

Jera

Energy for a New Era



JERA's Challenge for the Future of H₂ Business

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14th October, 2020

JERA's Profile

- ✓ JERA was founded in April 2015 by merging the fuel and thermal power generation sectors of TEPCO and CHUBU Electric Power. We now boast deep expertise in this field through its vertically integrated functions from upstream to downstream.



Upstream Development and Fuel Procurement



Gas liquefaction Base



Fuel Transportation and Trading



LNG Receiving and Storage Terminals



Domestic Power Generation

Overseas Power Generation
(including Renewables and Batteries)



JERA Zero CO₂ Emissions 2050

Taking on the challenge of zero CO₂ emissions in JERA's business both in Japan and overseas

JERA Zero CO₂ Emissions 2050

- JERA's mission is to provide cutting-edge solutions to the world's energy issues.
- In order to help achieve a sustainable society, JERA, in the course of carrying out its mission, is taking on the challenge of achieving zero CO₂ emissions* from its business both in Japan and overseas.

The Three Approaches of JERA Zero CO₂ Emissions 2050

1. Complementarity between Renewable Energy and Zero CO₂ Emission Thermal Power Generation

JERA will achieve Zero CO₂ emissions through a combination of renewable energy and zero CO₂ emission thermal power generation. The adoption of renewable energy is supported by thermal power generation capable of generating electricity regardless of natural conditions. JERA will promote the adoption of greener fuels and pursue thermal power that does not emit CO₂ during power generation.

2. Establishment of Roadmaps Suitable for Each Country and Region

Zero CO₂ emissions will be achieved by establishing roadmaps that show optimal solutions for each country and region. Since the energy situation is different for each country and region—such as the presence of regional transmission lines or pipelines and the types of renewable energy that could be adopted—JERA will work with stakeholders on a country and regional basis to establish roadmaps. We have developed a roadmap for our business in Japan and will extend this approach to other countries and regions.

3. Smart Transition

Zero CO₂ emissions will be achieved through a combination of technologies that are available and reliable at the time adoption decisions are made, lowering technical risk and smoothing the transition to a green society.

*"JERA Zero CO₂ Emissions 2050" is premised on steady advances in decarbonization technology, economic rationality, and consistency with government policy. JERA is developing its own decarbonization technologies and taking the initiative to ensure economic rationality.

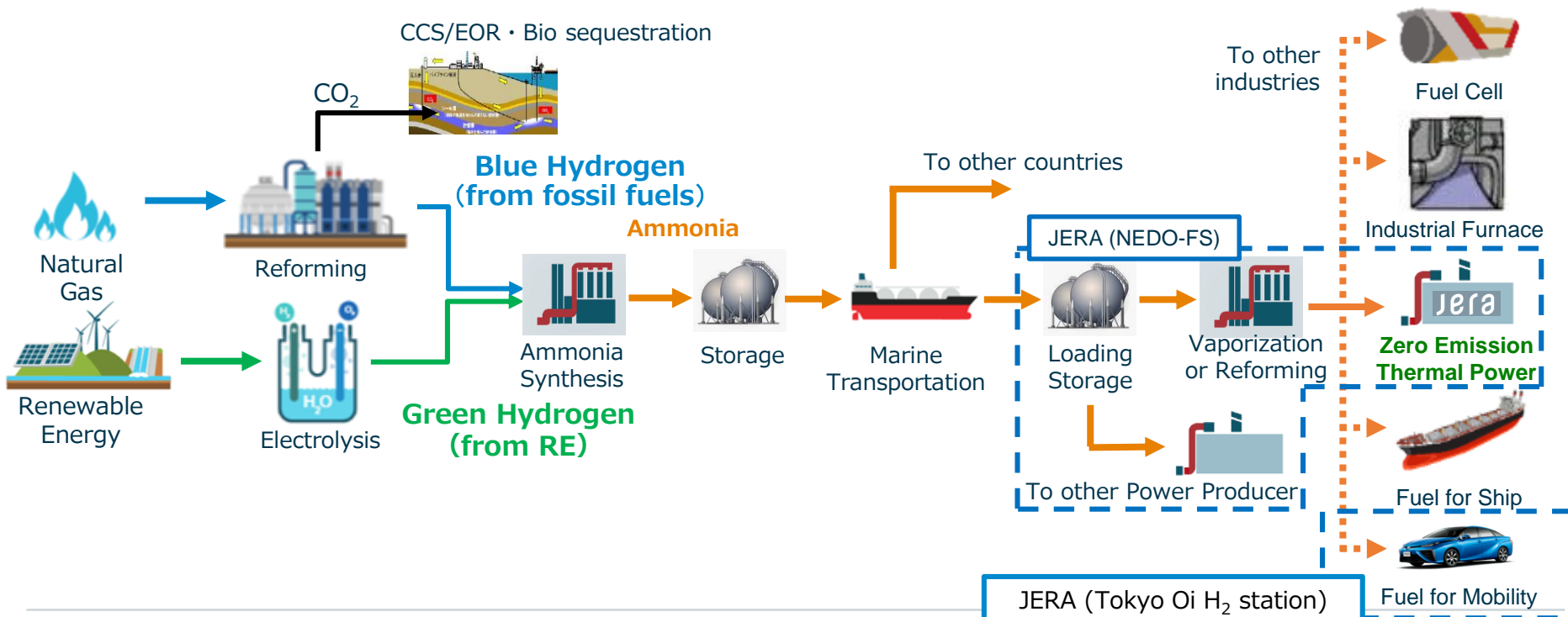
Efforts for hydrogen and ammonia

- ✓ To promote the use of hydrogen, it is important to reduce costs in the value chain, including transportation. Selecting ammonia as a hydrogen energy carrier leads to an increase in consumption and a reduction in price.
- ✓ Participation in NEDO commissioned work for ammonia co-firing in thermal power plants
- ✓ "Tokyo Oi Hydrogen Station" opened as a joint project to promote the use of hydrogen.

Upstream Development

Transportation and Storage

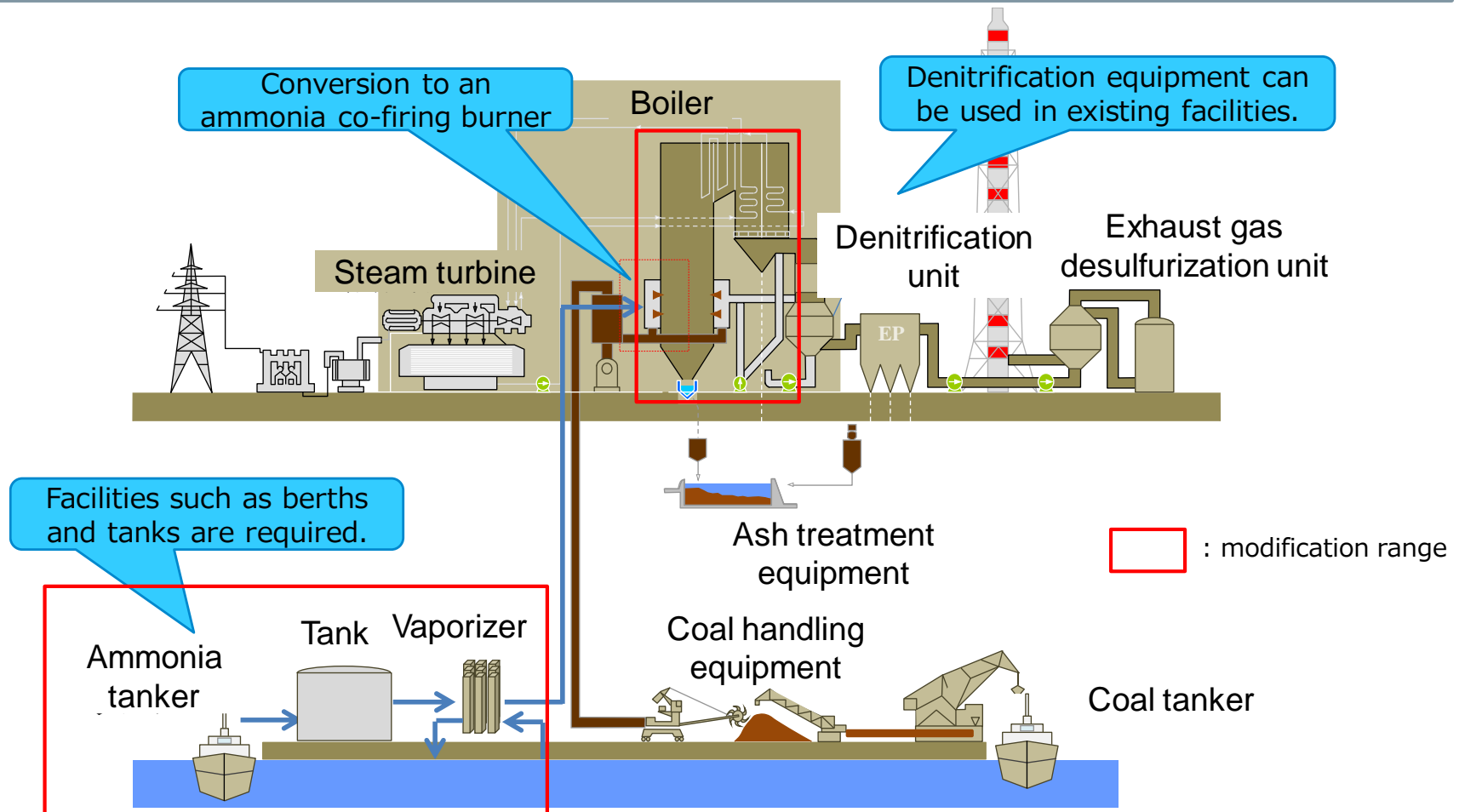
Utilization



JERA's Activities①

Ammonia co-firing at thermal power plants

- ✓ JERA, together with IHI, Marubeni, and Woodside, participated in the NEDO commissioned project "FS for mixed combustion of ammonia at commercial thermal power stations"

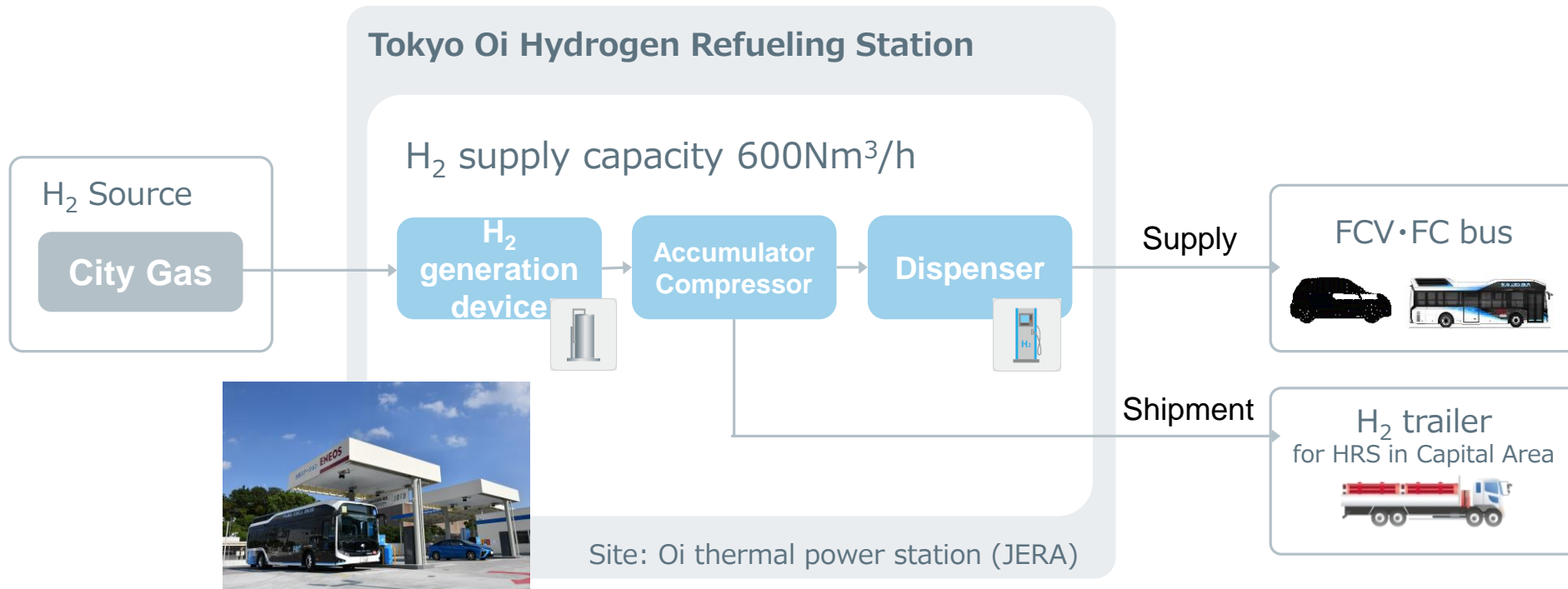


JERA's Activities ②

Market Prospects: Hydrogen for mobility fuel

- ✓ In Japan, the hydrogen market is in the early stages, driven by the use of hydrogen for mobility fuel.
- ✓ In August 2020, ENEOS Corporation and JERA opened the Tokyo Oi Hydrogen Station, a joint project to promote the use of hydrogen located on the site of the JERA-operated Oi Thermal Power Station.

【Overview of Tokyo Oi Hydrogen Refueling Station】



END

[Disclaimer]

The numbers of energy demand and supply forecast expressed or implied in this presentation are quoted from existing researches or experimentally calculated based on those. Those are NOT JERA's business plan, view, outlook, etc.

Global Potential for Future Use of Hydrogen

- ✓ Hydrogen holds long-term promise in many sectors beyond existing industrial applications. The transportation, construction, and power sectors all have the potential to use hydrogen if the costs of production and utilization prove this fuel to be competitive compared to other options.

Hydrogen potential by market in 2050, %, exajoules

Power Generation

Transport

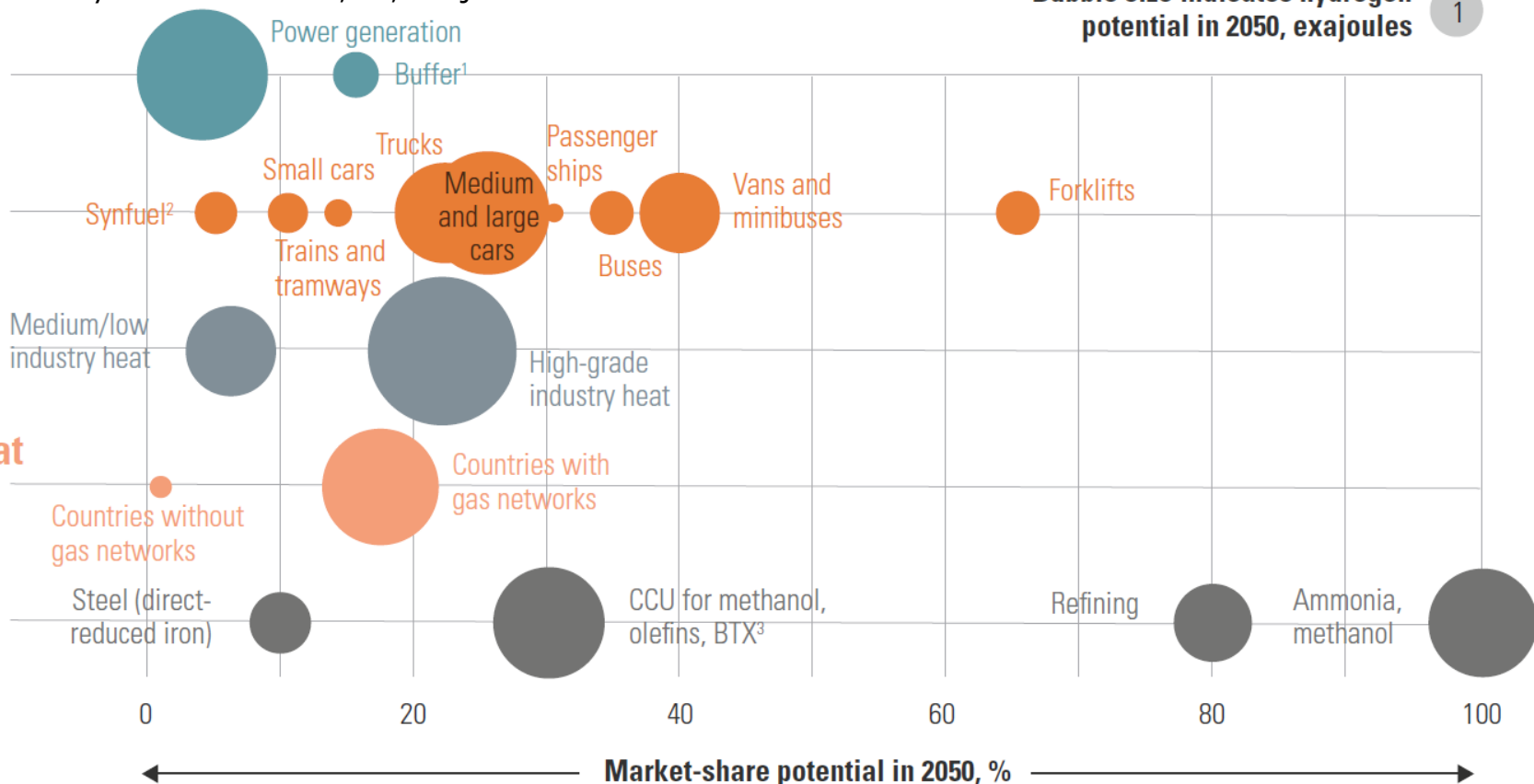
Industrial Energy

Building Heat and Power

Industry Feedstock

Bubble size indicates hydrogen potential in 2050, exajoules

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Four key opportunities for scaling up hydrogen to 2030

- ✓ Scale-up of hydrogen usage is expected in four areas/industries.

