Hydrogen roadmap and industrial development in France

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National roadmap for hydrogen

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Energy & Climate targets in France

- **Greenhouse gases reduction targets**

  → **-40%** between 1990 and 2030

  → **Carbon neutrality** by 2050

- **Reduction targets for consumption, fossil and nuclear**

  → Final energy consumption: **-7%** (2023) and **-14%** (2028) (vs. 2012)

  → Fossil fuels: **-20%** by 2023, **-35%** by 2028 (vs. 2012)

  → Dicrease nuclear power to **50%** by 2035 (closure of 14 reactors)

- **Development targets for renewable energy**

  → Renewable heat: **+25%** (2023) and **+50%** (2028) (vs. 2016)

  → Renewable electricity capacity: **+50%** (2023), **+100%** (2028) (vs. 2017)

- **Economic development**

  → Creation of **246000** jobs (2023), **413000** (2028)

Icons: Energy collection by Becris from the Noun Project
Ministry of Ecological and Solidary Transition | Ministry of Economy and Finance | Embassy of France in Japan

Hydrogen roadmap of France

June 2018: National roadmap for hydrogen

→ Essential to reaching carbon neutrality

→ H2 to be produced from clean sources

→ H2 to be used to store intermittent energy

#1 Creation of an industrial ecosystem for **decarbonized hydrogen**

#2 Development of **zero-emission solutions** for transport

#3 Development of **hydrogen storage** for renewables

Illustration: AFHYPAC

#1 Creation of an industrial ecosystem for decarbonized hydrogen

- **Aim: Sustitution of fossil H2 by H2 produced through electrolysis**
- **Challenges: price, logistics**
- **Targets:**

→ 2023: **10%** of low-carbon H2 in the industry

→ 2028: **20% to 40%** of low-carbon H2 in the industry

- **Measures:**

→ **Investment aid** allocated through a call for projects

→ Taking into account the production source of hydrogen **in greenhouse gas emissions regulations**

→ Creation of a **traceability system** for hydrogen by 2020 (guarantees of origin)

Illustration: AFHYPAC

#2 Development of zero-emission solutions for transport

- **Captive fleets and heavy vehicles are key for the business models of charging stations**
- **Challenges: distribution infrastructure, heavy vehicles**
- **Targets:**

	Light vehicles	Heavy vehicles	Charging stations
2023	5000	200	100
2028	20000-50000	800-2000	400-1000

- **Measures:**

→ Regulatory framework for **hydrogen stations** (2019)

→ Investment aid for **captive professional fleets**

→ Support to research for **hydrogen heavy vehicles**

#3 Development of hydrogen storage for renewables

- **Flexibility for power grids and decarbonation of gas grids**

- **Challenges: long term needs, technical and economic conditions, security**

- **Examples of actions:**

→ Determining the conditions for hydrogen feed-in into the gas grids

→ Scaling-up power-to-gas demonstrators

→ Pilot projects in French Overseas regions providing flexibility to the power grid

Industrial development

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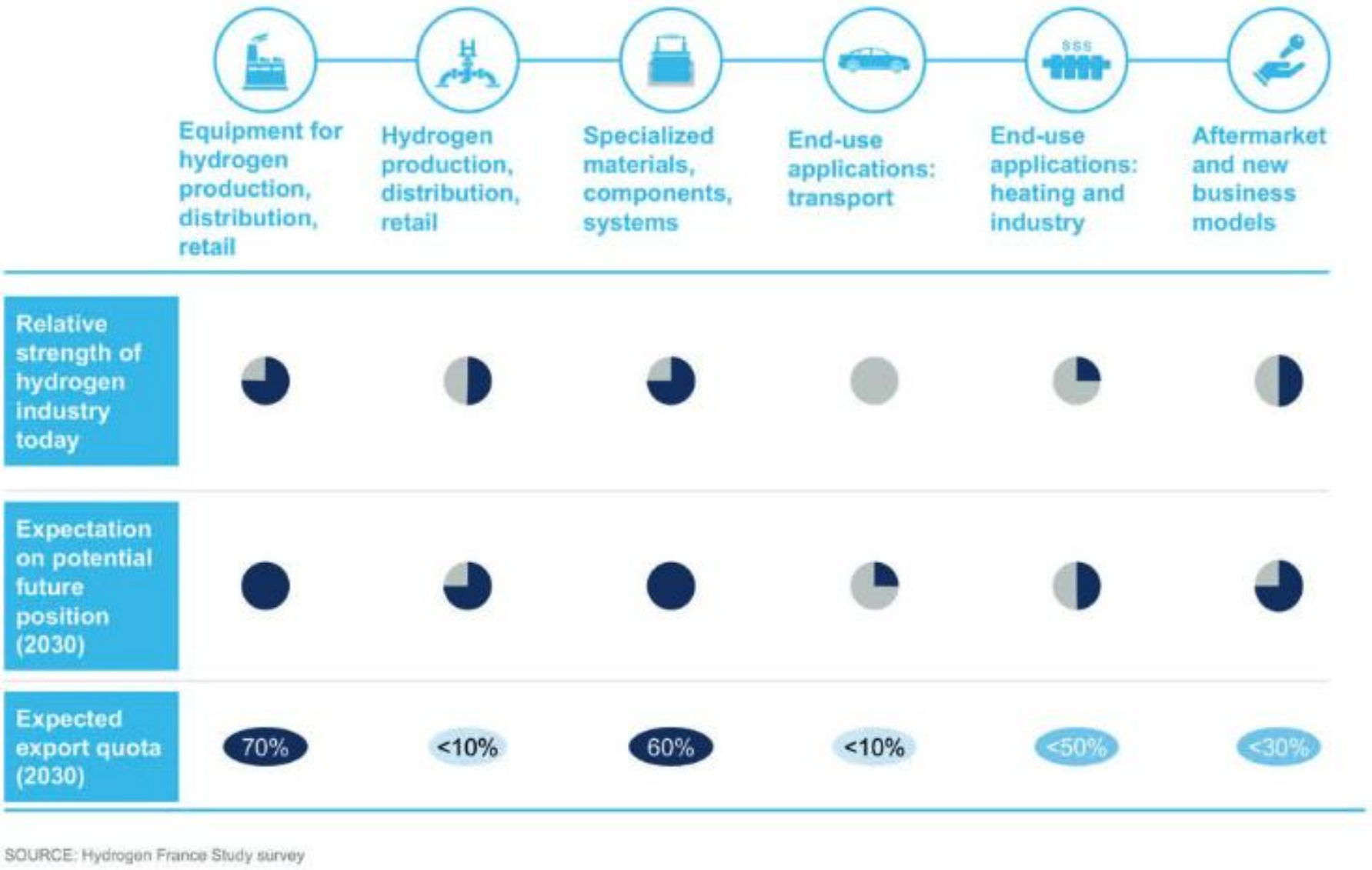
France’s industry is well positioned, particularly in the market for equipment, materials and components



SOURCE: Hydrogen France Study survey

French companies well represented in the Hydrogen Council

600 hydrogen taxis in Paris by 2020

Air Liquide

hype

idex
Efficience Energétique

TOYOTA

Alstom’s Coradia iLINT: the hydrogen train

Energy Observer: the hydrogen boat and French Ambassador for the Agenda 2030 SDGs

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