



IAEA

International Atomic Energy Agency
Atoms for Peace and Development



NICE Future
Nuclear Innovation: Clean Energy Future
An Initiative of the Clean Energy Ministerial

IAEA Webinar on Investing in Low Carbon Technologies: Job Creation for Just Energy Transitions

Tuesday, April 5, 2022
14:00-15:20 (CET)

Welcome



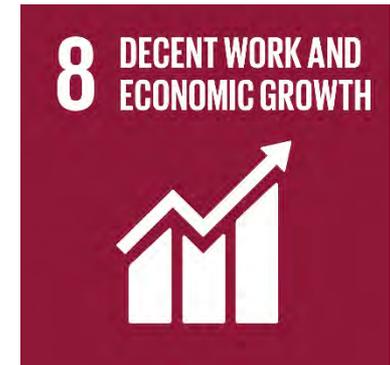
- Questions in the Q&A chat
- Questions will be collected and asked to panelists during the Q&A session
- Participants are muted
- Webinar is recorded and will be made available at the IAEA website



Energy Data Analyst
IAEA Planning and Economic Studies Section

Job creation and Just Transition

- Transformation of energy sector in line with the goals of Paris Agreement
 - Construction and operation of new climate-friendly energy facilities - **new job opportunities**
 - **Phase-down of fossil energy sources** - disruptive impact on the related sectors and destruction of existing jobs
- The **challenge** to
 - ... find the best ways to ensure **economic growth** and increase the quality of living through **job creation**...
 - ... while aligning investments to **climate change mitigation targets**
- General logic of **Agenda 2030**: interconnectedness of SDGs
- **Prospects for Just Transition?**



Webinar Objectives



- Provide an overview of **recent research** on job creation through investment in low-carbon energy sources and discuss their main results.
- Discuss the **factors** that can help **maximise job creation** (e.g., supply chain localisation).
- Discuss the **approaches to evaluation** of job types created through low-carbon investments: temporary and permanent jobs, part-time and full-time jobs, job creation by skill and salary level, and job creation in terms of gender mainstreaming.
- Discuss the **expectations from communities** aiming for the clean technologies' transitions.

Structure



- Presentations from:
 - **Brian Nyawinda**, *Nuclear Power and Energy Agency (NuPEA) of Kenya*
 - **Daniel Wetzel**, *International Energy Agency (IEA)*
 - **Michael Renner**, *International Renewable Energy Agency (IRENA)*
 - **Philippe Costes**, *World Nuclear Association (WNA)*
- Q&A session
- Panel discussion

- **Partnership:** *The **NICE Future initiative of the Clean Energy Ministerial** is sponsoring this webinar. NICE Future explores the potential for nuclear energy uses, innovations, and greater systems integration to accelerate progress toward clean energy and climate goals.*

Opening Remarks

Henri Paillere

- Head, IAEA Planning and Economic Studies Section since February 2020.
- Over 25 years of experience in the nuclear energy sector.
- Senior Analyst and Deputy Head of the Division of Nuclear Technology Development and Economics at the OECD Nuclear Energy Agency, 2011-2019.
- Head of the Technical Secretariat for two international initiatives, the Generation IV International Forum, and the International Framework for Nuclear Energy Cooperation.
- R&D Program Manager at the Alstom Power Company and at the French Alternative Energies and Atomic Energy Commission (CEA) in various positions.



NUCLEAR POWER & ENERGY AGENCY

Brian Nyawinda

- Financial Analyst, Strategy and planning Directorate at the Nuclear Power and Energy Agency, Kenya (NuPEA)
- TWG Member of the Nuclear Innovation: Clean Energy Future (NICE Future) for Kenyan Project
- Over 7 years of experience in the nuclear energy sector.
- Education: Finance and Economics (JKUAT)
- MSc. Engineering (Technology Management Economics and Policy) Seoul National University, S.Korea
- Nuclear Non-proliferation Education and Research (NEREC) Fellow (Korea Advance Institute of Science and Technology), S.Korea
- ICTP–IAEA Nuclear Energy Management Fellow at the International centre for theoretical Physics Trieste, Italy



NuPEA

NUCLEAR POWER & ENERGY AGENCY

Investing in Low Carbon Technologies: Job Creation for Just Energy Transitions

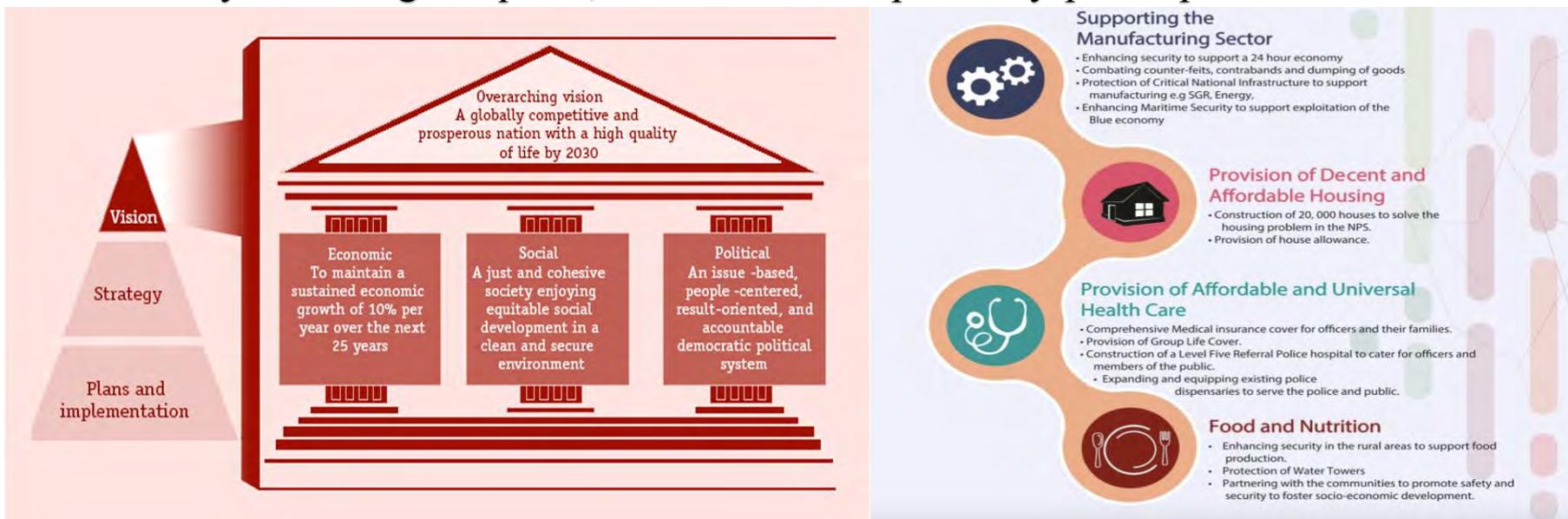
Virtual Meeting

Tuesday 5th March 2022
Presenter: Nyawinda Brian

NuPEA

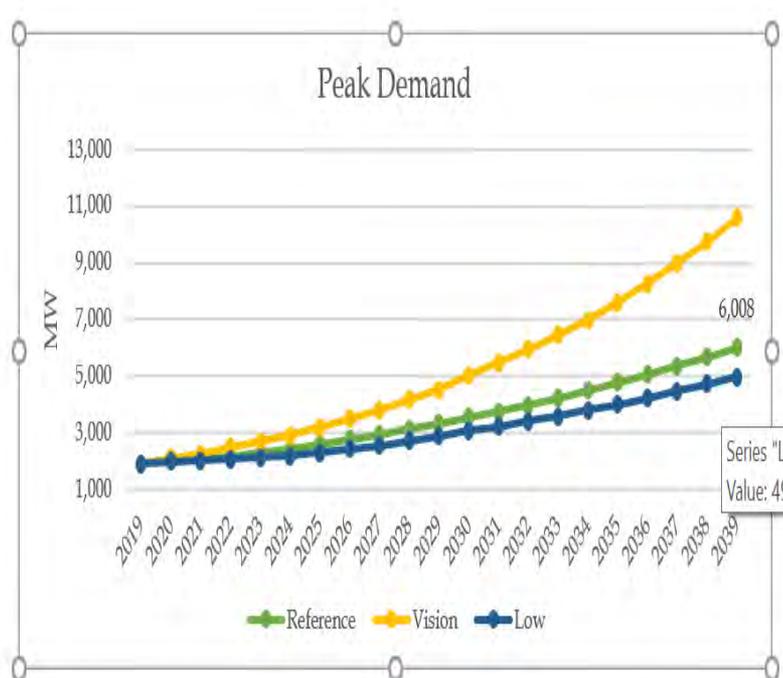


Energy is a key enable for vision 2030; driving flagship projects By: Providing adequate ,Reliable and competitively-priced power

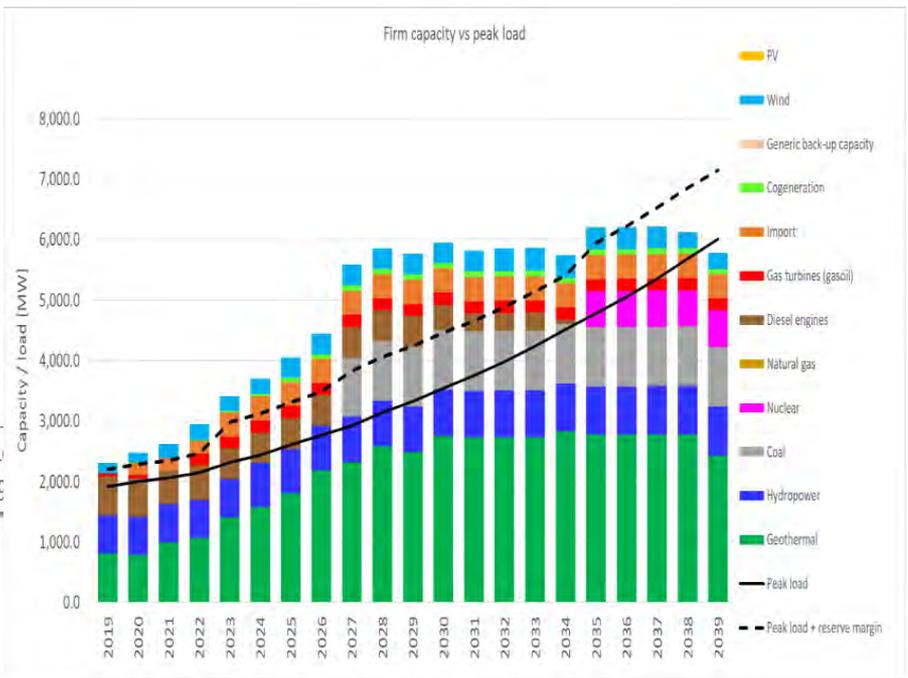


How: transforming Kenya into an economic powerhouse with a sustainable growth rate of over 10% by 2030 thus becoming a middle income prosperous country.

Longterm Energy Planning and Role of Nuclear



Installed capacity-3024 MW



Peak Demand-2036 MW

LCPDP 2020-2040.

Studies on economic benefits of Nuclear

- Undertake an in-depth economic study on having nuclear power plant operating in Kenya and its impacts.
- This is through estimating the **employment, earnings, gross domestic product, and output** from the construction and operation of nuclear power plants.
- Economic Analysis Tools being considered; IJEDI – **Jobs and Economic Development Impact** National Renewable Energy Laboratory (NREL), Engage (NREL), Economic impact analysis for nuclear, construction and operation-Idaho National Laboratory (INL)

Studies on economic benefits of Nuclear con't

Outputs

Report on **macroeconomic** impacts of a nuclear power project **in Kenya**

Outcomes

Increased stakeholder awareness on the economics of nuclear in Kenya

Improved accuracy in representation of nuclear option in national energy planning

Evidence based information to the Government to guide national decisions on nuclear power investments in the country.

Why is this solution better than other alternatives?

Currently the information that is used to justify nuclear in terms of economic impacts in Kenya is on a global scale (generic). This is not representative of the economic impacts of nuclear power in the country context.

The proposed studies will give country specific economic impacts of the nuclear power programme.



Economic Analysis & Generation Optimization Modeling –

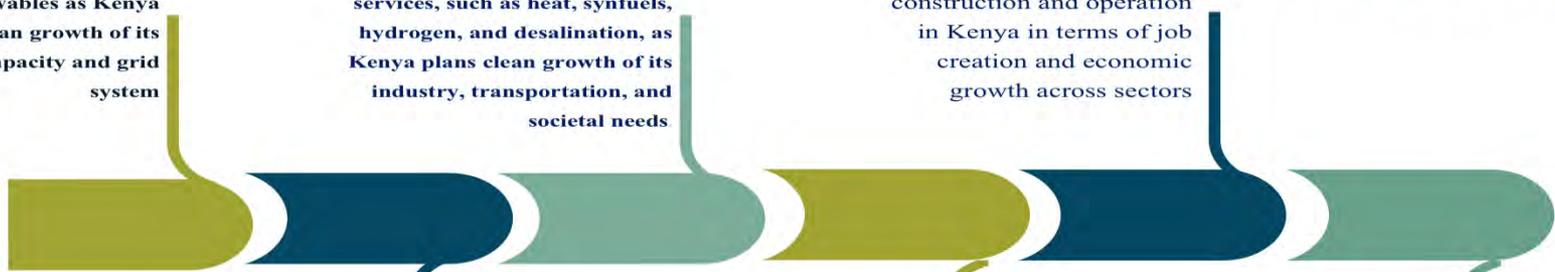
this study is under collaboration with NICE Future Initiative.

A1. Determine the optimal roles for nuclear power alongside renewables as Kenya plans clean growth of its generation capacity and grid system

A2. Determine the optimal roles for other nuclear energy services, such as heat, synfuels, hydrogen, and desalination, as Kenya plans clean growth of its industry, transportation, and societal needs

A3. Determine the potential benefits of nuclear construction and operation in Kenya in terms of job creation and economic growth across sectors

Analytical Objectives



S1. Inform potential nuclear customers in Kenya about SMR and microreactor designs and costs through a vendor symposium

S2. Inform national, county, and local leaders in Kenya about the potential nuclear contributions to clean growth and job creation through a decision-makers summit

S3. Inform the international community about the U.S.-Kenya nuclear collaboration case study through report and events for CEM13 and COP27

Stakeholder Objectives



Daniel Wetzel
Head of Tracking Sustainable Transitions
World Energy Outlook Team



Dan leads the IEA's work tracking how policy measures are actually moving the needle on clean energy transitions, energy access, and energy employment. He was one of the lead author's on the IEA's **Sustainable Recovery** report, the IEA's **Sustainable Recovery Tracker**, and oversees the employment, access, and policy components in the annual **World Energy Outlook**. Prior to joining the IEA, Dan worked at the Rocky Mountain Institute in their Beijing office, leading their Power Market Reform program, and also in Colorado, working on regional energy transition plans.

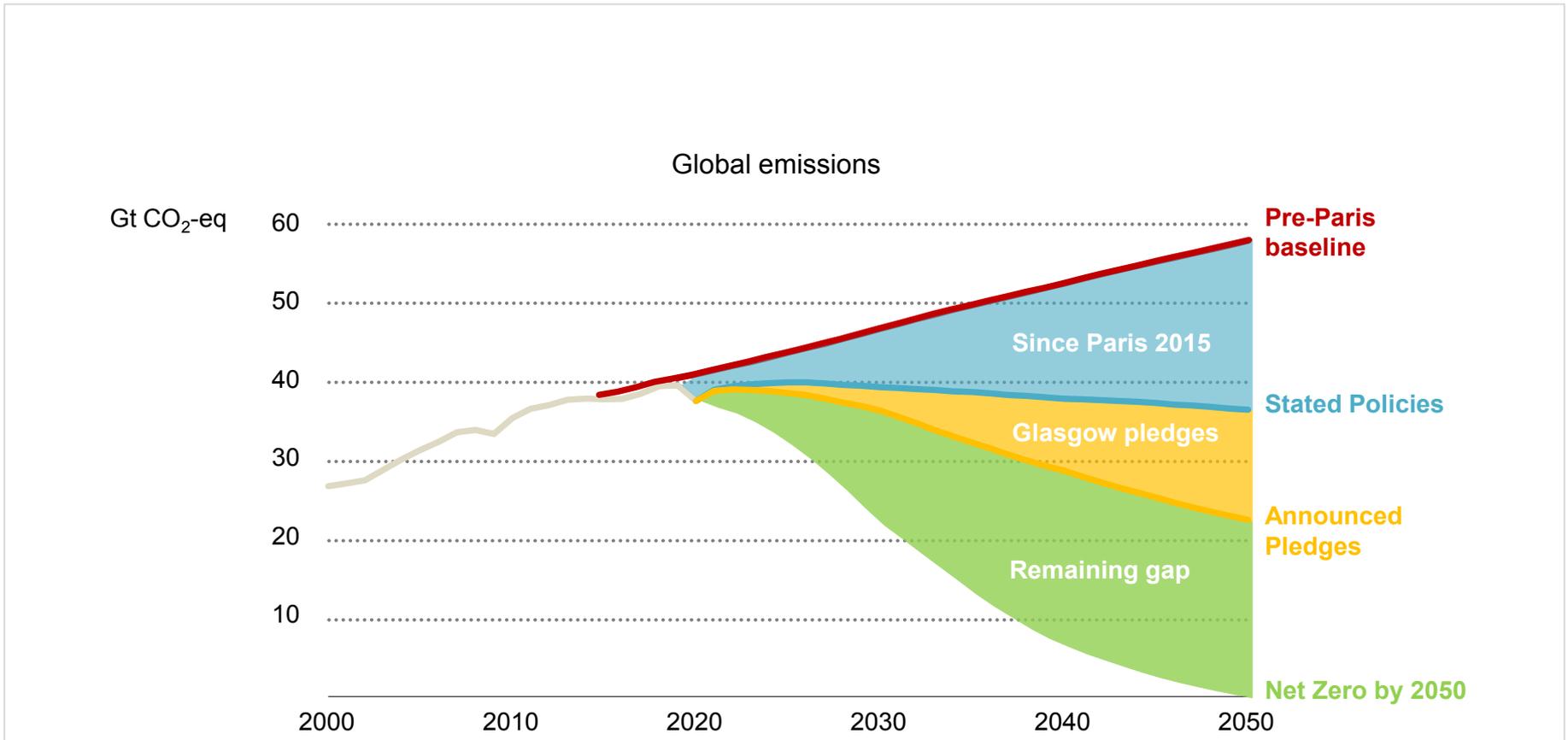


Labour impacts of the clean energy transition

5 April, 2022

Daniel Wetzel, Head of Energy Supply Unit, World Energy Outlook Team

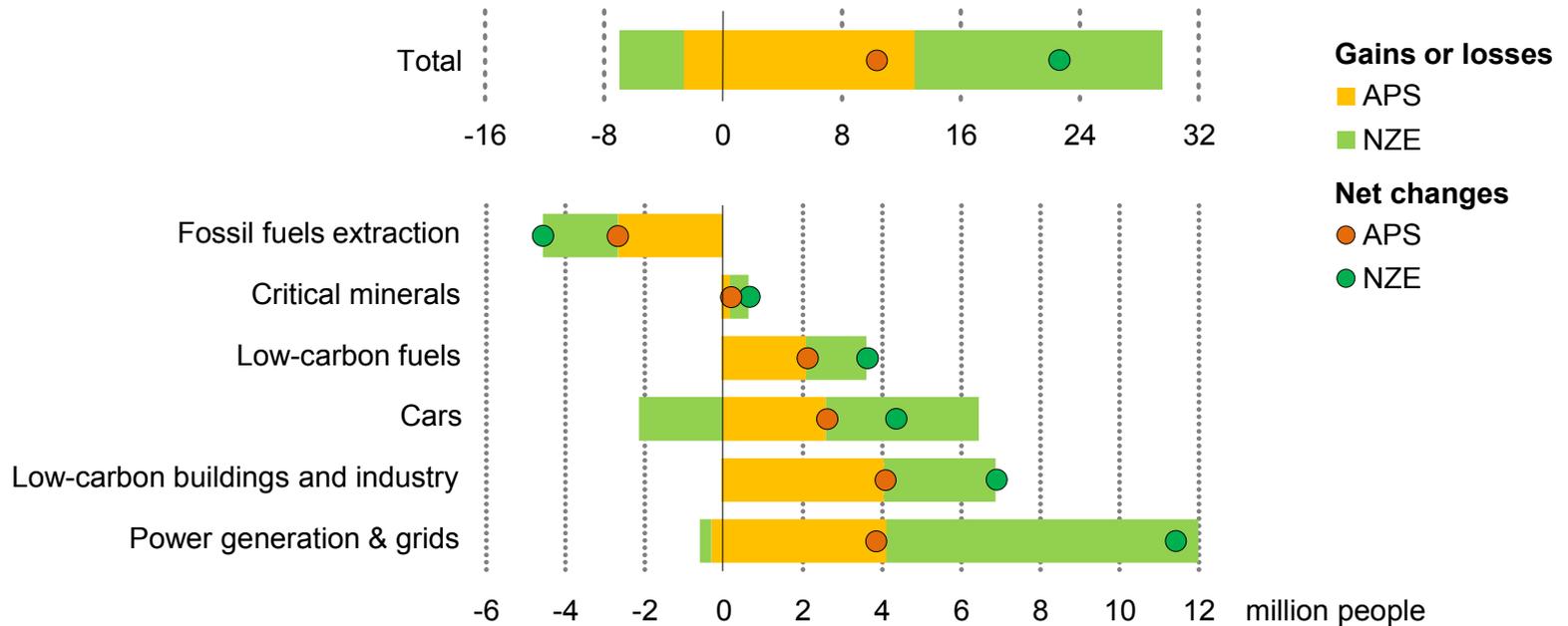
The world is beginning to shift tracks, but still a gap to net-zero



Despite some positive signs, today's pledges close less than a quarter of the gap to the Net Zero by 2050 scenario: countries with net zero pledges and countries without each account for about half the remaining ambition gap

Energy transitions create jobs, but job losses require attention

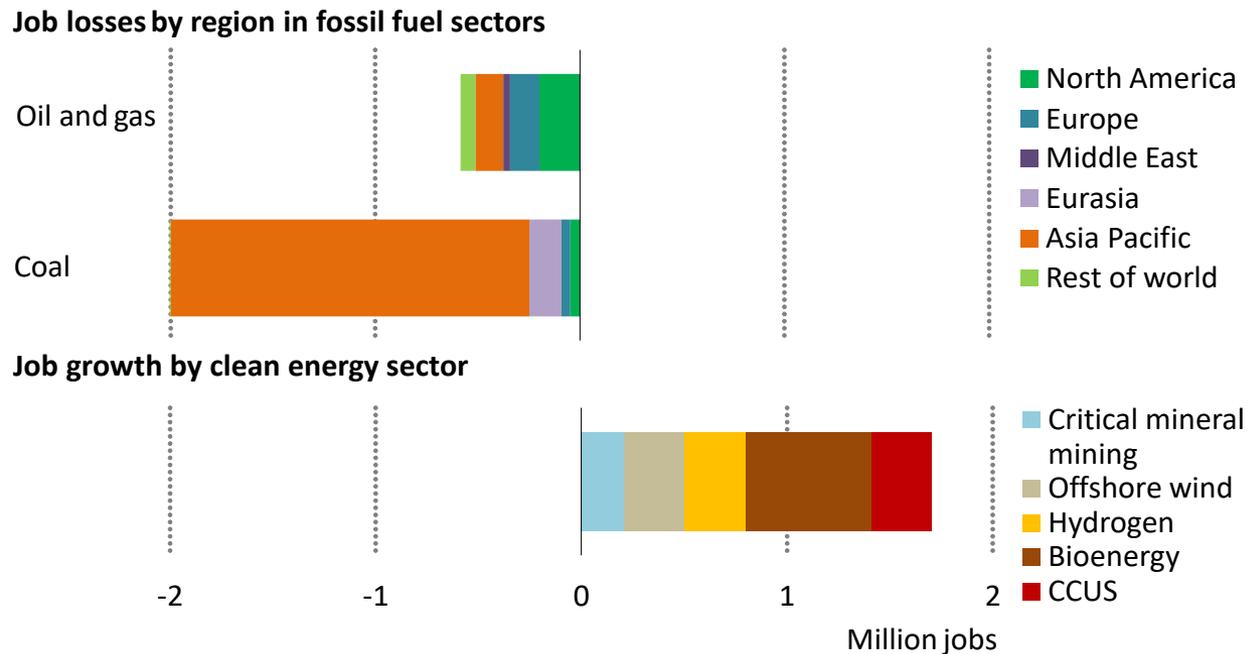
Employment growth in clean energy and related areas to 2030



Clean energy job gains outpace losses. However losses are acute in certain regions and sectors. Rapid employment growth also presents risks: growing skills gaps, and insufficient focus on decent work.

Coal jobs already in decline; oil and gas poised for transition

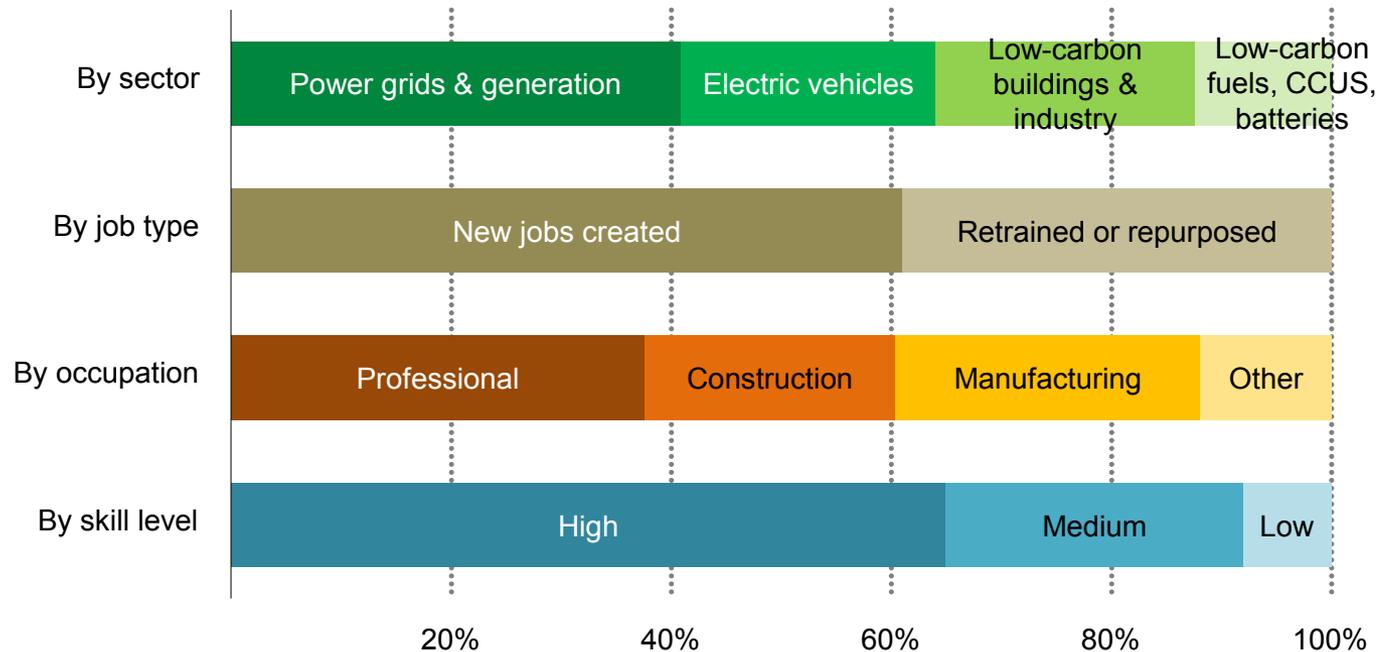
Changes in fossil fuel employment and energy areas with overlapping skills in the Announced Policies Scenario to 2030



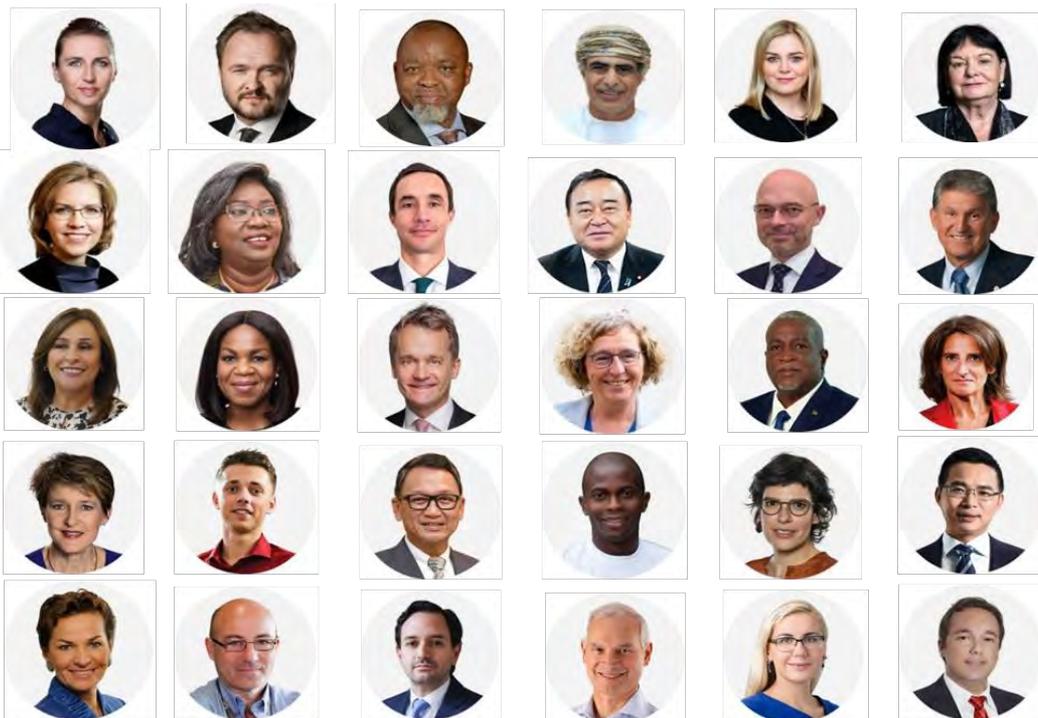
Skilled fossil fuel workers have opportunities to transition to clean energy jobs, though the options are not a direct match for most coal sector jobs lost in Asia

Growth goes beyond the energy sector, but skill gaps may arise

New workers in clean energy by sector, job type, occupation, and skill level in the NZE in 2030



About 30 million new workers are needed by 2030 to meet increased demand for clean energy, energy efficiency, and low-emissions technologies.



Ministers and policymakers from: Austria, Belgium, Canada, Chile, China, Colombia, Denmark, France, India, Indonesia, Italy, Japan, Mexico, Oman, Norway, Panama, Poland, Senegal, South Africa, Spain, Switzerland, United States, European Commission; Prime Minister of Guyana, the Vatican

Representatives from labour, youth, and civil society

**The Honorary Patron is Mette Frederiksen, Prime Minister of Denmark.
Members represent all geographies and perspectives.**

Michael Renner

- Programme Officer in the Knowledge, Policy and Finance Centre (KPFC) of IRENA, since October 2017.
- Senior Researcher, Worldwatch Institute (USA), 1987 - 2017.
- Consultant on green jobs for the International Labour Organization, 2007 - 2017.
- Over 35 years of experience in research and policy analysis of global energy and environmental topics.





Renewable Energy Job Assessments

Michael Renner
Programme Officer
Knowledge, Policy and Finance Centre, IRENA



Methodologies used in IRENA's reports



Jobs Review

- Literature review
- Employment factors
- Expert estimates



WETO & earlier

- Scenarios
- Economic modelling



PV; onshore & offshore wind;
SWH

Leveraging Local Capacity

- Survey of industry
- Literature review



All renewables; wind; solar

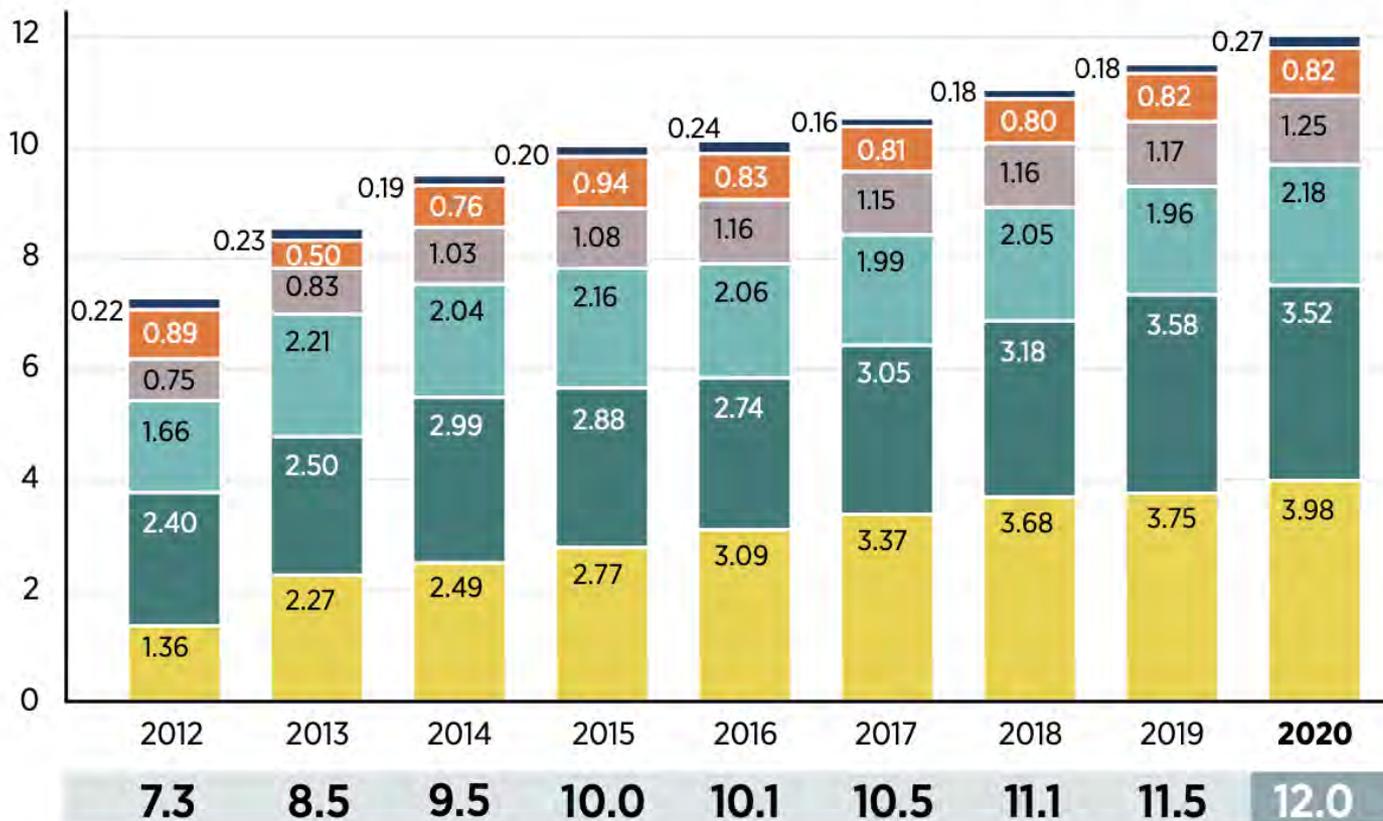
Gender Perspective

- Survey of people & organizations
- Literature review



Growth of renewable energy jobs, 2012-20

Million jobs

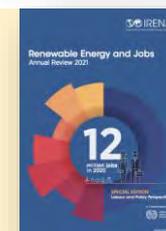


- Solar photovoltaics
- Bioenergy^a
- Hydropower^b
- Wind energy
- Solar heating/cooling
- Others^c



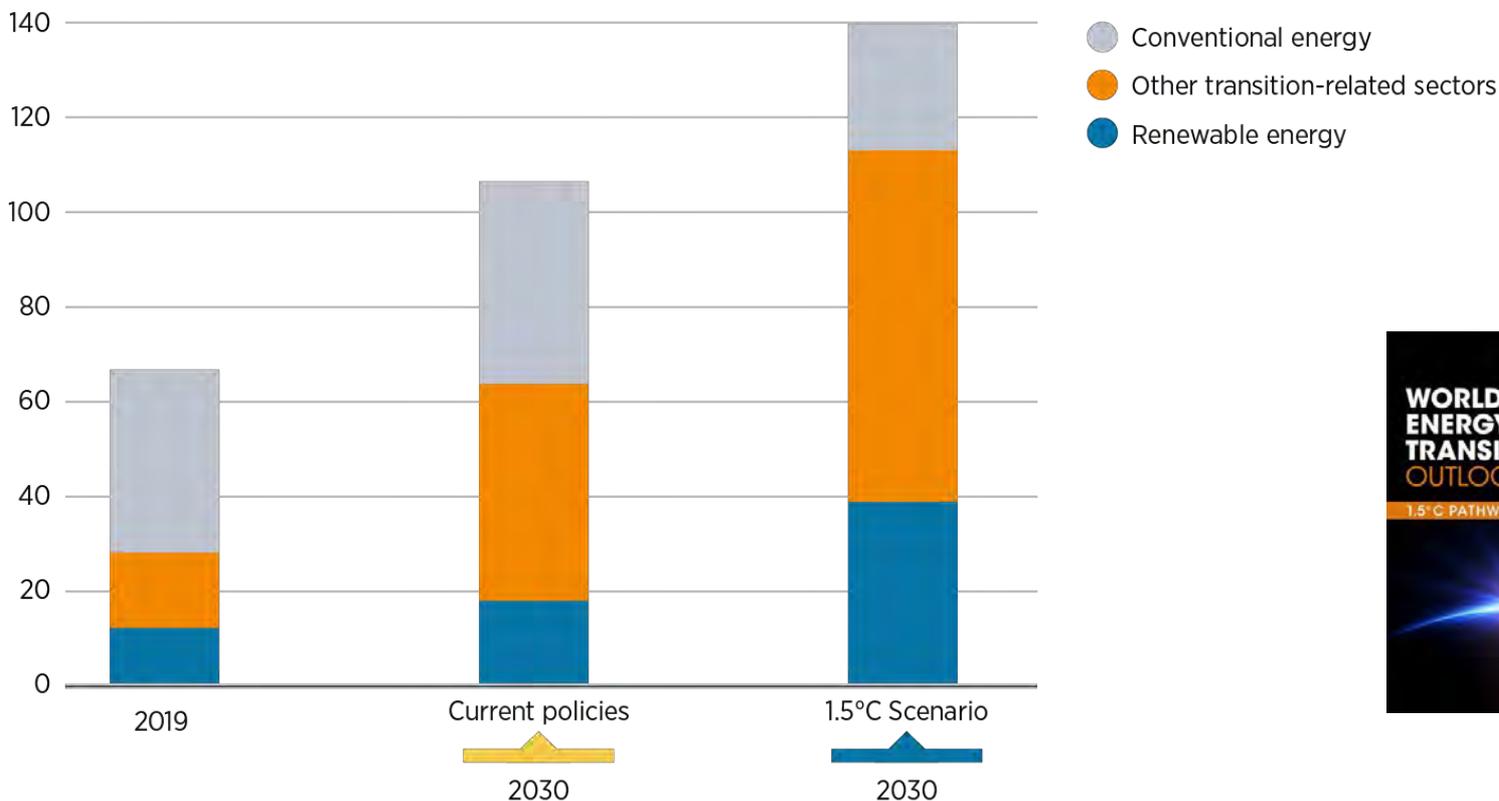
GENDER DIMENSION:

- **Women** account for 32% of the renewable energy workforce worldwide.
- In **wind power**, the share is only 21% (comparable to oil & gas sector)

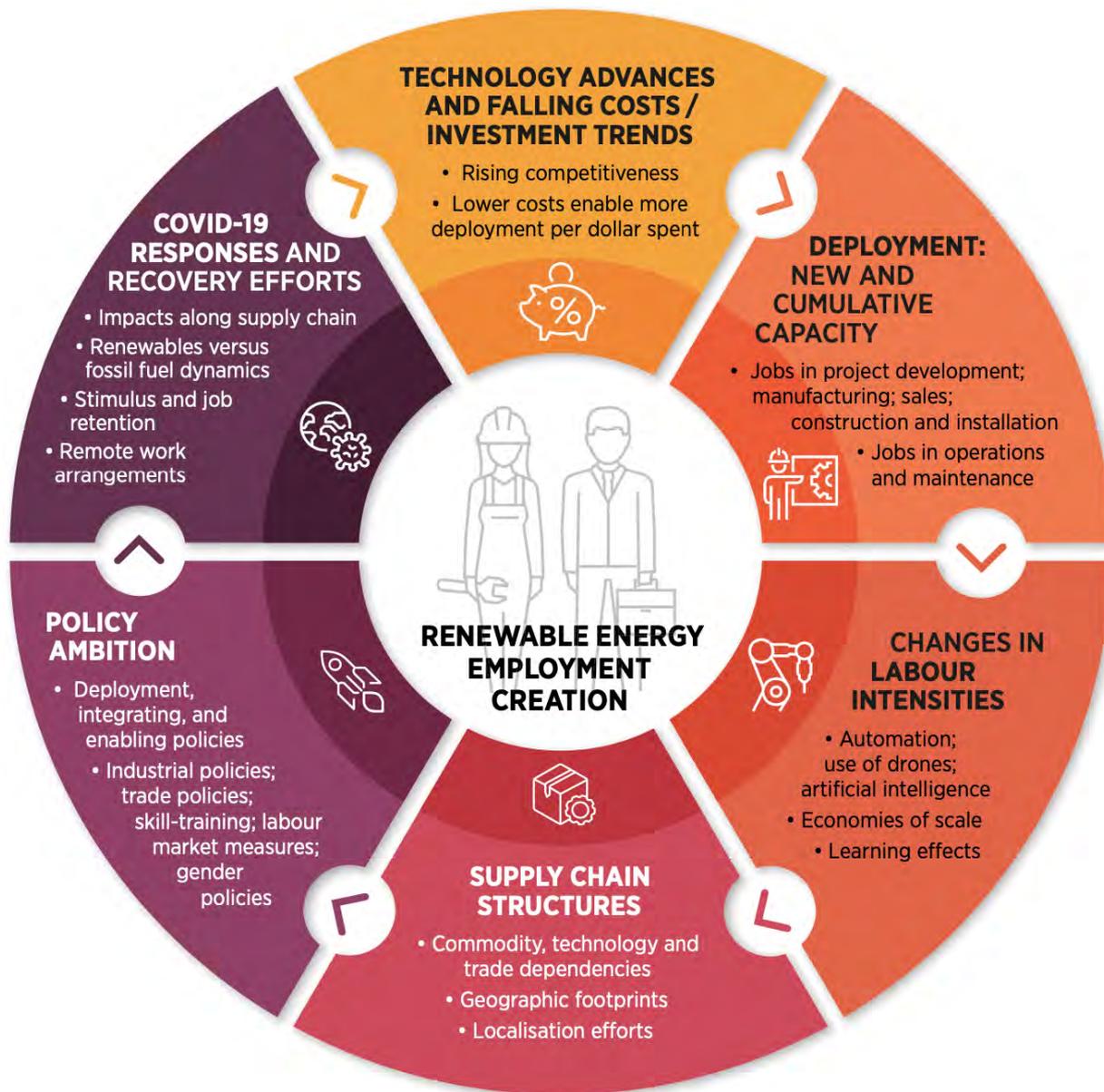




Jobs (in Million)



- **Renewables jobs** could grow from 12 million at present to 38 million in 2030 under the 1.5°C Scenario
- **Other energy transition-related* jobs** could grow from 16 million to 74 million
* = energy efficiency, power grids, energy system flexibility
- **Conventional energy jobs** would decline from 39 million to 27 million



Philippe Costes

- Has engineering degrees from both Ecole Centrale in Paris and Caltech
- First joined EDF for nuclear power plant engineering works
- Consultant with Andersen Consulting
- Head of development in Canada/North America for a waste to energy company.
- General Secretary to the EDF holding in charge of renewables
- EDF Nuclear Fuel Division on Group long term uranium supply strategy
- 2017 – WNA Senior Adviser to the General Manager



Job Creation for Just Energy Transition

WNA - Employment in Nuclear and Wind Elec Sectors

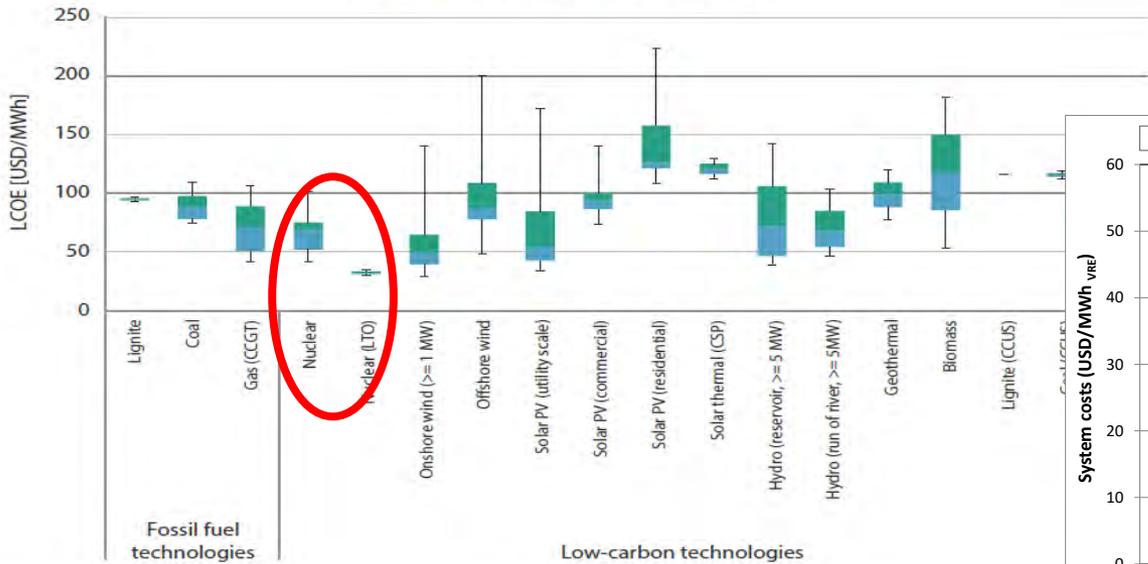


Philippe Costes
Senior Advisor

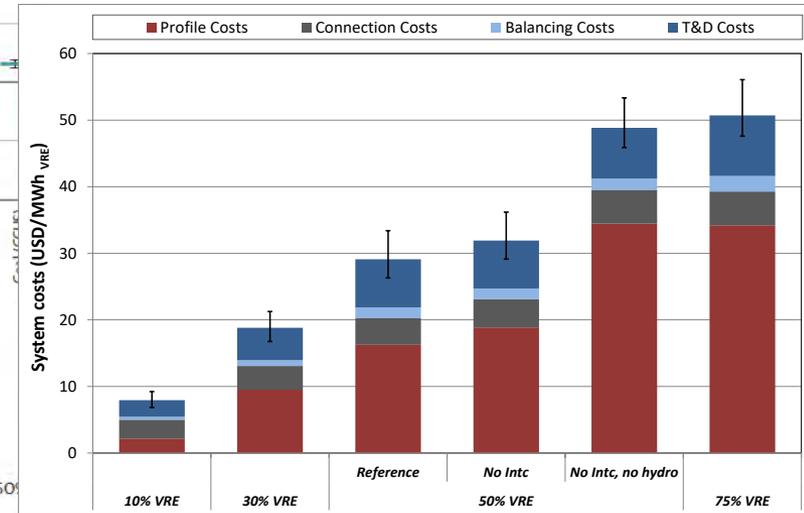
IAEA Webinar ²⁸
Tuesday April 5, 2022

Nuclear is providing reliable, clean and affordable electricity

Figure ES1: LCOE by technology

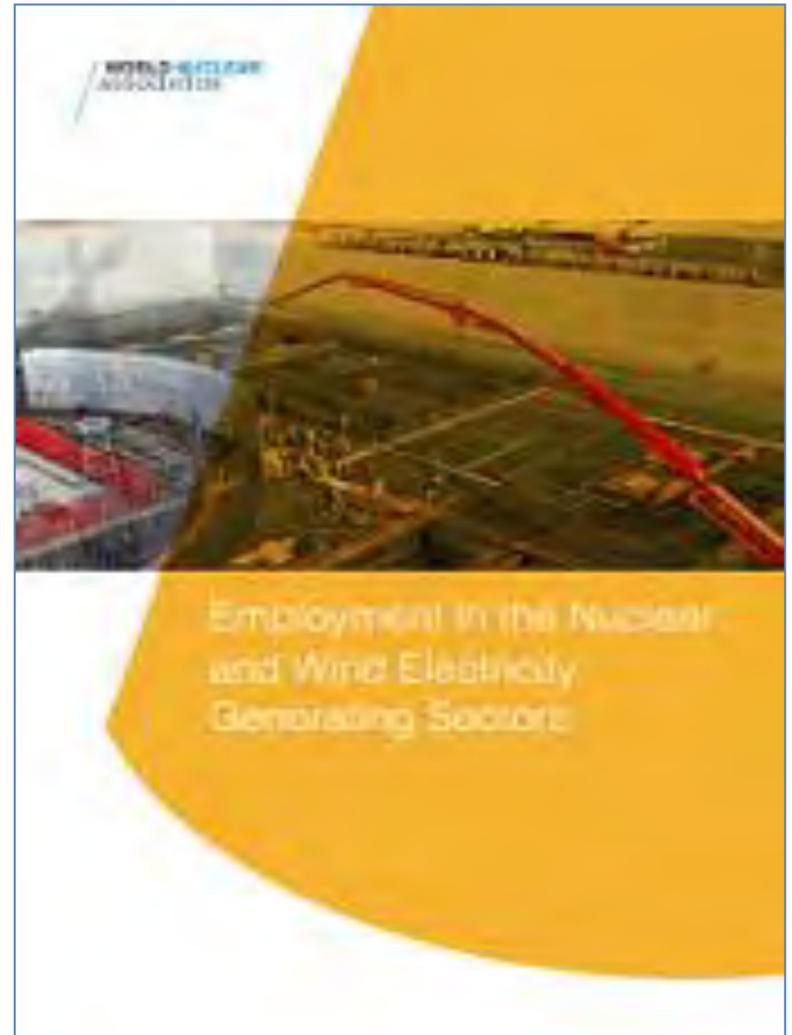


Note: Values at 7% discount rate. Box plots indicate maximum, median and minimum values. The boxes indicate the central 50% i.e. the second and the third quartile.



- World Nuclear Association Technical position paper - July 2020:

[Employment in the Nuclear and Wind Electricity Generating Sectors](#)



Employment in Nuclear and Wind Elec sectors

General Contours of Low-Carbon Electricity Generating Employment

1. Development Phase

High employment in Planning / Construction / Manufacture of original equipment

2. Operational Phase

Lower employment in running and maintaining the facility

3. Decommissioning Phase

Continuing employment in demolition of the facility and rendering safe (eg, used fuel management, environmental monitoring)

Employment in Nuclear and Wind Elec sectors

Key figures

For a given project, a higher proportion of nuclear jobs are 'local' and 'long term' than for wind power

Nuclear power provides about 25% more employment per unit of electricity in France, than wind power does in the USA.

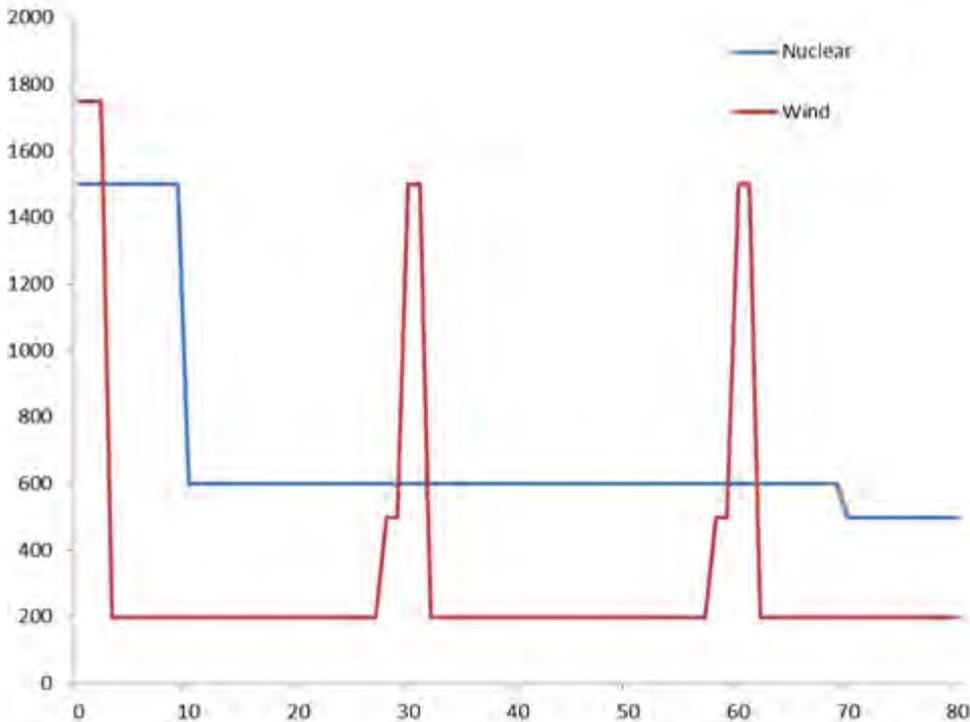


Figure. Schematic employment in nuclear (France) and wind (USA) for 1GW capacity (construction, operations, decommissioning)

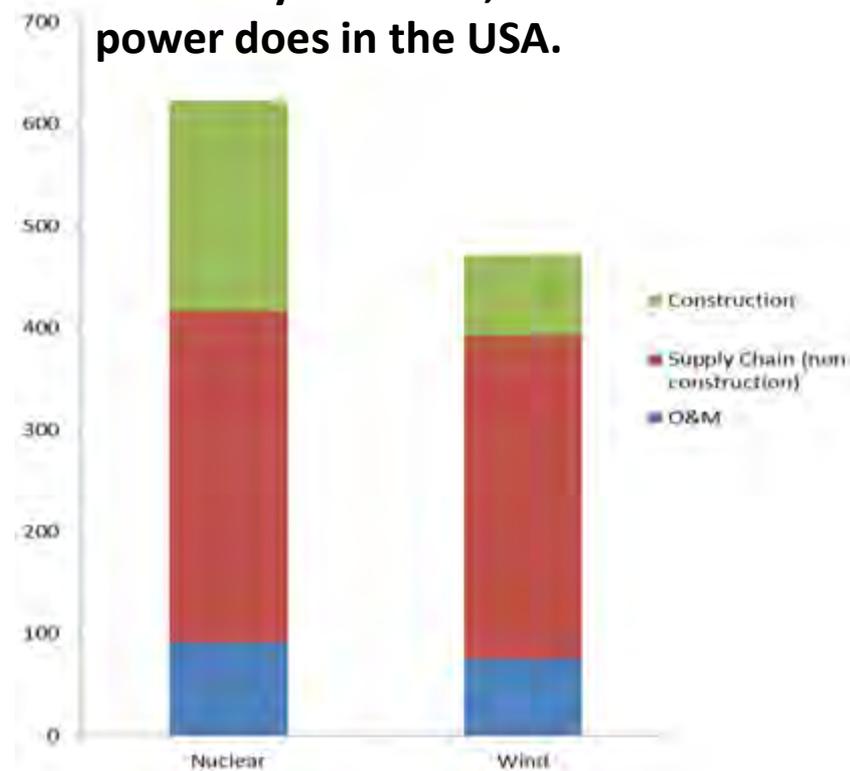


Figure. Direct and indirect employment created by nuclear (France) and wind (USA) capacity needed to generate 1000TWh

Employment in Nuclear and Wind Elec sectors

What other reports tell us about nuclear sector's socio-economic impacts

**The nuclear sector is good to workers!
Nuclear sector pay is typically the highest for any energy technology**

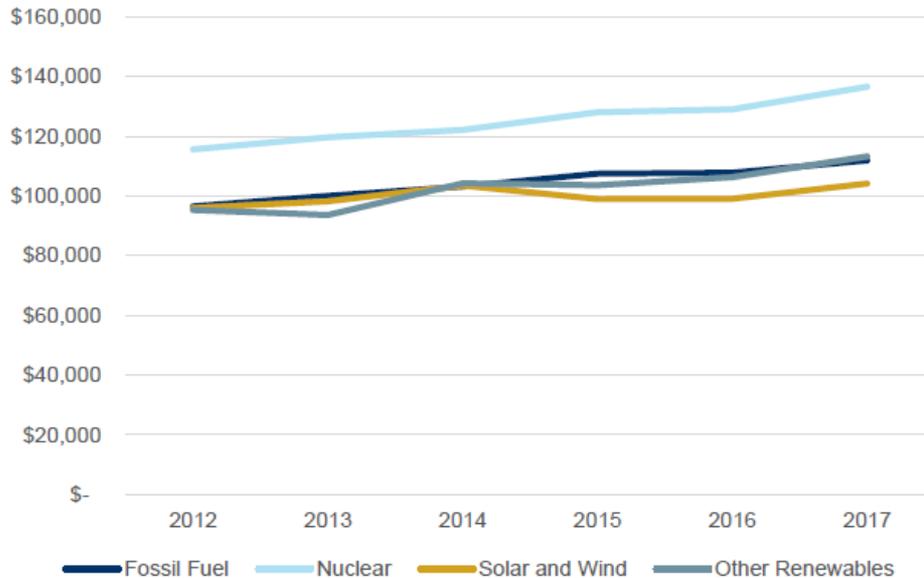


Figure. Average US energy worker pay trends. Source: Oxford Economics, 2019, *Nuclear Power Pays*

**The nuclear sector is good for the economy!
It drives significant economic activity at the national and regional level**

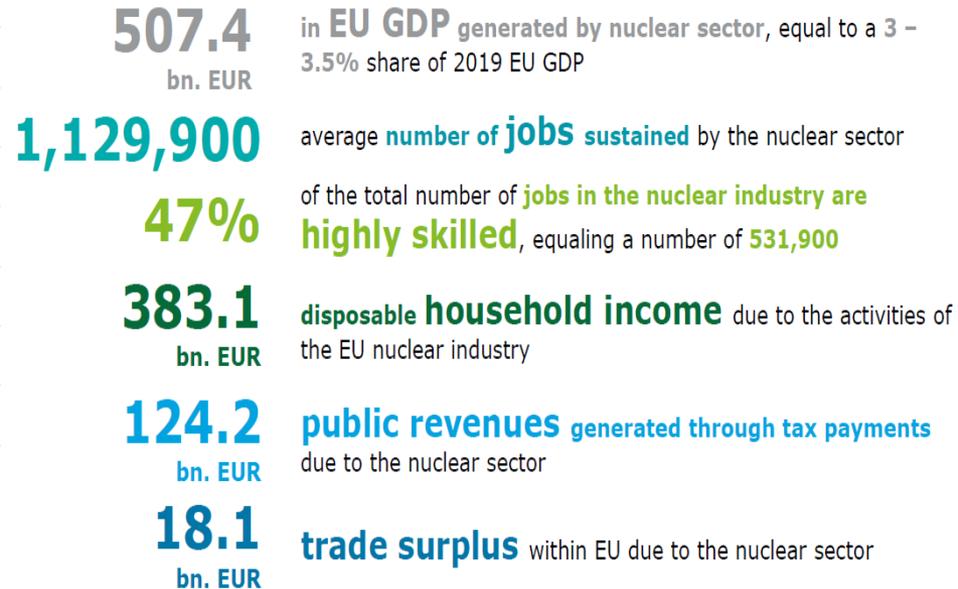


Figure. Impact of the Nuclear sector on the EU economy in 2019. Source: Foratom, *Impact Report -Vision to2050*

Employment in Nuclear and Wind Elec sectors

What other reports tell us about nuclear sector's socio-economic impacts

SDG 8 - Decent Work and Economic Growth

The nuclear industry provides well-paid, high-skill jobs and investment that supports local communities

Nuclear projects provide high spill-over investment into the local and regional economy.

IMF found nuclear energy investment spending has a large economic output multiplier effect, producing more growth.

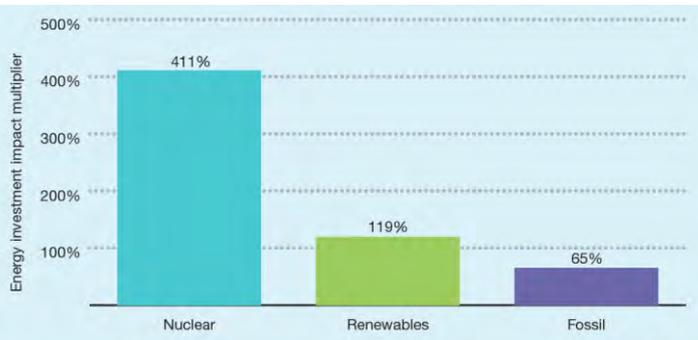
The UK Hinkley Point C nuclear power plant project:

Jobs - 22,000 people in Britain currently working on the project, with a total 71,000 projected jobs to be supported by the project.

Skills – 800 apprentices trained on the project to date

Local and regional economic development – £3.2 Billion spent with local companies in the South West region.

Industrial development and supply chain 64% of the value of Hinkley Point C contracts has been awarded to UK-based companies to date.



Hinkley Point C Socio-economic Impacts Report 2021

Data source: IMF Working Papers 2021 Building Back Better: How Big Are Green Spending Multipliers?

Key takeaways

- Nuclear power provides about 25% more employment per unit of electricity than wind power.
- the nuclear workforce can be seen as constituting some of the highest quality and best paid jobs in the energy workforce. Every direct job in the nuclear industry sustains 4 additional jobs in the wider economy
- A higher proportion of the nuclear workforce is located near the plant than is the case with wind, thereby providing a sustainable source of local jobs and contributing to local economic development.
- Even despite this employment effect, nuclear maintains a competitive advantage over intermittent renewables such as wind as it does not require additional investment in grids, backup capacity, or storage.

Nuclear energy, as major infrastructure development, attracts investment that drives sustained long-term local and national economic growth.

Questions & Answers