



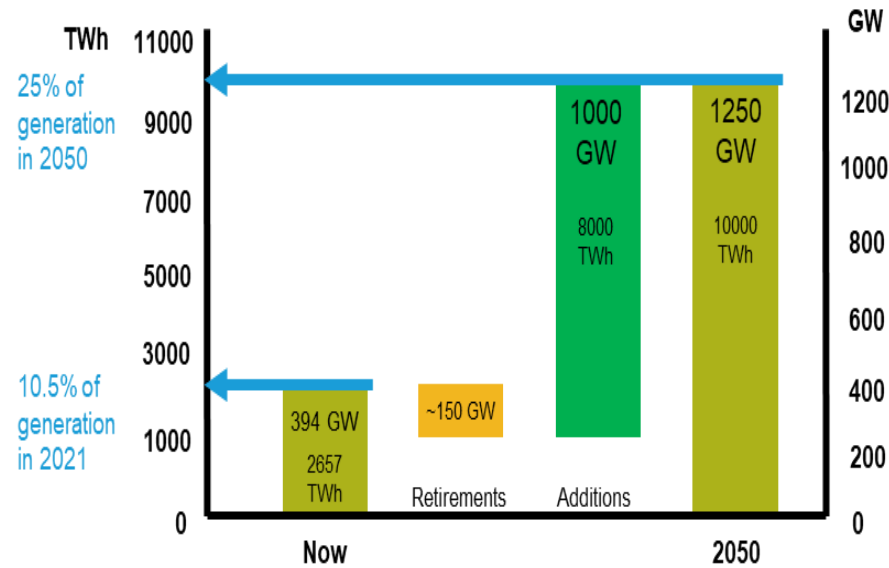
International cooperation to deliver new nuclear at speed and scale

Ronan Tanguy

Net-zero needs a lot of new nuclear

- IPCC 1.5°C median scenario calls for ~1200GWe nuclear capacity by 2050
- WNA Harmony programme translates as 1000GWe new nuclear by 2050

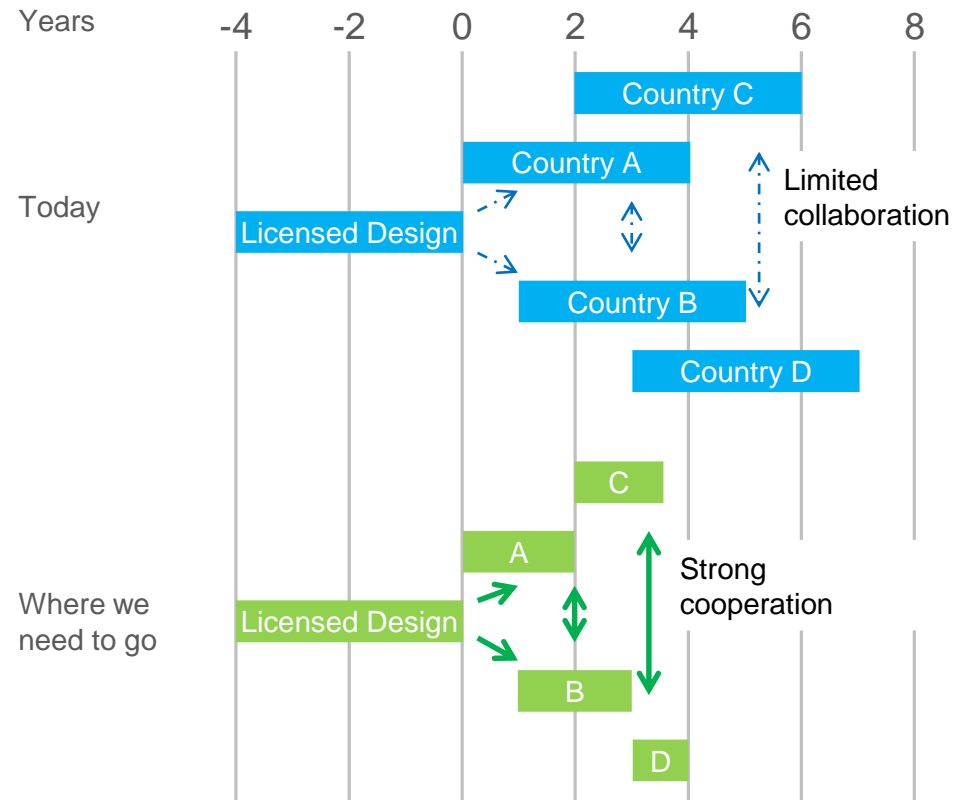
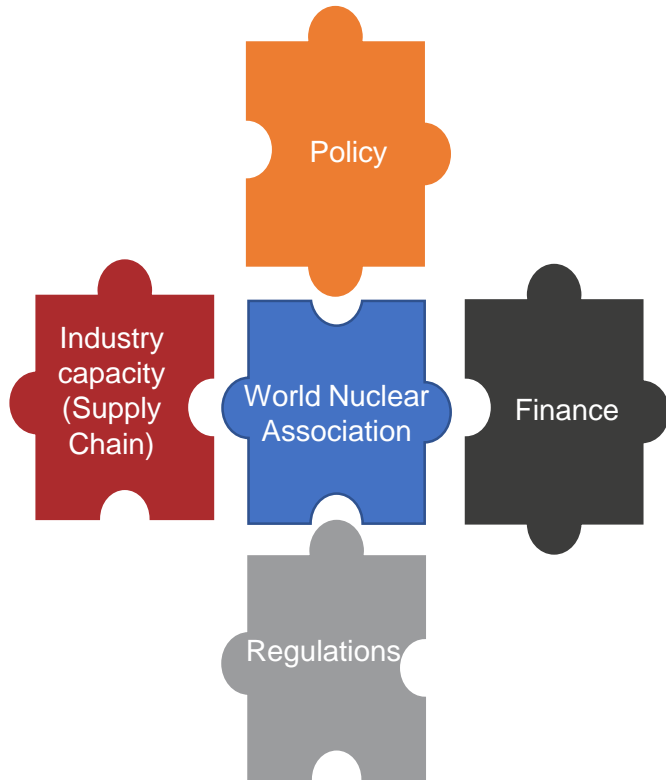
40 GWe per year for 25 years



Source: WNA Harmony Programme 2021

Today we build less than 10 GWe per year!!

Constraints

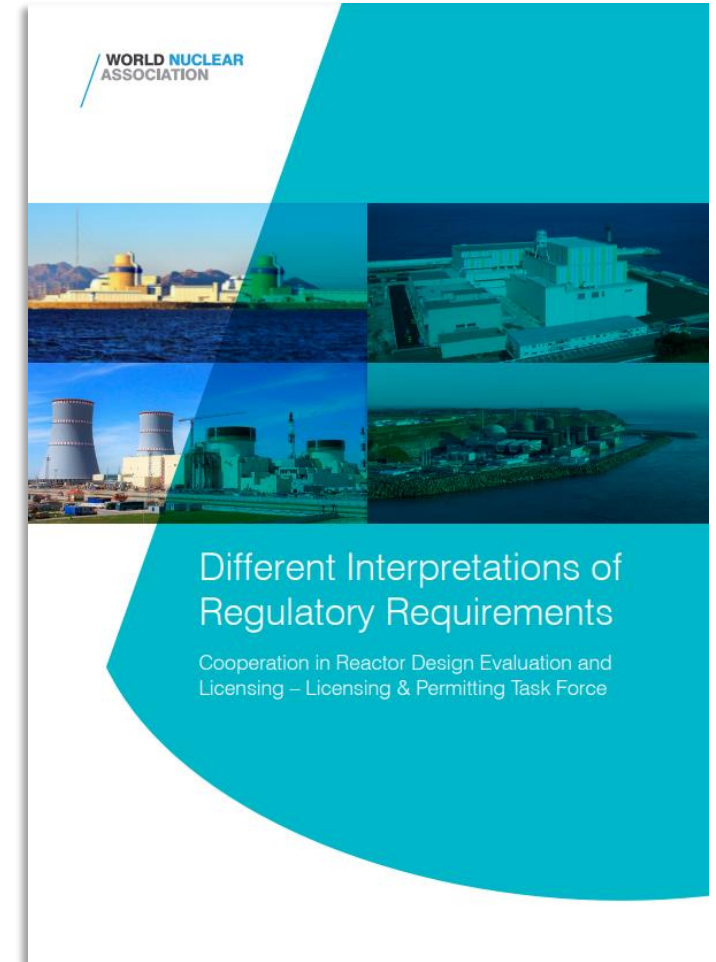


- Limited credit for initial licensing
- Duplication of effort and expense
- Alteration to design in each country

- Validation of initial regulators design approval
- Leverage of existing safety reviews and analysis
- Standardized designs

What are the current blockers?

- Nuclear safety requirements are aligned at IAEA level through safety standards
- Differences emerge at national level, resulting in multiple versions of the same reactor design
- All nuclear stakeholders; regulators, industry and governments must work together to overcome these differences
- Need to standardize designs and enhance regulatory harmonization.
- Essential for the success of SMR programmes built on a model of replication



What do we mean by harmonization?

Harmonization

- Facilitating outcomes from one regulator being reviewed and accepted by other regulators for their processes

Not harmonization

- International regulator / design certification
- Alignment of all technical requirements between all regulators
- Removal of ability to utilize existing approaches
- Mandating that the agreed outcomes must be adopted
- Mandating the approach regulators must use



[This Photo](#) by Unknown Author is licensed [CC BY](#)







Many initiatives have recognized the need for harmonization but we still have much work to do

Achievements



Limitations

Regulatory collaboration

Number of Regulators

 <p>IAEA International Atomic Energy Agency Atoms for Peace and Development</p>	<p>Common Standards & Regulatory Guides</p> <ul style="list-style-type: none"> • SMR Regulators Forum • NHSI 	<ul style="list-style-type: none"> • Open to interpretation • WCR specific (in places)
 <p>NEA NUCLEAR ENERGY AGENCY</p>	<p>Multinational Design Evaluation Partnership (MDEP)</p> <ul style="list-style-type: none"> • Common positions on specific technical issues 	<ul style="list-style-type: none"> • Fundamental safety requirements not addressed • Only for designs already under licensing
 <p>European Commission ENSUREG European Nuclear Safety Regulators Group</p>	<p>Implementation of nuclear safety directive</p> <ul style="list-style-type: none"> • Supporting member states • EU SMR partnership - TBD 	<ul style="list-style-type: none"> • Each regulator ultimately needs to do its own assessment → opportunity for different interpretations
 <p>Western European WENRA Nuclear Regulators Association</p>	<p>Safety Reference Levels</p> <ul style="list-style-type: none"> • Expected practices to be used in member countries • Method of incorporation of outputs into member states frameworks 	<ul style="list-style-type: none"> • Limited number of countries involved • Based on LWR's
 <p>ASN AUTORITE DE SURETE NUCLEAIRE SUJB Stuk</p>	<p>NUWARD Licensing agreement</p> <ul style="list-style-type: none"> • Increasing knowledge of regulatory practices at the European level 	<ul style="list-style-type: none"> • Too early to identify
 <p>CNSC CCSN UNITED STATES NUCLEAR REGULATORY COMMISSION</p>	<p>Bilateral Memoranda of cooperation</p> <ul style="list-style-type: none"> • Assessment of frameworks and areas for greater attention 	<ul style="list-style-type: none"> • Limited regulatory efficiencies to date • Limited acceptance of outputs from other regulators • Reactor vendor must approach each regulator independently

Industry efforts

 <p>WORLD NUCLEAR ASSOCIATION</p>	<p>CORDEL Working Group</p> <ul style="list-style-type: none"> • Mapping of initiatives and achievements • Development of strategies to streamline international licensing • Coordination of industry standards alignment 	<ul style="list-style-type: none"> • Limited coordination with regulatory initiatives • Drawing on the same small pool of resources
 <p>EUR ELECTRIC POWER RESEARCH INSTITUTE</p>	<p>Owner/Operator Requirements</p> <ul style="list-style-type: none"> • Common set of requirements for utilities – recent efforts on SMRs • Increased confidence in regional nuclear markets 	<ul style="list-style-type: none"> • Requirements are not considered by regulators • No examination of “licensability” of designs

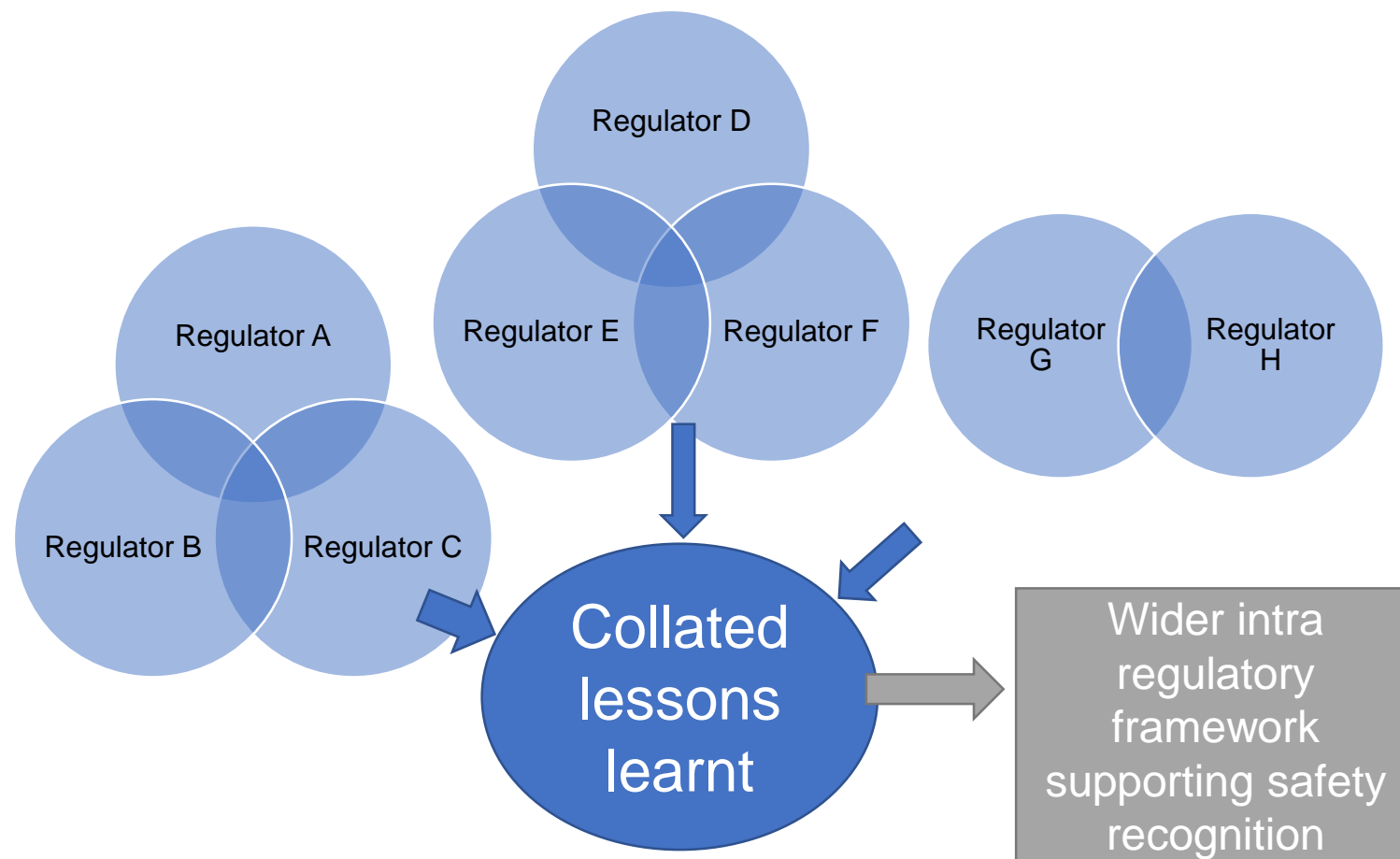
Supported by governments

- The current challenges are not going to be solved overnight
- Regulators working together on a small number of specific designs helps to facilitate the progress required
- Industry can support by ensuring that designs submitted for review are suitably mature
- A phased approach is needed, involving all stakeholders that will require time and effort
- Expanding regulatory collaboration initiatives requires more resources
- Industry might have opportunities to enable these activities in the short-term, but government support will be required to secure long term viability and is the only route to achieving the export markets envisaged to support the deployment required



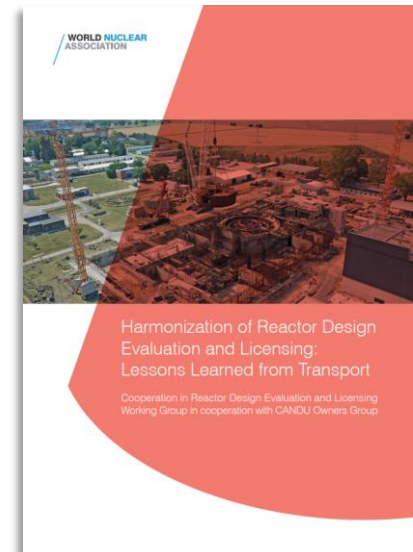
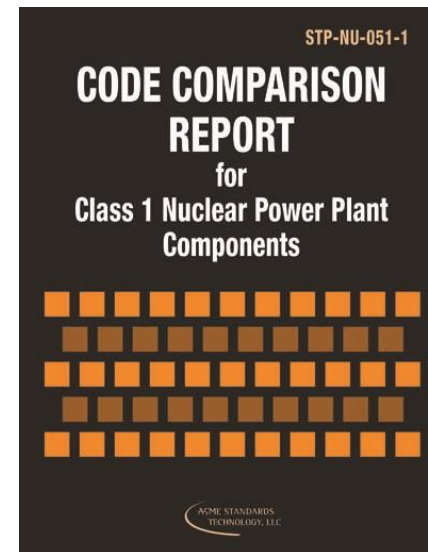
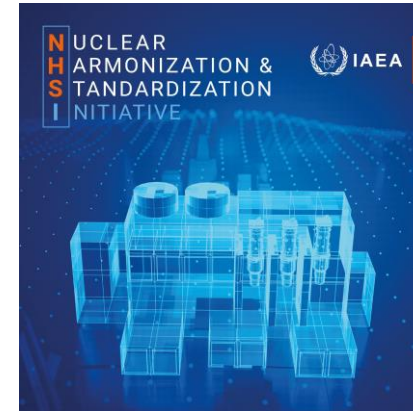
World Nuclear Association vision for harmonization

- Start with small groups of regulators working on broad areas of focus on specific designs alongside vendors and/or utilities
- US NRC, CNSC, TVA, OPG, GE-H BWRX-300
- ASN, SUJB, STUK, EDF Nuward
- FANR, KINS, APR-1400
- Russia & Bangladesh, China, Egypt, Hungary, Turkey, VVER designs



Enabled by industry initiatives

- Opportunities to align industry practices will support accelerated deployment goals
- World Nuclear Association working groups are engaged in many such activities
- Jointly managing IAEA NHSI Industry Track Topic 2 on Codes & Standards for SMRs and supporting activities of 3 Regulatory Track Working Groups
- Standard Developing Organizations Convergence Board aiming to converge where possible and limit divergence
- Supply chain activities such as common procurement specifications and use of commercially available items



Urgent need to move forward together

- Leadership by national governments for the development of suitable legal frameworks, policies and capabilities
- Effective collaboration among international organizations, regulators, and industry to streamline and coordinate international licensing and regulatory frameworks
- Set clear common goals between all stakeholders from the outset
- Support for newcomer countries to optimize their approach to regulation and adoption of low-carbon nuclear technology appropriate to their needs
- Make use of lessons learned in harmonization when developing new regulations for advanced technologies

Helping the global nuclear industry
deliver 24/7 clean energy for all

ronan.tanguy@world-nuclear.org

www.world-nuclear.org
info@world-nuclear.org





WORLD NUCLEAR *Symposium 23*

6th - 8th September 2023

Park Plaza Westminster Bridge, London, UK

www.wna-symposium.org

#nuclearsympo



www.world-nuclear.org
info@world-nuclear.org