



Eco-Tech Ceram

The carbon free energy





Table of contents

09/04/2024



- [Part 1 : Eco-Tech Ceram](#)
- [Part 2 : Our solutions to decarbonise the industry](#)
- [For more information](#)



1-Eco-Tech Ceram

09/04/2024



Part 1 - Eco-Tech Ceram

- [The ETC's mission : decarbonising the industry](#)
- [Our shareholders](#)
- [The industry decarbonisation](#)
- [Context and challenges](#)
- [From idea to industrialisation](#)
- [A complete expertise](#)



The ETC mission: decarbonisation the industry



“ *Industry is responsible for 20 % of the CO₂ emissions.*

More than the third of the consumed energy is lost in the form of heat, equivalent to 2450 Mt of CO₂ per year on a global scale.

We can profitably decarbonise the industry by recovering this waste heat.

Antoine Meffre, founder and CEO of Eco-Tech Ceram

Interview *Journal du Dimanche*, day 1,5°C organised by the CDC





Our shareholders



An independent French management company founded in 2013 by N. Rochon and a company with a mission, RGREEN INVEST specialises in investing in and financing the energy transition and adaptation to climate change.



Bpifrance finances businesses through loans, guarantees and equity. It supports them in their innovation and international projects. Bpifrance also supports their export activities through a wide range of products.



Created as part of the PIA programme, it is 100% owned by the French government. Its aim is to provide equity financing for innovative infrastructure projects in the field of energy and ecological transition, alongside private-sector players.



The Captain Watt Group (formerly Qair), owned by the Bouchet family, invests in companies involved in the transition to energy, the environment and the sea. It supports the development of 15 companies, mainly in the Occitanie region.



In the field of renewable heat, Johes is the family office of the Vaury family, specialising in the energy transition.



The Occitanie Regional Climate and Energy Agency creates solutions to facilitate the energy and climate transition in the regions. It operates across the entire energy transition value chain.



ETC: decarbonising industry



Climate change

30-50

% of ecosystems under threat

3 billion

people at risk

+ 2°C

maximum to limit global warming by 2100

*Global figures - IPCC 2022 report



CO2 emissions

78 million

tonnes of CO₂ emitted every year in France by industry



20

% of CO₂ emissions come from industries

20 million

fewer tonnes of CO₂ emitted by industry by 2032 - a French government requirement

*Haut Conseil pour le Climat figures, Sept. 2022 and Citepa, Secten inventory, ed. 2022 / Speech by E. Macron, Nov. 2022



Lost energy

50

% of energy is consumed as heat



1/3

of the energy consumed is lost as heat

100 = 2.4

TWh of heat is lost in France each year

million French people for their annual consumption

*ADEME figures Dossier waste heat recovery 2020



The ETC solutions

+20

% gains with energy sobriety and efficiency

+20

% gains with heat recovery with or without storage

+30

% gains with the electrification of heat

1000 tonnes

of CO₂ avoided each year

*ETC figures based on feedback from infrastructures installed on industrial sites



Context & challenges: an opportunity to seize now



World

Paris agreements: < 2°C



Europe

Fit for 55 %: 1990 vs 2030



France

SNBC: -35 % to -50 % 2015 to 2030



Carbone quotas

Banks will no longer finance industries that do not have a decarbonisation strategy (ESG, environmental standards).



Efficient, cost-effective and sustainable technology solutions.
Associated financing solutions with our partners.



From idea to production: from R&D to your factories



2011

2013

- Antoine Meffre thesis (CNRS PROMES): High temperature **energy storage**.

- The ETC concept:

Design of a thermal storage unit to recover waste heat from factories.

Design and production of prototypes for public research and higher education.



2014

2021

- Creation of Eco-Tech Ceram**
- Three-time winner of the Global Innovation Contest
- Prototypes** and industrial sales
- Fundraisings** (40 M€)
- Creation of ETC Invest
- 5 patents**
- 50 scientific publications



2023 ...

Today:

- 25 employees** experts in sobriety, energy efficiency and energy recovery.
- Contracts with industries and major industrial groups** (5M€)
- Contracts with public research laboratories**
- Active R&D thanks to a major scientific network



Your contact for a complete expertise

We understand every stage and every element of **industrial processes**, in ceramics and metallurgy to provide the most cost-effective and sustainable **decarbonised heat** possible.



Project management



Materials



Thermics



Process



Mecanics



Automation



Digitalisation



Funding

⇒ From design to implementation

⇒ From experimental laboratory bench to industrial infrastructure: **from TRL2 to TRL9**

⇒ All the necessary scientific and technical skills



2- Our solutions to decarbonise



Part 2 - Our solutions to decarbonise industry

- [Eco-Stock® and PTH](#)
- [Solutions for profitable decarbonisation](#)
- [Pragmatism and cost-effectiveness](#)
- [Proven decarbonisation strategy](#)
- [Profits / Efforts matrix](#)
- [Proven decarbonisation strategy - step 1](#)
- [Proven decarbonisation strategy - step 2](#)
- [Proven decarbonisation strategy - step 3](#)
- [Our turnkey offer](#)
- [Solutions 100 % OPEX](#)
- [Improvements and discounts](#)
- [They trust us](#)
- [For more information](#)



Eco-Stock® + PTH: our innovative solutions



The Eco-Stock® is certified by the Solar Impulse Foundation since 2018.

Eco-Tech Ceram has developed the Eco-Stock®, which can be combined with power to heat, a **low-carbon heat production duo**. With Eco-Stock®, high-temperature storage **captures** the plant's heat source at over 300°C, **stores** its energy and **reinjects** it into the processes.



TEMPERATURE
300 - 1500°C



YIELD
> 90 %



POWER
200 at 3000 kW



CAPACITY
Up to 3 MWh



MODULAR
Many applications



ROBUST



MOVABLE
Movable on site



ECO-DESIGNED
0.14 MWhth/m² footprint



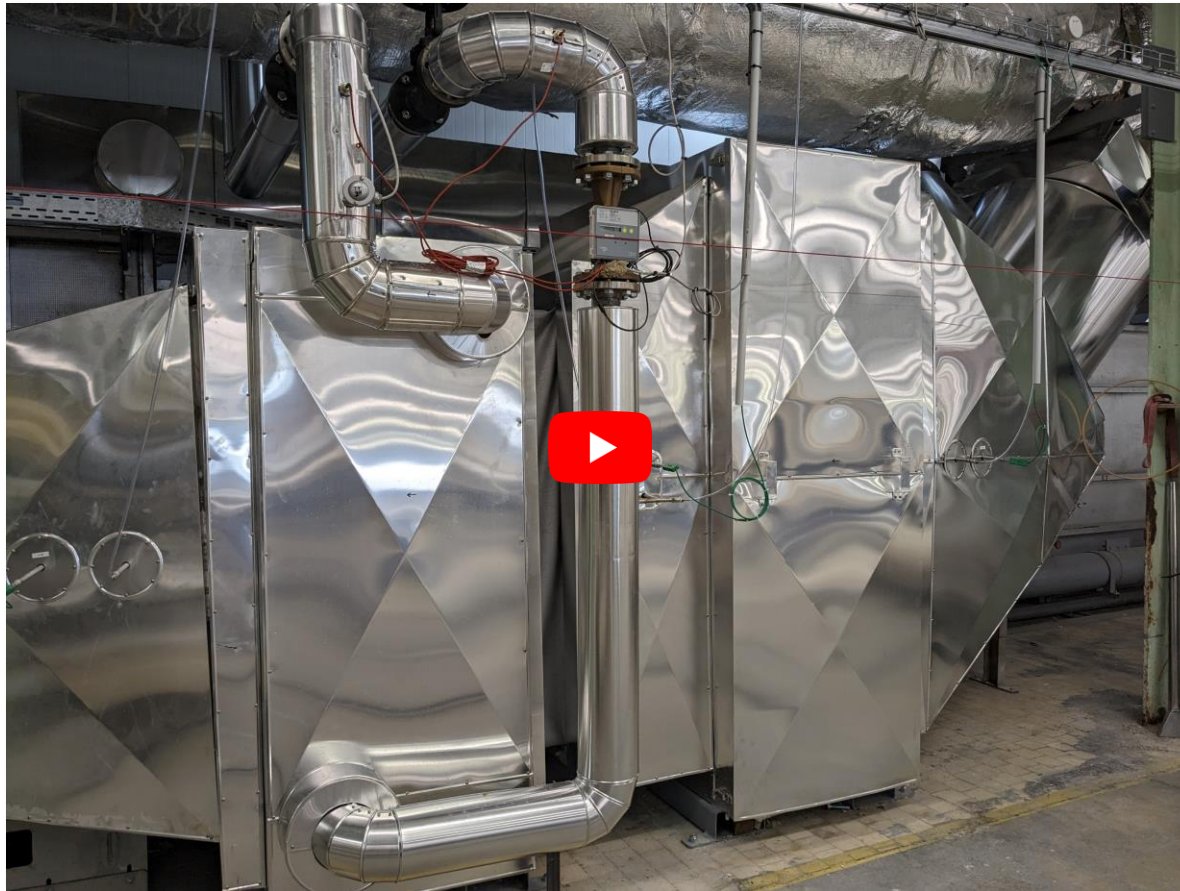
REDUCTION
Up to 1000 t / year



Solutions for cost-effective decarbonisation

The **Villeroy & Boch** exemple:

8 GWh in **energy** savings and **1400 tonnes of CO2** avoided each year.





Pragmatism and cost-effectiveness

1



Identifying energy consumption

5 % potential savings



Cost effectiveness +++

2



Sobriety and energy efficiency

20 % potential savings



Cost effectiveness +++

3



Heat recovery with or without storage

20 % potential savings



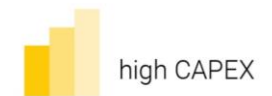
Cost effectiveness ++

4



Heat electrification

30 % potential savings



Cost effectiveness +



Proven strategy decarbonisation

Step 1

Find out about your consumption

Step 2

Global energy efficiency

Step 3

Renewable energies

1
Target

2
Measure

3
Visualize

4
Analyze

5
Action plan

6
Sufficiency

7
Efficiency

8
Recover

9
Substitute

Eco-Tech Ceram = 1 single point of contact to draw up your decarbonisation strategy

⇒ [ADEME methodology](#)

⇒ Scientific and rational approach- Pragmatism

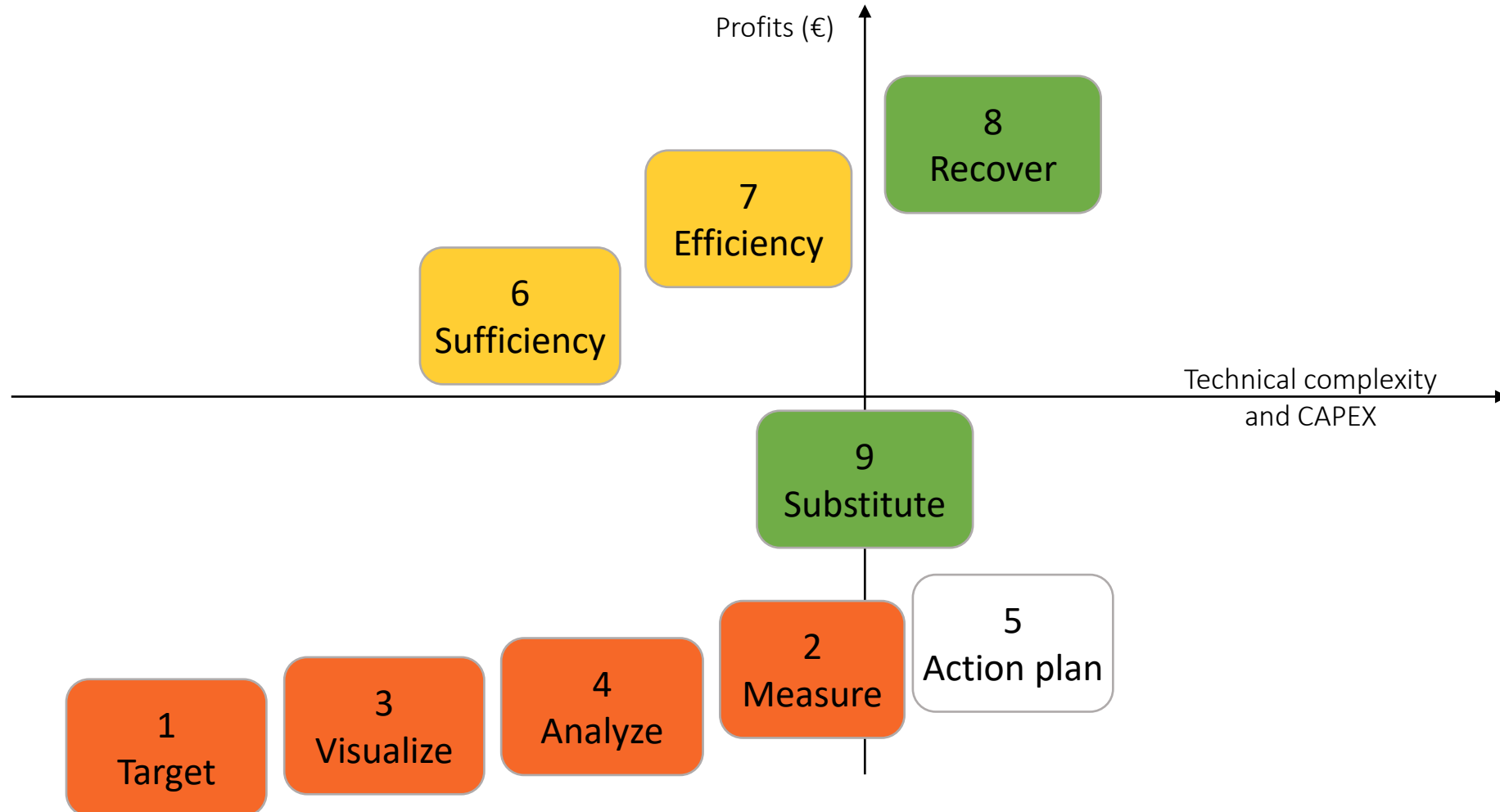
⇒ State of art T0

- Action plan ranked by increasing ROI
- CAPEX or OPEX implementation (over a maximum of 15 years) depending on your finances and the maximum ROI you can accept



Profits / Efforts matrix

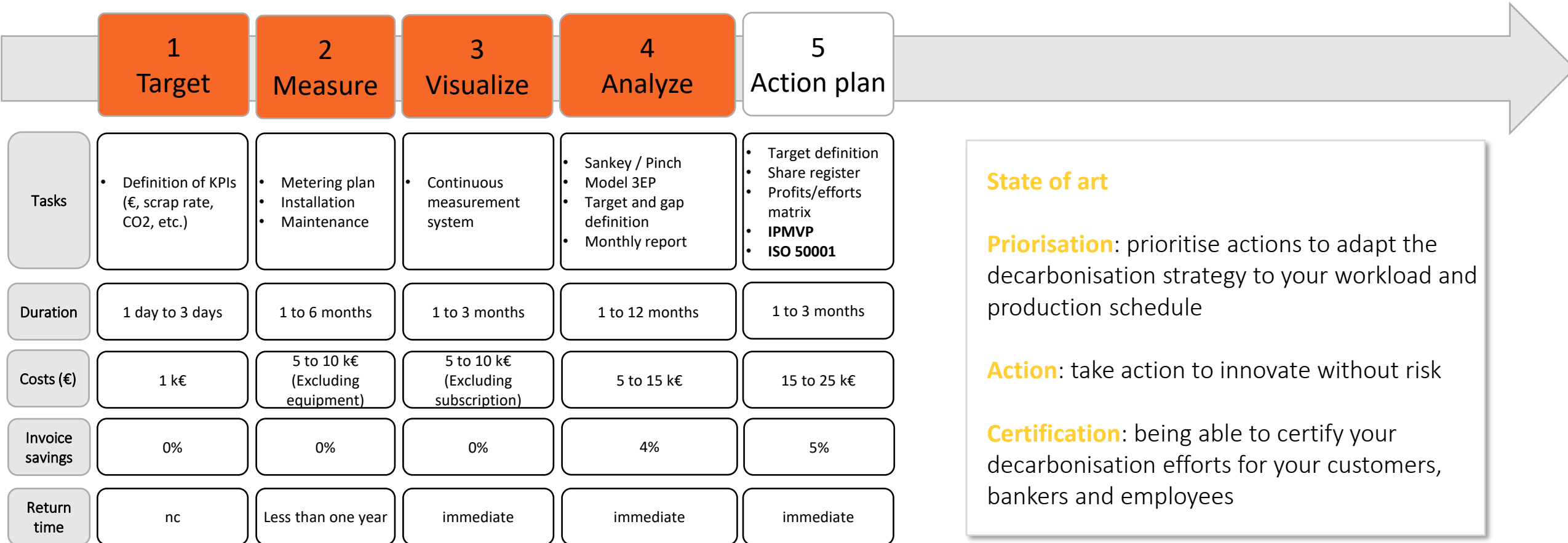
A logical, pragmatic approach to maximising your profits and prioritising the actions you need to take.





Proven strategy decarbonisation - step 1

1- Find out about your consumption





Proven strategy decarbonisation - step 1

1- Find out about your consumption pour so you can really manage the energy consumption of your processes

Diagnosis

Online self-diagnosis or a course supervised by a referenced service provider



bpifrance

Pact (studies)

Course supervised by an approved provider



Decision support

Your choice of design office and scope of work





Proven strategy decarbonisation - step 2

2 – Global energy efficiency

6 Sufficiency

7 Efficiency

8 Recover

	6 Sufficiency	7 Efficiency	8 Recover
Tasks	<ul style="list-style-type: none">Energy and production managementHeat transfer modelling	<ul style="list-style-type: none">Burner adjustmentPressure adjustmentLight revamping	<ul style="list-style-type: none">Resource requirementsScenario selectionTechnical and economic studySizingImplementation
Duration	3 to 12 months	3 to 12 months	6 to 18 months
Costs (€)	2 to 40 k€	2 to 40 k€	Study: 50 k€ 200 k€ to 2 000 k€
Invoice savings	5 to 10%	10 to 20%	10 to 30%
Return time	1 to 6 months	6 to 12 months	36 to 120 months

Concrete results: the most effective and rapid method of achieving concrete results at the lowest possible cost

ROI < 1 year

Beskop solutions: our design office specialising in thermal engineering adapts to your processes and the characteristics of your manufacturer's site

Efficiency: increase your efficiency to reduce your waste heat



Proven strategy decarbonisation - step 3

3 - Renewable energies

9 Substitute

Tasks	<ul style="list-style-type: none">• Scenario selection• Technical and economic study• Sizing• Implementation
Duration	12 to 24 months
Costs (€)	Study: 50 k€ 200 k€ to 2 000 k€
Invoice savings	20 to 50%
Return time	60 à 120 months

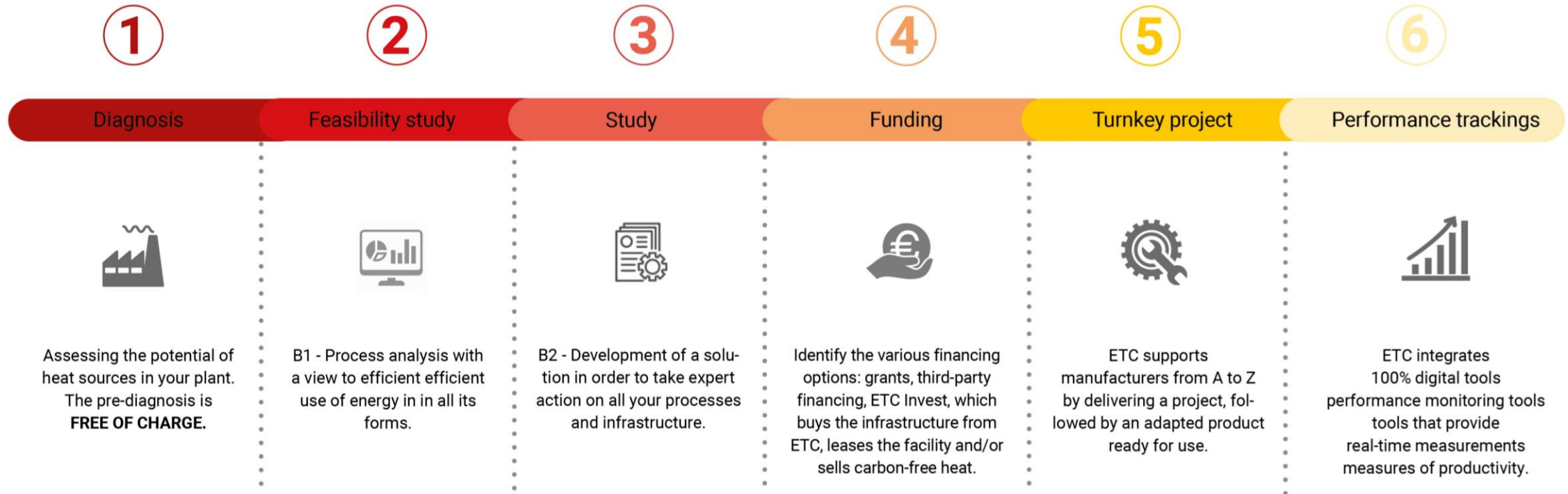
PTH: decarbonised heat revolution on a manufacturer scale

References: at major industries such as Villeroy & Boch, Wienerberger and ArcelorMittal

Innovations: proven maturity on industrial sites to reduce your energy consumption by up to 10%



Our turnkey offer to recover and substitute





Solutions 100 % OPEX

Do you want to retain your investment capacity for other projects? And are you looking for a short return on investment (max 5 years)?

The OPEX offer is for you!



- Assistance in obtaining government aid
- Financing facilities on behalf of industries
- Operation and maintenance



- Zero CAPEX
- Savings from the first year
- You buy low-carbon heat at a competitive and constant price over the duration of the contract (tariff shield)





In short, ETC's services enable you to:

↑ Improvements ↑



Competitiveness and resilience



Quality and productivity

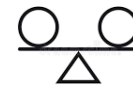


Employer branding

↓ Discounts ↓



CO₂ emissions



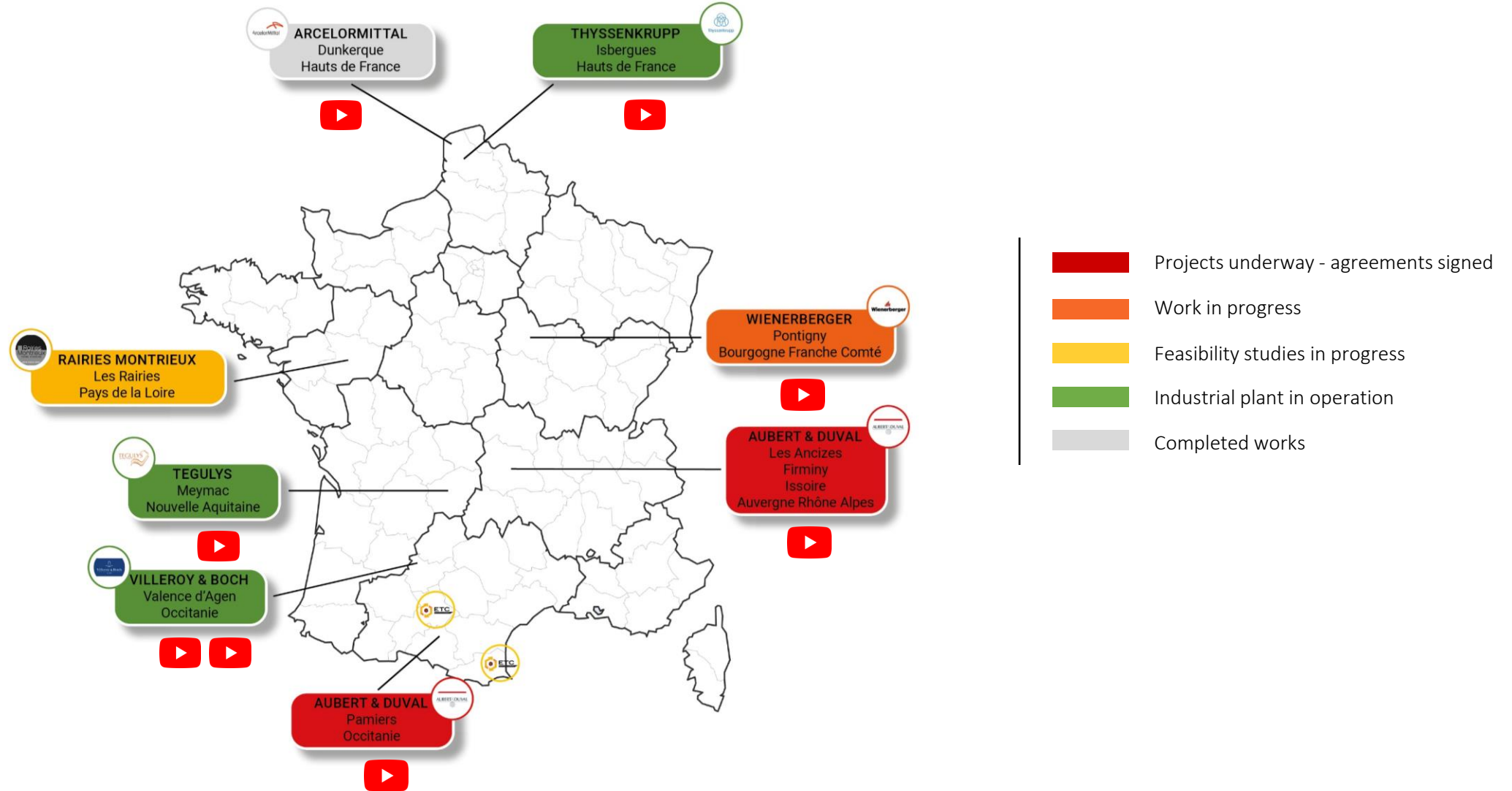
Energy volatility



Investment








They trust us in France





They trust us in Europe



-  Projects underway - agreements signed
-  Work in progress
-  Feasibility studies in progress
-  Industrial plant in operation
-  Completed works



They trust us: Teguly's



Recovery of waste heat



- Recovery of high-temperature (> 500°C) waste heat from a kiln.
- Heat recycled to the plant's dryer.
- The Eco-Stock® captures and stores waste heat from the kiln so that it can be used in the dryer and pre-cooking chamber at the desired moment.



Industrial plant in operation



Ceramics



364 MWh saved / year
equivalent to 10%



75 tonnes of CO₂ saved / year



5% productivity increase



1300 kWh storage capacity



They trust us: Villeroy & Boch 1



Exchanger from the kiln to the dryers



- Recovery of high-temperature waste heat (> 250°C) from the kiln.
- Heat recycled to the plant's dryers.
- 100% carbon-free drying process.



Industrial plant in operation



Top-of-the-range ceramics



3000 MWh saved / year
equivalent to 10%



500 tonnes of CO₂ saved / year



17% productivity increase

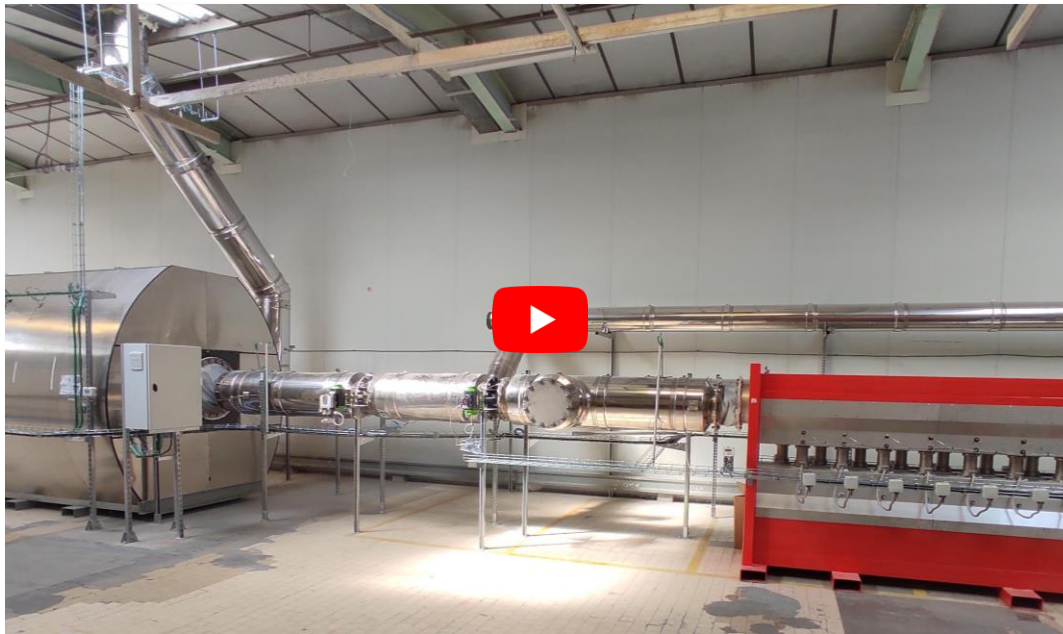


They trust us: Villeroy & Boch 2



Storage unit on a continuous tunnel kiln with power to heat

- Recovery of high-temperature waste heat (> 500°C), which goes to the power to heat unit via fans.
- Power to heat raises the temperature with low-carbon electricity.
- At off-peak times, the heat from the flue gases is stored in the Eco-Stock® and at the same time recovered at the furnace inlet.
- At peak times, only the heat stored in the Eco-Stock® is used in the tunnel kiln.



Industrial plant in operation



Top-of-the-range ceramics



3000 MWh saved / year
equivalent to 10%



2.3 MWh storage capacity



They trust us: Wienerberger



Exchanger/storage system from 6 kilns to 6 dryers



- Recovery of high-temperature (>500°C) waste heat from 6 kilns.
- Heat recycled to the plant's 6 dryers.
- The Eco-Stock® system captures and stores waste heat from baking ovens so that it can be used in the dryers when required.



Work in progress



Ceramics



2200 MWh saved / year
equivalent to 10%



500 tonnes of CO₂ saved / year



5% productivity increase



1300 kWh storage capacity



They trust us: Thyssenkrupp



Recycled waste heat from the flue gases of 1 furnaces to preheat the water used by the boiler



- Installation of flue gas / water exchangers.
- Hybridisation of the boiler producing the superheated water needed for the process.
- One furnace was studied and integrated into a waste heat recovery solution to pre-heat the water loop at the boiler return.



Industrial plant in operation



metallurgy



6 GWh saved / year
equivalent to 10%



1450 tonnes of CO₂ saved / year



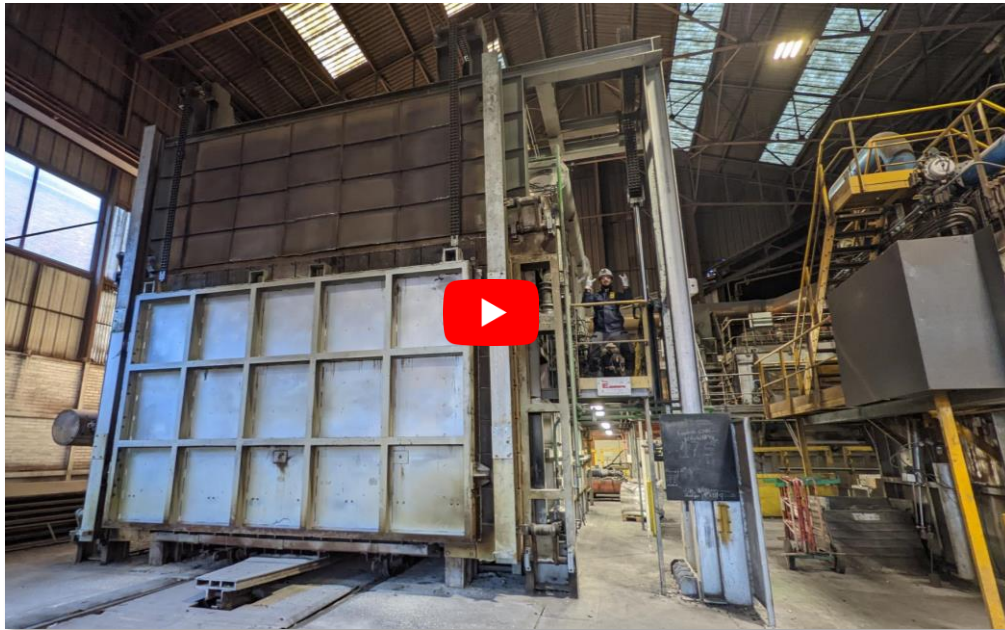
They trust us: Aubert & Duval



Exchanger/storage



- The hot fumes from the metallurgist's furnaces will be directed towards a heat exchanger.
- The decarbonised hot air will feed the burners.



Projects underway



metallurgy



1200 MWh saved / year
equivalent to 10%



240 tonnes de CO₂ saved / year



They trust us: ArcelorMittal



Pilot plant for drying agglomeration sludge



- Pilot project to avoid using fossil fuels to dry agglomeration sludge.
- Pilot scheme for eliminating the additional cost of transporting wet sludge (20%).
- This pilot plant can be used in a variety of industrial applications: recovery of waste heat from industrial furnaces, drying of materials from all types of industry, pre-heating of materials from all types of industry, production of hot water, production of electricity, recovery of heat from solar power plants.



Completed work



Metallurgy



360 kWh storage capacity at
600°C



They trust us

Feasibility studies

- ArcelorMittal
- Acappi
- ADEME
- Aperam
- Ascométal
- Bernardaud
- Ceramique & Développement
- EDF
- Faïencerie de Gien
- Ferroglobe
- Forges de Courcelle
- Geberit
- GRT Gaz
- IFB Refractories
- IMT Albi
- Industeel
- Leroy Somer
- Montupet
- Pall Exekia
- Patapain
- Rairie
- Roca
- Runeo
- SMA
- Tembec Tartas
- ThyssenKrupp
- TRB Neufchâtel
- Villeroy&Boch
- Wienerberger



For more information



[All our detailed customer references can be found on our website](#)



[All Antoine Meffre's press interviews](#)



[All about our industrial sites and 3D videos can be found on our YouTube channel](#)



The carbon free energy

Contact us

vincent.lorin@ecotechceram.com

+33(0) 767 376 716

antoine.meffre@ecotechceram.com

+33(0) 6 58 09 15 00

5 Rue de Vidailhan 31130 Balma - France

<https://www.ecotechceram.com/>

