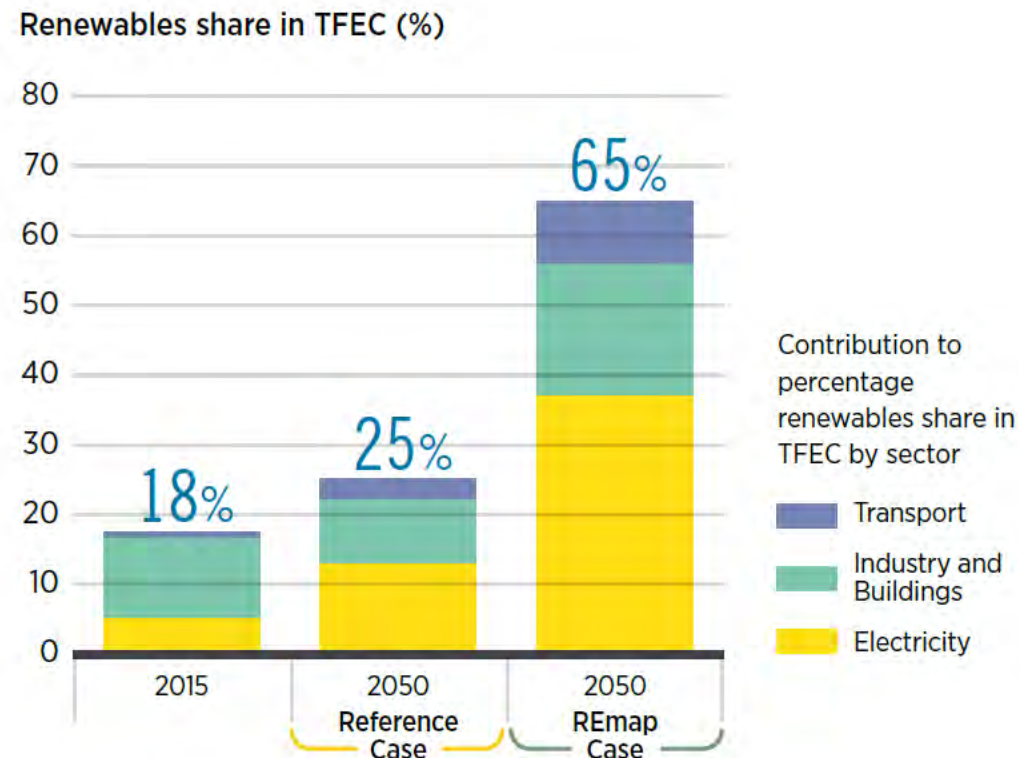
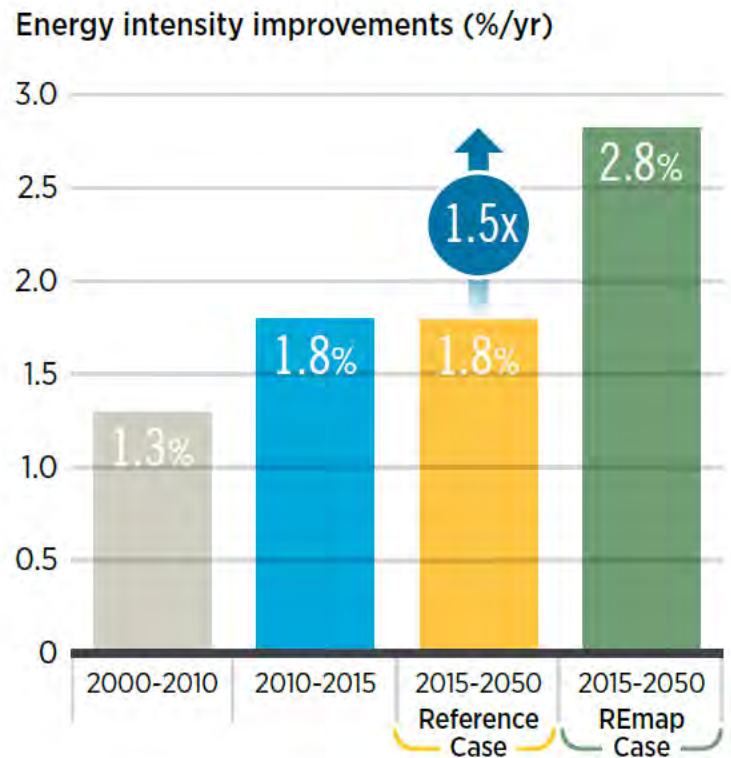




# Renewable energy benefits and Auction design elements that can support them

Ouarzazate, 5 February 2019

## 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 meet 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



+ 1.0 %

+ 52 USD trillion



**Almost 29 million**  
jobs in 2050

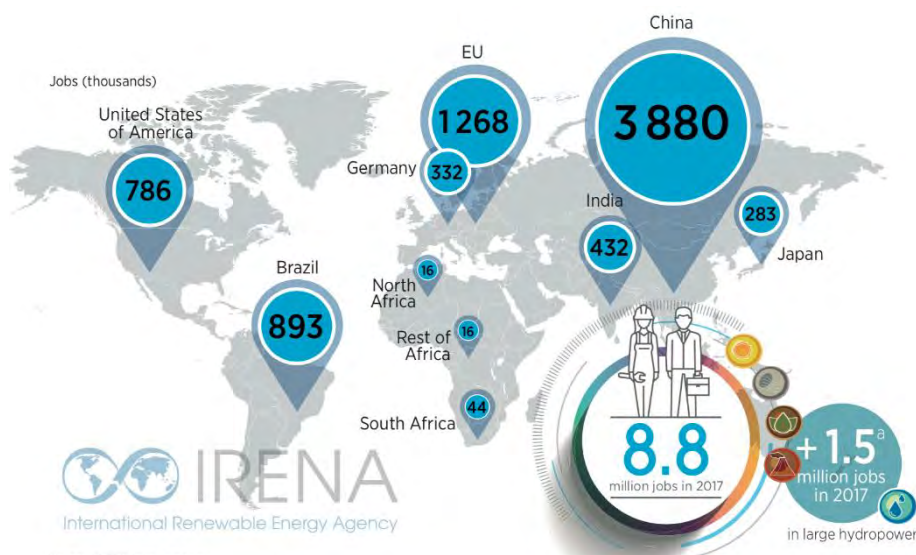
+ 15 %



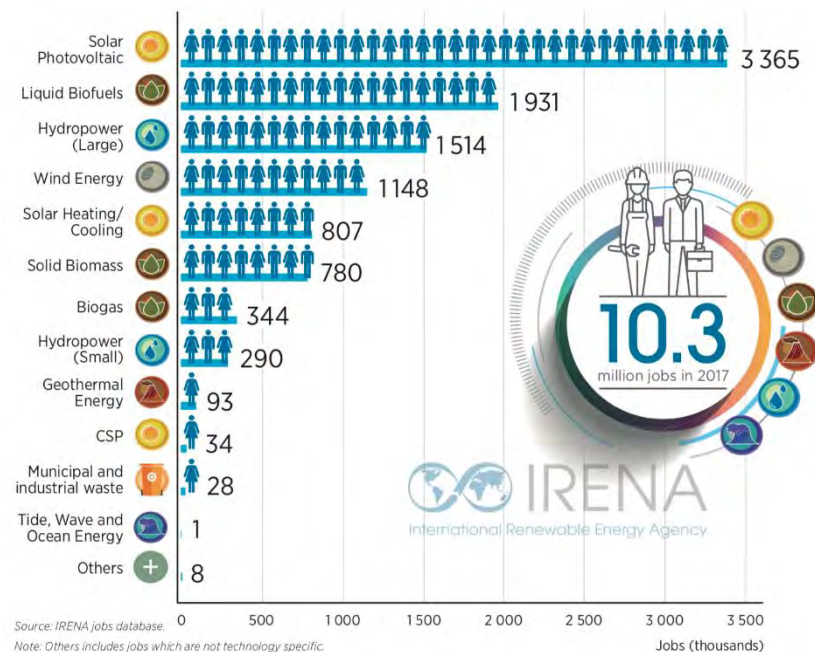
Source: [IRENA, Global Energy Transformation: A Roadmap to 2050, 2018](#)

## Jobs in renewable energy

Renewable energy jobs by country, 2017



Renewable energy jobs by technology, 2017

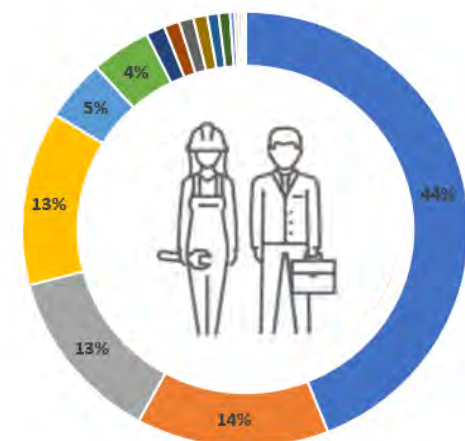


Source: IRENA, [Renewable Energy and Jobs - Annual Review 2018](#)

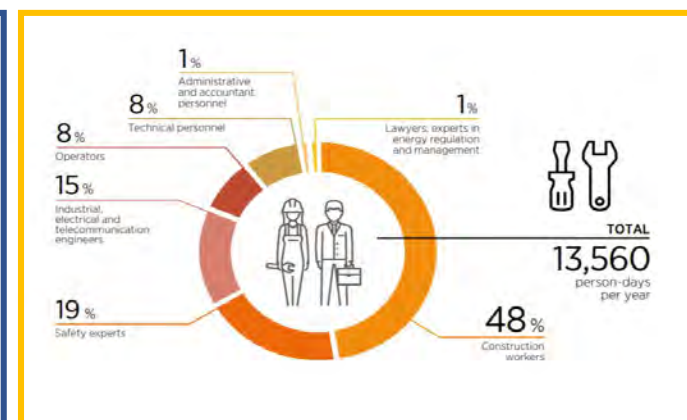
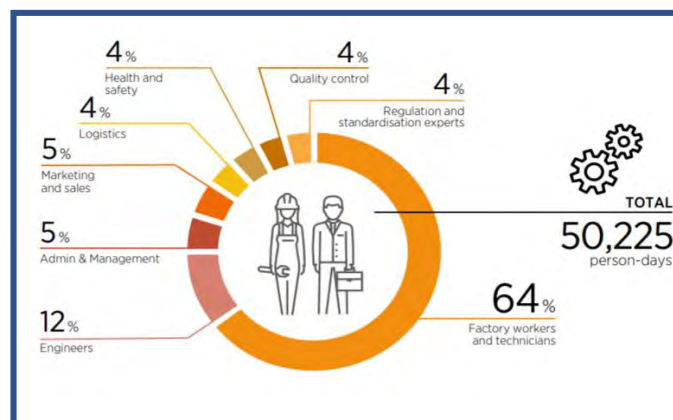
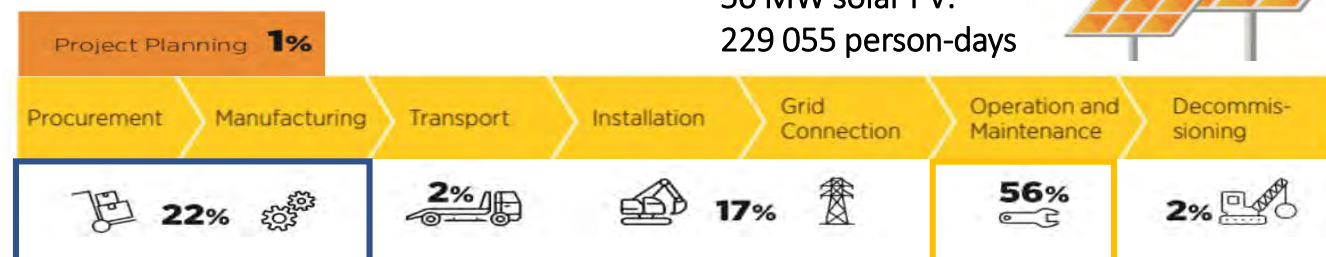
In 2017, there were 10.3 million jobs in renewables. Jobs are increasingly moving to Asia with concentration in China, India and Japan. By technology, solar PV is the largest employer



## Jobs in solar PV



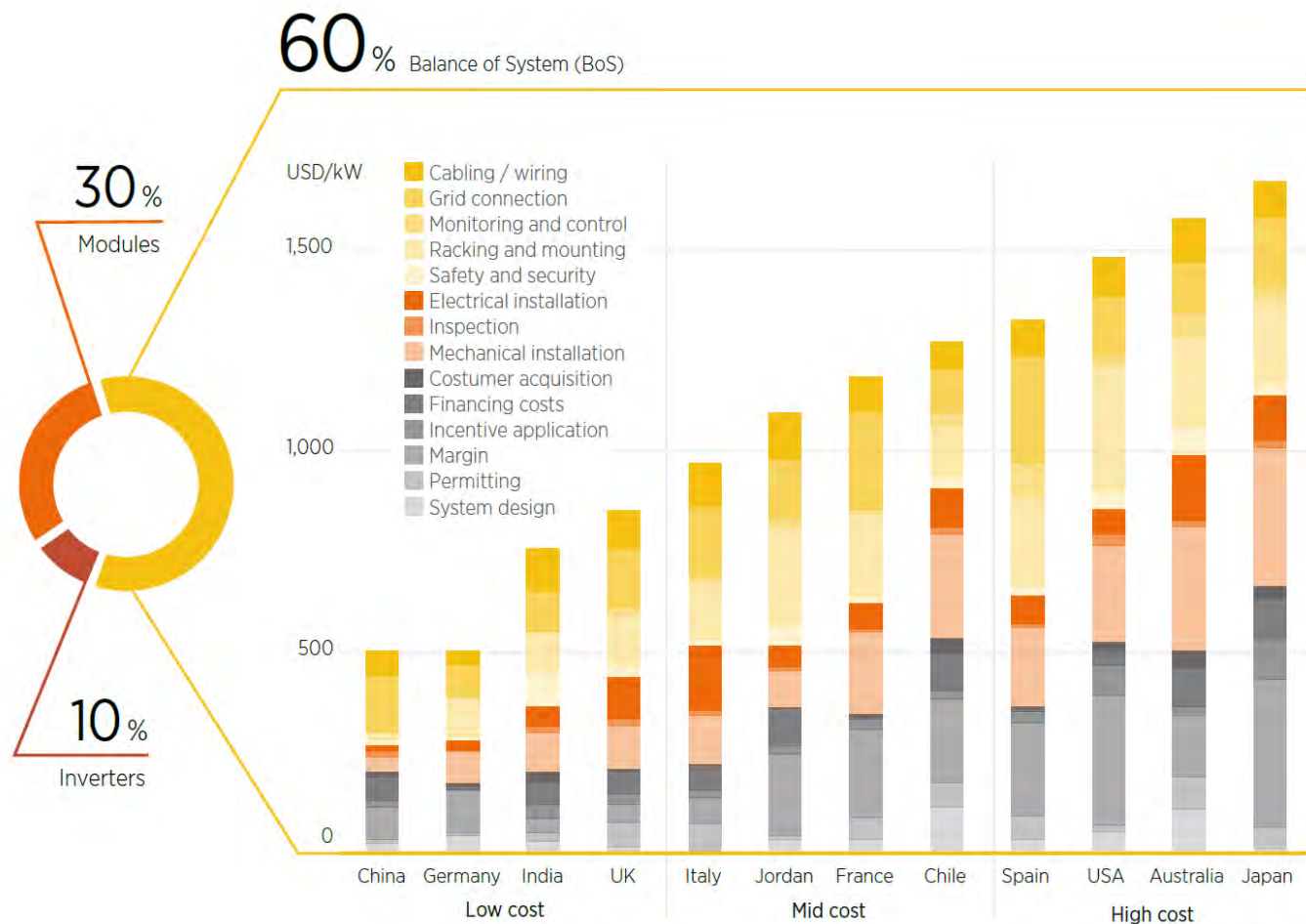
- Construction workers and technicians
- Factory workers
- Engineers
- Quality Health and Safety experts
- Operators
- Technical personnel
- Truck drivers
- Administrative personnel
- Logistic experts
- Marketing and sales personnel
- Legal, energy regulation, real estate and taxation experts
- Regulation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



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

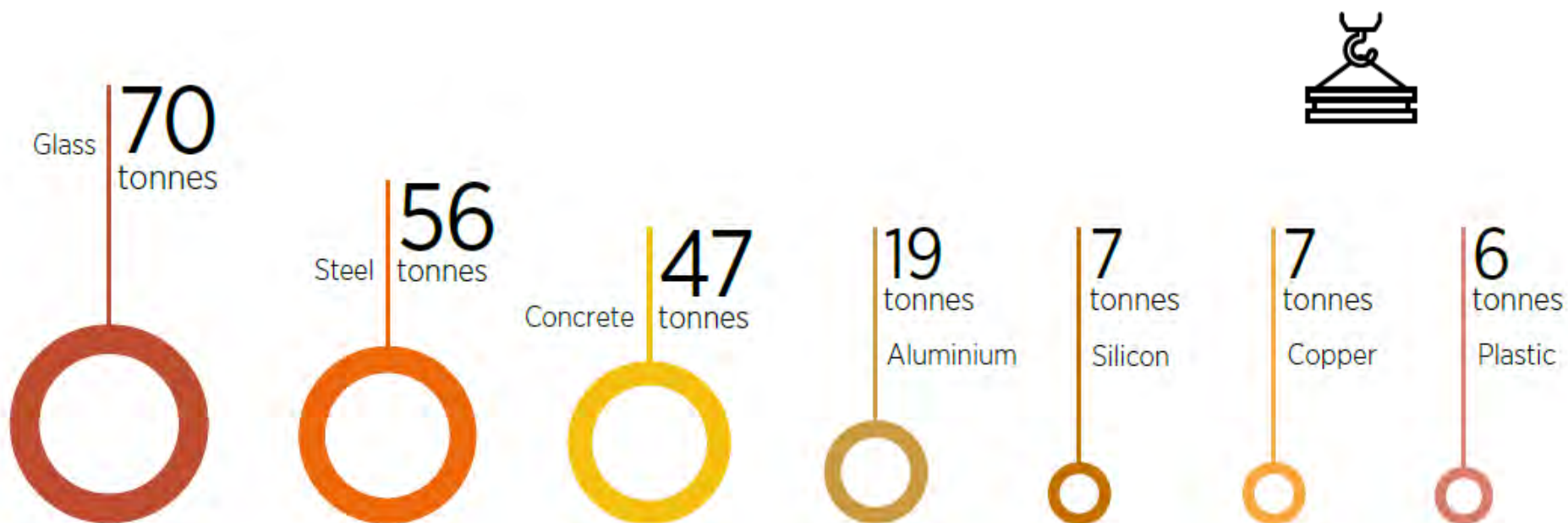
In the solar PV value chain, 56% of the human resources required are in O&M while manufacturing and procurement employs 22% of the total. The majority of labour are construction workers and technicians

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



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

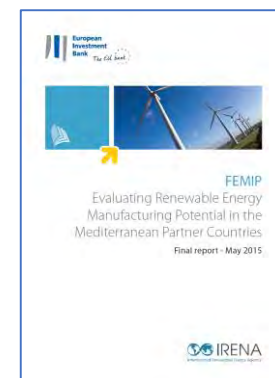
## Materials needed to develop a 1 MW Silicon-based solar PV plant (tonnes)



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

## Potential for jobs and local value creation in CSP

- Under the Moroccan Solar Plan, bidders are encouraged to promote local benefits. The 160MW NOOR I awarded to ACWA Power includes a 42% local content portion.
- Different local players identified during interviews were positioned along the value chain, depending on their ability and willingness to produce different components. Selected international players active in the local markets are also shown.



Moroccan companies potentially involved in the Solar CSP value chain in 2015

Value Chain	Components							Construction
	Raw materials	Mirrors and Receivers	Mounting structure	Balance of Plant	Power train	Storage system	Grid connection	EPC
Companies	Maghreb Steel	Not identified	Sonasid	CAM	Delattre Levivier ADETEL	Not identified	Not identified	MEGEC
	Not identified	Saint-Gobain	Seprob CEGELEC	Several companies active the steel industry	Not identified	DLM	Not identified	Local civil works companies
	Lafarge Italcementi Saint-Gobain	Rioglass Solar SchottSolar AG	Abengoa Solar Buzzichelli	Solutia (HTF) Abengoa Solar	Alstom Siemens	Buzzichelli	Abener	Abener, ABB, Teyma
	Local companies active in the sector	Local companies potentially active in the sector	International companies locally involved					

Source: EIB and FEMIP, Evaluating Renewable Energy Manufacturing Potential in the Mediterranean Partner Countries, 2015



# Potential for jobs and local value creation in CSP

Value chain	Materials		Components				Construction	
	Raw materials	Mirrors and receivers	Mounting structure	Balance of plant	Power train	Storage system	Grid connection	EPC
Existing industries and capabilities That can be leveraged	<ul style="list-style-type: none"><li>• glass for mirrors</li><li>• steel for support structure and piping</li><li>• chemicals for heat transfer</li><li>• salt for storage</li><li>• concrete for collector foundations and tower</li></ul>	<ul style="list-style-type: none"><li>• depends on local glass production and local demand and know-how</li><li>• high energy process</li><li>• international players might be interested if a stable significant market is created</li><li>• technology transfer and R&amp;D are required</li></ul>	<ul style="list-style-type: none"><li>• local steel can be used</li><li>• local skills available for the mounting</li></ul>	<ul style="list-style-type: none"><li>• the metal working industry could provide several kinds of tubes and pipes for industrial applications and different purposes.</li><li>• requirements in terms of corrosion, temperature, materials, insulation and pressure are very high for CSP tubes.</li></ul>	<ul style="list-style-type: none"><li>• blocks, turbines, generators and power plant controls might not be produced domestically in the medium term, but local subsidiaries could be in charge of installation, maintenance and operation of CSP plants.</li></ul>	<ul style="list-style-type: none"><li>• manufacturing of large tanks and silos for liquid materials in petroleum, water or phosphorus industry</li><li>• can supply foundation and shell of the storage tank.</li><li>• concrete foundations for tanks could be constructed by local civil works companies.</li></ul>	<ul style="list-style-type: none"><li>• Existing knowledge and experience can be complemented by foreign companies.</li></ul>	<ul style="list-style-type: none"><li>• local companies might be involved in future CSP projects</li><li>• significant involvement in ground works and land preparation for large infrastructure projects as well as conventional power plants.</li></ul>

Source: EIB and FEMIP, *Evaluating Renewable Energy Manufacturing Potential in the Mediterranean Partner Countries*, 2015

# Jobs and local value creation in Ouarzazate

## Socio-economic benefits of Noor-Ouarzazate I:

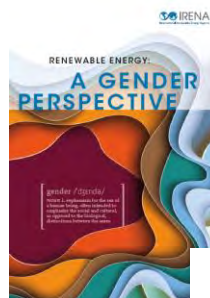
- Sourced 30-35% of the total project costs in local components and services
- Impacted 347,780 direct beneficiaries
- Returned 85% of site compensation cost (USD 3 million), to local communities through local development projects (draining and irrigation channels, drinking water facilities, community centers, etc.)



- Women represent only 4% of the CSP facility's workforce.
- Provisions for a safe and positive work environment for women attracted them but to traditional activities (catering, cleaning, and administration)
- Some more technical roles in quality control and the health and safety unit, and in highly skilled positions such as topographer and welder.
- Women see the complex as an opportunity for employment, including in high-skilled, longer-term jobs.



## Barriers to retention and advancement of women in the modern energy context



Perception of gender roles

Cultural and social norms

Prevailing hiring practices

Lack of gender targets

Lack of non-STEM background

Discouraging workplace policies

Lack of STEM background

Limited mobility

Self-perception

Lack of awareness of opportunities

### Glass Ceiling

Cultural and social norms

Lack of flexibility in workplace

Lack of mentorship opportunities

Lack of required skills and qualifications

Lack of training opportunities

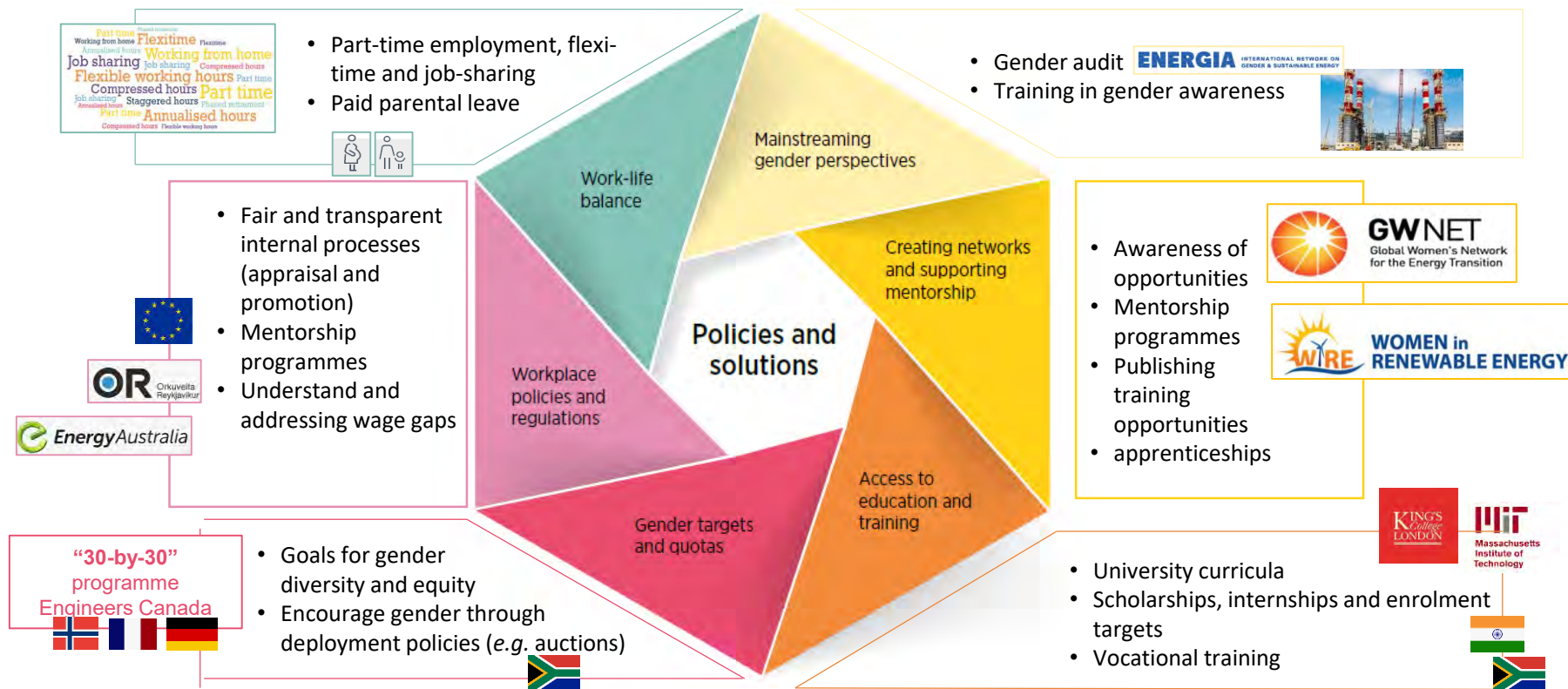
Lack of gender targets

Discouraging workplace policies

Limited mobility

Lack of childcare facilities

# Policies and solutions to increase women's participation in the sector

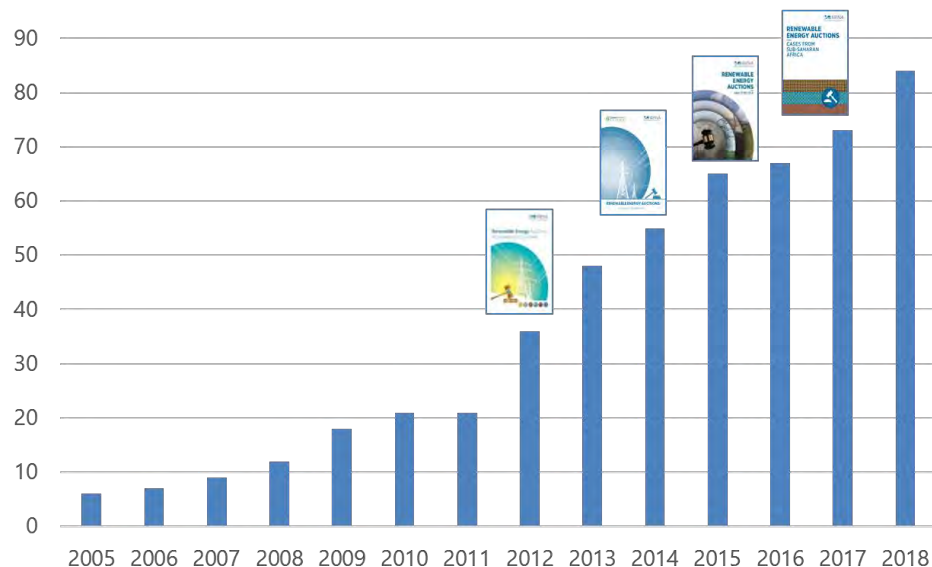




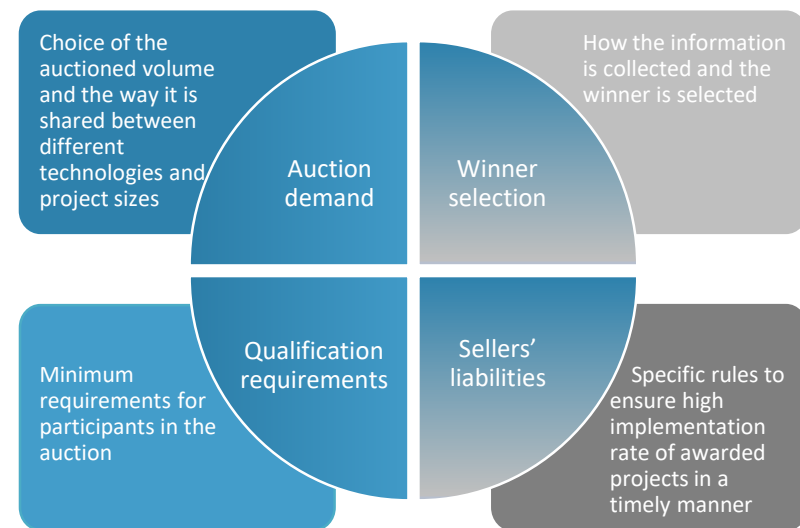
## Policies to promote gender equality and maximize benefits

- Mainstream gender in energy sector frameworks at all levels
- Strengthen the visibility of the diverse roles of women and helping them become agents of social and economic transformation influence perceptions of gender roles.
- Establish education and training programmes to ensure a well-trained workforce
- Leverage existing capacities in support of value chain development (labour, materials and equipment needs along the supply chain)
- Design industrial policies to strengthen the capability of domestic value creation
- Promote industrial upgrading, supplier development programs and joint ventures
- Design enabling deployment policies that are long term and stable.

## Trends in renewable energy auctions



Based on REN21 Global Status Report (2005 to 2016)



IRENA and CEM, 2015

## Design elements to support local value creation:

### Auction Demand

Choice of the auctioned volume and the way it is shared between different technologies and project sizes

#### 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

Minimum  
requirements for  
participants in  
the auction

### Qualification requirements

#### 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

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

### 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

## The case of South Africa

Element (weighting)	Description	Threshold	Target
Job creation (25%)	RSA-based employees who are citizens	50%	80%
	RSA-based employees who are black people	30%	50%
	Skilled employees who are black people	18%	30%
	RSA-based employees who are citizens and from local communities	12%	20%
	RSA-based citizens employees per MW of contracted capacity	N/A	N/A
Local content (25%)	Value of local content spending	40-45%*	65%
Ownership (15%)	Shareholding by black people in the seller	12%	30%
	Shareholding by local communities in the seller	2.5%	5%
	Shareholding by black people in the construction contractor	8%	20%
	Shareholding by black people in the operations contractor	8%	20%
Management control (5%)	Black people in top management	-	40%
Preferential procurement (10%)	BBBEE procurement**	-	60%
	QSE and SME Procurement**	-	10%
	Women-owned vendor procurement**	-	5%
ED (5%)	Enterprise development contributions***	-	0.6%
	Adjusted enterprise development contributions***	-	0.6%
Socio-economic development (15%)	Socio-economic development contributions***	1%	1.5%
	Adjusted SED contributions***	1%	1.5%

## 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
- Denomination of contracts in local currency is less risky

# 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	<ul style="list-style-type: none"> <li>• Binding targets</li> <li>• Quotas and obligations</li> <li>• Codes and mandates</li> </ul>	<ul style="list-style-type: none"> <li>• Rural targets, strategies, programmes</li> </ul>	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	<ul style="list-style-type: none"> <li>• Regulatory and pricing policies</li> <li>• Tradable certificates</li> <li>• Instruments for self-consumption</li> <li>• Support voluntary programmes</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory and pricing policies (e.g. legal provisions, price/tariff regulation)</li> </ul>	
	Fiscal and financial	<ul style="list-style-type: none"> <li>• Tax incentives</li> <li>• Subsidies</li> <li>• Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Tax incentives</li> <li>• Subsidies</li> <li>• Grants</li> <li>• Concessional financing</li> <li>• Support for financial intermediaries</li> </ul>	
Integrating policies	<ul style="list-style-type: none"> <li>• Measures to enhance system flexibility</li> </ul>		<ul style="list-style-type: none"> <li>• Integration of off-grid systems with main-grid</li> <li>• Coupling with efficient appliances and services</li> </ul>	
	<ul style="list-style-type: none"> <li>• Policies for infrastructure, sector coupling and R&amp;D</li> <li>• Better alignment of energy efficiency and renewable energy policies               <ul style="list-style-type: none"> <li>• Incorporation of decarbonisation objectives into national energy plans</li> <li>• Adaptation measures of socio-economic structure to the energy transition</li> </ul> </li> </ul>			
Enabling policies	<ul style="list-style-type: none"> <li>• Policies to level the playing field</li> <li>• Policies to ensure the reliability of technology</li> <li>• National renewable energy policy</li> <li>• Access to finance, Education, Labour, Land-use, RD&amp;D and innovation, Urban and Public health policies</li> </ul>			<ul style="list-style-type: none"> <li>• Industrial, trade policy and environmental and climate policies</li> </ul>
Enabling and integrating policies	<ul style="list-style-type: none"> <li>• Supportive governance and institutional architecture</li> <li>• Awareness programmes</li> <li>• Social protection policies to address disruptions</li> <li>• Measures for integrated resource management</li> </ul>			



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!**