IAEA
International Atomic Energy Agency

FISA 2019 • EURADWASTE '19

9th European Commission Conferences on EURATOM Research and Training in
Safety of Reactor Systems Radioactive Waste Management

Research and Innovation for a Safe and Secure Nuclear Power in Support of the UN Sustainable Development Goals

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International Atomic Energy Agency

IAEA & UN Sustainable Development Goals

Affordable energy reduces poverty (SDG1) and inequality (SDG10), and supports health (SDG3), education (SDG4), industry (SDG9) and economic growth (SDG8)

Energy for all fosters peace, justice (SDG16), and partnerships (SDG17)

Sustainable energy is crucial for climate action (SDG13), ecosystems (SDG14, 15), agriculture (SDG2), water (SDG6, 14), and reducing waste (SDG12)

Reliable energy is essential for industry (SDG9), agriculture (SDG2), health (SDG3) and education (SDG4)

Modern energy supports clean communities (SDG11), health (SDG3), and gender equality (SDG5)

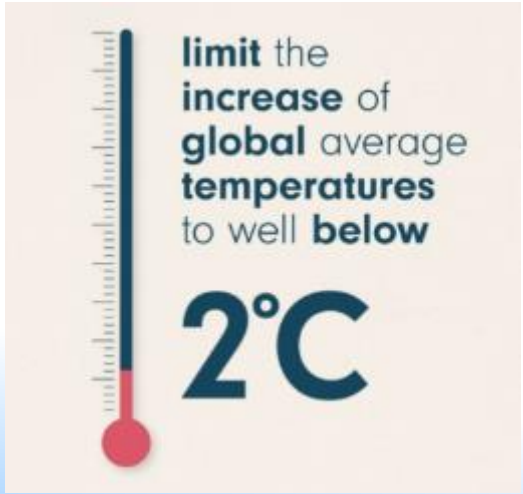
Clean Energy: Affordable, Reliable, Sustainable, Modern and for All

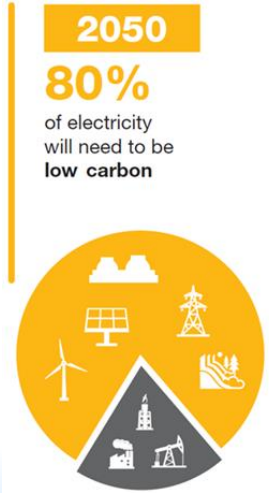
Challenge

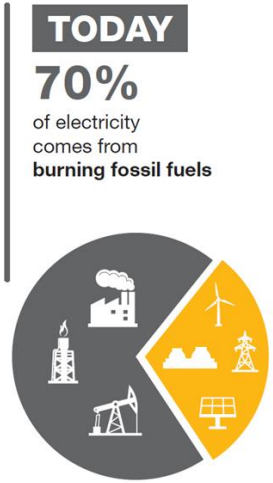

7
AFFORDABLE AND CLEAN ENERGY

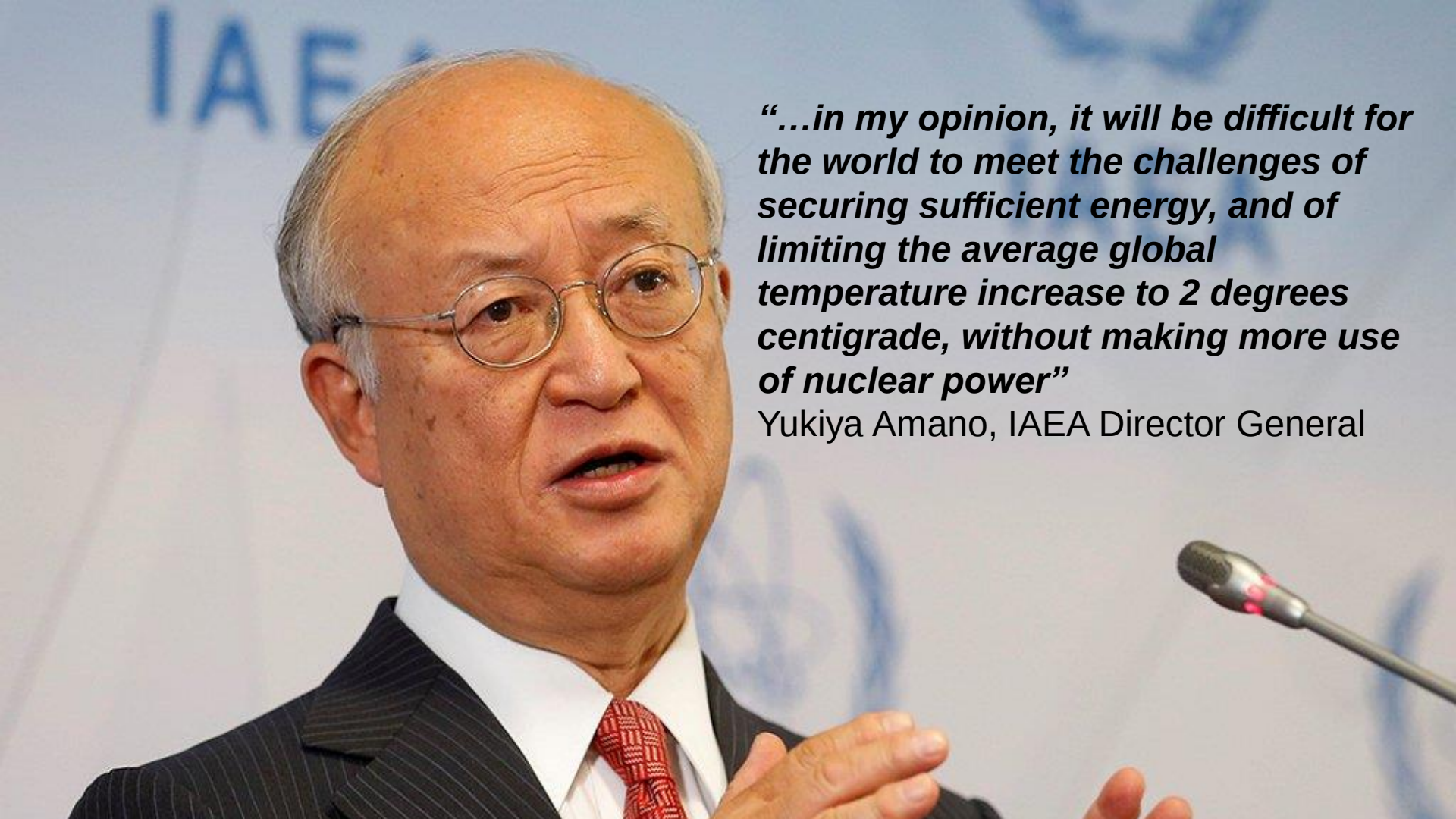

9
INDUSTRY, INNOVATION AND INFRASTRUCTURE


13
CLIMATE ACTION


limit the increase of global average temperatures to well below
2°C


2050
80%
of electricity will need to be low carbon

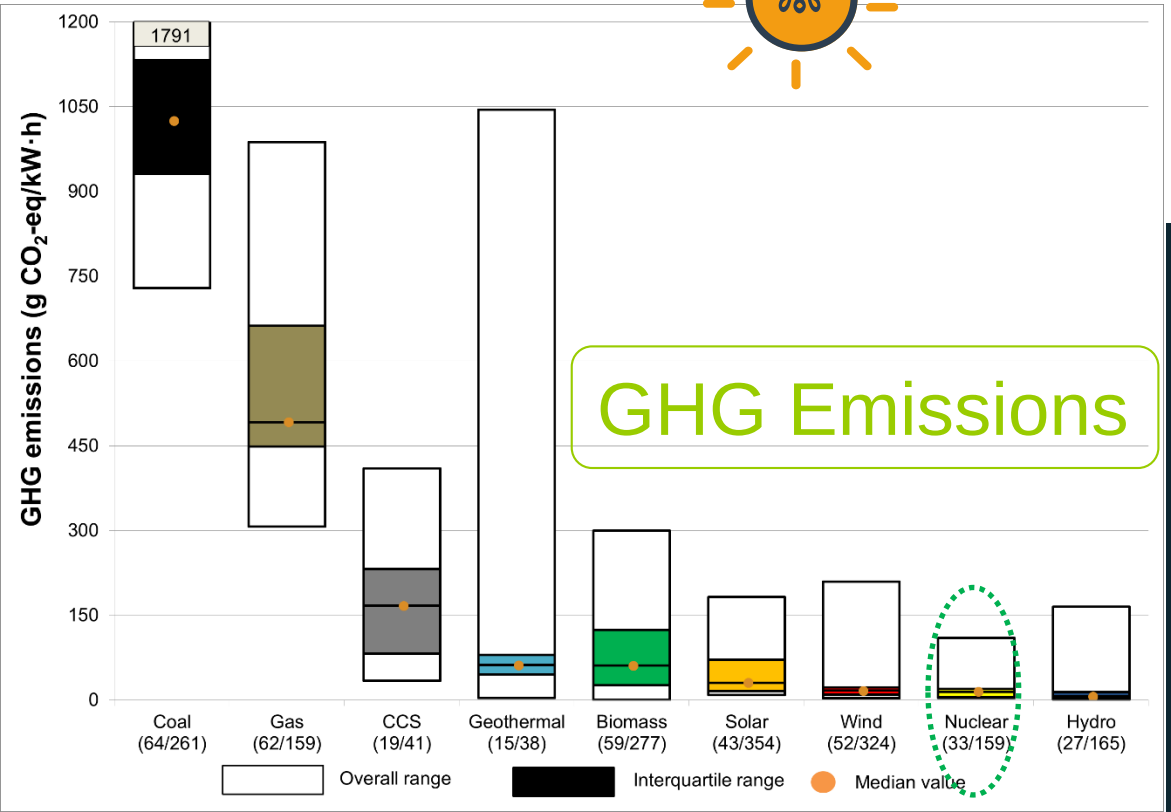

TODAY
70%
of electricity comes from burning fossil fuels



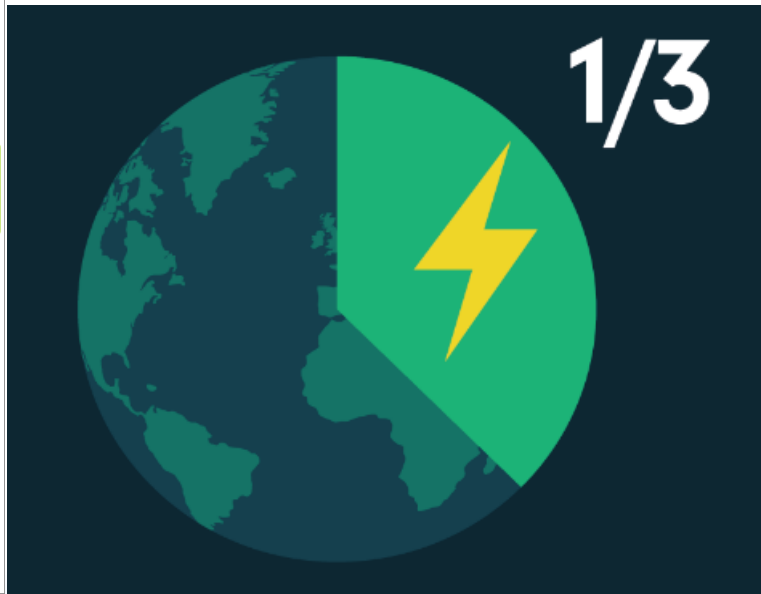
"…in my opinion, it will be difficult for the world to meet the challenges of securing sufficient energy, and of limiting the average global temperature increase to 2 degrees centigrade, without making more use of nuclear power"

Yukiya Amano, IAEA Director General

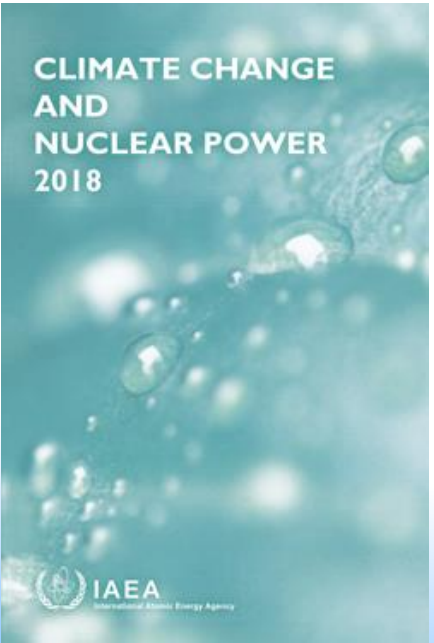
Nuclear Power & GHG Emissions



Low carbon electricity

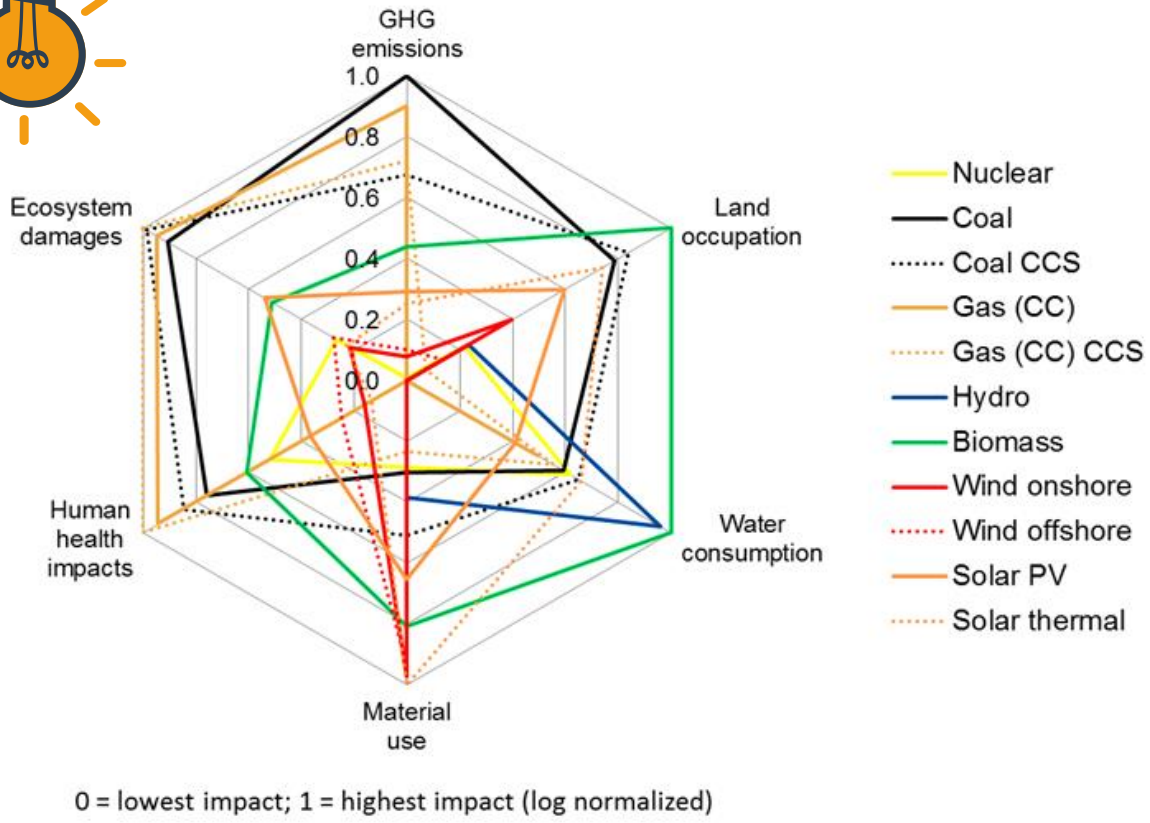


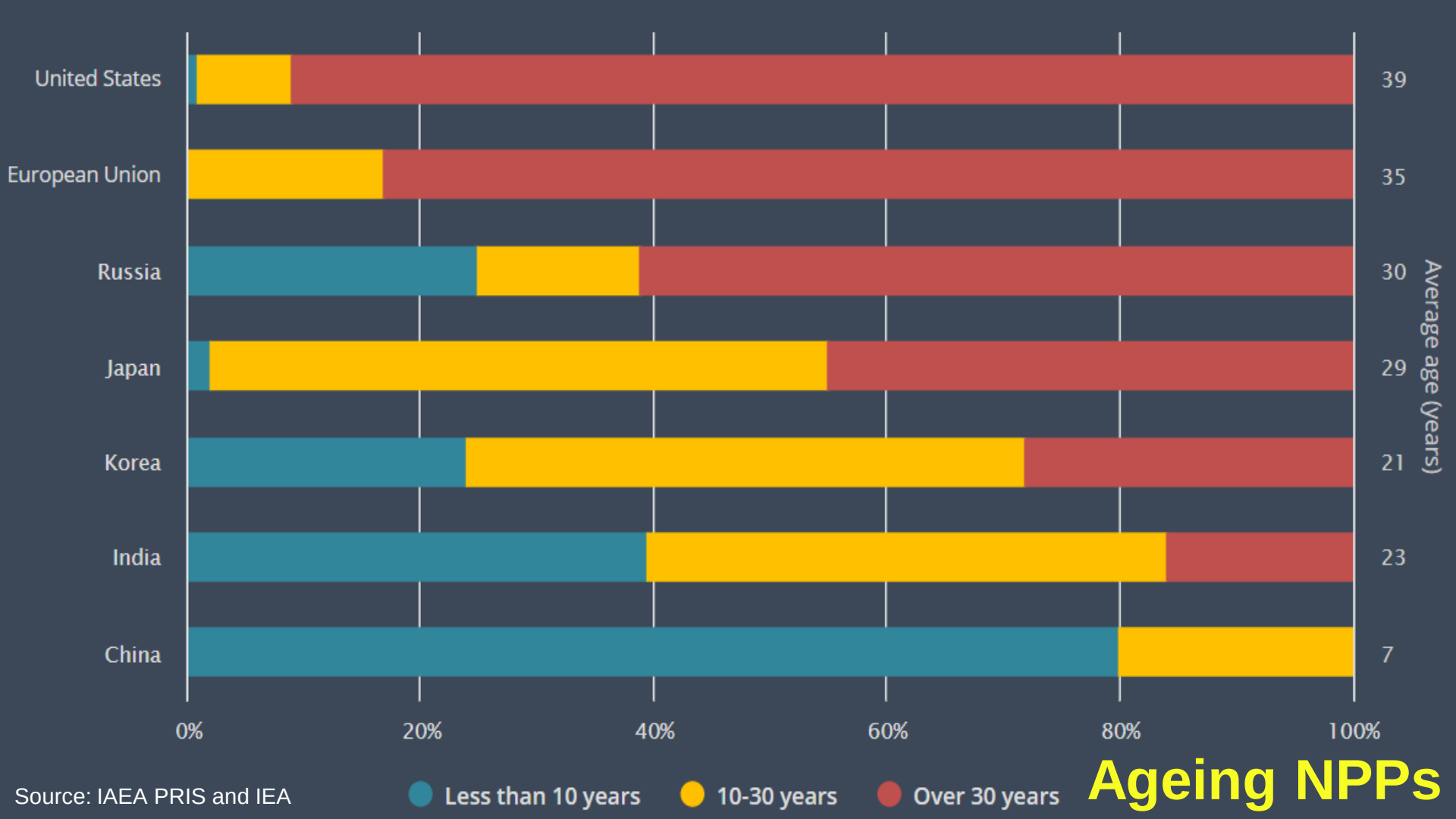
Nuclear Power & Sustainability



Impact

Innovation is key for the expanded role of nuclear power

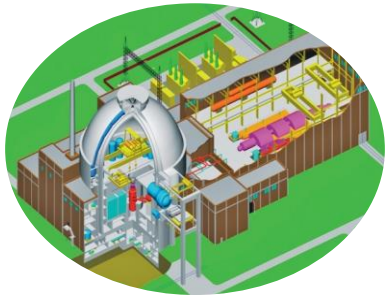



United States
European Union
Russia
Japan
Korea
India
China
39
35
30
29
21
23
7
Average age (years)
0%
20%
40%
60%
80%
100%
Less than 10 years
10-30 years
Over 30 years
Source: IAEA PRIS and IEA
Ageing NPPs

IAEA support of technical innovations to improve existing NPP fleet sustainability

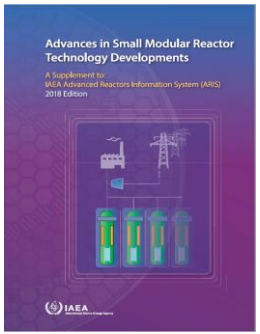
- Non-Baseload operation
- Transitioning toward a future integrated grid
  - Energy storage, H2 production, district heating and other examples of loosely integrated energy systems relevant to the current fleet of reactors
- Modernization
  - Deployment of wireless technology (CRP completed)
  - Digitalization (TWG-NPPI&C)
  - Condition-based monitoring and maintenance (TWG-NPPLM)
  - Innovative human-factors engineering
- Overcoming supply-chain atrophy
  - Additive manufacturing
  - Innovations to improve procurement and supply logistics
- International Partnership: Innovation for the future of Nuclear Energy, A Global Forum 10-12 June, Gyeongju, South Korea

Advanced Reactors - Fuel Cycles - Waste Management
An holistic view, from the start.



SMRs

EVOLUTIONARY



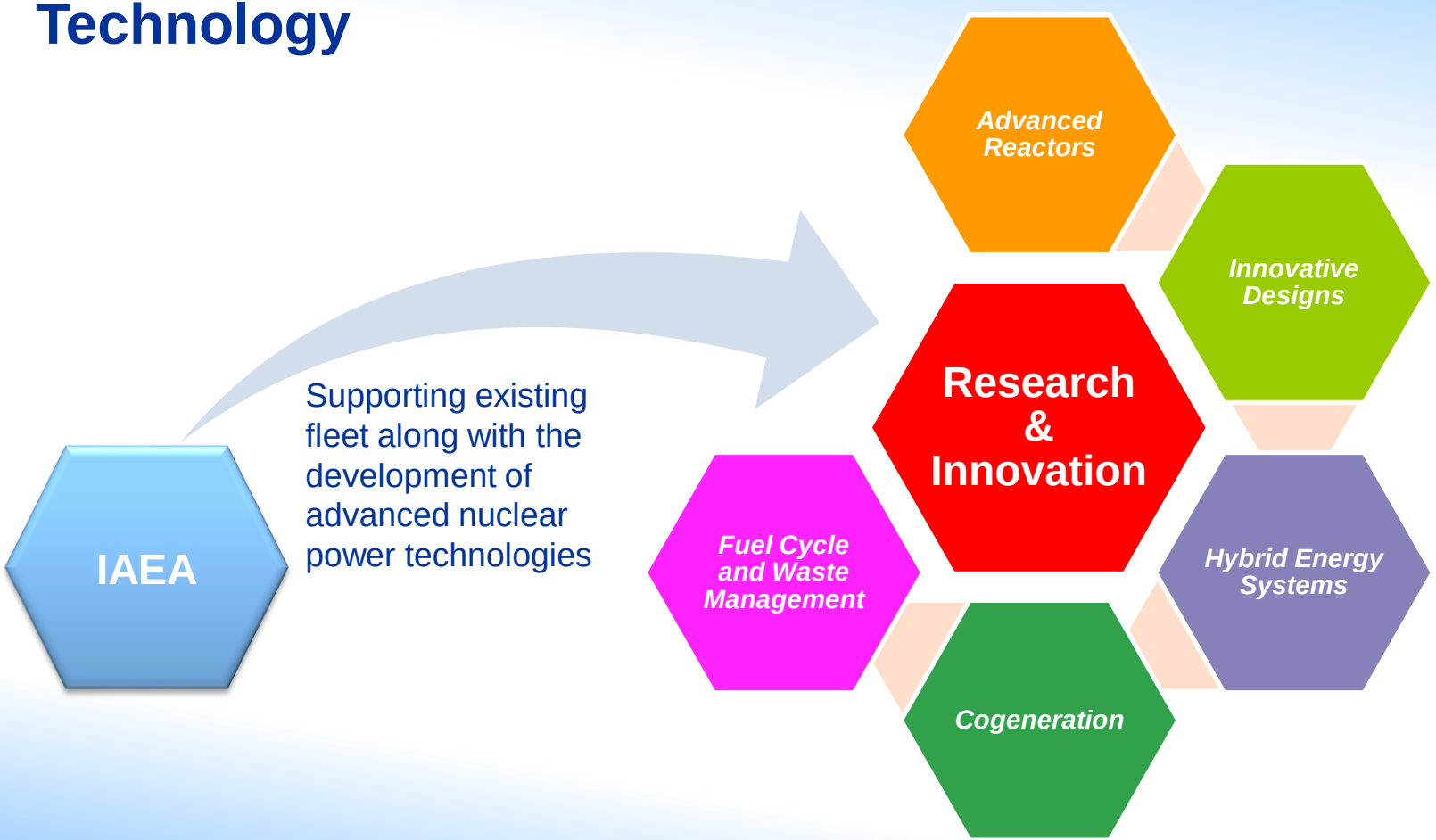
INNOVATIVE

Increasing focus to develop IAEA guidance regarding RWM, SNF and Decommissioning considerations during the design phase of new reactors, fuel types and advanced fuel cycles

IAEA Support for Advanced Nuclear Power Technology

IAEA

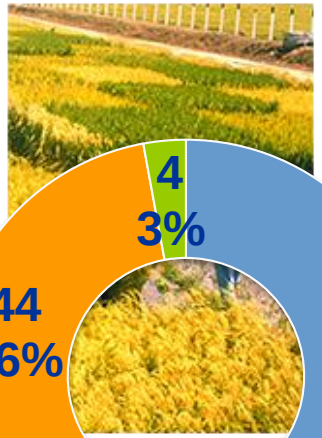
Supporting existing fleet along with the development of advanced nuclear power technologies



Supporting tools for Research and Innovation

Coordinated Research Activities

Uniting the World through Research



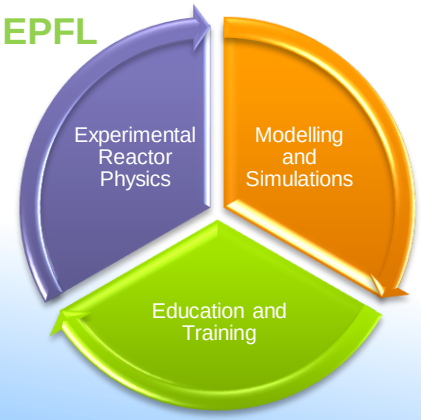
~130 active CRPs (30 in NE), ~1600 research institutions involved

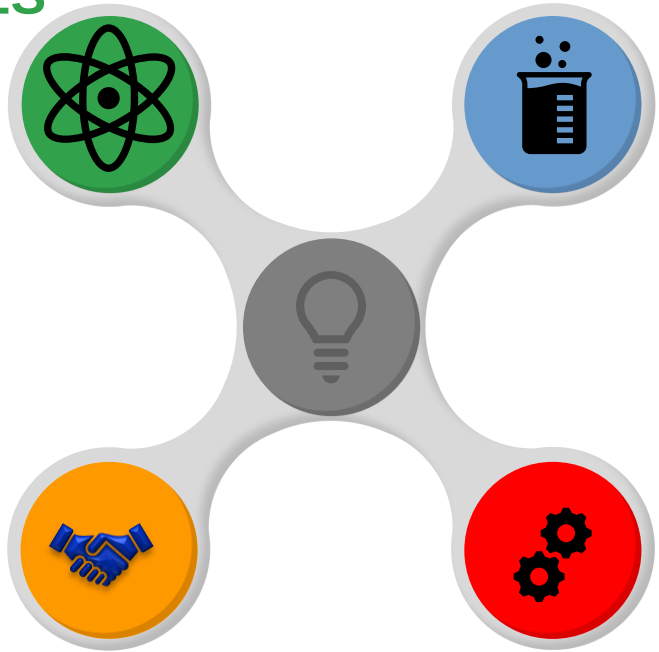
Supporting tools for Research and Innovation

Safety for Innovative NES

- SDC and SDG for FR and HTGR
- SMR Regulators' Forum
- Cooperation with GIF & NEA

Collaborating Centres





CRPs

- Advanced Reactors
- Non Electrical Applications
- ATF
- Fuel Cycle and Waste Technology
- Research Reactors
- NE & Climate Change Mitigation Strategies

Database and Toolkits

- Nuclear Data Libraries
- ARIS, PRIS, THERPRO, LMFNS
- SF and Waste Information Tool
- Toolkits for non-electric applications
- Knowledge Preservation Portals
- Simulators

Global Scenario

- Scenario modelling, decision analysis and road-mapping tools

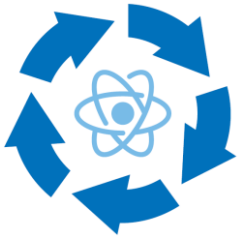
01

Collaborative Projects

02

- Investigate innovations in selected nuclear energy technologies, related R&D
- Innovative institutional arrangements to facilitate their development and deployment.

INPRO



Sustainability assessment & strategies

- Nuclear Energy System Assessment (NESA) using the INPRO Methodology

03

Dialogue and Outreach

04

- INPRO Dialogue Forum
- Regional Trainings

International Conference on

Climate Change and the Role of Nuclear Power

7–11 October 2019
Vienna, Austria

1. Advancing energy policies that achieve the climate change goals
2. The increasing contribution of nuclear power in the mitigation of climate change, including synergies with other low-carbon power generation sources
3. Development and deployment of advanced nuclear power technologies to increase the use of low-carbon energy
4. Shaping the future of the nuclear industry in regulated and deregulated energy markets to address climate change
5. Enhancing international cooperation and partnership in nuclear power deployment
6. Public and non-nuclear stakeholders' perception of the role of nuclear power in climate change mitigation

#Atoms4Climate
Atoms4Climate@iaea.org

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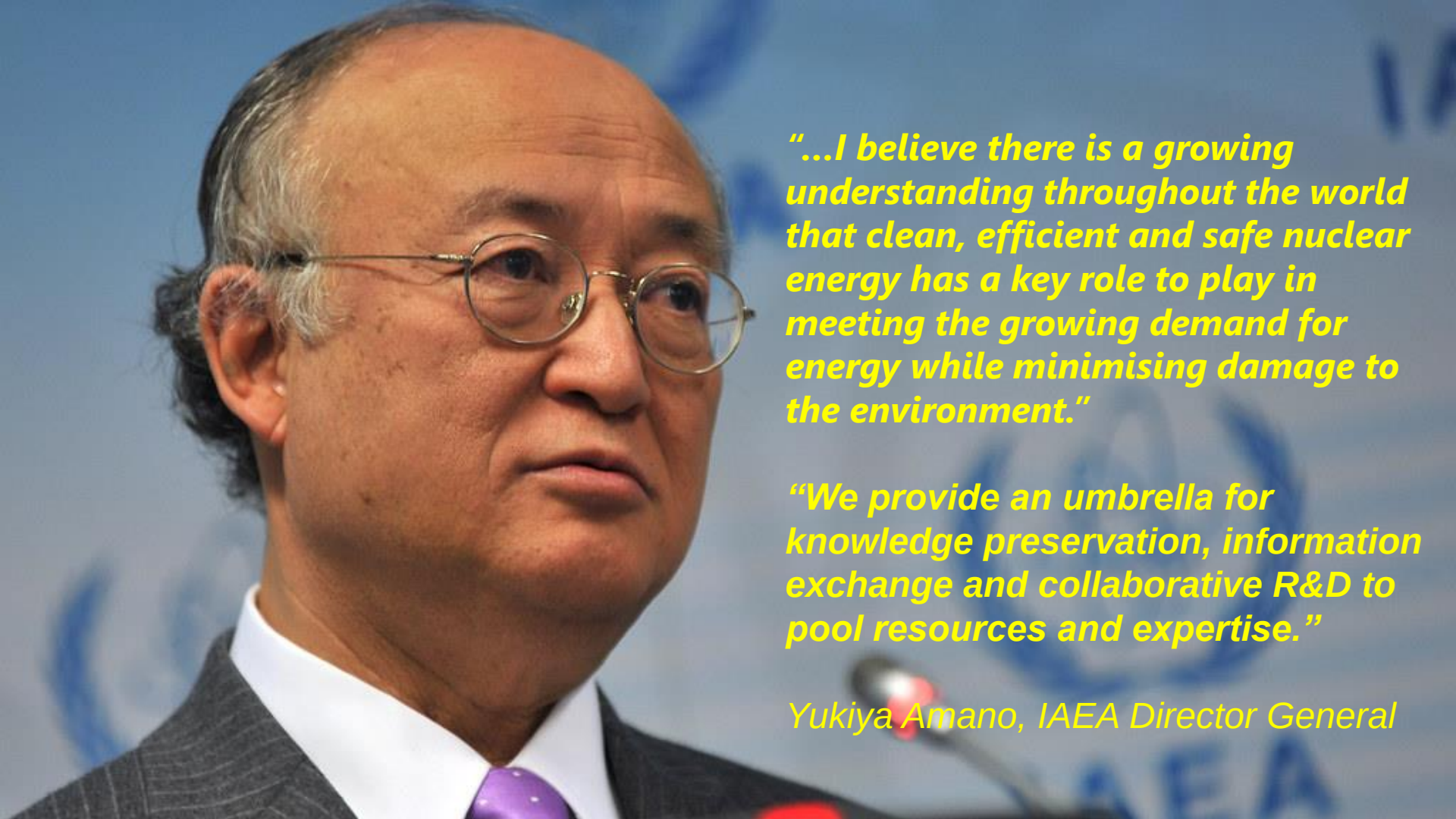

"...I believe there is a growing understanding throughout the world that clean, efficient and safe nuclear energy has a key role to play in meeting the growing demand for energy while minimising damage to the environment."

"We provide an umbrella for knowledge preservation, information exchange and collaborative R&D to pool resources and expertise."

Yukiya Amano, IAEA Director General

8 December 1953

1 to 23 October 1957

11 December 1957

1959

10 December 2005

1958 to 1979

23 August 1979

Thank you for your attention!

Contact:
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Atoms for peace and Development…

Overview


Innovation
IAEA
Advanced Reactors
Research
SDG
Safety
Nuclear Power
Climate Change