COMMENTS OF **THE UK** to the
ISSUES PAPER No 10

Targets

1. **Maintaining a high level of safety and security** _____

The priority is maintaining a high level of safety and security (current fleet, LTO, new-build). This involves organisational, operational and regulatory aspects, as well as further research & innovation, the latter often depending on the availability of research infrastructures of pan-

European relevance. Relevant targets are:

- by August 2017, transposition by MS of the Nuclear Safety Directive, followed by timely realisation of the new 'Nuclear Safety Objective' through a clear schedule for implementation;
- by 2020, availability of conclusive research findings on (i) ageing of structures, materials and components (LTO of NPPs and extended spent fuel storage) and (ii) more robust and accident-resistant designs (passive systems, accident-tolerant fuels, improved containment designs and protection strategies);]_____
- by 2020, implementation by MS of all actions to improve nuclear safety as follow-up to the stress tests[1];
- optimisation of NPP operation as a function of predicted demand, and integration with more intermittent suppliers in evolving electricity grids;
- observance of strict non-proliferation regime and physical protection of nuclear materials and facilities.

2. **Radioactive waste management and decommissioning**

- In line with obligations under the spent fuel / radioactive waste Directive in particular, MS are putting in place and carrying out national programmes, including necessary research. Key target is, by 2030, the operation in Europe of the world's first deep geological repositories for spent nuclear fuel and/or heat-generating high-level radioactive waste.
- By 2030, the development of a world-leading decommissioning sector, building on the EU's safety culture and know-how in waste management.]_____

3. **Advanced and innovative fission reactors**

Towards 2050 the availability of designs offering increased uranium resource efficiency and lower long-lived waste production may become attractive for utilities, and taking into account the increasing requirement for more flexible energy sources and recent MS initiatives in this regard, small modular reactors (SMR) and co-generation plants may develop on a shorter timescale:

Comment [A1]: It is unclear whether this priority supersedes all others, or whether it is simply one of several priorities. This reads as it is the first scenario.

Comment [A2]: This current objective is probably not achievable, as:

- "Conclusive" is a very specific term and sho only be used if a definition has been agreed in this context.
- Most of this research is ongoing in Member States and it will take a lot longer than 2020 to understand these fields.

A more narrowly defined agreement on a sub set of this may be achievable.

Comment [A3]: World-leading nuclear decommissioning is definitely within the UK's ambition.

1 ENSREG: Compilation of recommendations and suggestions - Peer review of stress tests performed on European nuclear power plants (http://www.ensreg.eu/sites/default/files/Compilation%20of%20Recommendationsl 0.pdf)

- licensed SMR design(s) available in the EU by 2025, with operating plant(s) by 2030;
- at least one Generation-IV demonstrator fast reactor operating in Europe by 2030, including associated fuel cycle facilities (pilot fuel fabrication and processing plants).]_____

Comment [A4]: Quite ambitious.... but we would support it.

4. Fusion

Successful ITER construction and operation in line with agreed baseline, and progress to fusion electricity in line with European roadmap and EUROfusion Joint Programme (see Annex 1 - targets to be further developed following publication of revised ITER baseline and revised European roadmap).

Cross-cutting challenges

To achieve the above top-level targets, and to enable nuclear to remain a safe and competitive option in the future energy mix, a number of cross-cutting challenges need to be addressed that also involve concerted efforts amongst stakeholders and MS, in particular:

- **stable / predictable investment conditions**, which for new build means the availability of appropriate financing schemes such as contracts for difference, an effective supply chain and a more appropriate carbon price[2];

- **diversification of nuclear fuel supplies**, in line with the objectives outlined in the Energy Union Communication (see footnote 3) and the European Energy Security Strategy Communication[3];

- availability of a **trained workforce**, including the education and training of scientists, engineers and other skilled workers, e.g. benefitting from a European Credit System for Vocational Education and Training (ECVET) but also ERC, MSCA or ERASMUS+ grants;

- **harmonisation of licensing rules and standards**, including mutual recognition by regulatory authorities, streamlining of design approval and harmonised classification schemes;

- ensuring **synergy between safety, security and safeguards;**

- **standardisation of reactor codes**, enabling a common reference to be established between all actors involved in the design, construction and licensing of nuclear facilities;

- a conducive **socio-political environment**;

- availability of **state-of-the-art research infrastructures** (in particular for materials research, including irradiation facilities, research reactors, hot cells, etc.);

- availability of **all potential EU funding options,** e.g. InnovFin, EFSI (European Fund for Strategic Investments), ESIF (European Structural and Investment Funds) and possible Euratom loans, with established mechanisms such as ESFRI remaining important in the setting-up of collaborations between MS in the development of new research infrastructures.]

Comment [A5]: Again. Essential to innovation and SMRs.

Comment [A6]: We would certainly agree with availability, but the question is to whom and how access opportunities will work and how one can integrate the experimental side (which requires reactors etc.) with advanced analysis hot cells, etc). They are not in the same place so maybe some word on co-ordination of availability / access of such facilities need to I provided in this objective for it to be useful.

Comment [A7]: Strongly support flexibility of funding options as the wider innovation landscape is quite diverse.

Regarding the exploitation and development of major research infrastructures, including demonstrator facilities, the European fusion research programme (implemented by EUROfusion) has shown the **effectiveness of joint programming** based on a detailed and resource-loaded roadmap, with clear milestones and deliverables, a risk register, coordinated use of and access to all priority facilities and centralised programme management.

Finally, though the achieving of the above targets will contribute significantly to maintaining **European technological leadership** in a number of areas, in line with the objective stated in the Energy Union Communication, **it will not be easy for Europe to retain leadership in all areas**, especially in view of the increase in nuclear generating capacity in the rest of the world. This underlines the **importance of international cooperation**, especially in areas such as development of advanced and innovative reactors.

2 For recent information on cost of nuclear electricity, from new-build Generation-III / III+ and LTO Generation-II, refer to, for instance, (i) William D. D'haeseleer *"Synthesis on the Economics of Nuclear Energy",* Study for the European Commission, DG Energy, Contract N° ENER/2012/NUCL/SI2.643067, November 27, 2013 (https://www.mech.kuleuven.be/en/tme/research/energy_environment/Pdf/wpen2013-14.pdf) and (ii) *Energy Technology Reference Indicator projections for 2010-2050* (https://setis.ec.europa.eu/publications/irc-setis- reports/etri-2014).

3 COM(2014)330 final, 25/5/2014 (http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0330&qid=1407855611566)