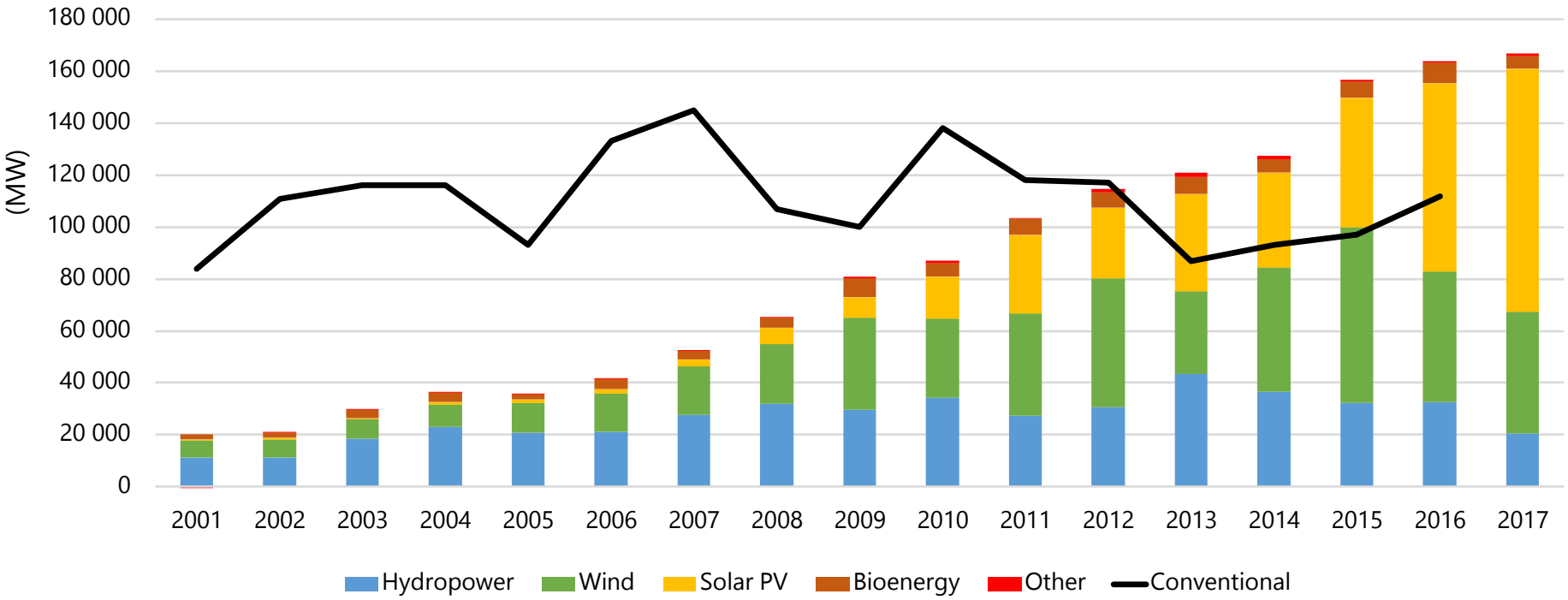
Overview of Global Renewable Energy Development

Renewables Readiness Assessment for Azerbaijan

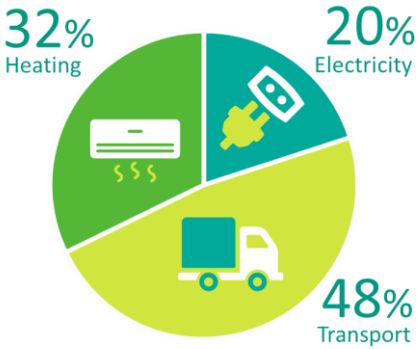
Expert consultation workshop, 31 May 2018

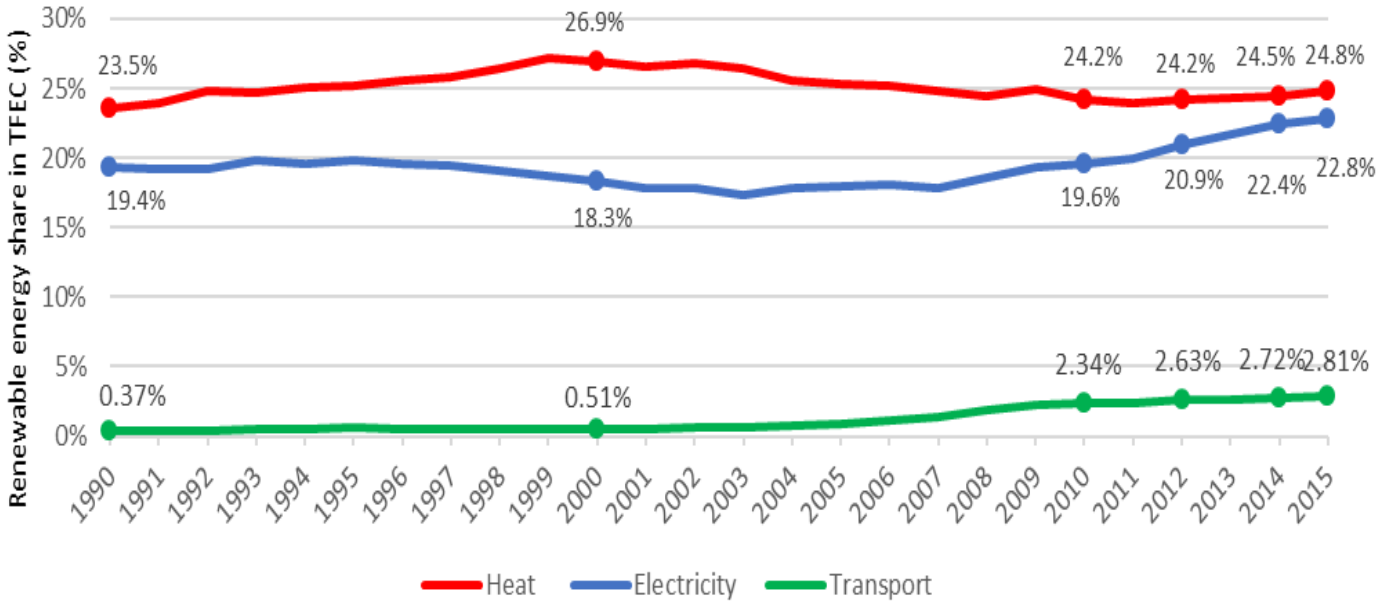
Annual global additional capacity by technology, 2001-2017



Since 2012, RES capacity additions exceed non-RES additions with wind and solar PV leading the uptake of RES. Solar PV accounted for more than 56% of total RES additional installed capacity in 2017.

Renewable energy shares in end-uses, 1990-2015





Progress in the electricity sector is not being matched in transport and heating – which together account for 80% of global energy consumption.

Drivers of renewable energy deployment

ENVIRONMENT AND HEALTH
Climate change
Local pollution

HUMAN DEVELOPMENT
Energy access
Poverty alleviation

ENERGY SECURITY
Trade balance improvement
Risk reduction

ECONOMIC GROWTH
GDP and welfare
Jobs
Industrial development

Socio-economic benefits of renewable energy

GDP

+ 1.0 %

+ 2.06
USD trillion

Jobs

+ 0.14 %

+ 11 million
in the energy sector

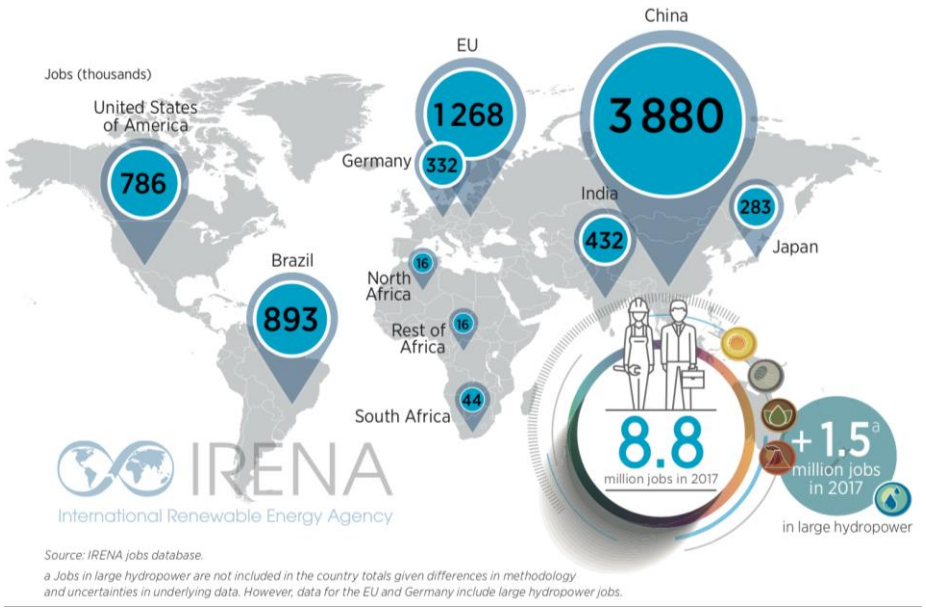
Welfare

+ 15 %

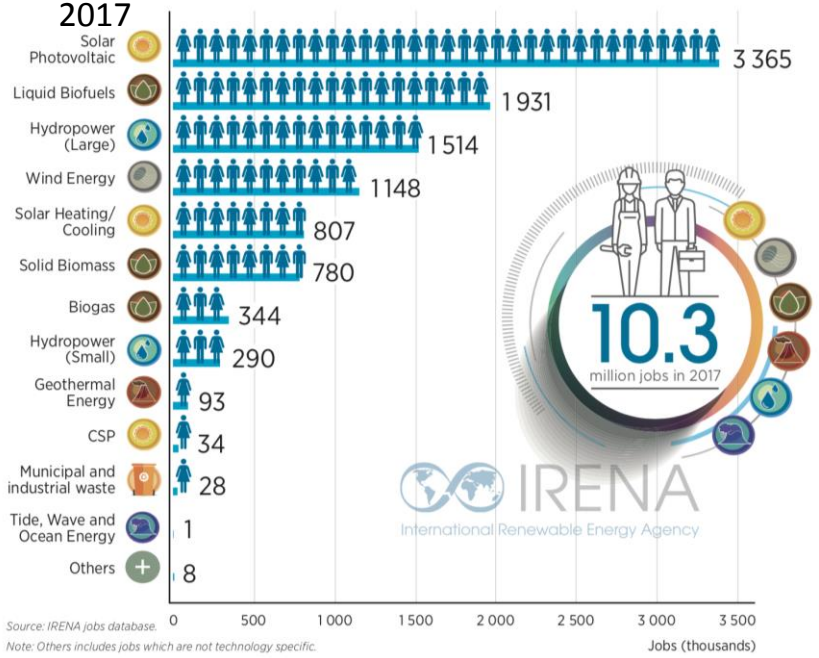
Achieving the energy transition (IRENA REmap case) can result in 1% increase in GDP, 15% increase in welfare and create 11 million additional jobs in the energy sector by 2050 compared to the reference case

Jobs in renewable energy

Renewable energy jobs by country, 2017

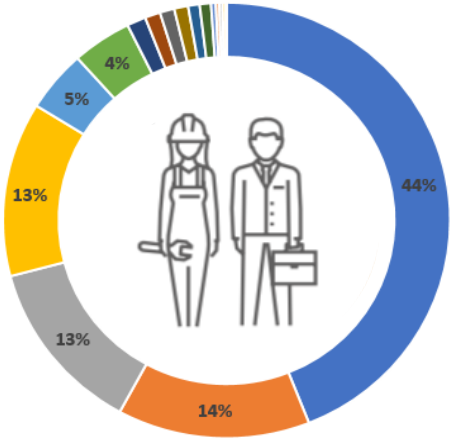


Renewable energy jobs by technology, 2017

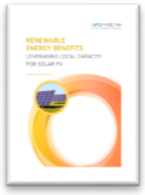


In 2017, there were 10.3 million jobs in renewables. Jobs are increasingly moving to Asia with concentration in China, India and Japan. By technology, solar PV is the largest employer

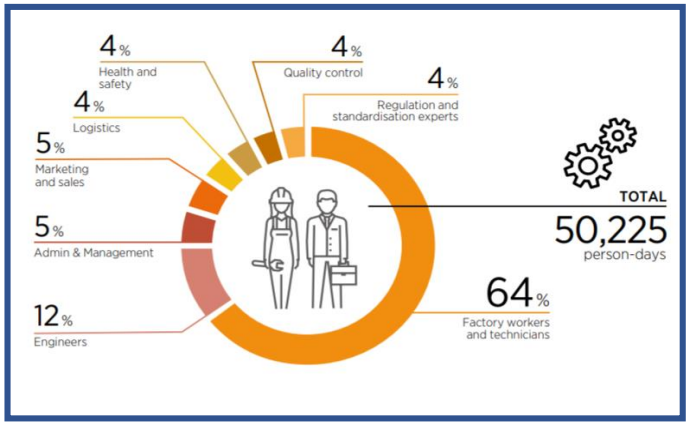
Jobs in solar PV

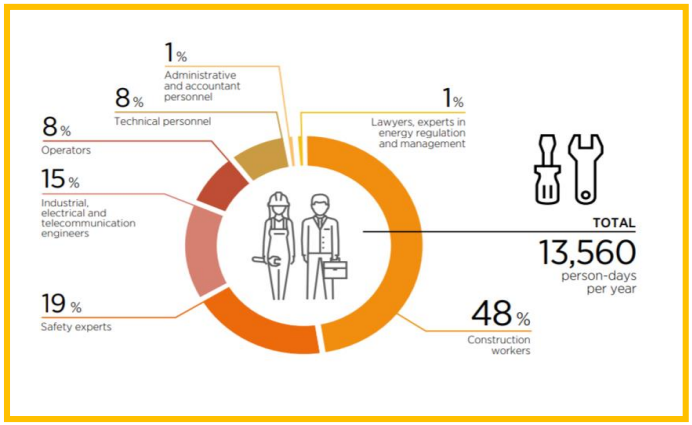


- Construction workers and technicians
- Factory workers
- Engineers
- Quality Health and Safety experts
- Operators
- Technical personnel
- Truck drivers
- Administrative personnel
- Logistic experts
- Marketing and sales personnel
- Legal, energy regulation, real estate and taxation experts
- Regulation and standardization experts
- Loading staff
- Environmental experts
- Management
- Financial analysts
- Shipping agents



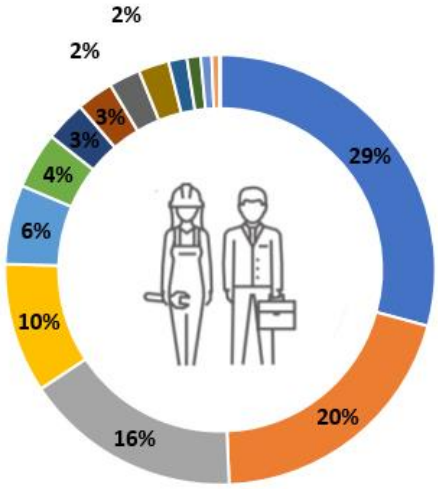
50 MW solar PV:
229 055 person-days



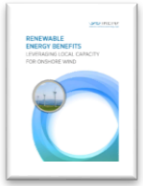


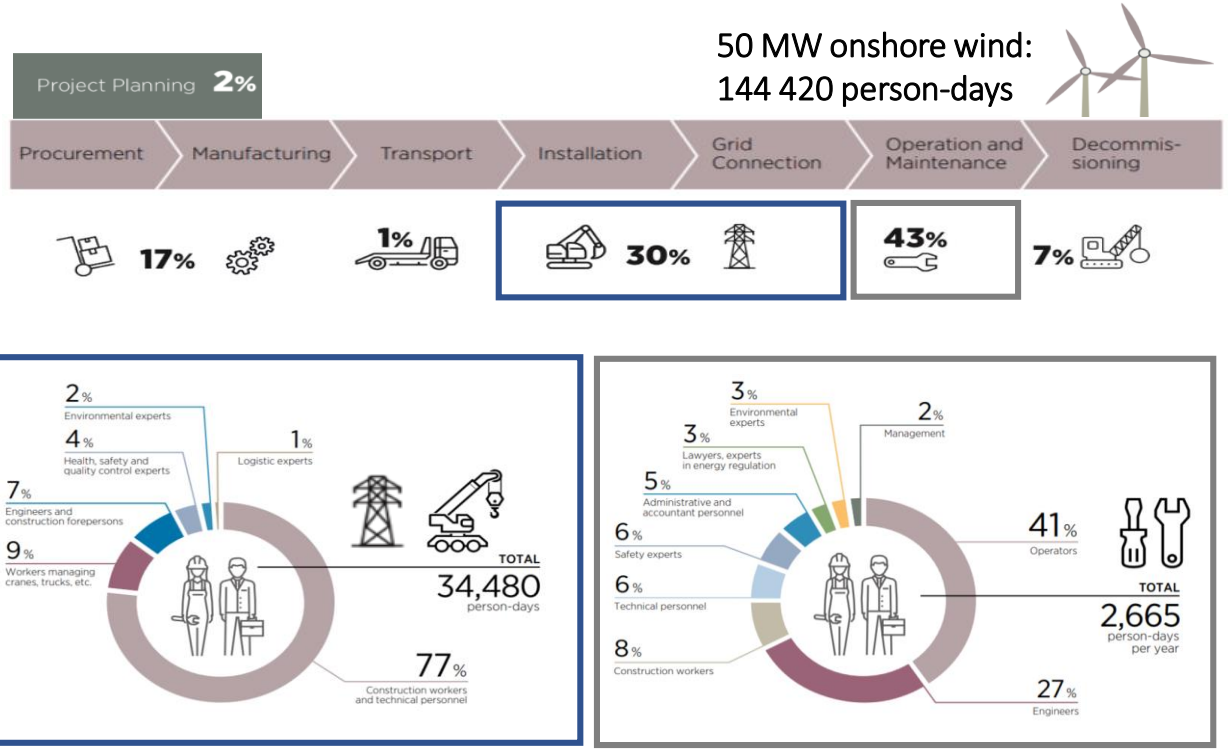
In the solar PV value chain, 56% of the human resources required are in O&M while manufacturing and procurement employs 22% of the total. The majority of labour are construction workers and technicians

Jobs in onshore wind



- Construction workers and technicians
- Operators
- Engineers*
- Factory workers
- Quality Health and Safety experts
- Truck drivers, crane operators
- Administrative personnel
- Technical personnel
- Environmental experts
- Legal, energy regulation, real estate and taxation experts
- Logistic experts
- Management
- Marketing and sales personnel
- Financial analysts
- Geotechnical experts
- Regulation and standardization experts

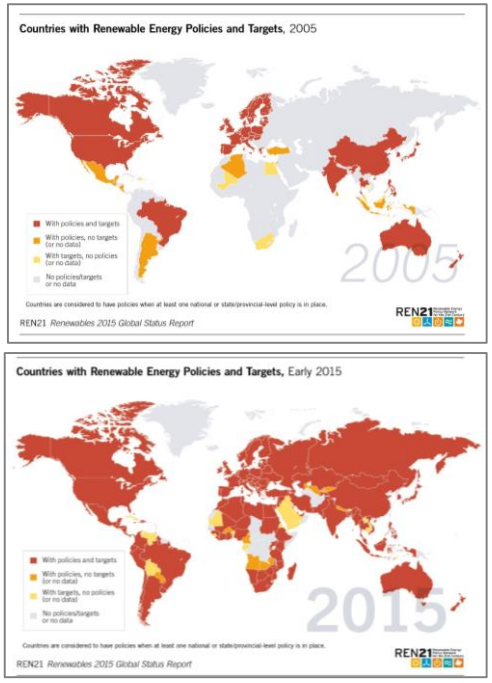




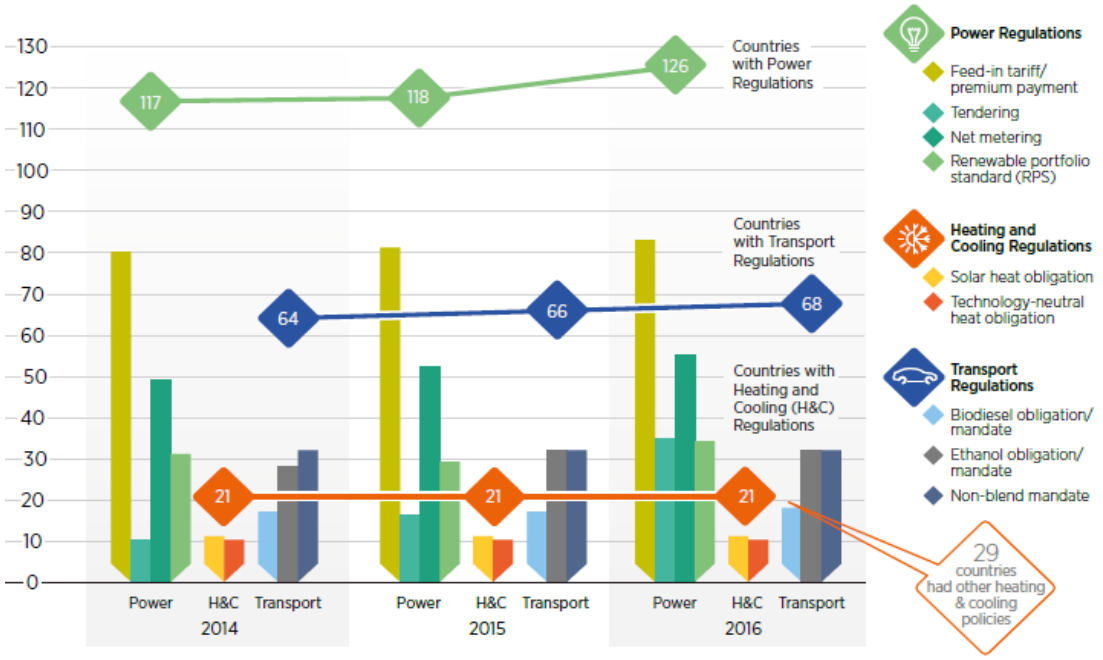
In the onshore wind value chain, 43% of the human resources required are in O&M, 30% are in installation and grid connection, while manufacturing and procurement employs 17% of the total. The majority of labour are construction workers and technicians

Renewable energy deployment driven by policies

Countries with policies and targets, 2005-15



Number of countries with renewable energy regulatory incentives and mandates, 2014-16



Renewable energy policies have become increasingly widespread. However, policy support focuses on the power sector while heating/cooling and transport are less dynamic.

Policies for renewable energy deployment

Policies to achieve the energy transition		Deployment of renewables in the general context	Deployment of renewables in the access context	Maximisation of socio-economic development from renewable energy
Direct policies	Push	• Binding targets • Quotas and obligations • Codes and mandates •	• Rural targets, strategies, programmes	Deployment policies designed to maximise benefits and ensure a sustainable transition (e.g., communities, gender) including requirements, preferential treatment and financial incentives provided to installations and projects that help deliver socio-economic objectives
	Pull	• Regulatory and pricing policies • Tradable certificates • Instruments for self-consumption • Support voluntary programmes	• Regulatory and pricing policies (e.g. legal provisions, price/tariff regulation)	
	Fiscal and financial	• Tax incentives • Subsidies • Grants	• Tax incentives • Subsidies • Grants • Concessional financing • Support for financial intermediaries	
Integrating policies		• Measures to enhance system flexibility	• Integration of off-grid systems with main-grid • Coupling with efficient appliances and services	
		• Policies for infrastructure, sector coupling and R&D		
		• Better alignment of energy efficiency and renewable energy policies • Incorporation of decarbonisation objectives into national energy plans • Adaptation measures of socio-economic structure to the energy transition		
Enabling policies		• Policies to level the playing field • Policies to ensure the reliability of technology		• Industrial, trade policy and environmental and climate policies
		• National renewable energy policy • Access to finance, Education, Labour, Land-use, RD&D and innovation, Urban and Public health policies		
Enabling and integrating policies		• Supportive governance and institutional architecture • Awareness programmes • Social protection policies to address disruptions • Measures for integrated resource management		

The importance of the broader policy context goes well beyond the energy sector and includes integrating and enabling policies

Country examples

- Russia's oil and gas industry generates 15% of GDP, 35% of federal budget revenue and 60% of exports
- Russia pledged to keep its greenhouse gas emissions at least 25% below 1990 levels by 2020
- Plan for a more than tenfold increase in non-hydro renewables by 2035.
- Potential to increase renewable share in energy consumption from current 3.6% to 11.3% by 2030, requiring about USD 15 billion a year in investments
- The jobs created would partly repay the spending, and the potential of selling clean energy would also bring in revenue

- Kazakhstan's economy has been driven by oil and gas, accounting for 50% of GDP in 2017, with the 11th largest proven oil reserves in the world
- Plan to increase the share of renewable energy in power generation to 30% by 2030 and 50% by 2050
- In the finalization stage of designing auctions for the purchase of renewable power

- Other oil exporting countries committed to renewable energy include Saudi Arabia and the United Arab Emirates
- Both have set targets and deployed policies including auctions with some of the lowest prices globally


IRENA
International Renewable Energy Agency