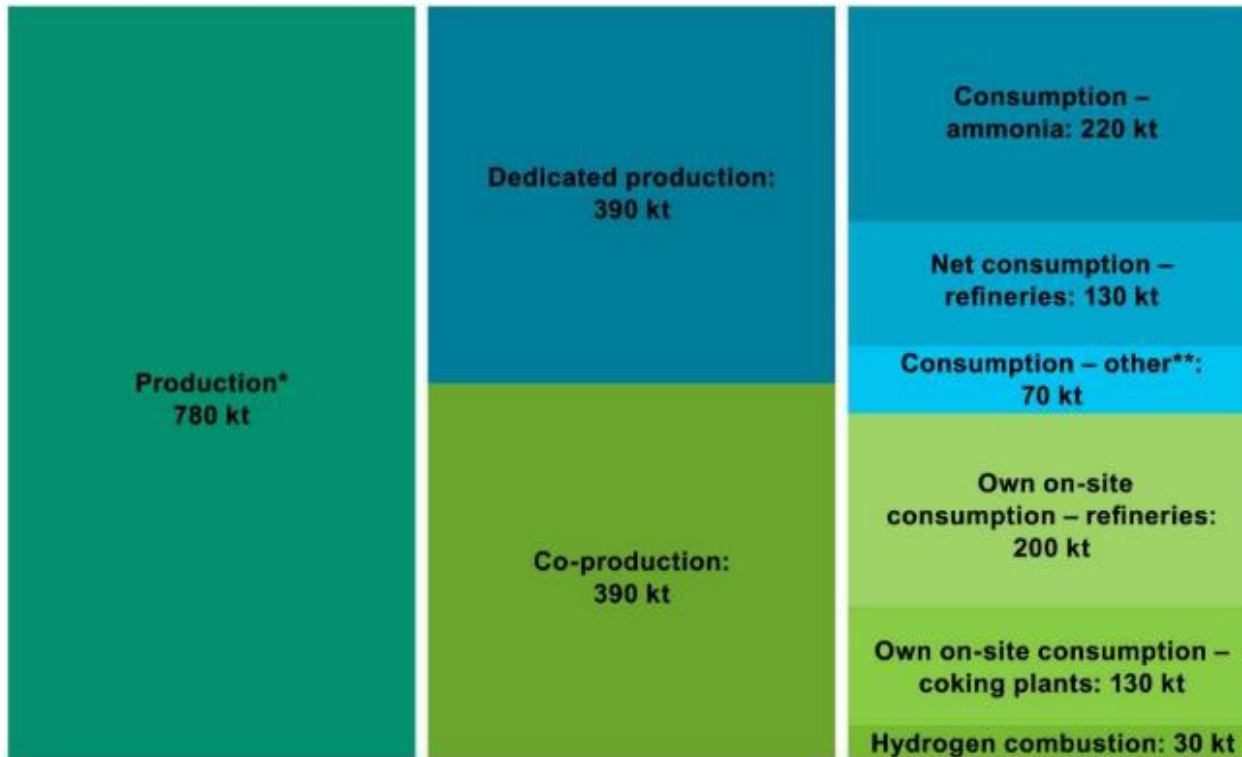


France's Hydrogen Strategy: Domestic and International Dimensions

Ines Bouacida (IDDRI)

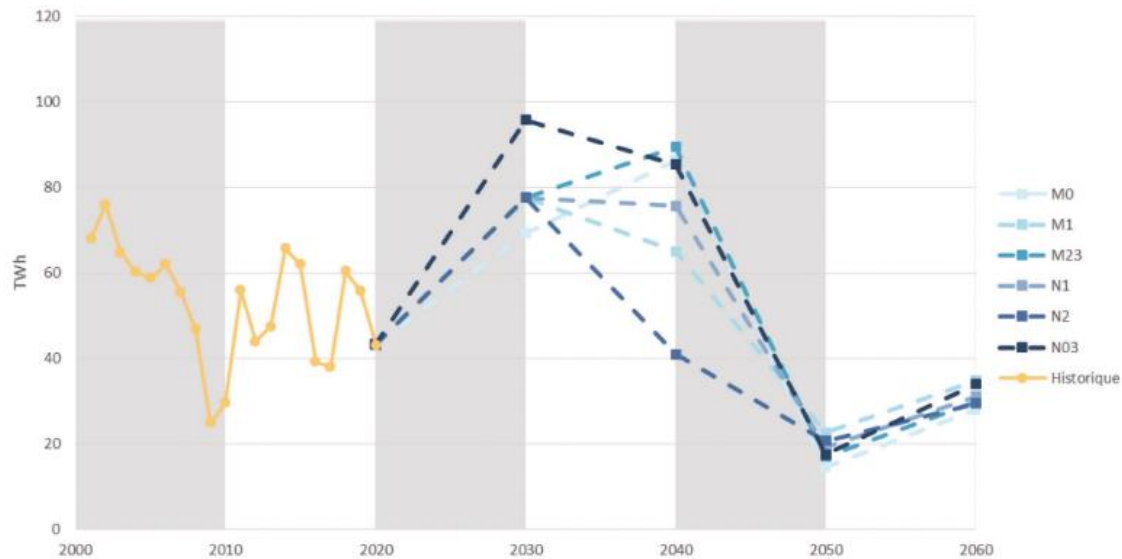


* production: hydrogen from processes generating pure H₂ or mixed with other gases
 ** of which hexamethylenediamine: 40kt; surface treatment of metals: 10 kt; hydrogen peroxide: 7 kt.

- Hydrogen production in 2019: 26 TWh = 800 kt (6th-largest European producer)
- Mostly for ammonia and refineries
- 1st hydrogen plan in 2018: €100 million
 - decarbonise existing uses of hydrogen in the industry
 - develop hydrogen in mobility as a “complement” to battery electric mobility
- Headstart in research & development
 - 1st European innovation cluster
 - 6% of all hydrogen patents
 - international corporates: Engie, Air Liquide, EDF, McPhy

Source: AFHYPAC et al. (2020), drawing on Hinicio & EY, 2020. Reproduced with permission (slightly modified).

Figure 7.54 Évolution du solde exportateur de la France dans les différents scénarios

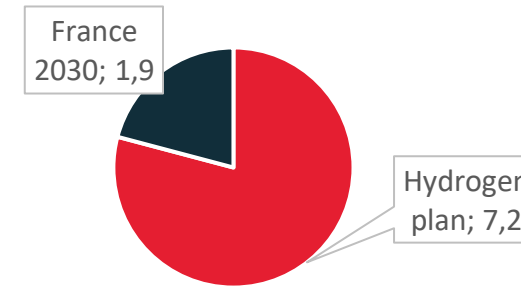
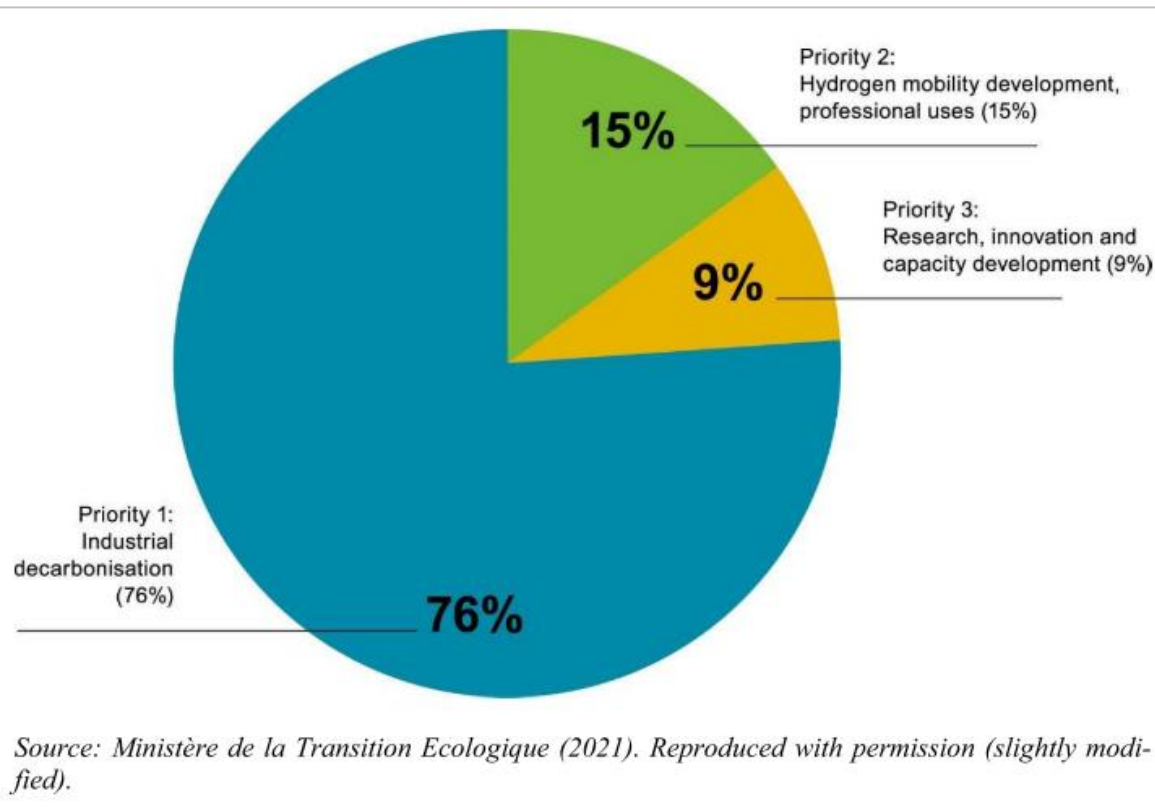


- France to remain an exporter of electricity?
 - actual delivery of new nuclear
 - Implementation of RE objectives
 - Might have short-term constraints on supply (2030)

- 2023 to see revision of several energy & climate planning documents
 - Implementation of Fit for 55

- Hydrogen to enhance « industrial sovereignty »
 - €54 bn for France 2030
 - Green Industry Law as a response to IRA

Hydrogen strategies in France: main objectives and implementation



- €9.1 bn until 2030
- Focus on electrolysis ; 6.5 GW target
- Control all parts of the supply chain: announcements for several « giga-factories »
 - ⚠ In practice, most funding so far towards mobility
- Silent regarding cross-border trade of hydrogen products
- Global hydrogen strategies by Engie & EDF

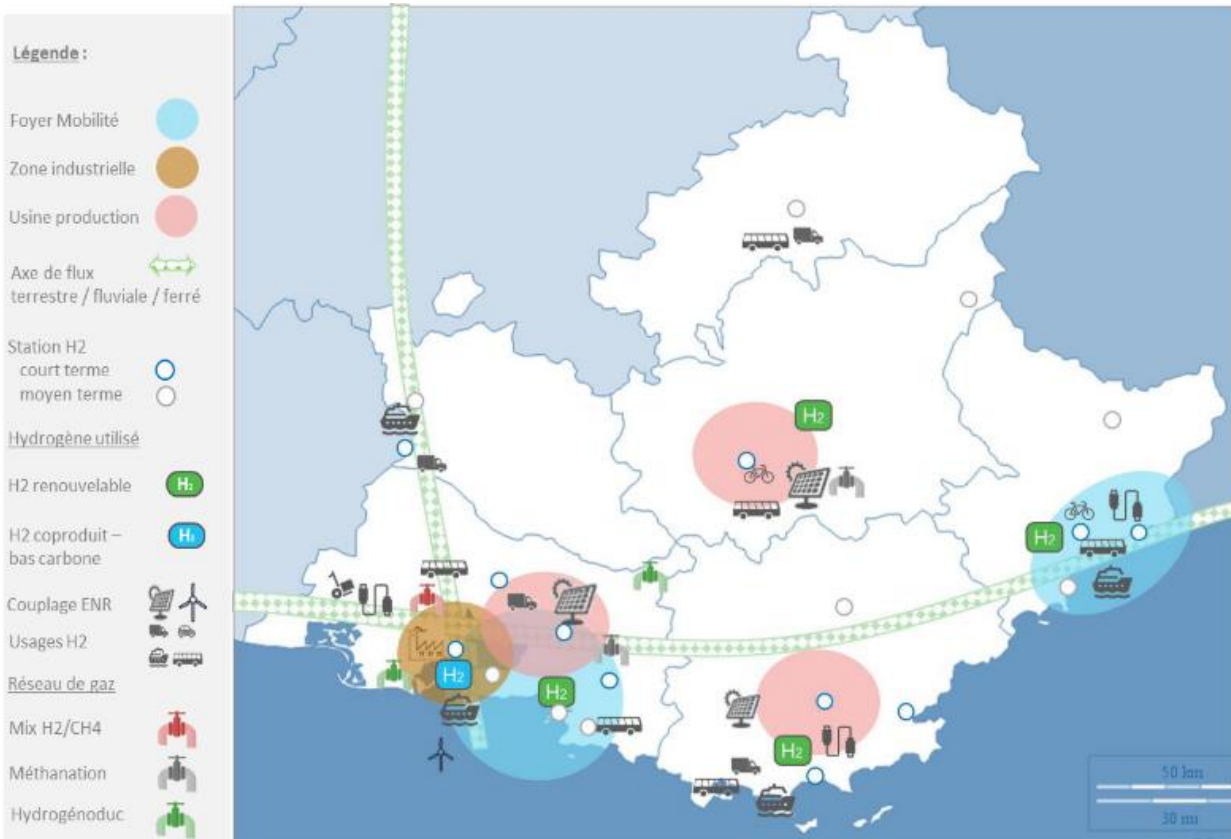
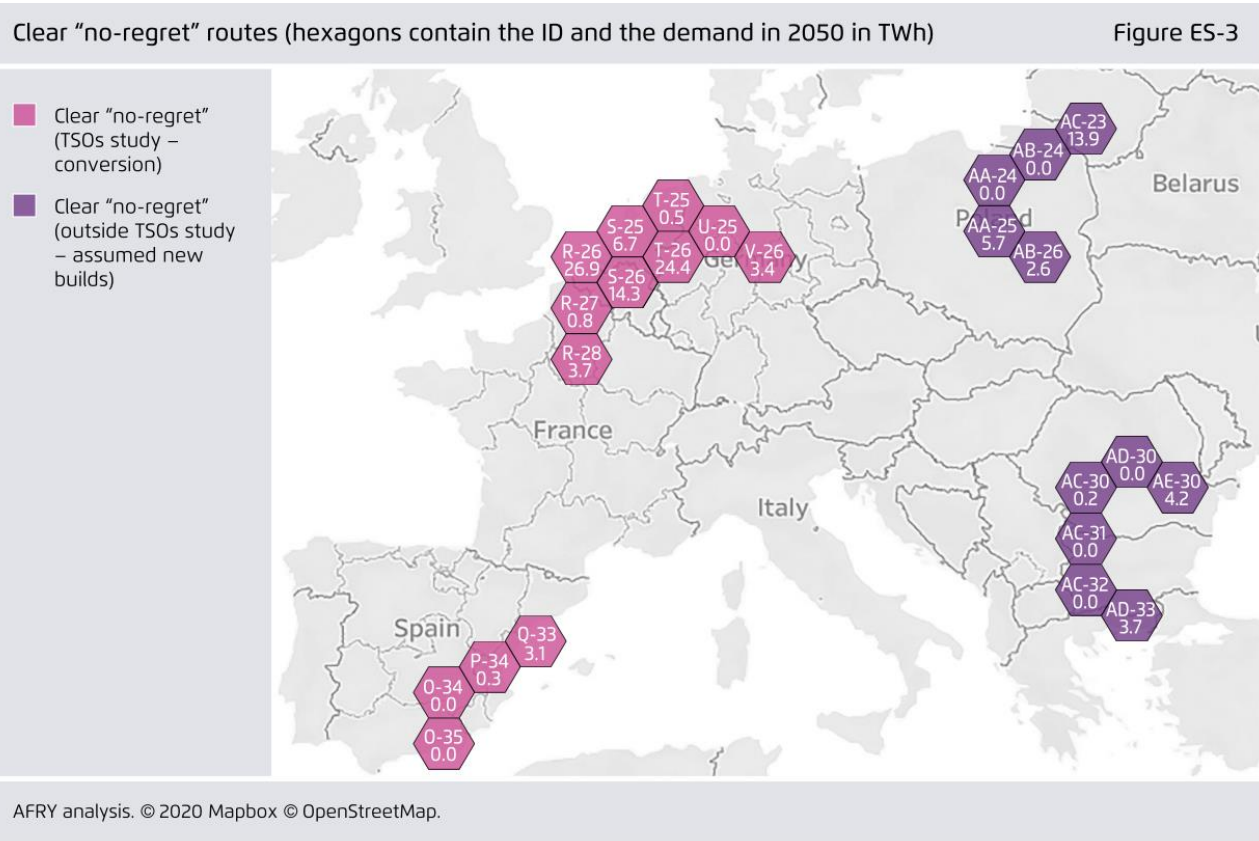


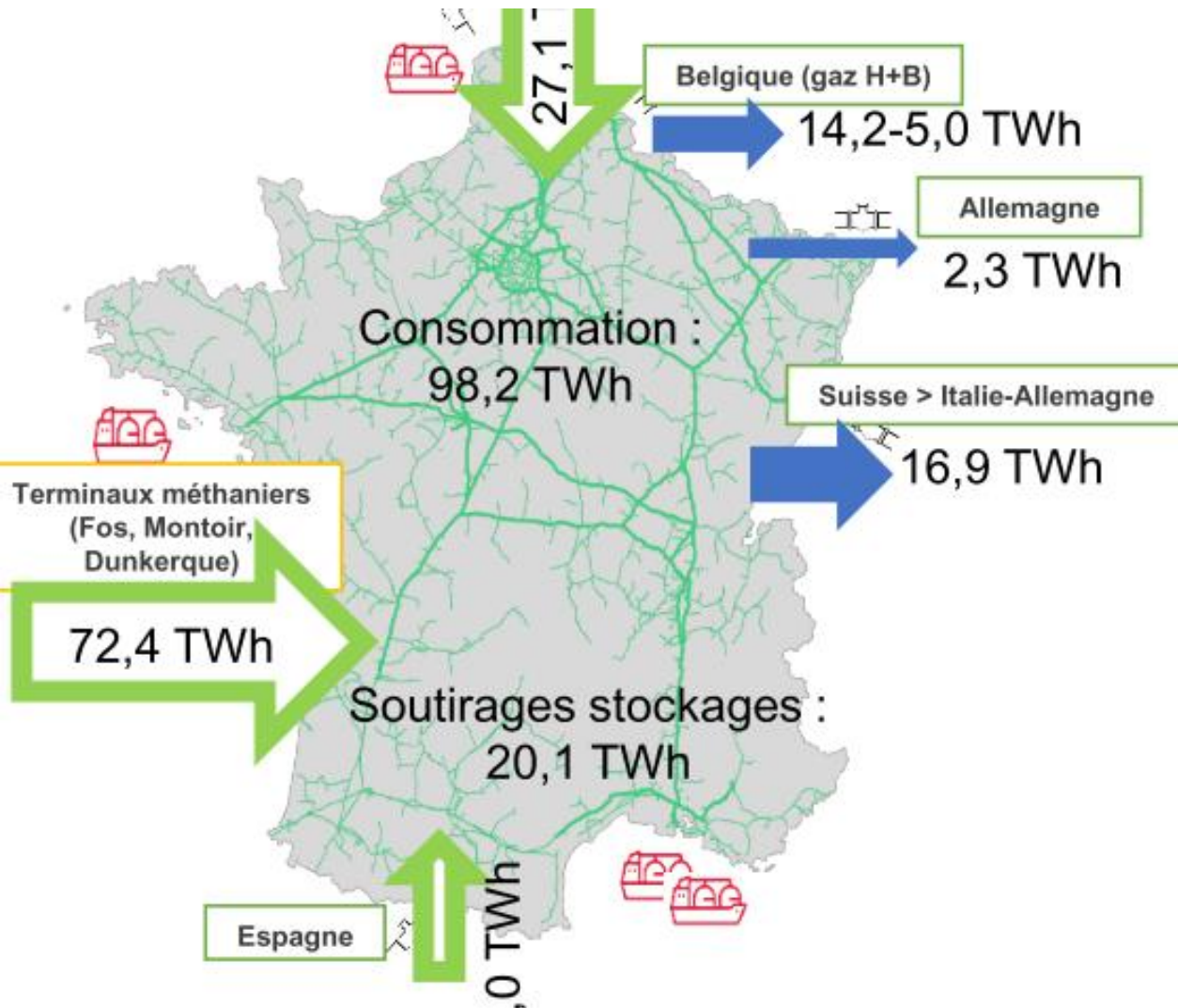
Figure 4 : Cartographie visualisant la spatialisation de la filière hydrogène régionale à horizon 2027 (dynamiques à l'œuvre, prémices d'une logique de corridors et de connexion à d'autres écosystèmes hydrogène)

- Many regional-level strategies with dedicated funding
- Competence over regional transport, economic development
- Key players for several cross-border project, e.g. mosaHYc (Saar, Lorraine, Luxembourg)

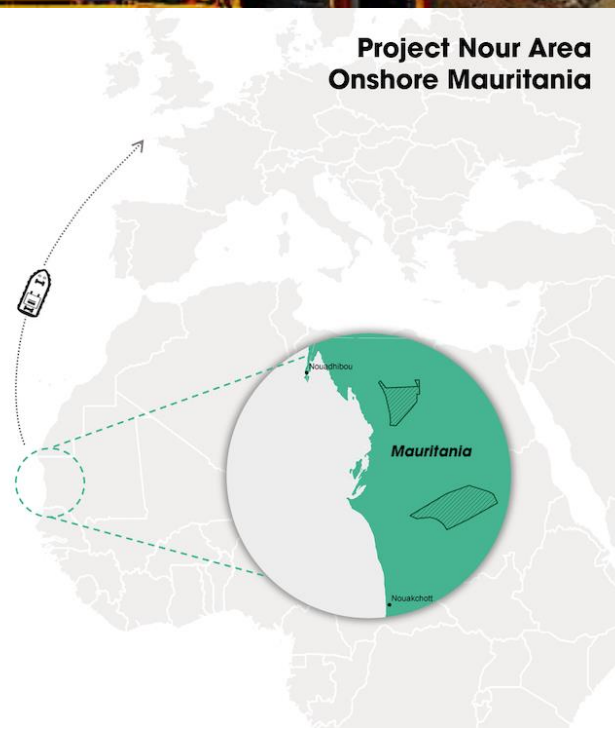


- Cautious approach towards hydrogen infrastructure planning
- Coherent with focus on industry hub and commercial mobility
- H2Med connection as a high-level political compromise: what actual implementation?

External dimensions of hydrogen development in France



- Availability of low-emissions electricity
- Pipeline interconnections & LNG terminals
- Potential importers in Benelux, Germany, potential surplus producers in Iberian peninsula, North Africa



Total Eren & Chariot in Mauritania

- Little enthusiasm from government actors, in line with several independent studies
- Different view from several private stakeholders
 - France Hydrogène
 - Engie planning production projects abroad (w/o exports)
 - French companies among European Hydrogen Backbone consortium
- Limited impact of gas crisis on hydrogen strategy



- Strong French influence over definition of « sustainable » hydrogen in Green Deal legislation
 - Allow nuclear-based hydrogen
 - Keep the door open to public funding for nuclear
 - Examples: REDIII, gas package

- « Unholy » alliance b/w nuclear and fossil gas supporters

- Strain on French-German relationship

- However, several French players are very active on the international scene

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