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# FRENCH STRATEGY FOR THE DEVELOPMENT OF RENEWABLE AND LOW-CARBON HYDROGEN

11/05/2021

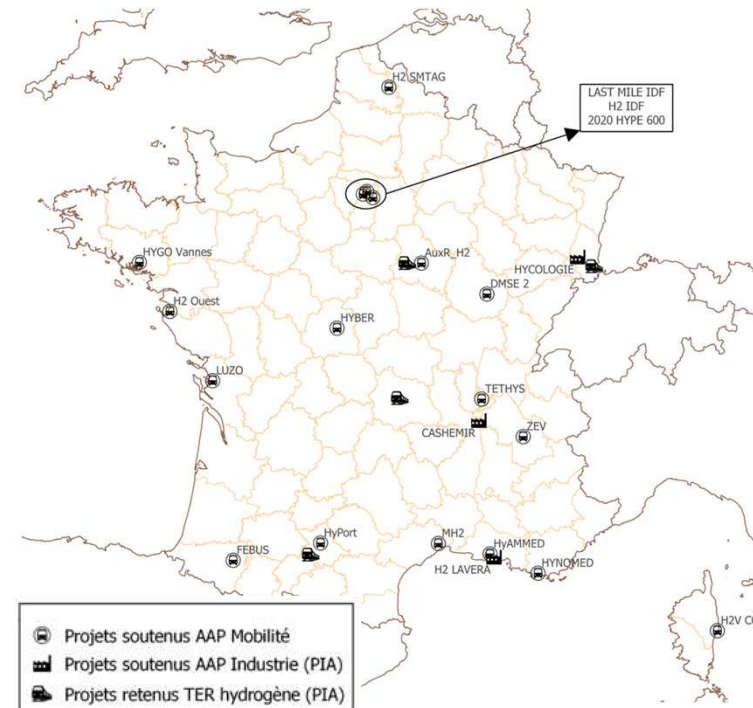
# Decarbonised hydrogen, a priority for the energy and industrial sovereignty of France



## Some key ideas

The strategy has been elaborated on some key ideas :

- The hydrogen by direct uses is a **to decarbonize the industry and decarbonize heavy mobility**.
- The **electrolyze** is powerful technology to produce this hydrogen decarbonized
- **To develop the hydrogen value chain**, in first time, on have to product local and consume local an hydrogen decarbonized.
- **Lot of consumers** want renewable or low carbone hydrogen
- **Consequently** ; in the interests of energy efficiency, the strategy gives priority to the **direct use of low-carbon hydrogen** rather than its transformation into a synthetic gas that can be injected into a natural gas network.



# French strategy for renewable and low-carbon hydrogen development **7 bn€ by 2030** **2bn€ 2020-2021**



Three priorities to reach climate neutrality by 2050

## • **Industry decarbonation and electrolysis market scale-up (6.5 GW by 2030)**



- Scale-up of the water electrolysis industry
- Financial support for large scale electrolysis demonstrators and carry on the small scale electrolysers deployment
- Set up support schemes to scale up large scale decarbonation projects with OPEX aid

## • **Clean hydrogen for heavy duty transport applications**



- Financial support for industrial projects for the key components of heavy duty transport applications
- Development of important hydrogen heavy vehicles fleet acquisition projects and the development of shared hydrogen refuelling infrastructures at local level through a "Local hydrogen hubs" call for projects



## • **Support R&D, large scale demonstrators and development of key components for tomorrow's hydrogen usages**

- Implementation of a Priority Research Program for hydrogen applications
- Investments for Future Program call for projects

# Action plan

2020

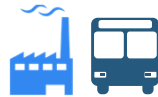
2021

2022

2023



## Innovation



Plurennial Research Program

Demonstration and technology bricks Call for projects for Innovative projects (PIA - ADEME)

**IPCEI** - The IPCEI H2 will aim to support industrialisation, in order to lower costs and to have technological sovereignty over this equipment :

- New generations of **electrolysers** (industrialisation and projects)
- **Key components** related to hydrogen **mobility**
- **To decarbonize mobility and industry**

## Deployment



Local hydrogen hubs call for projects (ADEME)

French Energy Regulatory Commission's support scheme for Non-interconnected areas

Incorporation of Biofuels tax exemption

Support mechanism for clean hydrogen (call for tenders)

## Call for Technologic Components and Demonstrators



- Axis 1 - Technological bricks : innovative components and systems
  - Axis 2 - Innovative industrial drivers and networks, temporary or localised energy supply
  - Axis 3 - Design and demonstration of new vehicles
  - Axis 4 - Large electrolysis demonstrators (>20MW)
- 
- Until 31 December 2022 or exhaustion of funds with an annual revision of the specifications
  - Project carried out by companies alone or in collaboration with a minimum cost of €2M and €5M for axis 4.
  - Selection criteria: quality of the project, eco-conditionality innovation, replicability of the solution, relevance of the business model, socio-economic impacts
  - Investment aid (grants and repayable advances), depending on the nature of the project and the size of the company; this may be supplemented by operating aid from an EU window, for example for electrolyser demonstrator projects.

**The project will be supported for CAPEX**

**New, more attractive funding modalities: increased share of grants, up to 75%.**

## Call for Hydrogen Ecosystems in Territories for Industry and mobility (deployment solutions)



The call aims to support, in the territories, supply/demand projects for decarbonized and renewable hydrogen consisting in deploying uses of technologies that have already been demonstrated with the associated H2 production and distribution and pooled infrastructures :



- Projects in industry in particular diffuse industry and valorization of H2 byproduct
- The deployment of H2 uses in the field of mobility and the transport of people and goods.



The aim is to :

- Reduce the impact of sectors (industry/mobility) on climate change
- Develop pooled production/consumption platforms
- Structuring the industrial offer to the rhythm of deployment projects

**The project will be supported for CAPEX**

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## Important Projects of Common European Interest (IPCEI)



European Research and Innovation Support Mechanism to :

- promote projects of transnational interest in strategic areas
- support participants at the research stage, also financing the transition of innovations into production.

The IPCEI H2 will aim to support industrialisation in France, in order to lower costs and to have technological sovereignty over this equipment :



- New generations of electrolysers (Gigafactories industrialisation and projects)
- Key components related to hydrogen mobility



Ongoing exchanges with the other Member States to identify common projects

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## Enabling the development of decarbonated hydrogen means providing answers to regulatory questions.

- **Some players in the hydrogen sector**, industries, local authorities or their representatives have been able to point out difficulties in the implementation of the regulatory aspects of their projects (safety, town planning rules, technical control, vehicles, market, training, etc.).
- The rise of the hydrogen sector will have to be accompanied by **reflection between the State and the sectors to ensure that the legislative and regulatory framework and the organisation put in place are appropriate to the changes** in the sector and the growing number of projects.
- Thus, **the Minister has decided to set up several working groups**, with industrialists, to deal with these issues as they arise and avoid regulatory uncertainties.

# Call for tender from 2022

## 8<sup>th</sup> November 2019 Energy and Climate law

- Sets clean H2 targets in the law for 2023 and 2028
- Empowers the government to issue an ordinance to
  - define hydrogen according to the energy resource used for its production
  - define the legal framework of incentives for hydrogen
- Requests the establishment of guaranties of origin mechanism for renewable hydrogen by decree

## Ordinance in the final stages of the procedure – 17 February 2021

- Hydrogen definitions
- Traceability
- **Support mechanism**
- Hydrogen underground storage

## Next steps

- Public consultation received, ongoing to draft regulatory texts
- Notification of the scheme to European Commission
- Regulatory framework to be set at regulatory level and preparation of call for tenders



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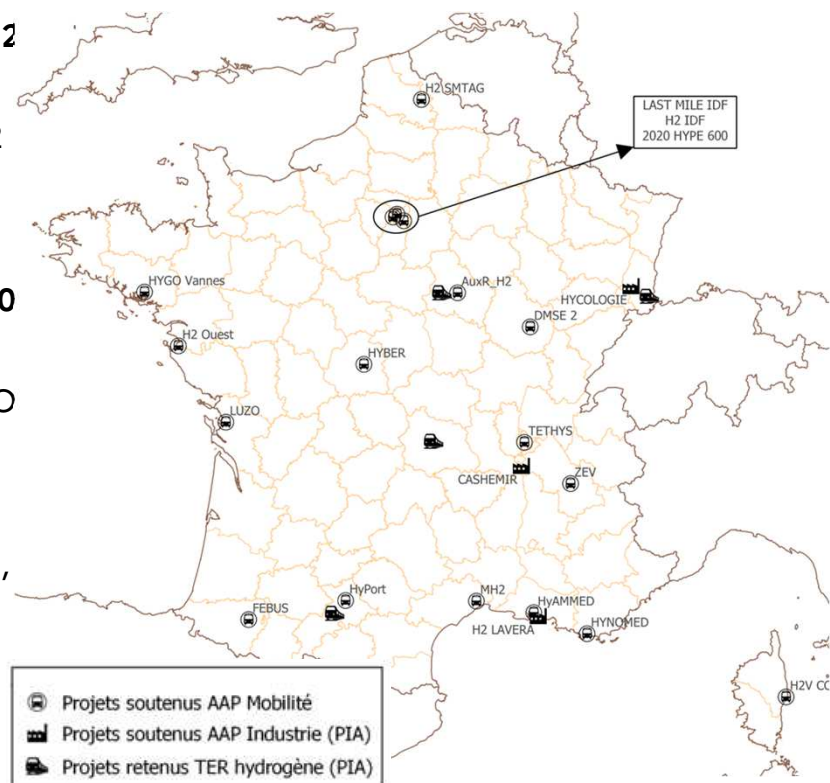
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**THANK YOU!**

**MERCI POUR VOTRE ATTENTION !**

## Sur 2019-2020, l'ADEME a déjà soutenu :

- 3 projects for the production or valorisation of decarbonated H2 in industry
  - 2,600 tH2/year, 4.5 MW of electrolysis and valorisation of H2 co-product for refining and food-processing uses
- 19 hydrogen mobility ecosystems
  - 22 MW of electrolysis producing 3,100 tH2/year, 57 HRS 2,40 light vehicles, 170 heavy vehicles
  - 98M€ grant for an investment of €449 million, (€250/tCO over 15 years)
- 4 experimental projects of electric dual-mode trains / H2
  - Grand Est, Auvergne Rhône-Alpes, Burgundy Franche Comté, Occitania
- In the framework of the Innovation Competition :
  - 10 SME projects for a total of €3.8M



# Energy transition law



**-40% of greenhouse gas emissions**  
between 1990 and 2030

and **carbon neutrality by 2050**



**Decrease the final energy consumption**  
by **-50%** between 2012 and 2050

And **-20%** by 2030



**-40% of fossil energy consumption**  
by 2030 compared to 2012



In 2030 : **33% renewable**  
**In the final energy consumption**  
40% of the power generation,  
38% of final heating consumption;  
15% of final fuel consumption  
and 10% of final gas consumption



**Decrease**  
**the share of nuclear to -50%** of the  
power generation  
by 2035