



Global H₂ Energy Value Chain & Companies

CleanTech unit

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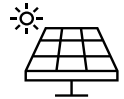
Webinar November 2021

Our services – Combining fields of expertise from research, data science to modelling



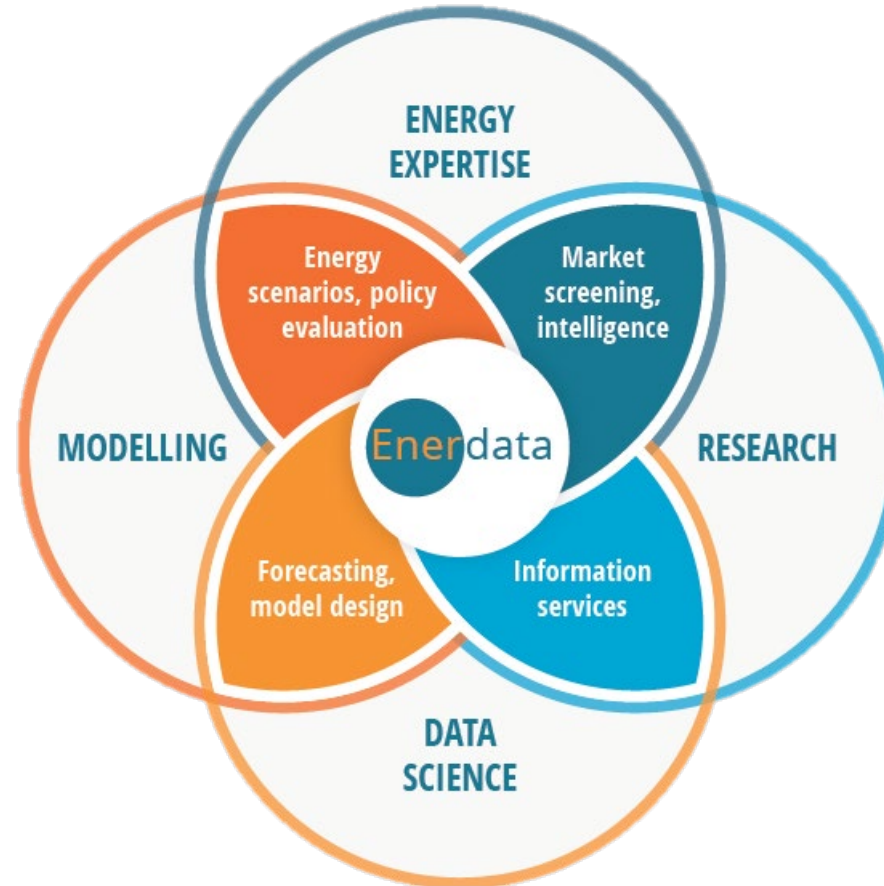
Modelling

- Creation of E-C scenarios, climate alignment trajectories
- Identification of alignment pathways by sector and by country



Expert in energy / climate

- Knowledge of market drivers
- Expertise covering all energy transition pillars: mix decarbonisation, energy efficiency, sufficiency
- Deep coverage: all energies, all sectors and 150+ countries



Market intelligence

- Market Research
- Business intelligence
- Energy market watch
- Tracking of E-C policies worldwide



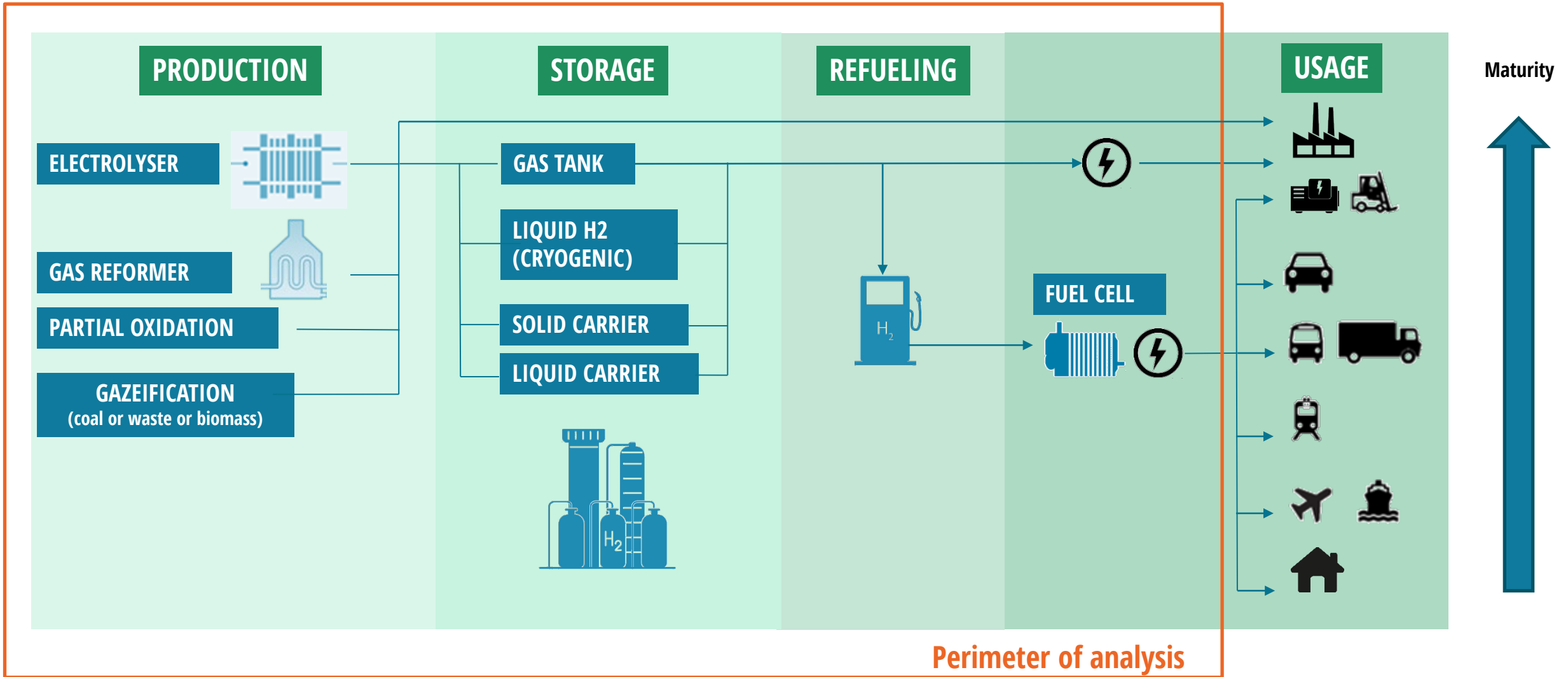
Data science

- Gathering, consolidating and analyzing energy data
- Market forecasts: supply, demand and prices

Agenda

- 1) Quick introduction on Hydrogen Value Chain worldwide**
- 2) Focus on Electrolysis market**
- 3) Focus on Fuel Cells market**
- 4) Conclusion**

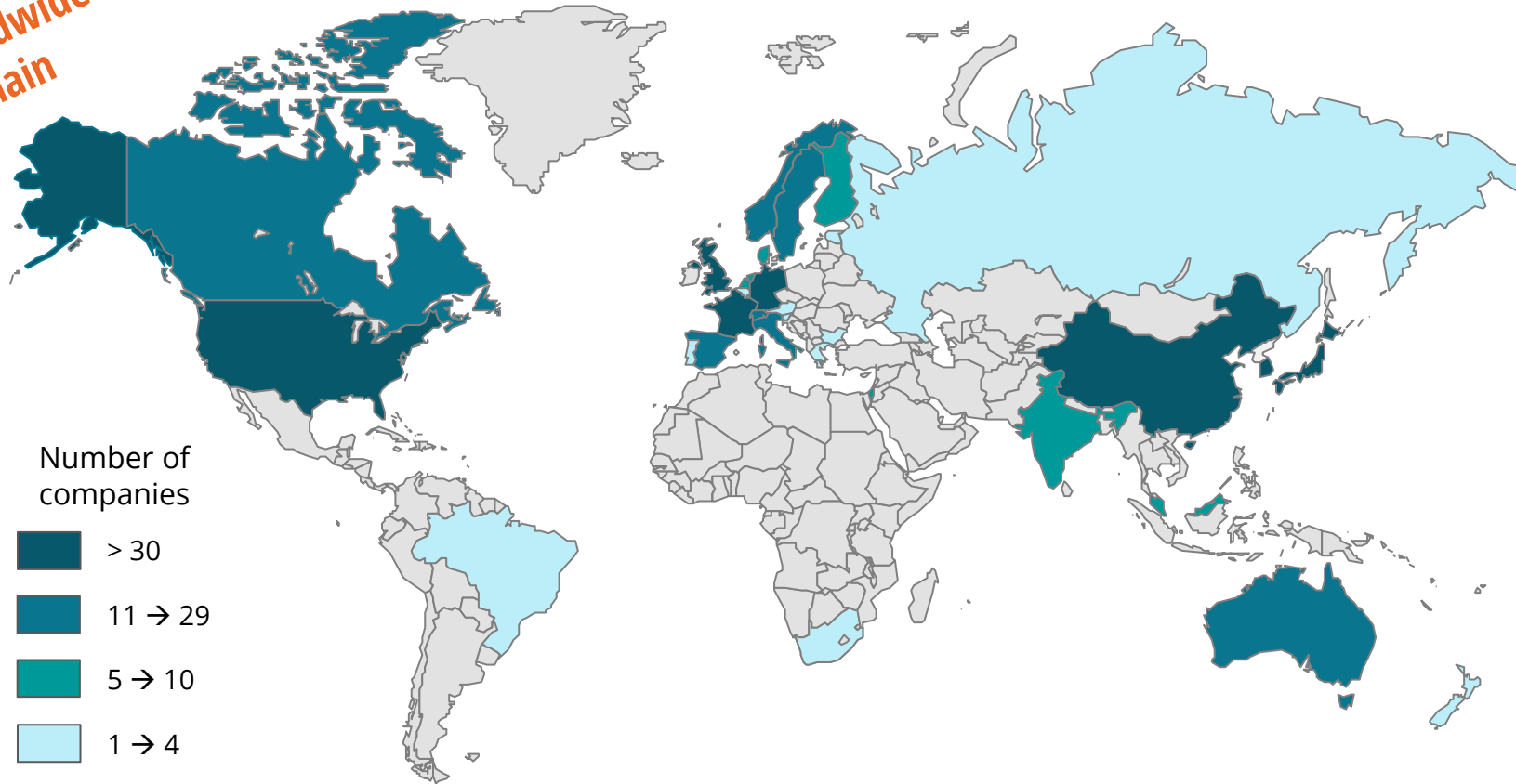
Hydrogen Industry Value Chain



H2 industry: companies per Country

~1000 companies worldwide along the value chain

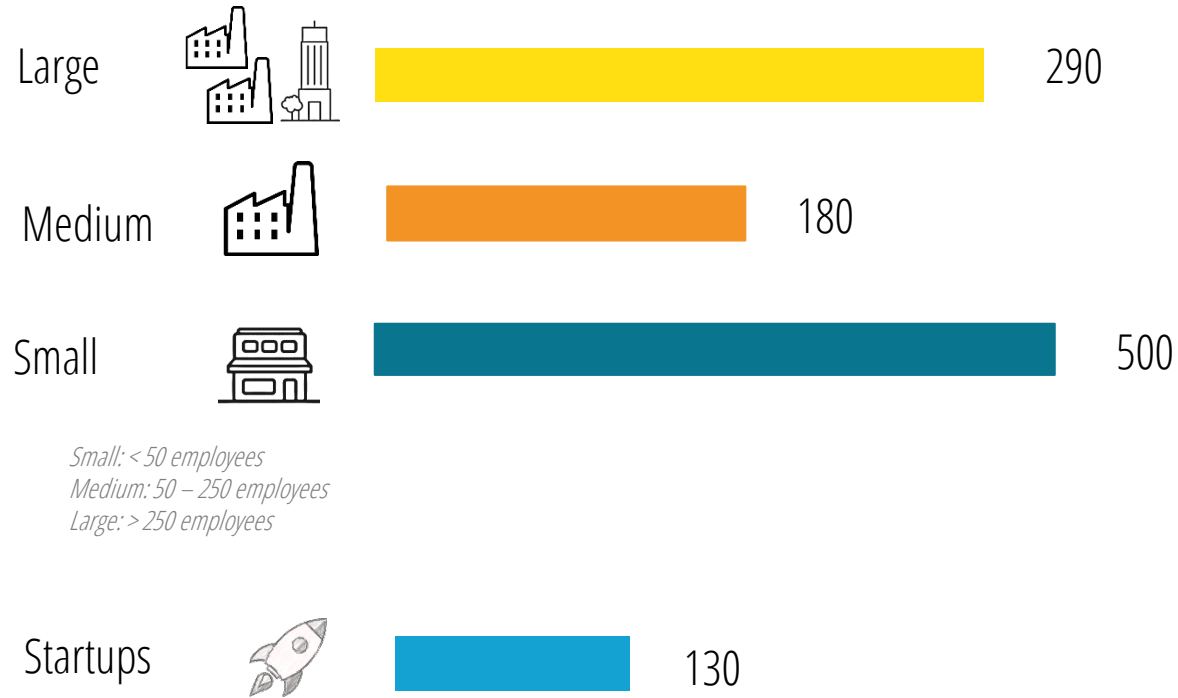
39 countries covered world-wide



120 B\$ market in 2021

Source: Enerdata, Global Hydrogen Companies Database, November 2021

H2 industry: companies per typology



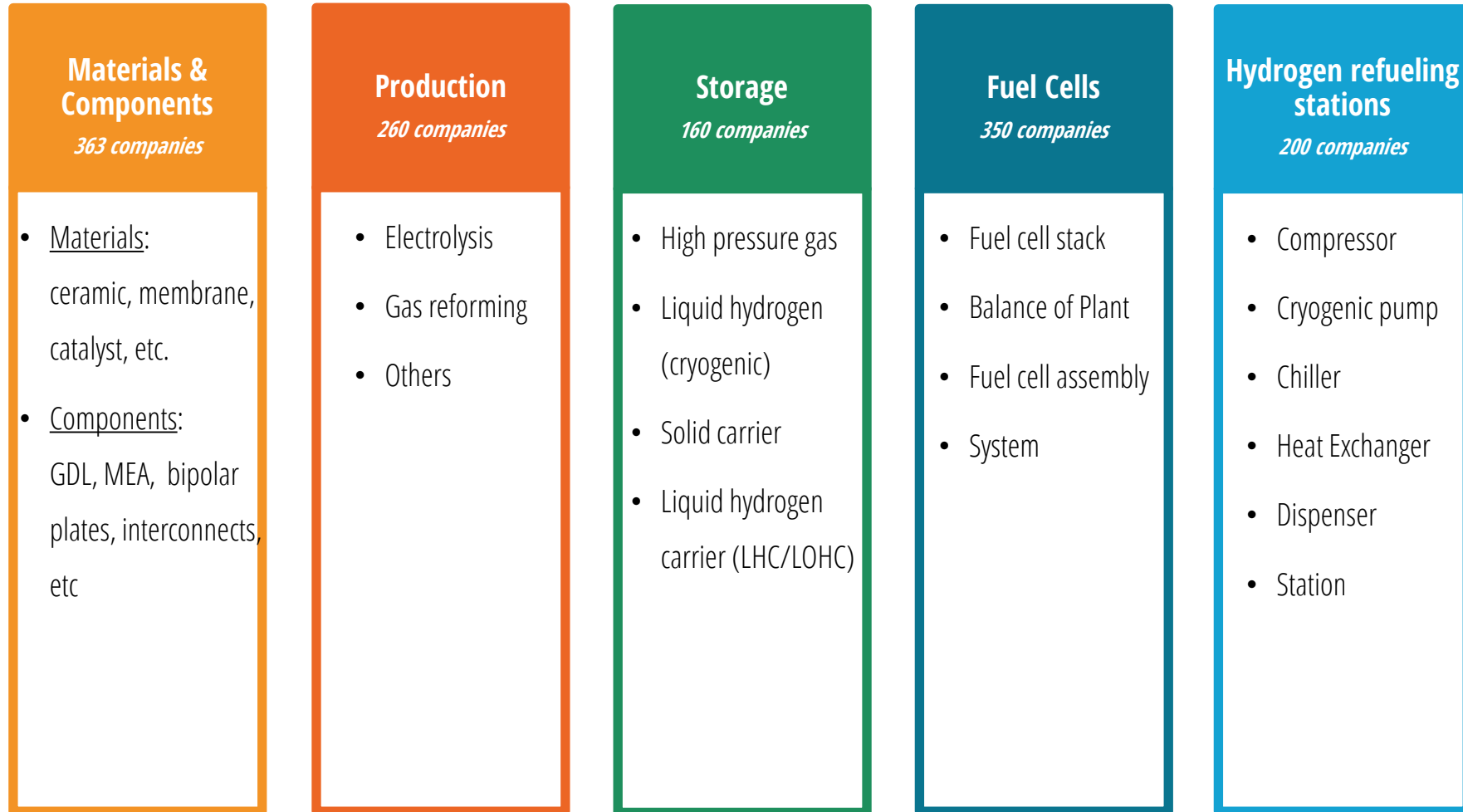
*Small: < 50 employees
Medium: 50 – 250 employees
Large: > 250 employees*

> 1 Million employees

Source: Enerdata, [Global Hydrogen Companies Database](#), November 2021

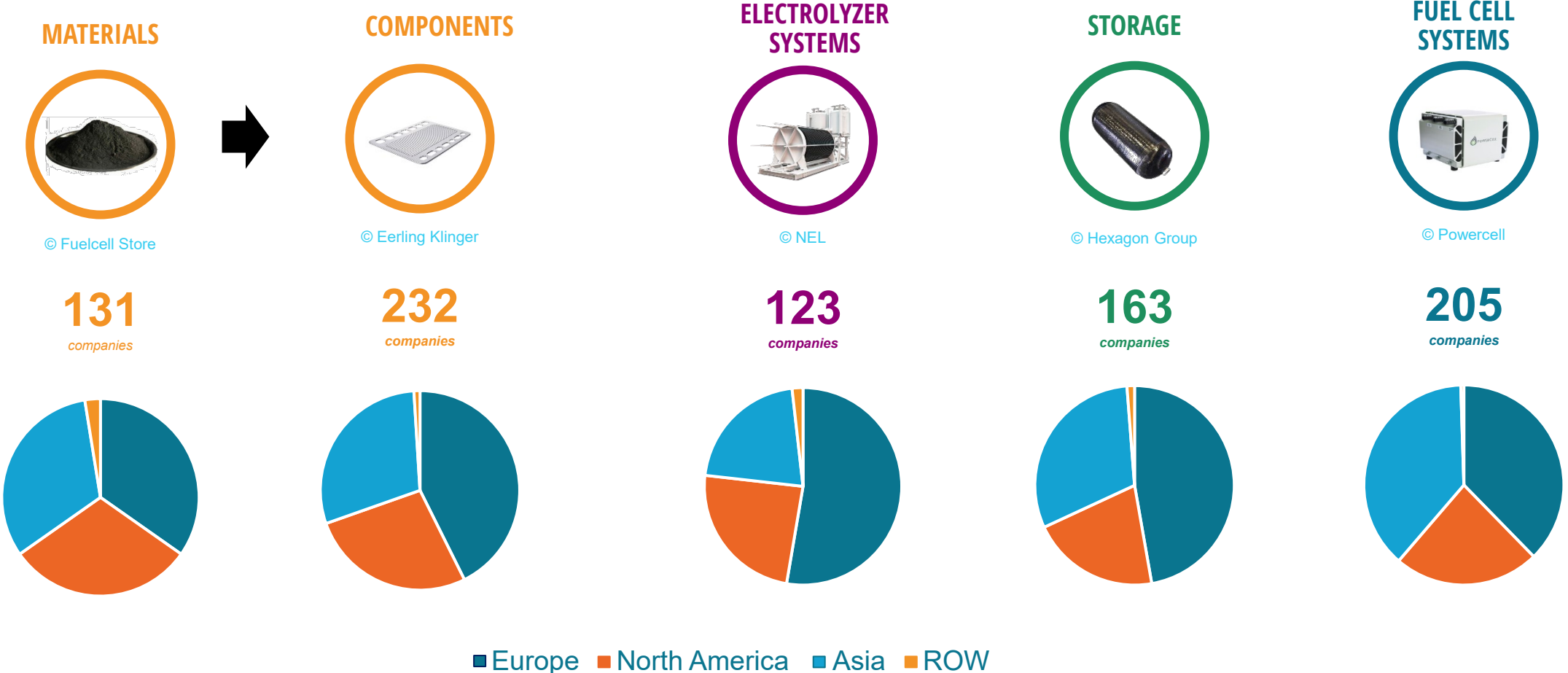
Companies globally per Value Chain step

Equipment
-
Component
-
System



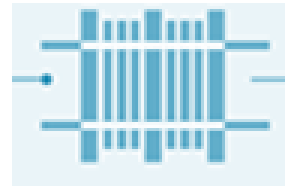
Source: Enerdata, [Global Hydrogen Companies Database](#), November 2021

Companies globally per Value Chain step & per Region



Source: Enerdata, [Global Hydrogen Companies Database](#), November 2021

Zoom on Electrolysis



- **Market**

- **< 300 MW of capacity deployed in 2020 worldwide**

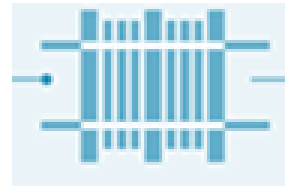
- **Multiple GW of projects under development driven by regional & national strategies.**

“at least 40 GW of renewable hydrogen electrolyzers by 2030 for Europe” (European Commission, 2020)

“65 GW of renewable H2 to reach cost competitiveness vs. fossil” (Hydrogen Council)

“850 GW of electrolyser capacity worldwide by 2030 for 150 M.t of low carbon H2” (IEA, NZE scenario)

Electrolysers leaders



- Leading technologies by installed capacity

1. Alkaline
2. PEM
3. SOEC

- Companies by planned prod. investment

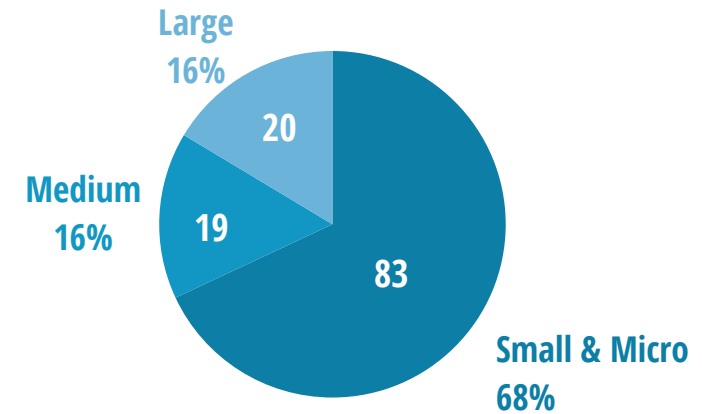
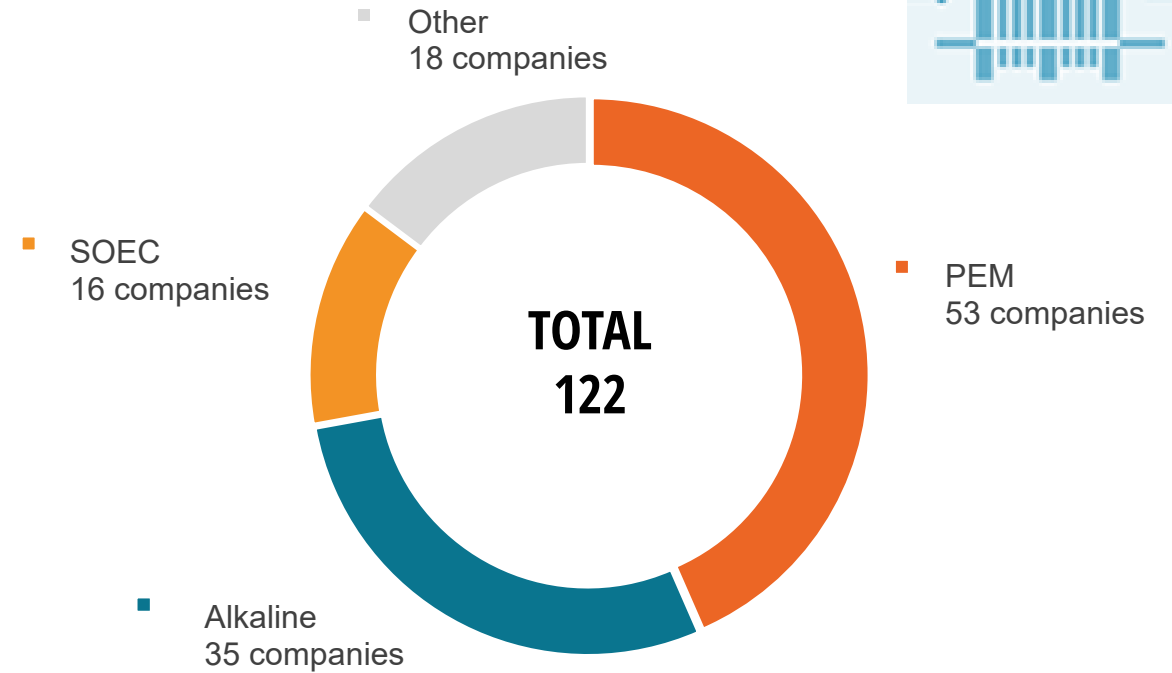
Alkaline

PEM

SOEC



etc.



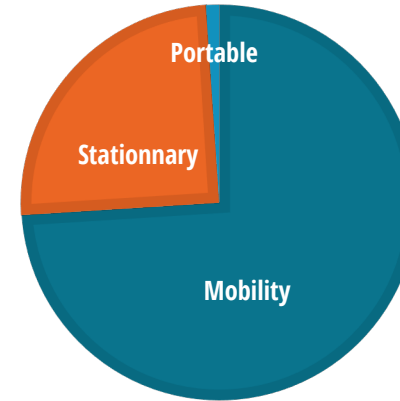
Zoom on Fuel Cells



- **Market**

- **1,3 GW capacity shipped at end 2020 ***

- ~ 1GW for mobility
- ~ 0,25GW for stationary
- < 1% for portable



- **Several 100s of MW/year expected for coming years:**



“Hyundai intends to produce 2 000 fuelcell-powered trucks in 2021”



“Alstom Group started in 2021 mass production of fuelcell-powered Train with 41 orders in”

Fuel Cells leaders



- Leading technologies by installed capacity:

1. PEM
2. SOFC
3. DMFC

- Companies by planned prod. investment:

PEM

SOFC

BALLARD

WEICHAI



Bloomenergy

HYUNDAI

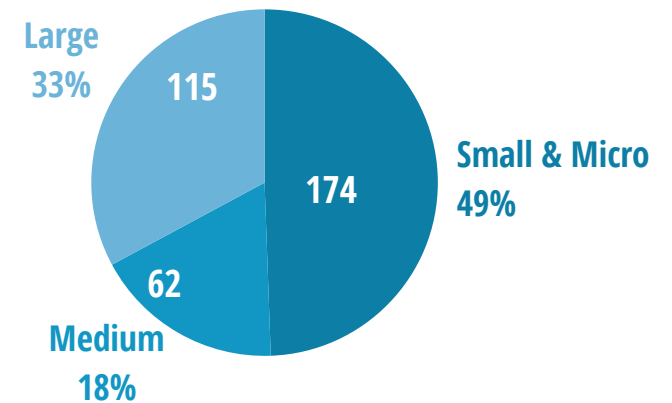
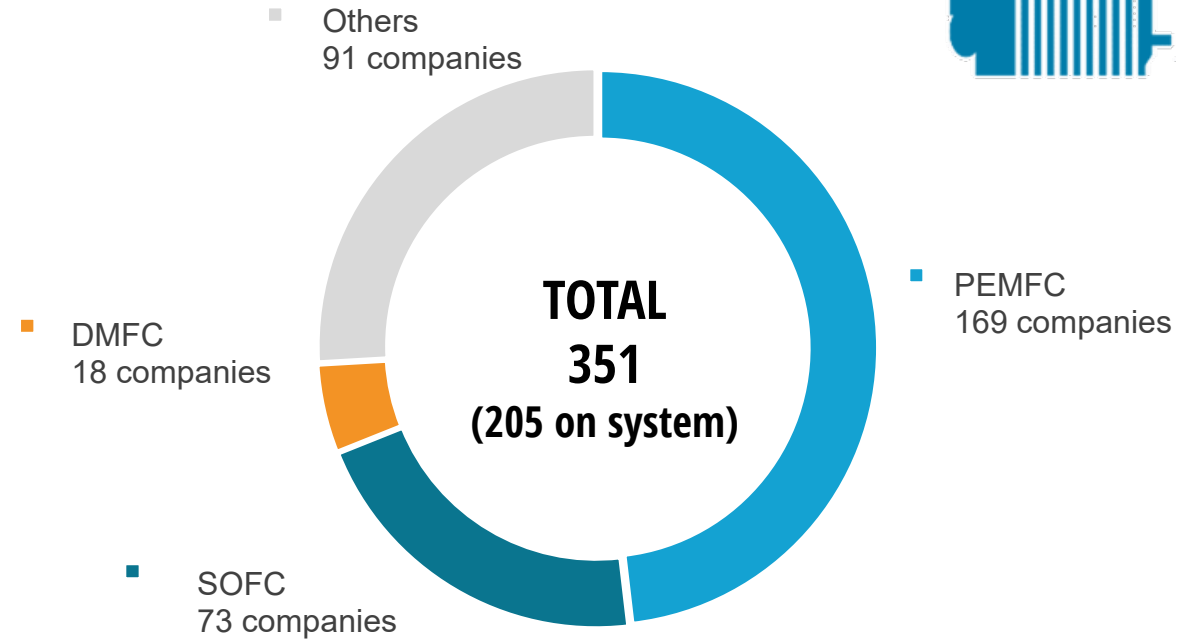


BOSCH

SYMBIO
A FAURECIA MICHELIN HYDROGEN COMPANY

GM 先特

etc.



Enerdata's offer on Hydrogen



• Global Hydrogen Companies Database

- Full hydrogen database with the latest update
- New release every 6 months
- **Worldwide coverage:** over **970 companies** located in 39 countries
- **Coverage of all the value chain:** from H₂ production to storage to fuel cell manufacturing and includes all major technologies
- Information on **each company's fields of activity**
- Specific details on these companies: size, targeted markets, etc.

• Custom consulting

- **Market Research**
- **Actors Mapping & Benchmarking**
- **Due Diligence**

DATABASE CONTENT

- Fact sheet
- Company activity
- Systems addressed
 - Fuel cell
 - Electrolyser
 - Storage
 - Hydrogen fuelling station
- Fuel cell targeted markets

HELPING YOU SHAPE THE ENERGY TRANSITION

About Enerdata:

Enerdata is an independent research company established in 1991, specializing in the analysis and forecasting of energy and climate issues, at world and country level.

Leveraging our globally recognised databases, intelligence systems and models, we assist our clients in designing their policies, strategies and business plans.

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Thank you for your attention!

<https://www.enerdata.net/>