

# NON-ENERGY BENEFITS OF ENERGY EFFICIENCY INVESTMENTS

*Ilyas Gain-Nachi - ALLICE*



# >>> Who are we ?

## The leading alliance for industry decarbonisation



Soutenu par



### Why ALLICE ?

- ➔ To **connect, inform and support** industrial stakeholders through a **cross-sector approach**
- ➔ To **accelerate innovation** for industry decarbonisation
- ➔ To **ensure informed decisions**

### Our organisation

- ➔ An **independent and objective** facilitation organisation
- ➔ A **membership-based** model
- ➔ A governance aligned to **industrial needs**

### Our founders



### Key figures

- ➔ Created in **2018**
- ➔ **130** members & partners
- ➔ **50+** published studies
- ➔ Study cumulative budget: **2,5 M€**

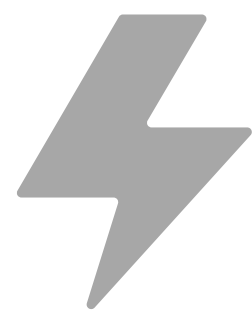
# >>> A diversified and cross-sector network



# While energy efficiency is the first lever for decarbonising industries, current investments are insufficient to meet targets



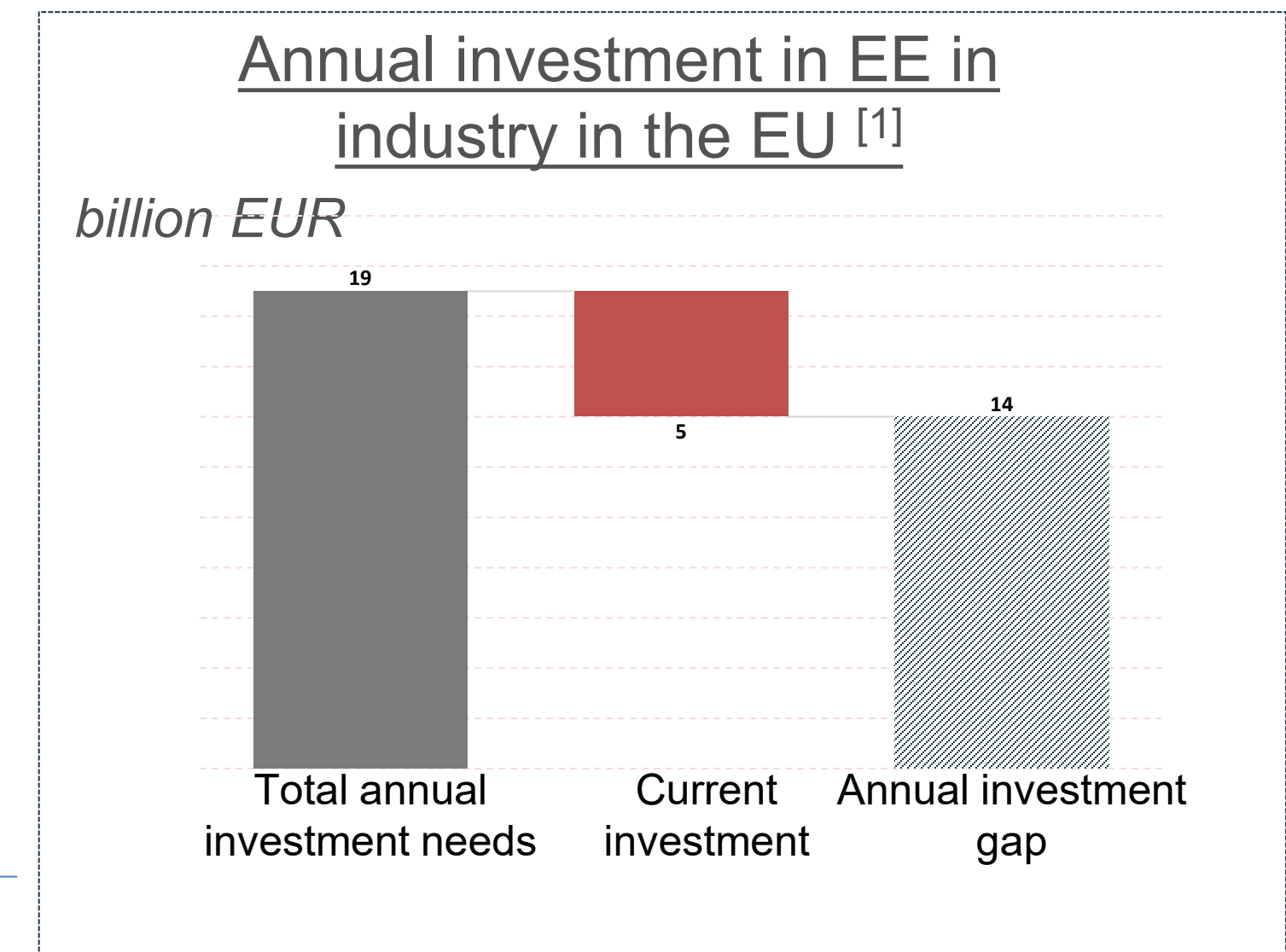
**18%** of greenhouse gas emissions in France are produced by industry



**20%** energy efficiency gains in 2030 (vs. 2010) per tonne produced needed to achieve carbon neutrality by 2050 (SNBC)<sup>[2]</sup> for the industrial sector in France



**75%** investment gap in energy efficiency in European industry to achieve the target of a 40% reduction in emissions by 2030 (vs. 2005) <sup>[3]</sup>



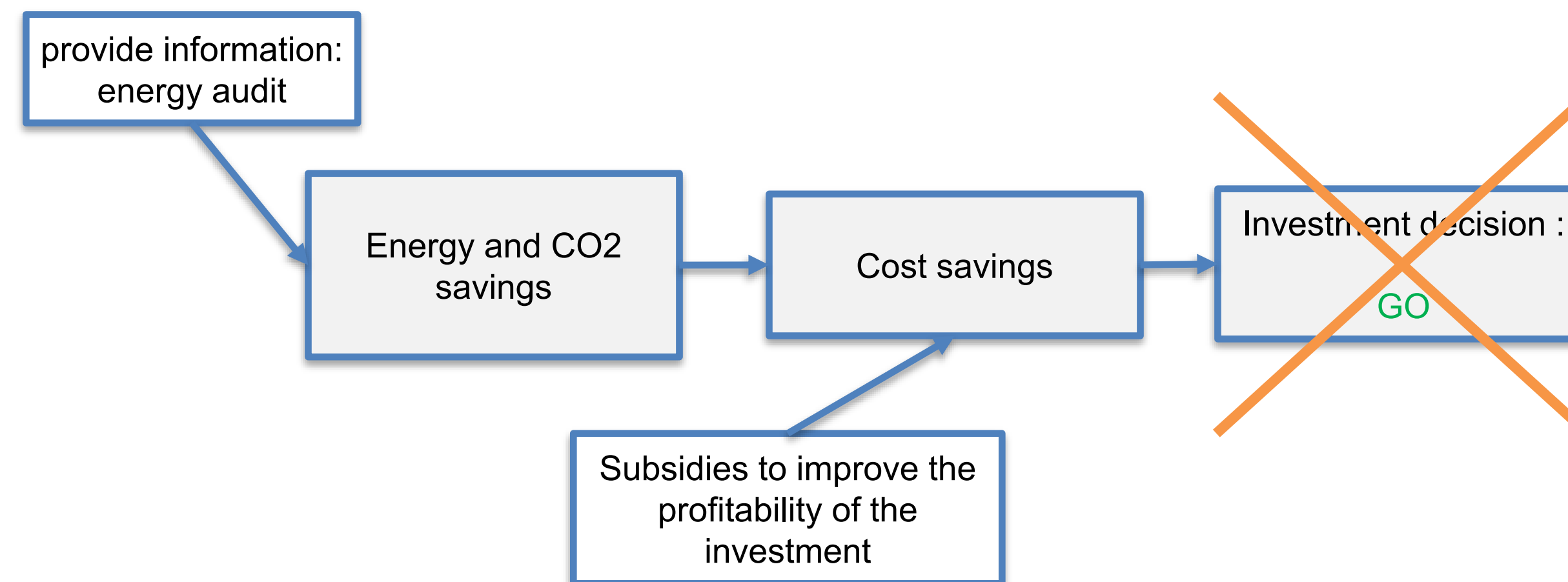
Notes: [1] Own production based on Holmes, I., Jess, T., Genard, Q. (2017). Efficiency first scorecard: is the EU's energy union on track? And IEA (2019). Energy efficiency in 2019; [2] [National Low Carbon Strategy](#), 2017; [3] Figure for 2022

# The traditional "technical-economic" approach is not sufficiently attractive to investors

Investments in energy efficiency follow a strictly "**technical-energy-economic**" logic:

- The only benefits and returns on investment are energy cost savings.
- Public subsidies are granted to improve the profitability and attractiveness of these investments.
- However, many projects do not meet the financial requirements (payback time of 2-3 years).
- Even when investments are profitable, they face competition from other projects.

The technical-economic approach to energy efficiency projects <sup>[1]</sup>



# NEBs include all the positive impacts of energy efficiency investments other than energy-related ones

## Examples of energy benefits

*Reduction in energy consumption*

*Reduction in energy costs*

*Reduction in greenhouse gas emissions (CO<sub>2</sub>, CH<sub>4</sub>)*

*Improved energy security (gas, etc.)*

*Reduction in the risk of energy price volatility*

## Examples of non-energy benefits

*Improved product quality/stability*

*Reduction in unscheduled production stoppages*

*Improved equipment performance/extended service life*

*Reduced future CAPEX requirements*

*Lower maintenance costs*

*Improved safety and working conditions*

*Reduced absenteeism*

*Reduction in legal and regulatory risks*

*Reduced consumption of raw materials, chemicals and water/reduced waste production*

*Reduction in gas and particle emissions (CO, SO<sub>x</sub>, NO<sub>x</sub>, dust)*

- **Energy benefits (EB)** are physical and monetary energy savings.
- **Non-energy benefits (NEB)** include all other impacts on the investor's business and competitiveness. It would be more accurate to refer to non-energy "impacts", both positive and negative, but as the impacts are mostly positive, the term "benefits" has become established.

# NEBs can be categorised in different ways, depending on their impacts and whether they are qualitative or monetisable

## Impacts of NEBs

### Areas

There is no consensus on the categorisation of NEBs, although some major themes seem to emerge:

- 1 Production
- 2 Operation and maintenance
- 3 Working environment
- 4 Environment (water, waste, emissions)
- 5 Other

### Business impacts

#### **Operational**

- *Process*
- *Activities*
- *Resources*

#### **Financial**

- *Return on investment (NPV, ROI)*
- *Financial risk (payback period)*

#### **Competitiveness**

- *Improvement of value proposition*
- *Cost reduction*
- *Risk reduction*

### Types of impacts

Quantitative impacts

Qualitative impacts

- 2/3 of net environmental benefits are quantifiable and monetizable
- It is not possible to use average or default values for quantitative impacts, given the unique nature of each industrial project

# Research on NEB has been conducted for 30 years, with an acceleration since 2014 under the impetus of the IEA and the EU (H2020 and LIFE research programmes)

## Review of the literature on NEB 1998-2018



### Main sources

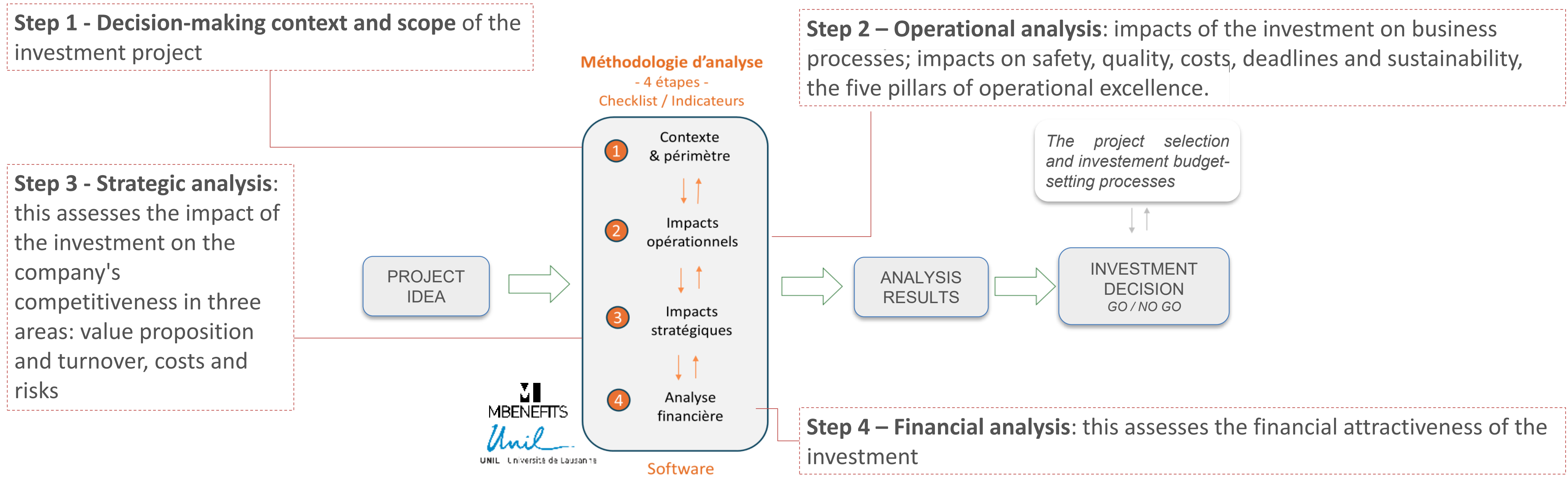


- The research focused on analysing investment decisions in energy efficiency
- It theorised the concept of NEB by proposing definitions, classifications and typologies of impacts and beneficiaries
- It analysed the barriers and levers for taking NEB into account in assessments and investment decisions

[1] G. Killip *et al.*, *M-Benefits Literature Review – Results*, 2018, p. 20. Available at: [https://www.researchgate.net/publication/330222578\\_ANNEX\\_A\\_M-ENEFITS\\_Work\\_Package\\_2\\_Literature\\_review-results](https://www.researchgate.net/publication/330222578_ANNEX_A_M-ENEFITS_Work_Package_2_Literature_review-results); [2] International Energy Programme Evaluation Conference (IEPEC), *Conference Proceedings*; [3] International Energy Policy and Programme Evaluation Conference (IEPEC), *European Conference associated with IEPEC*; [4] International Energy Agency (IEA); [5] T. A. Sandberg, "Promoting and Quantifying Non-Energy Benefits," *ACEEE*, 1998, p. 8,289.

# The MBENEFITS methodology, tested by the European research project M-Benefits, makes it possible to identify and evaluate the NEB of an EE investment project.

## MBENEFITS methodology



# A real case study : steel industry

## Step 1 : Context and scope

- European producer of top-grade grain-oriented electrical steel, with two sites and a 50% share of the European market.
- Five production teams working 33.6-hour shifts take turns to ensure 24/7 production.
- The customers are increasingly demanding 1st -grade electrical steel (resistivity  $\leq 0.73\text{W/kg}$ ).
- 2<sup>nd</sup> grade (following downgrading due to insufficient quality) accounts for a significant share of production volume, with negative impacts on turnover and profitability as it sells for less than 1<sup>st</sup> grade



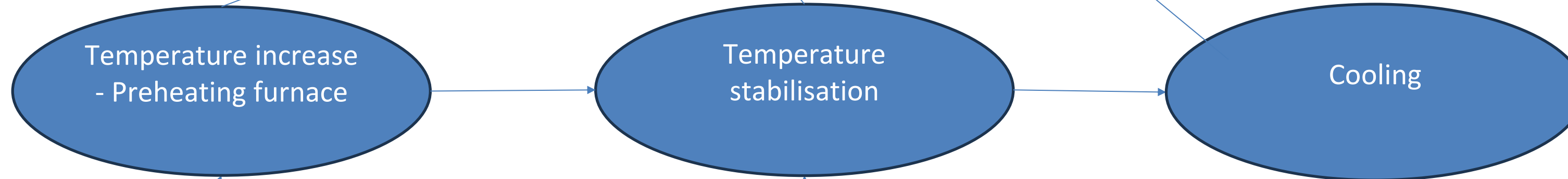
# A real case study : steel industry

## Step 2: Operational impacts

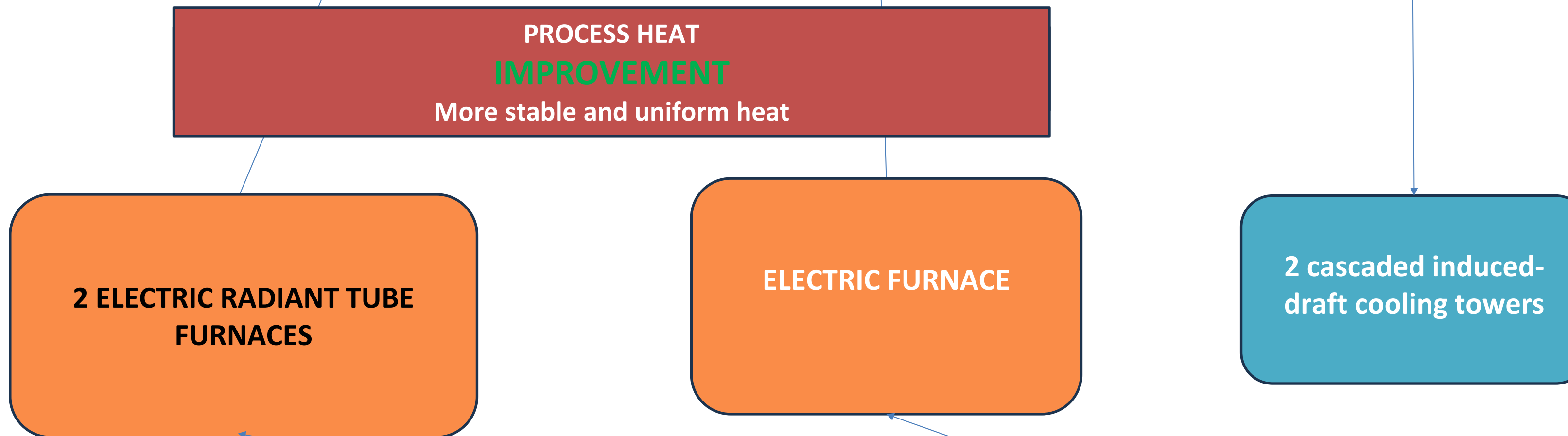
Process activities



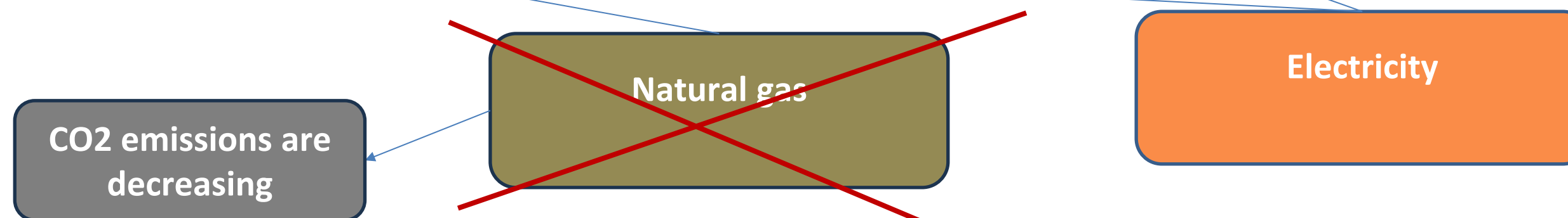
Energy services



Materials & equipment



Energy carriers



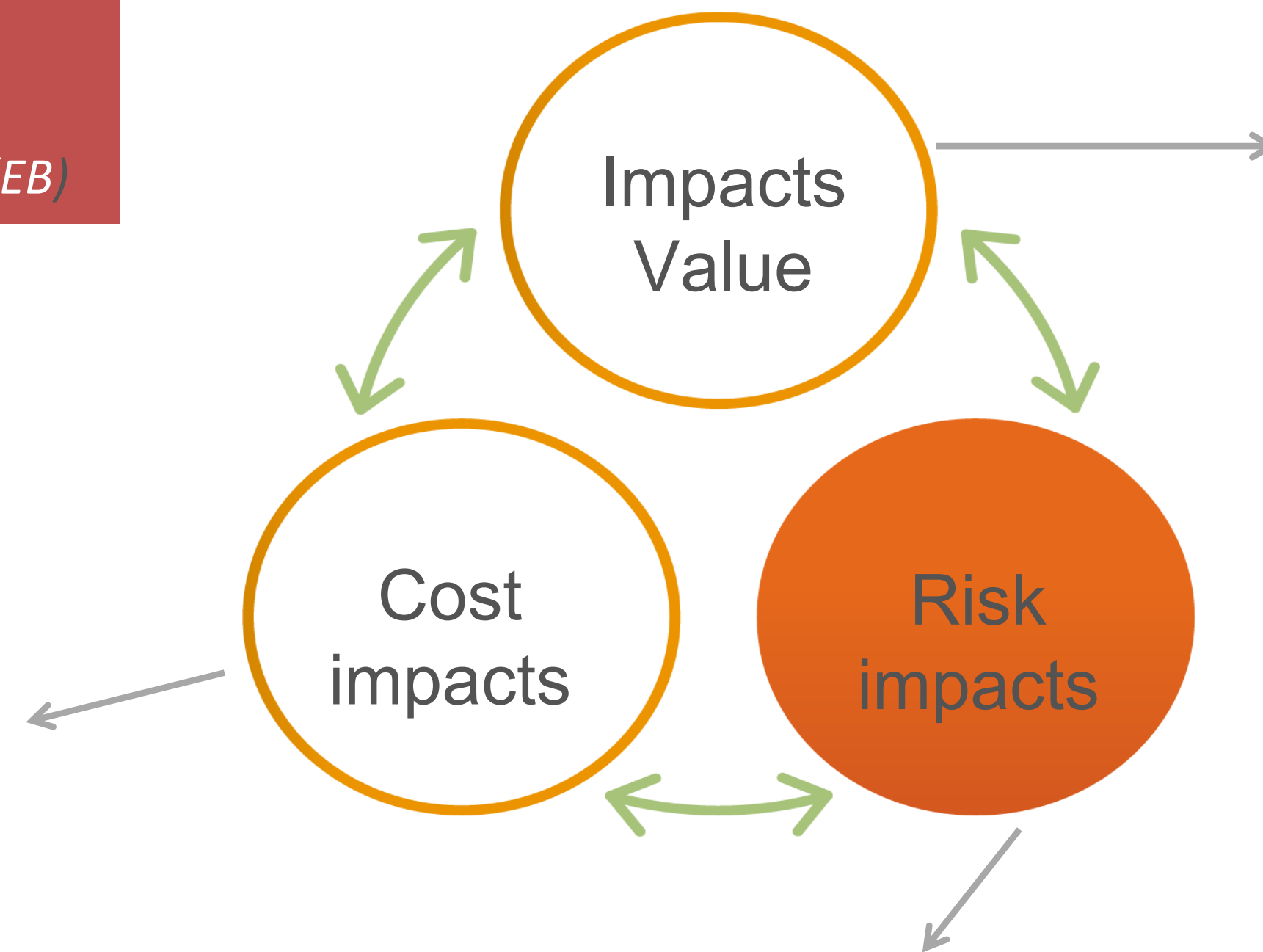
NEBs quantified and included in financial analysis

**Based on the MBENEFITS checklist:**

- 60 Non-energy benefits (NEB)
- 6 Energy and decarbonisation benefits (EB)

### Decreasing:

- Costs of material losses
- CO2 permit purchases
- External storage costs
- Costs of consumables (radiant tubes, energy, nitrogen)
- Annual Average Daily Consumption
- Control costs
- Water costs
- Energy costs



### Decreasing:

- Risk of business interruption (unscheduled downtime of bottleneck equipment)
- Risk of degraded mode operation
- Commercial risk
- Risk of accidents and work-related illnesses
- Energy and climate risks

### Increasing:

- Employee safety
- Production reliability (improvement of bottleneck equipment)
- More consistent and regular quality
- Turnover:
  - +5% increase in selling prices (Top Grade)
  - Fewer downgrades to 2<sup>nd</sup> choice sold at lower prices
- Customer, shareholder and financier satisfaction
- Contribution to the "Roadmap Decarbonisation" strategy
- Reputation: operational efficiency, innovation

### EB\*

- CAPEX: € --
- Income in Q4: --
- Net Present Value: € --
- IRR: **-10.85%**
- Payback period: **46 years**

### EB + NEB\*

- CAPEX: --
- Income in Q4: --
- Net Present Value: € --
- IRR: **78%**
- Payback period: **3 years**

NEB represents **99%** of total investment revenue.

**\*Figures are not provided for confidentiality reasons.**

Any subsidies have not been included in the calculations.

Discount rate: 12%

Investment period: 15 years

# The impact on financial analysis really depends on each individual project. The results are also different for the second case study

**EE Project :**  
improvement of defrosting and washing processes in agri-food factory

## EB\*

- CAPEX: **€1,295,000**
- Income in year 1 : **€251,738**
- Net Present Value: €842,070
- IRR: **15,6%**
- Payback period: **5 years**

## EB + NEB\*

- CAPEX: **€1,295,000**
- Income in Q4: **€295,760**
- Net Present Value: €1,166,230
- IRR: **18,4%**
- Payback period: **4,4 years**

NEBs represent here 15% of total investment revenue.

***Subsidies are not taken into account in the calculations***

*Discount rate: 8%*

*Investment period: 20 years\**

\*The number of years taken into account to calculate the NPV and IRR

# MBENEFITS applies the two winning tactics identified by "issue selling" to get ideas/projects adopted

## Illustration of "issue selling"



## Get the Boss to Buy In

72 Harvard Business Review January-February 2015

Harvard Business Review, Susan J. Ashford and James R. Detert, 2015.

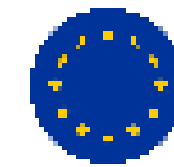


## Winning tactics

- **Winning tactic #1.** To be more persuasive, the three analyses at the heart of MBENEFITS methodology – operational, strategic and financial – are tailored to a diverse audience: they use concepts and arguments adapted to executives in the most important functions within the company (senior management, operations, sales and marketing, finance).
- **Winning tactic #2.** NEB makes investment strategic through its cross-functional impact on the company's competitiveness and its contribution to overall objectives.

Interest in NEBs has been growing since 2021: the subject is included, to varying degrees, in six European research projects under the LIFE programme.

European projects and their main sponsors since 2021



Sectors				Caption	Integration of NEB into the project			
 Industry	 Motors Electric	 Tertiary	 Furniture	 All Sectors	 Fully	 Partially	 Very partially	 Tool developed

# The NEBs were the subject of an ALLICE study in 2025 !

## NON-ENERGY BENEFITS OF ENERGY EFFICIENCY INVESTMENTS

State of the art ALLICE  
January 2026

This study was supported by the French agency for ecological transition, Cetim (Technical Centre for Mechanical Industries) and CETIAT (Technical Centre for Air Conditioning and Heating Industries).



**Alliance ALLICE**  
3 659 abonnés  
1 mois · 🔔

📺 **Decarboner l'industrie : L'essentiel des etudes ALLICE [en video] !**  
[ENGLISH BELOW 🌐] ... plus

Les bénéfices non énergétiques des investissements en efficacité énéraétique.

**Les bénéfices non énergétiques des investissements en efficacité**  
Alliance ALLICE

**Résultats d'étude**  
Les bénéfices non énergétiques des investissements en efficacité énergétique

DÉCOUVREZ L'ÉTUDE

RÉSUMÉ

Detailed content available exclusively to **our members**

**STUDY CONDUCTED BY :**

**IPSO FACTO**

**blunomy**

**CO-FUNDERS :**



**CETIM**

**Public dissemination of our work:**

- Video interview with the study contributors (also available on [LinkedIn](#))
- Executive summary of the study
- A 6-slide overview of the study
- ➔ Available on our [website](#)

Coming soon in 2027 : a public report of the study !

# Our upcoming ALLICE European Rendez-vous !

**ALLICE organises its third European E-Café!**  
 April 24, 2026

**Most of the ALLICE studies are now available in English !**



Following the success of the first two E-Café sessions, ALLICE is organising a third event on 24 April. Anyone who wants to find out more and make connections is invited to participate in this session, which will focus on **'Concentrated solar thermal energy for industry'**.

E-café are informal discussion groups bringing together energy and industry experts on Fridays from 11 to 12 (Paris timezone). Feel free to join!

**Friday 24th April: 11:00 am - 12:00 pm**  
 Join us to discuss:

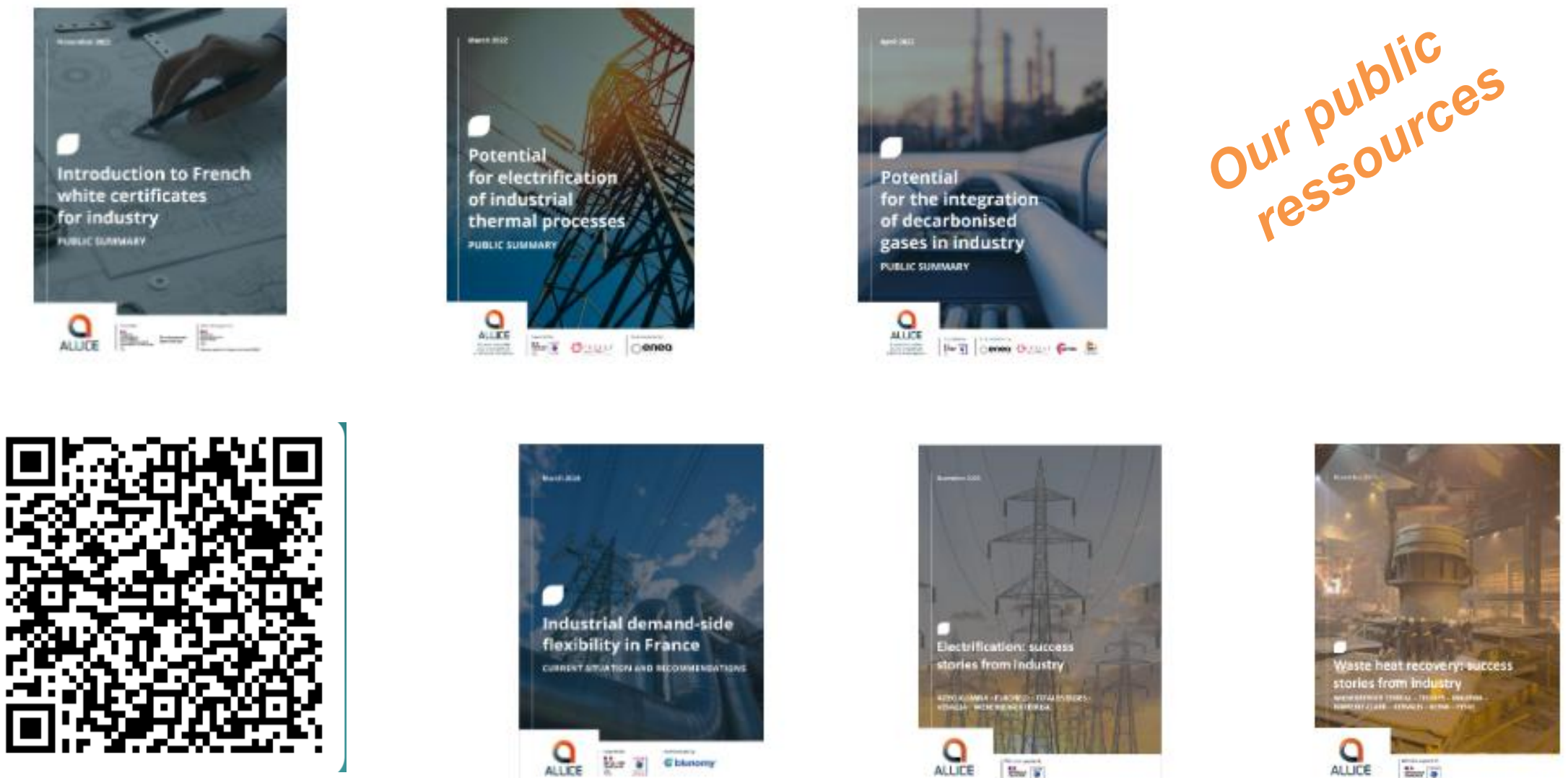
« **Concentrated solar thermal energy for the industry** », introduced by Alain Robic of Aztec Energy.



Registration



Access here



*Our public resources*

► **The ALLICE study catalogue now features 30 studies in English.**

Check out the latest translated publications :

- [Multiple benefits from energy efficiency projects](#)
- [Electrification of high-temperature furnaces \(1000°C and above\)](#)
- [Decarbonisation of cooking and drying processes – Part II](#)
- [Decarbonisation of hot utilities and networks at industrial site](#)

Find out more about our last published study « [Burners: new technologies and hybridisation for decarbonisation](#) »

# Thank you for your attention !



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