

## Creating high-value jobs in the post-COVID-19 recovery with nuclear energy projects

- The post-COVID-19 economic recovery is a perfect opportunity to create jobs and economic development while continuing to move ahead with the energy transition.
- Investing in nuclear energy creates a large number of high-skilled jobs, accelerates the transition to a low-carbon economy, and increases energy resilience.
- Nuclear energy projects are a proven way to create large numbers of long-term, high-skilled domestic jobs that pay premium wages.
- Nuclear projects provide high spill-over investment into the local and regional economy.

### What's the problem?

As the world's societies and economies continue to endure the effects of the COVID-19 crisis, it is crucial that planning starts for the post-pandemic recovery. With most OECD governments aiming at an economic recovery that preserves the ambition for affordable energy transition plans, any post-pandemic economic recovery plans and associated investments must align with long-term economic, social and environmental objectives - be it the Paris Agreement or the UN Sustainable Development Goals. With rising unemployment in the wake of the pandemic, the question of how to deliver socially equitable and affordable decarbonisation, whilst preserving and developing quality employment has to be at the core of all revitalisation plans.

### Why is this important?

The low-carbon energy sector, and nuclear energy in particular, can play a major role in not only supporting the economic recovery while keeping the pace for the energy transition, but also in terms of job creation and leading the efforts towards building a more sustainable and resilient future. It will be crucial to develop and invest in sectors that contribute to local, national and regional economic growth and employment prospects, as well as essential resilient infrastructures such as roads, railways, healthcare systems, electricity infrastructure and welfare provisions that contribute to elevate the quality of life for society as a whole. It is equally important that countries invest in sectors with a proven track record of contributing to socially sustainable and equitable economic development while helping create a reliable low-carbon modern energy system that offers resilience with regards to weather fluctuations or future geopolitical and economic shocks.

### What should policy makers do?

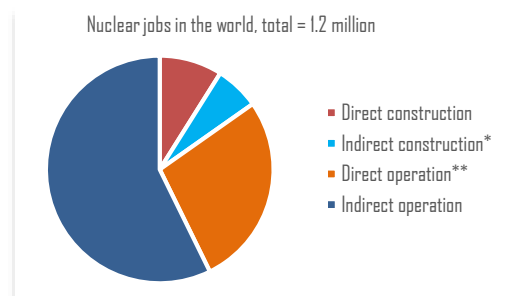
*Promote investment in nuclear projects that galvanise long-term sustained economic development*

The development of nuclear power has historically proven to be a catalyst for industrial and economic growth and prosperity across the world. Countries with limited

domestic energy resources such as France, Japan or Korea are excellent examples of how nuclear energy not only delivers widespread growth along with energy independence and security of supply, but also builds resilience against geopolitical shocks and have helped galvanise national efforts to spur economic development and expansion. At present, some 438 nuclear reactors are proposed and planned around the world, and investing in the realisation of these projects could play a crucial role in the post-pandemic economic recovery.

In helping with the post-pandemic economic recovery, it is crucial not only to look towards developing new reactors, but also to preserve the current fleet. Countries with already-operating nuclear power plants should actively consider investments to ensure the long-term operations (LTO) of these assets, as well as modernisation or uprate programmes. Nuclear LTO not only is the most cost-effective low-carbon source of energy (IEA, 2019), but also provides shovel-ready investment projects, which both preserve the current workforce and "know-how", but also result in spill-over jobs and economic development in the local and national economy. For example, the refurbishment of six reactors by Bruce Power in Canada will provide low-cost, reliable, carbon-free electricity until 2064 and will sustain 22 000 jobs.

Figure 1: Total nuclear employment



\* Manufacturing & Engineering Studies.

\*\* Fuel cycle, maintenance, supporting R&D, regulation.

*Consider not only the number of jobs, but their quality, duration and location*

With a global nuclear fleet of about 400 GW today, nuclear energy generates about 1.2 million direct and indirect jobs, or an average of 3 000 jobs/GW (FORATOM, 2019). These jobs are long-term, require highly-educated people and provide high-skilled employment with premium wages that result in significant spill-over investment into the local and regional economy. For example, the Hinkley Point C project in the United Kingdom will result in 25 000 employment opportunities, including over 1 000 apprenticeships during the construction phase, and 900 permanent jobs onsite during the 60-year life of the plant. About 64% of the construction contracts will be delivered by UK companies, and the project will contribute to the local economy GBP 1.5 billion during construction, and about GBP 40 million a year during operation. In contrast, 39% of all renewable energy jobs are in China (IRENA, 2019).

A Deloitte study found that every Euro spent in the nuclear industry generates a further EUR 5 in the EU economy and a further EUR 3.6 of disposal household income, and every direct job created in the nuclear industry creates an additional 3.2 jobs in the EU economy as a whole (FORATOM, 2019). In the United States each dollar spent by an average nuclear power plant during one year of operation is estimated to trigger an additional USD 1.04 of output in the regional economy, USD 1.18 in the state and USD 1.87 at the national economy level (NEI, 2014).

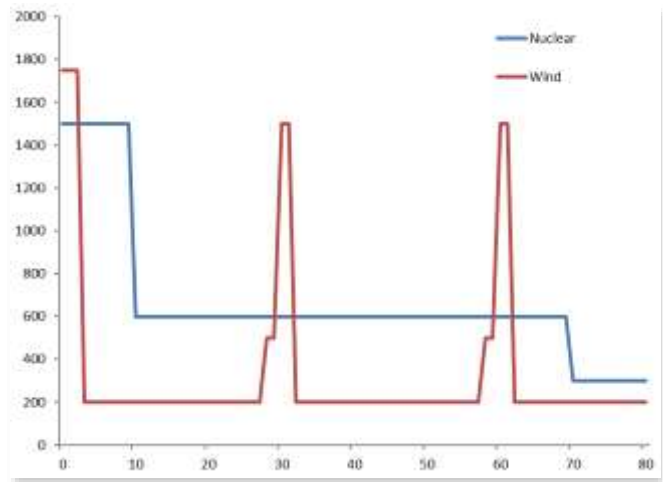
The nuclear sector generates a significant amount of high-skilled, high-paid and mostly local jobs for an extended period of time - often for 60 to 80 years - including during construction, operations and decommissioning. An Oxford Economics study for the Nuclear Energy Institute in the United States indicated that on average jobs in nuclear energy are 20% better paid than in fossil fuel generation, and 30% better than wind and solar generation, directly demonstrating the higher education in nuclear as well as a higher potential for induced activities and jobs.

Economic stimuli should be used to help accelerate research and development in all low-carbon technologies with a focus on those that most contribute to nationwide localisation in jobs creation and economic development. It is important to consider not just the number of jobs created, but their location, their quality and their duration. Only high quality local stable jobs will result in sustainable and equitable economic development that translates into an increase in the quality of life of all citizens.

With nuclear energy as an integral part of a modern industrial strategy, with support for skills development, R&D, and trade and investment, nuclear development and construction will result in long-term clean growth. Nuclear energy is a proven technology, with the lowest life-cycle environmental impacts, that results in the most cost-effective approach to decarbonisation when all costs (generation and system costs) are considered. Investing in nuclear energy would create a large number of high-

skilled jobs, accelerate the transition to a low-carbon economy and increase energy resilience, and would attract invaluable inward investment that drives sustained long-term local and national economic growth for a cleaner, modern and more resilient future energy system.

Figure 2: Schematic of employment in nuclear and wind for 1 GW capacity



Source: NEA (2018).

## Further reading

FORATOM (2019), Impact Report - Vision to 2050, Foratom - European Atomic Forum.

IAEA (2009) *Nuclear Technology and Economic Development in the Republic of Korea*, IAEA, Vienna.

IEA (2019) *Nuclear Power in a Clean Energy System*, IEA, Paris.

IRENA (2019), *Renewable Energy and Jobs - Annual Review 2019*, International Renewable Energy Agency, Abu Dhabi.

NEA (2018) *Measuring Employment Generated by the Nuclear Power Sector*, OECD Publishing, Paris.

Nuclear Energy Institute (2014), *Nuclear Energy's Economic Benefits – Current and Future*, NEI, Washington, DC.

Oxford Economics (2019), *Nuclear power pays: Assessing the trends in electric power generation employment and wages*, Oxford Economics, New York.

World Nuclear Association (2020), *World Nuclear Power Reactors & Uranium Requirements*, [www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx](http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx) (Accessed 7 June 2020).