

NEA Activities on Non-Electric and Hybrid Applications

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Nuclear Technology Development and
Economics (NTE)

Outline

- NEA activities on hydrogen from nuclear energy
 - REPORT: Role of Nuclear Power in the Hydrogen Economy
 - H2-VAL Working Group
- NEA Industrial Case Studies for SMR Markets
 - Mining
 - Coal replacement
 - District energy
 - Industrial cogeneration

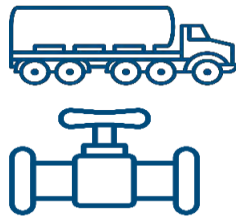
NEA activities on hydrogen from nuclear energy

Role of Nuclear Power in the Hydrogen Economy

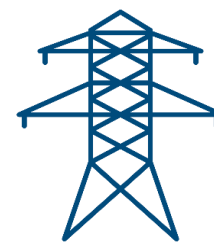
- *The Role of Nuclear Power in the Hydrogen Economy* report published in September 2022.
- Understanding the competitiveness of hydrogen produced from Nuclear:
 - I. Plant-level analysis
 - II. Value Chain analysis
 - III. System level analysis



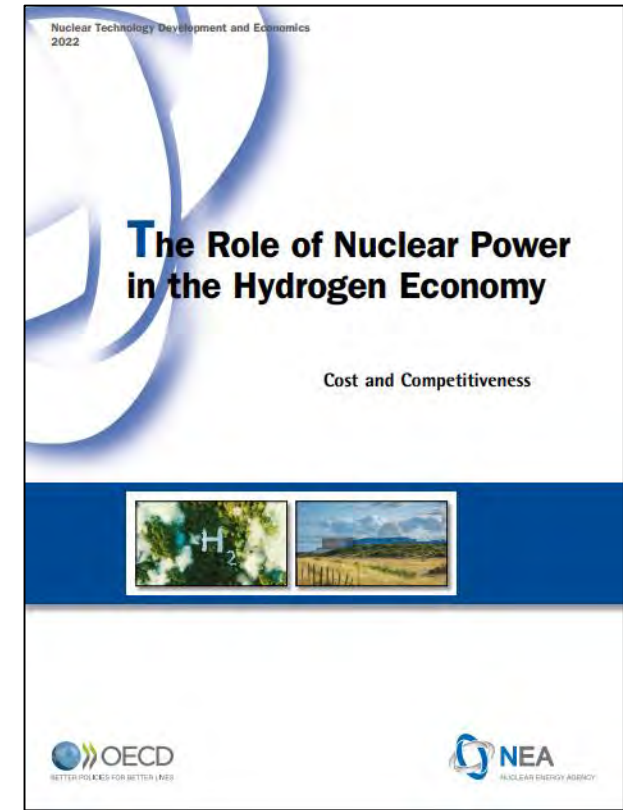
I. Hydrogen Production



II. Hydrogen Delivery



III. Hydrogen Integration



NEA Working Group on Hydrogen Value Chain (H2-VAL)

1st H2-VAL WG Meeting on 9-10 April 2024 at Paris, France, OECD Boulogne-Billancourt

- Chair: Julie Mougin, CEA, France
- Co-Chair: Todd Knighton, INL, USA

Participation from 10 NEA member countries
with 5 international organizations represented



Main objectives from the
2-day H2-VAL WG meeting:

- Take stock of capabilities (including modelling capabilities), expertise, and domestic interests
- Discuss the scope for case studies on the value chain of hydrogen produced from nuclear energy to support:
 - Ammonia
 - Synfuels (methanol)
- Explore areas of collaboration with:
 - Generation IV International Forum (GIF)
 - IEA Hydrogen from Nuclear Energy Task 44
 - IAEA activities on non-electric applications

NEA Industrial Case Studies for SMR Markets

NEA Industrial Case Studies for SMR Markets



1. Remote Mining

(in publication process)



2. Coal replacement

(final revisions)



3. District energy

(under development)



4. Industrial cogeneration

(under development)

The choice of industrial case studies is based on the markets that are viewed as the most near-term for SMR deployment

These also represent sectors that have been identified as **“hard to abate”** in leading decarbonization pathways

1. Mining industrial case study

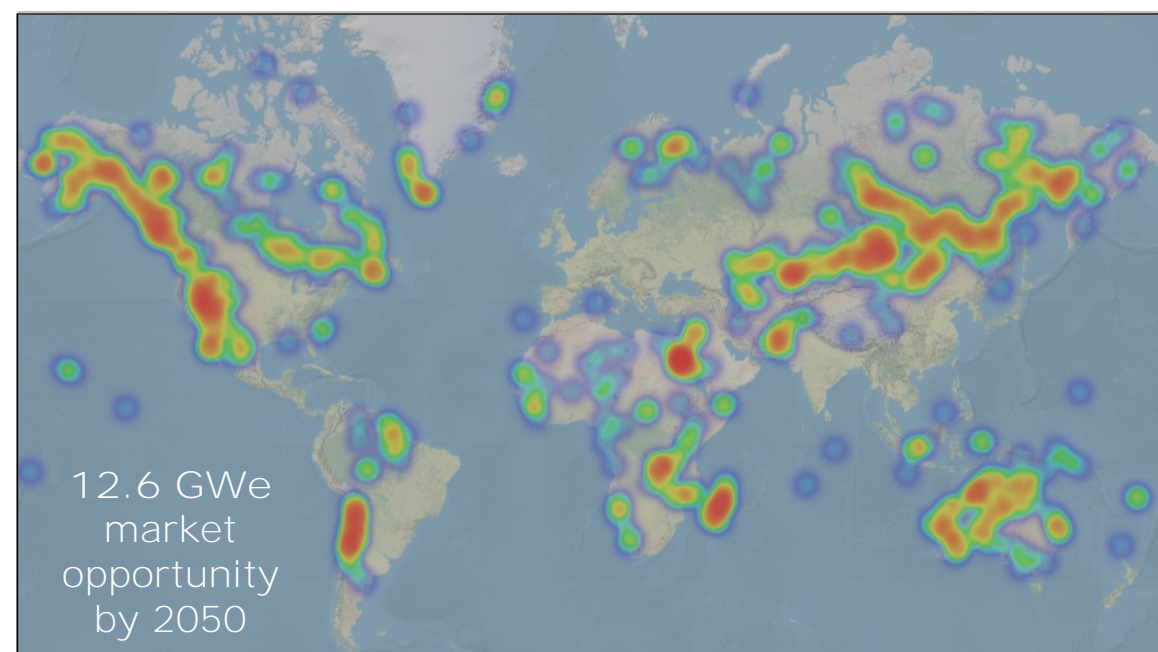
Market size assessment for remote mining

- Existing mines and mineral deposits more than 20kms from an electricity grid were **determined to be “remote”**.
- A **“representative” remote mine determined to have installed thermal generating capacity of 16.3 MWe** and a lifetime of 16 years based on a literature review of 50 off-grid mining projects.

Existing brownfield remote mines

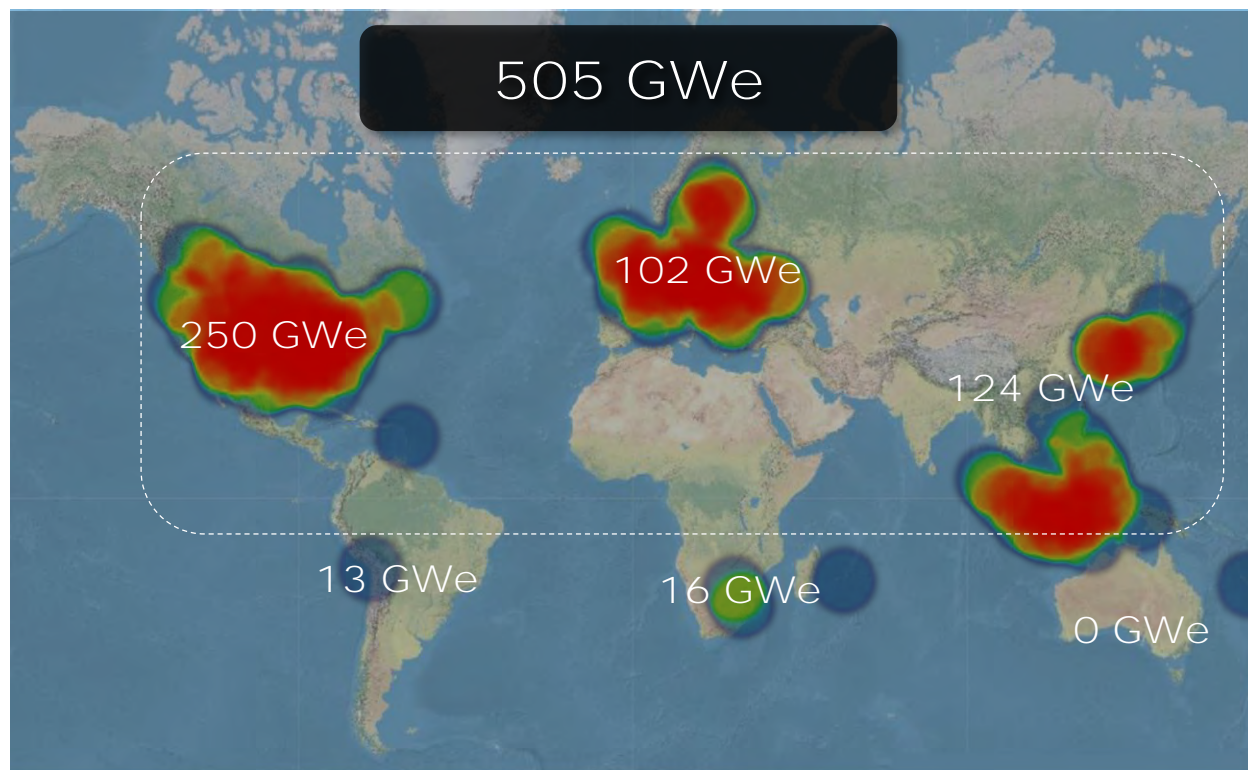


Future greenfield remote mine sites



2. Coal replacement industrial case study

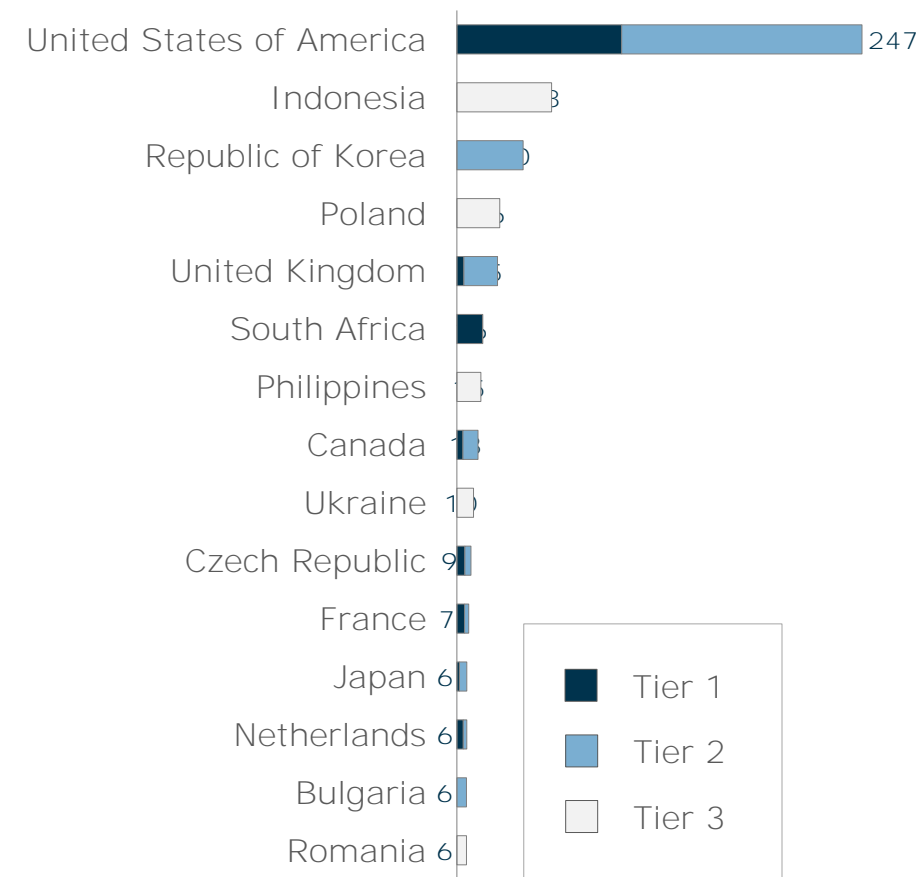
Total Preliminary Market Estimate for Coal Replacement



High concentration with 10 countries
representing 90% of the market

75% of market could be seized in the by 2040

Potential Market by Country (Top 15) in GWe



Source: NEA analysis based on [Global Coal Plant Tracker](#)

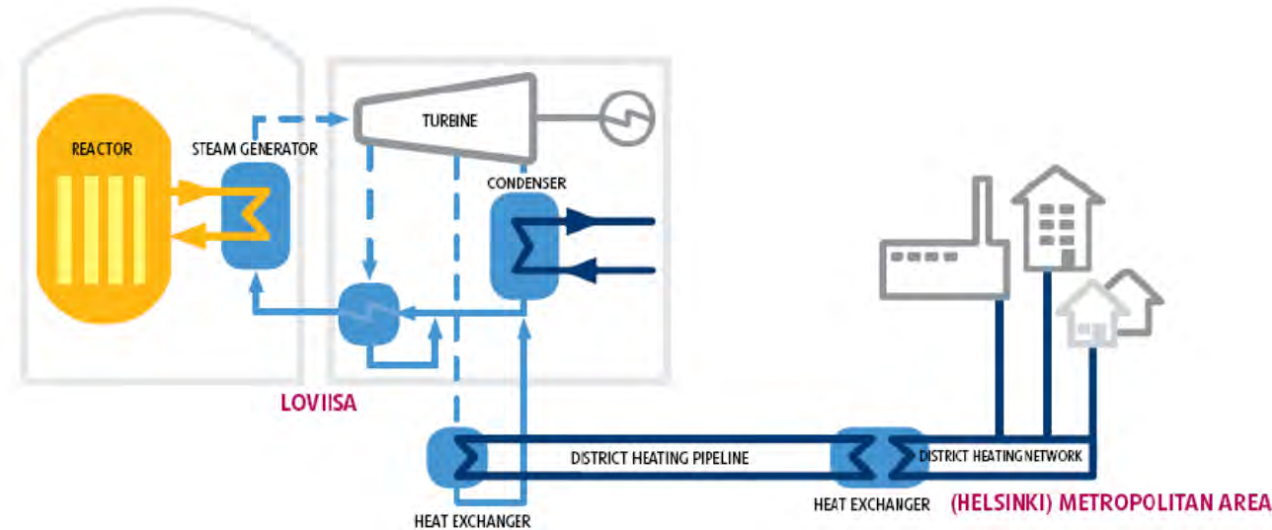
3. District energy industrial case study

Scope

- Opportunity for SMRs to replace fossil fuels in existing and future district energy applications, including market size, drivers, and technical considerations.

Status

- Existing market data has been collected, primarily in North America and Europe



Source: Fortum, Presented at Joint NEA/IAEA Expert Workshop on the "Technical and Economic Assessment of Non-Electric Applications of Nuclear Energy" OECD Headquarters, Paris, France , 4-5 April 2013

4. Industrial cogeneration case study

Scope

- Focuses on the oil & gas, petrochemical, and chemicals sectors, including upstream and downstream activities.
- Feature end-users “stories” from industrial companies

Status

- Extensive initial engagement and data analysis ongoing



Source: Dow Chemical



Thank you for
your attention