United Nations Conference on Trade and Development

10th MULTI-YEAR EXPERT MEETING ON COMMODITIES AND DEVELOPMENT

25-26 April 2018, Geneva

Value addition in renewable energy sector and its implications for diversification and economic development

By

Dr. Rabia Ferroukhi, Deputy-Director, IRENA

The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.

IRENA
International Renewable Energy Agency

Renewable Energy Value Creation

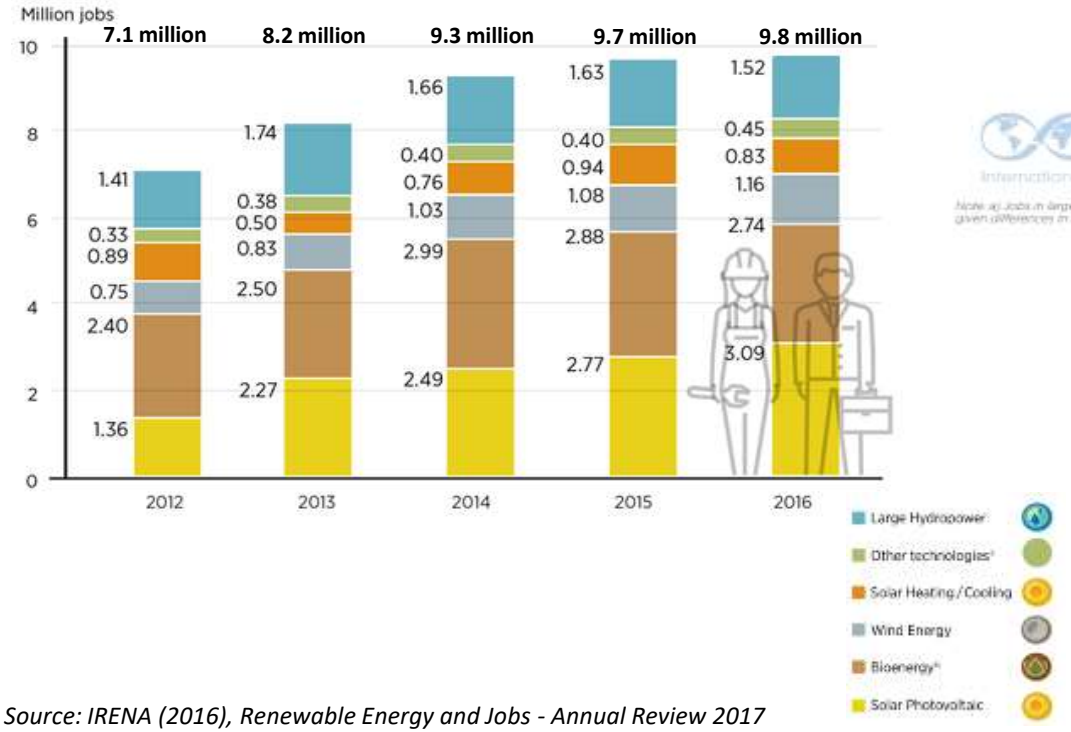
Value addition in renewable energy sector and its implications for diversification and economic development

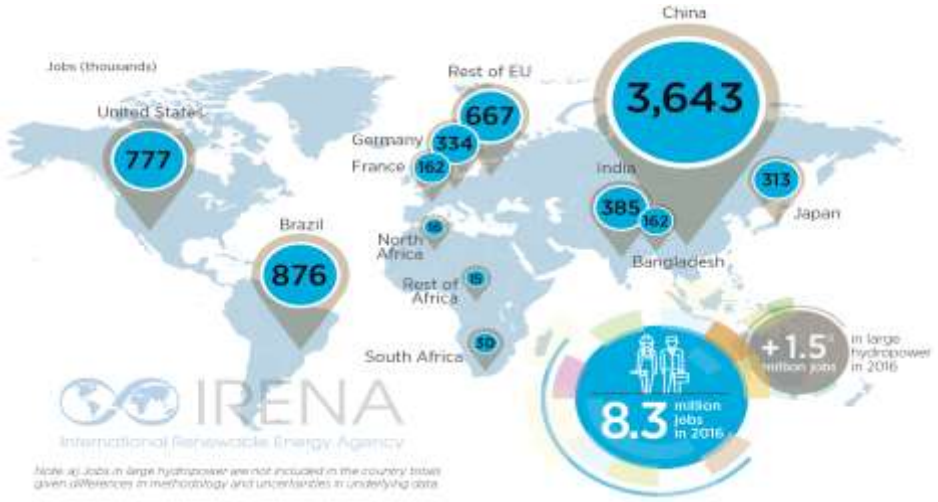
UNCTAD, 10th Multi-year Expert Meeting on Commodities and Development
Palais des Nations, Geneva, 26 April 2018

Benefits of renewable energy

IRENA's Knowledge on socio-economic impacts, and jobs

Renewable energy jobs





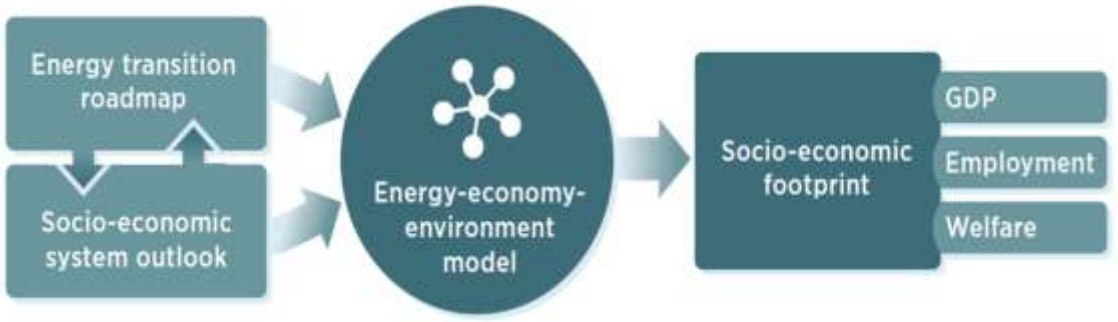
Job Loss in the Fossil Fuel Sector: Selected countries

Oil and Gas: (2015-2016)
440,000 jobs lost globally

- 40% of jobs in oil & gas lost
- 70% job loss in 3 decades
- Plans to close 5,600 coal mines
  Loss of 1.3 million jobs expected
- 90% jobs loss in 3 decades

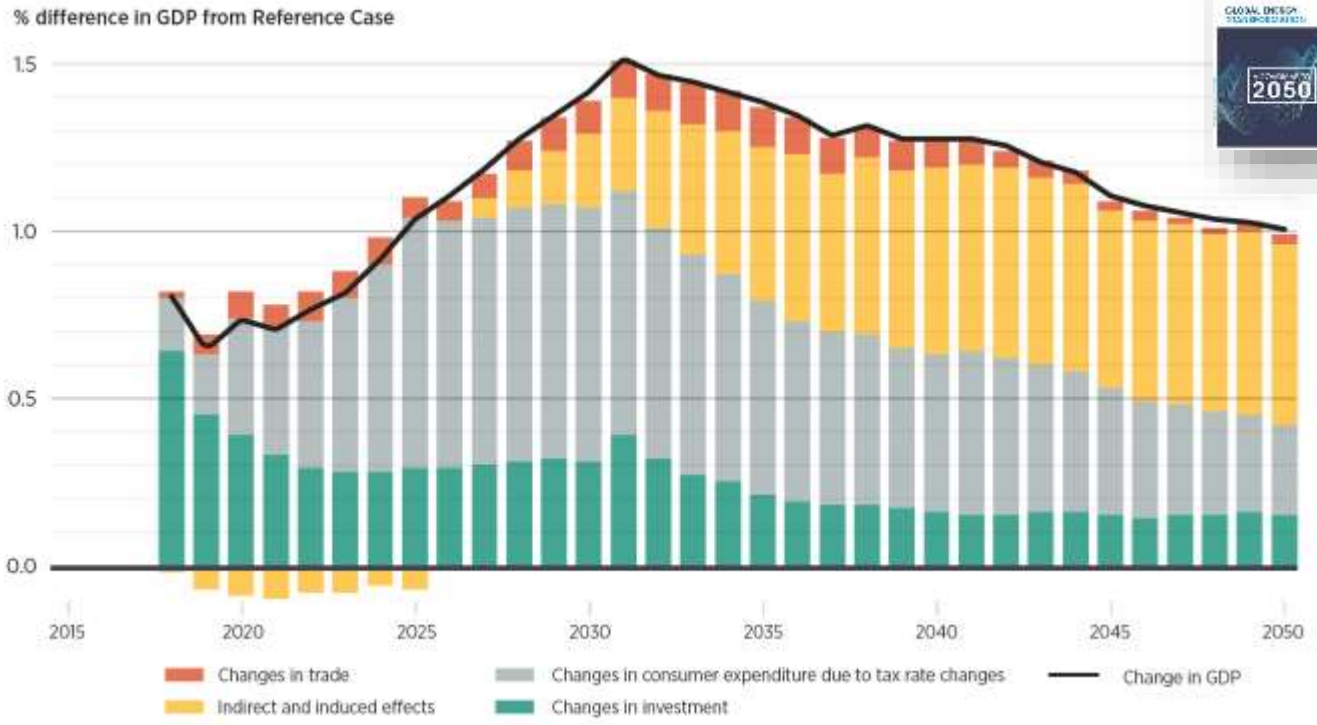
Source: IRENA (2016), Renewable Energy and Jobs - Annual Review 2017

The energy transition and the socio-economic system



A true and complete transition includes both the energy transition and the socio-economic system transition, and their interlinkages.

Global economic growth
(measured in GDP)



Investment

+0.31% compared to the Reference case in 2030

+0.15% compared to the Reference case in 2050

Trade

+0.10% compared to the Reference case in 2030

+0.03% compared to the Reference case in 2050

Tax rate

+0.76% compared to the Reference case in 2030

+0.27% compared to the Reference case in 2050

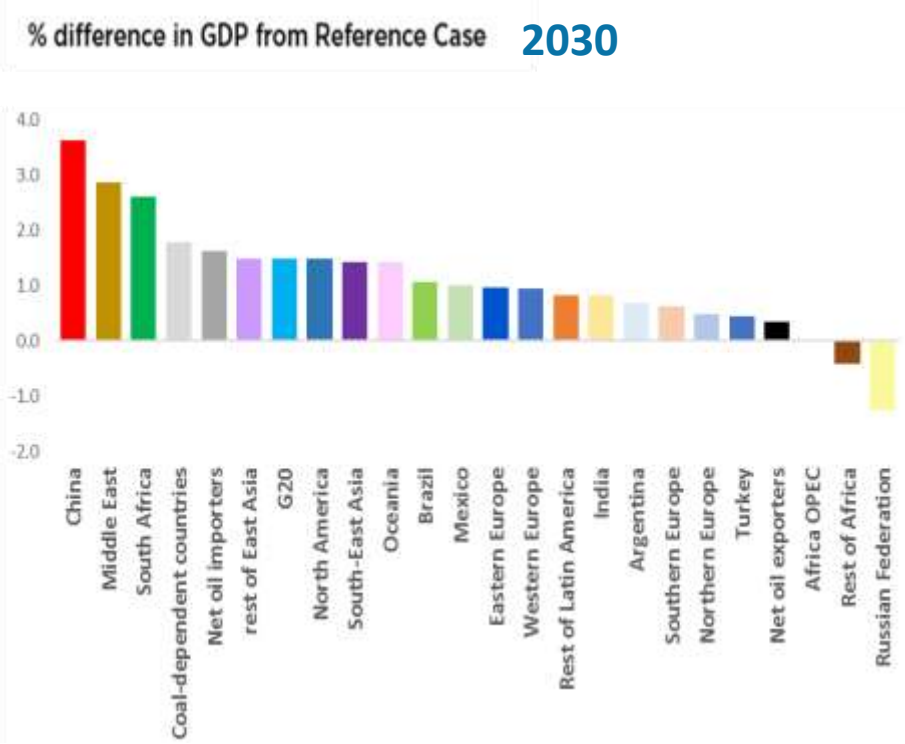
Indirect and induced

+0.22% compared to the Reference case in 2030

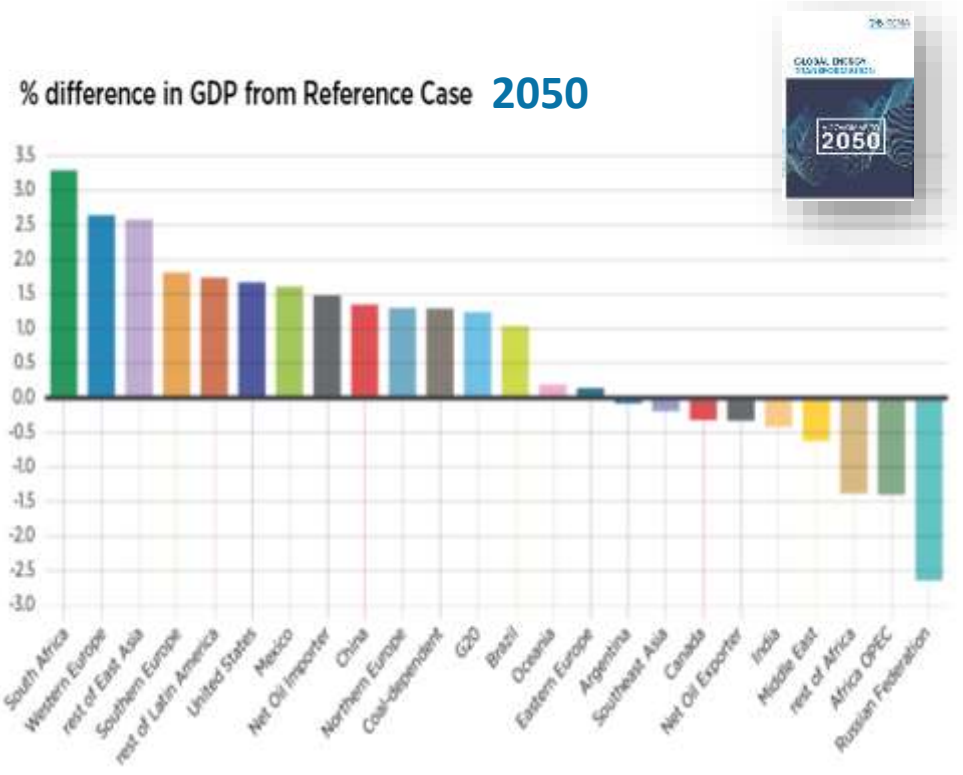
+0.54% compared to the Reference case in 2050

The energy transition is estimated to increase the global GDP by 1.0% in 2050, compared to the reference case. This is primarily driven by indirect and induced effects post 2035.

GDP impacts in the transition by grouping: 2030 vs 2050

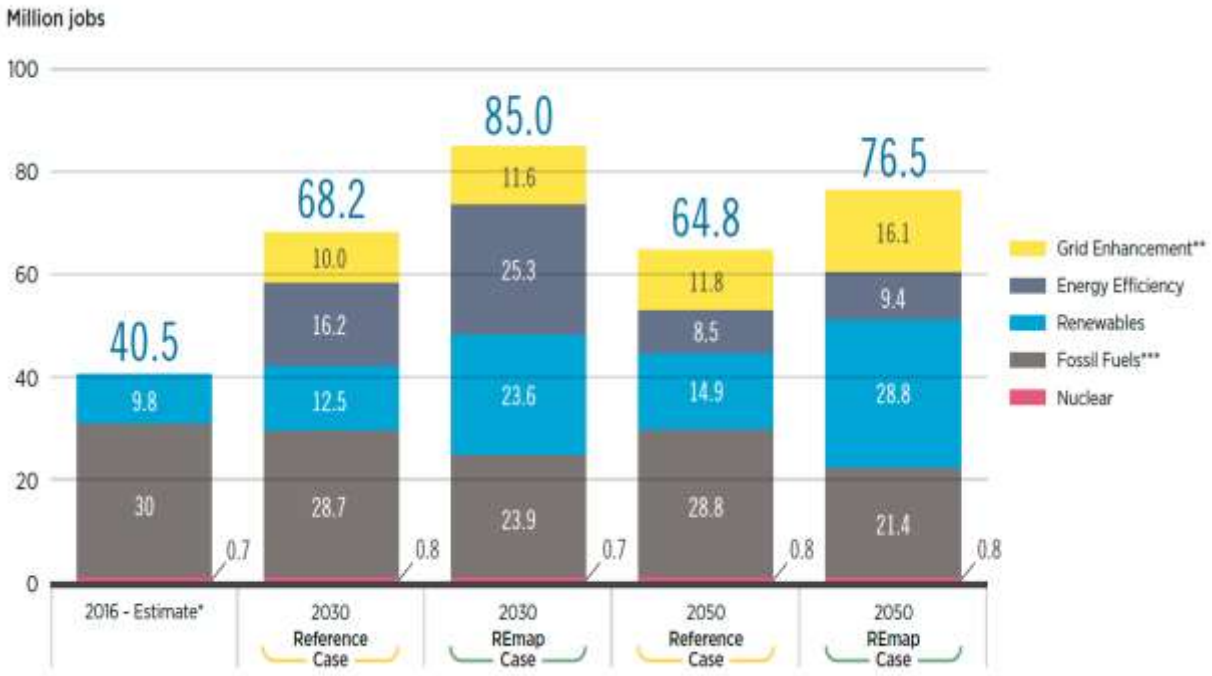


The REmap Case compared to the Reference Case: 2030



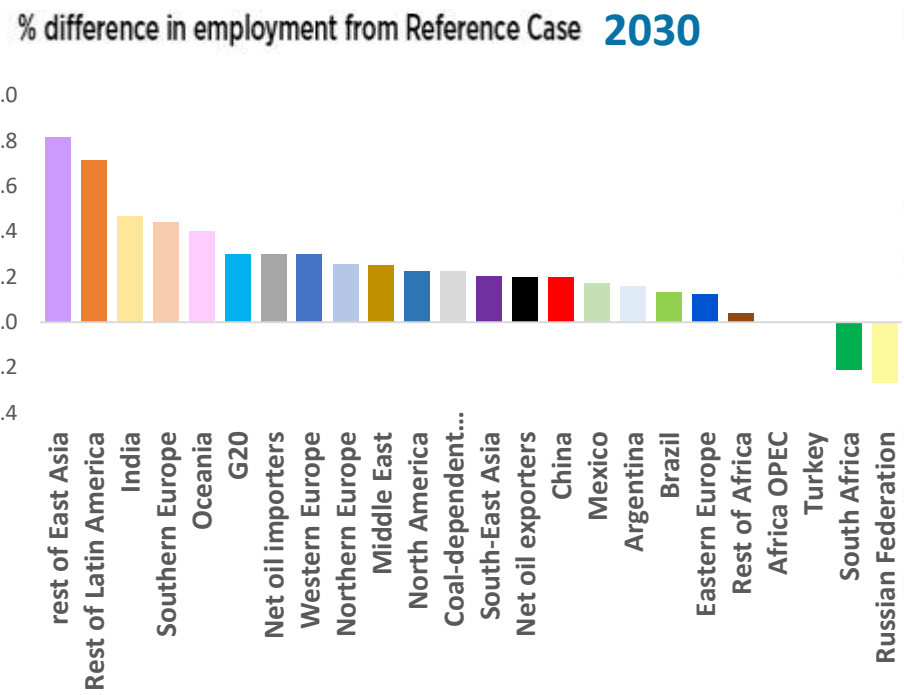
The REmap Case compared to the Reference Case: 2050

Global energy jobs: 2030 vs 2030
(measured in GDP)

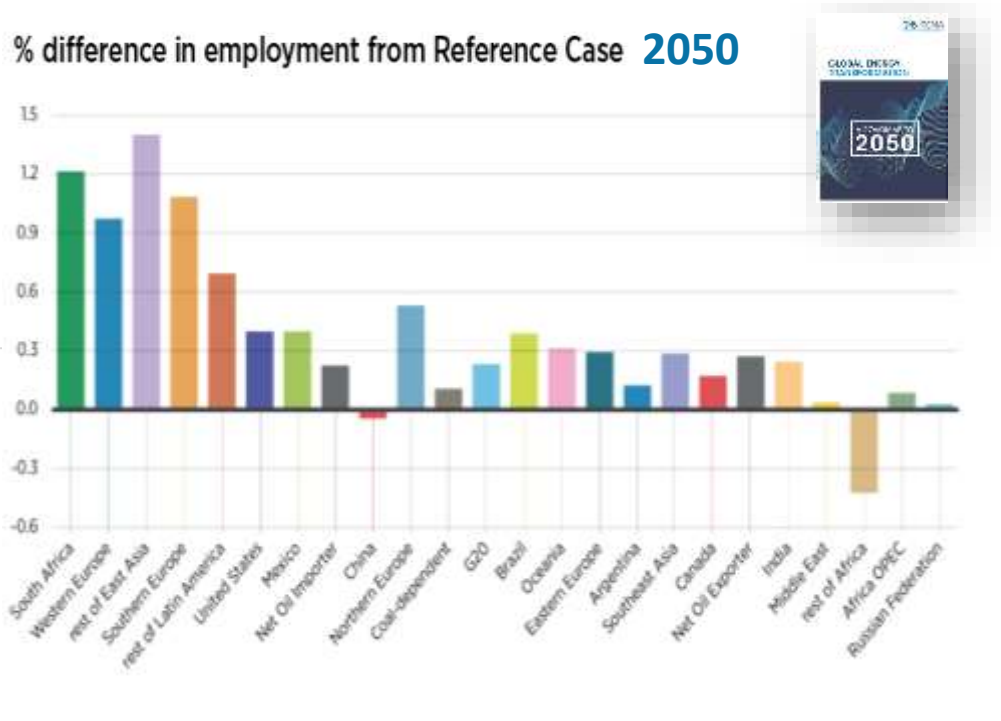


The energy transition would generate over 11 million additional energy sector jobs by 2050

Employment impacts in the transition by grouping: 2030 vs 2050

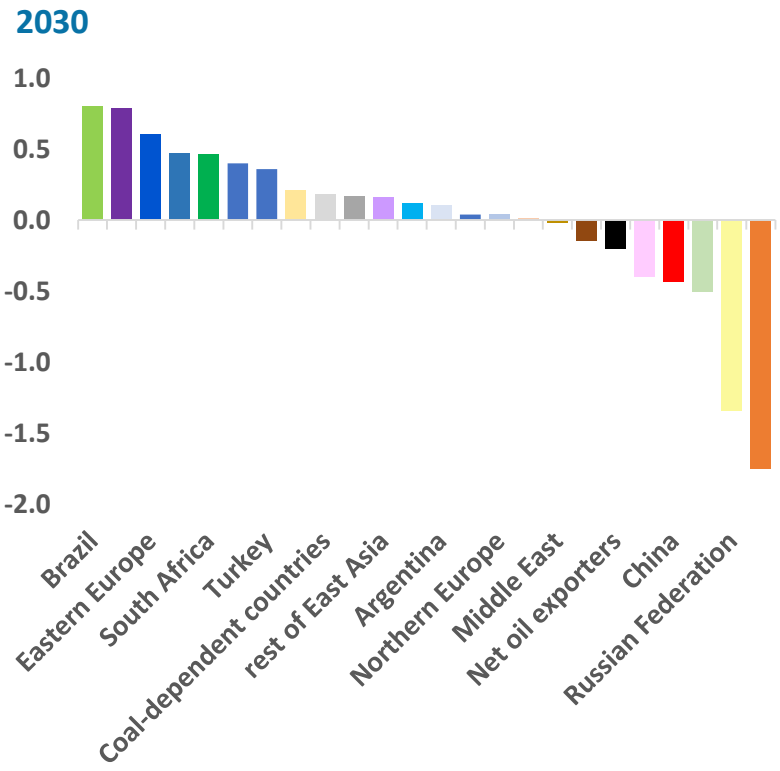


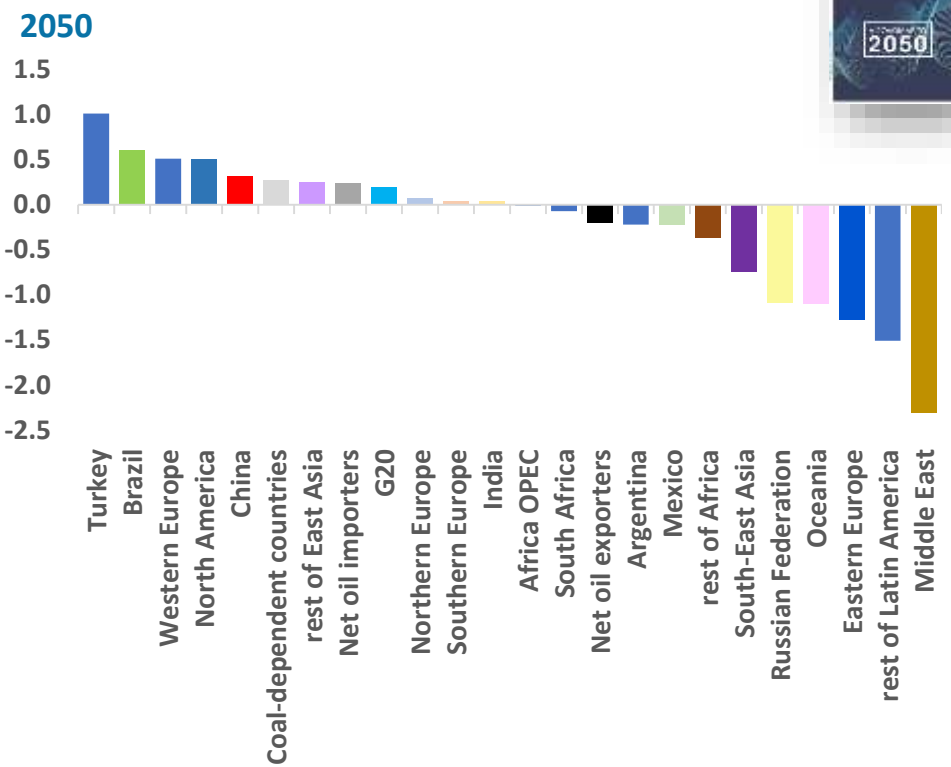
The REmap Case compared to the Reference Case: 2030



The REmap Case compared to the Reference Case: 2050

Trade impacts in the transition by grouping: 2030 vs 2050





Renewable energy jobs in the transition

The energy transition to renewables will result in **24 million jobs** worldwide in 2030, and **28.8 million** in 2050.

Fossil fuels: loss of 8.8 million jobs in fossil fuels by 2050

IRENA's analysis goes beyond the global aggregated impacts on GDP, employment and welfare to also include regional and structural aspects, labor market dynamics and the role of finance

Priority Actions

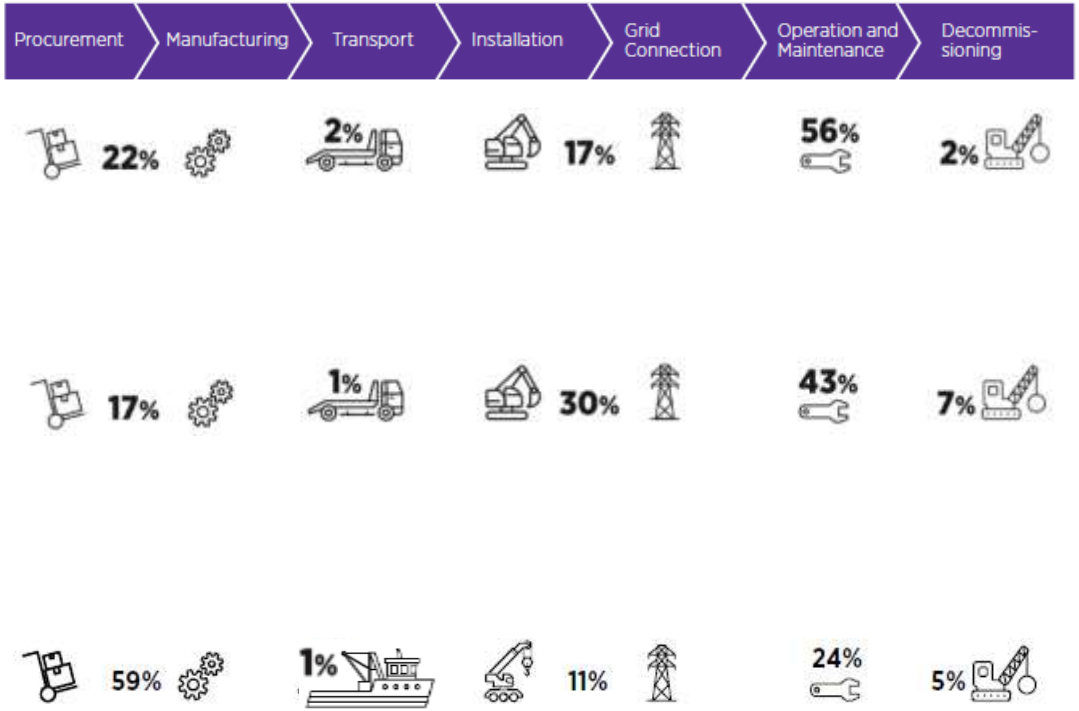
- Improve data collection and analysis
- Provide stable and predictable policy support
- Leverage existing capacities in support of value chain development
- Design active labour market policies to respond to evolving market needs
- Assess skills needs and coordinate education and training policies with the needs of the RE sector

Solar PV and wind value chains

50 MW solar PV:
229 055 person-days

50 MW onshore wind:
144 420 person-days

500 MW offshore wind:
2.1 million person-days



Solar PV value chain, by occupations

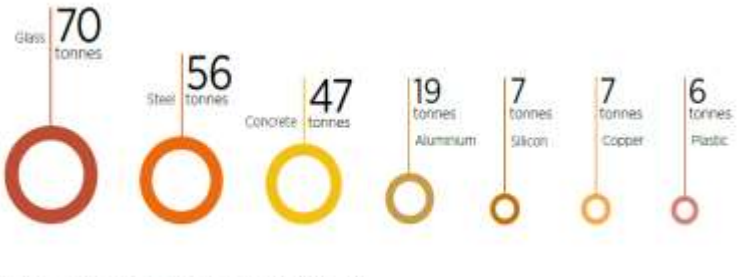
Type of Human Resources	Project Planning	Manufacturing and procurement	Transport	Installation and grid connection	O&M	Decommissioning	TOTAL	TOTAL (as %)
Construction workers and technicians				35,500	61,515	3,750	100,765	44%
Factory workers		31,920					31,920	14%
Engineers	385	5,950		2,680	20,432	230	29,677	13%
Quality Health and Safety experts	40	3,710	35	900	24,807	160	29,652	13%
Operators					10,439		10,439	5%
Technical personnel					9,890		9,890	4%
Truck drivers			2,398			740	3,138	1%
Administrative personnel		2,450	104				2,554	1%
Logistic experts	250	2,030	35			85	2,400	1%
Marketing and sales personnel		2,310					2,310	1%
Legal, energy regulation, real estate and taxation experts	825				1,082		1,907	1%
Regulation and standardization experts		1,855					1,855	1%
Loading staff			799				799	0%
Environmental experts	90			300		185	575	0%
Management					540		540	0%
Financial analysts	530						530	0%
Shipping agents			104				104	0%
TOTAL (person-days)	**2,120**	**50,225**	**3,475**	**39,380**	**128,705**	**5,150**	**229,055**	

Onshore wind value chain, by occupations

Type of Human Resources	Project Planning	Manufacturing and procurement	Transport	Installation and grid connection	O&M	Decommissioning	TOTAL	TOTAL (as %)
Construction workers and technicians				26,600	5,127	5,500	37,227	29%
Operators					25,633		25,633	20%
Engineers*	290	1,019		2,300	16,778	430	20,817	16%
Factory workers		12,440					12,440	10%
Quality Health and Safety experts	50	2,135		1,620	3,495	310	7,610	6%
Truck drivers, crane operators			621	3,000		1,800	5,421	4%
Administrative personnel		868	123		2,913		3,904	3%
Technical personnel			26		3,495		3,521	3%
Environmental experts	80			720	1,864	335	2,999	2%
Legal, energy regulation, real estate and taxation experts	1,020		52		1,864		2,936	2%
Logistic experts	360	1,060	53	240		45	1,758	1%
Management		385			932		1,317	1%
Marketing and sales personnel		1,045					1,045	1%
Financial analysts	730						730	1%
Geotechnical experts	50						50	0%
Regulation and standardization experts		15					15	0%
TOTAL (person-days	2,580	18,967	875	34,480	62,101	8,420	144,420	

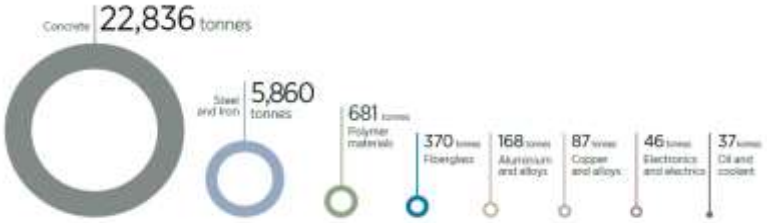
Solar PV and wind value chains

50 MW solar PV



Source: Results of surveys and questionnaires conducted for this study.

50 MW onshore wind



Source: Vestas, 2015

500 MW offshore wind

Overarching framework for RE policy

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		

IRENA

International Renewable Energy Agency

www.irena.org

www.twitter.com/irena

www.facebook.com/irena.org

www.instagram.com/irenaimages

www.flickr.com/photos/irenaimages

www.youtube.com/user/irenaorg

Priority Actions (2/2)

- Ensure that jobs are decent
- Undertake measures to minimise disruptions in the energy transition through social protection measures and retraining efforts
- Remove barriers to entry for women's employment in renewable energy

IRENA Survey in gender:

Renewable energy has more gender parity than the broader energy sector.

35%
Average share of women working at 90 renewable energy companies surveyed