At the dawn of a new era

France to become a leader for Green hydrogen

France Hydrogène
Engagée pour la transition écologique

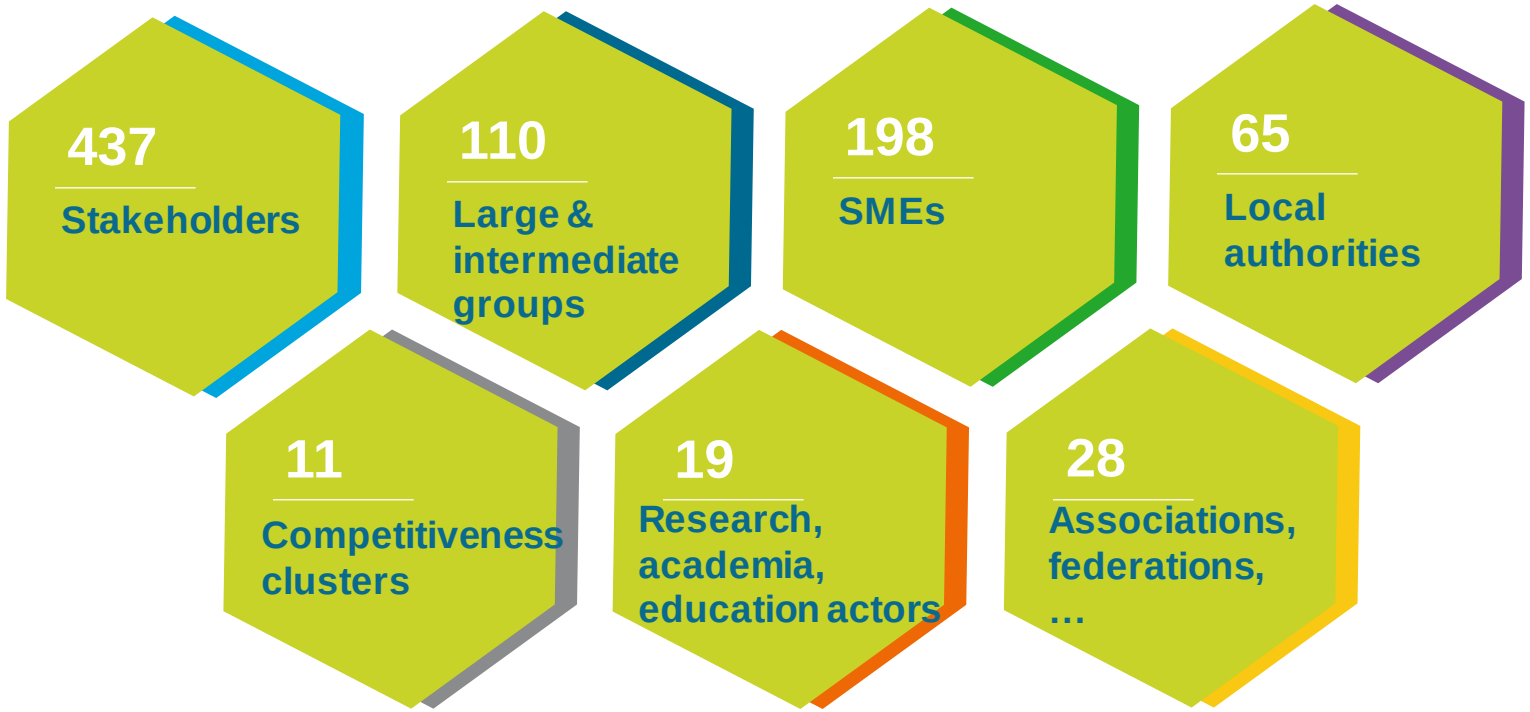
French-Norwegian Decarbonization Forum

12. September 2022

Philippe BOUCLY, President

France Hydrogène enjoys a strong dynamic

Key figures (July 2022)



Member of the National Hydrogen Council
Member of Hydrogen Europe and of the European Clean Hydrogen Aliiance
Co-founder of the Hydrogen Task Force with MEDEF International

French Hydrogen Strategy (8. September 2020)

- **Pillar 1 : To Decarbonize industry**

Objective : to scale up a competitive French electrolysis industry

- **Pillar 2 : To Develop hydrogen for professional mobility**

➢ Vans, Buses, Coaches, Trucks, Railways, Ships, Airplanes

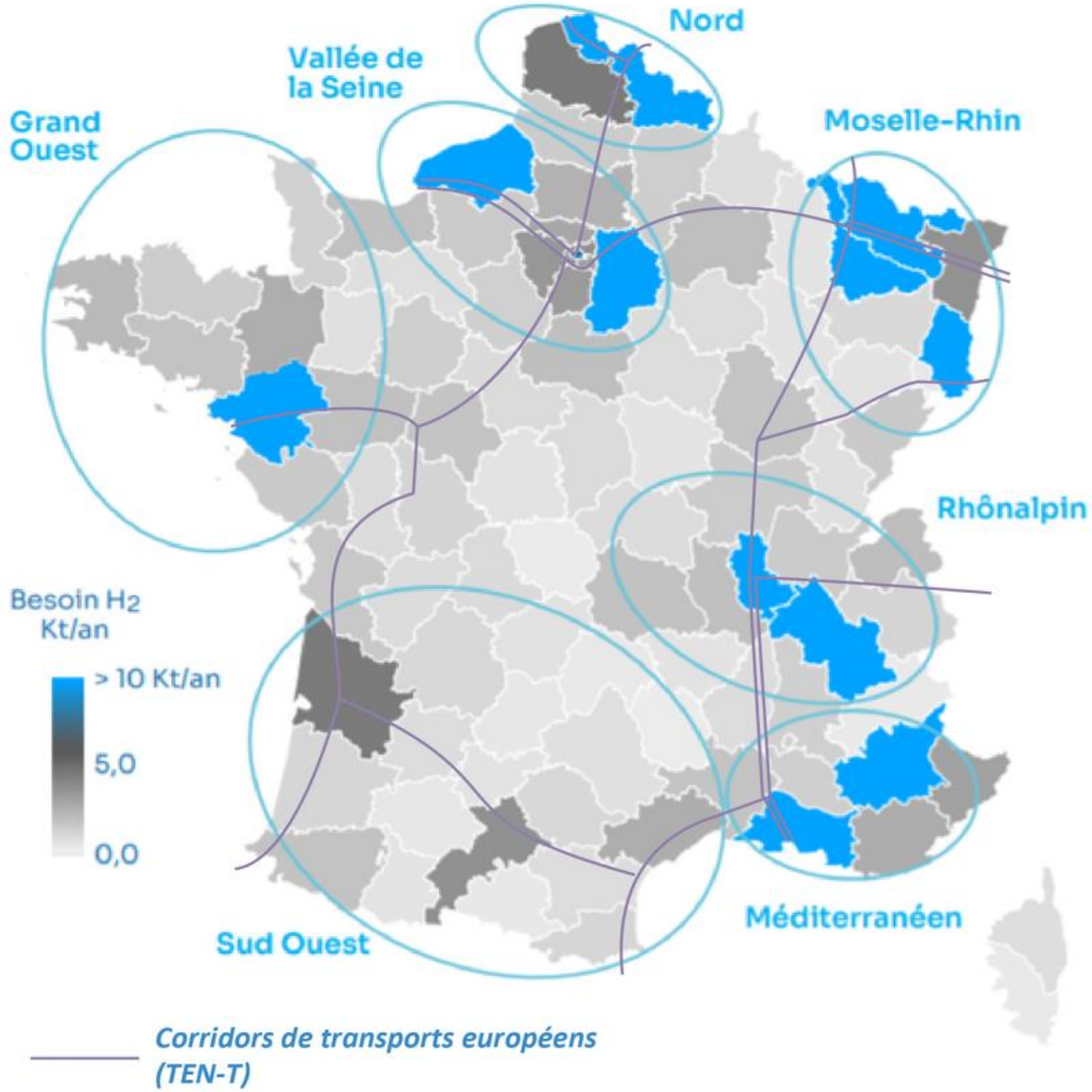
- **Pillar 3 : To Develop R & D & Innovation**

➢ Implementation of a Priority Research Programme for hydrogen applications and a programme to increase competences and training

✓ In total : **7,2 + 1,9 billion €** up to 2030 (**3,4** during 2020-2023 period)
6500 MW of electrolysers – **680 000** tons of Hydrogen

✓ Objective : to create between **50 000** and **150 000** jobs

✓ Cooperation with European partners (**IPCEI**)



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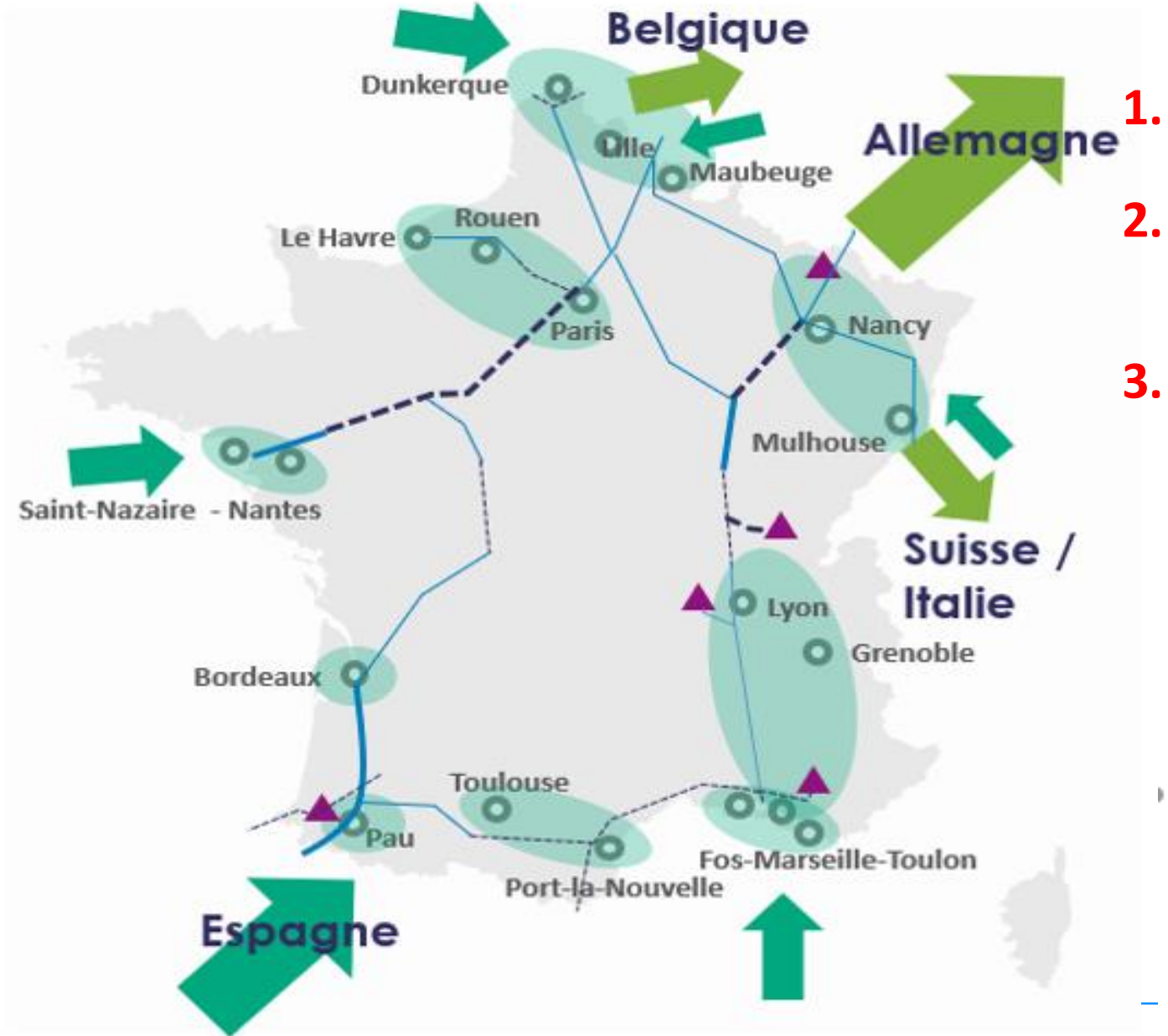
Deployment by 2030 : Consumption is concentrated within 7 bassins

- 680 to 1090 kt of hydrogen (160 resp 325 kt for mobility)
- 6.5 to 10 GW of electrolysis power
- 37 to 60 TWh of low carbon or renewable electricity
- 1000 à 1700 H2 refuelling stations, mainly public

Toward a European hydrogen market



1. **MosaHYc (with Creos)** : 100 km between France and Germany (2026)- Repurposed
2. **RHYn** : 100 km (60 km repurposed) between Chalampé and Mulhouse (2028), potential extension to Basel)029)
3. **DHune (with Fluxys)** : study of a transborder pipe between France and Belgium (Open season Valenciennes area)

Consumption area

Potential exports

Potential imports

H2 storage

Potential new pipes

Conversion of existing pipes to H2

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REPower EU (18.May 2022)

3 major corridors

- Mediterranean area
- North Sea area
- Ukraine (as soon as conditions allow)

- **European Hydrogen Backbone**
- **31 TSO –28 000 km by 2030;**
  53 000 km by 2040
  (60% repurposed)

- .Estimated cost of transport :
  0.11 à 0.21 €/kg for 1000 km,

Strong support of the French Government

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- Through "**Calls for projects**"

(managed by ADEME, French Agency for Ecology)

  - Technological bricks : **350** Million euros
  - Territorial ecosystems (mixing industry and mobility) : **275** Million euros

- and also through an **IPCEI** (Important Project of Common European Interest) within the European framework (**1,5 +1,7** billion euros)

- A support mechanism in order to fill the gap between the costs of low carbon/renewable hydrogen and grey hydrogen
- and also a specific mechanism for refineries (TIRUERT)

Challenges for the French Hydrogen Sector

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- To **reduce costs : scaling up**
- To promote **technological neutrality**
- To contribute to **reindustrialisation**
- To get access to **renewable** or **low carbon electricity** at « reasonable » cost

A strong dynamic

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- **Recent succesfull IPO** : McPhy, H-R-S , HDF Energy, Haffner Energy
- **Project of gigafactories (IPCEI)** : McPhy, John Cockerill, Elogen, HdF Energy, Symbio, Faurecia, Hyvia
- **Projects in all regions** :
  Normandy (200 MW),
  Grand East (MosaHyc),
  South (Hyammed, Hygreen, MassHylia),
  Occitanie (H2 Corridor, Hyport),
  Auvergne Rhône Alpes (Zero Emission Valley, Hympulsion),
  Harbours (Bordeaux, Dunkirk, Saint Nazaire, etc…)

As a CONCLUSION

- **Without Hydrogen, we will NOT succeed (for decarbonisation of economy and integration of renewables within energy systems)**
- **Versatile energy carrier : holistic/systemic approach is needed**
- **Massifying/ Pooling usages in order to reduce costs : to build territorial ecosystems, to scale up, import of H2**
- **To maintain R&D efforts and foster innovation**
- **A strong dynamic thanks to Regulation and public financial support**

Thank you
for your attention !

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