

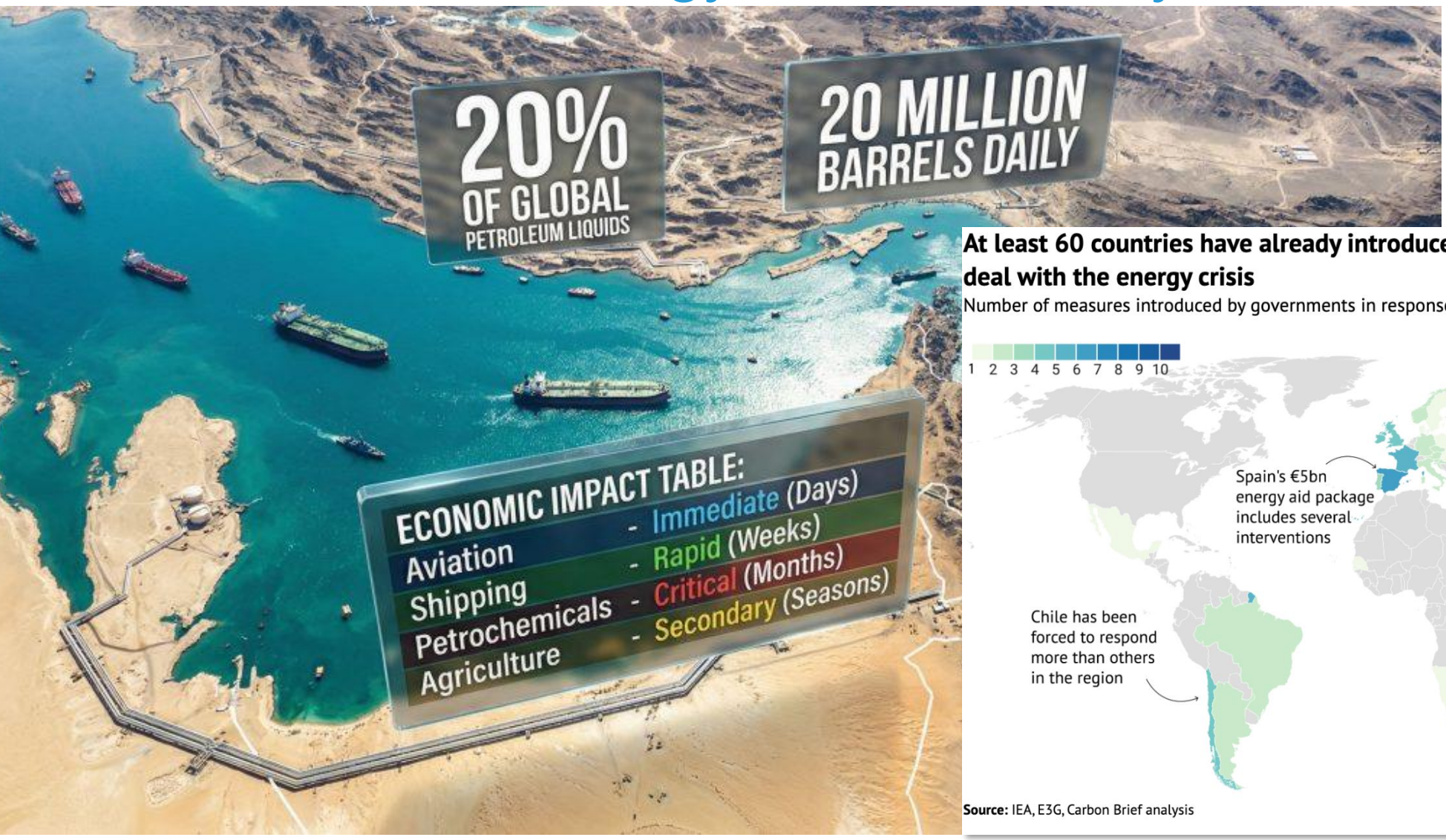
Nuclear Energy - Engine of Economic Growth ?

PWR Conference

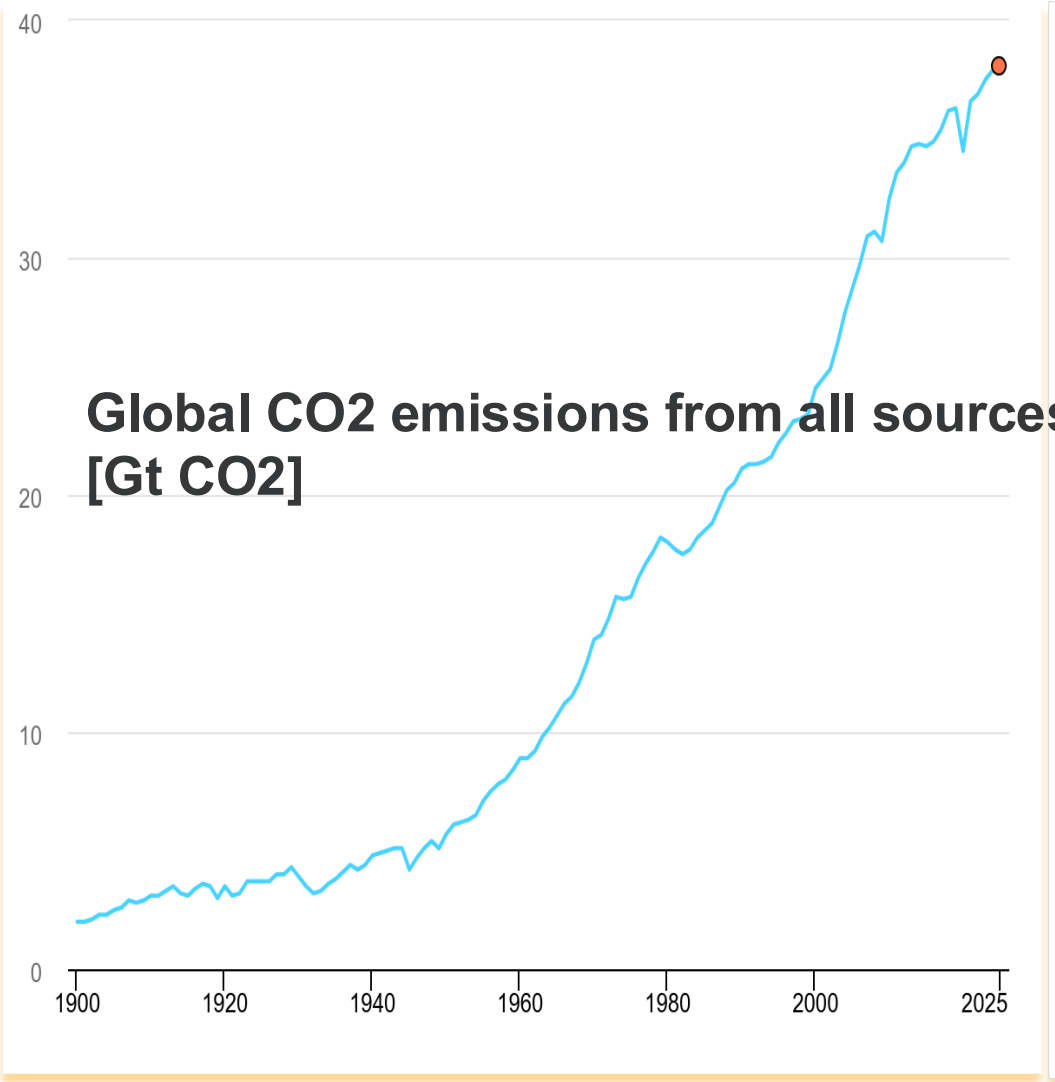
Bohdan Zronek

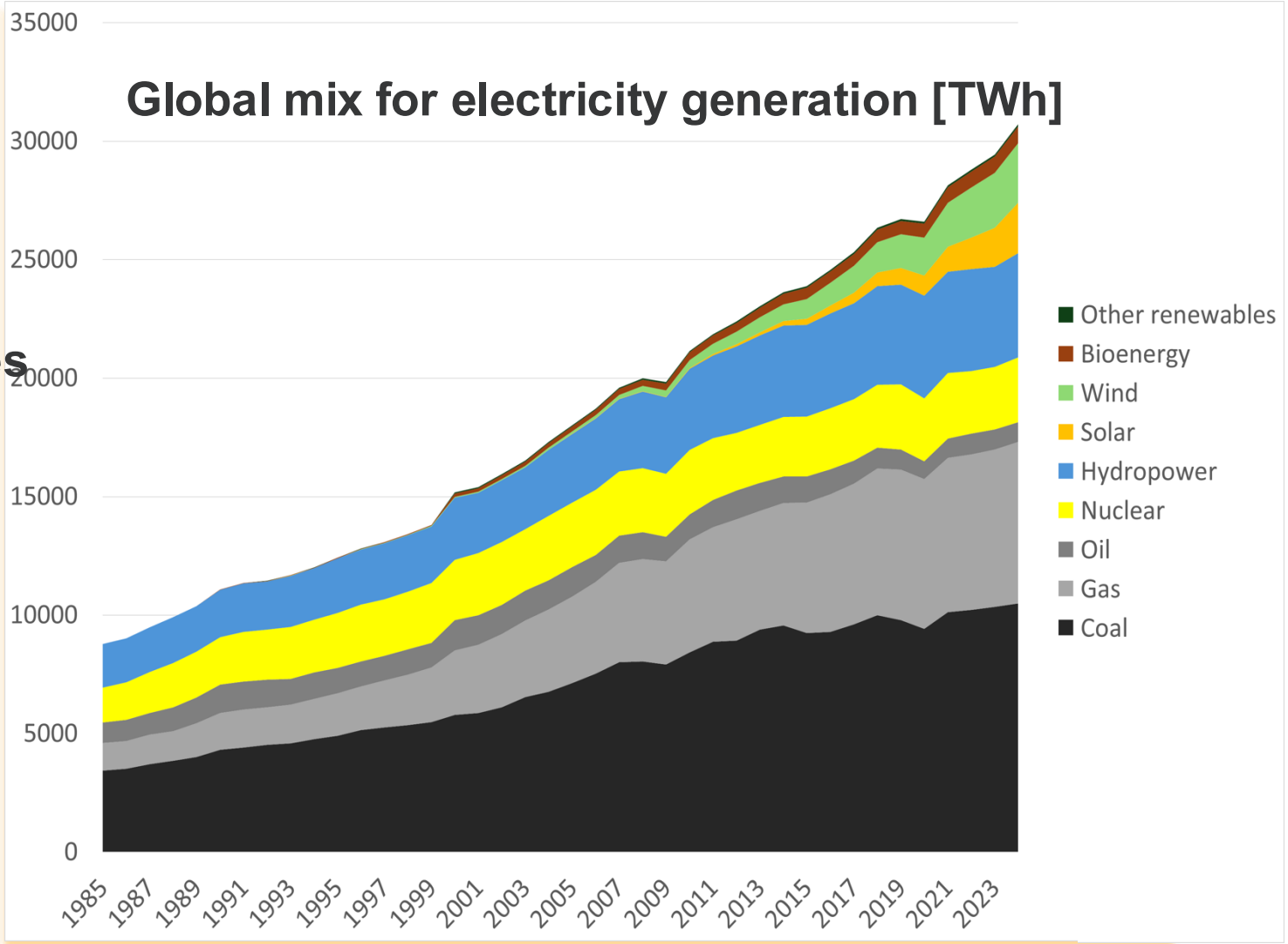
October 2026

“The worse energy crisis in history”, Fatih Birol



Another year, another record for CO2 emissions





Nuclear is the 2nd largest source of low carbon electricity
The 1st in OECD countries

438

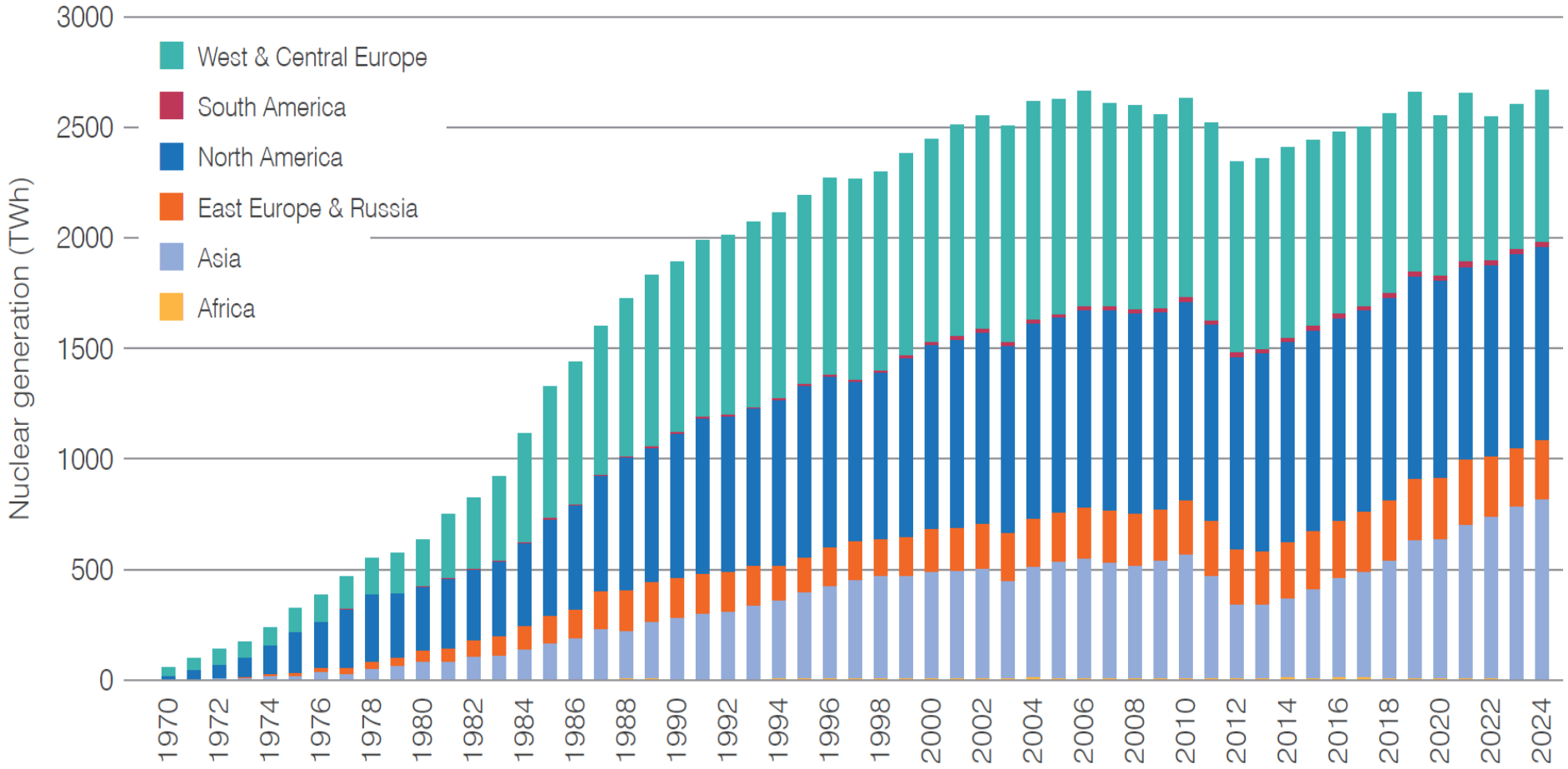
OPERABLE REACTORS

400,680 MWe

80

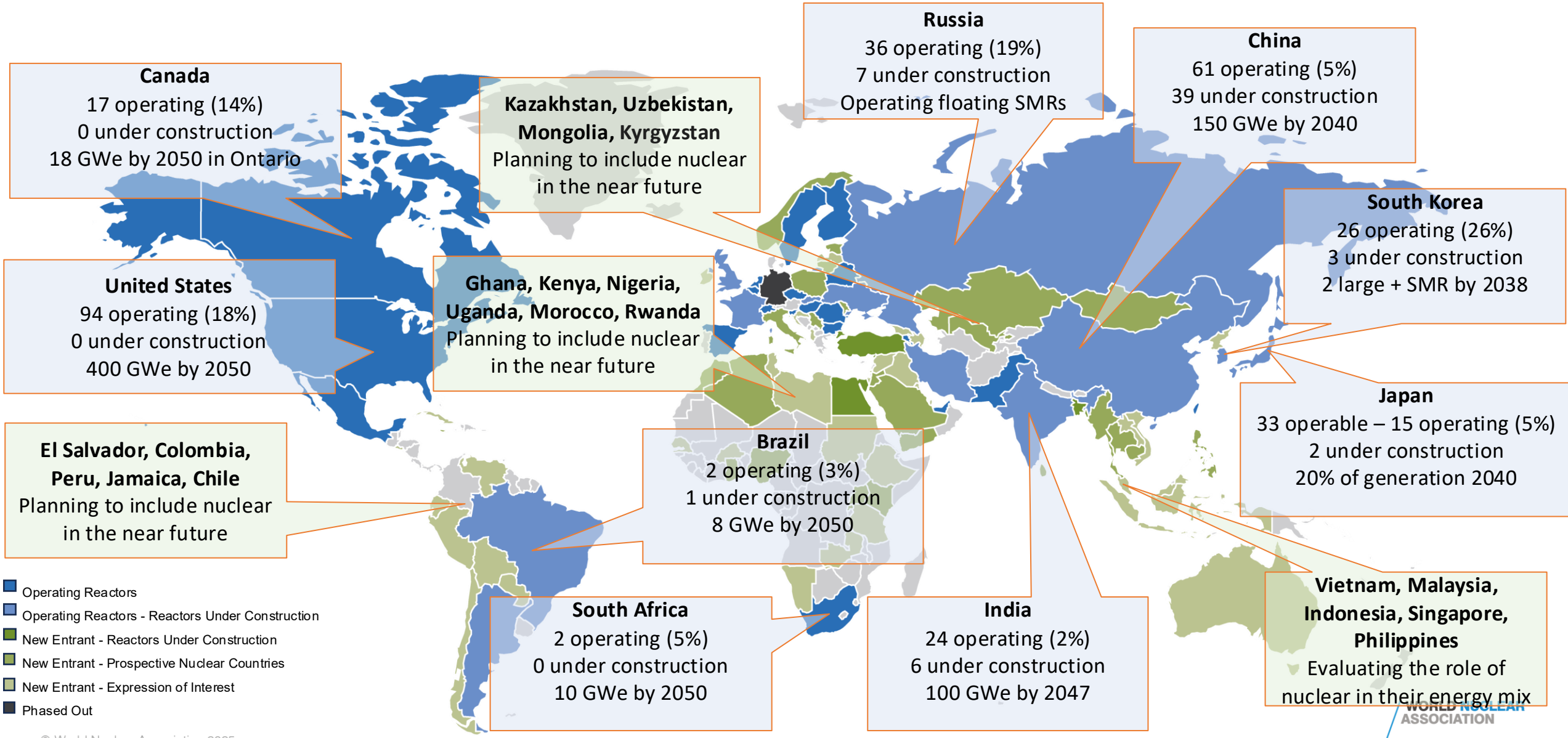
REACTORS UNDER CONSTRUCTION

81,442 MWe



Source: World Nuclear Association and IAEA Power Reactor Information Service (PRIS)

THE ESSENTIAL ROLE OF NUCLEAR ENERGY IS GLOBALLY RECOGNIZED



© World Nuclear Association 2025

WORLD NUCLEAR ASSOCIATION

China
61 operating (5%)
39 under construction
150 GWe by 2030

Bangladesh
0 operating (0%)
2 under construction
7.5 GWe by 2050

India
24 operating (2%)
6 under construction
100 GWe by 2047



Japan
33 operable – 15 operating (5%)
2 under construction
20% of generation 2040

South Korea
26 operating (30%)
3 under construction
2 large + SMR by 2038

Philippines
1.2 GW by 2032
2.4 GW by 2035
4.8 GW by 2050

Vietnam
4 GW by 2034
14 GW by 2050

Thailand
600 MW by 2037

Indonesia
8 GW by 2035
21 GW by 2050
50-60 GW by 2060

Sweden
6 operating (40%)
0 under construction
2 by 2035 + 10 by 2045

Finland
5 operating (33%)
0 under construction

Estonia
0 operating (0%)
0 under construction
1 SMR

Belarus
2 operating (14%)
0 under construction

Russia
36 operating (19%)
4 under construction
14 new

United Kingdom
9 operating (15%)
2 under construction
24GW new by 2050

Czech Republic
6 operating (33%)
0 under construction
1 by 2035 + 3 new

Norway
0 operating (0%)
0 under construction
SMR under consideration

Poland
0 operating (0%)
0 under construction
3 by 2035

Ukraine
15 operating (50%)
2 under construction
9 new

Belgium
2 operating (35%)
0 under construction

Netherlands
1 operating (3%)
0 under construction
2 new

Denmark
0 operating (0%)
0 under construction
Policy Review

Slovakia
5 operating (50%)
1 under construction
1 new

Romania
2 operating (20%)
0 under construction
2 by 2035 + 6 SMRs

France
56 operating (70%)
1 under construction
6 (+8) new by 2050

Slovenia
1 operating (41%)
0 under construction
1 new

Italy
0 operating (0%)
0 under construction
Policy Review

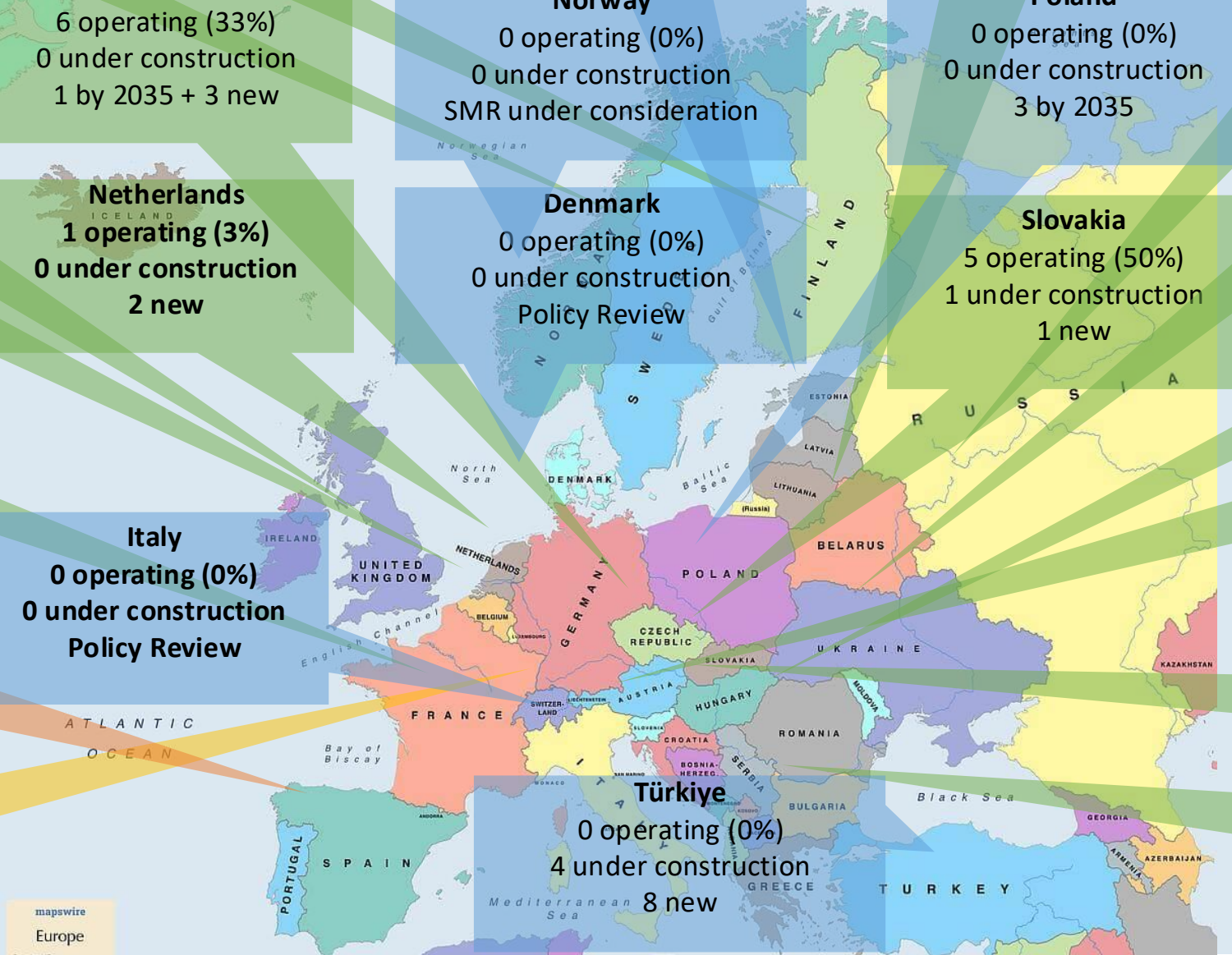
Hungary
4 operating (50%)
2 under construction
2 new

Spain
7 operating (21%)
0 under construction
Full Shutdown 2035

Türkiye
0 operating (0%)
4 under construction
8 new

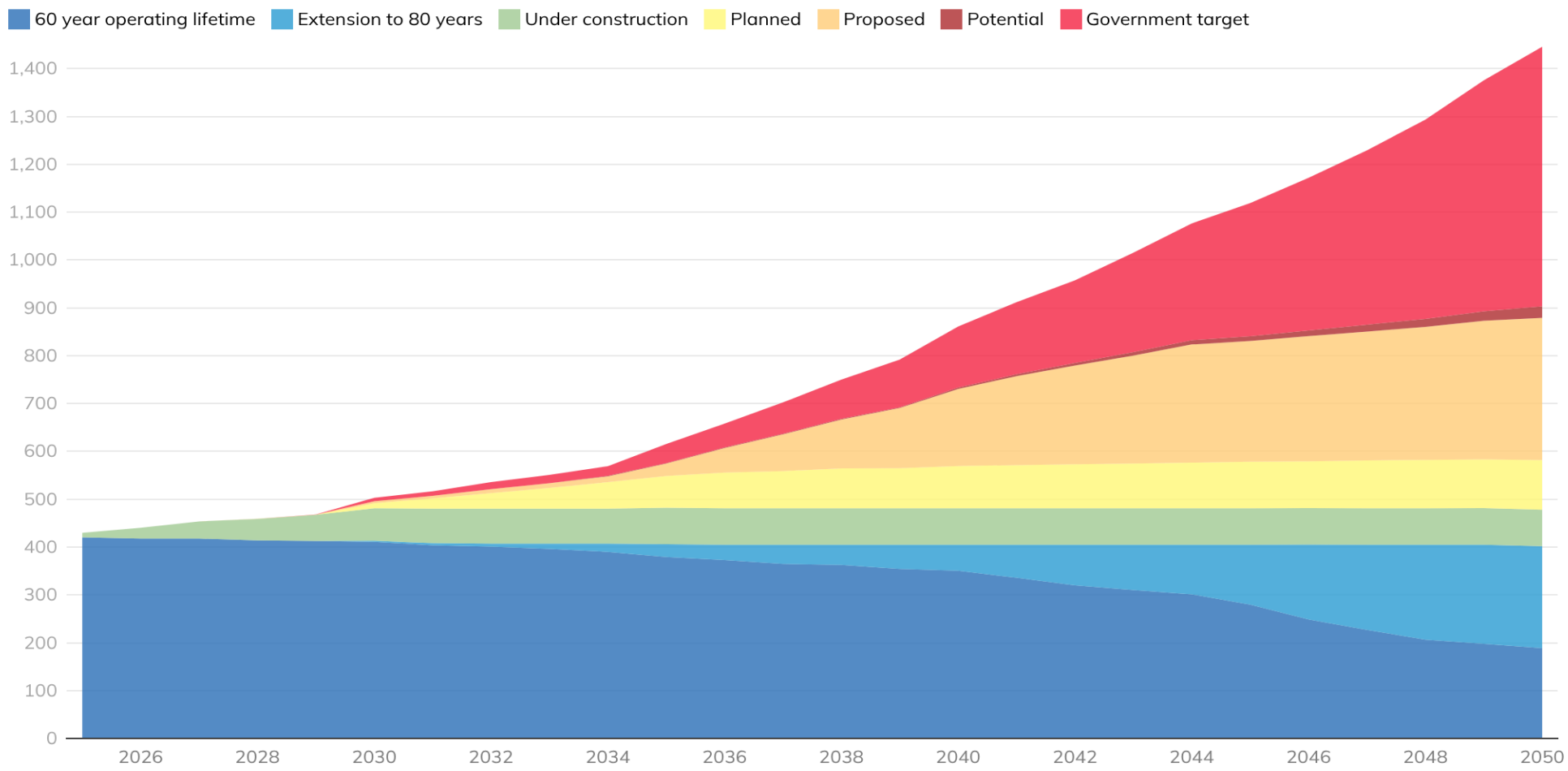
Switzerland
4 operating (40%)
0 under construction
Policy Review

Bulgaria
2 operating (33%)
0 under construction
2 by 2036



Total capacity in 2050 would reach 1446 GWe by 2050, surpassing the approximately 1200 GWe target established under the ***Declaration to Triple Nuclear Energy***, if national goals and targets are met.

World Nuclear Outlook Report, Jan 2026



© World Nuclear Association 2025

WORLD NUCLEAR ASSOCIATION

Nuclear Power in CEZ Group
Current Production and Further Development

Nuclear portfolio in 2025

32 TWh

Gross electricity production from nuclear

63 %

Share of nuclear power in CEZ Group electricity production

4,346 MW of installed capacity

Existing power plants

Extended service life to 80 years

New large reactors project in Dukovany

CEZ holds 20% of the Dukovany II Power Plant

The majority owner is the Czech State

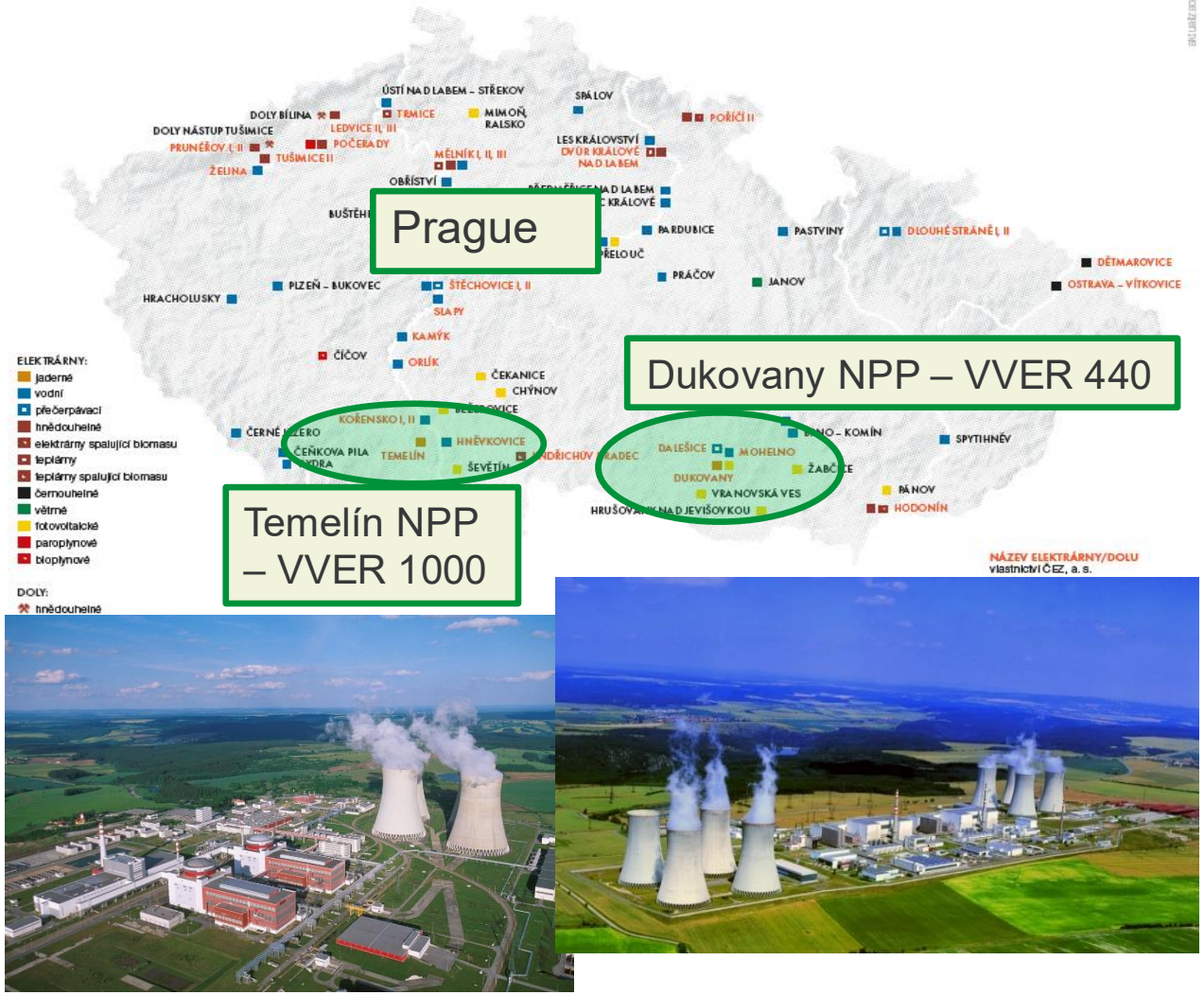
Small modular reactors

Preparation of the first SMR in Temelín site

A plan of 3,000 MW by 2050.

ČEZ GROUP – NUNCLEAR FLEET

- **Long Time Operation - lifetime 80 decided**
- **Fuel cycle extension 12 → 18 months**
- **Power uprates,**
  Temelin 981 MW → 1086 MW (1100 MW peak)
  Dukovany 440 MW → 512 MW (520 MW peak)
- Black start ready (grid recovery after blackout)



- **Reactor design**: Atomenergoprojekt / Russia
  VVER 440, type V213 (commissioning **1985-87**)
  VVER 1000 type V320 (commissioning **2000-02**)

- **Conventional island** – Energoprojekt Praha / Czech
  - Most deliveries (> 90%) - Czech companies
  - Škoda Praha, Škoda JS, Doosan Škoda Power, Vítkovice, Sigma, etc.
    (incl. reactor vessels, steam generators, turbines)

ČEZ nuclear division - safe & effective operation

Unlimited operational licence based on Atomic Act

- Periodic safery review (PSR) each 10 years (licence condition)
- Ageing management program,
- Design basis/design requirements reconstitution

  → LTO and investment program

  (E.g. Temelin I&C upgrade – Westinghouse, Dukovany electric switchboards&cables replacement)

- **Decommisioning preparation**

Nuclear Fuel Management – course to diversification

- Dukovany NPP – TVEL (Russia) deliveries till 2028
  Westinghouse contract signed 2023
  Framatome delivery
  - First deĺivery 2025, Fist load 2027
- Temelin NPP – Westinghouse/ Framatome contracts
  Westinghouse licence issued 2026
  - first fuel load in 2026



Nuclear energy could be a game changer for AI and data centers



Constellation to restart Three Mile Island unit, powering Microsoft

Constellation has signed a 20-year power purchase agreement with Microsoft that will see Three Mile Island unit 1 restarted, five years after it was shut down.

Corporate · Friday, 20 September 2024



First nuclear-powered data centre at Susquehanna completed

Talen Energy's Cumulus Data says that the powered sh… for its first 48 MW, 300,000 square foot data centre is complete and with various fibre routes in service. The data centre is powered by a direct connection to the 2.5 GW Susquehanna nuclear power station in northeast Pennsylvania.

Corporate · Wednesday, 18 January 2023

NUCOR

Google Microsoft

Google, Microsoft and Nucor team up on clean energy development

… and US tech giants Google and Microsoft Corporation are to work together across the electricity ecosystem to develop new business models and aggregate their demand for advanced clean electricity technologies, including advanced nuclear.

Energy & Environment · Wednesday, 20 March 2024

Momentum is here..

What will be our (nuclear industry) next steps??



ubitus

Japanese data centre seeks nuclear electricity supplies

The head of cloud-based gaming services provider Ubitus KK has said the Tokyo-based company is planning to construct a new data centre in Japan and is specifically looking at areas with nearby nuclear power plants.

Corporate · Friday, 18 October 2024

Investing in the clean energy future.

ENERGY NORTHWEST amazon energy

Amazon invests in X-energy, unveils SMR project plans

Amazon has announced it has taken a stake in advanced nuclear reactor developer X-energy, with the goal of deploying up to 5 GW of its small modular reactors in the USA by 2039.

New Nuclear · Wednesday, 16 October 2024

Google

Kairos Power

Google and Kairos Power team up for SMR deployments

Google has agreed to purchase energy from small modular reactors under a deal that will support the first commercial deployment of Kairos Power's reactor by 2030 and a fleet totalling 500 MW of capacity by 2035.

Corporate · Tuesday, 15 October 2024

Typical Power Densities

- Traditional Data Center: 4 to 6 kW per rack
- Cloud Service Providers: 10 to 14 kW per rack
- High-density AI: more than 20 kW per rack