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EU-Kazakhstan Green Hydrogen Partnership:

Mapping Barriers and Establishing a Roadmap

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Layout

1. Context

- Kazakhstan's energy mix
- Trade with the EU
- Hydrogen economy: from grey to green?

2. Challenges

- Lack of incentives to decarbonise the economy
- Lack of local R&D&D and transport infrastructure
- No H2 without H2O

3. Policy Recommendations

- Regional cooperation
- An EU–Kazakhstan Hydrogen Incubator
- Explore infrastructure options

4. Discussion with Jury & Participants

1. Context

Context

Kazakhstan: Energy and Trade

- A deeply energy- and CO₂- intensive economy (95% of domestic energy production comes from hydrocarbons)
- Largest renewable energy potential in Central Asia
- Central Asia's pioneer in developing renewables since 2013 (4.53% share in the power mix in 2022)
- Limited natural gas availability for H₂ production
- The EU is Kazakhstan's biggest trade partner
- 39% of Kazakhstan's exports went to the EU (2021); most exports are energy and carbon-intensive
- CBAM to have an impact as of 2026

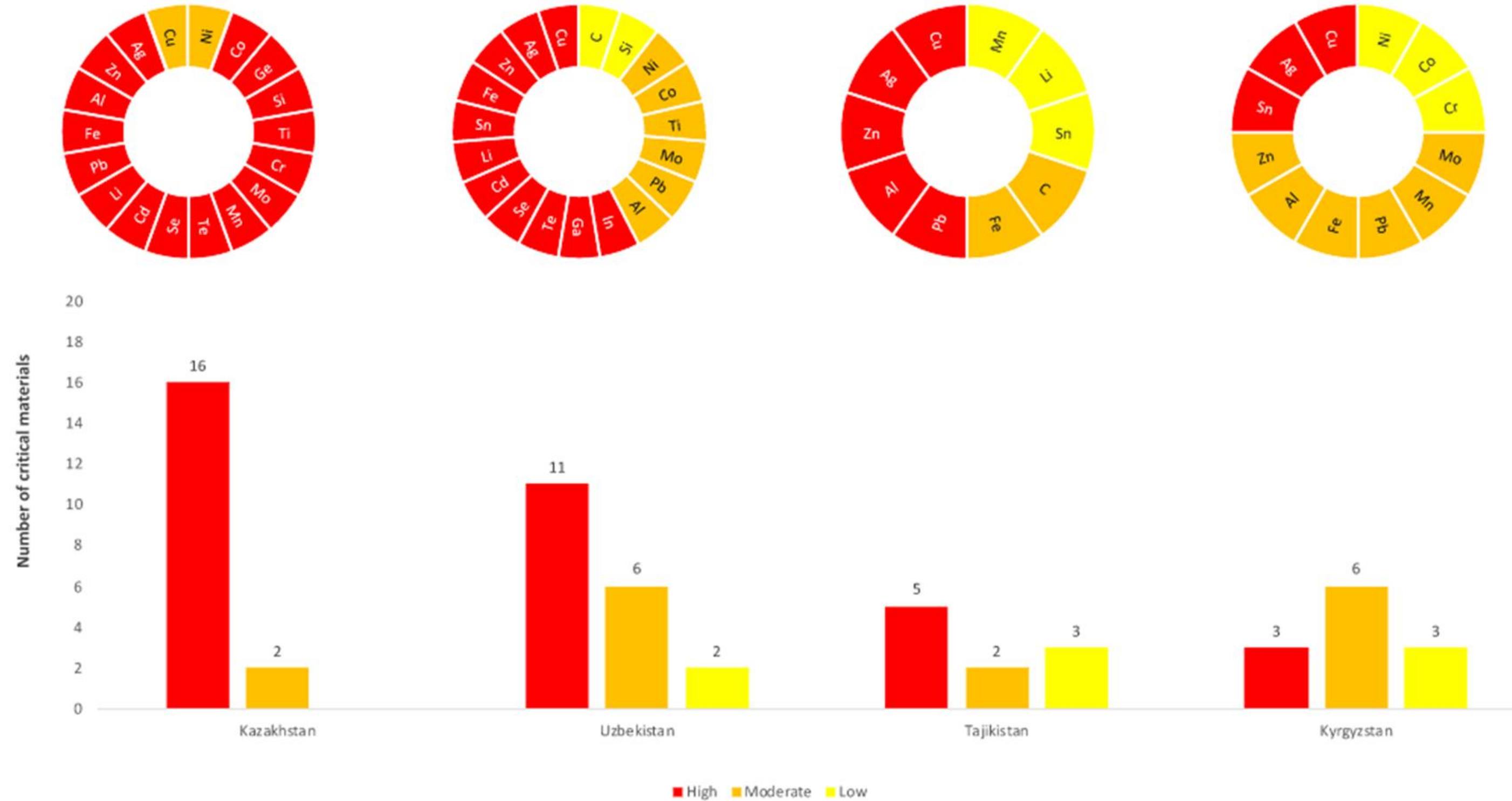


Figure 1. Resource potential of 22 critical materials in Central Asia

This figure shows the geological potential of each critical material by country in Central Asia. The critical materials not included here require further geological exploration. Classification according to Taylor and Steven.⁶¹ Source of data: Vakulchuk and Overland.⁵⁹

Context

Hydrogen Economy: from Grey to Green?

- Unabated hydrogen mainly used in refineries and fertiliser production
- Large-scale **Svevind's HyrasiaOne** project focusing both on exports and future domestic demand (40GW capacity planned)
- Very few small-scale pilot H2 projects (e.g. Green Spark Ltd's green H2 for mobility project)
- Fortescue Future Industries has abandoned initial plans for a large H2 project in KZ

2. Challenges

Challenges

Lack of domestic demand for green hydrogen & obstacles to investments

- Low CO2 price (1.2 EUR in May 2023)
- No regional common certification standards for hydrogen
- Unfavourable investment climate

Lack of local R&D&D and transport infrastructure

- Lack of knowledge about green hydrogen technologies or potential uses
- Hydrogen infrastructure missing; Russian route no longer feasible
- R&D&D very limited; few H2 pilot projects

Challenges

No H₂ without H₂O

- Water scarcity in the southern and western regions – population heavily relies on irrigation for agriculture.
- The Aral Sea crisis and a potential 9–to–18 meters reduction of Caspian Sea levels.
- Population growth, expanding industrial activities, and agricultural demands place additional strain on water security.



3. Policy Recommendations

Policy Recommendations

Regional cooperation in Central Asia +

- A regional green hub based on a sectorial approach. The EU can promote a cooperative model with a focus on green industrial development
- EU-aligned green hydrogen certification rules in the region. Levelling the playing field would allow increased investment opportunities on the part of international actors and increased green exports in the future
- Water security. (1) Mapping of water availability, (2) locating specific sectorial and geographical water needs, (3) promoting desalination of water from the Caspian Sea as a co-benefit for local communities, (4) implementing strict environmental requirements for brine disposal

Policy Recommendations

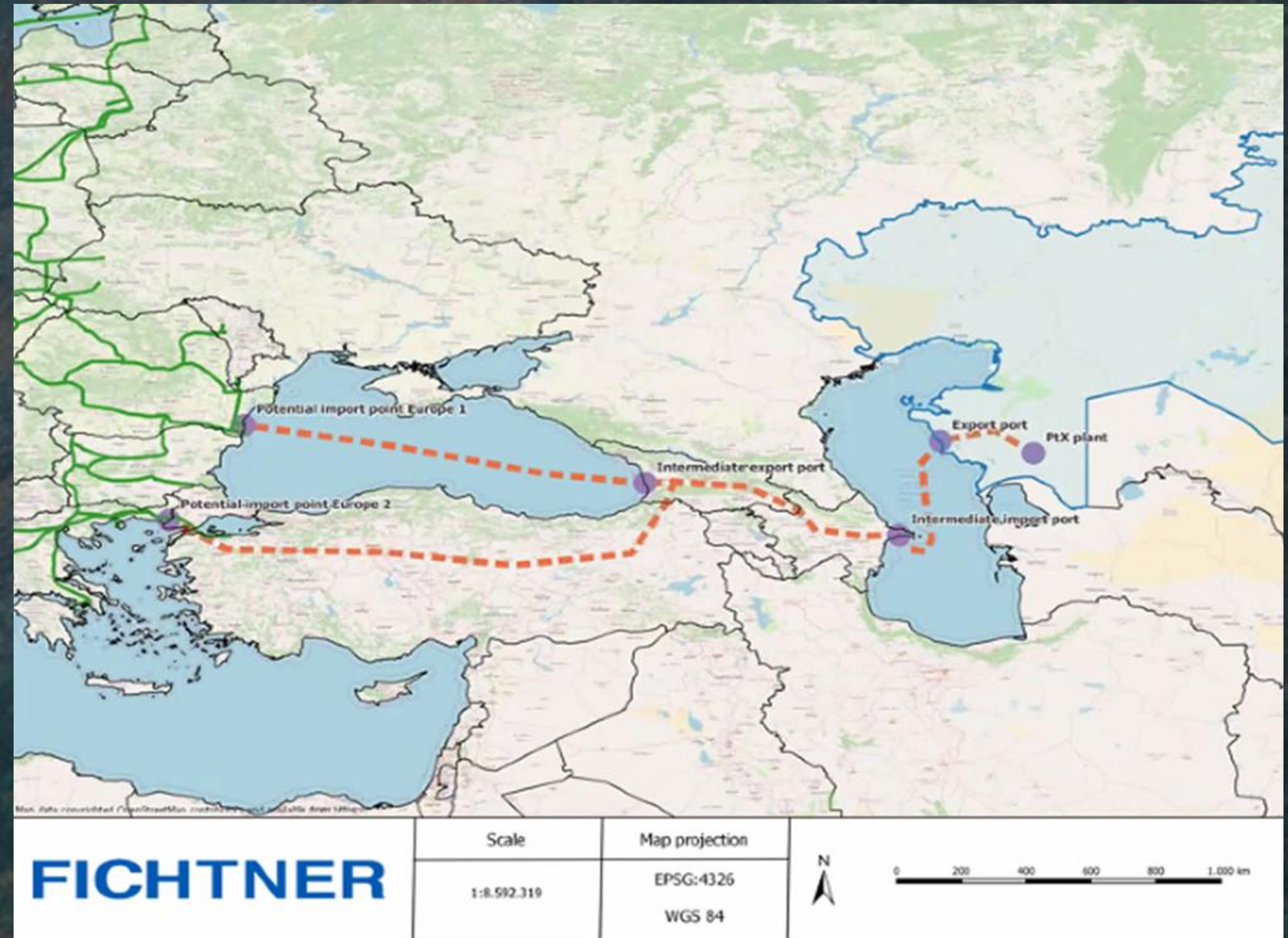
An EU-Kazakhstan Hydrogen Incubator

- Mobilising public and private finance to de-risk investment in hydrogen production and use (e.g. through EFSD+, Global Gateway)
 - Technical assistance
 - Pilot projects
- Promoting R&D&D on hydrogen in Kazakhstan (e.g. in cooperation with Horizon Europe)
- **Knowledge-sharing, education programmes and capacity building** to contribute to the country's green industrial development, regulatory reform, and export potential.

Policy Recommendations

Explore infrastructure options

- Feasibility study on hydrogen transport infrastructure from Central Asia to Europe through the trans-Caspian Middle Corridor
- Pipelines versus multimodal routes



Thank you!

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