An effective and efficient "Clean Industrial Deal" for Europe

January 2025

The better the question. The better the answer. The better the world works.

Shape the future with confidence

Europe is at a crucial juncture of its industrial transformation and energy transition processes

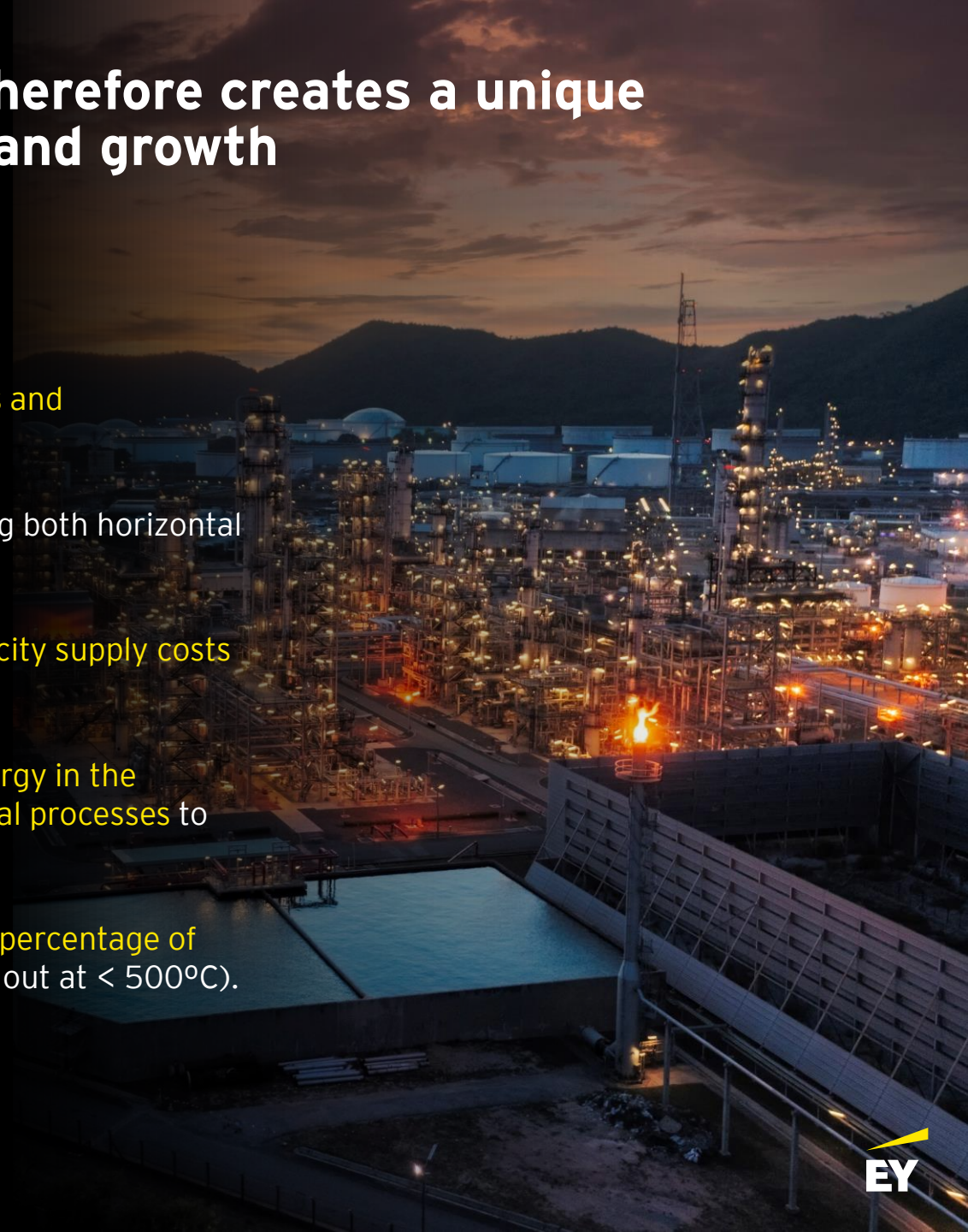
- The new European Commission needs to tackle the huge challenge of reverting Europe's economic decline against the backdrop of a changing and increasingly complex geopolitical climate.
- The Draghi Report delivers a roadmap for how the EU could recover its international positioning and is part of the thinking about the EU's future strategic direction, laying the foundations for the CLEAN INDUSTRIAL DEAL.

The future of European competitiveness *(Mario Draghi)*

- The report provides an assessment of the European Union's competitive situation compared to the US and China and identifies the three transformations needed for the EU to boost its long-term growth potential: innovation, decarbonisation and economic security.
- The first two thrusts are related with the twin digital and green transition, the core components of the EU's economic policy in recent years, albeit now approached through a different lens.
- In addition, the report proposes several measures and flags the need for significant investments (at least €800 billion per year).

- Against this backdrop, decarbonisation has a role to play in driving competitiveness in European industry, while reducing the current vulnerability derived from its reliance on gas imports.

The decarbonisation of European industry therefore creates a unique opportunity to boost EU's competitiveness and growth



EY HAS CONDUCTED A STUDY TO ANALYSE THE FOLLOWING ASPECTS:

- Compatibility and mutual reinforcement of industrial competitiveness and decarbonisation.
- The range of solutions to drive industrial decarbonisation, considering both horizontal needs and the needs specific to each productive process.
    - Within the horizontal measures, those focused on making electricity supply costs more competitive for the entire industry.
    - Given that heat represents the biggest source of demand for energy in the industrial sector, it is necessary to differentiate between industrial processes to arrive at a correct assessment and targeted solutions.
- The funding gap for accelerating the decarbonisation of a significant percentage of heat demand in European industry (the majority of processes carried out at < 500ºC).
- Conclusions

Contents

Industrial competitiveness and the green transition are complementary

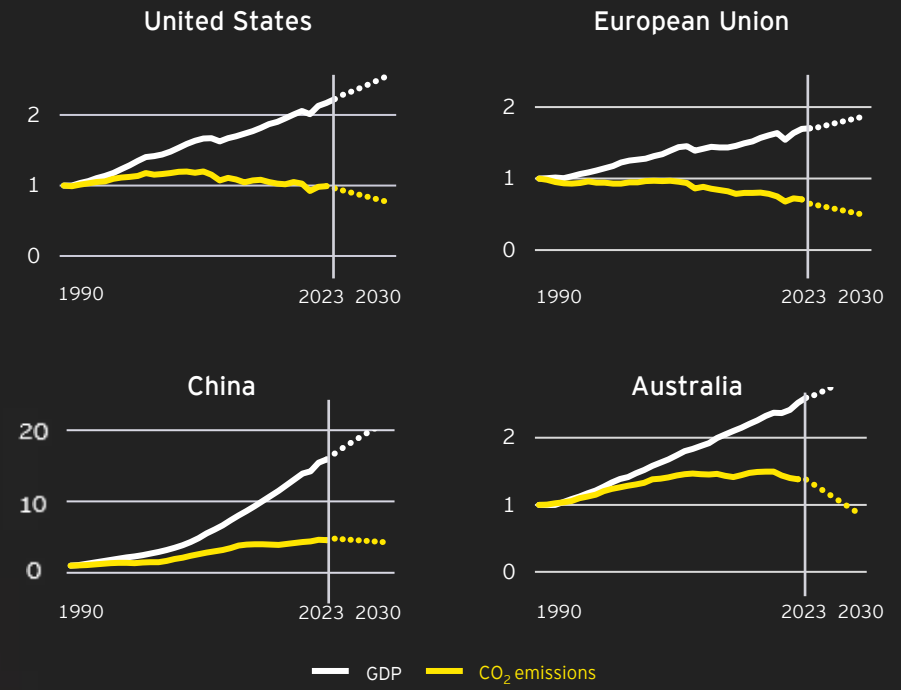
Decarbonisation represents a unique opportunity for economic growth and industrial competitiveness

CORRELATION BETWEEN CO_2 EMISSIONS AND GDP GROWTH

- Many economies have already demonstrated that it is possible to achieve economic growth at the same time as emissions abatement.

- As highlighted in the Draghi Report, *"Decarbonisation offers an opportunity for Europe to lower energy prices and take the lead in clean technologies ("clean tech"), while also becoming more energy secure"*.

Regions in which emissions are falling while GDP continues to grow...[1]



Notes: The GDP estimates to 2030 are taken from the IMF's latest forecasts. The CO_2 emissions forecasts are based on the stated policies scenario (STEPS) in the IEA's World Energy Outlook 2024. The historical GDP figures were taken from the World Bank Group data and the historical CO_2 emissions figures, from the Energy Institute

Source: [1] EY analysis; IEA; GDP – World Bank Group; CO_2 emissions – Energy Institute.

The Clean Industrial Deal should adopt a cross-cutting approach, integrating horizontal measures to decarbonize all segments of the industrial sector…

Horizontal measures

Ensure availability of efficient energy infrastructures under EE1st (Energy Efficiency First) principle

- EU-level: coordinated planning for E/G/H2/CO2 + accelerate PCIs + solve inter-TSOs compensation issues + increase EU finance (CEF)
- MS-level: long-term planning for E/G/H2/CO2 + anticipatory investments in electricity (and H2 grids where appropriate)

Create lead markets for green industrial products

- Green labelling schemes for industrial products (see recital 21 & Art 22a.2 REDIII); harmonised across the EU for the sake of internal market
- Public procurement requirements for green labelled products
- Incorporate green labelled products requirements into EcoDesign framework

Effective Framework to avoid Carbon Leakage

- Full use of aids for indirect CO2 cost in a harmonised manner across the EU
- Coordinated phase of free EUAs allocations vs. full CBAM deployment

Effective measures for fair trade vis-a-vis third countries (including foreign aid)

Competitive electricity cost

...prioritising those aimed at electricity supply costs

COMPETITIVE ELECTRICITY COSTS:

1) Massive deployment of renewable energies (permits and CfDs as appropriate).

2) Boosting flexibility and storage (capacity / flexibility mechanisms).

3) Reducing taxes and charges via full application of the "polluter pays" principle (also contemplated in the Energy Taxation Directive (ETD)) + taking public policy costs off-bill.

4) Promotion of long-term electricity offtake contracts (PPAs), especially industrial customers (using public risk reduction instruments such as guarantee schemes, etc.).

5) Speeding up and boosting investment in electricity grids to connect industry (revised methodologies and grid financing, e.g. faster permitting; grid connection costs; loans for forward-looking investments: public contributions).

6) Simplification and reduced fragmentation of access to finance.

7) Enhanced information (free allocation of emission allowances, support for the indirect costs of CO_2, application of the Carbon Border Adjustment Mechanism (CBAM), tariffs, etc).

Demand for heat is the biggest use of energy by EU industry

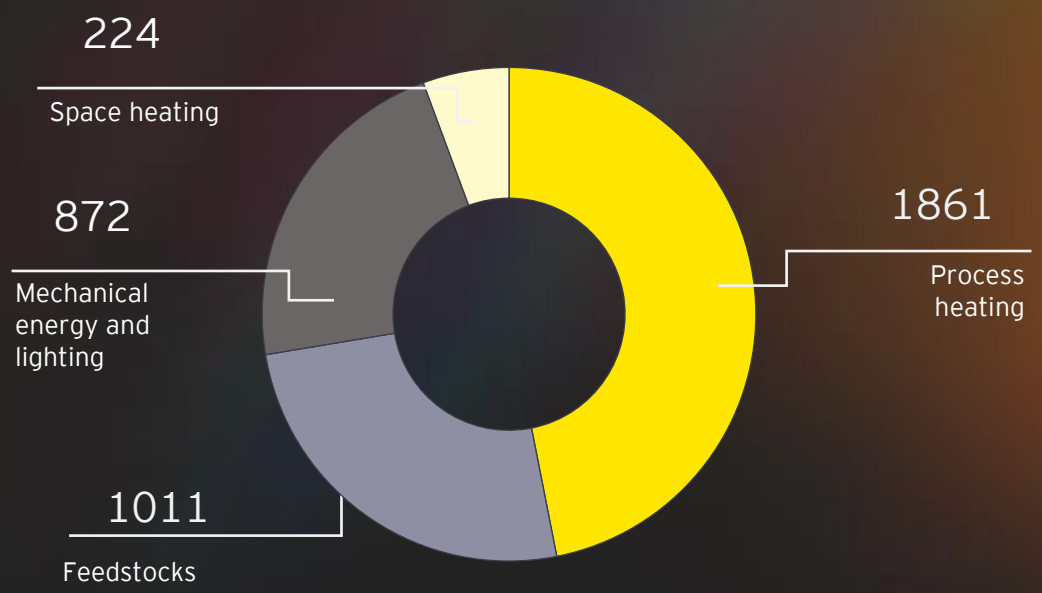
END CONSUMPTION OF ENERGY AND DEMAND FOR HEAT IN INDUSTRIAL PROCESSES

- End consumption of energy in industry can be divided into four main uses:
  - **Process heating:** energy used to deliver the heat required (at low, medium or high temperatures) in manufacturing processes.
  - **Feedstocks:** energy used as an input for industrial production.
  - **Mechanical energy and lighting**: energy to fuel industrial machinery, equipment and lighting systems.
- **Demand for heat in industrial processes:**
  - Represents the highest use of energy in the industrial sector (almost 50% of total demand for energy in 2019).
  - Accounts for the biggest source of greenhouse gas (GHG) emissions.
  - Represents the area presenting the biggest wins from decarbonisation.

Notes: Our analysis builds from the Energy Balances data for 2019 published by Eurostat, as that was the last year of normal patterns in industrial energy demand before the disruption caused by COVID-19 and the energy crises.

Source: Agora Industry (June 2024) – "Direct electrification of industrial process heat"

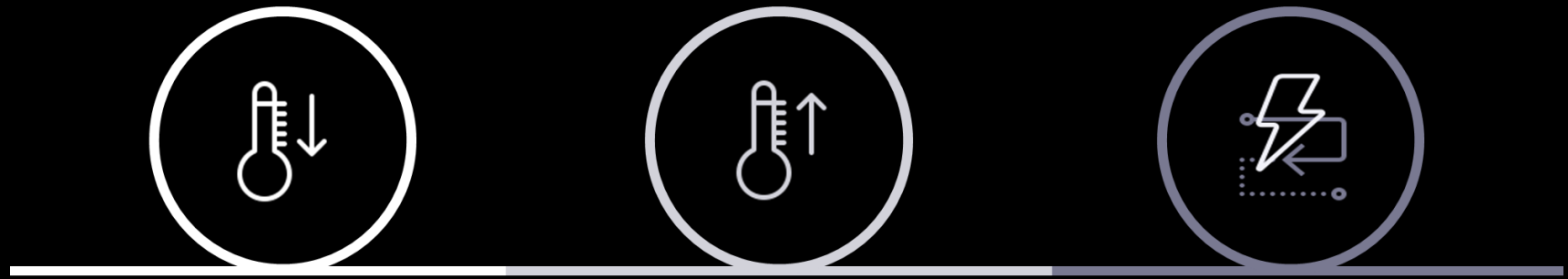
ESTIMATED TOTAL ENERGY DEMAND IN INDUSTRY BY END USE (TWh) (2019) – EU-27



Industrial heat is by and large supplied by natural gas, so constituting a vulnerability to external shocks.

Not all industrial sectors are the same: segmentation is necessary for a correct assessment and the formulation of appropriate measures

- To effectively decarbonise demand for industrial heat, it is essential to understand each sector's heat requirements and industrial processes:



	Industrial applications <500°	Industrial applications >500°	Industrial uses already electrified
% OF THE ENERGY DEMANDED FOR INDUSTRIAL HEAT	50%	46%	4%
DEFINITION	Industrial processes that require low- and medium-temperature heat, for which	Industrial processes carried out at high temperatures, for which	Industrial processes that are already electrified but are
SITUATION	electrification technologies are already available for implementation	decarbonisation technologies are still at the development phase	facing significant pressures on their competitiveness in the short term
POSSIBLE SOLUTIONS	Accelerated electrification with direct support on competitive terms (EU funds)	Technological development via R&D&I funds and support (innovation funds, IPCEIs, etc.)	Analysis of the EU's resilience and support for OPEX for industries in critical sectors

The Clean Industrial Deal also needs to feature vertical measures specific to each industrial subsector

Vertical measures

Industrial Steam / Heat Applications <500°

- Electrification action plans for steam and heat at low temperatures in each member state in 2025
  - Identification of opportunities
  - Technical assistance programmes for industries
  - Accelerated permits
  - Additional grid investments
  - Tax incentives
- Direct support scheme using contracts akin to the CfDs to cover volatility in CO_2 prices and the difference in energy costs, financed by the revenue generated by the emissions trading scheme (ETS).
- Development of specific financial instruments (EIB, etc.)

Industrial Applications >500°C

- Technical assistance programmes for industries
- Development of industrial clusters to achieve economies of scale, reduce the need for H2 and CCS infrastructure and facilitate the elimination or reconfiguration of redundant gas infrastructure
- Specific financing rounds under umbrella of the Innovation Fund

- Direct support scheme similar to that for low-temperature steam / heat.

- IPCEIs – Strategic initiatives in the EU targeted at the entire supply chain.

Industrial applications already electrified

- **EU resilience analysis** – identification of external dependencies / risks; establishment of targets as appropriate.
- **Direct public support for OPEX for industries in sectors flagged as critical for European resilience** – overall approach / design similar to the Temporary Crisis and Transition Framework (TCTF), without affecting the energy market.

Industrial processes carried out at temperatures of < 500ºC are common across most subsectors of European industry

INDUSTRIAL USES AT < 500ºC

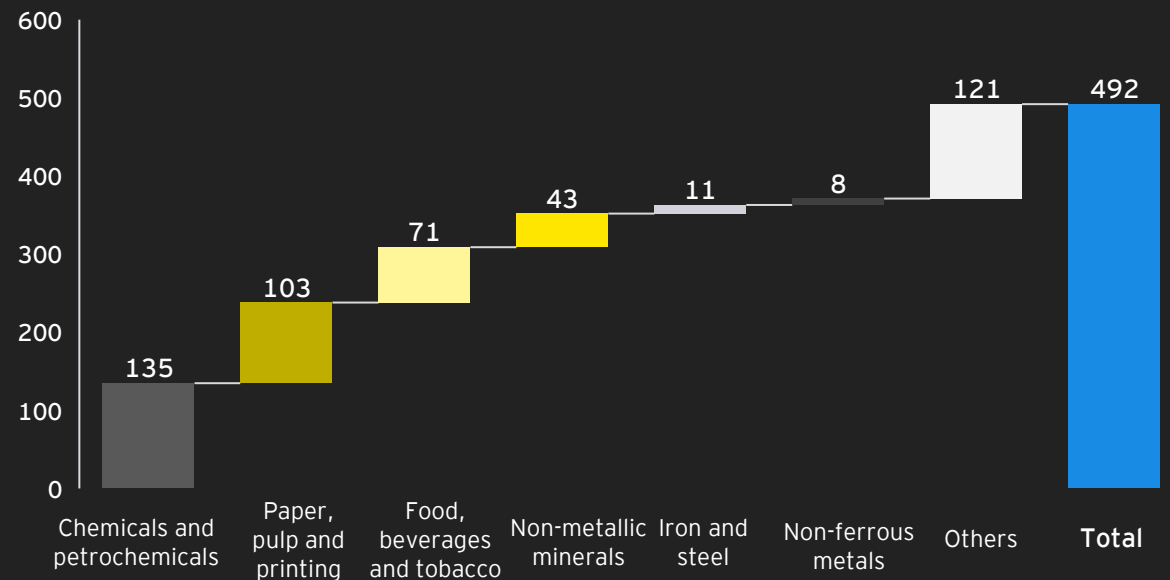
These processes represent around 50% of all demand for energy for industrial heat (c.930 TWh in 2019). However, not all processes at these temperatures are electrifiable in the short term, for several reasons:

I. The industries that consume heat seasonally[1] present less potential as their heat needs are discontinuous, making investments in electrification less profitable.

II. The specific uses of heat in each sector and degree of technological maturity mean that only a portion of the technical potential can realistically be electrified in the short term.

Analyzing the processes of the different sub-sectors, it is estimated that more than 50% of the energy demand for industrial heat of < 500º C could be electrified in the short term

POTENTIAL DEMAND FOR ELECTRIFIABLE HEAT (TWh)



Note: Others includes Transport equipment, Machinery, Mining & quarrying, Wood & wood products, Construction, Textile & leather and Not elsewhere specified (industry)

- This temperature range is widely used in several industrial subsectors which between them represent around 18% of the EU's gross added value.

Note: Eurostat - The seasonal industries (sugar, oils and fats, flour, starch, cacao) represent 33% of the energy consumed by the food, beverages and tobacco industry; Co-generation is assumed to supply 16% of total demand for heat - COGEN Europe ("The Role of Cogeneration in Europe's Energy Transition").

Source: SYSTEMIQ – "Catalysing the global opportunity for electrothermal energy storage", *Agora Industry – "Direct electrification of industrial process heat; Eurostat - Energy Balances 2019; EY Analysis - Potential demand for electrifiable heat*.

An estimated €50 billion of aid would be needed to decarbonise over 50% of the energy used in heating processes at < 500ºC in the EU

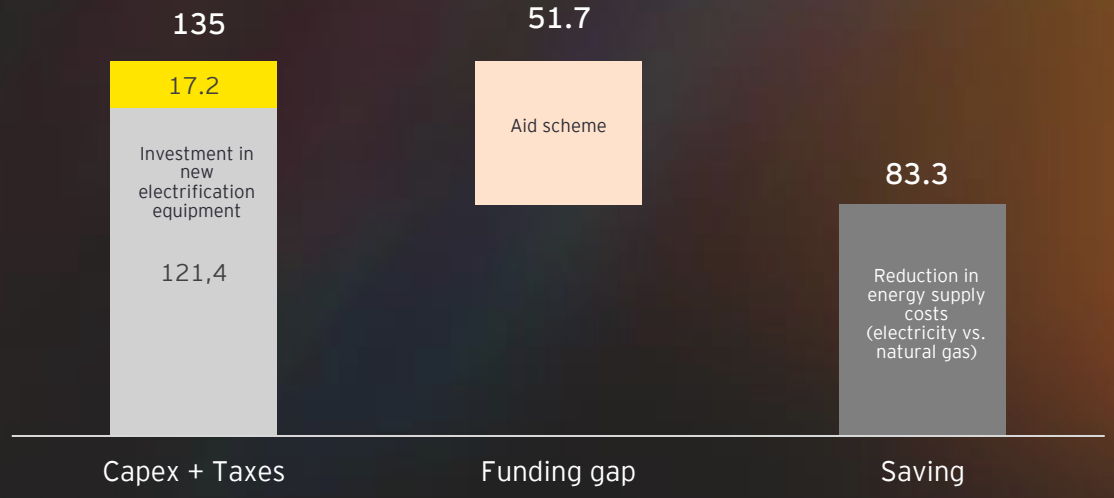
THE FUNDING GAP

- We estimate that short-term electrification of the potential analysed in the EU (almost 500 TWh) would require approximately €52 billion[1] in incentives.

To put this funding gap into context it is important to consider that the income generated by the ETS would reach approximately €44 billion a year[2], so that 20% of this annual income would be enough to decarbonise a very significant percentage of European heating processes in six years.

The funding gap represents just 6.5% of the additional investments contemplated in the Draghi Report.

This decarbonisation process would promote also higher flexibility in the electricity markets.



Notes: Gap: difference between the cost of gas + CO_2 + tolls + O&M and the cost of electricity + tolls + O&M (net present value during a period of 10 years); Taxes: corporate income tax, discounted to year 1, that would be paid on the required return on investment (after-tax return of 7%).

Source: [1]EY analysis based on the simulation of the Spanish market extrapolated to Europe

Boosting European industry's resilience and competitiveness is feasible with the right approach to the Clean Industrial Deal

The results of our study demonstrate that industrial competitiveness and the green transition are not only compatible but can be mutually beneficial

CHALLENGES FACING EUROPE

- The Clean Industrial Deal should focus on the rollout of horizontal solutions for all sectors and on differentiated measures for the various industrial processes.
- Among the horizontal measures, we would highlight those designed to guarantee competitive electricity costs for the entire industry (permits, tax, renewables, flexibility, storage, PPAs, grid investments, etc.).
- Demand for heat is the biggest use of energy in industry. To define specific measures for its decarbonisation, it is important to clearly differentiate between the various industrial processes to arrive at a good assessment:

POSSIBLE SOLUTIONS

Industrial uses < 500ºC

Accelerated electrification with direct support on competitive terms (EU funds)

Industrial uses > 500ºC

Technological development via R&D&I funds and support (innovation funds, IPCEIs, etc)

Industrial uses already electrified

Analysis of the EU's resilience and support for OPEX for industries in critical sectors

- With approximately €50 billion it would be possible to quickly decarbonise a significant percentage of demand for heat in European industry (most industrial processes carried out at < 500ºC).
- This decarbonisation process would promote higher flexibility in the electricity market

Many thanks

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