





IEA/NEA 2015 Nuclear **Technology** Roadmap What role for nuclear energy in coping with climate change?

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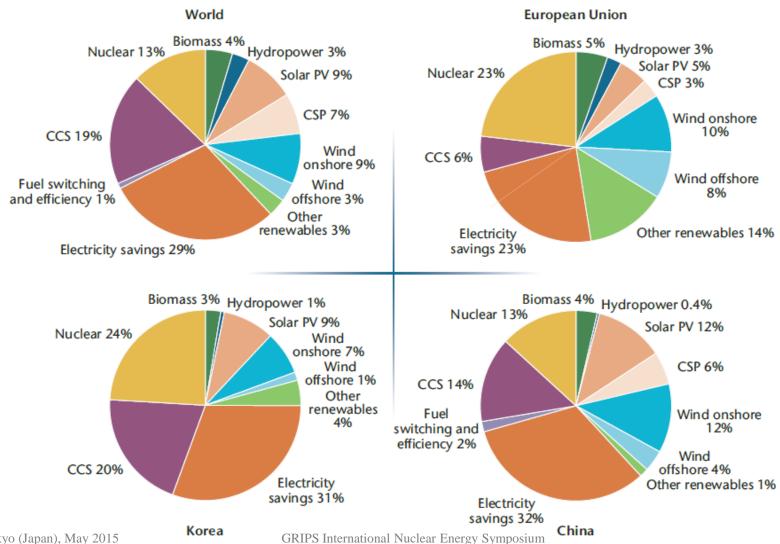
Contributions of Nuclear to mitigate CC

- Largest source of low-carbon electricity in OECD countries and 2nd at global levels
- Already contributes to reduction of CO₂ emissions from power sector
- Mature low-carbon technology
- Different designs to meet different needs
- Important non-electric applications, such as
 - Nuclear cogeneration
 - Energy storage
 - Process heat applications
 - Desalination





2 DS: Emissions reduction in power sector







Key actions for the next 10 years

- Offer same level playing field to all low C technologies (electricity markets)
- Industry to build on time and to budget, FOAK →NOAK
- Enhance standardisation, harmonise C&S and regulatory requirements
- Continue to share information & experience (among regulators and among operators) to improve safety
- Public acceptance must be strengthened (post F safety upgrades, fact-based information)
- Develop long-term strategy for radwaste management





Roadmap actions and milestones

2015 2020 2030 Reactor Recognise the value of long-term operation to maintain low-carbon generation capacity and security technology of energy supply, provided safety requirements are met Clearer policies needed to encourage investment Government in both long-term operation and new build Industry Academia/research Optimise Gen III designs to improve constructability and reduce costs. The learning rate from FOAK construction needs to be accelerated to ensure that NOAK plants are Financial Institutions built on time and to budget Accelerate the development of SMR prototypes and launch construction projects. (at least 5 projects per design) that can demonstrate the benefits of modular design and factory assembly Incorporate feed-back from operation of Recognise the long-term benefits of developing Gen IV systems in terms of resource utilisation and waste management, and support R&D and the development of at least one or two Fast Breeder Reactor prototypes to ensure technology is ready for deployment by 2030-2040 Gen IV prototypes to develop FOAK Gen IV commercial plants Put in place public-private partnerships to develop demonstration projects for nuclear cogeneration Nuclear Invest in environmentally sustainable uranium mining to address expected long-term demand fuel cycle Ensure that policies are in place for long-term storage and disposal, including deep geological disposal of high level waste Licensing and Ensure that regulator are strong, independent and staffed with enough skilled, competent and adequately remonerated personnel to carry out their missions regulation, nuclear safety Continue to promote international co-operation through fora of regulators, industry and operators, and intergovernmental organisations and initiatives Develop licensing frameworks for advanced reactors, including SMRs and Gen IV reactors Implement post-Fukushima safety upgrades in existing reactors in a timely manner Enhance and monitor safety culture across the nuclear sector and at all levels of staff

Financing nuclear development

Ensure a level playing field for all low-carbon power technologies, and provide clear policies (national but also within financial institutions, e.g. multilateral development banks) and stable lo

Favour investment in low-carbon electricity sources through carbon-trading schemes, carbon taxes or mandates for low-carbon electricity





Acknowledgements for Nuclear Technology Roadmap

 +150 experts who participated in workshops, reviewed drafts, provided input incl. case studies

Report & case studies

On NEA site:

http://home.nea.fr/pub/techroadmap/

On IEA site:

www.iea.org/publications/freepublications/publication/technology-roadmap-nuclear-energy-1.html

www.iea.org/etp/





THANK YOU!

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