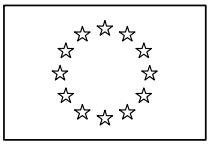

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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL AND THE ECONOMIC AND SOCIAL COMMITTEE

UPDATE OF THE NUCLEAR ILLUSTRATIVE PROGRAMME IN THE CONTEXT OF THE SECOND STRATEGIC ENERGY REVIEW

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1. INTRODUCTION

This document – as part of the Second Strategic Energy Review – updates the information contained in the 2007 Nuclear Illustrative Programme[1]. It focuses on the key aspects of security of supply, investment needs, the conditions for realising investments, and makes recommendations for the continued safe use of nuclear energy in the EU.

Over the past two years, there have been political statements of interest with respect to nuclear energy in some EU Member States and around the world. Nuclear energy has come back into the political debate[2], with the subsequent establishment of the European Nuclear Energy Forum, the High Level Group on Nuclear Safety and Waste Management and the Sustainable Nuclear Energy Technology Platform. The International Energy Agency and the OECD Nuclear Energy Agency have also highlighted the important contribution of nuclear energy in the near future[3,4]. In this context, the EU can play a central role to further develop an even more advanced framework meeting the highest standards of safety, security and non-proliferation.

The Spring 2007 European Council endorsed the Commission proposal to cut greenhouse gas emissions by 20% as well as to increase energy efficiency in the EU by the same amount by 2020. At present, nuclear energy generates two thirds of the EU low carbon electricity and makes an important contribution to mitigation of global climate change. The Community's SET-Plan, which addresses Research and Development needs in all low-carbon technologies, including nuclear fission, is important to the future long term requirements of nuclear energy.

Nuclear energy is also one of the most economic energy sources, less vulnerable to fuel price changes, thereby protecting EU economies against raw materials price volatility. It also increases the security of energy supply in Europe, since uranium sources are widely distributed around the globe, in geopolitically stable areas.

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1 Nuclear Illustrative Programme - COM(2007) 565, 4.10.2007.

2 EESC Opinion on the Commission's nuclear Illustrative Programme (TEN/283, 12.07.2007); The Maldeikis report of the European Parliament, Assessing Euratom 50 Years of European nuclear energy (A6-0129/2007, 02.04.2007); Reul Report of the European Parliament, Conventional energy sources and energy technology (A6-0348/2007, 24.10.2007).

3 World Energy Outlook 2006, International Energy Agency.

4 Nuclear Energy Outlook, OECD/NEA, published in October 2008.

The concerns of the general public on nuclear safety and waste management still need to be fully addressed. As shown by a recent Eurobarometer study[5], a large majority of European citizens considers that the European Union is best placed to ensure that the highest level of nuclear safety is guaranteed in Europe. On the other hand, the fragmentation of the regulatory framework in the European Union, in particular for the issuing of licences and design certification, constitutes an obstacle for investments. The European Union should promote a more coherent economic and regulatory framework. This will facilitate the investments in the Member States which choose to include the nuclear energy in their energy mix and will ensure that investment decisions are based on more transparent and comprehensible rules.

2. INVESTMENT NEEDS FOR NUCLEAR GENERATING CAPACITY

2.1. Projections for energy and electricity demand

Under the PRIMES New Energy Policy scenario, the overall final energy demand in the EU by 2020 is expected to grow slightly (+1,5%) in case of moderate oil prices and to decrease slightly (-2%) in case of high oil prices[6]. Electricity demand growth is expected to be 8-9% over the same period. As a result, the share of electricity in the final energy demand would grow from 20% to 23%. Electricity generation capacity is forecast to grow between 20% and 24% by 2020, but under the PRIMES New Energy Policy assumptions and depending on the oil price, the share of nuclear energy will decrease from 30% to between 25% and 26% in electricity generation and from 14% to between 12% and 14% in total primary energy demand by 2020[7]. However these figures reflect policies implemented in the Member States and thereby exclude the most recent discussions on possible lifetime extensions and new constructions that could change the future capacity situation.

Energy efficiency measures should curb the growth of total energy consumption as well as electricity demand. Yet, if fossil fuel prices remain at the 2008 record levels, electricity demand, especially in the transport sector, can be expected to increase. Therefore, the security of electricity supply will increase its importance for the overall economy.

2.2. Investment perspectives in the nuclear sector

Regardless of the exact evolution of energy consumption, EU electricity demand is expected to continue growing faster than overall energy demand. Insufficient base load capacity may jeopardise the stability of the EU's electricity network unless countermeasures on a large scale are introduced. Renewable energy sources will

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5 http://ec.europa.eu/public_opinion/archives/ebs/ebs_297_en.pdf

6 Given the uncertainty concerning crude oil prices the development under current trends is described by giving ranges for 2020 depending on a moderate or high oil price environment. The moderate price environment means an oil price of 61$(2005)/barrel in 2020. The high price environment would have an oil price in 2005 money of 100 $/barrel in 2020.

7 In the EU Energy Policy review, the IEA also notes that *"…EU nuclear generating capacity will decline from now on, unless significant investment is forthcoming in the near future for plant lifetime extensions and the replacement of facilities reaching the end of their operational lives. Without this investment, this low carbon source of base load electricity generation could be reduced from 31% to 21% of the total electricity generated in the EU in 2020"*.

increase their share but other energy sources will be needed, since possibilities to store electricity are limited and demand has to be met at all times. Replacement and/or life extension of ageing nuclear power plants coming to the end of their originally foreseen lifetime before 2020 need increasing levels of attention. If shut down, the contribution of nuclear energy to the overall electricity supply will substantially decrease, unless new plants are built or older ones are safely upgraded to operate for an extended period.

The graph (Fig.1 Annex 1) illustrates the decreasing trend of nuclear power capacity in the EU despite new plants under construction or notified to the Commission[8] (FI, FR, BG and SK), and the already agreed (or pending) operating lifetime extensions up to 40, 50 or 60 years.

According to current projections, the nuclear generation capacity in the EU would fall by as much as 33 GWe[9] by 2020. If this base load capacity is not replaced by new nuclear power plant (NPP), an important part of it will be replaced by gas or coal-fired plants. The extension of the lifetime of existing plants or new build would be needed just to maintain the share of nuclear power generation at the current level, contributing to the attainment of the EU's emissions reductions and security of supply objectives. With generalised lifetime extensions of existing reactors to 50 years, capacity would remain stable until 2020. However, generalised lifetime extensions have an upper limit as the actual number of installations that can be extended will have to be assessed case by case, subject to the respect of the highest safety standards available. The Sustainable Nuclear Fission Technology Platform will play a significant role in identifying research and development needs with respect to lifetime extensions.

In these scenarios, immediate decommissioning after obsolete plants shutdown would ease the construction of replacement capacity on existing nuclear sites. New investments in the nuclear sector need to be planned sufficiently in advance as industrial capacity also needs to be developed in order to realise these investments. This is not only valid for generation of electricity but also for other applications, in particular, nuclear medicine.

2.3. Overview of new and planned NPPs, planned closures and extensions

2.3.1. New plants under construction, new investment plans

Two 1600 MWe European Pressurized Reactor (EPR) are being built: in Finland (3rd Unit of the Olkiluoto NPP) and at Flamanville, France, expected to be operational by 2012. Finland is also starting the procedure for the possible construction of a 6th reactor, and France has announced it will construct a second EPR and is planning more reactors by 2020-30.

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8 Under Article 41 of the Euratom Treaty, investment projects related to the nuclear fuel cycle in the EU must be notified to the Commission prior to conclusion of contracts with suppliers or, if the work is to be carried out by the undertaking with its own resources, three months before work begins.

9 These figures take into account firm decisions on new NPPs, already agreed life extensions and the currently announced phase-outs, but do not include assumptions on potential new NPPs.

Other on-going, or firmly planned, new build in the EU are the two units of the Belene AES-92 VVER in Bulgaria, Units 3 and 4 of the Mochovce VVER in Slovakia. Romania is close to notify their plans to complete Units 3 and 4 of the Cernavoda CANDU NPP (unit-2 connected to the grid in 2007).

The Baltic countries, Poland and the Netherlands are considering regional projects and national options for new nuclear power plants.

In January 2008 the UK government gave the go ahead for new nuclear build, stating that nuclear power should play a role in providing the UK with clean, secure and affordable energy. It published its Energy Bill, which encourages nuclear investment, with clauses to ensure an adequate funding provision is made by potential developers of new nuclear power stations for full costs of decommissioning and their full share of waste costs. The government has invited companies to draw up plans to build and operate new stations indicating that land surrounding 18 mostly shut-down sites around Britain would be made available for sale and development through the Nuclear Decommissioning Authority (NDA). At least 7 new Generation III category NPPs are expected to be built.

Italy announced on 22 May 2008 that only nuclear can produce energy on a large scale, in a secure manner, at competitive costs and with respect for the environment and it therefore plans to restart the nuclear sector, with a 2020 horizon with view to constructing between 4 and 8 new NPPs.

2.3.2. Capacity uprating and Lifetime extensions

Capacity uprating continues to be undertaken at more than 25% of all NPPs; the EU-wide average unit availability has steadily increased over the last 10 to 15 years (reaching 84% for the period 2004-06). Over the same period, programmes on both capacity uprating and increasing plant availability have resulted in over 5000 MWe additional net power output in the EU-27 (equivalent to 3 to 5 reactors depending on their power level).

However, all operating plants are soon approaching the limits of their original design lifetime (30 to 40 years): the EU-27 average fleet age is 23 years, compared to a world average of 20 years (Fig.2, Annex 1). Of the current EU nuclear generating capacity, 18% comes from plants of 30 years old or more, and only 8% from plants which are 15 years old or less.[10]

Based upon the original 30 to 40-year plant lifetimes, about 44 GWe or 33% of the installed EU-27 nuclear net capacity would need to be removed from the grid over the next 10 years and be replaced. And yet, the utilities face political and regulatory uncertainty when applying for new builds, which are investments with long break-even periods. Therefore, extending the operating lifetime under safe conditions looks, under current circumstances, more cost effective than opting for new construction and is becoming normal practice in many countries.

There is no evidence of approved life extension programmes compromising the continued safety of nuclear plant operation**.** Those plants selected for lifetime

[10] 45% from NPPs over 25 years, 25 % from NPPs having less than 20 y (Fig.3, Annex 1).

extension are subject to significant investments for power uprating and modernisation, including improved safety features. Life extension is applied only in those cases where sufficient safety margins to cover ageing mechanisms of major components are in place. A discussion on lifetime extensions is currently on-going in both Belgium and Germany despite the official phase out policies presented below.

2.3.3. Recovered capacity

In addition to uprating and lifetime extensions, the progressive transition from use of gaseous diffusion to centrifuge enrichment plants will recover approximately 3000 MWe of electricity production capacity.

2.3.4. Planned closures

Belgium and Germany are planning to phase out nuclear energy after closure of the existing NPPs[11].

Apart from nuclear phase-out decisions taken by these 2 countries at political level, at least 11 operational plants in the EU are expected to be shut down by 2010, totalling about 7.7 GWe or 5.5% of the EU's current capacity. Lithuania and Slovakia will still have to shut down one reactor each as part of their EU accession commitments. All these closures contribute to the forecast decrease in the share of nuclear energy by 2020, unless phase-out policies are reversed.

3. CONDITIONS FOR REALISING THE NECESSARY INVESTMENTS

3.1. Public acceptance

Public acceptance is essential for the use of nuclear energy in Europe. The EU has a mature nuclear industry, covering the entire nuclear fuel cycle, with a good safety and security record. However, a number of concerns still need to be addressed.

Public authorities at local, regional, national, EU and international level all have a role to play. It is necessary to reinforce the current European legal framework to enhance transparency and governance of nuclear activities. Efforts need to be made to provide factual, timely and easily understandable information to the public, ensuring an open debate among the key actors on all aspects of nuclear energy.

The Commission is addressing these issues through both the High Level Group on Nuclear Safety and Waste Management (HLG), composed of senior national regulators, as well as the European Nuclear Energy Forum (ENEF), a broader cross section of society.

The HLG was established by the Commission in 2007 with the mandate to develop a common understanding and to suggest common approaches for further improving

[11] According to current policy, the generating power of German reactors is limited hence reactors should be shut down after about 32 years of operation, meaning that the currently operating reactors would be closed by 2022. In Belgium, the operating lifetime is limited to 40 years and the closure of all existing reactors is currently foreseen by 2025. Sweden has also made a political decision to phase out nuclear energy, but concrete actions to this effect have not yet been implemented.

nuclear safety and the management of spent fuel and radioactive waste. In the framework of the HLG initiative and taking into account discussions and developments in other fora, the Commission is preparing a revised proposal for a Directive setting up a Community framework for Nuclear Safety.

The ENEF provides a platform for a broad stakeholder discussion on opportunities and risks of nuclear energy, concentrating on the competitiveness of nuclear energy, the specificities of financing new nuclear build, the need for a legal roadmap accompanying the responsible use of nuclear energy, ways to progress on waste management and approaches to enhance trust, transparency and confidence between the public and the actors involved in the process.

A recent Eurobarometer survey[12], conducted during February to March 2008, concluded that European citizens' attitudes towards nuclear energy were more positive than in 2005. However it also confirmed that public acceptance of nuclear energy is very much linked to the availability of permanent and safe solutions for management of radioactive waste. While Member States bear full responsibility for managing its own radioactive waste, European citizens want the EU to play an active role to ensure that national practices and programmes for radioactive waste are monitored, harmonised and coherent with specific plans and fixed deadlines. Scientific and technological areas important to geological disposal have reached a level of maturity and a "wait and see" policy is no longer acceptable. Progress has to be made towards identified solutions, including through further research and development, not leaving political decisions for later generations. A collaborative effort amongst the key research and development stakeholders, in particular the national waste management agencies, is needed to establish a strategic research agenda and deployment strategy for the implementation oriented research.

Synergy to address the issue of nuclear waste at EU level is fostered through the HLG on nuclear safety and waste management, the European Nuclear Energy Forum as well as the Sustainable Nuclear Energy Technology Platform and a new Technology Platform on Geological Disposal, with the aim to facilitate additional efforts to optimise European research and development, to better co-ordinate, in setting common goals and in having a larger participation and commitment from industry to tackle radioactive waste management issues. On the occasion of the presentation of the sixth report on nuclear waste[13], the Council took stock of the situation of nuclear waste management in the EU.

Nuclear non-proliferation is a global issue, which reminds and concerns the public of the potential security risks associated with the use and future development of nuclear energy. With the growing number of countries starting or considering starting a nuclear power programme, there is a clear need to strengthen nuclear safety, security and guarantees for non-proliferation. The European Union has an important role to play in this context using the available external dimension instruments: the Instrument for Nuclear Safety Cooperation (INSC) and the Instrument for Stability[14]. A key priority of the Community is to maintain its support for the Non-Proliferation

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12 Special Eurobarometer, no. 297 "Attitudes to radioactive waste", published July 2008.

13 COM(2008) 542, 8.9.2008.

14 COM(2008) 312: "Addressing the international challenge of nuclear safety and security".

Treaty (NPT), by developing a shared approach with the IAEA towards the risks of proliferation. The Joint Statement between the European Commission and the IAEA of 7 May 2008 outlines that importance[15].

The Commission intends to address a Communication to the Council and the European Parliament on nuclear non-proliferation.

In the framework of an early exchange of information and warning in case of nuclear incidents in the EU, the Commission also discusses with Member States the functioning of the ECURIE system.

3.2. Licensing issues

3.2.1. Licensing

There is a need for planning stability and for reduction of investment risks due to regulatory uncertainty for investors and other stakeholders. Licensing includes standard design certifications, early site permits, construction permits, operating licenses or combined licenses. Public authorities in the EU should be encouraged to harmonize and simplify licensing procedures in order to provide legal certainty.

3.2.2. Design certification

Although there are moves in Europe towards harmonised requirements for licensing, design certification is done nationally and is safety-based.

The EUR document is a nuclear power plant specification written by a group of potential investors in electricity generation in Europe, mostly utilities and other industrial institutions, originally designed to facilitate the licensing of EPR reactors. Although used as a basis for the bid specification of the new nuclear constructions in Finland (EPR at Olkiluoto 3) and Bulgaria (AES-92 at Belene), it is not a regulatory type of design safety standard at EU level.

WENRA brings together the nuclear regulatory authorities of EU Member States and Switzerland. Its main objectives are to develop a common approach to nuclear safety, to provide an independent capability to examine nuclear safety in accession and candidate countries to the EU and network regulators in Europe by exchanging experience and discussing significant safety issues. WENRA has established and regularly revises its reference levels applicable to reactor safety, taking into account the Safety Requirements issued by the International Atomic Energy Agency (IAEA).

Recommendation: common reactor safety levels for existing NPPs and new build should be adopted.

3.2.3. Generation III designs

Generation I reactors were developed in the 1950-60s, and outside the UK, none are still operating today in the EU. Generation II reactors are those that are predominantly in operation in both the EU-27 and the rest of the world. Generation

[15] www.iaea.org/NewsCenter/News/PDF/iaea_euratom070508.pdf

III advanced Light Water Reactors and evolutionary designs offer advances in both safety and economics over preceding generations and are thus proposed for construction of new plants in the EU. Lacking formal definitions, they are characterised by the following features:

– Improved safety systems, including passive or inherent safety features and a containment providing protection against internal impacts due to effects of accidents as well as against external impacts;

– Increase in thermal efficiency and thus a reduction in fuel requirements;

– Longer plant life;

– Improved fuel technology and thus reduction of the volume of high level waste.

Examples of Generation III reactors are the recent new builds in Olkiluoto (Finland), Flamanville (France) and Belene (Bulgaria).

Nuclear plants must also be carefully protected against both attempted sabotage or terrorist attack and possible theft of nuclear material. Recent plants in the EU have included safeguards and security requirements into their design, setting an example in terms of nuclear security and non-proliferation.

Recommendation: only designs whose safety and security levels are equivalent to Generation III, or subsequent improvements should be considered in the EU for future new build.

3.3. Financing issues

A NPP has significantly higher construction costs than an equivalent coal or gas-fired plant. However, an NPP is less costly to operate over the design lifetime, due to lower and more predictable fuel costs. Yet, the size of the initial investment and the time needed to pay it back implies a high risk for private companies that sell electricity on short-term contracts or on the exchanges. So far, this has favoured generation plants with lower capital costs and higher, potentially fluctuating, fuel costs (such as gas-fired plants). The price increase of fossil fuels over the last five years is strongly influencing a reassessment of the structure of financing, leading to a renewed interest for investing in new NPPs.

However, the recent volatility in global credit markets is likely to put pressure on large scale investment projects in the near term. At the same time, rising costs for construction materials and labour have led to increased cost estimates for new power plants in general.

All forms of electricity generation produce some form of negative externality – costs imposed on third parties that are not directly paid by the producer – and generation costs often do not reflect these external costs. The most significant external costs for nuclear power, i.e. costs for decommissioning and waste management, should be

internalised in the electricity price[16]. Measures to mitigate global warming, such as an effective emissions trading mechanism, are ways of internalising external costs of fossil fuels and could provide a level playing field for the economics of nuclear power.

It is important to ensure in the EU that nuclear energy projects do not benefit from any State subsidy. Different ways to proceed are possible in this regard.[17]

3.3.1. Cost structure for NPPs

Servicing the construction costs of a nuclear power plant is the most important factor determining the competitiveness of nuclear energy. Despite high investment costs (~70% of total generation costs for nuclear in contrast to ~40% for coal and ~30% for gas) and the need to internalise all waste disposal and decommissioning costs, nuclear power plants compete favourably with fossil-fuelled units (€40–45/MWh and no emissions trading costs). Improvements in nuclear power plant performance over the last 10 to 15 years have resulted in increased plant availability and output, further lowering generating costs.

Because a power plant does not yield profits during construction, longer construction times and construction delays translate directly into higher interest charges on borrowed funds. Standardised regulatory processes for siting, licensing, and construction would shorten the overall time frame required and increase certainty that, if the plant is built as designed, it will be allowed to operate.

3.3.2. Level playing field for financing

In order to achieve the transition to a low-carbon economy, the EU needs a balance between market investment decisions and regulation. While the market will ultimately influence decisions on technologies and concrete investment projects, public authorities have a vital role in guiding clean energy investments by providing clear and credible long-term policy frameworks.

While financing new NPP construction belongs to private operators and the capital markets, some measures may be justified to facilitate financing, especially since the general investment climate for large-scale borrowers has become more difficult over the past year. The European Investment Bank revised in 2007 its investment policy to include nuclear power related projects. Euratom loans have been provided in the past for new nuclear installations and for safety improvements of reactors in the acceding and other countries. This facility is limited by an overall ceiling, adopted by the Council. The amount currently available could only provide a small part of the financing required for 2 or 3 projects. The Commission has proposed raising the borrowing and lending ceilings for Euratom loans and remains committed to doing so at an appropriate time[18]. These loans are given at market rates by borrowing on

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16 Commission Recommendation on adequate financial resources for decommissioning funds (OJ L 330, 28.11.2006).

17 The UK in its recent Energy Bill, stipulated that development of new nuclear plants should be initiated, funded, constructed and operated through the private sector to avoid any perception of State aid.

18 COM(2002) 457, 6.11.2002.

the international capital markets; they do not come from the Community budget and do not constitute subsidies.

3.4. Civil liability for nuclear damage

Operators of nuclear power plants are liable for any damage caused by them, and are therefore required to take out insurance. National laws are supplemented by a number of international conventions[19]. Compensation above the limits provided in the conventions and in national legislation needs to be covered by the individual insurance, or the State concerned must accept responsibility as insurer of last resort, as is the case for liability in other industries. Additional details are given in Annex II.

Recommendation: a more coherent and harmonised liability scheme should be developed to ensure a comparable level of protection for citizens and to create a level playing field for EU nuclear industry.

4. SECURITY OF SUPPLY FOR NUCLEAR FUELS

Nuclear reactor operators usually purchase concentrated uranium ores and conclude contracts with fuel cycle service providers for the chemical conversion of the concentrates to uranium hexafluoride, for its enrichment and chemical conversion to uranium oxide, and finally for its fabrication into fuel elements for loading into a power reactor. For all these production activities, long term contracts prevail (5 years being typical but 10 years or even longer term contracts are not uncommon). Spot market deliveries play a minor role, although long term contract prices are often linked to recent spot prices.

4.1. Supply and demand situation, investment needs (Fig.4 Annex 1)

With about one third of the world's reactors, EU fuel needs are also about one third of the global nuclear fuel market. The EU industry has the needed capacity to fulfill EU requirements for uranium enrichment and fuel fabrication (except for the Russian design VVER reactors), but lacks some capacity for uranium conversion and is dependent on imported uranium.

Annex II describes the nuclear fuel cycle.

[19] Paris Convention (OECD) on Third Party Liability in the Field of Nuclear Energy of 1960 bolstered by the Brussels Supplementary Convention in 1963 and entered into force 1968. Vienna Convention (IAEA) on Civil Liability for Nuclear Damage of 1963, entering into force in 1977.

5. CONCLUSIONS

Nuclear energy plays an important role in the transition to a low carbon economy and reduces EU external supply dependency. The choice to include nuclear energy in the energy mix lies with the Member States. Nevertheless, it should be noted that if strategic investment decisions about power generation capacities in nuclear as well as in renewable energy are taken rapidly, nearly two thirds of EU's electricity generation could be low carbon in the early 2020s.

The role of the European Union is to ensure that this source of energy is developed while meeting the highest level of safety. The European Union should also promote more coherent rules on licensing and safety for the construction of new nuclear power plants. This will facilitate investments and ensure to the citizens that these decisions are implemented on the basis of clear and transparent rules. An appropriate regulatory framework for new nuclear investments would facilitate future investments in this sector and thereby contribute to security of supply.

The strategic investment choices for the generation of electricity will have an impact for decades on CO_2 emissions, competitiveness and security of supply in the EU.

Public authorities have a role to play, by establishing predictable and effective licensing procedures, improving public acceptance by addressing concerns related to nuclear safety, waste management and decommissioning. Due consideration should also be given to the issue of facilitating access to financing.

The EU industry is a global leader in nuclear technology and has the capacity to supply both reactor equipment and most of the fuel cycle services, even though natural uranium is mostly imported. To maintain this leadership and to develop the next generation of nuclear reactors required to meet the ambitious 2050 EU low carbon vision, research and development effort in the framework of the SET Plan European Industrial Initiative on fission energy needs to be progressively stepped up.

The role of the EU is to develop further, and to support third countries through its external instruments in accessing, the most advanced framework for nuclear energy, meeting the high standards of safety, security and non-proliferation as required by the Euratom Treaty. The Commission is preparing a revised proposal for a Directive setting up a Community framework for Nuclear Safety. The Commission supports the implementation of the already existing technical solutions for nuclear waste management. While maintaining the high level of nuclear safeguards throughout the EU, as a model for security inside and outside the Union, the EU should continue its efforts to promote high safety and security standards internationally through its external cooperation instruments.

Security of supply of nuclear fuels cannot be taken for granted, especially should there be a rapid increase in global demand due to an expansion of nuclear power programmes. However, the situation is better than for fossil fuels, due to the wide ranging availability of uranium and the possibility to recycle nuclear materials several times. The industry must increase its capacity in line with demand, but with the exception of new mines, this can be done within the time frame of the construction of a new power plant. When there is enough evidence of additional demand, the required processing capacities will be built.

While the capital requirements are often important, financial markets have recognized the profit potential of energy related investments and capital is available to financially sound projects. Significant new investments are already being undertaken in the EU and elsewhere. Increasing natural uranium production takes more time, but over the next 5 to 10 years, production around the world is expected to increase significantly. Global uranium resources are sufficient at the current rate of consumption[20]. However, over the longer term, new reactor technologies are needed to reduce the depletion of uranium resources.

The implementation of a diversified supply policy remains vital for the EU nuclear industry. The low number of major players at the various steps of the fuel cycle may create unexpected supply constraints. Due to the need for uranium imports and taking into account EU's leading position for developing nuclear technology, it is important for the EU to maintain and further develop cooperation with third countries, in particular through Euratom agreements on peaceful uses of nuclear energy as well as on research cooperation.

[20] Without taking into account more efficient utilization of resources resulting from the potential deployment of Generation IV reactors in the future.