FORATOM
THE VOICE OF THE EUROPEAN NUCLEAR INDUSTRY

NUCLEAR ENERGY: POWERING THE ECONOMY CARBON-FREE GROWTH, JOBS AND LEADERSHIP IN INNOVATION

Maintaining a one quarter share of nuclear in the 2050 electricity mix will support jobs and economic growth in the EU - as well as helping to decarbonise the economy!

NUCLEAR

- Is a low-carbon energy source
- Ensures security of supply
- Is environmentally, economically and socially sustainable

NUCLEAR INDUSTRY IN NUMBERS

- Accounts for **26%** of electricity in the EU
- Almost **50%** of low-carbon electricity
- Supports around **1.1 million** jobs
- Turnover of **100bn** per year

April 2019

If Europe is serious about decarbonising its economy by 2050 then one quarter of the electricity produced in the EU will need to continue to come from nuclear. Not only will this enable the EU to achieve its carbon-free targets, whilst at the same time ensuring it has access to the energy it needs when it needs it, it will also provide a significant contribution in terms of economic growth and job creation.

According to a new study by Deloitte, having 150 GW of installed nuclear capacity in the EU in 2050 would:

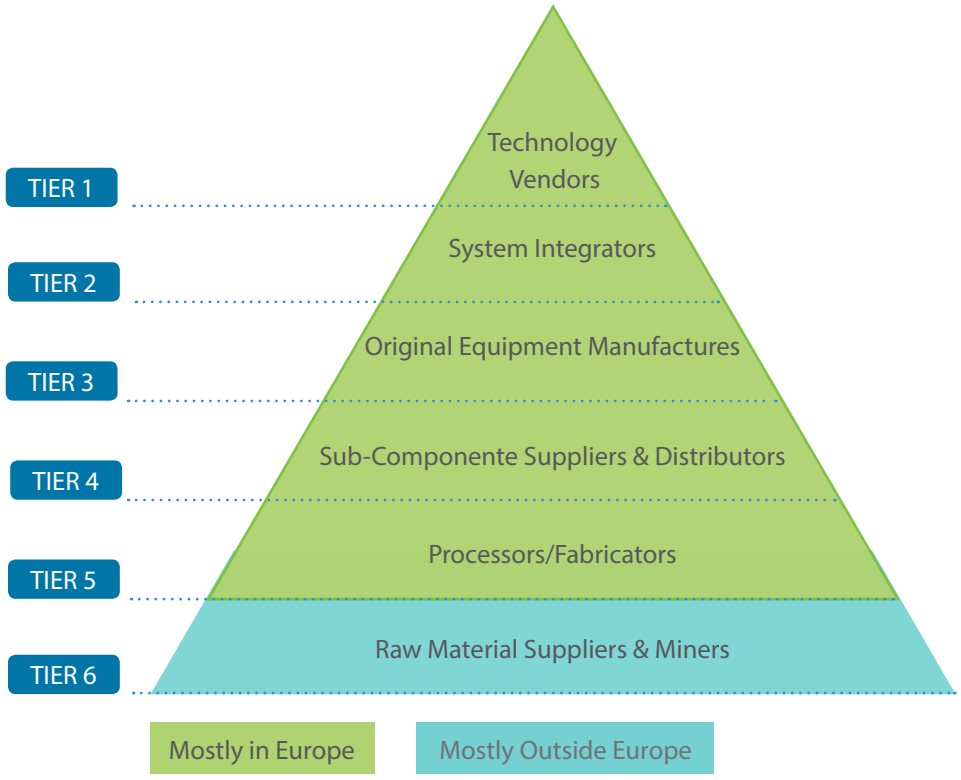
- support more than 1.3 million jobs annually
- generate €576 billion per year in GDP
- boost tax revenues by €110.2 billion per year
- provide households with €490.9 billion in disposable income

The contribution of nuclear to the EU's economy

For more than 60 years, nuclear technologies have been providing Europe with a reliable source of low-carbon electricity. The aim of the work undertaken by Deloitte was to assess the contribution of the nuclear sector to the overall economy of the EU28. It focuses on economic and societal benefits both today and in 2050. There is currently 118 GW of installed nuclear capacity in the EU. For 2050, the authors have assumed an installed nuclear capacity of 150 GWs, as per the high scenario outlined in the FTI-CL Energy Consulting study commissioned by FORATOM[1].

The high scenario is based on a combination of the long-term operation of existing nuclear power plants, new projects currently under construction or in the planning stage, as well as additional new projects. The assumption is that the EU will have decarbonized its economy by up to 95% in 2050 (compared to 1990 levels), with electricity demand rising to more than 4,100 TWh (from 3,100 TWh currently) due to increased electrification.

The nuclear supply chain



Source: World Nuclear Association 2014

[1] Pathways to 2050: role of nuclear in a low-carbon Europe

Facts and figures

The report focuses on employment, GDP, state revenues and disposable household income and takes into account both direct and indirect impacts. Based on their assessment, the nuclear industry has a significant positive economic and social impact in the EU.

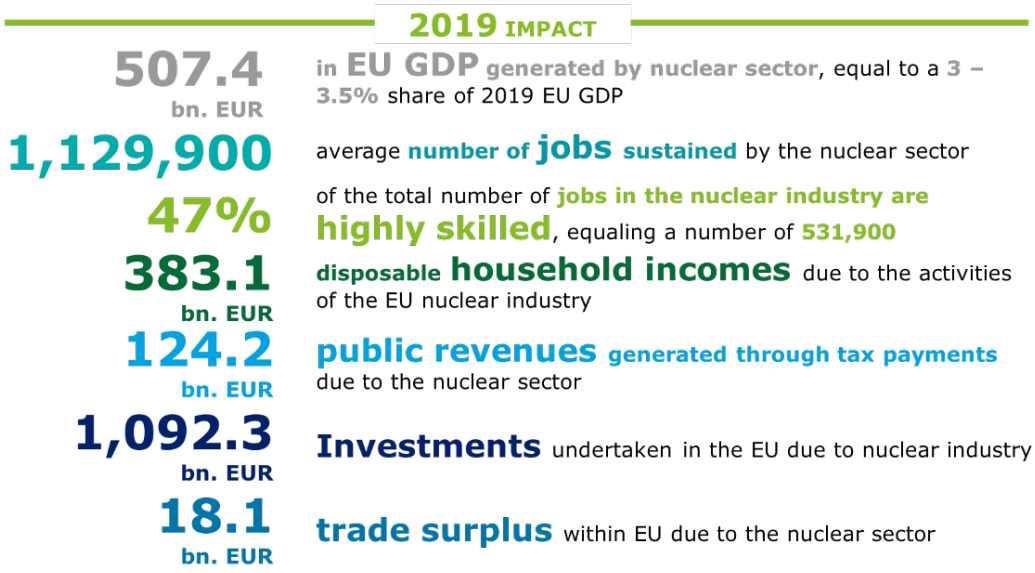
2019

According to the authors, one GW of installed nuclear capacity in the EU triggers €9.3 billion in annual investments both in the nuclear and connected economic sectors. In addition, each GW provides permanent employment to just under 10,000 people and generates €4.3 Bn in EU GDP. In total this means that the nuclear industry currently sustains more than 1.1 million jobs in the EU and generates more than half a trillion euros in GDP.

This shows that

- every euro spent in the nuclear industry generates €5 in EU GDP
- every direct job created in the nuclear industry creates 3.2 jobs in the EU economy as a whole.

These figures are significantly higher than, for example, the wind and solar industries. The wind industry (with an installed capacity of 160 GW) supports just over 250,000 jobs in Europe and generates €36.1 billion in GDP. The solar power sector supports just over 80,000 (with an installed capacity of 100 GW)[2].



Source: Deloitte calculations

2050

Assuming that one quarter of the electricity generated in 2050 continues to come from nuclear, this would mean that the nuclear industry would support over 1.3 million full-time jobs and generate €576 billion annually in GDP. The following chart below highlights this significant contribution.

[2] EU energy in figures - Statistical pocketbook 2018 (European Commission)
Local impact, global leadership (Deloitte & WindEurope)
Solar PV Jobs & Added Value in Europe (Solar Power Europe)

2020 — 2050

576.0 bn. EUR in **EU GDP** generated annually by nuclear sector, equal to a 1.5 - 2% share of EU GDP

1,321,600 average **number of jobs sustained each year throughout the period** by the nuclear sector

45% of the total number of **jobs in the nuclear sector will be highly skilled**, equaling a number of **595,600**

490.9 bn. EUR average disposable **household income** per year due to the activities of the nuclear sector

110.2 bn. EUR average **state revenues** generated annually through **tax payments** deriving from the European nuclear sector

33.5 bn. EUR average **trade surplus** generated annually within the European nuclear sector

Source: Deloitte calculations

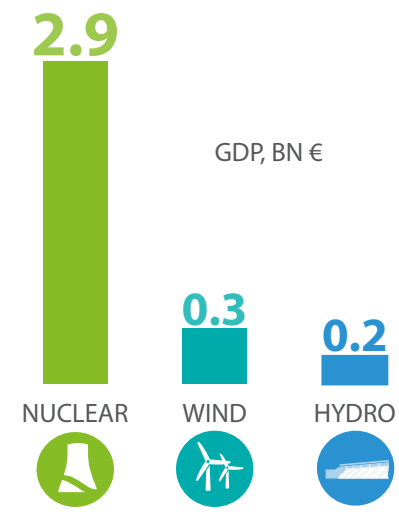
What does this all mean?

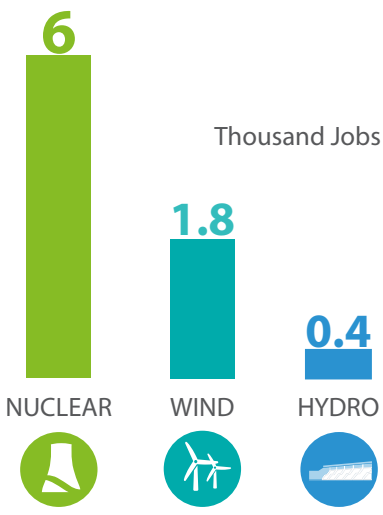
The economic benefits of maintaining a strong, European nuclear supply chain do not end here, as the industry can positively respond to many of the other challenges which the EU is facing.

Just transition

We all agree that the EU needs to reduce its CO2 emissions. Nevertheless, it is clear that, if not done correctly, it could trigger significant social impacts, for example in terms of job losses in the coal industry. Therefore, the aim should be to secure the future and livelihood of workers and their communities in the transition to a low-carbon economy.

In 2030 one GW of installed capacity would generate:





Source: Deloitte calculations

The previous chart clearly shows that out of the different low-carbon technologies available in Europe, nuclear creates the greatest number of jobs per GW of installed capacity. Around half of these jobs can be considered as highly skilled, and the majority are local jobs located in more rural areas. But one of the challenges which the nuclear sector is facing is finding sufficient people to come and work in the industry.

A high nuclear scenario in 2050 will provide a high number of local jobs in both the nuclear industry and related supply chain. Furthermore, in order to achieve 150 GW of installed nuclear capacity in 2050, a significant amount of additional capacity will need to be built, generating jobs in the construction industry (ranging from the construction of the power plant itself to the surrounding infrastructure such as roads and housing).

This offers a win-win opportunity. For example, some of those employed in the coal industry could be retrained in order to fill the employment gap in the nuclear industry.

Maintaining a competitive and decarbonised industrial base

Maintaining jobs and growth in the EU is one of Europe's priorities, and for this it will need to maintain a strong industrial base. Due to increased globalisation, Europe's industries are facing strong competition for other parts of the world, which is in part due to higher energy costs. Furthermore, many industries are energy intensive and so they will need to find stable solutions which can help to decarbonise their manufacturing process. Otherwise, Europe will run the risk of loosing its industries due to so-called 'carbon leakage'.

Nuclear clearly has a role to play in supporting these industries and helping them to remain in Europe. For example, nuclear can provide a stable supply of the low-carbon electricity which they will need as they shift towards an increased electrification of their industrial processes. In addition, the nuclear industry is working together with, for example, the steel industry to produce hydrogen from nuclear power for industrial purposes. Nuclear reactors can also provide heat for other industrial processes.

Ensuring EU leadership in innovation

The EU is keen to show leadership when it comes to innovation. The European nuclear industry remains very active on this, with R&D projects leading not only to the development of advanced reactors, but also to technologies which can be used in other applications, such as medical, mobile phones and even electric vehicles! By supporting nuclear energy and a European nuclear supply chain, the EU will also be supporting innovation.

Exports

The European nuclear industry is a net exporter of goods and services, currently generating a trade surplus of €18.1 billion in the EU. This figure is expected to rise to €24.8 billion annually by 2050, based on a high nuclear scenario.

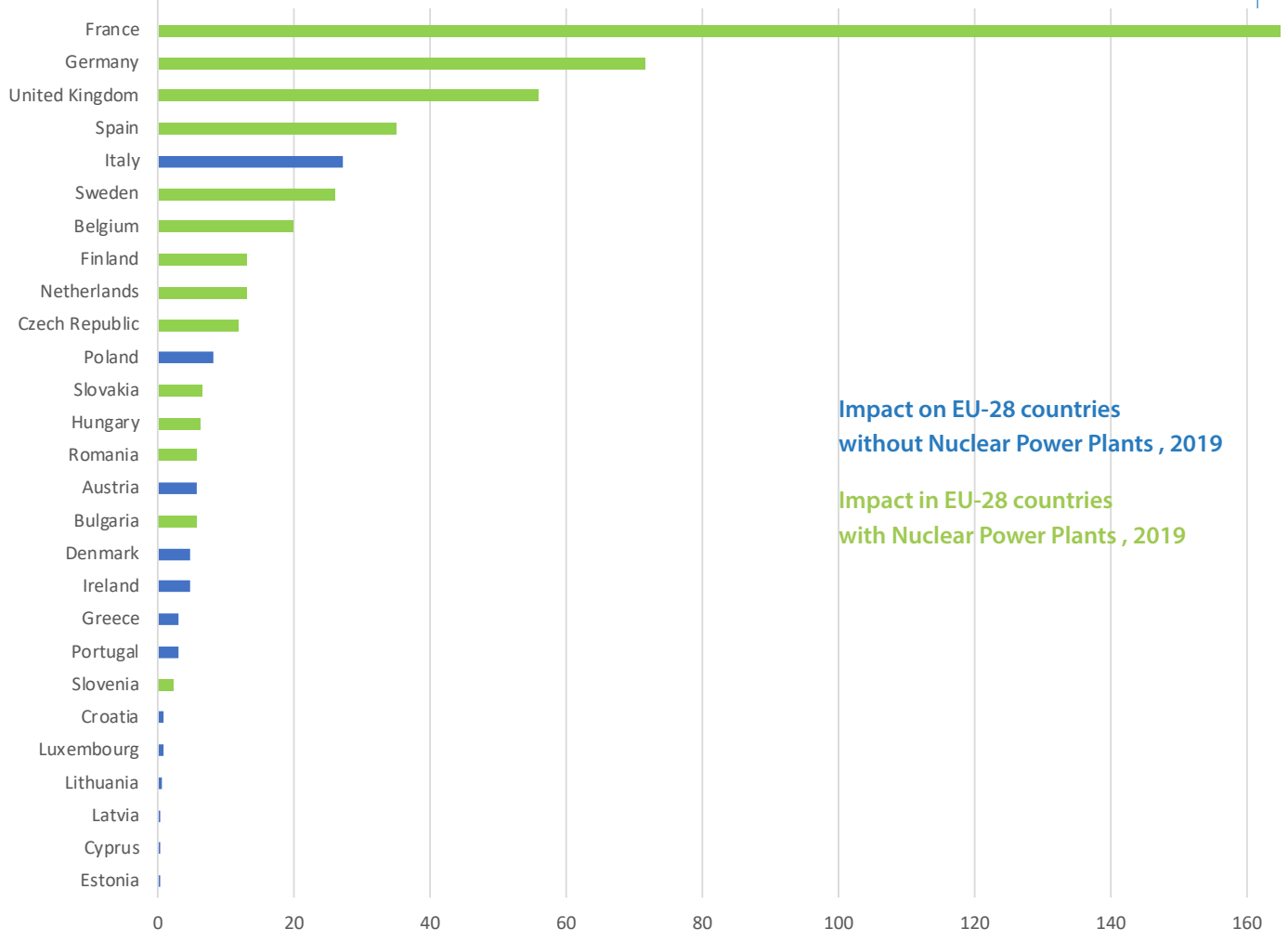
In a nutshell

A high nuclear power capacity of 150 GW would entail widespread economic benefits throughout the EU, sustaining more than one million new jobs and hundreds of billions of Euro in additional GDP growth, tax revenues and household income. Based on the results of this study it can be concluded that one GW of installed nuclear capacity in the EU

- triggers €9.3 billion in annual investments both in the nuclear and connected economic sectors.
- provides permanent and local employment to just under 10,000 people
- generates €4.3 Bn in EU GDP.

This would benefit all EU Member States even those without any nuclear power plants. This is demonstrated by the following charts which show the current impact of the nuclear industry on GDP and employment in each MS.

GDP bn €



Source: Deloitte calculations

Employment

France	457,200
Germany	136,300
United Kingdom	111,000
Spain	74,500
Sweden	64,500
Belgium	48,200
Italy	40,600
Finland	32,900
Czech Republic	29,600
Netherlands	21,000
Slovakia	16,700
Bulgaria	15,200
Hungary	15,000
Romania	12,600

Impact on EU-28 countries without Nuclear Power Plants , 2019

Impact on EU-28 countries with Nuclear Power Plants , 2019

Poland	12,000
Austria	8,400
Denmark	7,000
Ireland	7,000
Slovenia	5,500
Greece	4,700
Portugal	4,600
Croatia	1,200
Luxembourg	1,200
Lithuania	1,000
Latvia	600
Estonia	500
Cyprus	500
Malta	300

Source: Deloitte calculations

About us

The European Atomic Forum (FORATOM) is the Brussels-based trade association for the nuclear energy industry in Europe. The membership of FORATOM is made up of 15 national nuclear associations and through these associations, FORATOM represents nearly 3,000 European companies working in the industry and supporting around 1.1 million jobs.

More information: Executive Summary

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