WORLD NUCLEAR ASSOCIATION

International Nuclear Energy Symposium

Agneta Rising, Director General

18 May 2015

WORLD NUCLEAR ASSOCIATION

Nuclear Power Plants under Construction

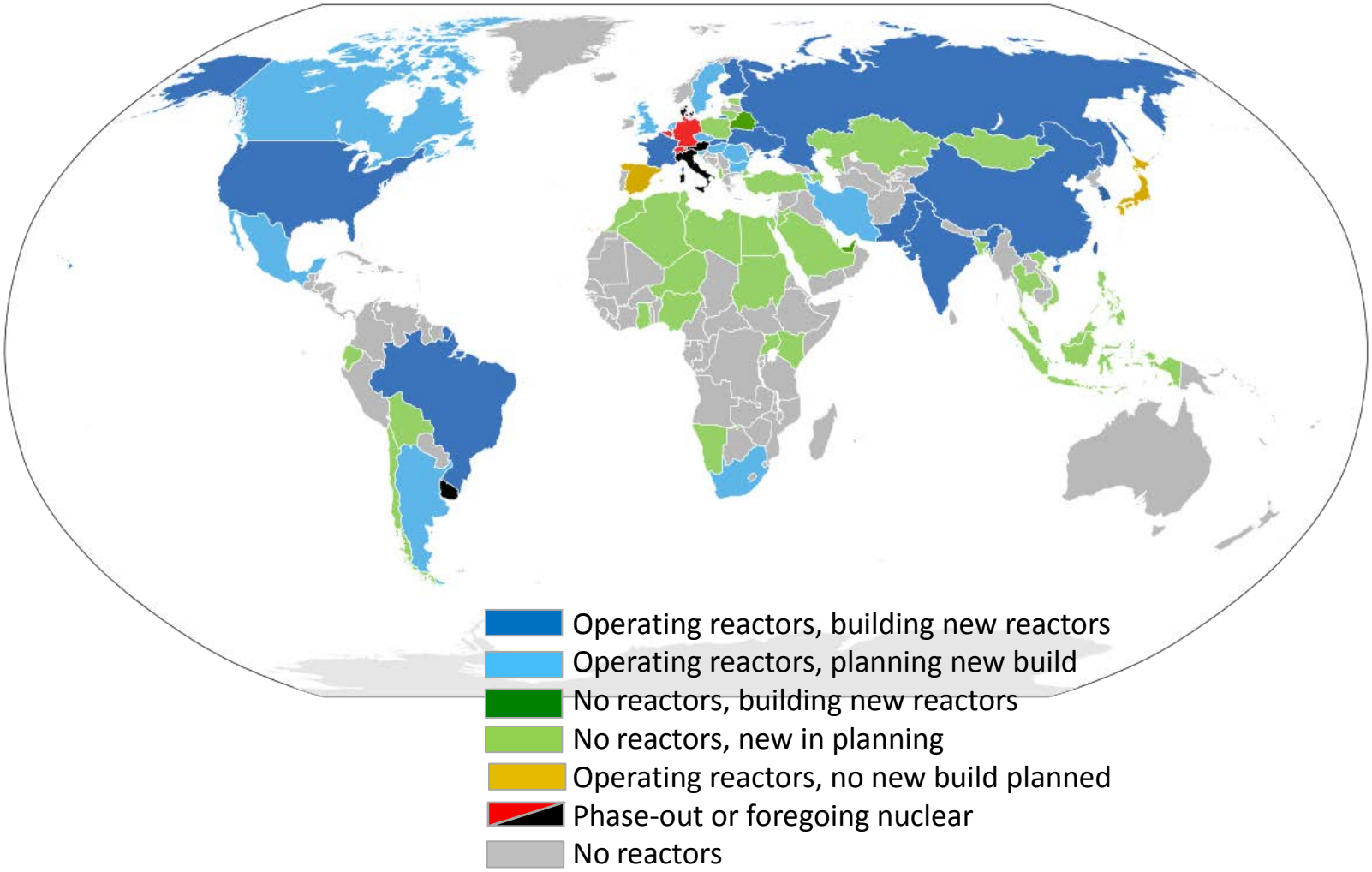
Strongest in 25 years – but not fast enough

Location	No. of units	Net capacity (MW)
Argentina	1	25
Belarus	2	2 218
Brazil	1	1 245
China	23	22 738
Finland	1	1 600
France	1	1 630
India	6	3 907
Japan	2	1 325
Korea	4	5 360
Pakistan	2	630
Russia	9	7 371
Slovak Republic	2	880
Ukraine	2	1 900
United Arab Emirates	3	4 035
United States	5	5 633
***Other:* Chinese Taipei**	2	2 600
TOTAL:	**71**	**68 136**

Source: IAEA May 2015

WORLD NUCLEAR ASSOCIATION

Global Nuclear Status



WORLD NUCLEAR ASSOCIATION

Nuclear energy must more than double worldwide

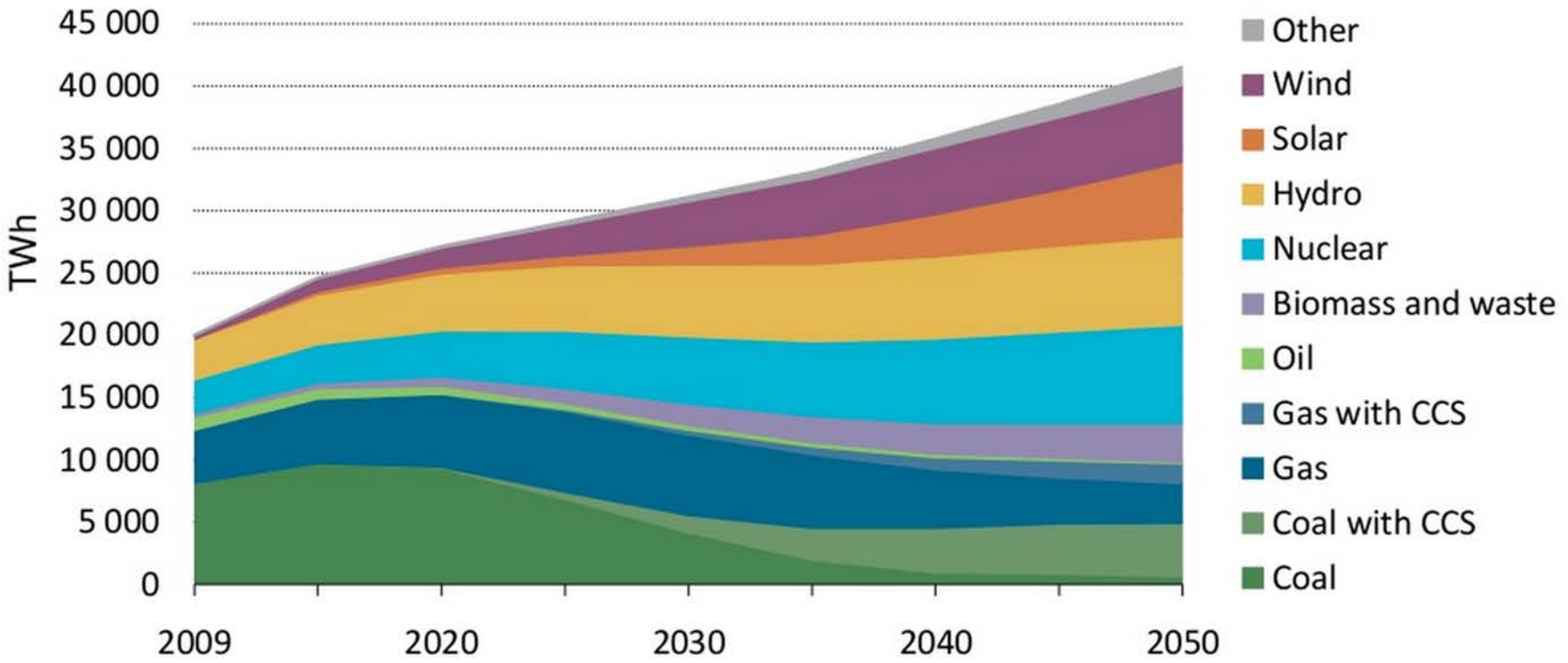
"The contributions of nuclear energy - providing valuable base-load electricity, supplying important ancillary services to the grid and contributing to the security of energy supply - must be fully acknowledged“

“Global capacity (of nuclear) must **more than double**, with **nuclear supplying 17% of global electricity generation in 2050**, to meet the IEA 2 Degree Scenario for the most effective and efficient means of limiting global temperature rise to the internationally agreed maximum.”

International Energy Agency

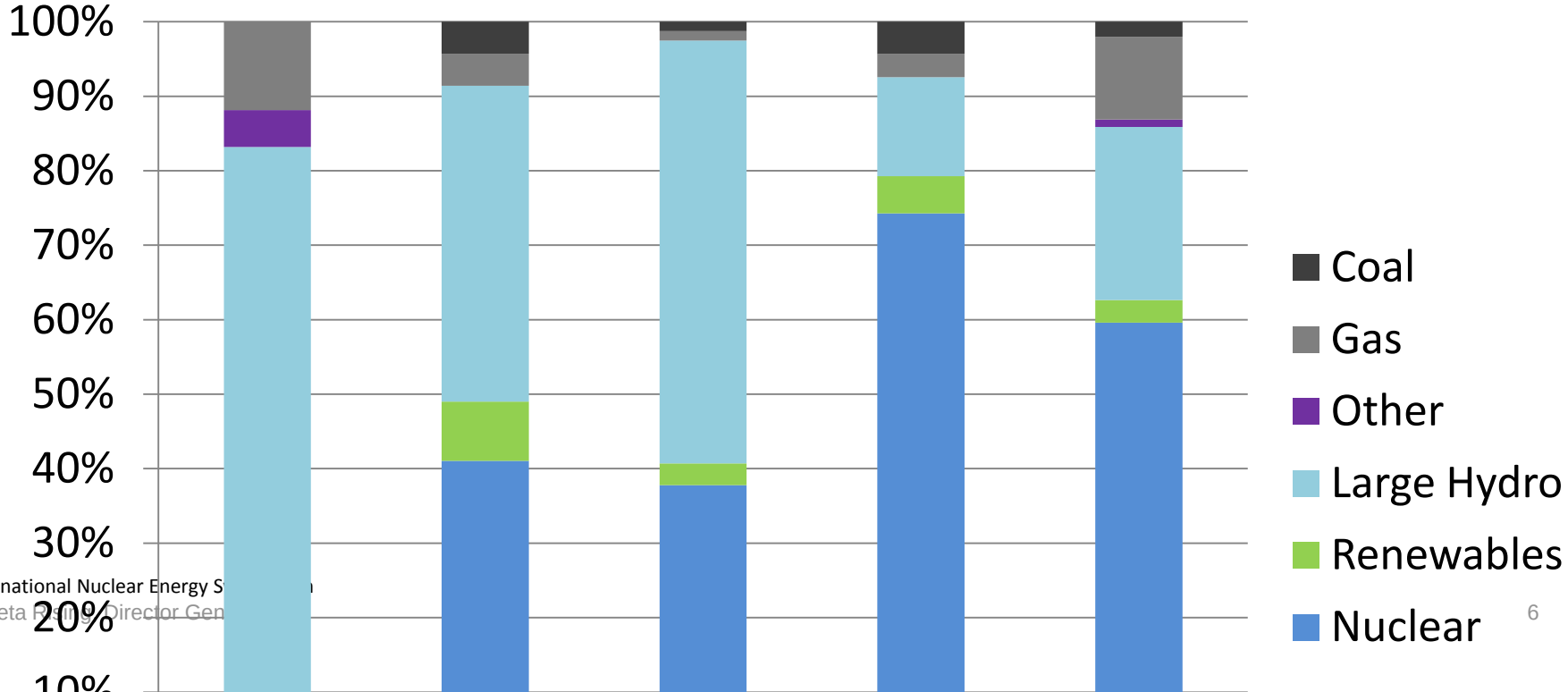
WORLD NUCLEAR ASSOCIATION

IEA 2°C Scenario: Nuclear is Required to Provide the Largest Contribution to Global Electricity in 2050



WORLD NUCLEAR ASSOCIATION

Nuclear is an important part of the low carbon solution



WORLD NUCLEAR ASSOCIATION

Governments investing in nuclear: important long-term factors

Environment

Industry

Jobs

Energy Independence

WORLD NUCLEAR ASSOCIATION

Public acceptance
Communicating radiation home truths

Radiation health impacts of nuclear accidents have been small.
Real consequences have been made worse by fear-mongers.

UNSCEAR

UNSCEAR on Chernobyl:

- 30 workers dead from radiation
- Increase in thyroid cancers among children. Few fatalities
- No demonstrated increase in other cancers in public

"However there were widespread psychological reactions to the accident, which were due to fear of the radiation, not to the actual radiation doses"

"A new Greenpeace report has revealed that the full consequences of the Chernobyl disaster could top a quarter of a million cancer cases and nearly 100,000 fatal cancers."

WORLD NUCLEAR ASSOCIATION

Fukushima - the real impact from radiation exposure

The doses to the general public, both those incurred during the first year and estimated for their lifetimes, are generally low or very low.

No discernible increased incidence of radiation-related health effects are expected among exposed members of the public or their descendants.

Source: UNSCEAR, United Nations Scientific Committee on the Effects of Atomic Radiation

WORLD NUCLEAR ASSOCIATION

Public support can return

1979 Three Mile Island, United States

Since TMI public support has gradually increased, so there is now a clear majority in favour of nuclear.

1986 Chernobyl, Ukraine

Public support for nuclear has returned in Ukraine, driven by priority to get fuel security and clean environment.

2011 Fukushima, Japan

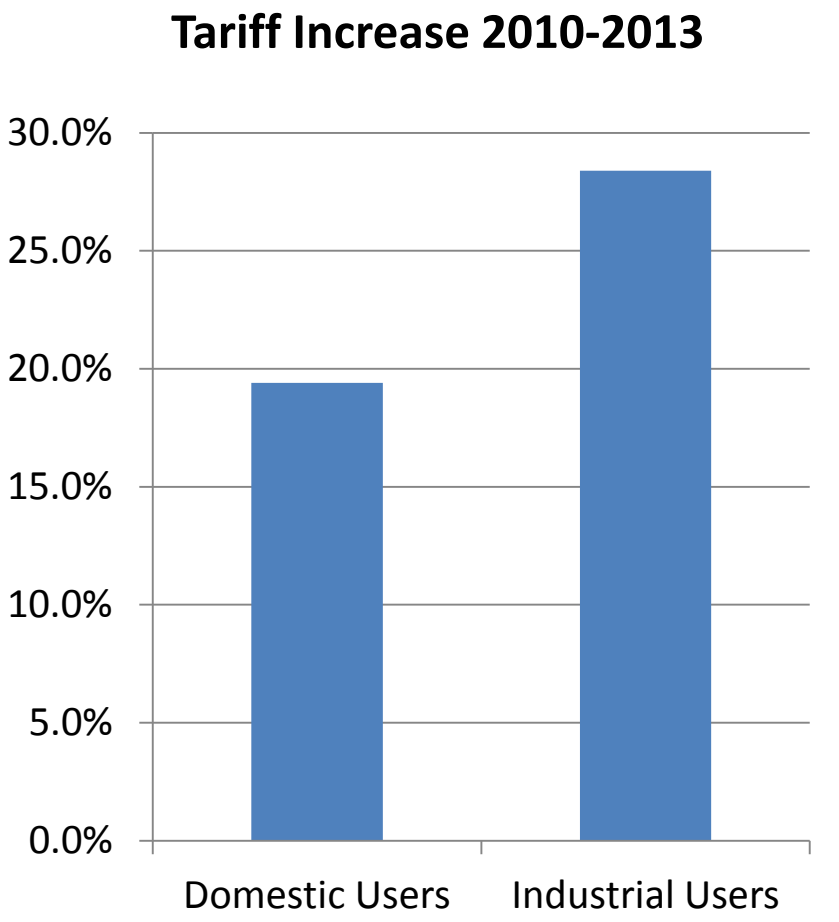
Public support can be regained. Approval for reactor restart will demonstrate industry and regulators have learnt and improved.

WORLD NUCLEAR ASSOCIATION

Nuclear provides fuel security

¥3.6 trillion ($35.2 billion)

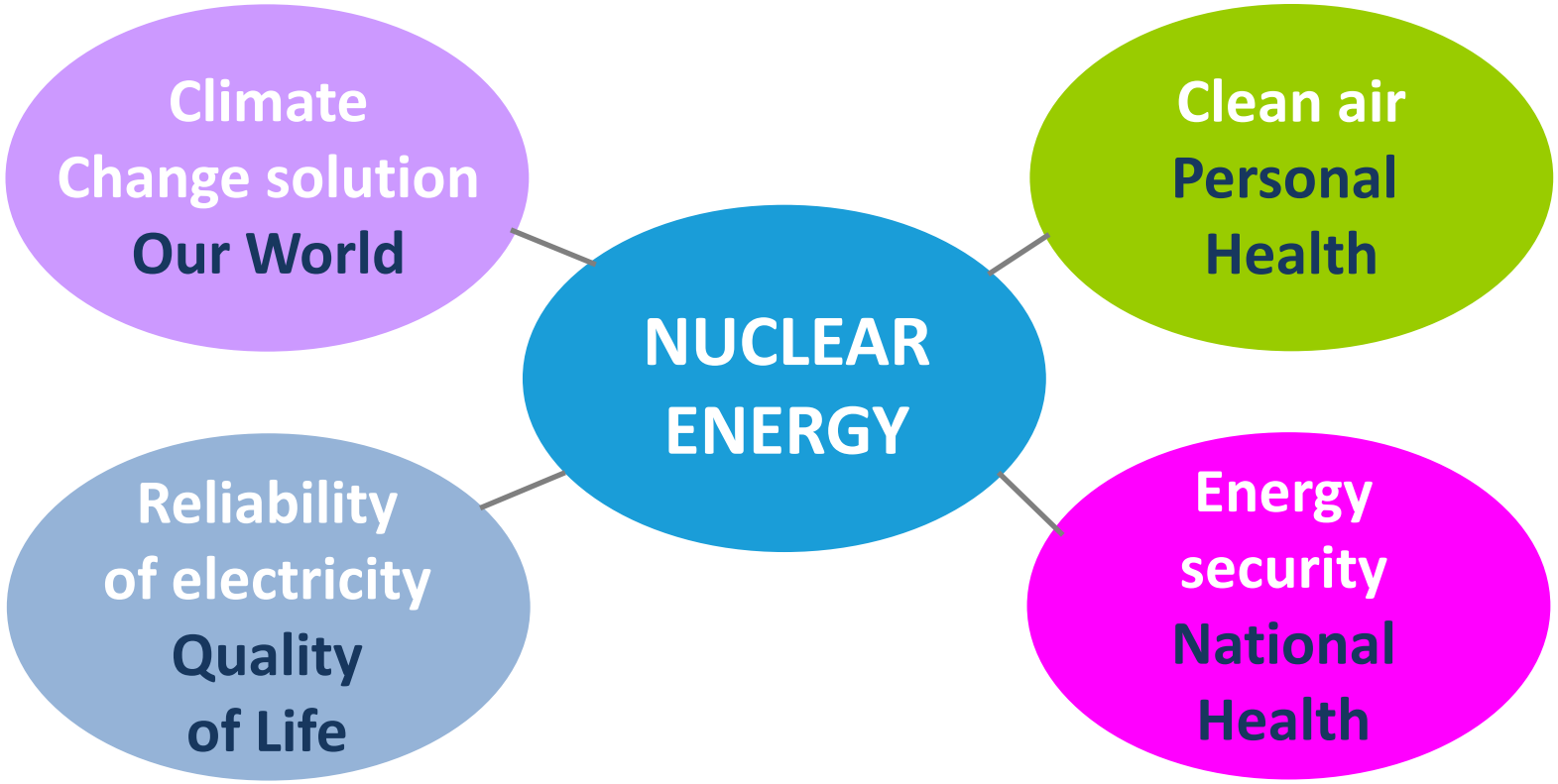
Cost of fossil fuel imports to compensate for idled nuclear reactors in fiscal 2013



Percentage Increase in Electricity Tariffs from Fiscal 2010-2013

WORLD NUCLEAR ASSOCIATION

Benefits of Nuclear Energy
Values from different perspectives

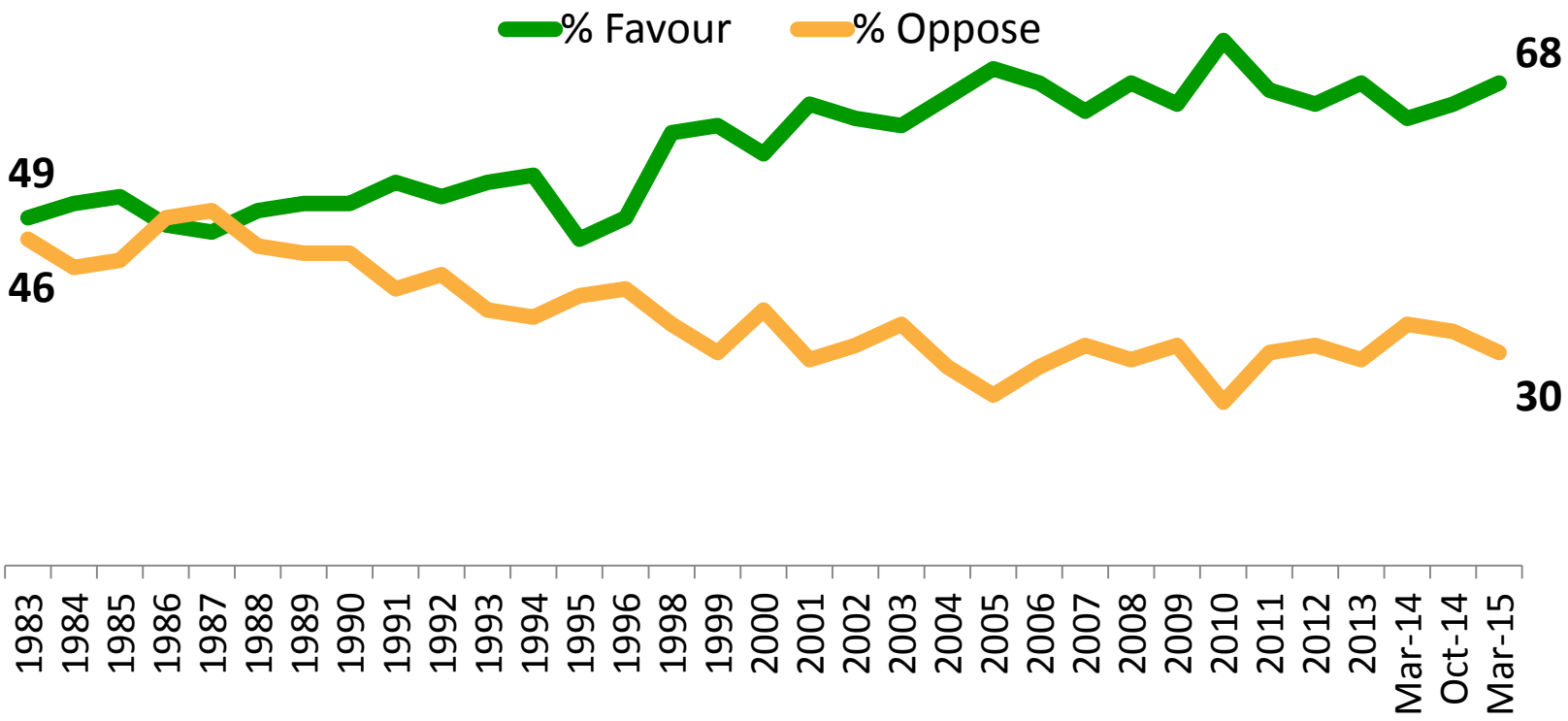


WORLD NUCLEAR ASSOCIATION

Spiral of Silence: the Perception Gap

WORLD NUCLEAR ASSOCIATION

Public Opinion in United States

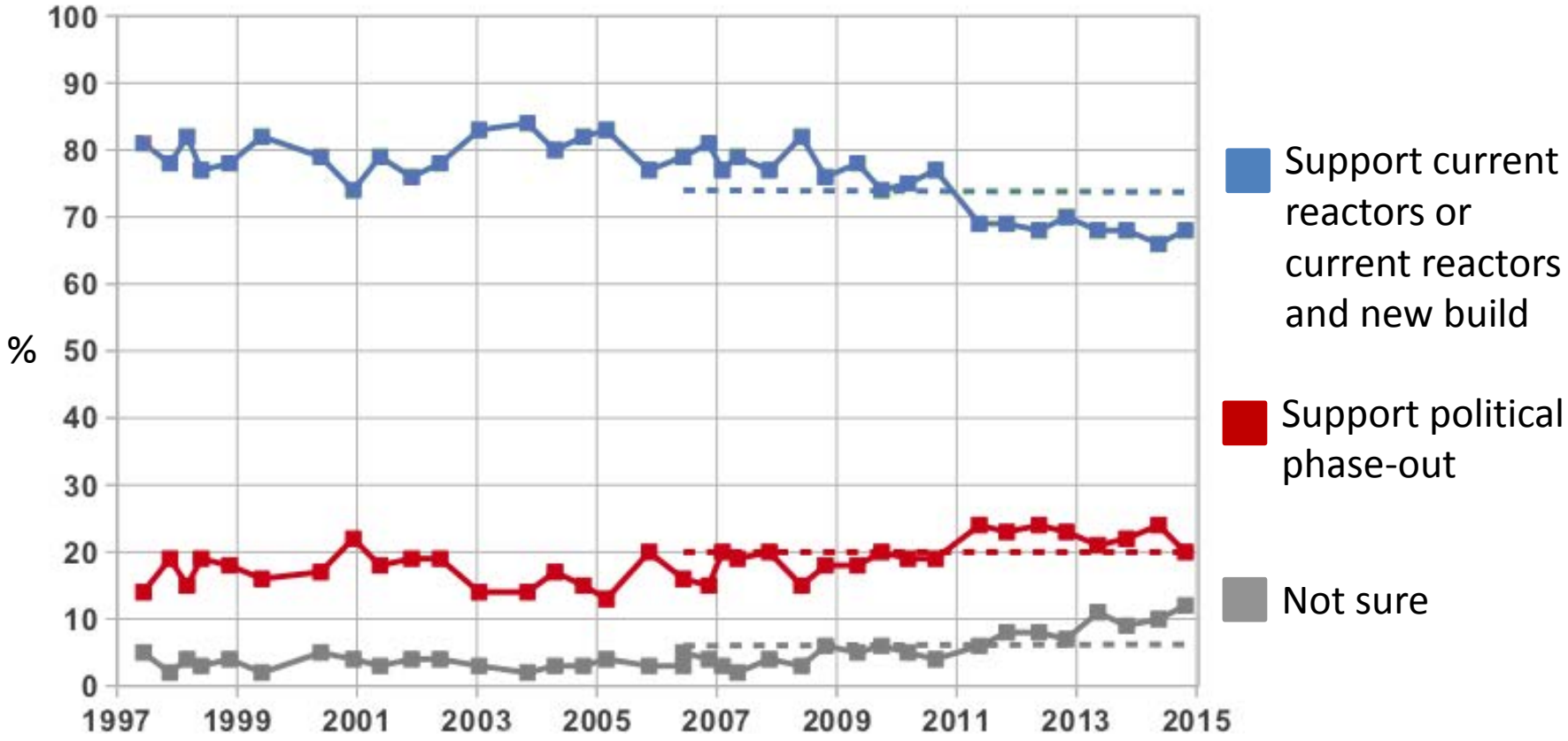


Overall, do you strongly favour, somewhat favour, somewhat oppose, or strongly oppose the use of nuclear energy as one of the ways to provide electricity in the United States?

Bisconti Research, Inc. with GfK Roper and Quest Global Research

WORLD NUCLEAR ASSOCIATION

Public Opinion in Sweden



WORLD NUCLEAR ASSOCIATION

Swedish Policy Journey
From Phase Out to Support

- 1980 Swedish Nuclear Referendum
- Three options for a nuclear phase-out.
- No pro-nuclear option was offered.
- Government introduced policy banning new nuclear build and a decision to phase-out existing reactors by 2010.
- Policy cancelled in 2010.
- Only two of twelve units had been closed.

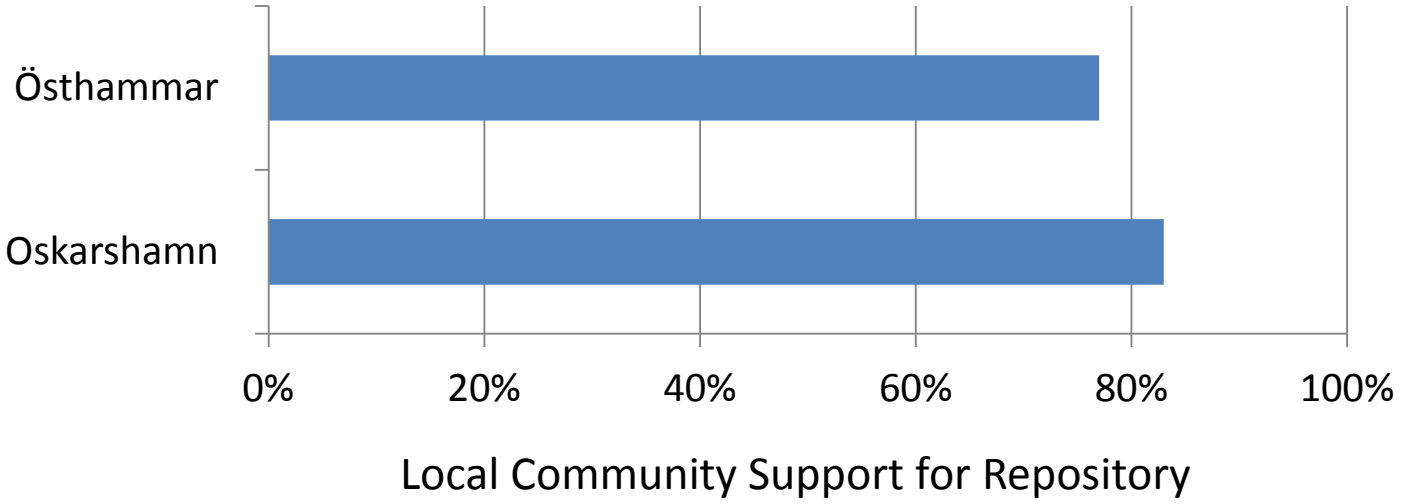
WORLD NUCLEAR ASSOCIATION

Swedish Public Journey
From fear of waste to Hosts of Repository

- Nuclear waste disposal is portrayed as insoluble.
- Deep geological repositories are an accepted technical solution, supported by scientific studies, for used fuel and high-level waste disposal
- Support from politicians and local communities is needed for construction of repositories.

Swedish Repository

- Feasibility studies selected two candidate locations, Oskarshamn and Östhammar.
- Transparent dialogue with local communities and other stakeholders was key to build support.



Swedish Repository

- The two communities competed to be the host of the repository.
- Östhammar was chosen, Oskarshamn received funding to compensate for missing out on the opportunities of hosting the repository.

Östhammar Repository mock-up: SKB

WORLD NUCLEAR ASSOCIATION

What is important for a government to return to nuclear

Environment

Industry

Jobs

Energy Independence

WORLD NUCLEAR ASSOCIATION

What is important for a government to return to nuclear

WORLD NUCLEAR ASSOCIATION

Gaining Support for Japanese Restarts

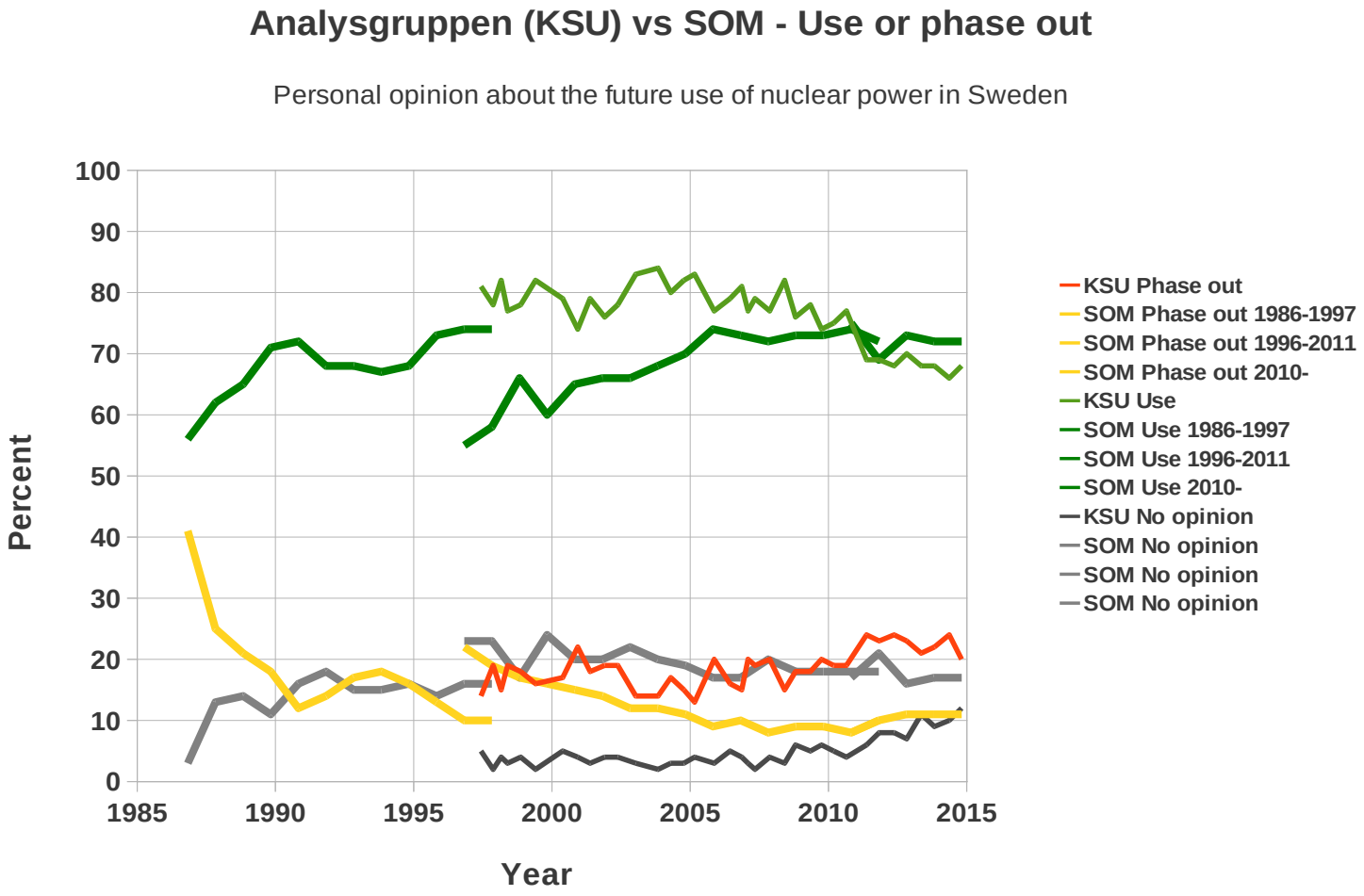
- Understand and acknowledge people's concerns. Do not dismiss them. Build trust to build credibility.
- Address the emotive issues before trying to present facts on why restart should happen and why it is safe to do so.

WORLD NUCLEAR ASSOCIATION

Gaining Support for Japanese Restarts

- Explain how the restart will benefit them.
- Involve men and women, young and old.
- The people representing the nuclear industry should be as diverse as the communities they are meeting.

WORLD NUCLEAR ASSOCIATION



WORLD NUCLEAR ASSOCIATION

Rebuilding the public trust

- Two-way communication
- Specialists talk with the concerned people
- Go step by step

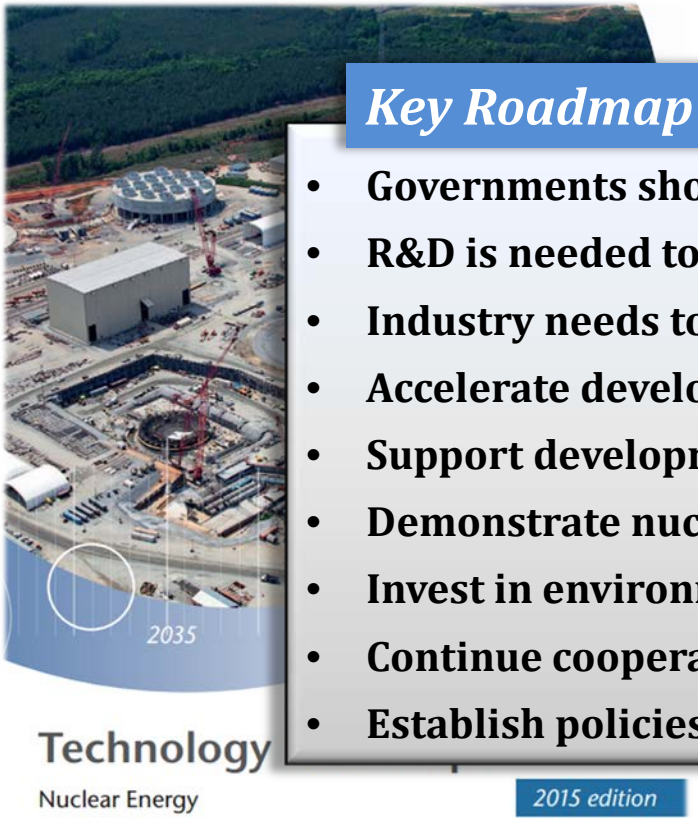
WORLD NUCLEAR ASSOCIATION

Report Conclusions and Key Messages

- NEA countries' nuclear plants are safe to continue operation.
- Safety enhancements related to extreme events and severe accidents were identified and are being implemented.
- Provisions for dealing with and managing radiological emergencies, onsite and offsite, must be planned, tested and regularly reviewed.
- Nuclear safety professionals have a responsibility to hold each other accountable to effectively implement nuclear safety practices.
- The Fukushima accident revealed significant human, organisational and cultural challenges — especially ensuring the independence, technical capability and transparency of the regulatory authority.

WORLD NUCLEAR ASSOCIATION

2015 NEA/IEA Technology Roadmap



Key Roadmap Recommendations

- **Governments should recognize the value of low-carbon capacity.**
- **R&D is needed to support long-term operation.**
- **Industry needs to optimise constructability of Gen III designs.**
- **Accelerate development of SMRs.**
- **Support development of one or two Gen IV reactors.**
- **Demonstrate nuclear desalination or hydrogen production.**
- **Invest in environmentally sustainable uranium mining.**
- **Continue cooperation and discussions on international fuel services.**
- **Establish policies and sites for long-term storage and disposal.**

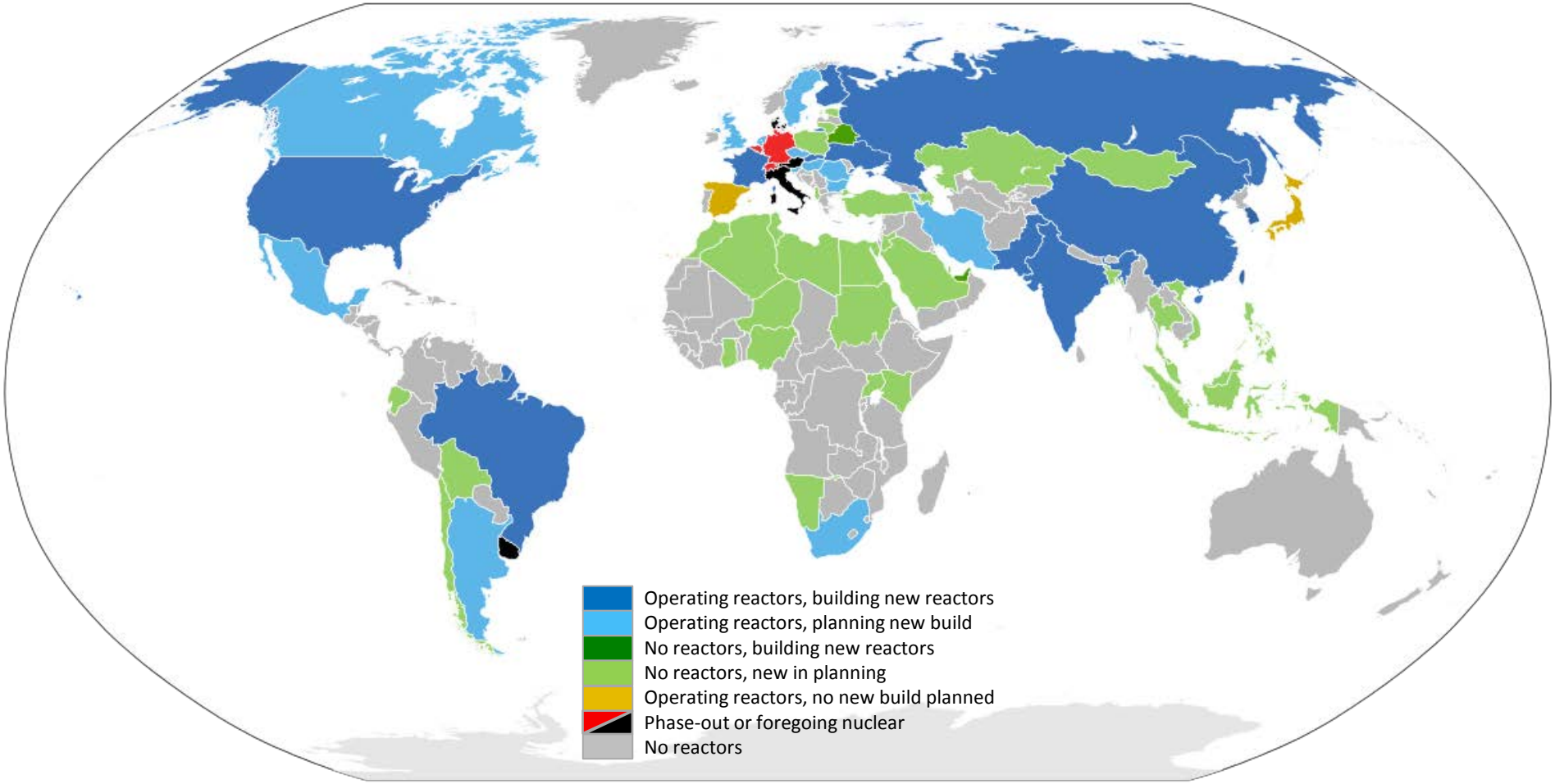
NEA Nuclear Energy Agency

International Energy Agency
Secure • Sustainable • Together

Agneta Rising, Director General

WORLD NUCLEAR ASSOCIATION

Global View of Nuclear Power Today



International Nuclear Energy Symposium
Agneta Rising, Director General

Source data: World Nuclear Association
Update 2015

Contact: report@tky.ieej.or.jp