Renewable energy benefits and Auction design elements that can support them

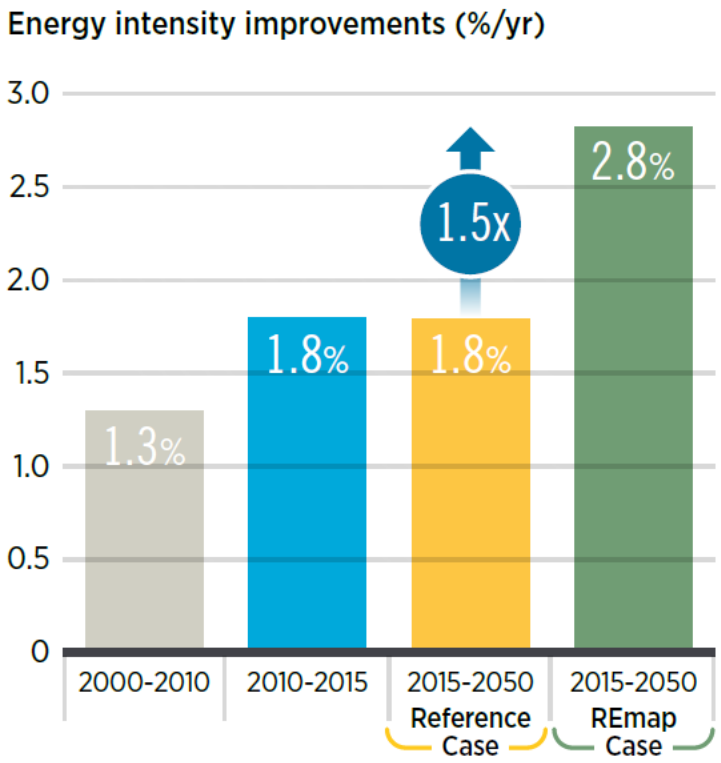
Price trends: onshore wind in Brazil

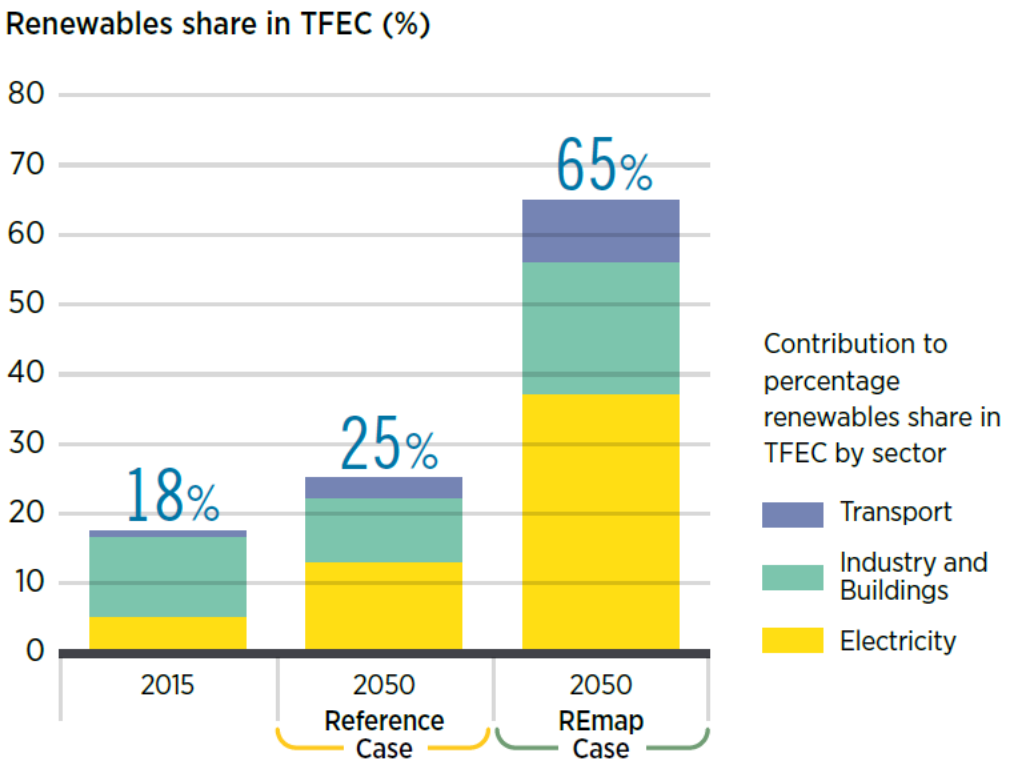
Fluctuating prices in Brazil

- Project lead times
- Intensified competition
- Availability of concessional financing
- Depreciation of the local currency
- Auction design

Source: based on ANEEL, 2016

Renewable energy needs to be scaled up at least six times faster for the world to start to meet the goals set out in the Paris Agreement





Source: *IRENA, Global Energy Transformation: A Roadmap to 2050, 2018*

Significant improvements in energy intensity are needed and the share of renewable energy must rise to two-thirds to meeting energy-related emission reduction needs of the Paris Climate Agreement and limit global temperature rise to two degree

Socio-economic benefits of the energy transition

GDP

+ 1.0 %

+ 52 USD trillion

Almost 29 million
jobs in 2050

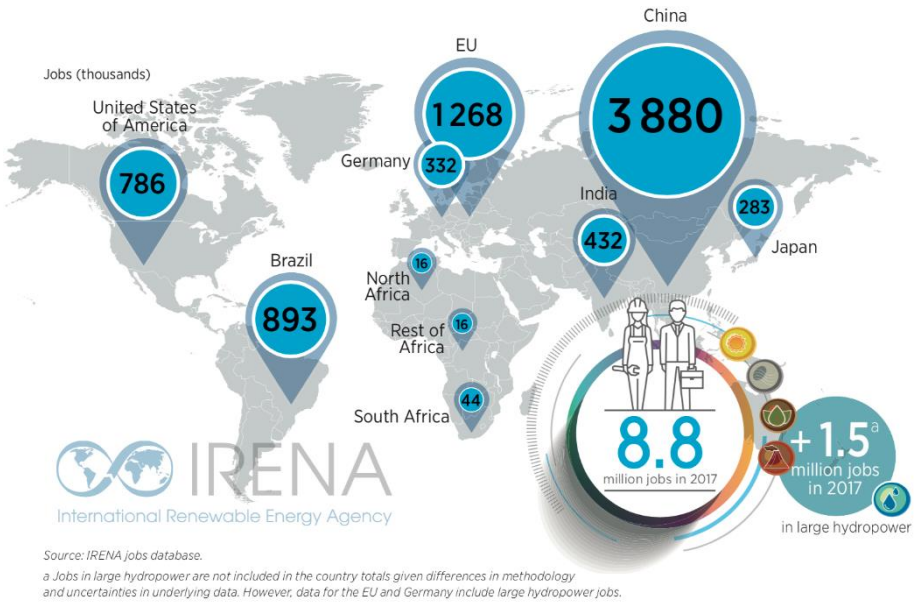
+ 15 %

Welfare

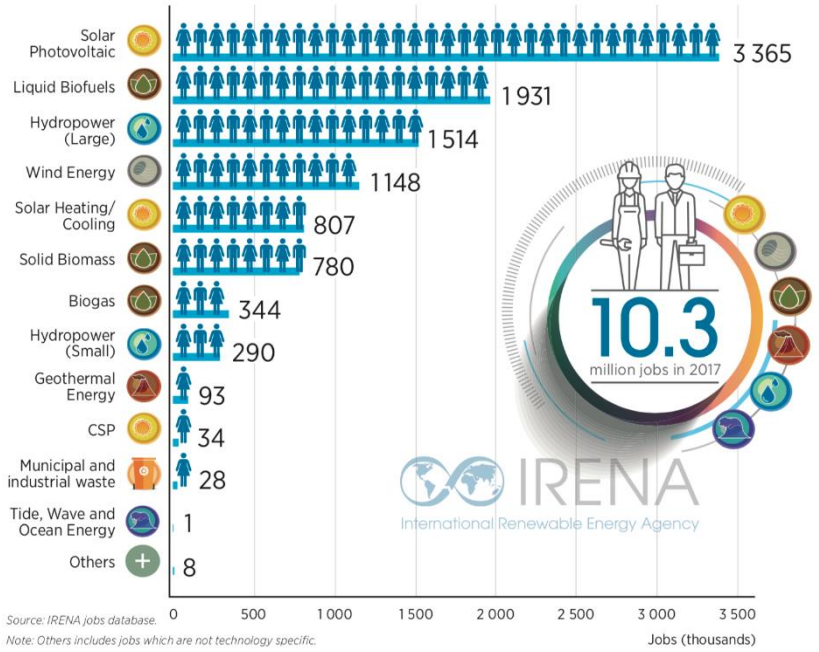
Source: IRENA, Global Energy Transformation: A Roadmap to 2050, 2018

Jobs in renewable energy

Renewable energy jobs by country, 2017



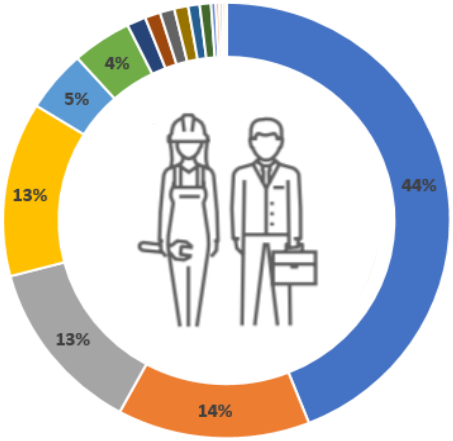
Renewable energy jobs by technology, 2017



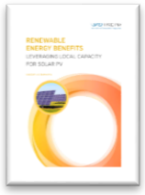
Source: IRENA, [Renewable Energy and Jobs - Annual Review 2018]

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

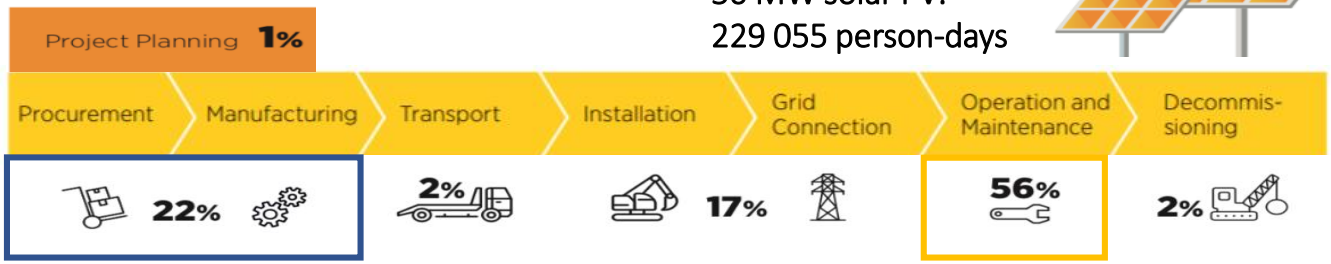
Jobs in solar PV

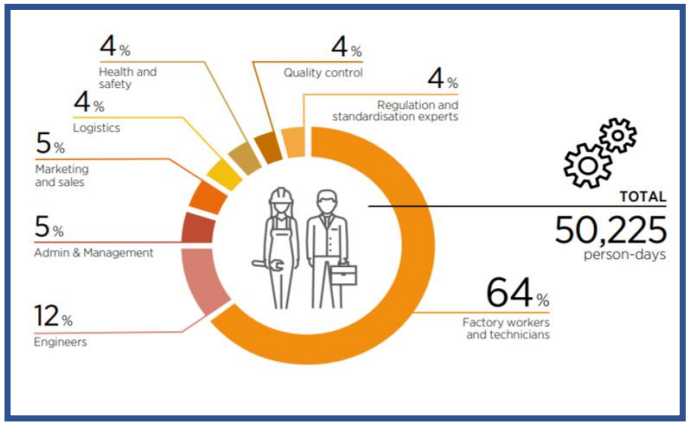


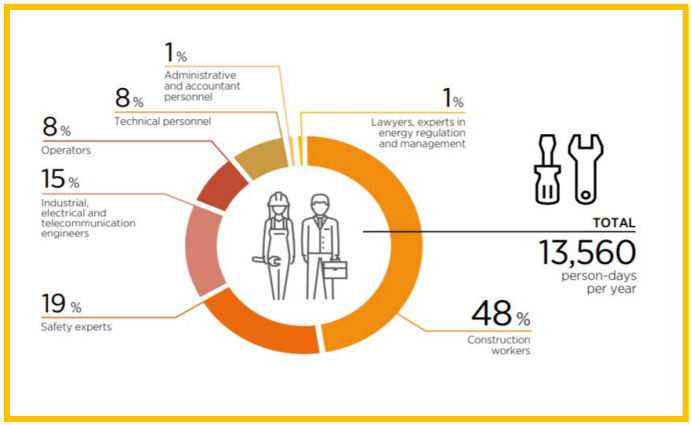
- Construction workers and technicians
- Factory workers
- Engineers
- Quality Health and Safety experts
- Operators
- Technical personnel
- Truck drivers
- Administrative personnel
- Logistic experts
- Marketing and sales personnel
- Legal, energy regulation, real estate and taxation experts
- Regulation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



50 MW solar PV:
229 055 person-days



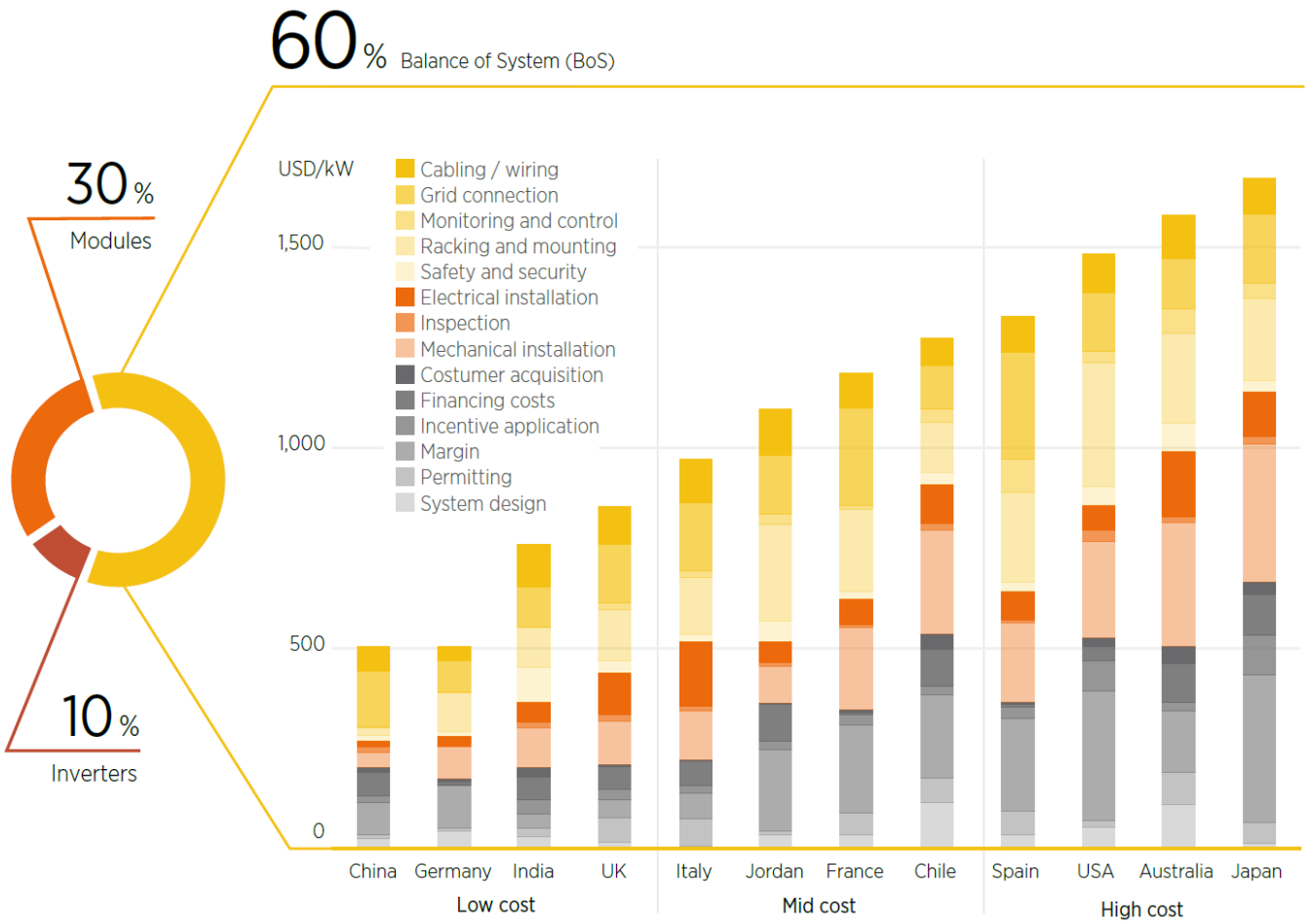




Source: IRENA, Renewable Energy Benefits: Leveraging Local Capacity for Solar PV, 2017

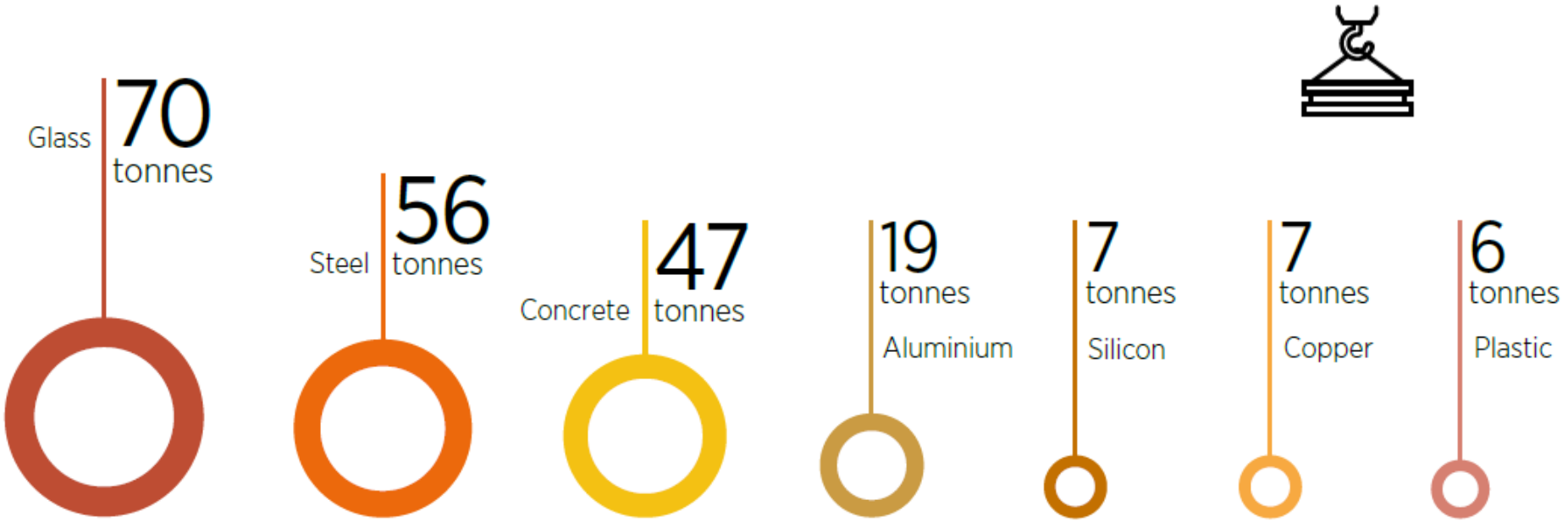
In the solar PV value chain, 56% of the human resources required are in O&M while manufacturing and procurement employs 22% of the total. The majority of labour are construction workers and technicians

Distribution of costs of a large-scale solar PV in 2015



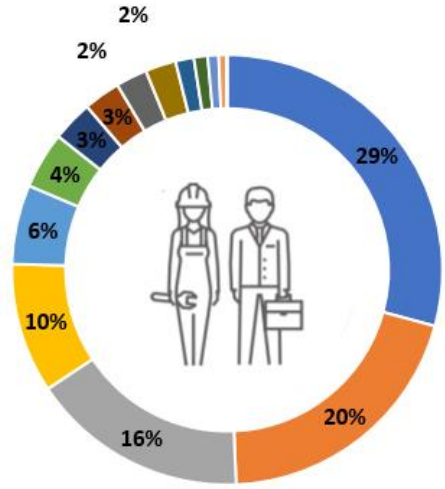
Source: IRENA, Renewable Power Generation Costs in 2017, 2018

Materials needed to develop a 1 MW Silicon-based solar PV plant (tonnes)

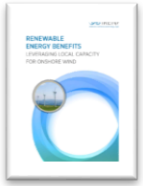


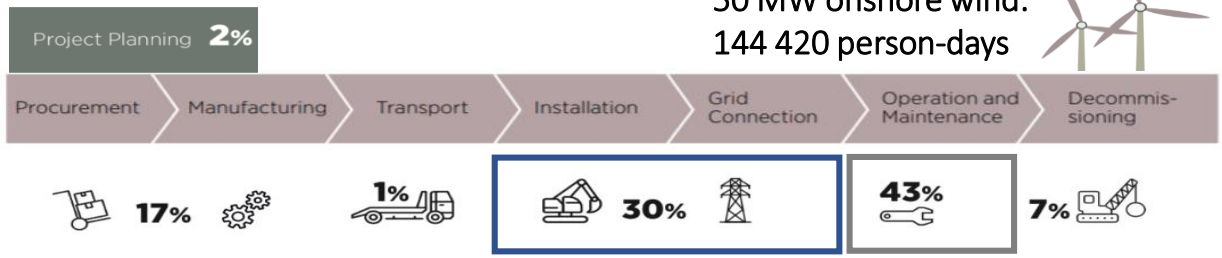
Source: IRENA, Renewable Energy Benefits: Leveraging Local Capacity for Solar PV, 2017

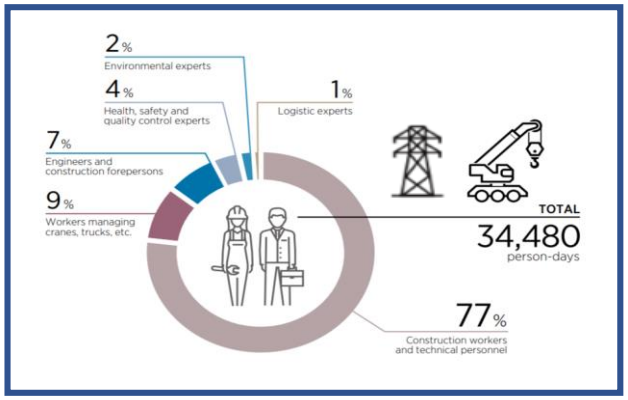
Jobs in onshore wind

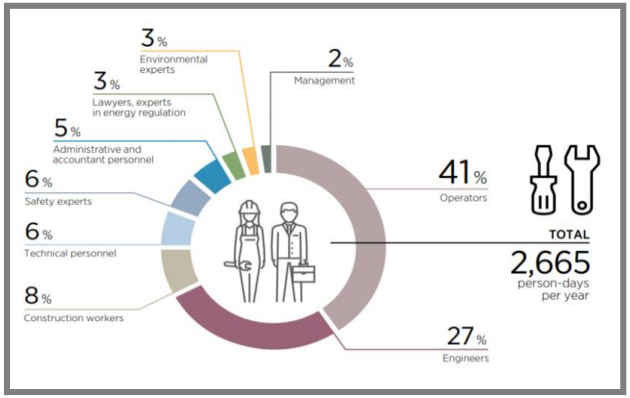


- Construction workers and technicians
- Operators
- Engineers*
- Factory workers
- Quality Health and Safety experts
- Truck drivers, crane operators
- Administrative personnel
- Technical personnel
- Environmental experts
- Legal, energy regulation, real estate and taxation experts
- Logistic experts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





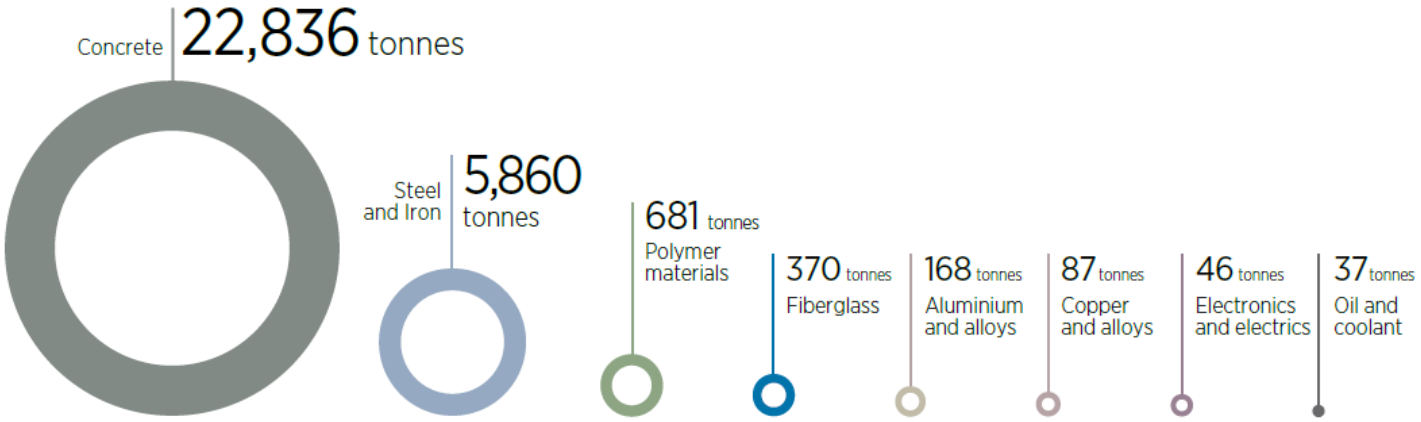




Source: IRENA, Renewable Energy Benefits: Leveraging Local Capacity for Onshore Wind, 2017

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

Materials needed to develop a 50 MW wind farm (tonnes)



Source: Vestas, 2015

MATERIAL	Turbines	Foundations	Cables	Site switch-gears and transfomers
Concrete	–	22,836	–	–
Steel and iron	4,607	1,228	–	25
Fiberglass	368	–	1	1
Polymer materials	325	1	355	–
Electronics/electrics	46	–	–	–
Copper and alloys	32	1	41	13
Oil and coolant	18	–	–	19
Aluminium and alloys	9	–	159	–

Source: Vestas, 2015 *Source: IRENA, Renewable Energy Benefits: Leveraging Local Capacity for Onshore Wind, 2017*

Design elements to support local value creation: Auction Demand

Technology-specific auction

- A technology-specific auction can support the development of a local industry for this technology

Schedule of regular auctions

- A long-term schedule of auctions for a specific technology can enable its local development

Volume dedicated to small players

- A dedicated volume to small players, cooperatives, communities can support their participation in the market

Design elements to support local value creation: Qualification Requirements

Qualification requirements

Minimum requirements for participants in the auction

Permitting and documentation

- Leniency can support small/new players
- Specific zones that are underdeveloped can be selected

Extensive track record and financial capability

- Leniency can support small/new players

Ensuring global socio-economic development goals

- Minimum requirement for local content, local jobs, and benefits for communities and marginalized people
- Requesting that all bidders present a Community Engagement Plan and Benefit Sharing Plan.

Design elements to support local value creation: Winner Selection

Winner selection

How the information is collected and the criteria for the winner selection

Winner selection criteria

- Based on socio-economic benefits, job creation and favouring locations in need of economic activities

Ceiling price and payment to winner

- Higher ceiling price can give a chance to small/new players
- To increase the revenues for projects implemented in locations with less favorable resource conditions, a premium could be established and paid to bidders to top up the initially tendered price.

Project size

- Small project size limit could lead to multiple winners

Design elements to support local value creation: Sellers' Liabilities

Sellers' liabilities

Specific rules to ensure high implementation rate of awarded projects in a timely manner

Compliance rules

- Appropriate level of financial guarantees for each group of actors/bidders

Bridging the gap through enabling policy and investment frameworks – Industry

Many efforts to develop a local solar industry

Malaysia aims to be the second-largest producer of PV modules by 2020. In 2015, third-largest exporter, contributing to 12% of total global shipments with almost 51 MW:

- Malaysia's National Renewable Energy Policy and Action Plan coordinating education, training, finance, etc.
- FiT provided additional USc 1/kWh for the use of locally manufactured or assembled PV modules and additional USc 1/kWh for the use of locally manufactured or assembled solar inverters.
- Auction capped foreign participation at 49%.

Indonesian FiT provided additional tariffs for ensuring a minimum local content of 43.8%.

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

Source: IRENA-IEA-REN21, Renewable Energy Policies in a Time of Transition, 2018

Thank you!