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DECARBONIZATION OF THE INDUSTRY
ADEME/NEDO SEMINAR

CHRISTOPHE KASSIOTIS
CHIEF OF STAFF

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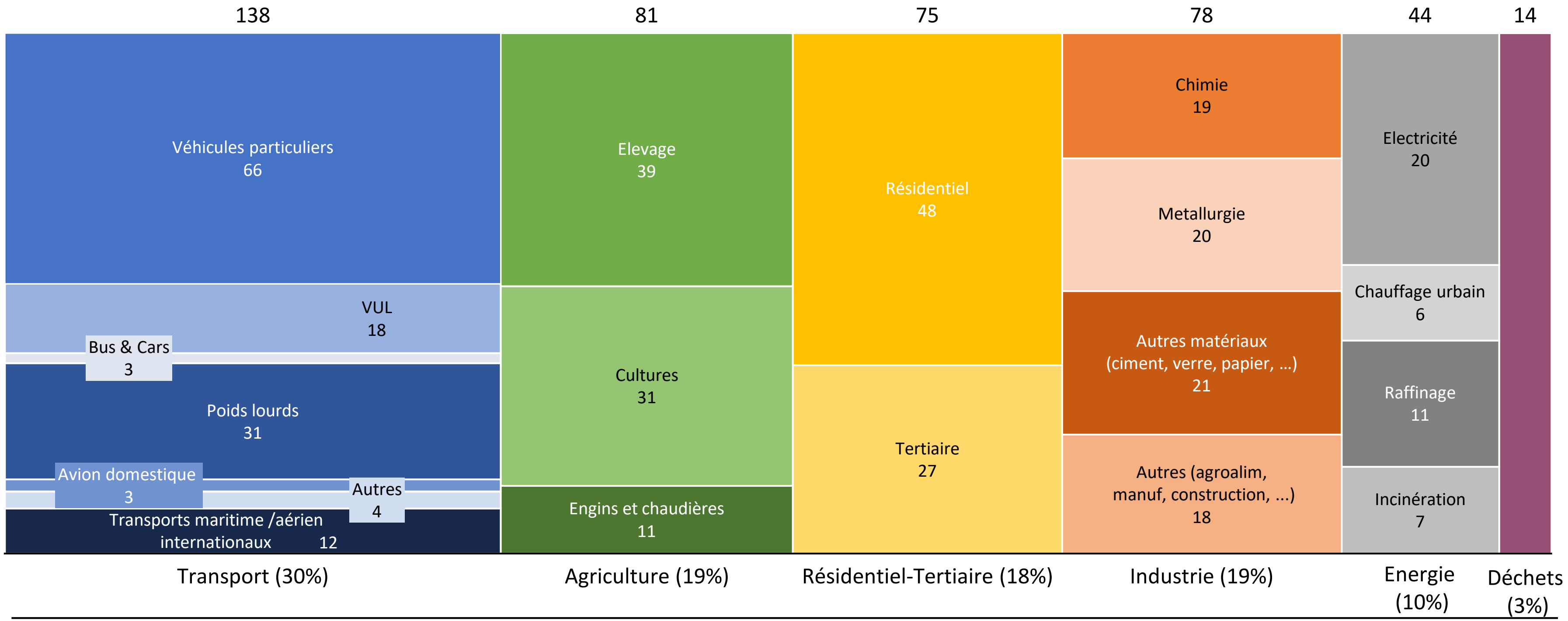
Emissions nationales annuelles de gaz à effet de serre (2021, en $MtCO_{2,e}$)



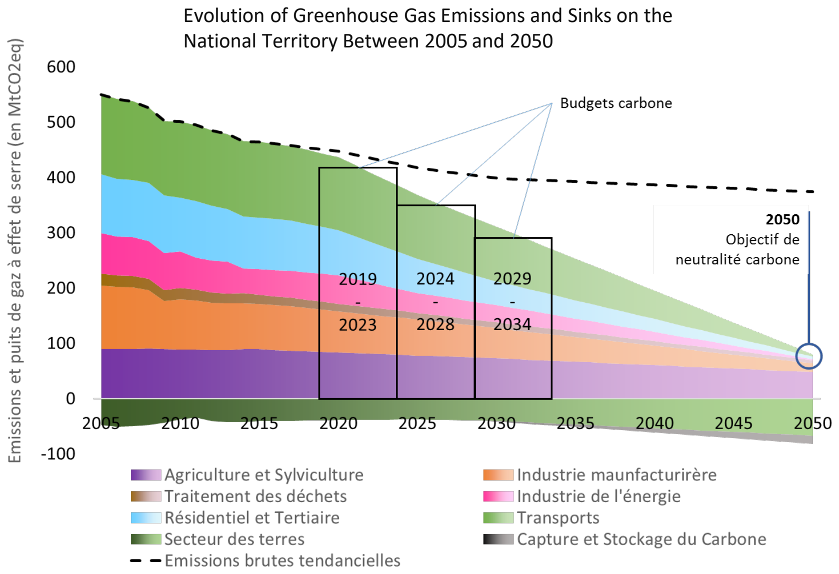
Source : CITEPA-SECTEN, baromètre mensuel – hors UTCATF

The challenges of the next SNBC (Stratégie nationale bas-carbone)

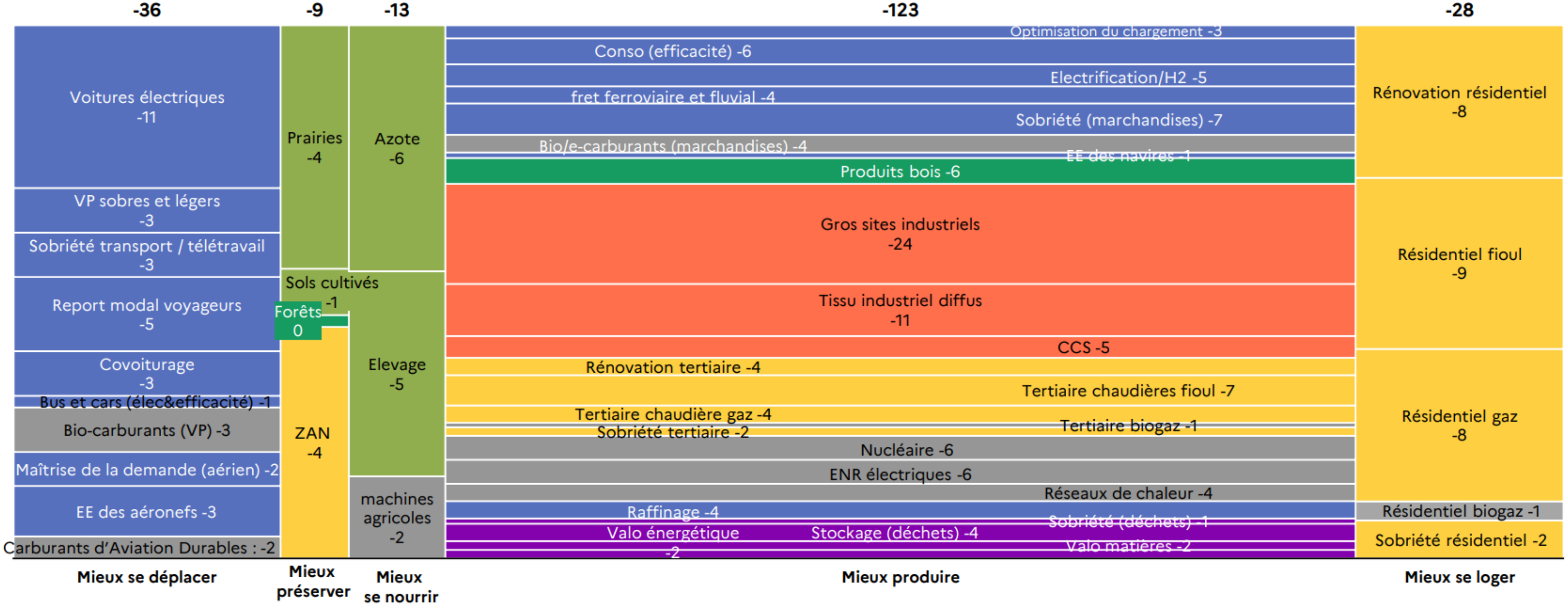
Translating the European Climate Ambition for France: The new European milestone for 2030 could entail an overall reduction of France's greenhouse gas (GHG) emissions by at least -50% in gross terms compared to 1990 (in contrast to the current target of -40%), and approximately -55% in net terms (including the land and forestry sector). These new targets will require an unprecedented acceleration of our climate action, imposing efforts and transformations across all sectors emitting GHGs in our economy.

Strengthening the Alignment Between National Climate Goals and Territorial Planning: Enhancing the coordination between national climate objectives and territorial planning to ensure coherence of actions at different levels.

Ensuring the Implementation of Adequate Support Measures: Ensuring the establishment of tailored support measures, particularly for households and businesses.



Action Plan to Achieve Our 2030 Goals: A Collective Project



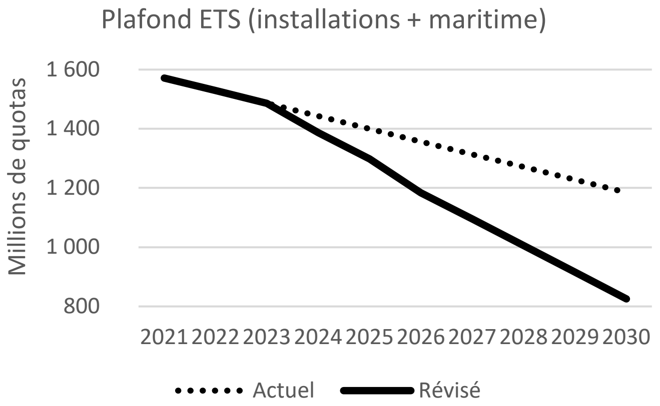
Fit for 55: Revision of the EU ETS (Industry Component)

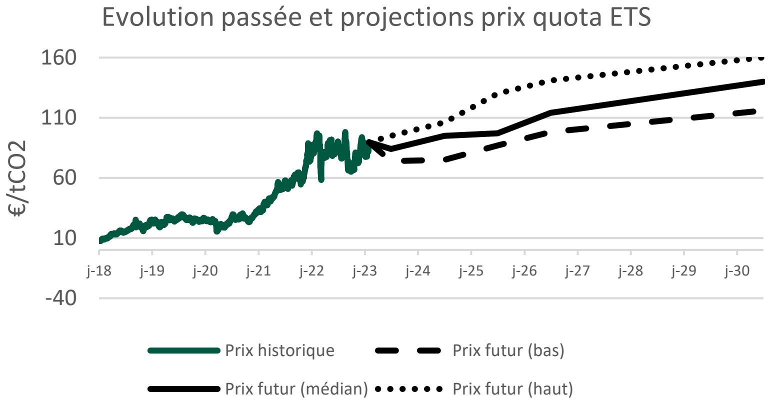
Increased Ambition: A significant downward revision of the ceiling (from -43% to -62% by 2030), expected to result in a carbon price increase.

Reduced and Conditional Free Quotas for Industries:
- **Gradual phase-out for sectors under the CBAM.**
- **Accelerated reduction of benchmarks.**
- Conditionality **(otherwise a 20% quota penalty):**
  - Obligation to implement recommended investments from **energy audits if the payback period is less than 3 years**.
  - "**Carbon Neutrality Plan**" for the least efficient 20% of installations.

Enhanced Innovation Fund to Support Industrial Decarbonization:
- A Fund endowed with approximately €40 billion from 2021 to 2030.
- "Special attention" for CBAM sectors.
- Possibility to finance carbon contracts for differences.

Transposition of the EU ETS 1 expected in early 2023 through a DDADUE bill (presentation to the Council of Ministers on November 15), with all provisions, including the Decree, becoming effective in the first quarter of 2024.





Fit for 55: Carbon Border Adjustment Mechanism

Innovative policy measure aimed at combating **carbon leakage** by applying **a carbon pricing to imported products** equivalent to that of European products through the EU ETS.

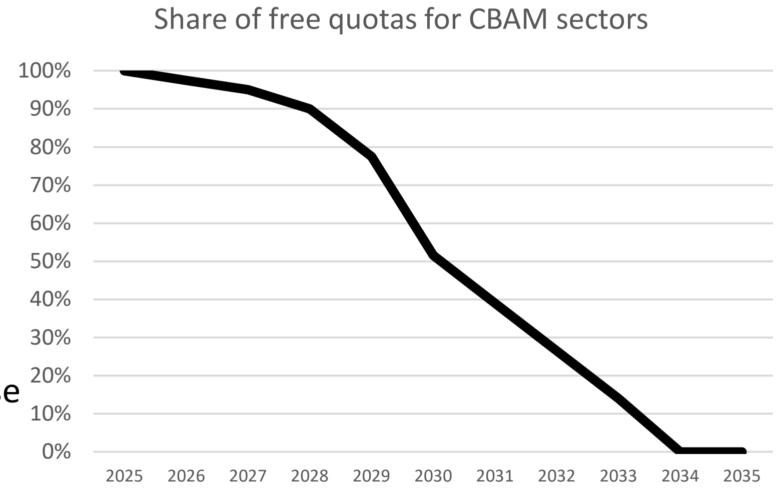
Covered sectors: steel, cement, aluminum, fertilizers, hydrogen (comprising half of the industrial emissions under the ETS), and electricity.

Covered emissions: direct and indirect emissions, excluding products covered by indirect cost compensation.

Timeline: Transition phase with reporting only from October 2023 to the end of 2025, followed by financial obligations starting from 2026.

Free allowances from the ETS gradually phased out for the relevant sectors

Exports and downstream sectors: review and evaluation clause every two years; expansion of covered products, increased support for decarbonization.



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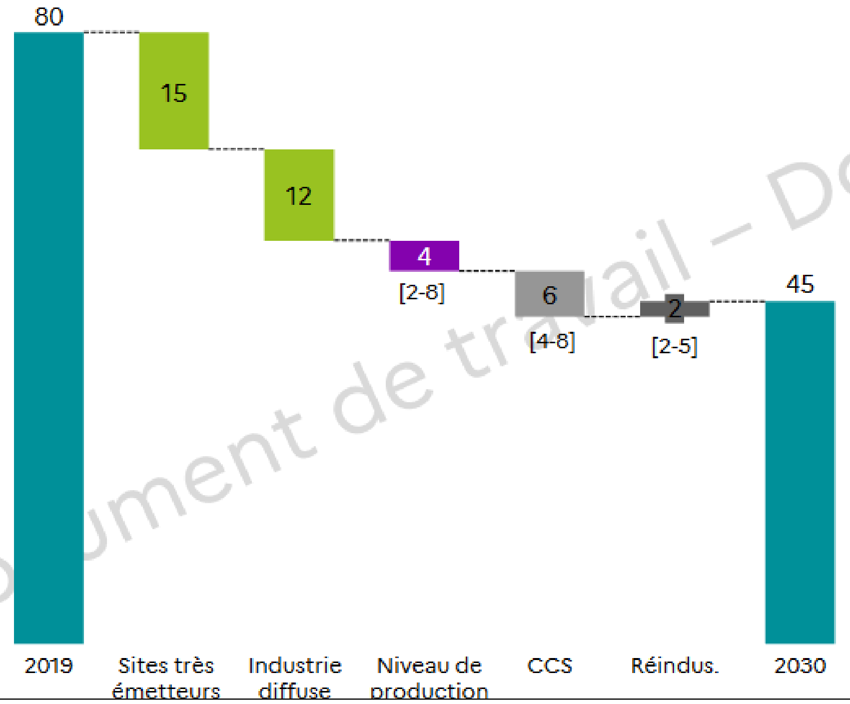
Proposed trajectory for the industry - by site size

Expected impact of industry decarbonization levers (preliminary modeling)



Key underlying hypothesis

High-emission sites (excluding CCS): Compilation of decarbonization trajectories for the 50 most emitting sites.

Diffuse industry (excluding CCS): Estimation based on the macroeconomic framework provided by the European Commission on value-added and industrial production.

CCS: Between 4 and 8 Mt of capacity by 2030, subject to adjustment based on feedback from the ongoing consultation and the actual deployment speed of capture projects.

Production levels and reindustrialization:

- Evolution of production levels for the most emitting sectors to be clarified in the continuation of the work (ethylene, steel, aluminum, cement, paper) in connection with end markets (construction, plastic...) and assumptions about the trade balance.
- Impact of the reindustrialization policy to be refined based on sectors where new factories will emerge.

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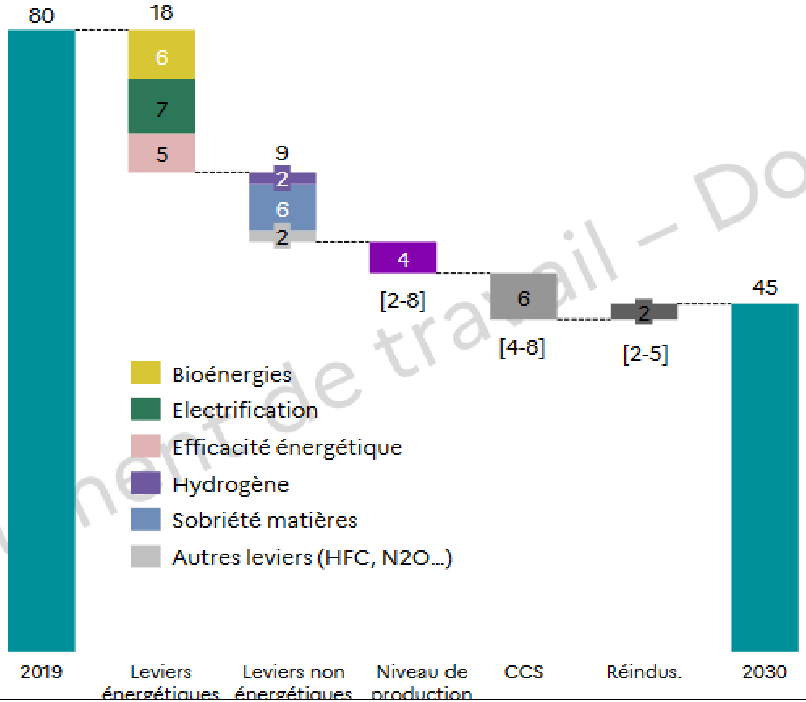
Proposed trajectory for the industry - by levers

Expected impact of industry decarbonization levers (preliminary modeling)



Key underlying hypothesis (including results from the work on the 50 sites).

Energy emissions: -18 Mt CO2e (9 of which are from large sites) :

- Decrease in the consumption of coal, oil, and natural gas.
- Increase in the consumption of electricity and bioenergy.
- Improved energy efficiency.

Non-energy emissions: -9 Mt CO2e (6 of which are from large sites).

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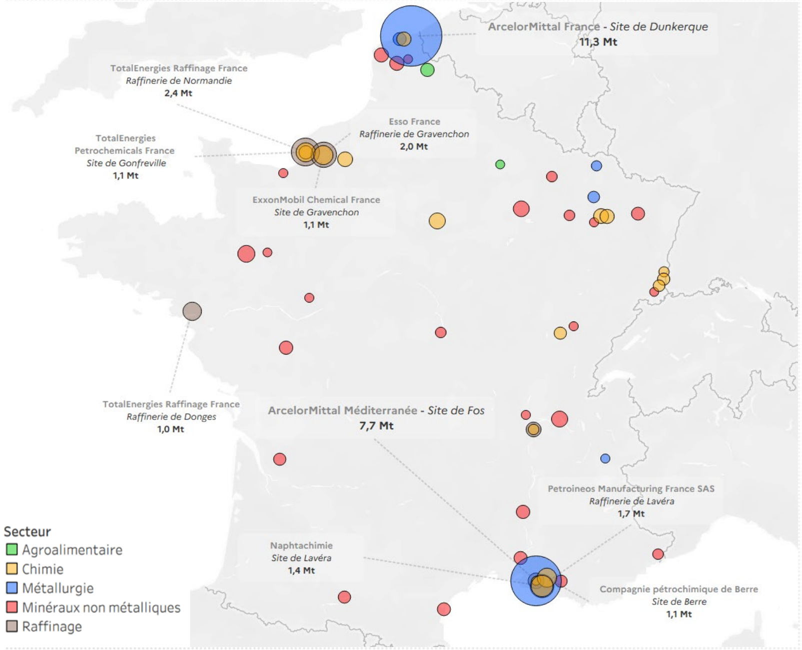
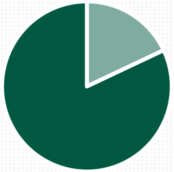
Mapping of the 50 most emitting sites



Metallurgy

6 sites
= **82%** emissions from the sector



Non-metallic mineral materials

25 sites
= **49%** emissions from the sector

Chemistry

16 sites
= **55%** emissions from the sector

Agri-food

2 sites
= **7,5%** emissions from the sector

+ **6** refineries

Source : Direction Générale des Entreprises/SDP3E à partir des données du système européen d'échanges de quotas d'émissions.
Les émissions des dix plus gros sites émetteurs sont détaillées en $MtCO_{2eq}$.

CCUS national strategy

Launch December 2022

MEFSI-MIND-MTE

January 2023

Valuation of works (strategic sector committee, CO2 Club)

1st trimsester 2023

Assessment of needs in 2030. Economic and regulatory conditions for transport

June 2023 - CNI

Strategy project consultation

Automn 2023

Taking the consultation into account

End 2023

Finalization

Carbon capture

- Quantity captured between 4 and 8.5 MTCO2 by 2030 and up to 30 MtCO2 by 2050
- Financing (France 2030)
- **Important not to prolong fossil assets**

Storage capacity in France

- Financing study of global capacities France
- Lacq, Paris Basin, Atlantic and Mediterranean OffshoreFinancing of injection and seismic pilots
- Social acceptability / competition uses (H2)

Limited potential, but important for sovereignty and diffuse industry

CO_2 transport

- CO2 hubs and "no regrets" infrastructures (Dunkirk, Lacq, Fos) – Rhône Valley CO2 transport
- Export of CO2: ratification of the London Protocol, bilateral agreements (Norway, Denmark, etc.), participation in the North Sea Basin Task Force (NO, UK, NL, DK, DE)
- Legal organization model (regulation of access and pricing) to be determined
- Funding

Use of CO2

- CCU doctrine to be clarified
- Biogenic CO2: CCU efuel or negative emissions
- Fossil CO2: CCS preferable, but issues linked to transport

National hydrogen strategy

A strategy with ambitious objectives and means: nearly €9 billion by 2030 (**¾ of the €9 billion have already been earmarked**).

Goals :

- **Decarbonize hydrogen for industry and develop a mass market** (6.5GW of electrolysis in 2030)
- **Developing heavy mobility:** French value-added captive fleets
- **Preparing the uses of tomorrow:** fundamental research, financing of large-scale demonstrators, development of key components

Principle of neutrality (renewable/low-carbon) of carbon-free hydrogen.

Update of the strategy to take into account the evolution of the context since 2020 and the next energy policy.

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Overview of aid for the decarbonization of industry

FRANCE RELANCE

238 projects supported – €1.2 billion in aid

4.5 MtCO2e/year avoided through iso-production(i.e. 3.2 MtCO2e/year in net)

FRANCE 2030

€5 billion technology deployment

€610 million acceleration strategy:

- Innovation (AAP DEMIBaC and IBaC PME)
- Industrialization of decarbonizing technologies (AAP SOLINBaC)
- Territorialization (AAP ZIBaC)

IPCEI H2 volet industrie

In progress of pre-notification to the European Commission

Up to **€1.2 billion in aid** could be granted

Ex: DRP-EAF of ArcelorMittal Dunkerque, deployment of electrolyzers to supply industrial sites, etc.

Industrie Zéro Fossiles 300 M€

- Winner announcements April 5, 2023
- Biomass: 39 projects, €174.2 million in aid and 492ktCO2 avoided
- Décarb: 16 projects, €51 million in aid and 170 ktCO2e/year avoided

ZIBaC

- **ZI Dunkerque, Fos, Ax Seine, Loire Estuaire already winners**
- **€26.6 million in aid to date**
- **11 ZI under investigation**

DECARB IND 2023 BCIAT 2023

- Launch April and June 2023
- Budget 2* 125 M€ / Aid < 30M€
- Under investigation

DECARB IND +

- Launch in June 2023
- Budget of around €700 million
- Aid > 30M€ and < 400M€

Fond Innovation de l'ETS

2 winning French CCS projects

€278 million in European aid

1.4 MtCO2/year avoided

+ 1 pre-selected French CCU project

Thank you for your attention