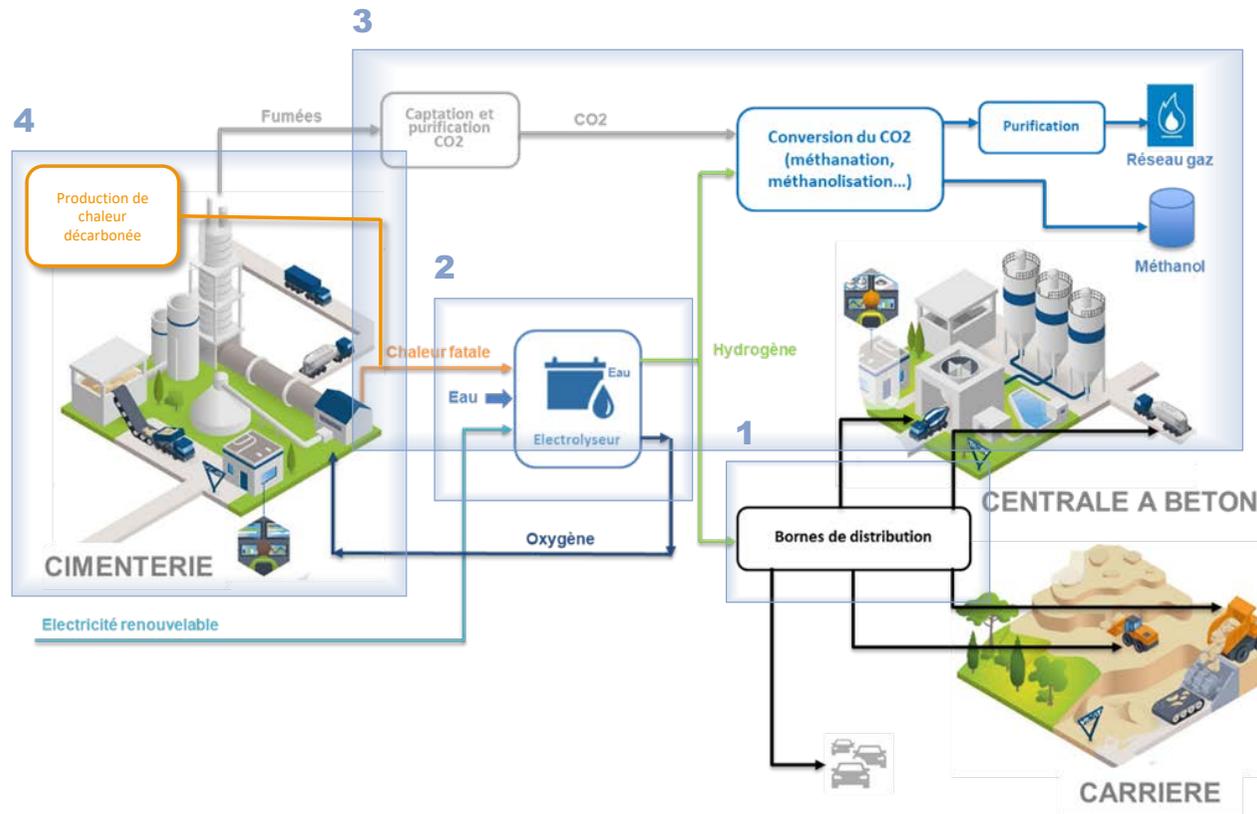
Vicat joins the Board of Administration of France Hydrogène



The Vicat hydrogen model



Vicat hydrogen projects



1- HYPULSION: H2 distribution station in Saint Egrève as part of the AURA region's ZEV project.



2- GENVIA/ VICTORHYA :

Share in GENVIA for the acceleration of the development of the innovative high temperature and reversible SOE (solid oxide electrolyzer) technology developed by CEA. Reduction of nearly 30% of electricity consumption to produce the same amount of hydrogen thanks to the use of waste heat.



VICTORHYA" industrial demonstrator using the waste heat from a cement kiln on a Vicat site in France.

3- HYNIVI:

Capture and conversion of CO₂ into methanol by combining with hydrogen. -1/2 Million tons per year of CO₂ avoided.



Local production of a new low-carbon energy carrier.

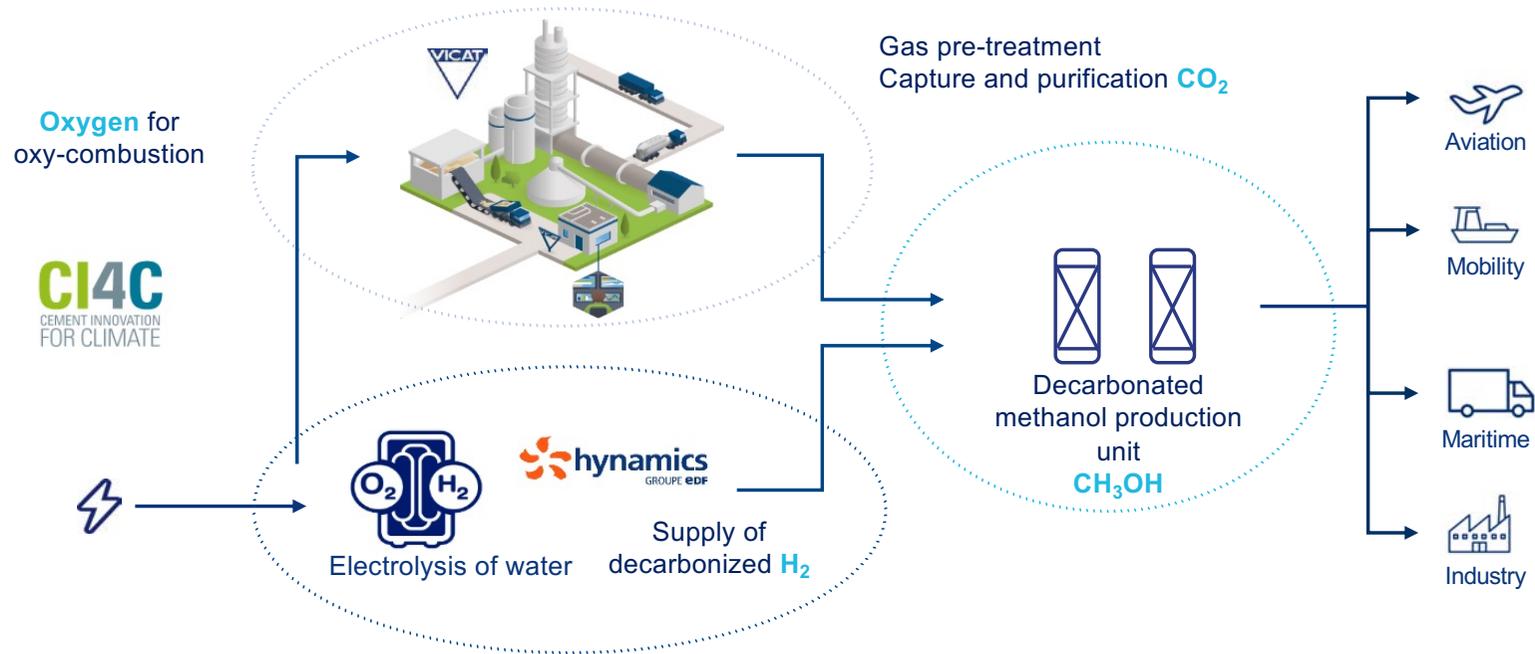
4- CATCH4CLIMATE:

Creation of the C4C company (Vicat, Buzzi - Dyckerhoff, HeidelbergCement, Schwenk). Construction of a 450 t/d clinker pilot plant in Germany to industrially validate the Oxyfuel technology. Objective: Facilitate the capture of CO₂ in the flue gas



HYNOVI Project

POWER-TO-METHANOL FOR MASSIVE, CROSS-SECTORAL DECARBONIZATION



CCU is a doubly relevant solution for cement sites, which are generally far from industrial hubs:

Decarbonization by capturing CO₂ from cement plants which are intrinsically producers of fatal process carbon, co-produced with the cement.

Use of the captured CO₂ to synthesise a decarbonated methanol to replace grey methanol and provide new markets.



HYNOVI: multiple positive effects



Almost 500 kilotons of CO₂ per year will be captured/avoided thanks to the HYNOVI project



More than 2000 jobs created (including indirect jobs), while preserving jobs in the construction and cement sectors, characterised by a strong fabric of SMEs



Relocation of more than 1/4 of the current methanol production in France while providing a low-carbon product. Creation of a new energy carrier with multiple uses.

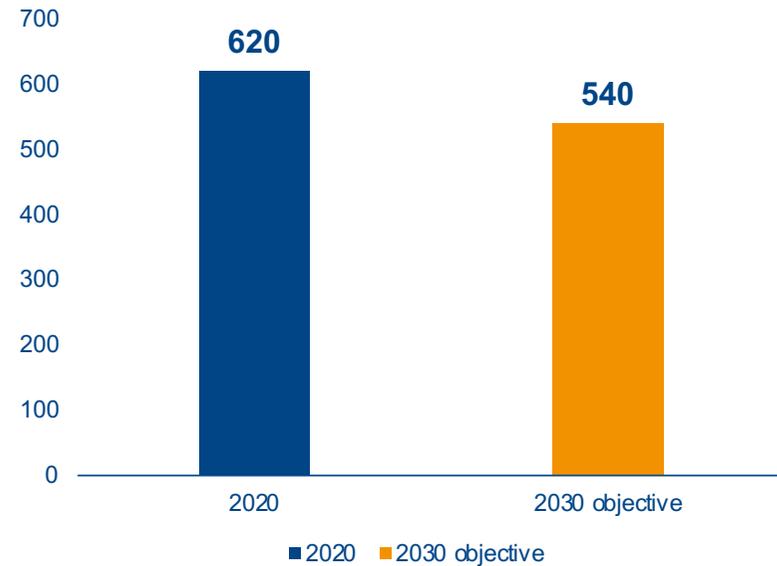
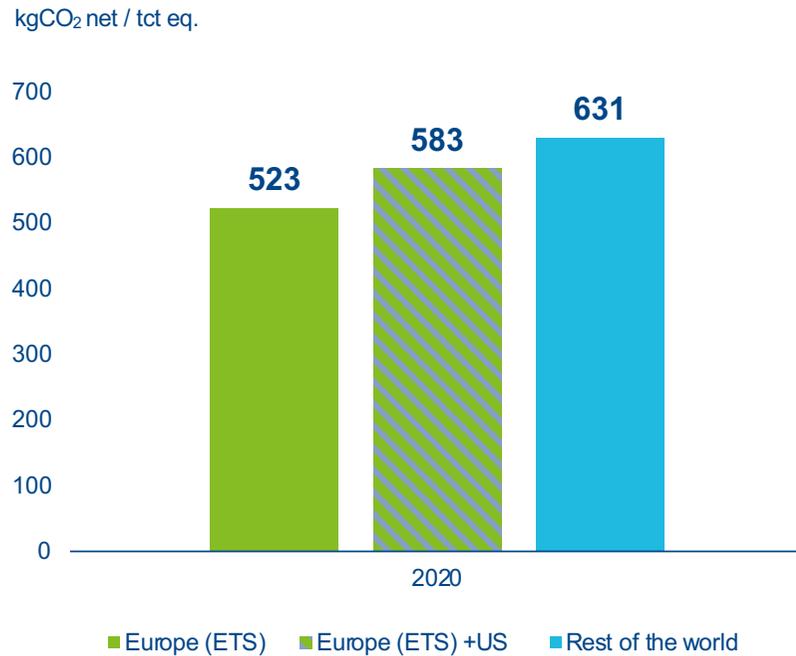


With an installed electrolyser capacity of 330 MW, the HYNOVI project covers 5% of the French target of 6.5 GW by 2030 and offers a significant opportunity for future "gigafactories"

- **The HYNOVI project has been pre-notified by the French government and is currently being examined by the European Commission in the framework of the IPCEI programme**

2030 objectives

Net CO₂ direct emissions*



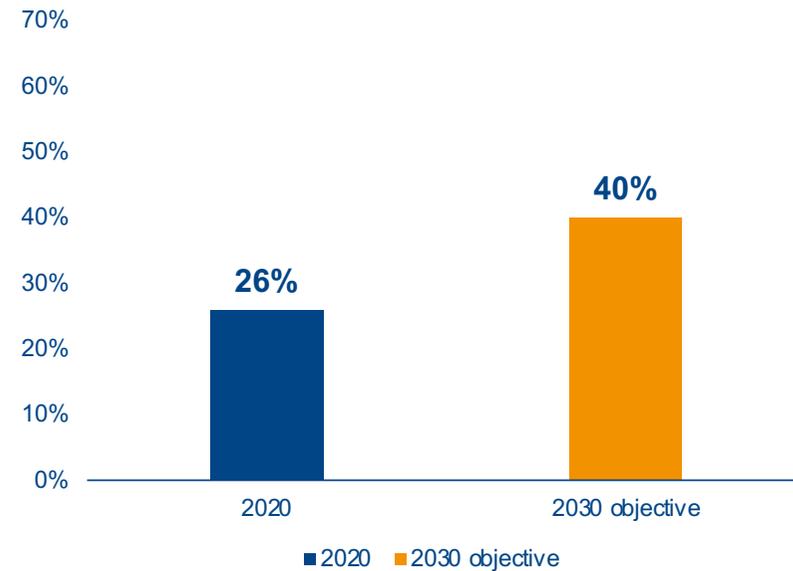
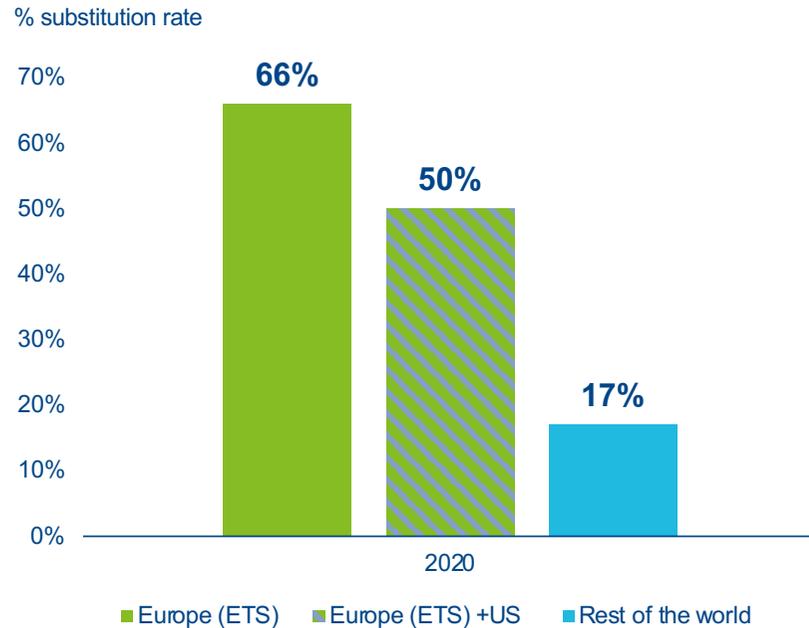
2030 Objectives of

- 430 KgCO₂ in Europe
- 540 KgCO₂ at Group level

*Definition of net CO₂: direct emissions including the physico-chemical transformation of raw materials at high temperatures and the use of fossil fuels, excluding all alternative fuels.



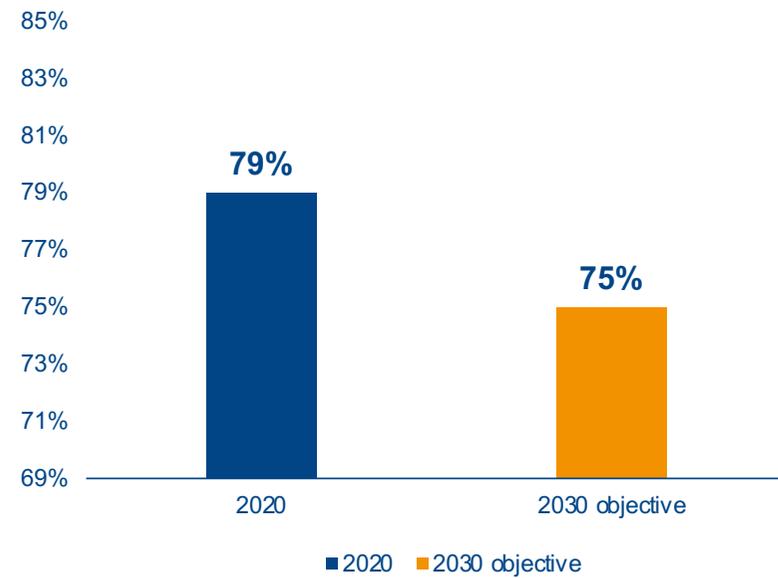
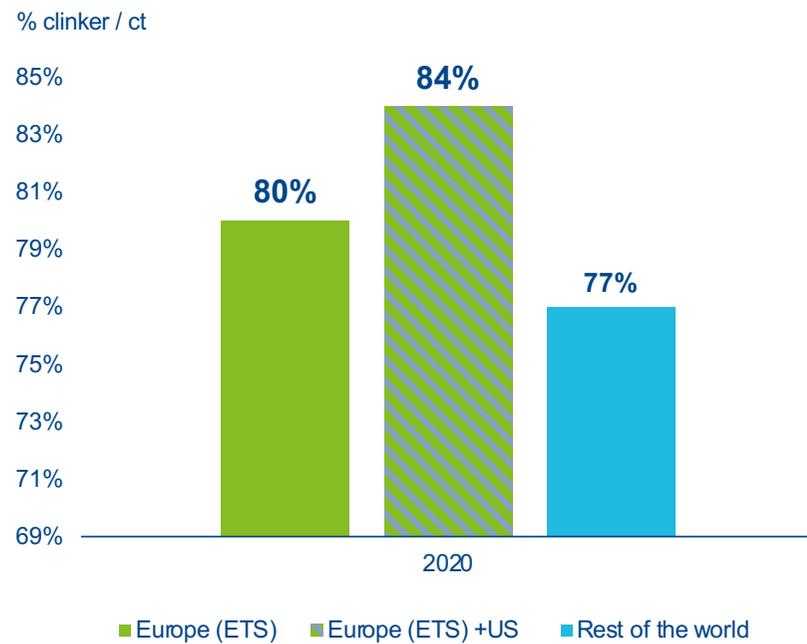
Substitution rate



2030 Objectives of

- Close to 100% in Europe
- 40% at Group level

Clinker factor



Going forward



Show our achievements



Commit to understandable objectives



Use the CSR report as a lever in our extra-financial communication



Have our commitments confirmed by third parties



Costs & Financing



Proven ability to finance the industrial conversion



Vicat has invested 3.7 billion euros in industrial capex over the last 15 years doubling its installed capacity while investing 1.2 billion euros to enter 4 new countries



During that period, the Group has generated steady levels of gross cash



While maintaining its debt ratios



Capex to reach our 2030 objectives



Cost of various projects for 2030:
800 million euros

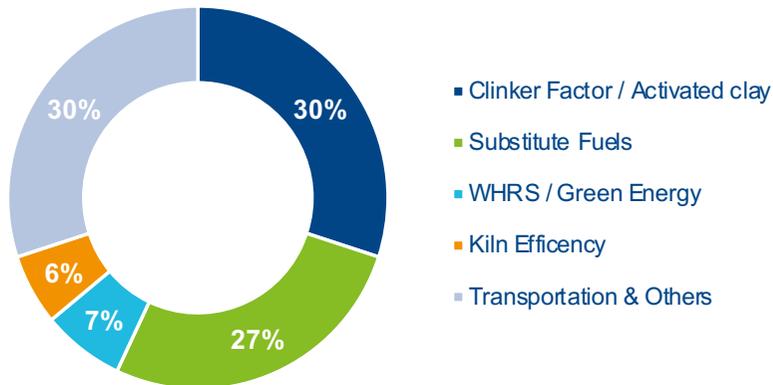


The equivalent of **80 million euros per year** in specific investments

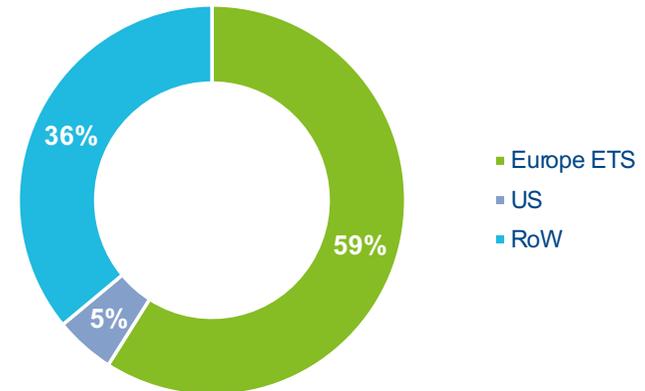


Not fully additional to existing investment trends

Nature of Capex



Capex by region



Investment financing



Reduction
in costs



Rise
in sales prices



Public support
mechanisms



Green
financing

2030-2050



Choice in CCUS technology not settled



Drop in CCUS technology costs



Partnership on specific projects



Public funding



Gradual ramp up of all 16 plants to highest decarbonized standards



Price rises
+ New opportunities



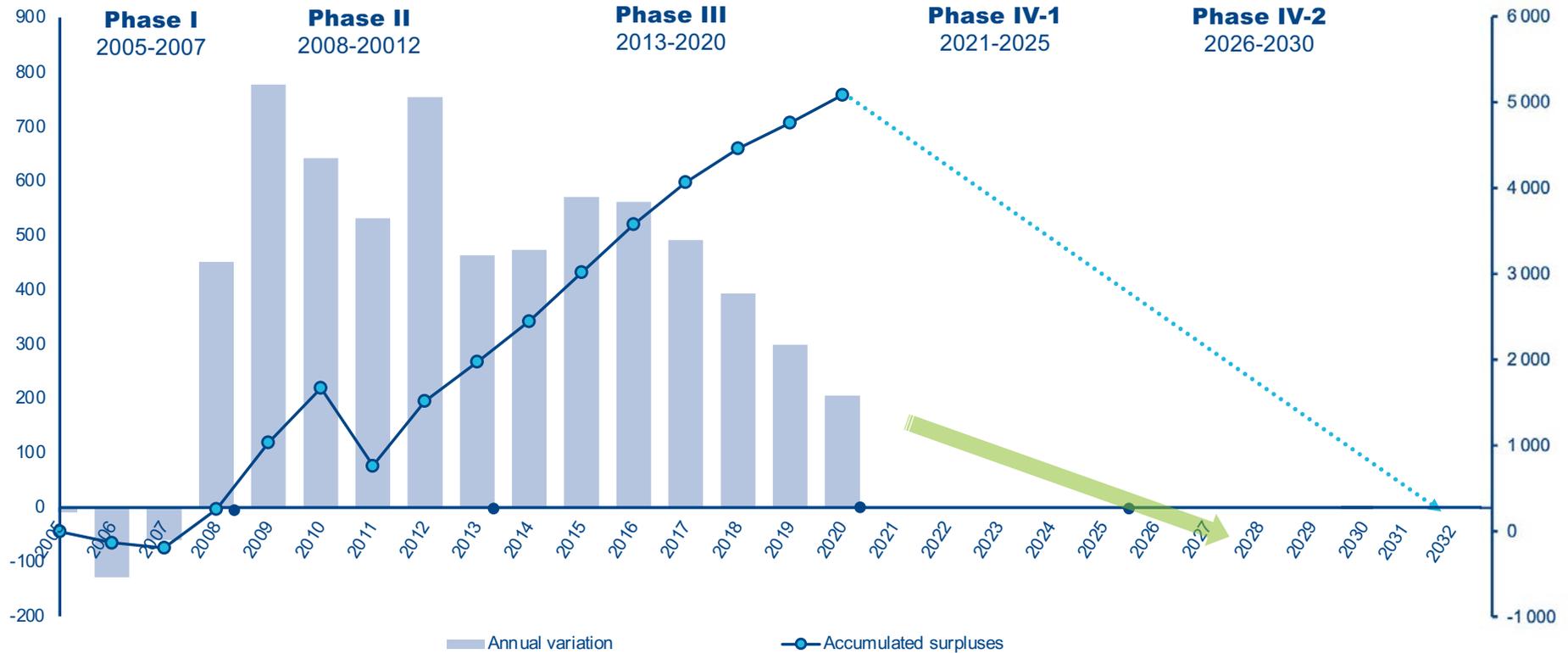
Available Free Cash Flow after 2030 investment



Quotas to be unblocked

Financial leverage to invest in the transition

THE VICAT CO₂ QUOTAS STOCK SURPLUS STANDS AT 5.1 MILLION TONS IN 2020 AND IS EXPECTED TO LAST UNTIL 2032





Conclusion

With Guy Sidos,
Chairman & CEO of Vicat



