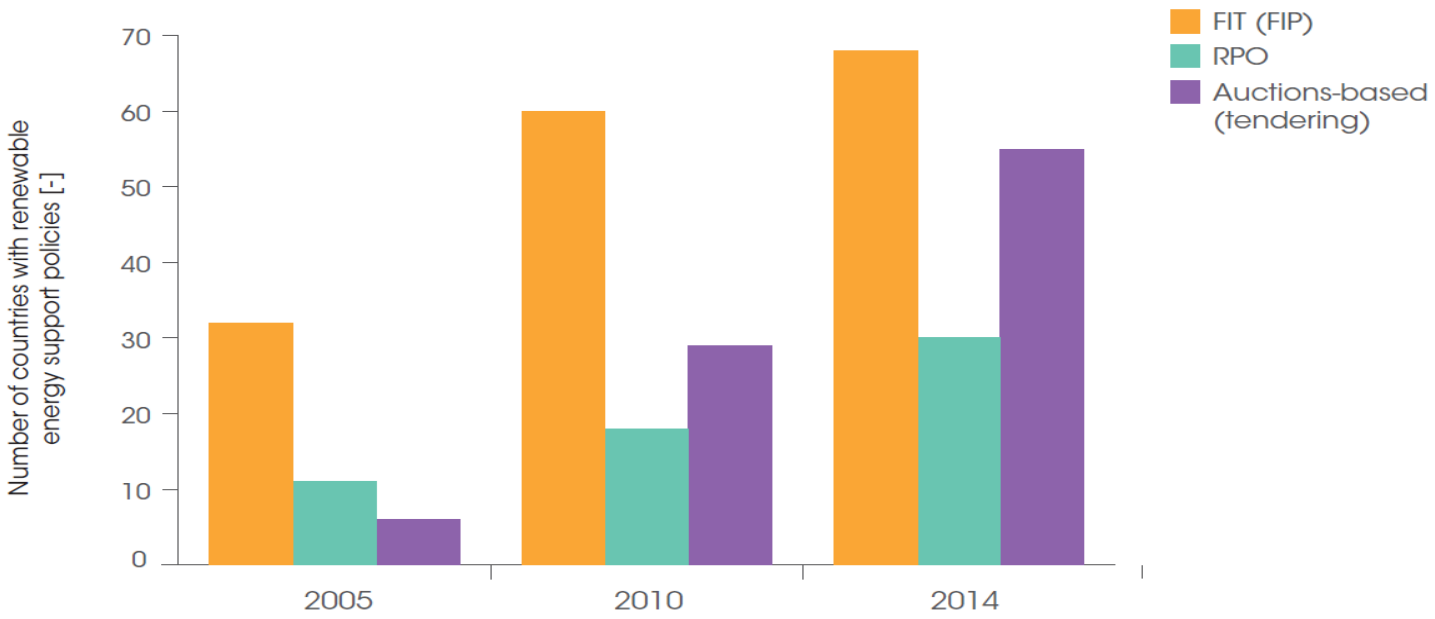
IRENA
International Renewable Energy Agency

Renewable Energy Auctions: A Guide to Design

Renewable Energy Policies

Number of countries with renewable energy policies, by type



Moved from a feed-in tariff to auctions

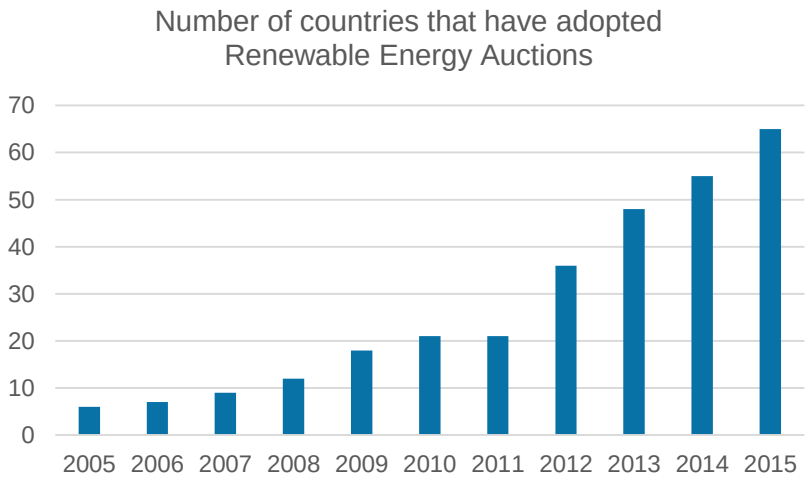
Moved from auctions to a feed-in tariff

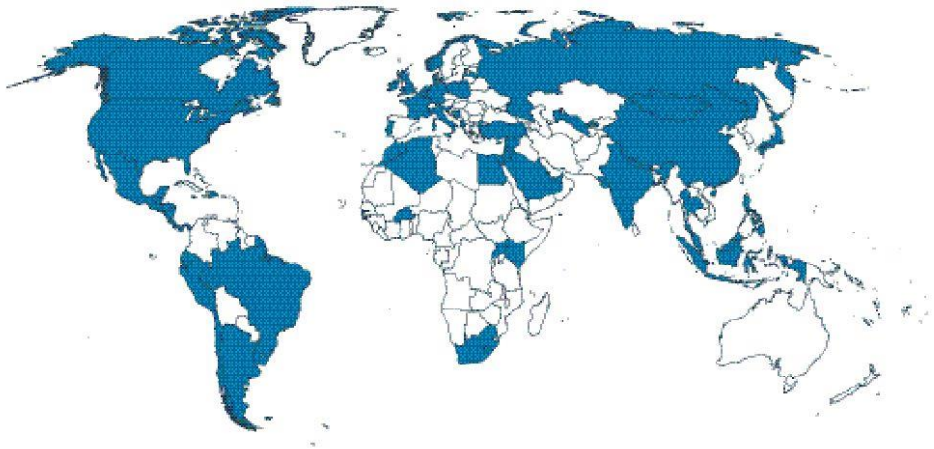
Implemented auctions and a feed-in tariff simultaneously

Renewable Energy Auctions

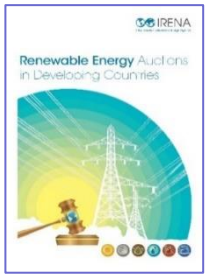
IRENA
International Renewable Energy Agency

Auctions have increasingly been adopted to support renewable energy deployment

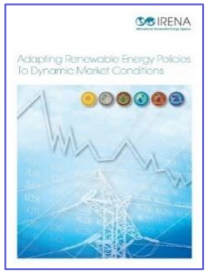




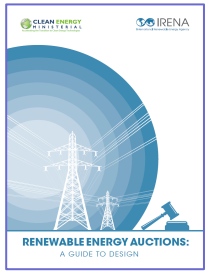
Based on REN21 Global Status Report (2005 to 2015)



2013

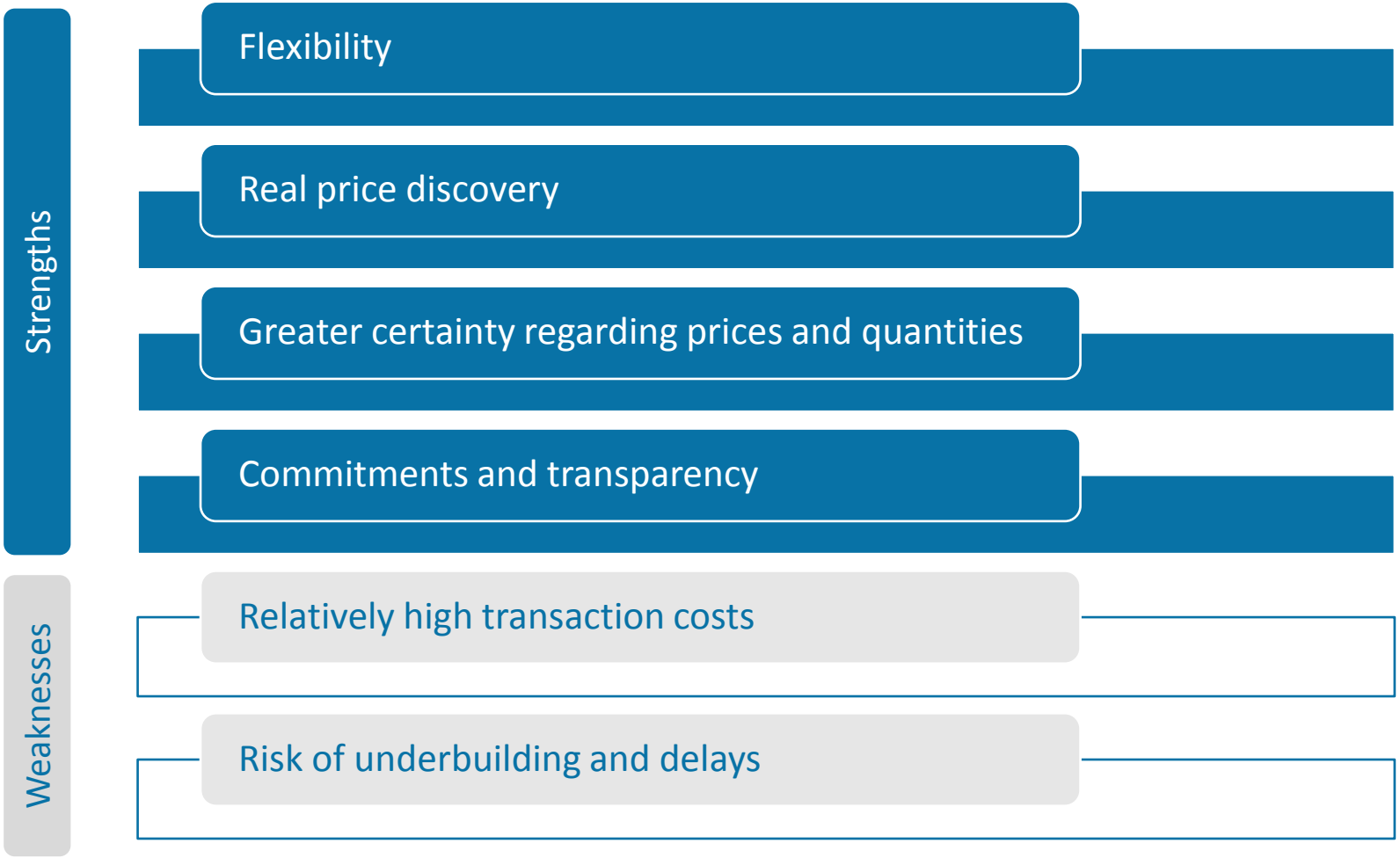


2014



2015

Strengths and weaknesses of Auctions



Renewable Energy Auctions

IRENA
International Renewable Energy Agency

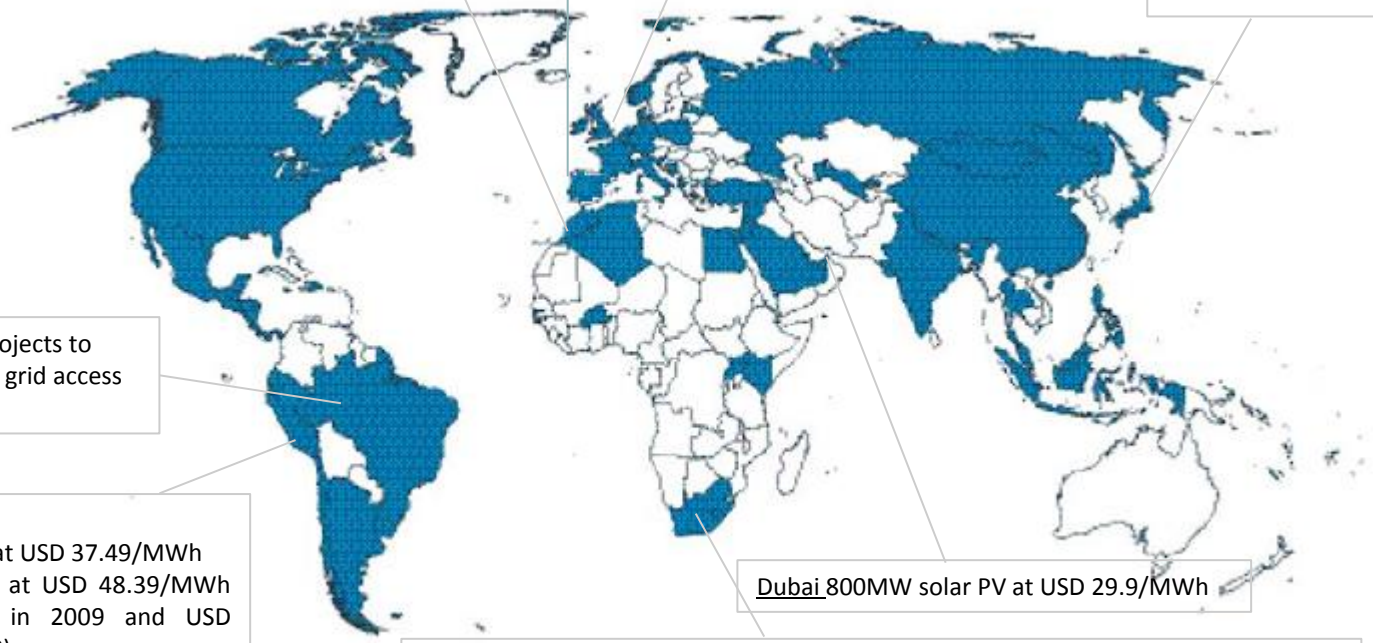
Recent highlights

Germany third round of solar PV
204 MW at 0.08 EUR/kWh (0.0849 EUR/kWh for the 2nd and 0.0917 EUR/kWh for the 1st with a cap of 150 MW)
Among the winners 3 individual investors, 2 registered cooperatives and 3 small privately held businesses

Spain awarded 500 MW of wind and 200 MW of biomass with no financial incentive

Morocco achieved a new low for wind with average bids of USD 30/MWh for 850 MW (the lowest at around USD 25/MWh)

Japan announces move to auction from FIT in 2017 to cap installations and reduce costs on consumers



Brazil mandates projects to secure guaranteed grid access prior to bidding

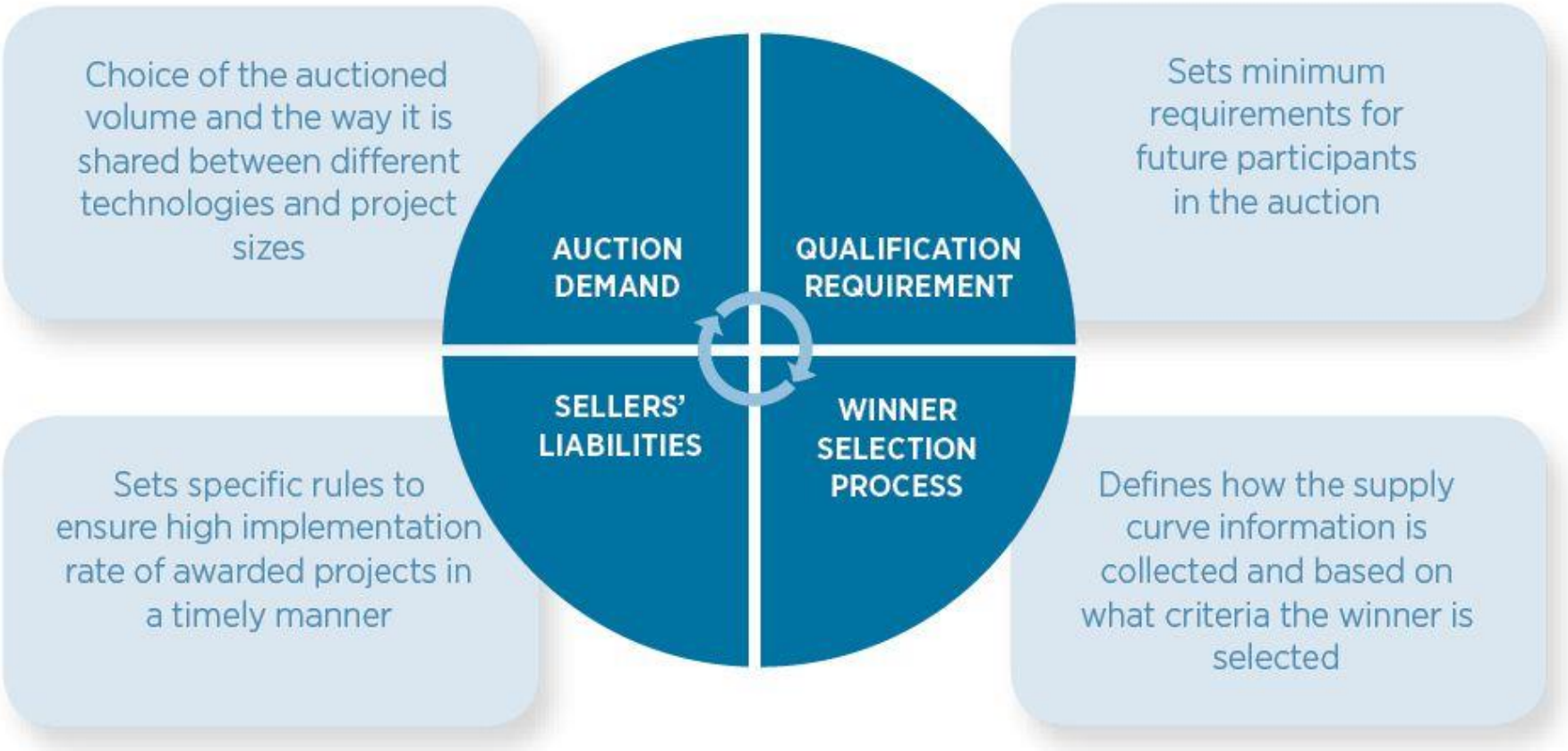
Peru 4th auction:
162 MW of wind at USD 37.49/MWh
184.5 MW of PV at USD 48.39/MWh
(USD 220/MWh in 2009 and USD 110/MWh in 2010)

Dubai 800MW solar PV at USD 29.9/MWh

South Africa announces 5th auction to target 1.6 GW of new capacity

Auction design elements

IRENA
International Renewable Energy Agency



Key considerations in designing and implementing auctions

IRENA
International Renewable Energy Agency

Increasing competition for cost-efficiency

- Increased participation of bidders
- Prevention of collusion and price manipulation

Limiting participation to bidders who can meet goals

- Project delivery
- Deployment goals

Ensuring global and local socio-economic goals

- Qualification requirements
- Multi-criteria selection

Increasing competition for cost-efficiency

Diversity of technology

- Implementing a technology-neutral auction can enable the development of least-cost technologies

- Implementing a technology-specific auction can fulfil deployment goals

Volume auctioned

- Auctioning a large volume at once allows for rapid capacity addition but might result in lack of competition

Increasing competition for cost-efficiency (cont'd)

Level of participation of bidders

- Reducing entry barriers:
  - Requirements and compliance rules commensurate with market conditions
  - Resource assessments, feasibility studies and permits provided to bidders
  - Streamlined administrative procedure and one-stop-shop
  - Fair and transparent rules

- Reducing the perception of risk
  - Demand-side responsibilities
  - Increased certainty and regularity of auction rounds
  - Mitigated financial risk

Prevention of collusion and price manipulation

- Selecting an appropriate bidding procedure may prevent collusion
- Introducing a ceiling price can limit the price

Limiting participation to bidders who can deliver the project

IRENA
International Renewable Energy Agency

Reputation requirements

- Proof that bidders have the financial, technical and legal capability to develop the project to prevent speculative bidding

- Proof that bidders have the past experience and proven track record to help ensure successful delivery

Compliance rules

- Bid bonds and project completion bonds to help ensure successful and timely delivery

- Penalties for delay and underbuilding to help ensure successful and timely delivery

- Penalties for under (or over) performance to help prevent under (or over) producing

Limiting participation to bidders who can meet deployment goals

IRENA
International Renewable Energy Agency

Technological requirements

- Technologies that can compete to align with national energy policy
- Equipment specifications to ensure quality

Project size requirements

- Minimum size to enable economies of scale and reduce transaction costs
- Maximum size to encourage small and/or new players

Location constraints

- Achieve geographic diversification and avoid competition with other sectors
- Ensure proximity to the grid

Grid access requirements

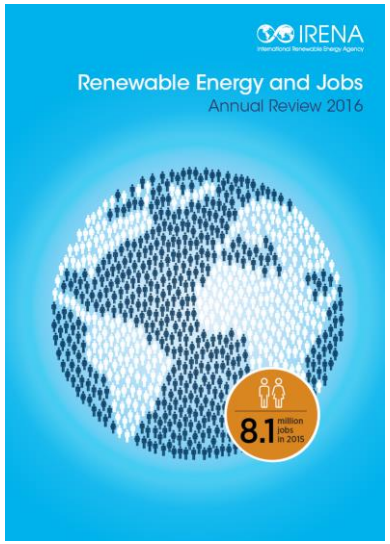
- Ensure feasibility of integrating renewable electricity into the grid
- Avoid delays due to grid expansion

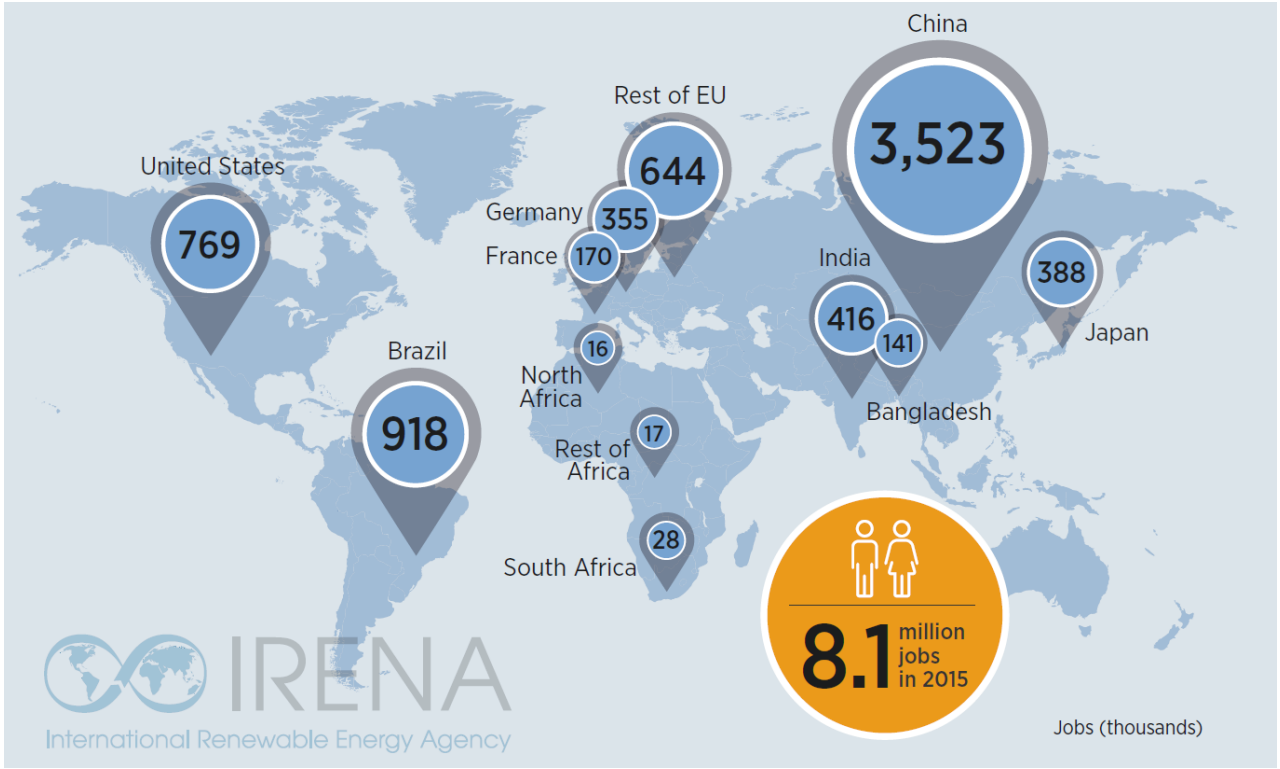
Ensuring global and local goals

IRENA
International Renewable Energy Agency

Socio-economic impacts

- Qualification requirements
- Multi criteria selection





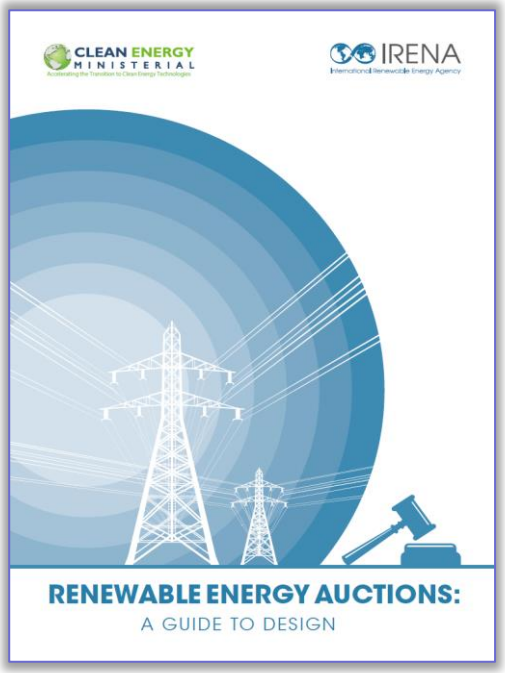
Employment in Selected Countries

Conclusion

IRENA
International Renewable Energy Agency

While designing auctions, policy makers may want to consider the following recommendations:

- Account for the trade-offs between different design elements
- Different policy options to support deployment are not mutually exclusive.
- Tailor the design of auctions to the specific context



Thank you!