



60 Years

IAEA

Atoms for Peace and Development

Climate change and nuclear power from IAEA perspective

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KIVI-Ke / NNS New Years Meeting

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Overview

- COP-21 → Paris Agreement
- Role IAEA
- Decarbonization of the power sector → potential for nuclear power
- Climate action in the broader context of UN SDGs
- IAEA responding to COP-21

Introduction to the Paris Agreement

- Annual United Nations Climate Change Conferences
- United Nations Framework Convention on Climate Change (UNFCCC)
- Held from 1995 on
- 21st in Paris 2016
- 6th in Den Haag 2000
- 3rd in Kyoto 1997



United Nations
Framework Convention on
Climate Change

COP-21 (2015) a turning point in the global climate action, ..not an end point

Paris Agreement - “historic, durable and ambitious”

Goal: 2°C, aspire to 1.5°C

Bottom-up: action at the national level

Vital: design of rules, processes and institutions under negotiations for its entry into force in 2020

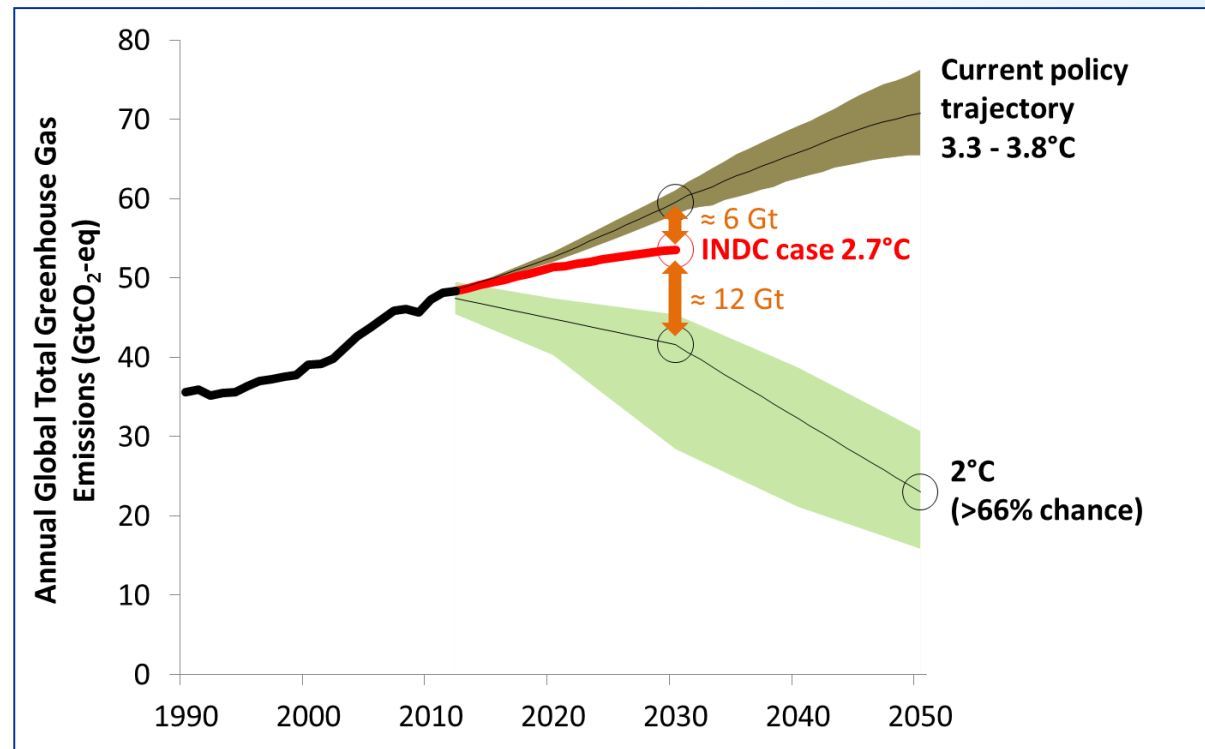


Key features of the Paris Agreement

- long term **goal**: to limit the average global temperature increase to well below 2°C above pre-industrial levels (and aspires to 1.5°C);
- clear **signal** to policymakers, businesses, investors, and the public: the low-carbon, climate-resilient economy is inevitable;
- providing a **dynamic mechanism** to take stock and strengthen mitigation ambition over time;
- setting up an enhanced **transparency and accountability framework**;
- **solidarity package** with adequate provisions on
 - climate finance
 - addressing needs linked to adaptation, loss and damage

Contributions to curb emissions

- Country plans to curb emissions: Intended Nationally Determined Contributions (INDC)
- INDC help, but still fall short of 2°C target → greater ambition from Countries is needed



Source: Derived from Climate Action Tracker, UNEP and IEA

Paris Agreement emphasizes the role of incentives to reduce emissions

- National **mitigation targets** formulated by NDCs;
- **Price** on carbon;
- Support and long-term policy orientation for **investors** in low carbon energy;
- **RD&D investments** and technology transfer
- Policy incentives serving joint purposes of **sustainable development**

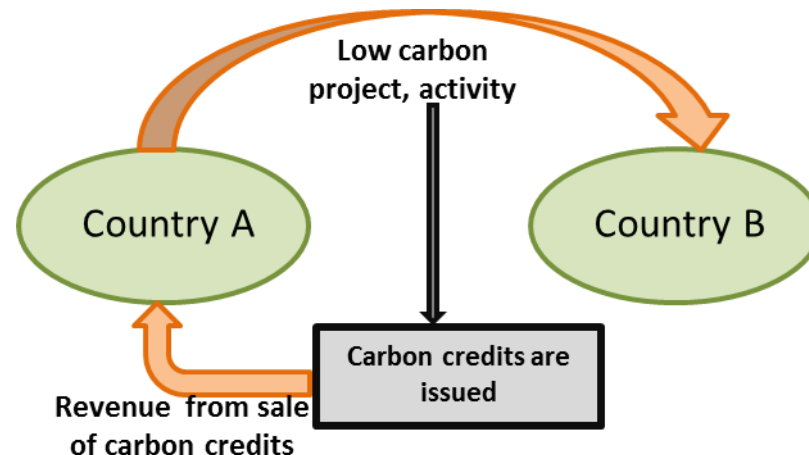
137. *Also recognizes* the important role of providing incentives for emission reduction activities, including tools such as domestic policies and carbon pricing;

Choose and design policy instruments that are best suited for implementing your country's NDCs !

Paris Agreement: new Mechanism for international cooperation

Mechanism allowing parties to pursue cooperative approaches involving international transfer of mitigation outcomes

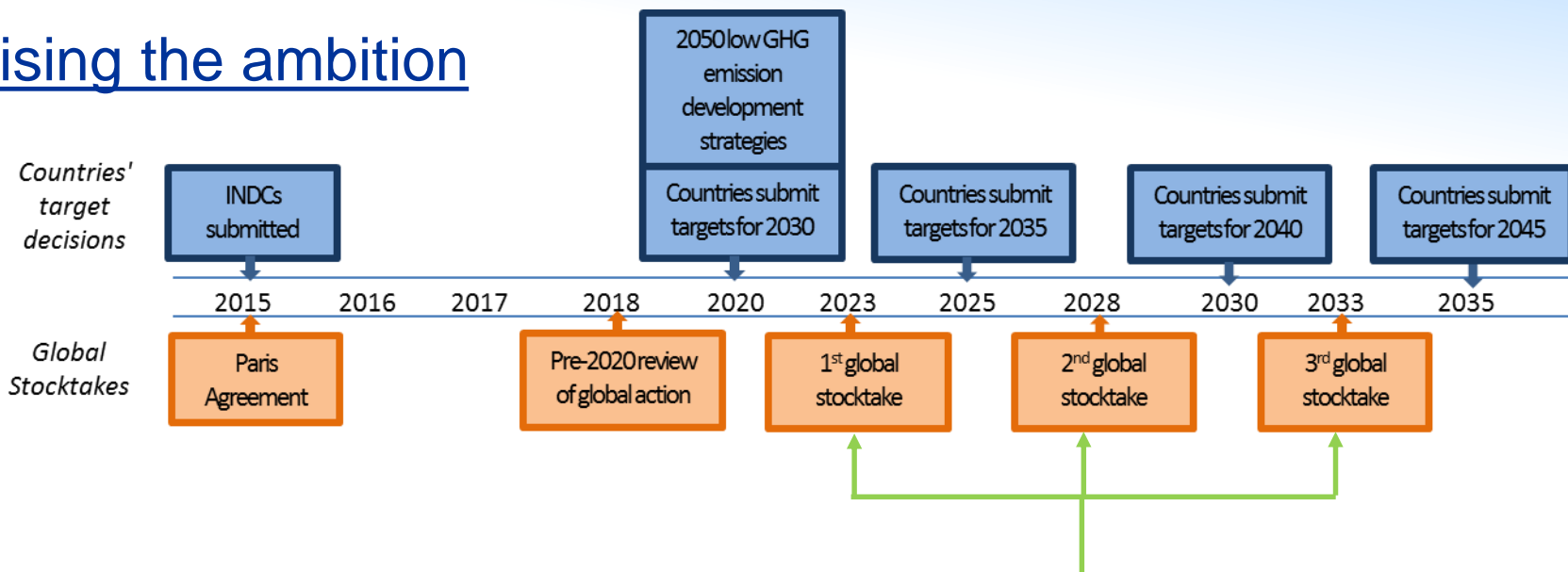
- details to come before 2020



- replacement Clean Development Mechanism under Kyoto Protocol?
- restriction or exclusion of nuclear energy would likely increase mitigation costs

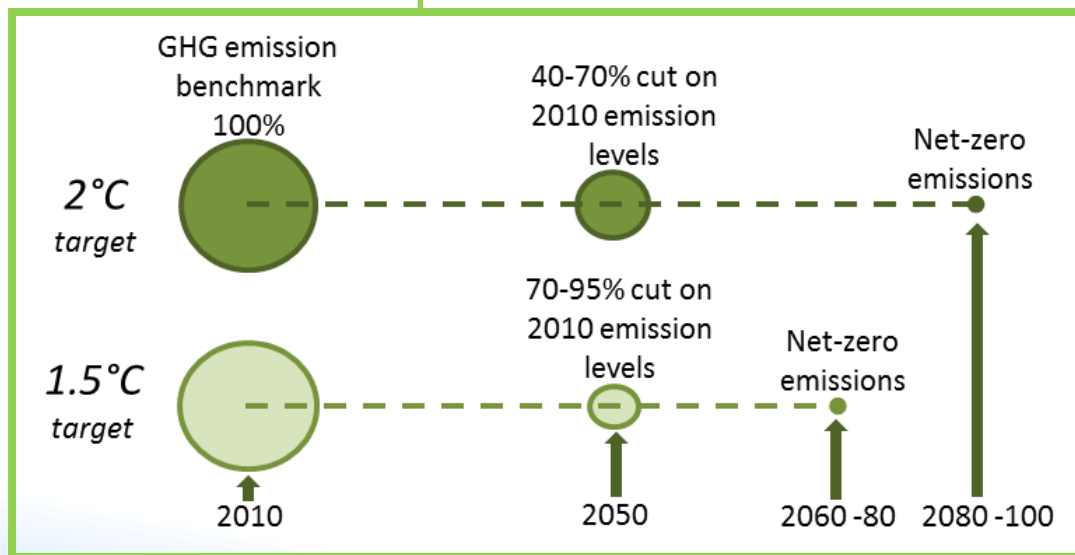
Linking policies to science

Raising the ambition



Based on latest science

- Special IPCC report in 2018 on the impacts of 1.5°C and related global GHG emission pathways



IAEA at COP-21

Objective: Increase awareness of nuclear energy and technology in addressing climate change.



IAEA Exhibit Booth among other UN Agency booths

Introduction IAEA

- IAEA is the world's centre for cooperation in the nuclear field
- IAEA seeks to promote the safe, secure and peaceful use of nuclear technologies.
- IAEA is an organization related to the United Nations, reporting to
 - UN General Assembly
 - UN Security Council
- Three main areas of work:
 - Safety and Security
 - Safeguards and Verification
 - Science and Technology
- Research centres and scientific laboratories in Vienna and Seibersdorf, Monaco and Trieste
- Regional safeguards offices in Tokyo and Toronto



IAEA Participates in COP21 as One UN for Climate Action



Pathways to Sustainable Energy for a Climate Friendly World

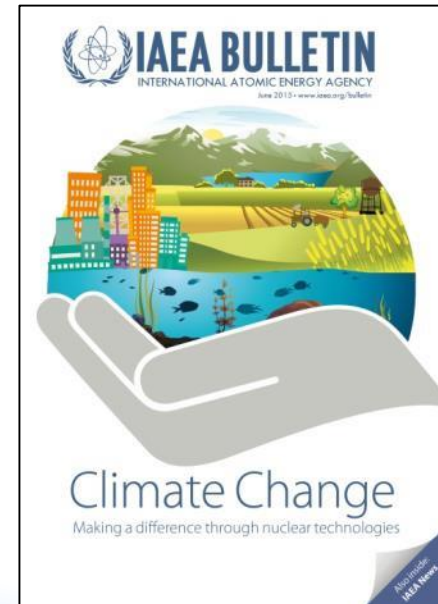
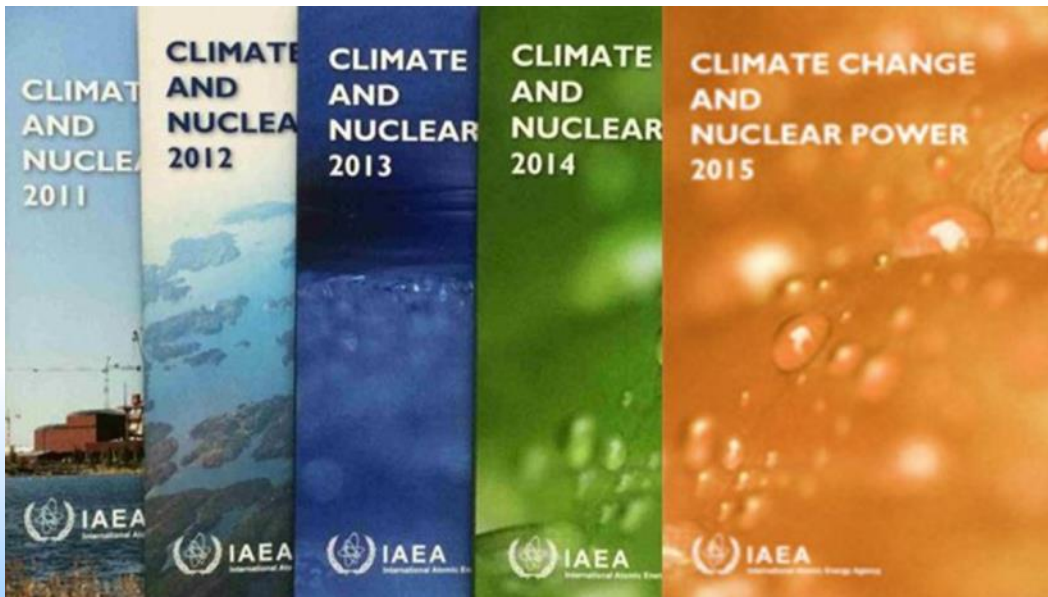


“ Nuclear energy has low life-cycle greenhouse gas emissions and has the potential, with innovative technologies, to serve humanity effectively for a very long time”

— — Mikhail Chudakov, Deputy Director General, IAEA

Over 600 copies of Climate Change and Nuclear Power distributed at COP-21

- 2015 Climate Change and Nuclear Power
- 2014 revised CC&NP report (in French)
- IAEA Bulletin (Climate Change)
- Other Agency publications

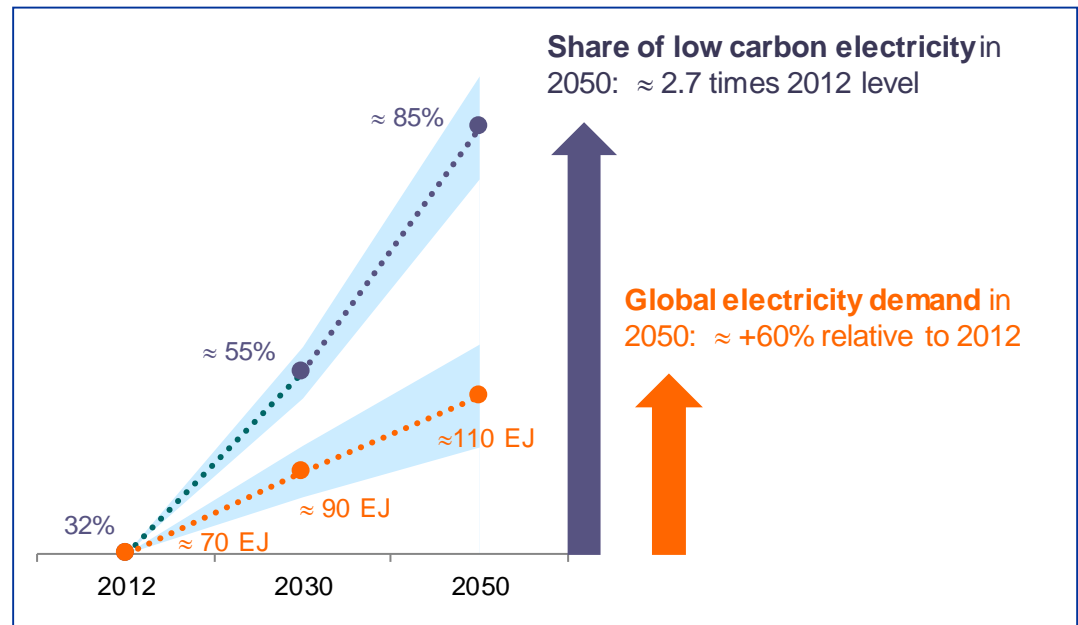


Key to meet goal of Paris Agreement (2°C target): decarbonise power sector

- Energy – largest source of global GHG emissions
- Electricity – fastest growing share

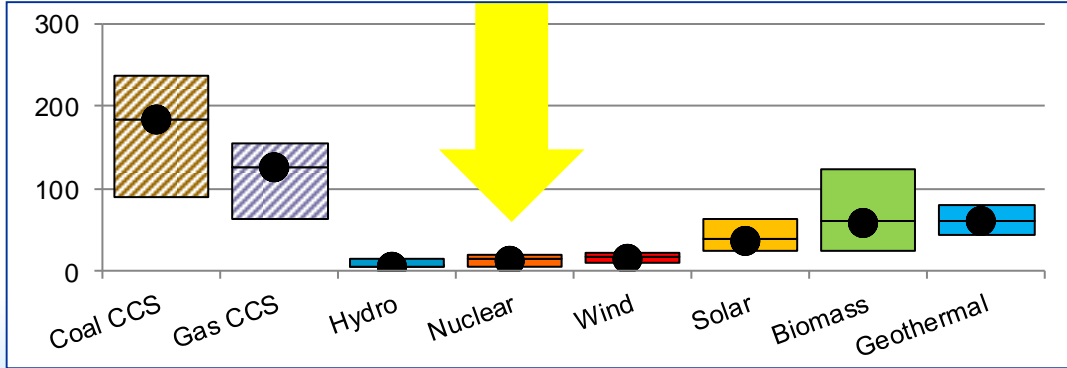
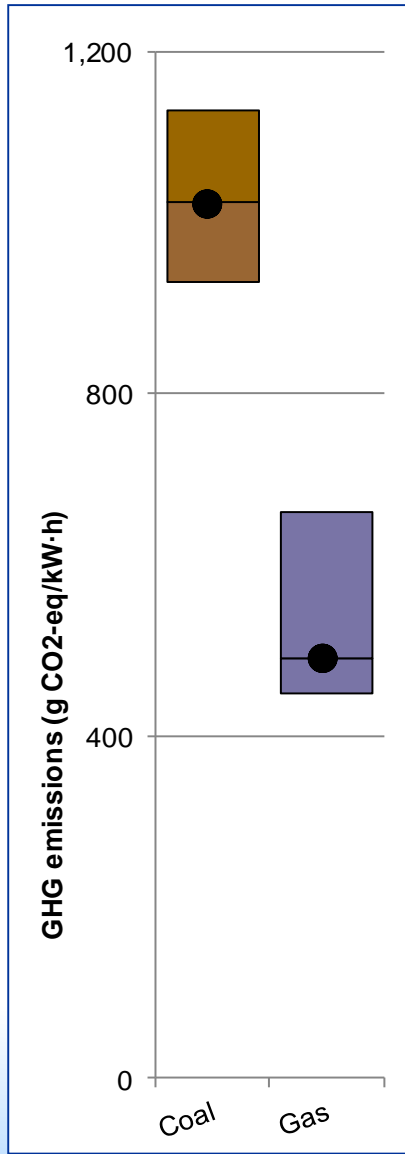
two fundamental actions

- Massive deployment of low carbon sources of electricity:
-renewables, nuclear, CCS
- Apply stringent Energy Efficiency measures to reduce growth of electricity demand



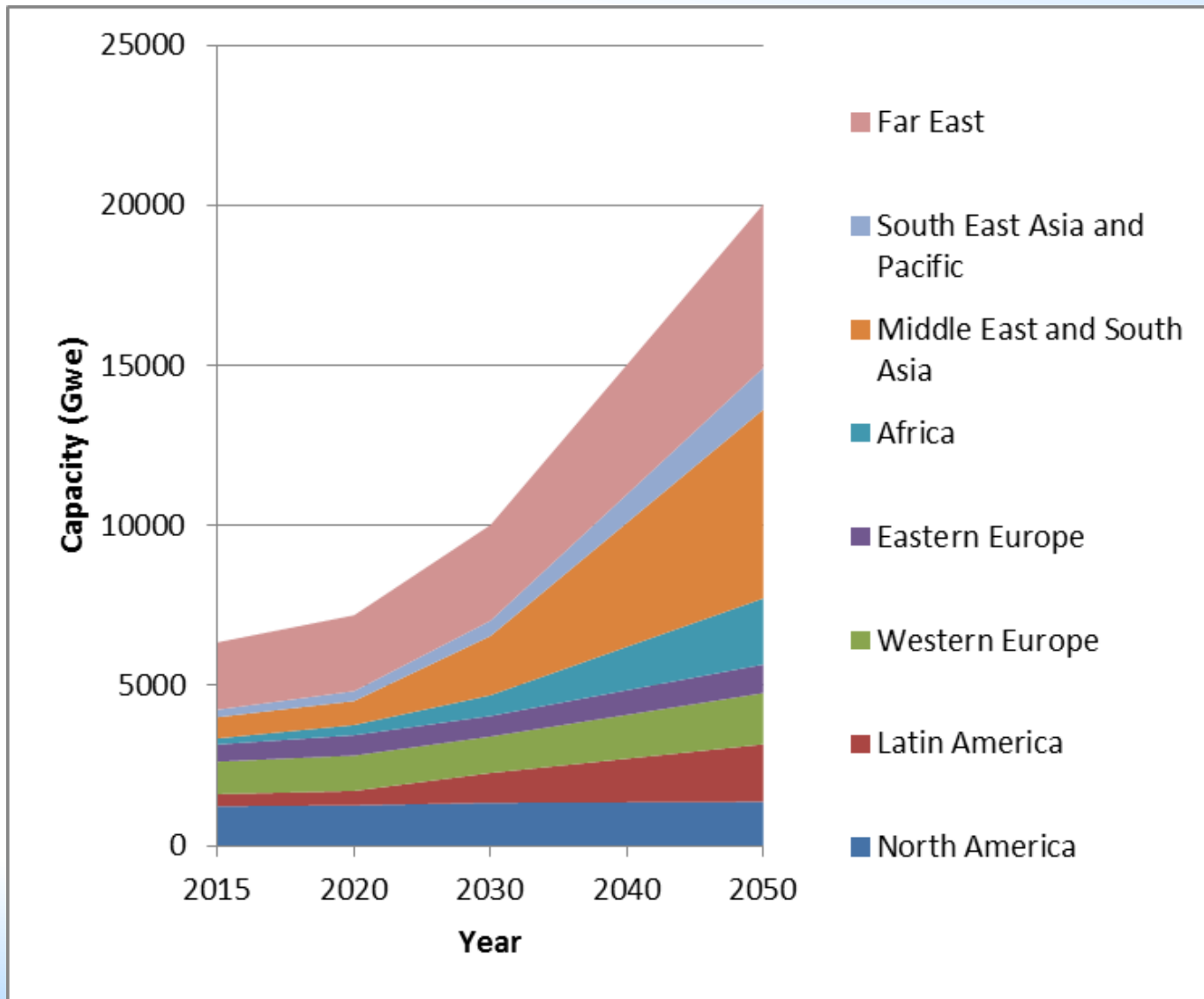
Comparison of GHG emissions of electricity generating technologies

Life cycle GHG emissions from electricity generation

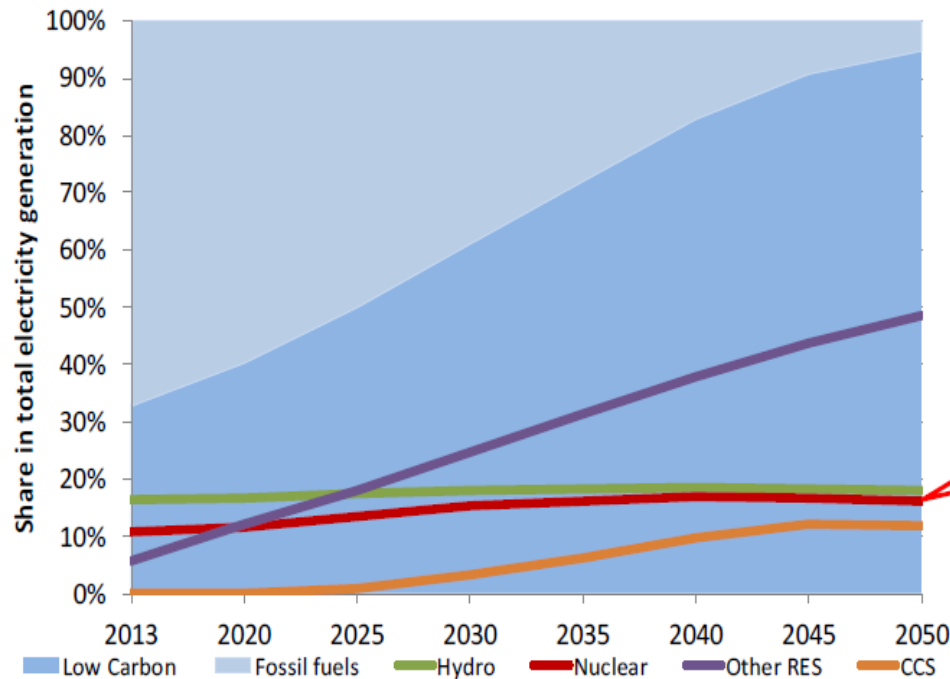


● Median value □ Interquartile range

Electricity generating capacity estimates: IAEA 2016 projections (RDS#1)



Decarbonization of the electricity sector: potential of nuclear power



Based on IEA scenario for the 2°C target

Share of nuclear expands to 16% in 2050 in 2°C target scenario

Major investment shift to developing Asian countries

Energy policy scenarios of OECD IEA: take into account broad policy commitments and plans announced by countries, including

- national pledges to support the deployment of renewable energy,
- decisions to expand or phase out nuclear power,
- pledges to reduce GHG emissions,
- plans to phase out fossil energy support.

>2x growth needed to support the Paris Agreement 2°C target

Nuclear power in 2050 in **scenarios consistent with the 2°C target**

	2014	2050	2050
		IPCC	IEA
Deployment (TW·h)	2400	4 700–13 000	6 800
Rate of change (%/yr)	–	1.9–4.8	2.9

- Countries including nuclear energy in INDC: Argentina, China, India, Iran, Japan, Turkey, Belarus, United Arab Emirates, Jordan and Niger
- Other countries do not exclude the possibility of nuclear when raising ambitions (NDCs every 5 years)
- Short term option: plant lifetime extension

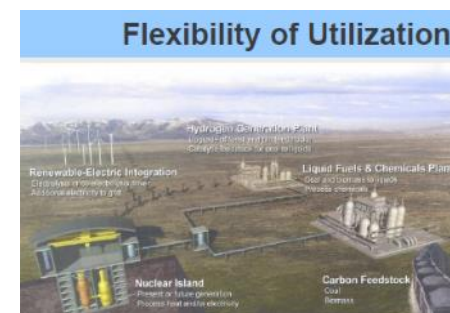
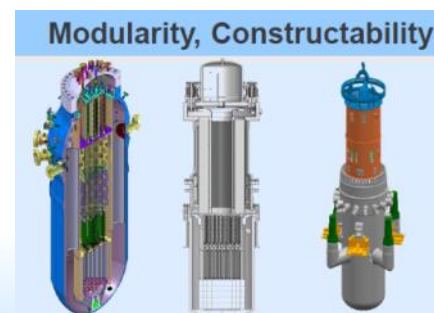
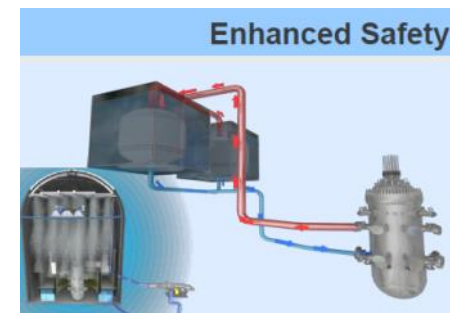
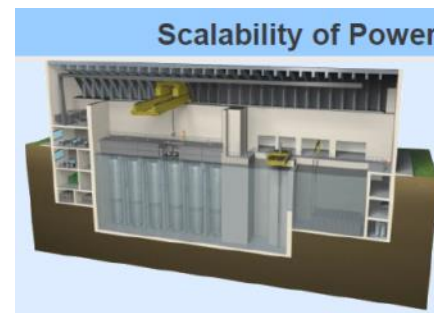
Paris Agreement emphasises innovation

Upscaling of public and private RD&D (eg. Breakthrough Energy Coalition)

Innovation: opportunity for nuclear power expansion

➤ Future Revolutionary (GenIV) (eg. programmes NI2050, GAINS)

➤ Small Modular Reactors (SMRs)



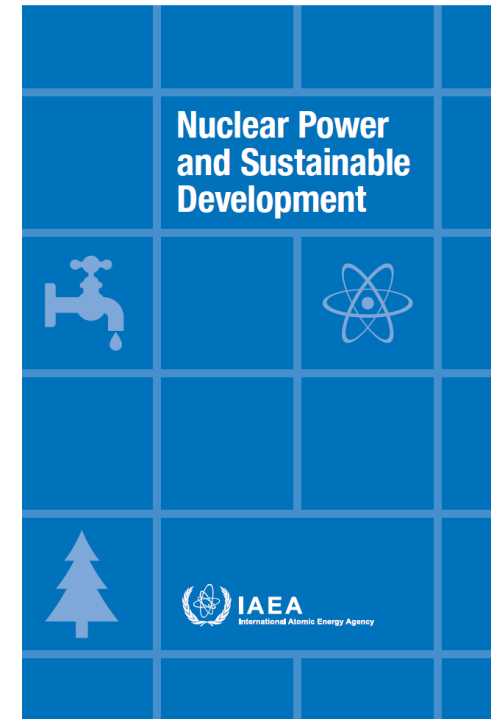
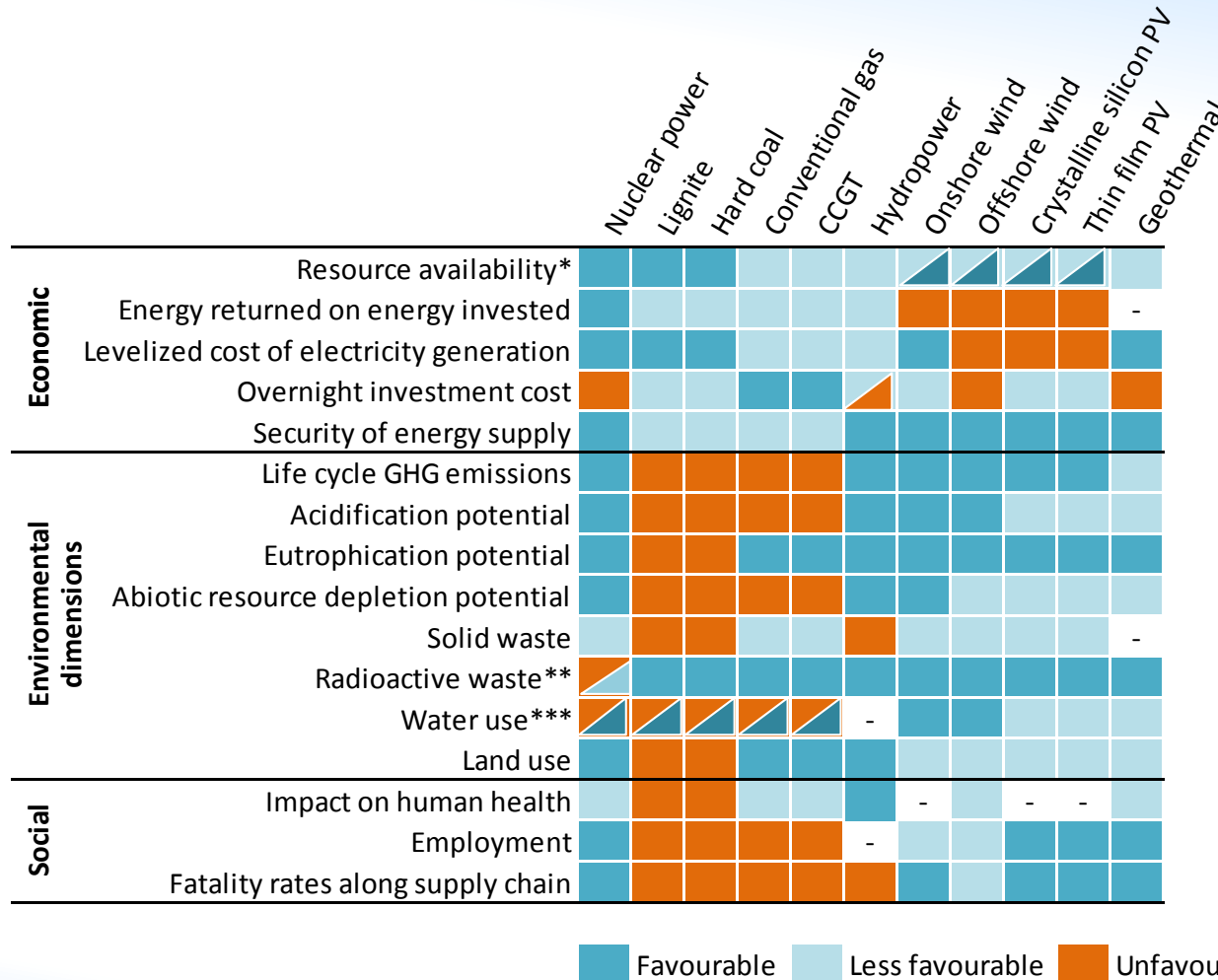
Coupling to UN Sustainable Development Goals

- Sustainable Development Goals (SDGs) = 17 goals to mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change
- adopted by world leaders in September 2015 at an historic UN Summit
- On 1 January 2016 officially came into force.
- Action for the next 15 years

Climate action in the context of Sustainable Development

<p>1 NO POVERTY End poverty in all its forms everywhere</p>	<p>2 ZERO HUNGER End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<p>3 GOOD HEALTH AND WELL-BEING Ensure healthy lives and promote well-being for all at all ages</p>	<p>4 QUALITY EDUCATION Ensure inclusive and quality education for all and promote lifelong learning</p>
<p>5 GENDER EQUALITY Achieve gender equality and empower all women and girls</p>	<p>6 CLEAN WATER AND SANITATION Ensure access to water and sanitation for all</p>	<p>7 AFFORDABLE AND CLEAN ENERGY Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<p>8 DECENT WORK AND ECONOMIC GROWTH Promote inclusive and sustainable economic growth, employment and decent work for all</p>
<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE Build resilient infrastructure, promote sustainable industrialization and foster innovation</p>			<p>10 REDUCED INEQUALITIES Reduce inequality within and among countries</p>
<p>11 SUSTAINABLE CITIES AND COMMUNITIES Make cities and human settlements inclusive, safe, resilient and sustainable</p>			<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION Ensure sustainable consumption and production patterns</p>
<p>15 LIFE ON LAND Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss</p>	<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS Promote just, peaceful and inclusive societies</p>	<p>17 PARTNERSHIPS FOR THE GOALS Revitalize the global partnership for sustainable development</p>	

Comparison of sustainability indicators for generating technologies



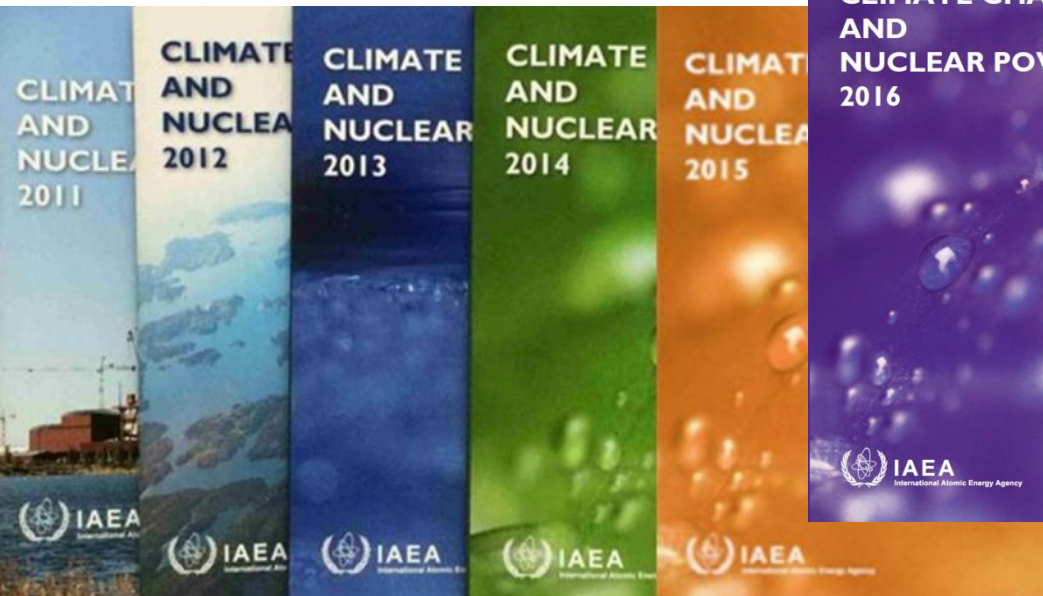
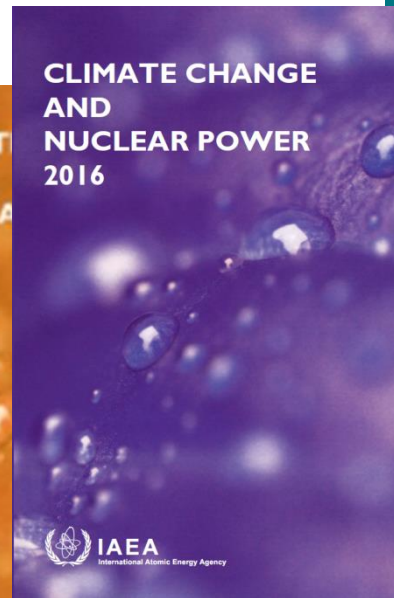
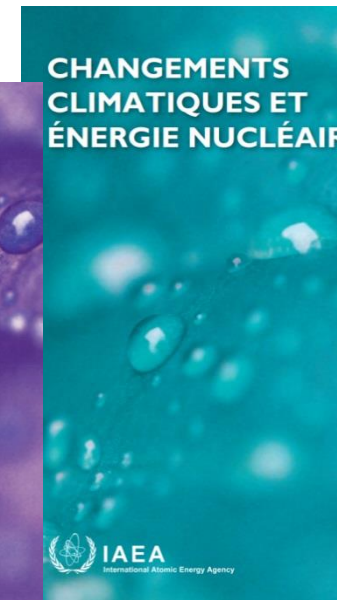
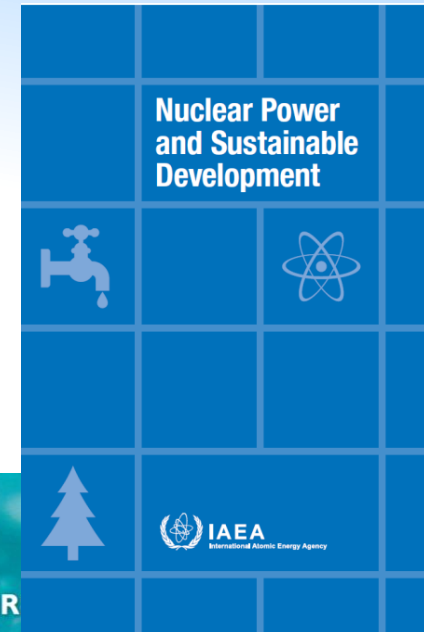
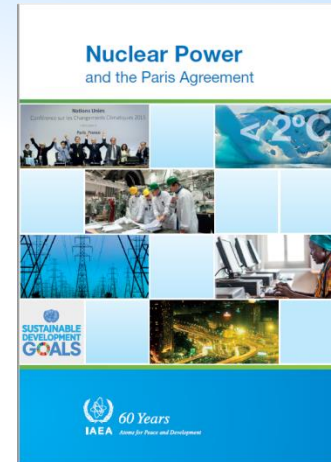
The implementation of Paris Agreement together with SDGs might provide additional incentives for nuclear programme development

Post-Paris Agreement Activities

- New Reports
- Continue Communication Outreach
- Support activities (research, training) for Member States to realize their Nationally Determined Contributions (eg. CRP, regional training course)
- Continued engagement in collaborative research (UN, IPCC, NEA)
- Couple role of Nuclear addressing Climate Change with the new UN Sustainable Development Goals
- Continued engagement at COPs.

IAEA Reports on Climate Change and SD

- Climate Change and Nuclear Power
- Nuclear Power and Sustainable Development
- Nuclear Power and the Paris Agreement
- IAEA Bulletin Special on Climate Change





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Thank you!



Links to IAEA reports

- Climate change and nuclear power 2016: <http://www-pub.iaea.org/MTCD/Publications/PDF/CCANP16web-86692468.pdf>
- Nuclear power and sustainable development: <http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1754web-26894285.pdf>
- Nuclear power and the Paris Agreement: <https://www.iaea.org/sites/default/files/16/11/np-parisagreement.pdf>
- IAEA Bulletin Special on Climate Change: <https://www.iaea.org/publications/magazines/bulletin/56-2>