



Position Paper

Input of the ENS High Scientific Council to the public consultation on the Establishment of the Innovation Fund

The EU emission trading scheme (ETS) after 2020 foresees the establishment of the Innovation Fund to accelerate the commercialization of low carbon technologies.

The energy sector is responsible for almost 30% of the CO₂ emissions of the EU. With a share of almost 30% in the EU electricity production, nuclear energy now provides more than half of the low-carbon electricity consumed in the EU. Nuclear is a strategic low-carbon energy source for many EU Member States and will have an important role in the future of the EU's energy mix: the EU will need nuclear energy to fulfill its climate policy objectives, to insure its energy security of supply and maintain competitive electricity prices together with the highest safety standards. EU Nuclear Illustrative Programme (PINC) and the 2050 Energy Roadmap both show that nuclear energy will remain an important constituent of the EU power generation mix for years to come. IEA scenario 2DS predicts that a quarter of the emission reductions in the electricity sector, which must be achieved by 2050 in the EU, should be provided by low-carbon nuclear energy, in substitution for fossil fuels (coal, gas) and in addition to reductions expected from energy efficiency, and to renewable development. Two EU countries, France and Sweden, have succeeded in de-carbonizing their electricity sector (at more than 90%) owing to a combination of nuclear and hydroelectricity, and are thus well ahead of the other EU member countries: France thus exhibits the lowest level of CO₂ emissions per capita of the G7 countries.

Nuclear energy is a relatively young technology: with a solid background of developments for electricity generation, it is still in its first innovation cycle. It exhibits, thanks to expected scientific and technical advances in the 21st century, a great potential for future technological breakthroughs, both with regards to its applications (electricity, heat), and to new concepts of reactors and fuel systems. Future nuclear reactors will be more competitive and flexible: they will operate in electrical grids together with a significant share of intermittent renewables. They will show advances in intrinsic safety, together with materials and waste management.

The ~50 start-ups that have emerged in the United States around new reactor concepts, for example around the MIT or UC Berkley, demonstrate this potential for technological innovation in nuclear energy. These start-ups are funded by large private entrepreneurs, such as Bill Gates. A new dynamic is also taking place in Russia and China, which has launched

parallel research programs on several new concepts. Drivers are, first of all, the search for new low-carbon solutions to fight climate change, but also, from a geopolitical point of view, industrial leadership and technological independence regarding the energy infrastructures of tomorrow.

To date, half of the EU countries rely on nuclear energy for their energy future; a mixture of new build and long-term operation of existing nuclear power plants will be needed; and a strong nuclear research and innovation is essential to underpin these operations. All these countries have nuclear research assets and innovation capabilities that can make the EU to preserve its leadership in nuclear industry and make sure nuclear energy brings its essential contribution to enabling EU climate policy objectives to be delivered.

Up to now, quite regrettably, nuclear energy was not eligible to the [NER 300 funding programme for innovative low-carbon energy demonstration projects](#), the “precursor” of the Innovation Fund: only [carbon capture and storage \(CCS\)](#) and [innovative renewable energy \(RES\)](#) technologies were.

Recommendation

The ENS HSC therefore requests that a technology neutral approach be adopted for the Innovation Fund so that all low-carbon technologies, including nuclear energy, be eligible to funding benefitting from CO2 revenues with appropriate carbon price. So that private investors, energy providers or research organizations could promote technology neutral investments in research in all low-carbon technologies.