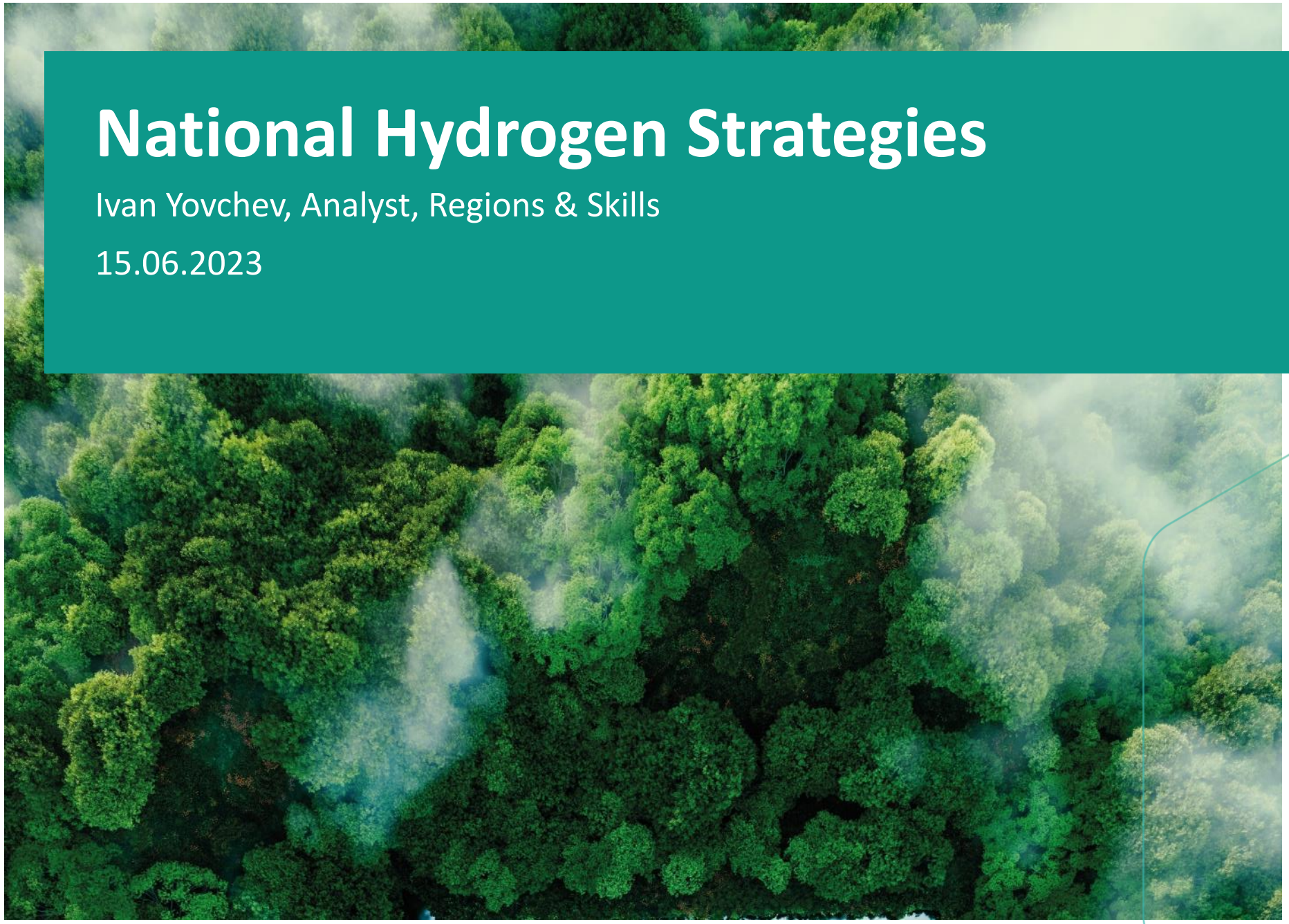


National Hydrogen Strategies

Ivan Yovchev, Analyst, Regions & Skills

15.06.2023

Hydrogen Europe

For more information, please contact:
i.yovchev@hydrogeneurope.eu

Introduction

- What and why are we tracking?

- Overview of global and European NHS adoption

- US National Clean Hydrogen Strategy and Roadmap
- Belgium Vision and strategy - Hydrogen
- Hydrogen Future for Bulgaria

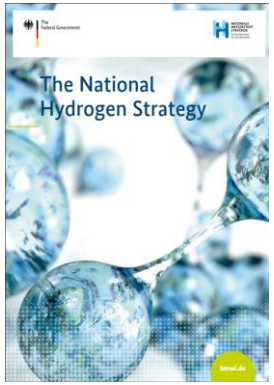
- Conclusions

What and why are we tracking?

- Monitoring national and regional hydrogen strategies on ongoing basis;

- Irrespective of title (roadmap, plan, strategy, etc.)
- Document must be adopted by a public body with competence to adopt it
  - Ministries, governments, parliaments, etc.
- Addresses the hydrogen sector only;

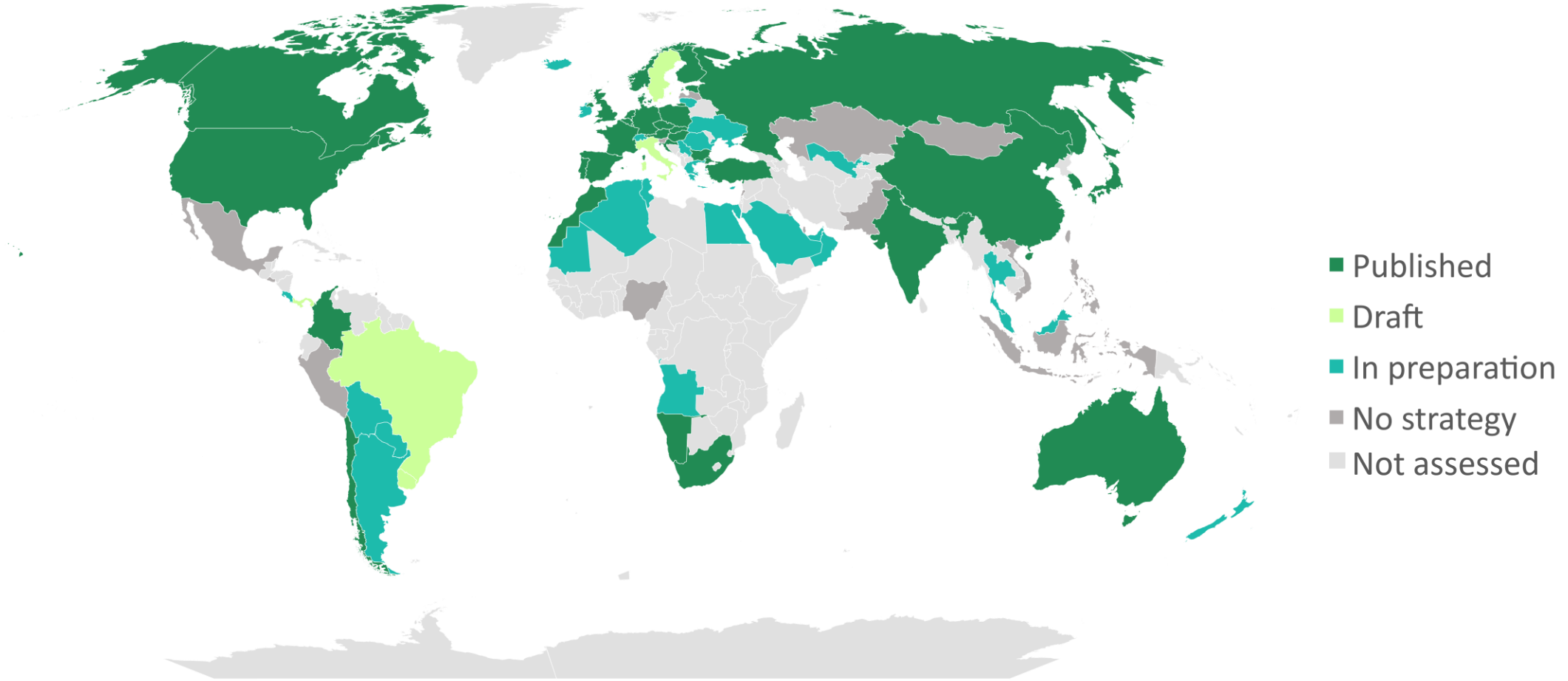
- Strategies provide:
  - update on the development of the sector;
  - identify key challenges and opportunities;
  - vision for development;
  - quantitative targets;
  - identify funding opportunities.



35 countries have published a national hydrogen strategy

Hydrogen Europe

Data as of 07/06/2023

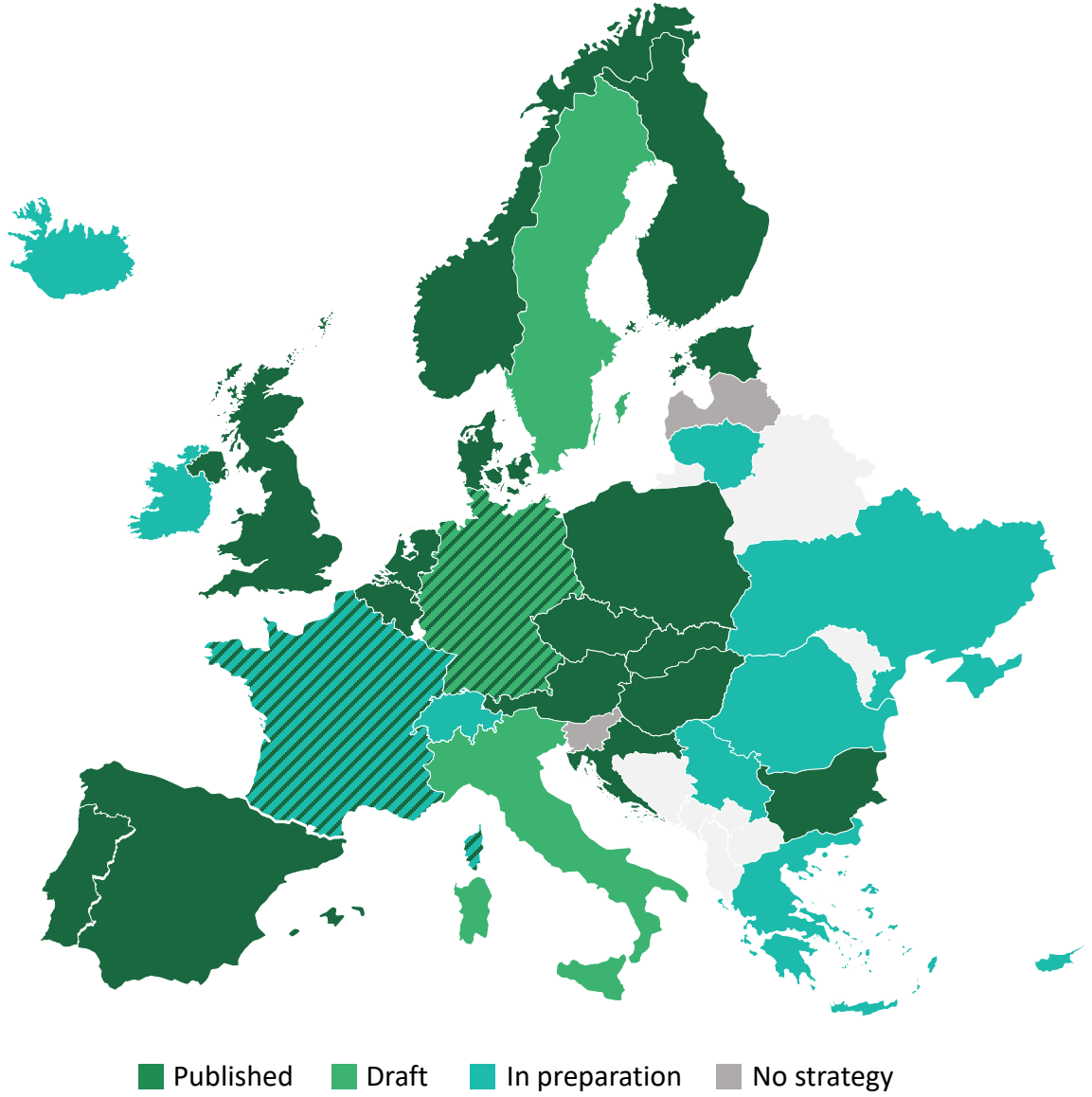


19 countries have published national hydrogen strategies

Hydrogen Europe

Data as of 07/06/2023

- Three countries have published strategies in 2023 – Bulgaria, Estonia, Finland;
- 2022 - Austria, Croatia and Denmark published strategies & Belgium and UK updated;
- Italy and Sweden have published drafts;
- 8 countries are currently preparing their H2 strategies;
- Germany and France to update strategies in 2023;
- 13 countries announced electrolyser capacity targets for 2030;
- 10 countries have committed public funding towards hydrogen.



Electrolyser capacity commitments by 2030 amount to 39.76 GW

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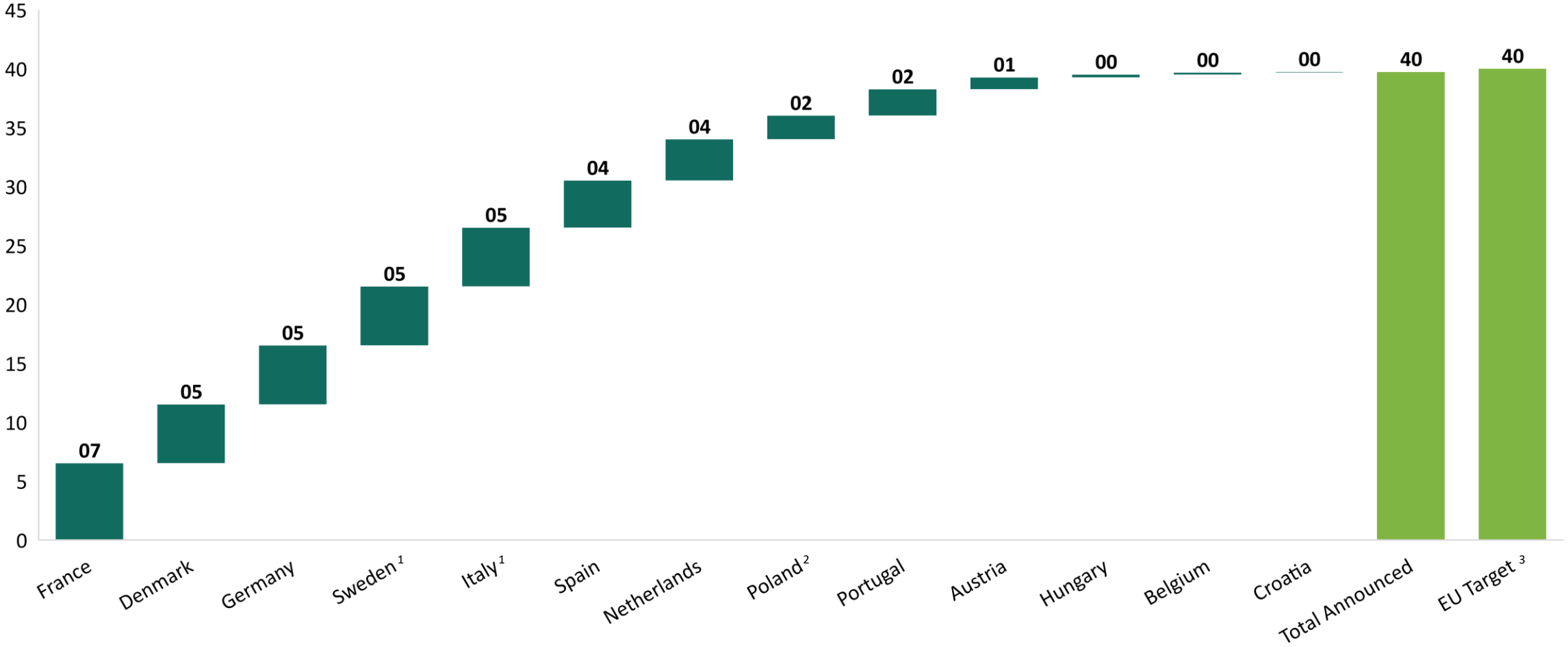
Data as of 07/06/2023



Included countries are the only ones with specific targets for planned electrolyser capacity.
When the target is a range, the median value of that range was used.

[1] Target is provisional and subject to change in the final version of the national H2 strategy.

[2] Polish target is for low-carbon emission sources, including electrolysers.

[3] EU target is in electrolyser capacity output, while for the values in national strategies no indication is given.

10 countries have committed €20.9bn of public funds towards H2

Hydrogen Europe

Data as of 07/06/2023

	Country	National Funding Committed (€)	Details
	Austria	**0.545bn**	Non-exclusive for R&D, IPCEI and subsidies for electrolysers/biomethanation
	Belgium	**0.401bn**	Energy Transition Fund (non-exclusive) & Infrastructure;
	Czech Republic	**0.522bn**	Non-exclusive, available through 3 funds and operative programmes
	Denmark	**0.176bn**	Exclusive, PtX subsidies based on tender and PtX task-force
	Estonia	**0.121bn**	IPCEI & H2 in transport and chemical industry support
	France	**5bn**	Priorities: Industry & heavy-duty transport decarbonisation and R&D
	Germany	**11.11bn**	Non-exclusive, spread among 6 funds/programmes
	Poland	**0.446bn**	Non-exclusive, available through 4 programmes and funds
	Portugal	**0.525bn**	Exclusive for H2 production in the form of a variable feed-in-premium until 2030
	United Kingdom	**2.45bn**	Non-exclusive funds through 14 funds, competitions and programmes

When the committed funds are a range, the median value of that range was used.

Hydrogen Infrastructure

Infrastructure measures

Production to take place near consumption

- Austria, Croatia and Czechia

Studies on hydrogen integration in natural gas grid planned

- Bulgaria, Estonia, Hungary, Slovakia, Spain

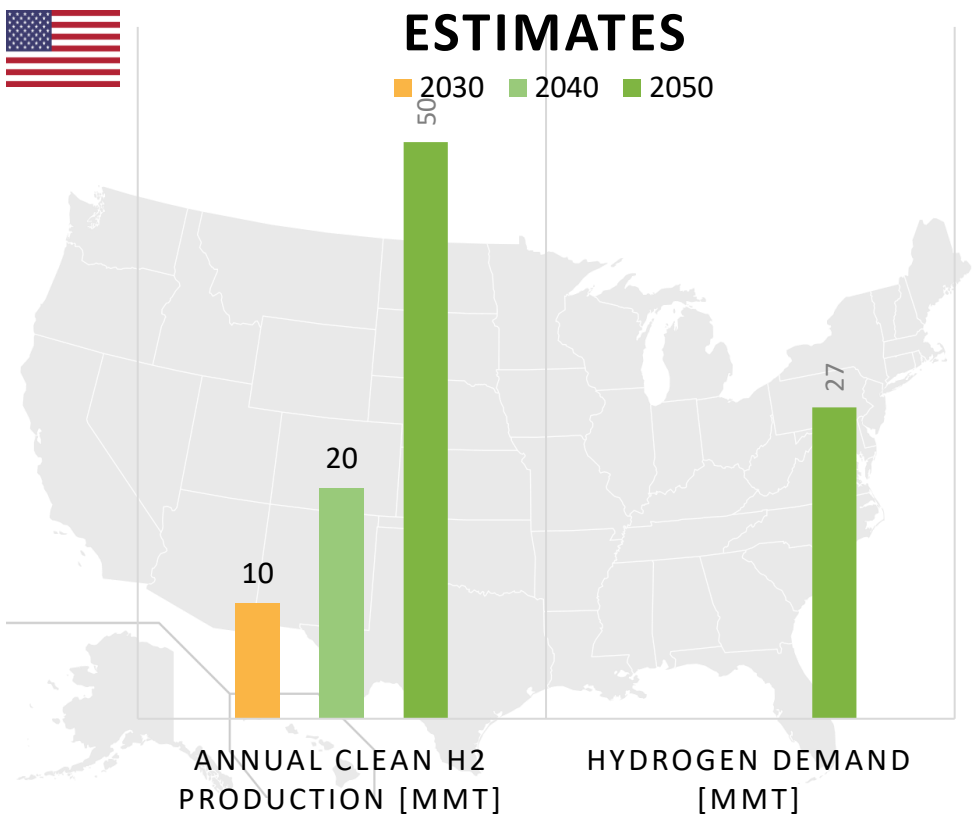
National regulation to be developed

- Belgium, Denmark, Finland, Luxembourg, Netherlands, Poland, Portugal

Infrastructure targets

Hydrogen injection in natural gas grid 2030 (%)	
Austria	> 10
Hungary	10
Poland	10 (hydrogen or biomethane)
Portugal	10-15

US National Clean Hydrogen Strategy and Roadmap (2023)



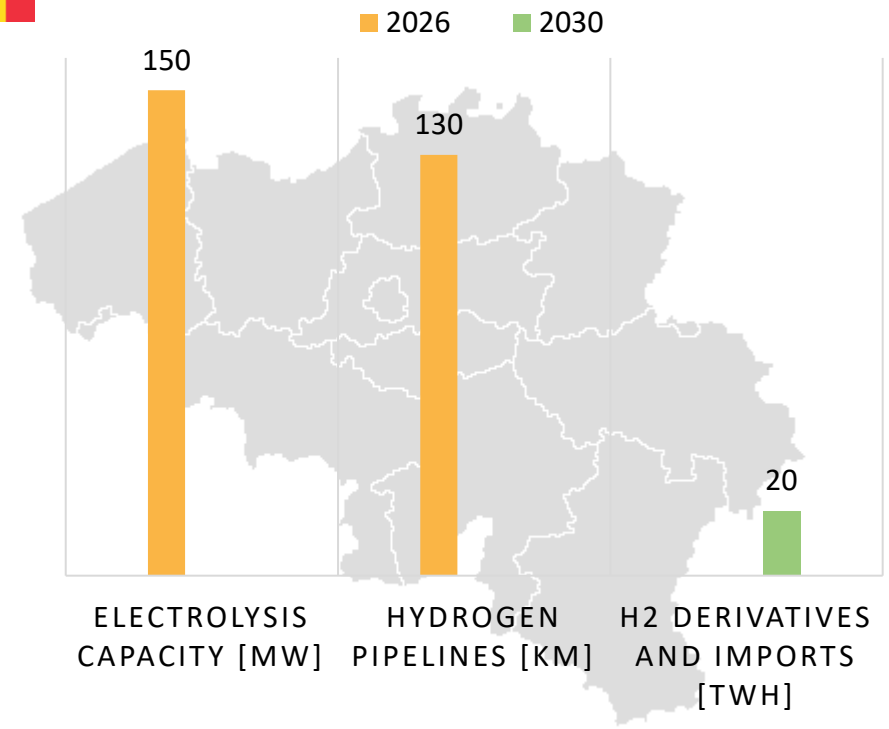
FUNDING

- Bipartisan Infrastructure Law: **$9.5BN** (exclusive)
- IRA Production tax credit

- Three key strategies:
  - Target strategic, high impact uses for clean hydrogen:
    - Industry (chemical, steel, refining), heavy-duty transportation, long-duration energy storage;
    - Clean hydrogen standard: carbon intensity ≤ 2 kgCO2eq / kgH2 at the site of production;
  - Reduce the cost of clean hydrogen:
    - R&D, stimulate private investment, address critical materials and supply-chain vulnerabilities;
    - Targets on technology developments;
  - Focus on regional networks:
    - $7bn to establish 6-10 hydrogen hubs;
- Actions supporting the roadmap:
  - $1 bn for Electrolysis R&D;
  - $500 mln for Manufacturing & Recycling R&D;

Vision and strategy: Hydrogen (2022)

TARGETS

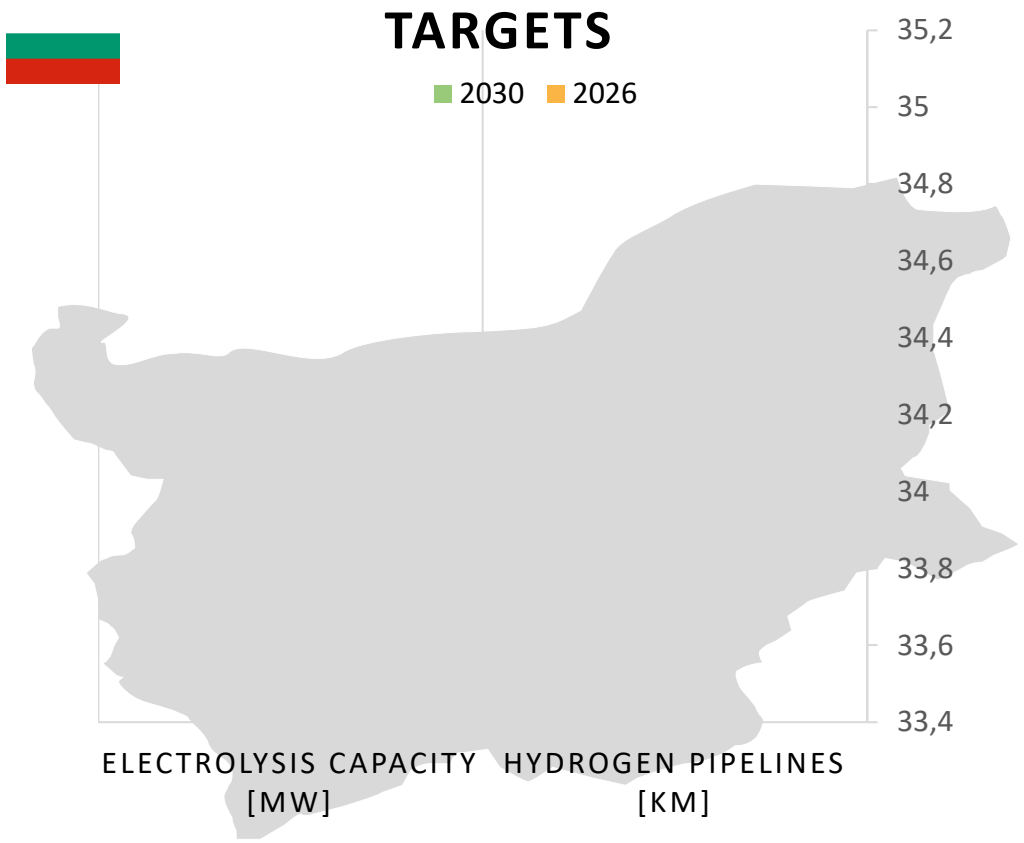


FUNDING

- **€0.401 BN** (non-exclusive)
- €75 mln Belgian Energy Transition Fund (2022-2025);
- €10 mln H2 import call;
- €16.2 mln VKHyLab;
- €300 mln Connection with DE;

- Achieving full decarbonisation by 2050, with limited local renewable energy potential;
  - Transitional role for blue H2, but only green H2 in 2050;
- Hydrogen imports and derivatives;
- Priorities:
  - Positioning Belgium as import and transit hub in Europe;
    - North Sea, South and Shipping corridors;
    - Connections with DE, FR, NL by 2028;
  - Expand Belgian leadership in hydrogen technologies;
    - 150 MW for R&D, education and strategic capacity;
  - Establish a robust hydrogen market;
    - H2 Gas market regulations;
  - International cooperation.

Hydrogen Future for Bulgaria (2023)



EU FUNDING

- **€2.637 BN** (non-exclusive)
- €322 mln - OP "Competitiveness and innovation in companies"
- €2.138 bln - Scientific research, innovation and digitalisation for intelligent transformation
- €177 mln - Programme for economical transformation

- Priorities:
  - Integration of H2 technologies: production, transport and use of hydrogen (industry, energy, mobility);
  - Intensification of R&D;
  - Education & training for H2 professions;
  - EU and international cooperation;
- Measures:
  - Analyses & studies on hydrogen export, TSO & DSO grids, potential production sites;
  - Industry switch quotas from grey H2;
  - PtX integration in energy markets;
  - FCEV purchase support & HRS deployment plan;
  - Administrative capacity building, safety trainings, guidelines for developers;
  - Research & development on system integration, retrofitting, synthetic fuels;

Thank You

Hydrogen Europe

Avenue Marnix 23
1000, Brussels / Belgium

secretatariat@hydrogeneurope.eu
hydrogeneurope.eu