



Geopolitics of Hydrogen in Europe: Strategies and Interests in Key Member States

Dr. Rainer Quitzow

Presentation at "60Minuten3Themen", 26.5.2023

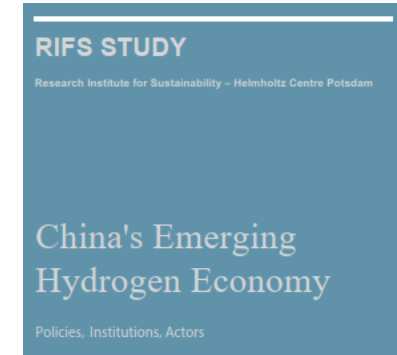
Geopolitics of the Energy Transformation: Implications of an International Hydrogen Economy (GET Hydrogen)



Globale H2-Potenzialatlas (HYPAT)



<https://www.hypat.de>



New Political Economy

ISSN: (Print) (Online) journal homepage: <https://www.tandfonline.com/loi/cnpe20>

The EU as catalytic state? Rethinking European climate and energy governance

Andrea Prontera & Rainer Quitzow



Auf dem Weg zur Klimaneutralität – Neustrukturierung industrieller Wertschöpfungsketten
Ergebnisse und Impulse aus einer Workshopreihe



Targeted hydrogen supply by
2030 (REPowerEU)

**10 million tonnes of
domestic supply**

**10 million tonnes of
imports**

Projected share of the energy mix
in Europe by 2050

13 – 14 %

Source: EU Hydrogen Strategy

What's at stake?

Announced investments in Europe
through 2023

USD 117 billion
**(35% of global
investments)**

Announced electrolyzer capacity
in Europe through 2023

80 GW
**(34% of global
capacity)**

Source: Hydrogen Council/McKinsey (2023) Hydrogen Insights 2023

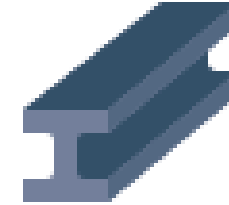
What's at stake?

Announced investments in Europe
through 2023

USD 117 billion
**(35% of global
investments)**

Announced electrolyzer in Europe
capacity through 2023

80 GW
**(34% of global
capacity)**



European steel sector

- 16% of global production in 2021
- €23,4 billion in value added
- 308,000 jobs with 60% in DE (27%), IT (10%), FR (8%), PL (8%), Romania (7%)
- 190 million tonnes of carbon dioxide (CO₂) equivalent in 2020 or 5% of emissions in the EU

Source: EUROFER

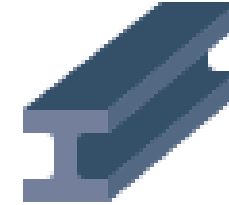
Source: Hydrogen Council/McKinsey (2023) Hydrogen Insights 2023



European chemical sector

- 15% of global production in 2021
- €594 billion in sales with two thirds in DE (29%), FR (17%), IT (10%), NL (10%)
- 1,2 million jobs
- 120 million tonnes of carbon dioxide (CO₂) equivalent in 2020 or 4% of emissions in the EU

Source: cefic

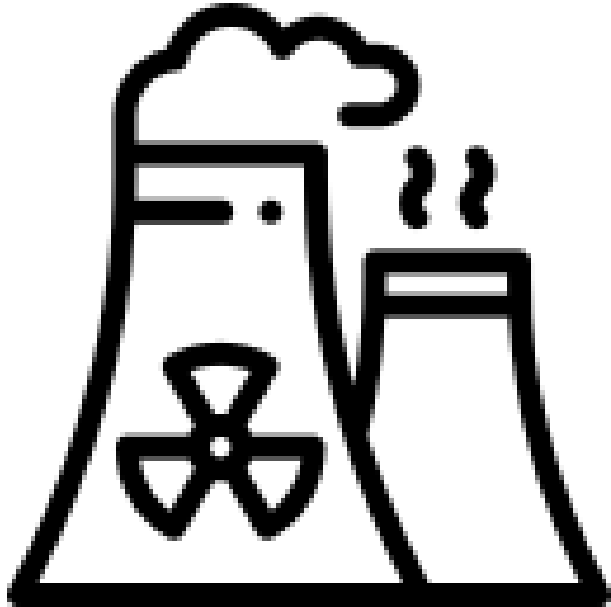


European steel sector

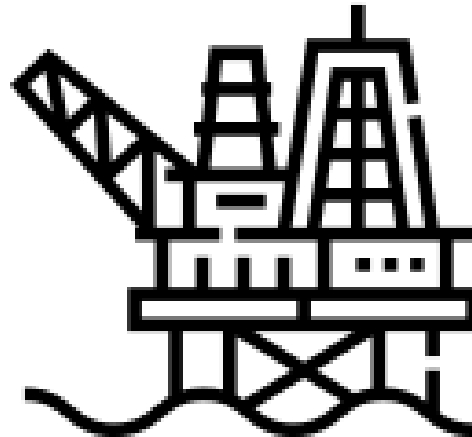
- 16% of global production in 2021
- €23,4 billion in value added
- 308,000 jobs with 60% in DE (27%), IT (10%), FR (8%), PL (8%), Romania (7%)
- 190 million tonnes of carbon dioxide (CO₂) equivalent in 2020 or 5% of emissions in the EU

Source: EUROFER

What's at stake?



Nuclear



Gas + CCS

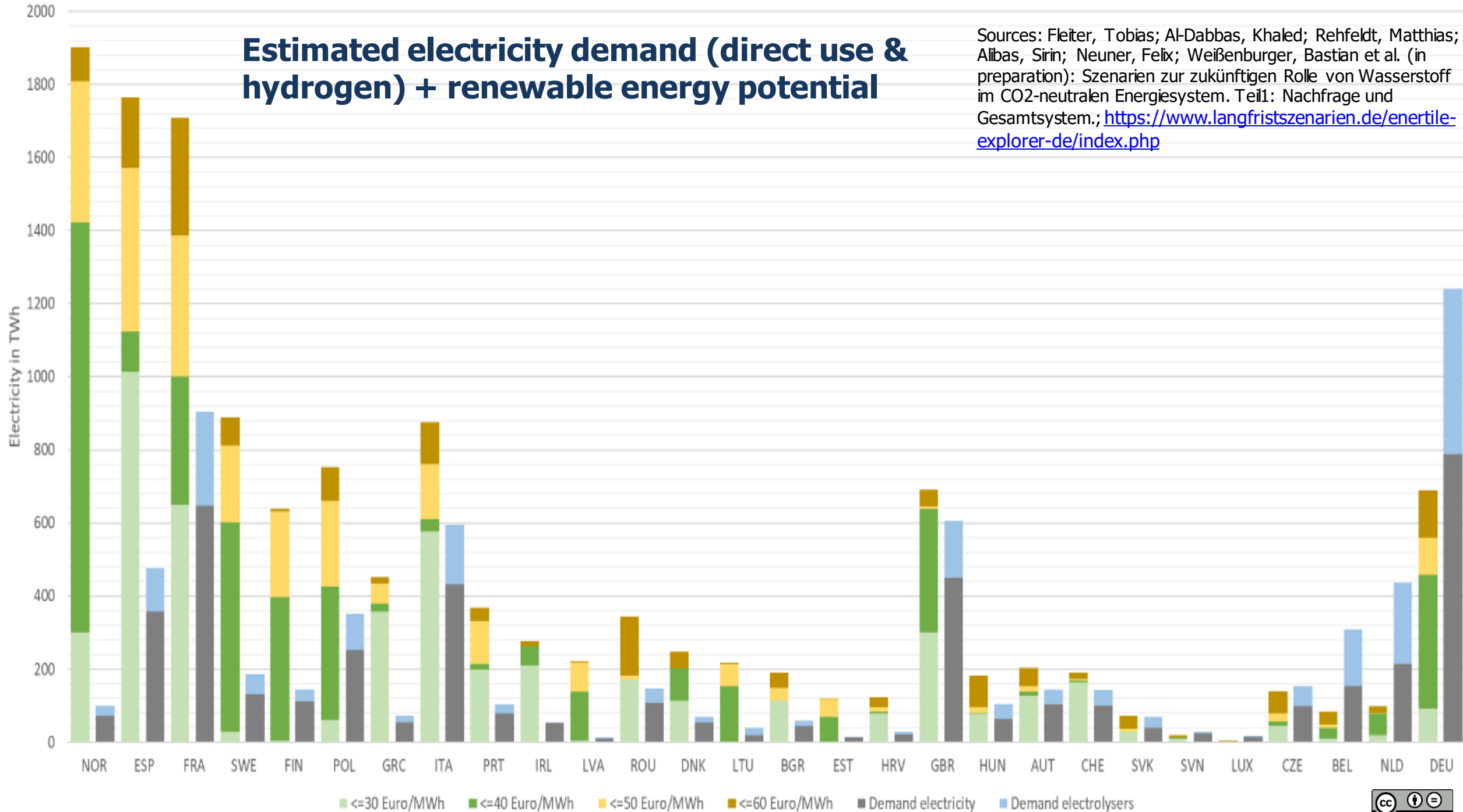


Renewables



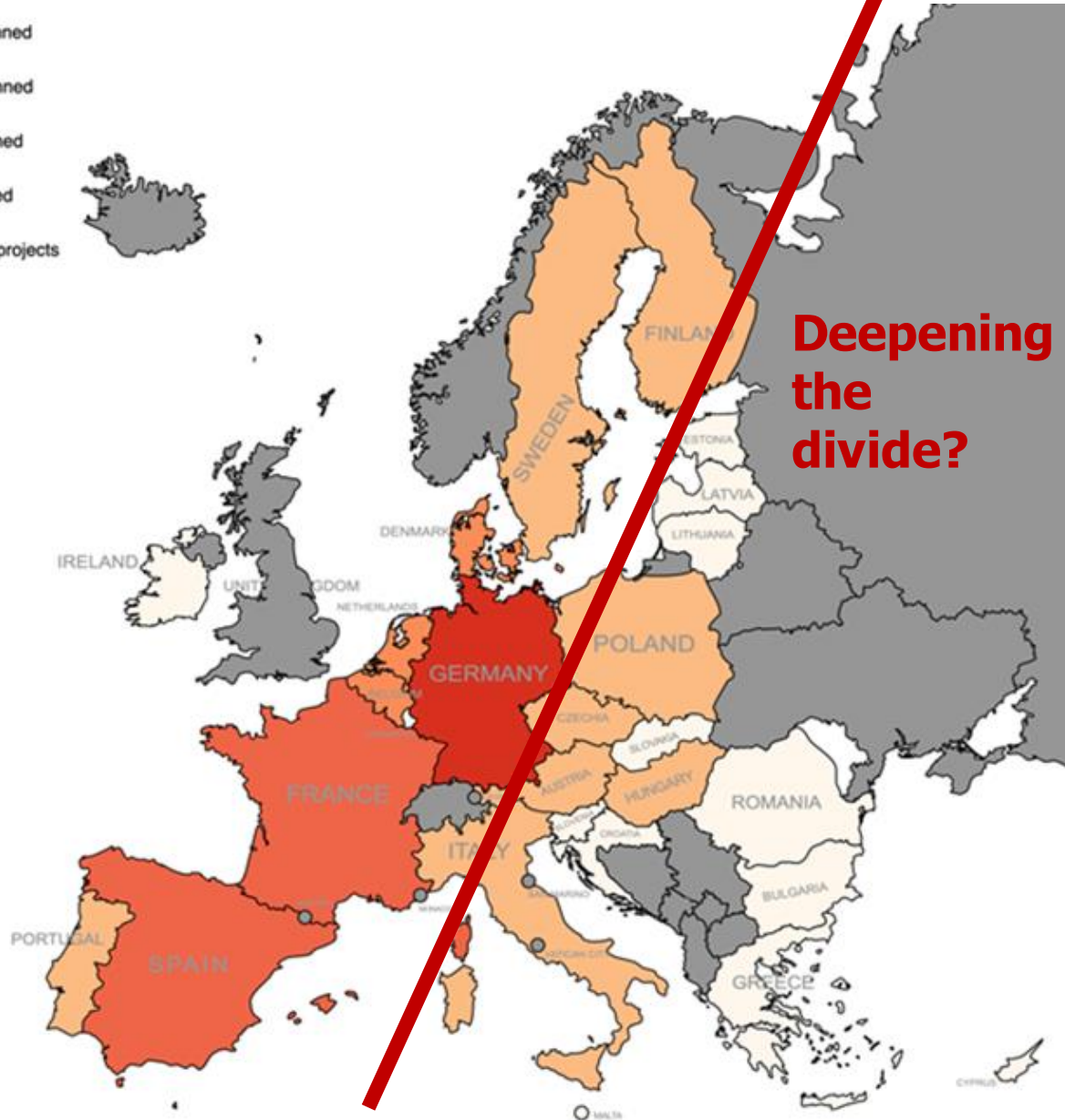
Estimated electricity demand (direct use & hydrogen) + renewable energy potential

Sources: Fleiter, Tobias; Al-Dabbas, Khaled; Rehfeldt, Matthias; Alibas, Sirin; Neuner, Felix; Weißenburger, Bastian et al. (in preparation): Szenarien zur zukünftigen Rolle von Wasserstoff im CO₂-neutralen Energiesystem. Teil1: Nachfrage und Gesamtsystem.; <https://www.langfristszenarien.de/enertile-explorer-de/index.php>



Ongoing hydrogen projects by country (final investment decision or under construction, IEA Database)

- Over 20 green H2 planned projects
- 10 to 15 green H2 planned projects
- 5 to 10 green H2 planned projects
- 1 to 5 green H2 planned projects
- No green H2 planned projects



Capacities by country (FID, under construction)

Sweden	1320,0
Germany	1149,4
Spain	561,0
Netherlands	211,6
France	134,3
Denmark	106,0
Belgium	76,0
Finland	40,0
Austria	39,1
Poland	5,0
Portugal	4,8
Italy	4,1
Hungary	2,5
Czechia	0,7



Interest in EU trade - high



Interest in global trade - low

Interest in global trade - high



- Germany and Spain are aligned in their support for European hydrogen trade
- Germany, Netherlands and Italy strongly support global trade
- France is isolated in its strongly skeptic stance towards hydrogen trade

Interest in EU trade - low

Support for nuclear H2 - high



Support for blue hydrogen - high



Support for blue hydrogen - low

- Germany and Spain are aligned in their strong support for renewable hydrogen
- Most countries – except Spain – either support or tolerate blue hydrogen
- European countries are divided on nuclear hydrogen

Support for nuclear H2- low



The elephant in the room



Contact



Prof. Dr. Rainer Quitzow
Research Group Leader
Geopolitics of Transitions in Energy and Industry

rainer.quitzow@rifs-potsdam.de

Research Institute for Sustainability (RIFS Potsdam)

Helmholtz Centre Potsdam

Berliner Straße 130

D – 14467 Potsdam

Web: www.rifs-potsdam.de