SYNERGETIC
NU PRIMARY ENERGY

Nuclear Innovation Conference

Amsterdam June 2022

ABOUT US

ENERGY FOR HUMANITY_

Advocacy

LUCID CATALYST

Analysis

TERRA PRAXIS

Ambition

SYNERGETIC

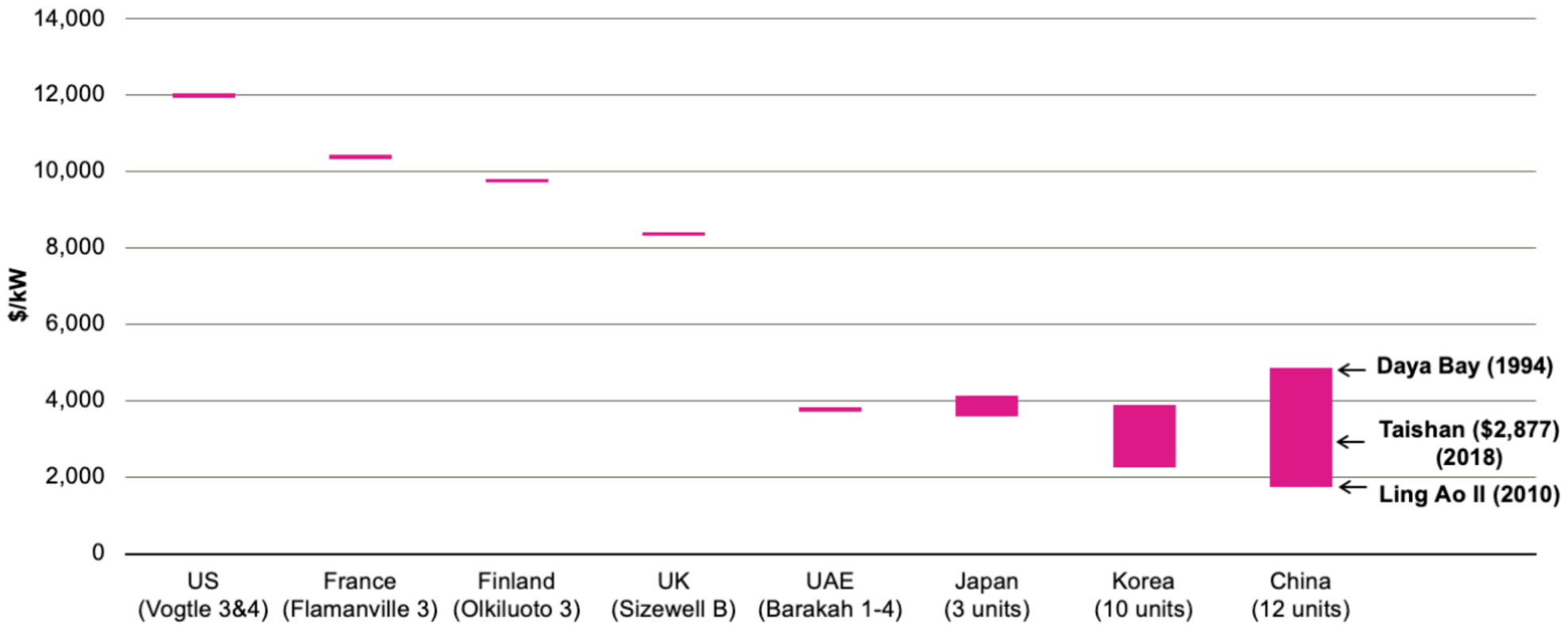
Action

01

CONVENTIONAL NUCLEAR

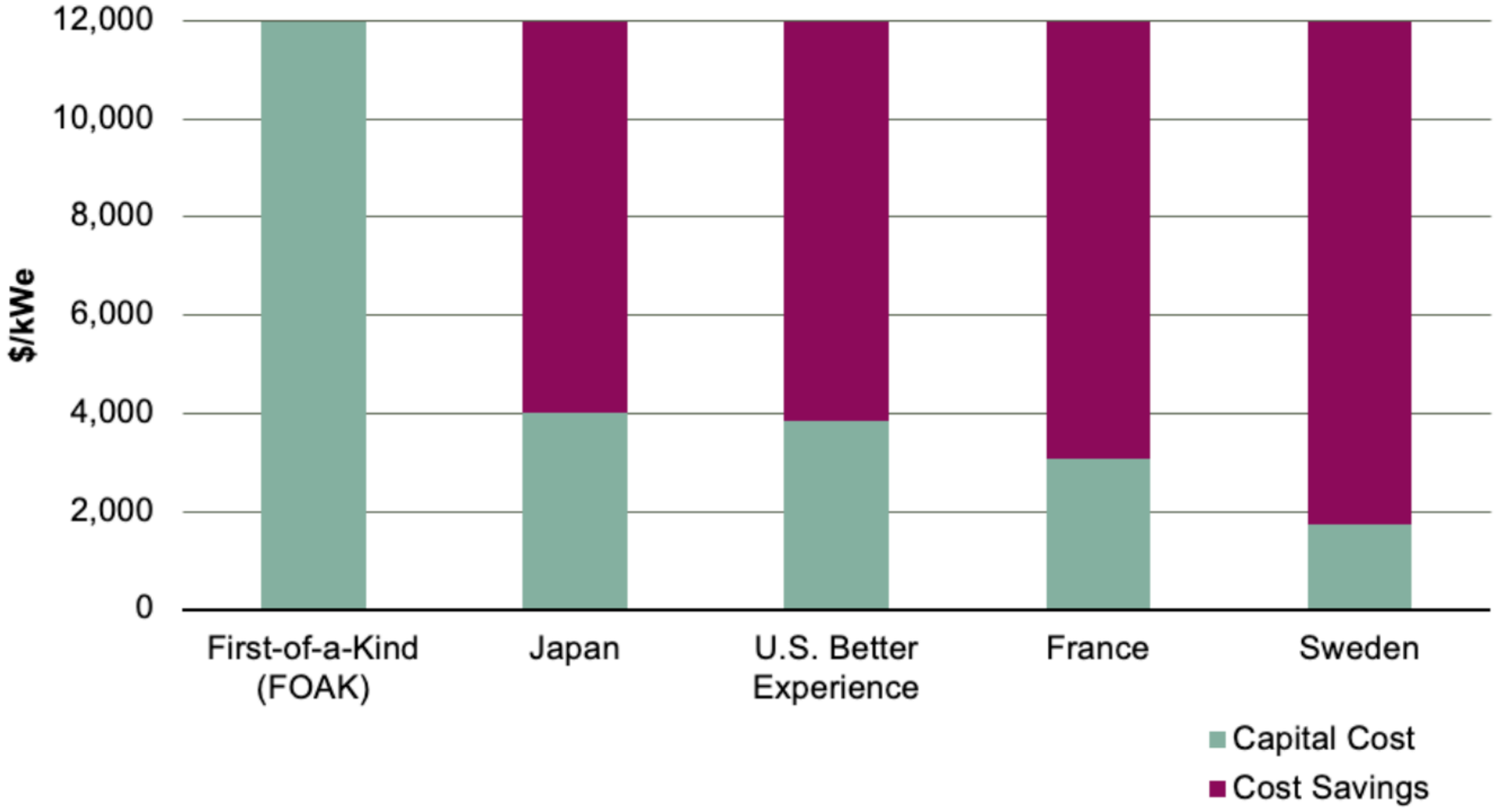
WHERE ARE WE NOW?

How to Make Nuclear Cost Competitive



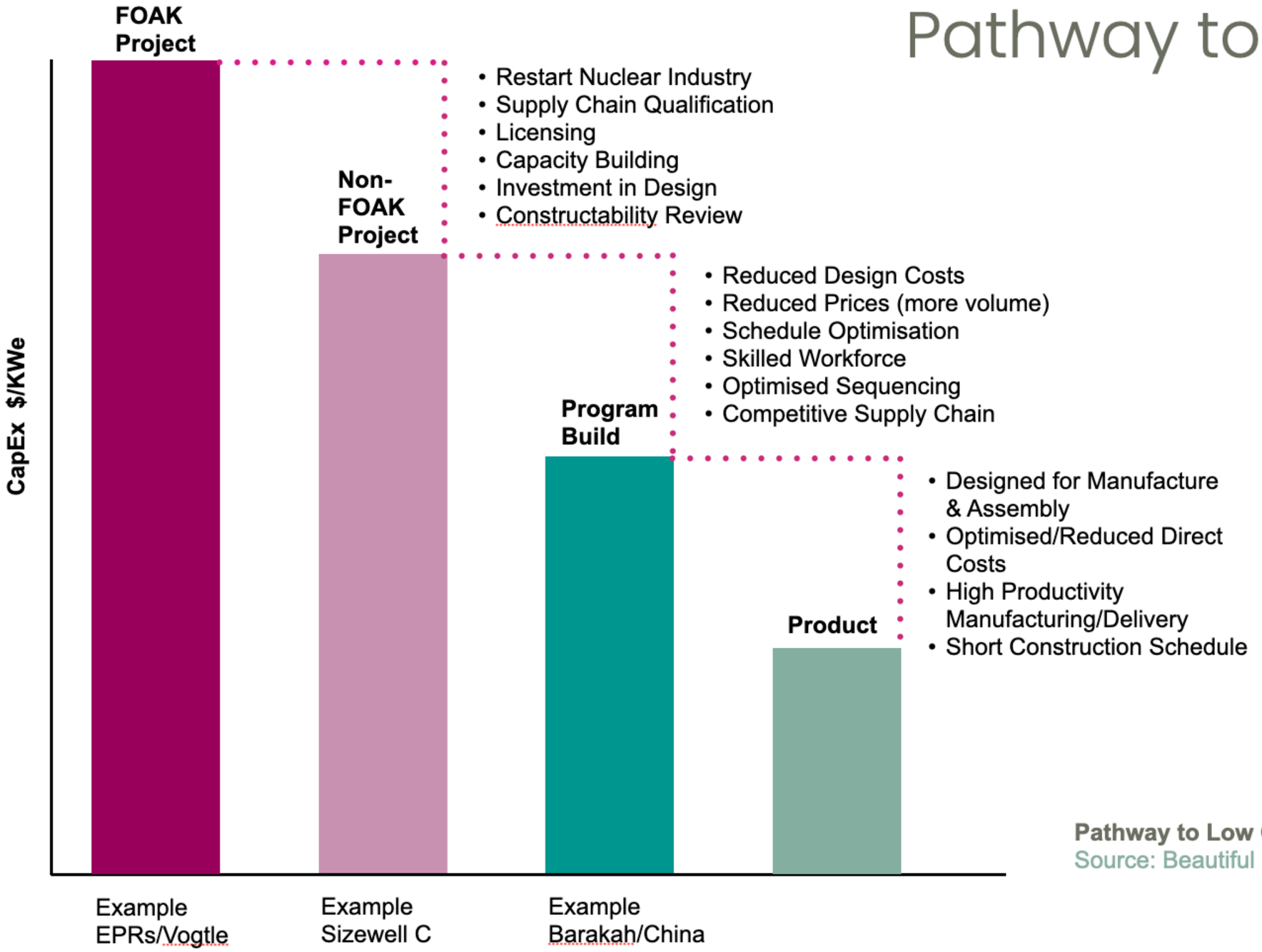
Sample of global nuclear project capital costs (with interest)
Source: LucidCatalyst (2020)

FOAK Compared to Programmatic Costs



First-of-a-kind compared to costs achieved in consistent, real world build programmes
Source: Beautiful Nuclear (2021)

Pathway to Low Cost



Pathway to Low Cost
Source: Beautiful Nuclear, LucidCatalyst (2021)

Extending Operating Life of the Existing Fleet is the Lowest Cost Emissions Reduction

"Extending long-term operation of the current fleet is the most cost-effective way to add clean energy production."

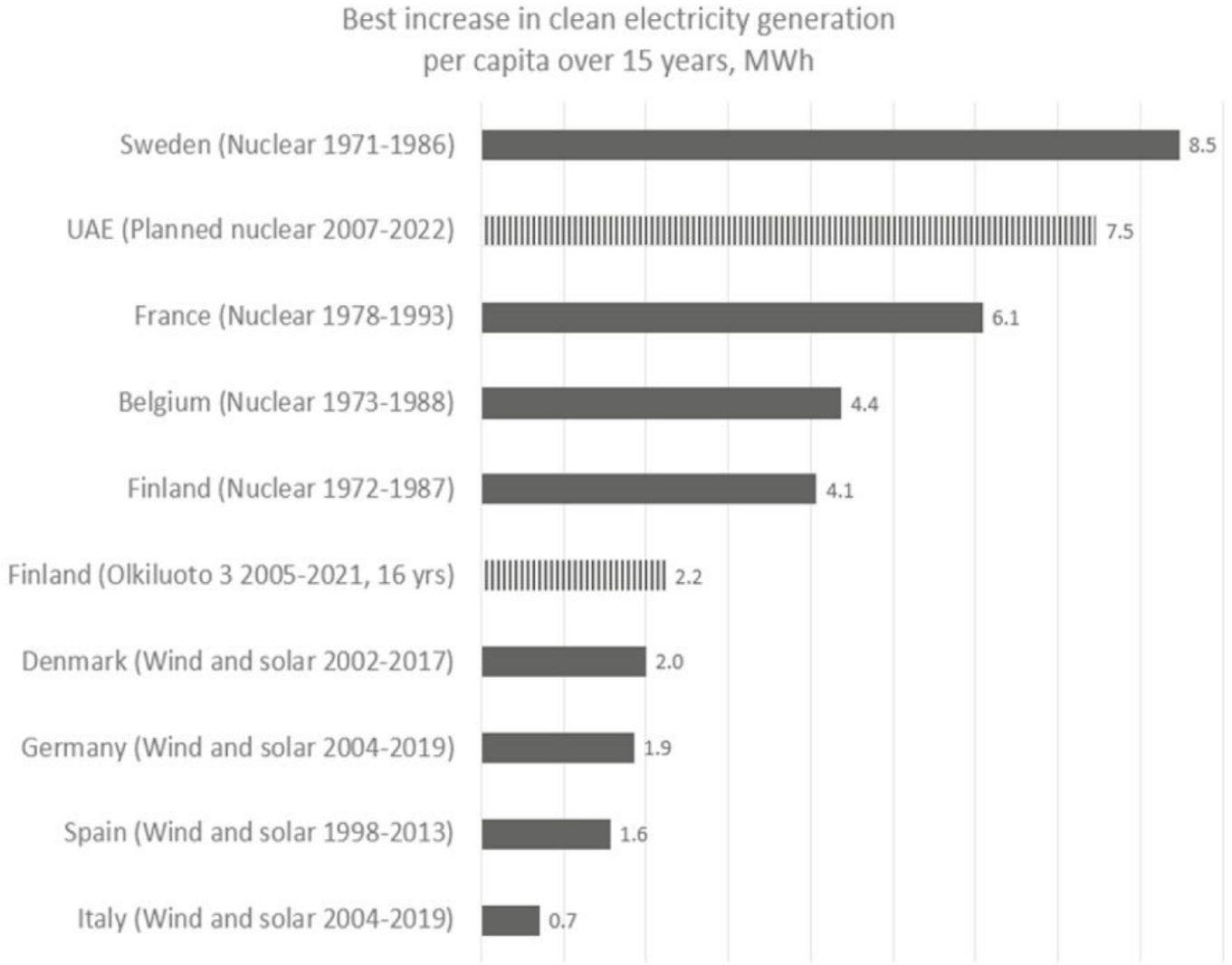
International Energy Agency (2020)

Policy recommendations regarding Long Term Operation could not be clearer: authorise the longest possible lifetime extensions of existing plants, set up risk management and financing frameworks that help mobilise capital for new and existing plants at an acceptable cost, and value the dispatchability and other non-market benefits that nuclear energy can bring to the power system.

The EU should move from premature closures of plants to supporting policy and financing frameworks for refurbishments of existing plants to be funded with the lowest cost of capital possible.

Long term operation allows EU member states to lock in immediate low carbon gains with relatively little additional cost, new infrastructure or socio economic disruption.

FASTEST PATH TO ZERO CARBON ELECTRICITY



02 **SYNERGETIC**

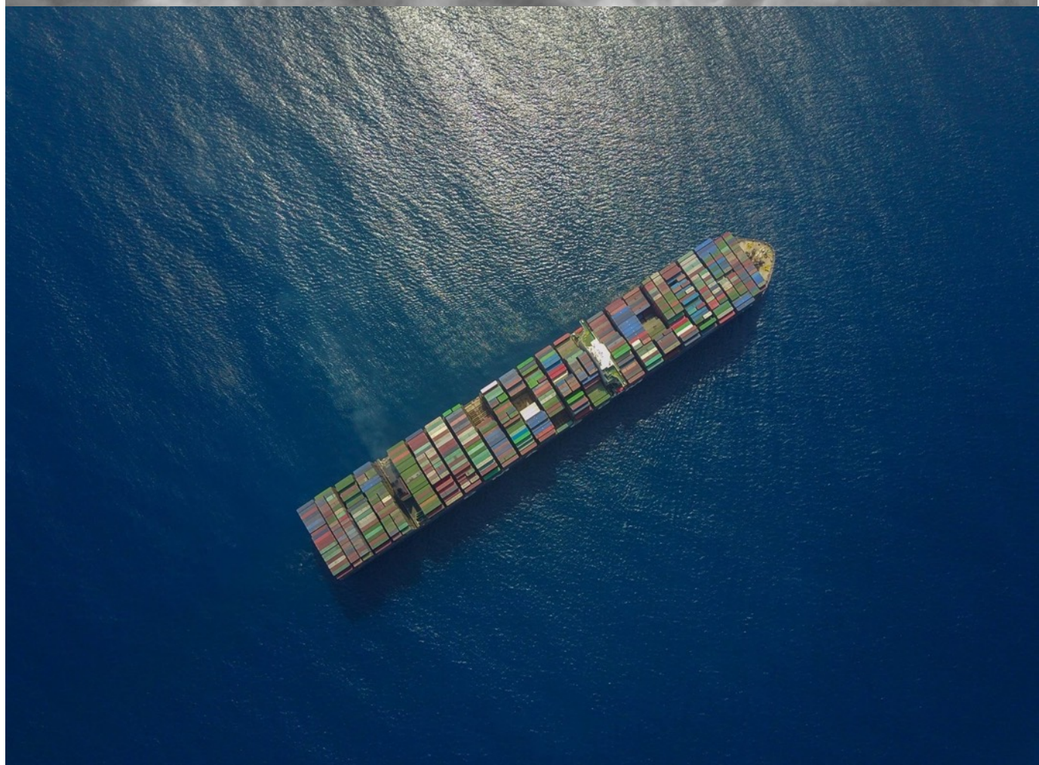
ACTION:
RAPID DEPLOYMENT AT SCALE

Our Vision

Our large, highly standardized projects – in partnership with Team Korea - will deliver zero carbon and carbon neutral liquid fuels that are cost-competitive, clean and globally available.

CUSTOMERS WANT AFFORDABLE DECARBONIZATION

- Customers want to achieve their decarbonization goals faster
- Customers want fuels that are compatible with their existing applications
- Clean fuels cannot cost 3-5x more than conventional fuels cost today
- Market share for cost competitive clean fuels will be limited by supply, not demand



03

SYNERGETIC

DEPLOYMENT ARCHITECTURE

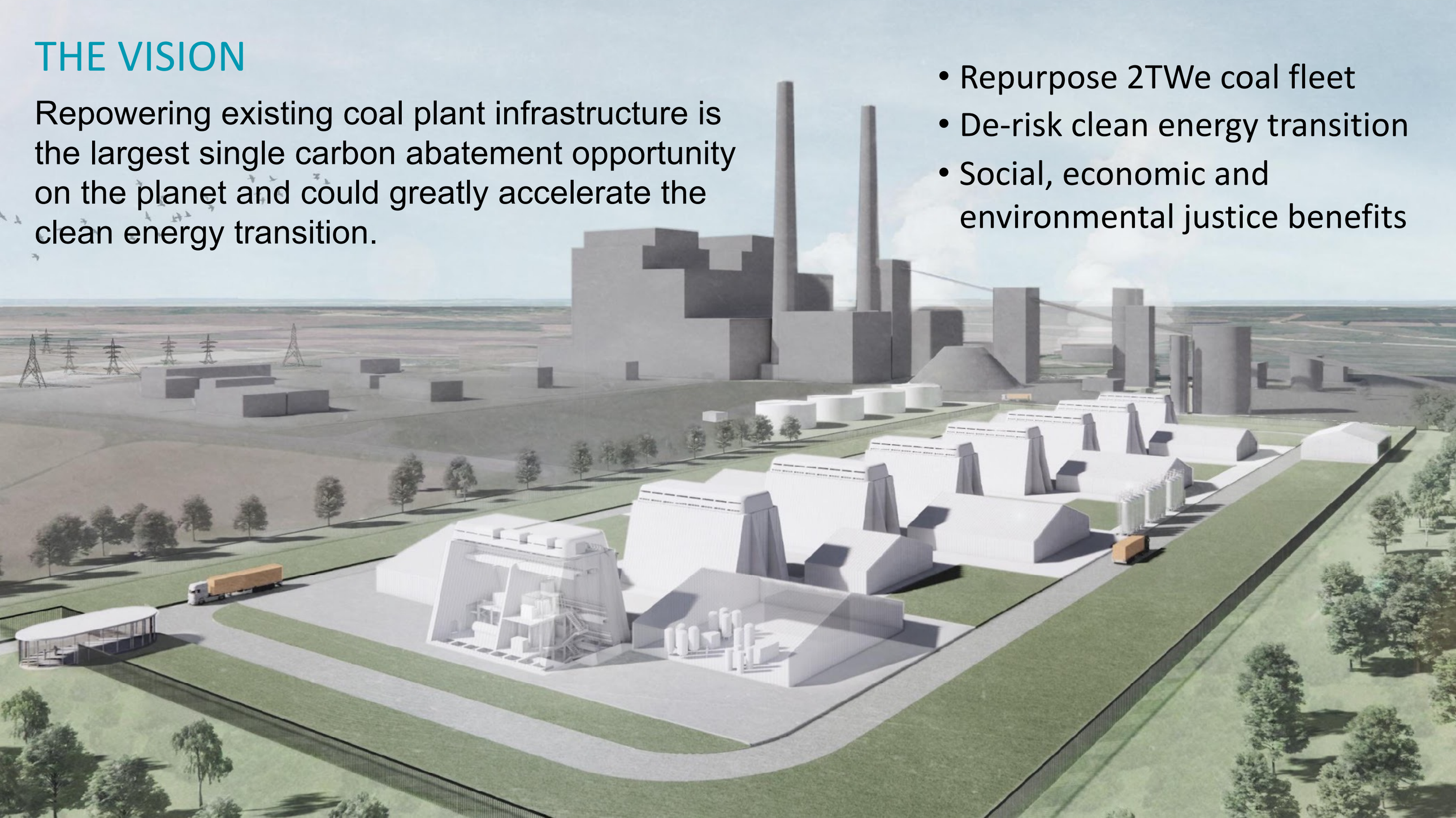
01 REPOWERING COAL

FAST, LOW COST, REPEATABLE

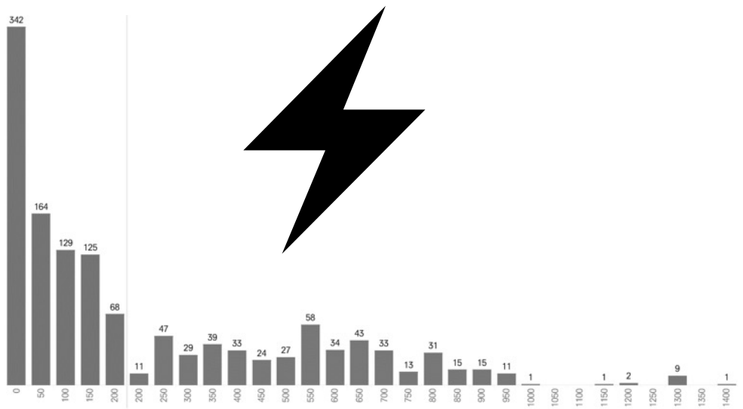
THE VISION

Repowering existing coal plant infrastructure is the largest single carbon abatement opportunity on the planet and could greatly accelerate the clean energy transition.

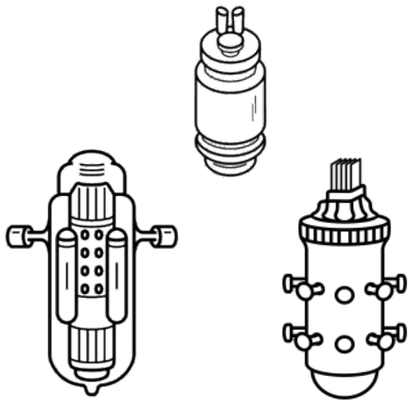
- Repurpose 2TWe coal fleet
- De-risk clean energy transition
- Social, economic and environmental justice benefits



Standardization to Address Wide Variety of Requirements



Different
Energy and heat requirements

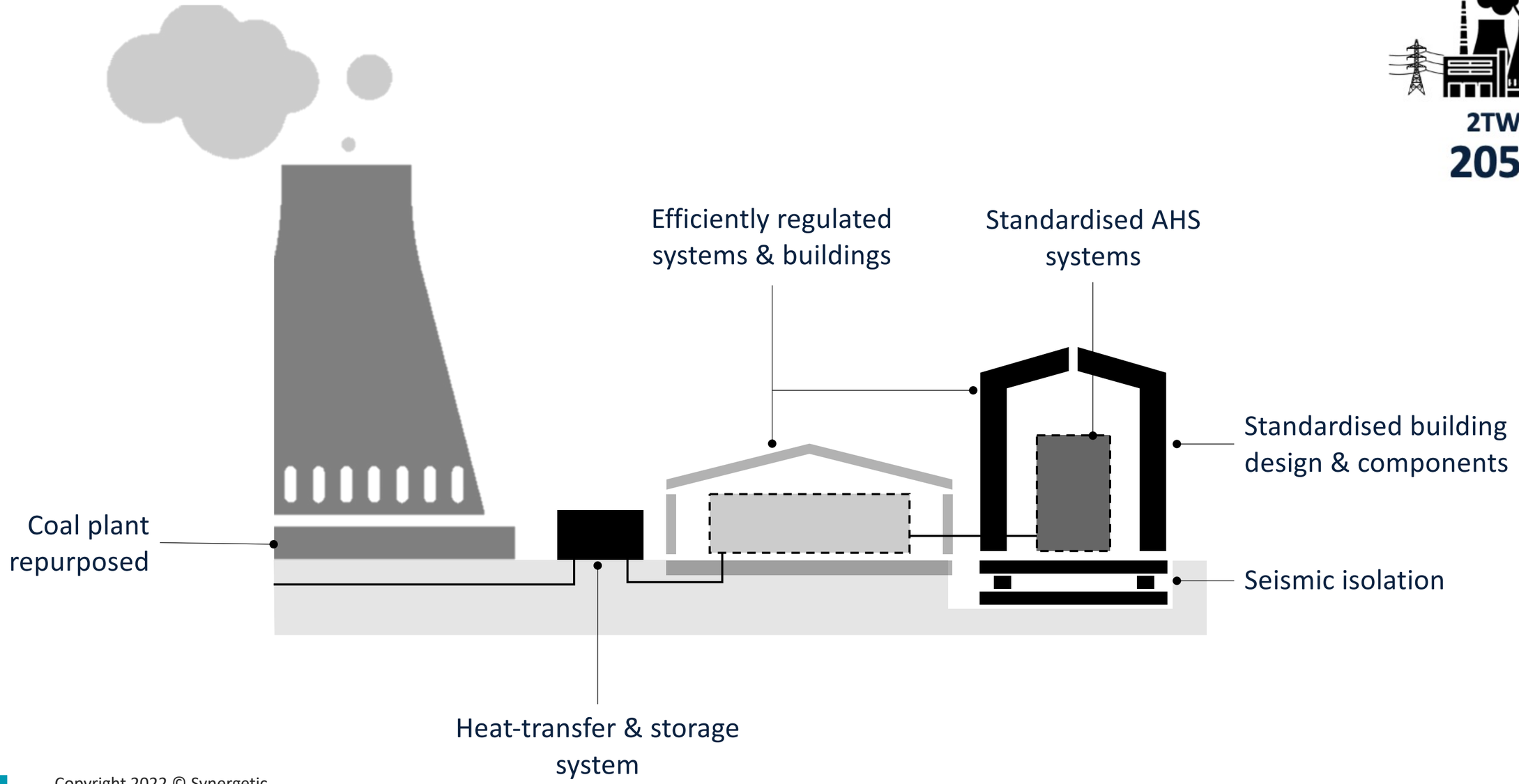


Different
Advanced heat-source (AHS) technologies

Different
Site layouts and local requirements

Built Systems Must Enable Scale and Speed

2TWe
2050



Thermal energy storage de-links the nuclear heat island safety case from the existing coal plant power island. This enables flexible generation and continued use of the existing plant.

TerraPraxis has assembled a world-class team to deliver Repowering Coal

Microsoft

Bryden Wood

SIMPSON GUMPERTZ & HEGER

Engineering of Structures and Building Enclosures

TERRA PRAXIS

University at Buffalo

Southern Company

TVA

Tennessee Valley Authority

Learn more at
www.terrapraxis.org

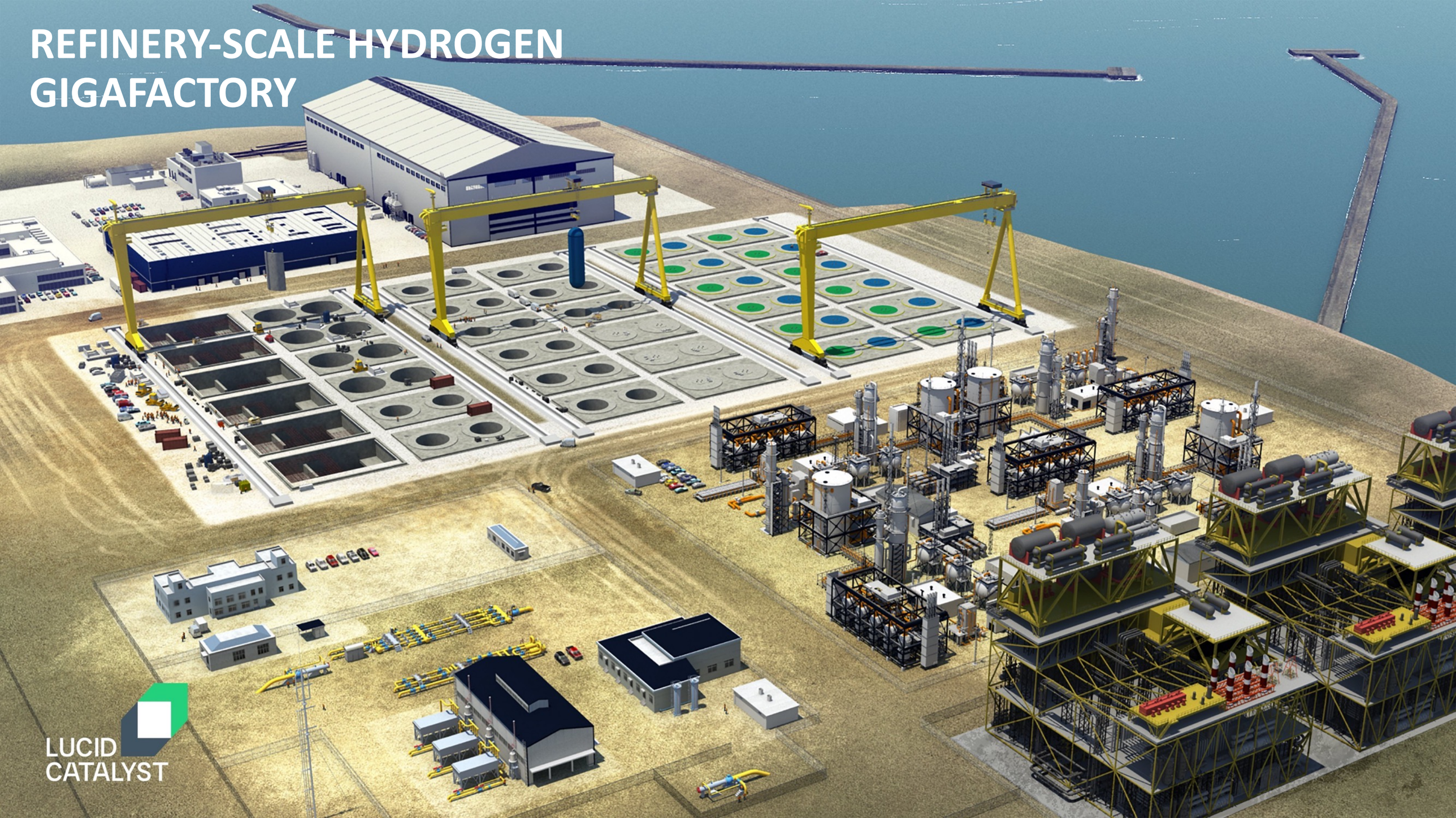
Repowered coal plants can protect jobs and energy security by continuing to operate for decades, supplying emissions-free, reliable, flexible, and cost-competitive electricity.

02

REFINERY-SCALE HYDROGEN GIGAFACTORY

BRING THE FACTORY TO THE PROJECT

REFINERY-SCALE HYDROGEN GIGAFACTORY



LUCID CATALYST

03

SHIPYARD-MANUFACTURED CLEAN SYNTHETIC FUELS

BRING THE PROJECT TO THE FACTORY

SYNERGETIC AMMONIA FPSO

12k boe/d
1.2 GWe

FLEET FACILITIES

200k boe/d

SYNERGETIC: ACHIEVING SCALE

Seven FPSO platforms each producing 1.2 million tonnes per year of the world's lowest cost zero-carbon ammonia would be the equivalent to 5% of total global ammonia production.

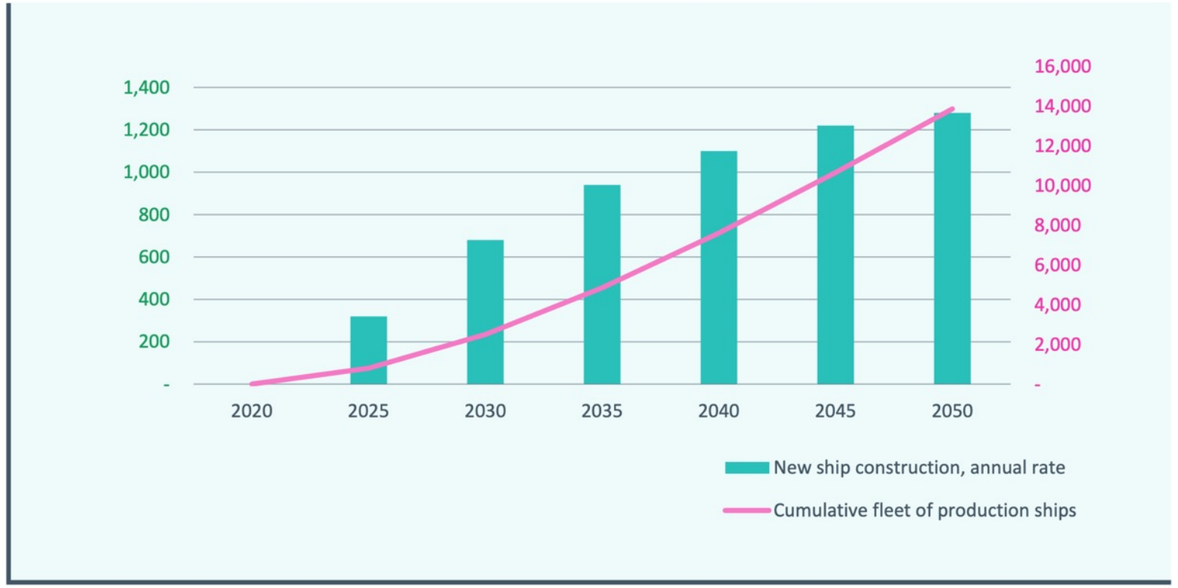
04

SYNERGETIC

TRANSFORMING OIL PRODUCERS INTO CLEAN FUELS SUPPLIERS

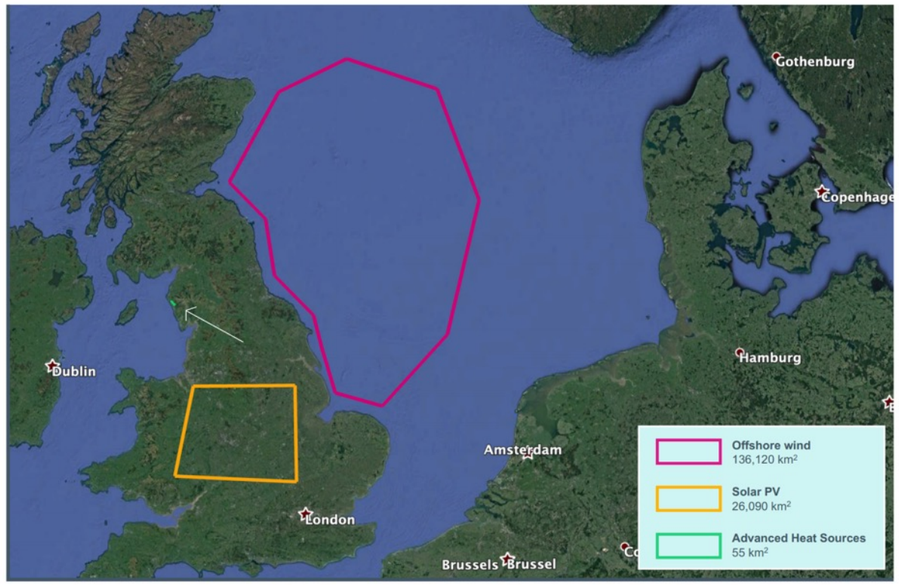
TRANSFORMING MAJOR OIL PRODUCERS INTO GLOBAL SUPPLIERS OF CLEAN LIQUID FUELS

- 100 million Barrels of Oil per day = ~10,000 FPSOs
- Currently ~ 60,000 large ships operating
- Shipyards: 281 operating in 2019

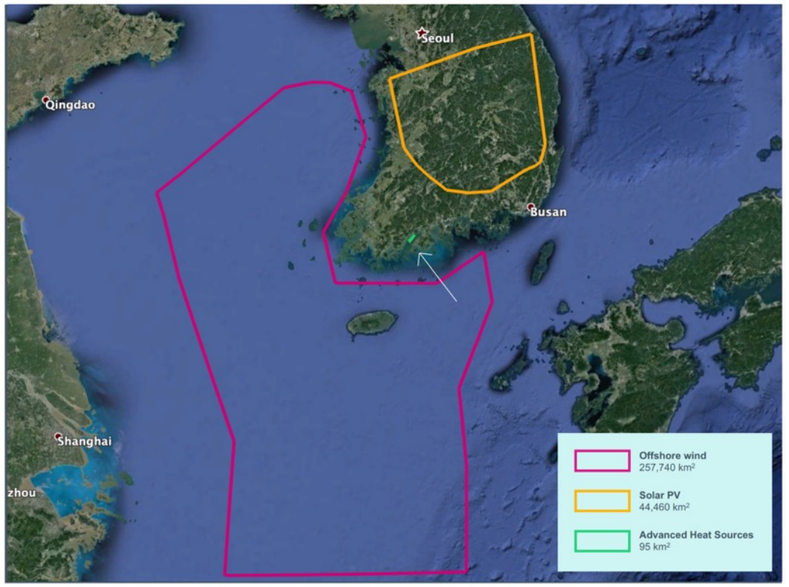


EXXON/Mobil	4,000,000	334
Shell	3,700,000	308
ADNOC	3,000,000	250
Equinor	2,000,000	167

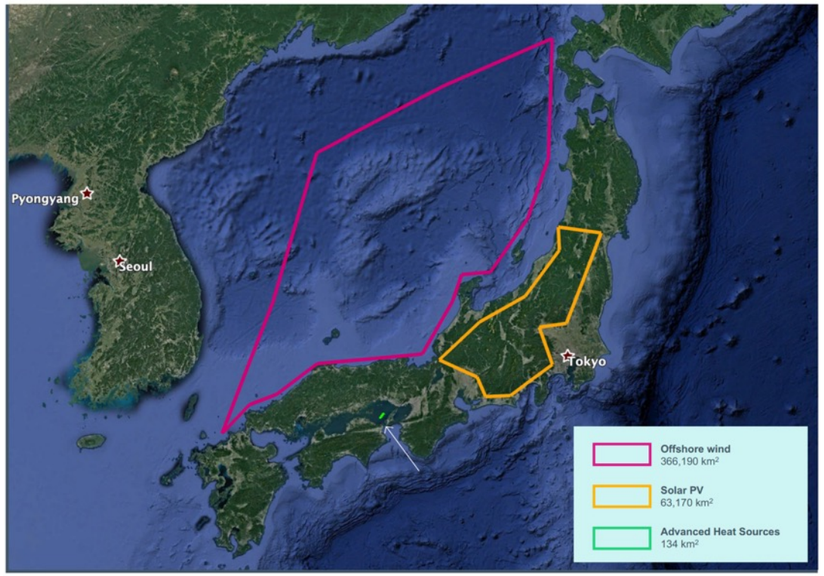
SYNERGETIC WILL DELIVER CLEAN FUELS, COST-COMPETITIVELY, AT THE SCALE OF OIL AND GAS



Each colored outline represents the total area that would be required for the siting of each type of resource if it were to be the only one used to generate enough hydrogen to replace current oil consumption in the UK.



Each colored outline represents the total area that would be required for the siting of each type of resource if it were to be the only one used to generate enough hydrogen to replace current oil consumption in South Korea.



Each colored outline represents the total area that would be required for the siting of each type of resource if it were to be the only one used to generate enough hydrogen to replace current oil consumption in Japan.

IF WE CAN:

Repower 2 TWe of coal

Deliver refinery-scale hydrogen

Substitute 100M barrels of oil per day

WHAT DO WE HAVE?

NEW (NU) PRIMARY ENERGY

FUELLING A LIVABLE CLIMATE