



Seaborg

The CMSR Power Barge

NRG Conference

2022.06.09

Jonas Stampe, Head of Business



SEABORG IN A NUTSHELL



Founded in **2015**

Privately held and
privately funded company

100+ employees

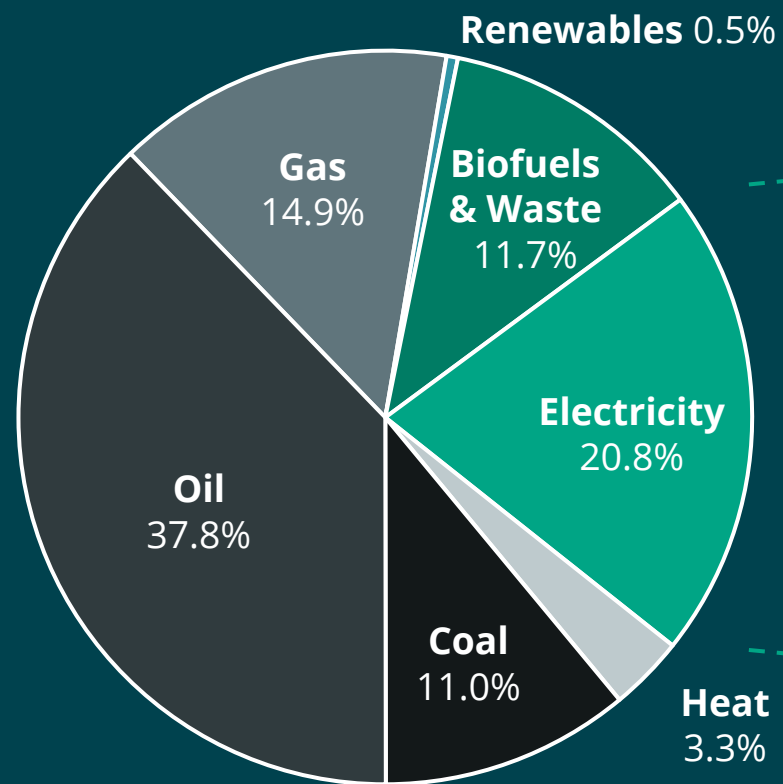
HQ in Copenhagen, Denmark

Business office in South Korea & Singapore

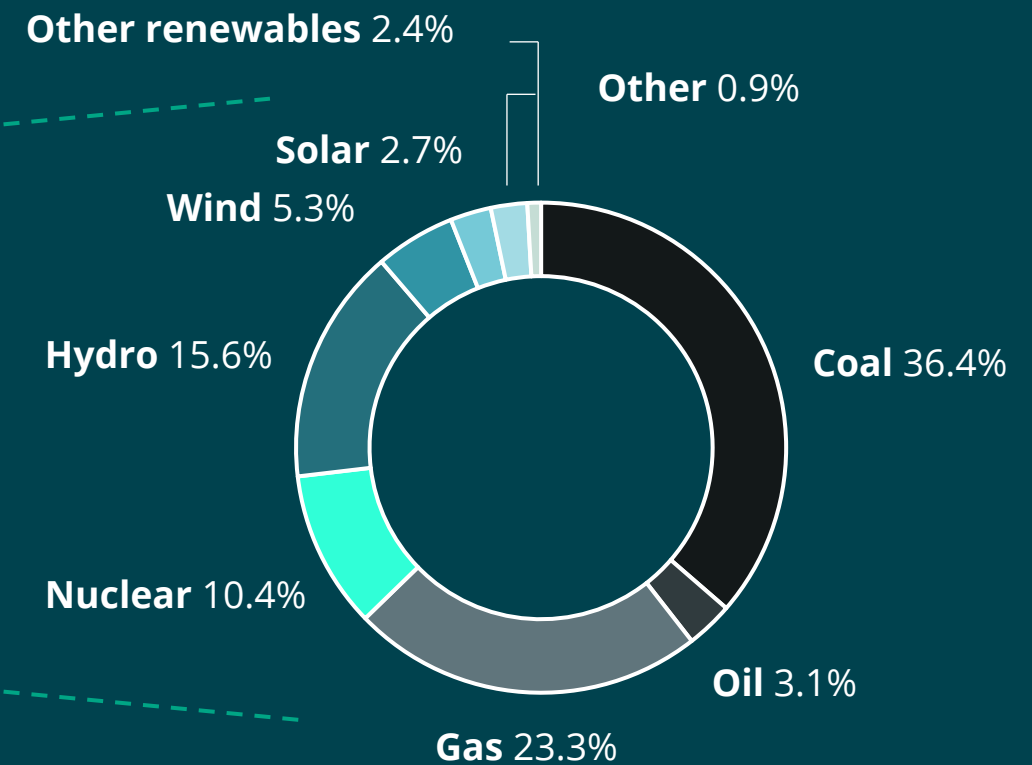
Partnerships with shipyards, nuclear
players and heavy industry

TARGETING THE GLOBAL ENERGY SECTOR

World energy consumption
63.7% from fossil fuels



Electricity by source
62.4% from fossil fuels



We will only reach our goals for **decarbonisation** if the alternative is **cheap** enough and scales **fast**.

VISION

Transform energy markets and **out-compete fossil fuels** to create a bright future with abundant clean energy for everyone.

UNPRECEDENTED OPPORTUNITY

Executing a rapid **world-wide deployment** of the Compact Molten Salt Reactor via **shipyard serial production** of power barges.



SAFE AND SECURE

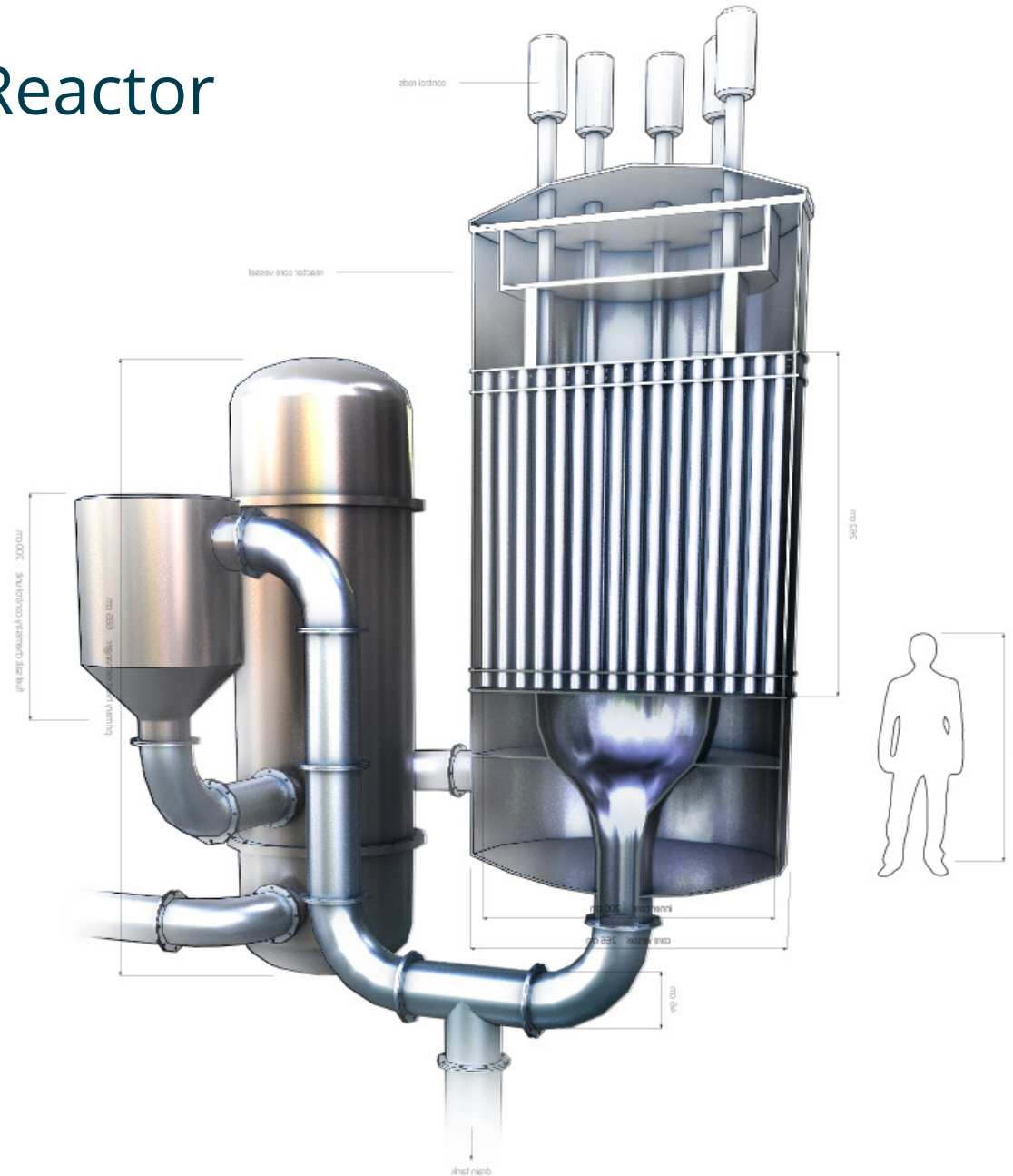
Seaborg's modular Compact Molten Salt Reactor

The Seaborg CMSR is **inherently safe**.

1. Suitable for **Power Barge** installation

2. Operates for **12 years** without refuelling

3. **No spent fuel handling** throughout the 24-year operational lifetime



TURNKEY FLOATING POWER PLANT

Designed and built by



SAMSUNG HEAVY INDUSTRIES



Standardized Modular Design

- **3 years** from order to grid
- Fully commissioned **at Samsung shipyard**
- **Flexible deployment**

	Length [m]	Net electrical output [MWe]
2x CMSR	98	200
4x CMSR	160	400
6x CMSR	223	600
8x CMSR	286	800

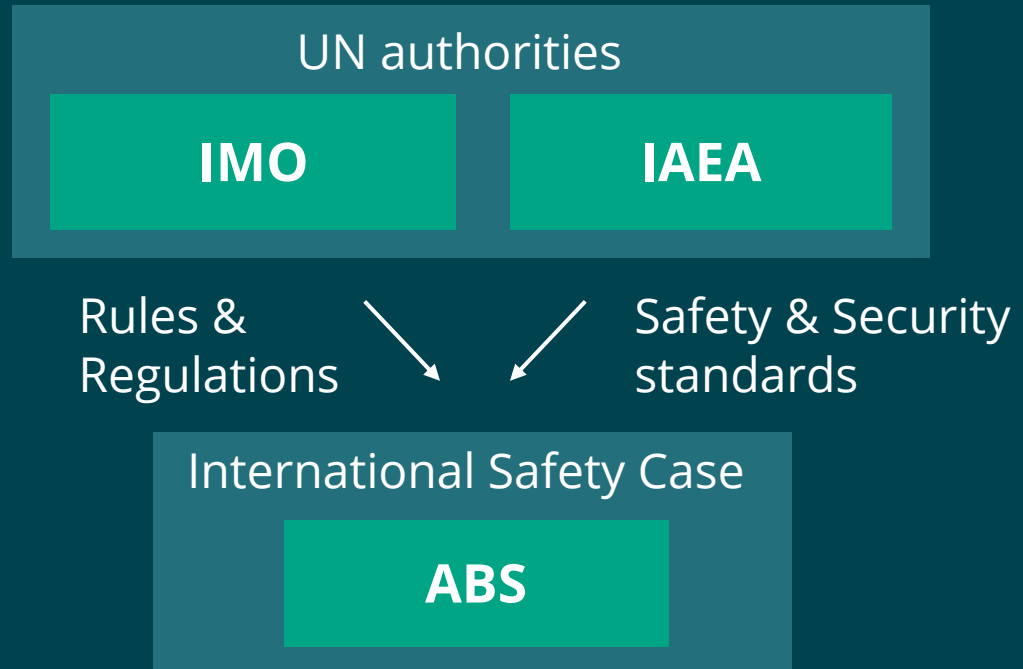
LICENSING OVERVIEW

UN authorities

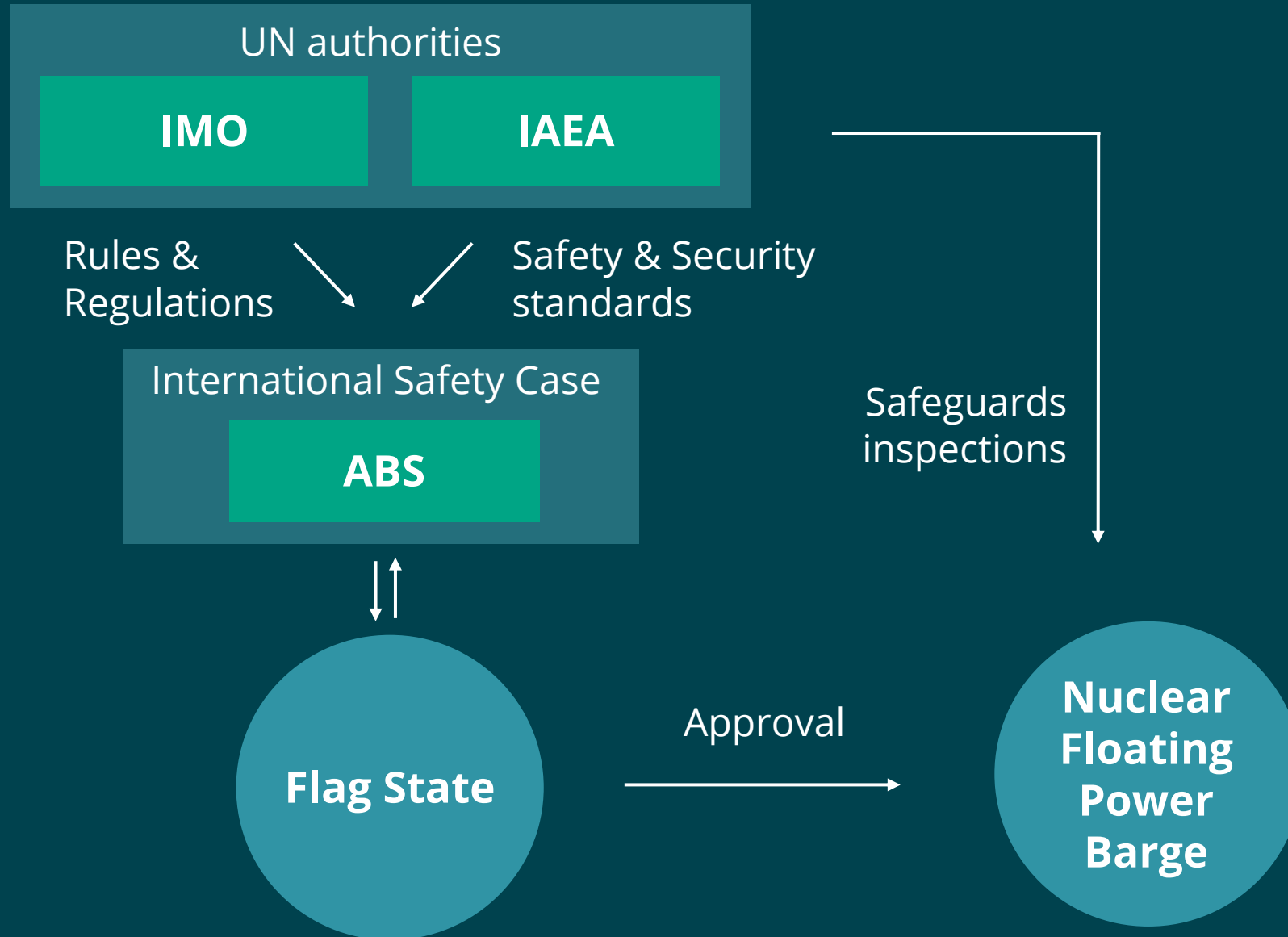
IMO

IAEA

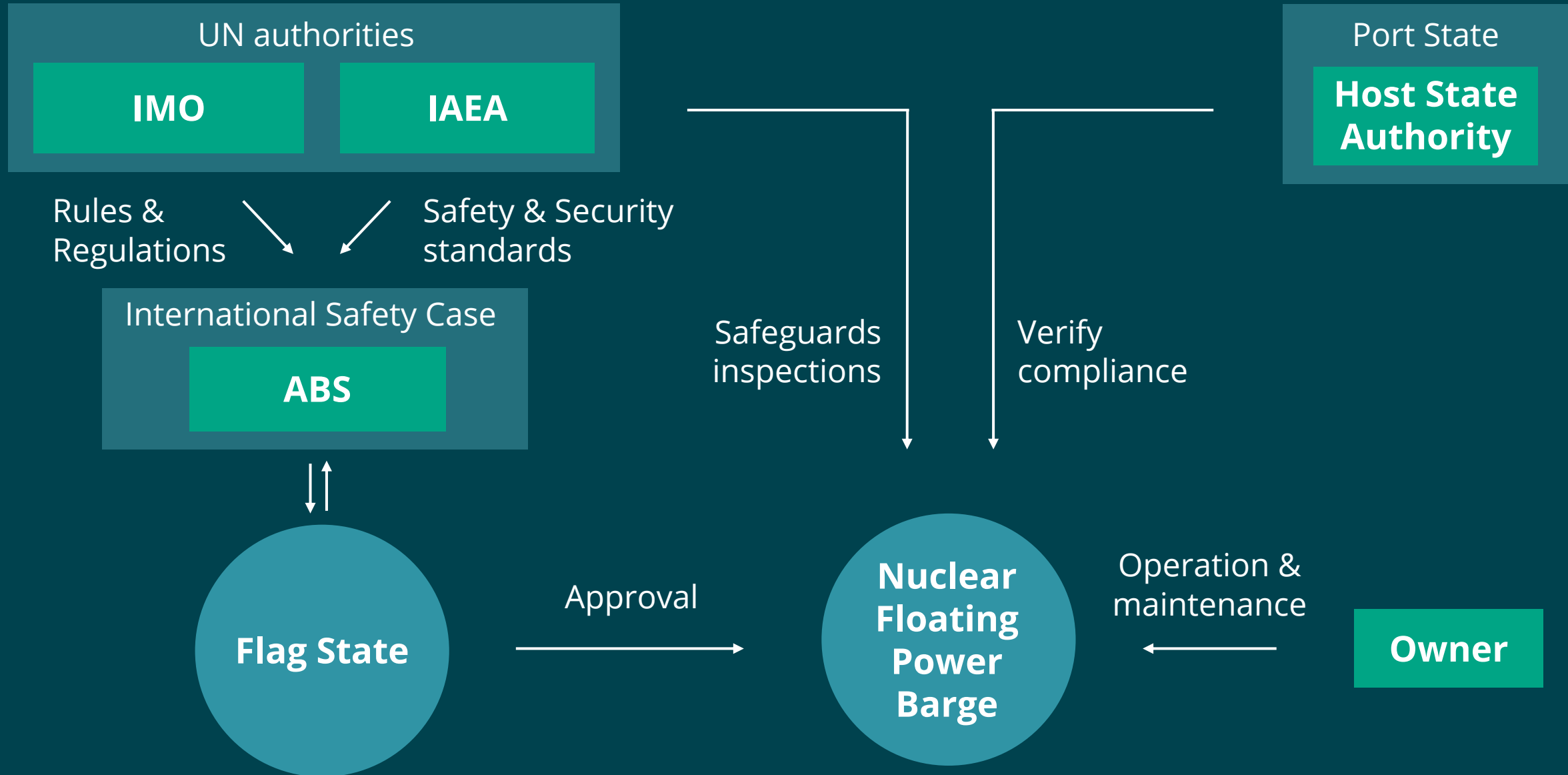
LICENSING OVERVIEW



LICENSING OVERVIEW



LICENSING OVERVIEW



THE SOUTHEAST ASIAN CHALLENGE

Rapidly growing economy

Decarbonization commitments

3-month monsoon season,
affecting wind and solar power

Limited opportunities for expanding
hydro power and geothermal



Strong reliance on coal and gas power



Vietnam feasibility study

Scope:

4 GWe for grid + 1.2 GWe for hydrogen & ammonia production

Phased approach

- 1 x **200 MWe** CMSR Power Barge
- 1 x **400 MWe** CMSR Power Barge
- 1 x **600 MWe** CMSR Power Barge
- 5 x **800 MWe** CMSR Power Barge incl. hydrogen + ammonia production

Technology Partners



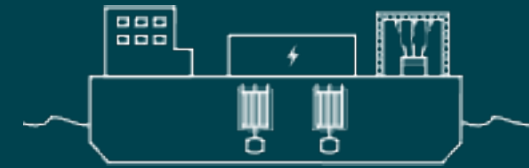


Electricity

\$ 48 MWh

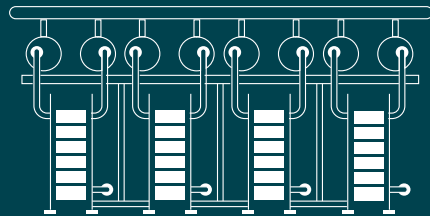
Competitively priced

Low-cost supply
over 24 years



High speed deployment

3 years from order to grid



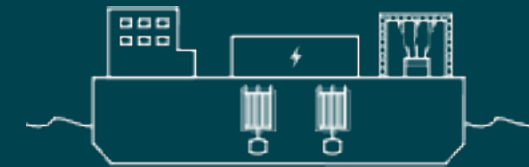
Hydrogen

\$ 2.7 / Kg H₂

Competitively priced



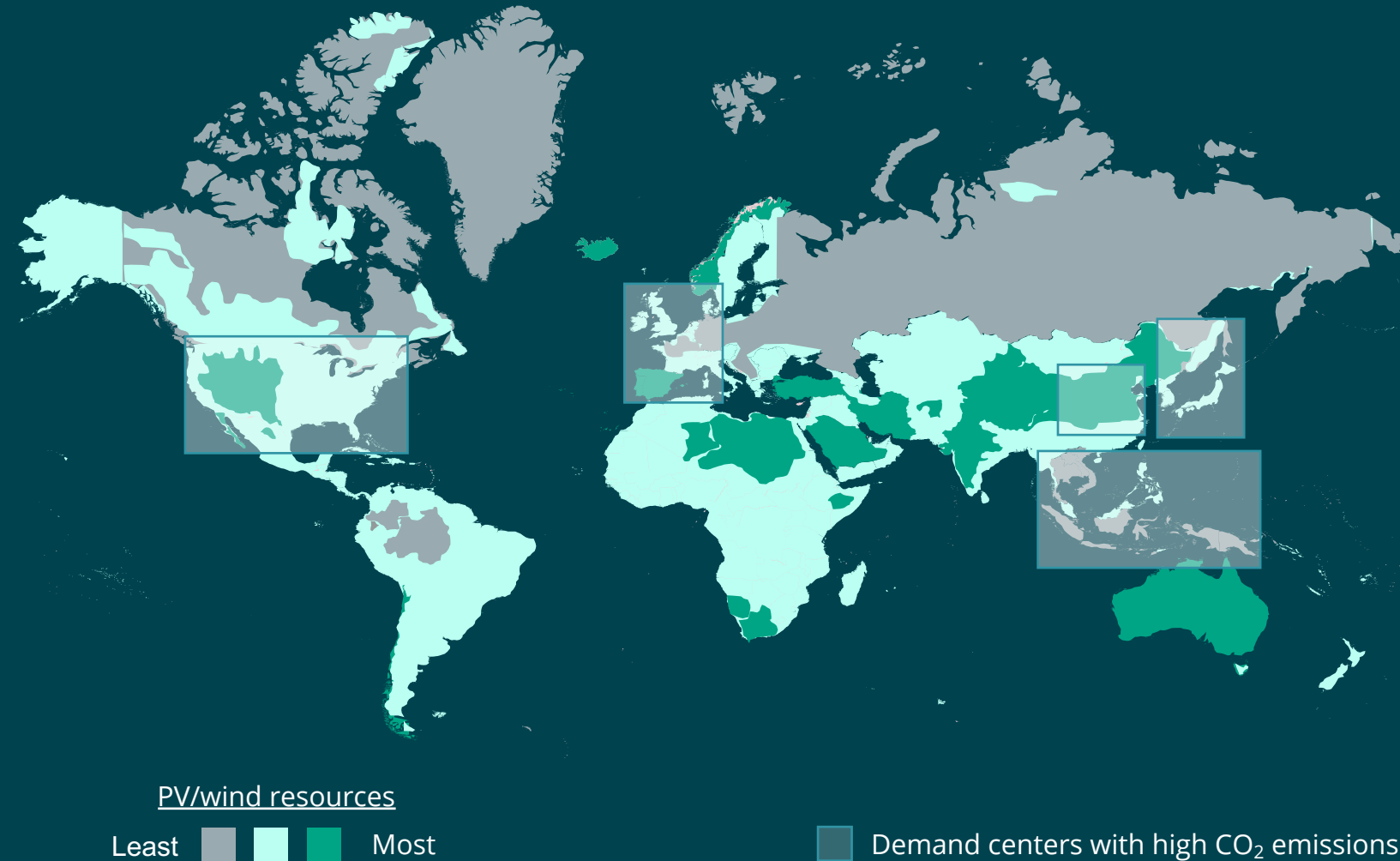
\$ 2.6 - \$ 23.0 / Kg H₂



Economies of scale

Large-scale production
for domestic and export
opportunities

Green energy not always present where it is needed



Decarbonising shipping

Powering the future bunkering infrastructure

70,000

Total number of ships globally ⁽¹⁾

2.7%

shipping sector's share of global GHG emissions ⁽³⁾

300mil

tons of fuel consumed by sector annually ⁽¹⁾

USD 26mil

in annual fuel cost for a single containership ⁽²⁾

USD 6tril

in total investments through 2070 for decarbonisation ⁽¹⁾

90 GW

of additional electricity demand for hydrogen production by 2030 ⁽²⁾

1. New **bunkering infrastructure** is needed **for zero-carbon shipping fuels**
2. **Hydrogen & ammonia production** will require additional power generation
3. CMSR Power Barges perfectly suited for **scaling up along world's shipping lanes**

Sources:

(1) Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, (2021). "Sailing Towards Zero- ver. 1.0"

(2) Hydrogen Council, McKinsey & Company (2021). "Hydrogen Insights Report 2021 "

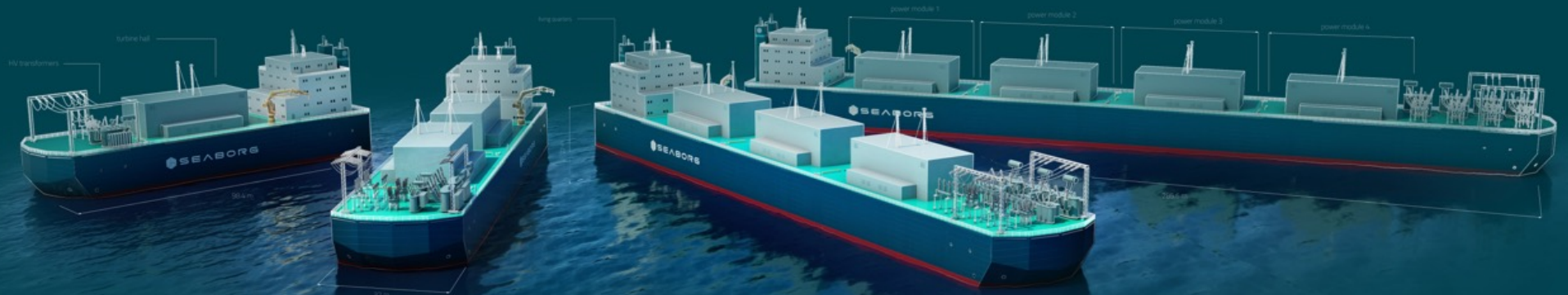
(3) International Maritime Organisation (IMO)

Local, green hydrogen production at the Port of Rotterdam – serving the European market

Current plans aim to deliver **4.6 million tons** of hydrogen per year by 2030.

Imports:
4 million tons

Local production:
600,000 tons



200 MW Power Barge
30,000 tons of hydrogen per year

400 MW

600 MW

800 MW Power Barge
120,000 tons of hydrogen per year

Building a WIN–WIN ecosystem

The Netherlands

Enhanced **energy security**
and technology development

Rapidly expanding **electricity
generating capacity**

Securing Positioning as a
net exporter of clean energy

Owners

Building a WIN–WIN ecosystem

The Netherlands

Enhanced **energy security** and technology development

Rapidly expanding **electricity generating capacity**

Securing Positioning as a **net exporter of clean energy**

Owners

Investing in a new **zero-emission** technology

High speed deployment of energy source

High return on investment

Involving stakeholders throughout the value chain

Regulatory



Maritime
Nuclear
Flag state
Port state

Suppliers



CMSR components
Electricity generation
Hydrogen
Ammonia

Construction



CMSR components
Electricity generation
Hydrogen
Ammonia

Joint ownership



International energy companies
Financing houses
Institutional investors
Project partners

Operators



Local company for O&M
International nuclear partner
Service providers

Fuel cycle



Fuel suppliers
Decommissioning
Fuel reprocessing

Energy Off-Takers



International energy companies
Local electricity companies

DIFFERENTIATORS

1 Policy & regulation

International safety and licensing approach utilizing the **international maritime regulation** in combination with the **framework** of the **International Atomic Energy Agency**.

DIFFERENTIATORS

1

Policy & regulation

International safety and licensing approach utilizing the **international maritime regulation** in combination with the **framework** of the **International Atomic Energy Agency**.

2

Private ownership

Project financing secured through **private and institutional investors**.

DIFFERENTIATORS

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Policy & regulation

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2

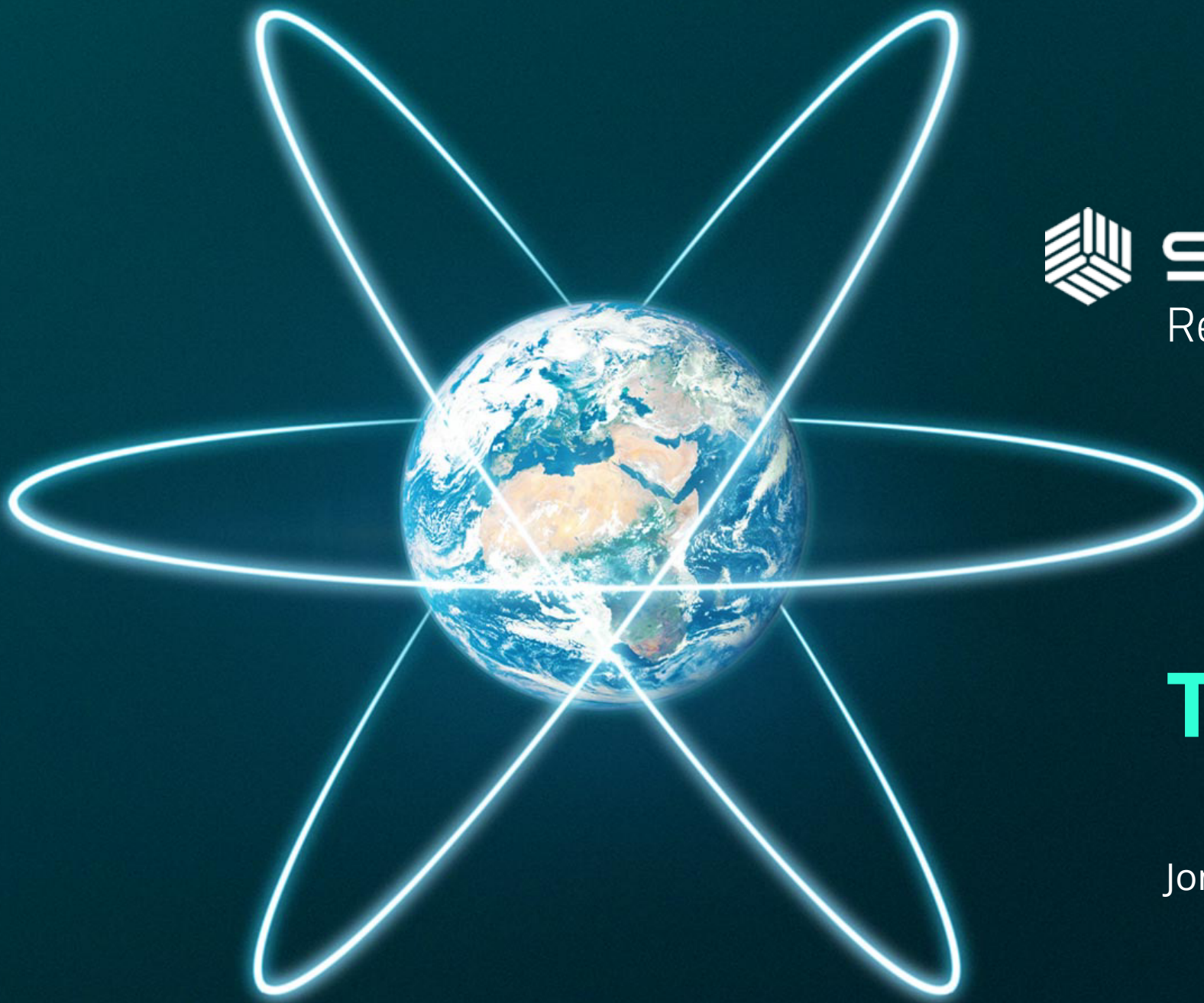
Private ownership

Project financing secured through **private and institutional investors**.

3

Energy transition & energy exports

The Netherlands can enhance **national energy transition** and **create new exporting opportunities**



SEABORG

Rethinking nuclear

THANK YOU

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