

Renewable Energy Auctions

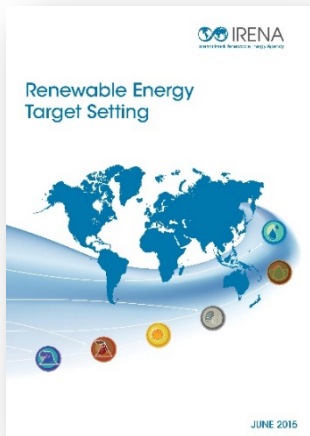
An overview of design

IRENA – Energy Community Workshop on Renewable Energy
Auctions

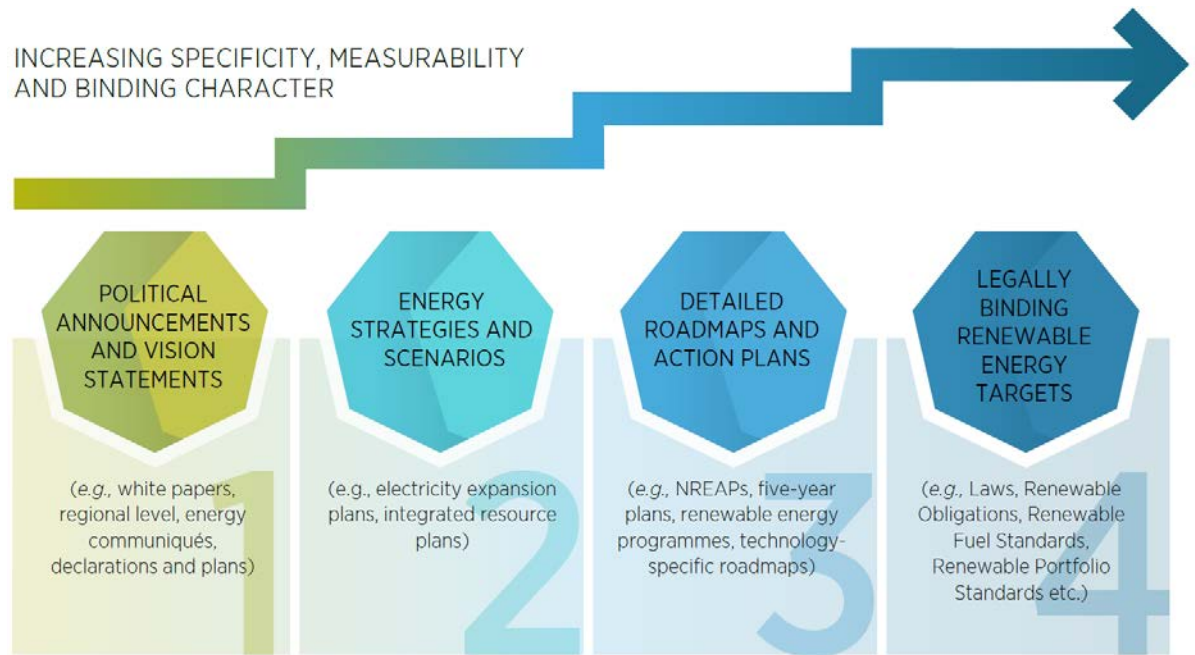
8 March 2017

Targets in the global renewable energy landscape

173 countries have at least one type of renewable energy target – up from **43 in 2005**



INCREASING SPECIFICITY, MEASURABILITY AND BINDING CHARACTER



Note: NREAP: National Renewable Energy Actions Plans.

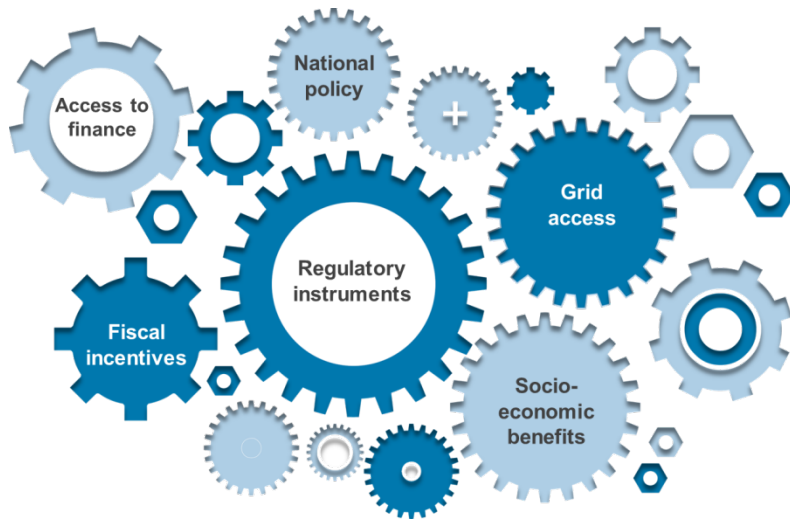
Source: IRENA (2015), Renewable energy target setting.



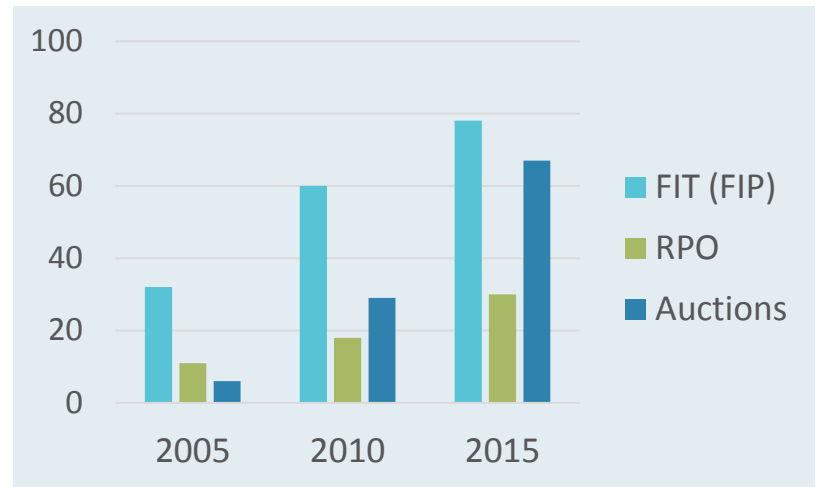
Types of renewable energy policies and measures

NATIONAL POLICY	REGULATORY INSTRUMENTS	FISCAL INCENTIVES	GRID ACCESS	ACCESS TO FINANCE ^a	SOCIO-ECONOMIC BENEFITS ^b
<ul style="list-style-type: none"> ◆ Renewable energy target ◆ Renewable energy law/strategy ◆ Technology-specific law/programme 	<ul style="list-style-type: none"> ◆ Feed-in tariff ◆ Feed-in premium ◆ Auction ◆ Quota ◆ Certificate system ◆ Net metering ◆ Mandate (e.g., blending mandate) ◆ Registry 	<ul style="list-style-type: none"> ◆ VAT/ fuel tax/ income tax exemption ◆ Import/export fiscal benefit ◆ National exemption of local taxes ◆ Carbon tax ◆ Accelerated depreciation ◆ Other fiscal benefits 	<ul style="list-style-type: none"> ◆ Transmission discount/exemption ◆ Priority/dedicated transmission ◆ Grid access ◆ Preferential dispatch ◆ Other grid benefits 	<ul style="list-style-type: none"> ◆ Currency hedging ◆ Dedicated fund ◆ Eligible fund ◆ Guarantees ◆ Pre-investment support ◆ Direct funding 	<ul style="list-style-type: none"> ◆ Renewable energy in rural access/cook stove programmes ◆ Local content requirements ◆ Special environmental regulations ◆ Food and water nexus policy ◆ Social requirements

Trends in renewable energy support policies



Number of countries with renewable energy policies, by type



Implemented auctions and a feed-in tariff simultaneously



Used feed-in tariffs to set price cap for auctions



Used auctions to set feed-in tariffs

FITs Strengths and weaknesses - Keeping pace with rapidly decreasing costs

FITs

Strengths

Limits the risks for investors also in emerging technologies

Facilitates the entry of new players in the market

Often funded by consumers and not exposed to public budget cuts

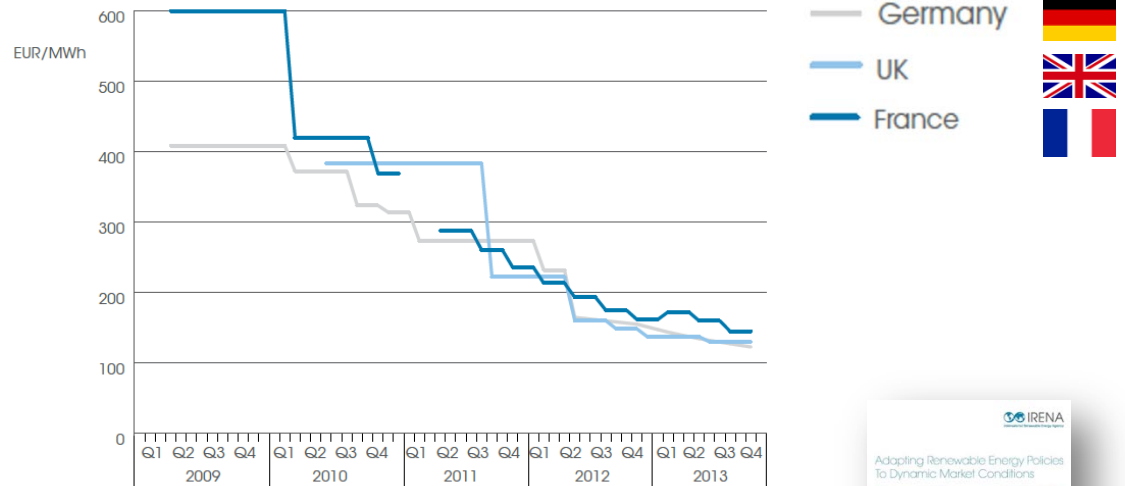
Long term security drives technological development

Weaknesses

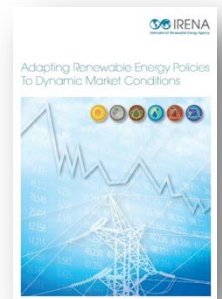
Costly with high deployment rates and Generation is not exposed to electricity market prices

Tariff setting and tariff adjustment process is challenging and complex

PV FIT degradation mechanism in Germany, the U.K. and France



Source: IRENA (2014), *Adapting renewable energy policies to dynamic market conditions*



Auctions Strengths and weaknesses - Keeping pace with rapidly decreasing costs

Auctions

Strengths

Flexibility in the design according to conditions and objectives

Permit real price discovery

Provide greater certainty regarding prices and quantities

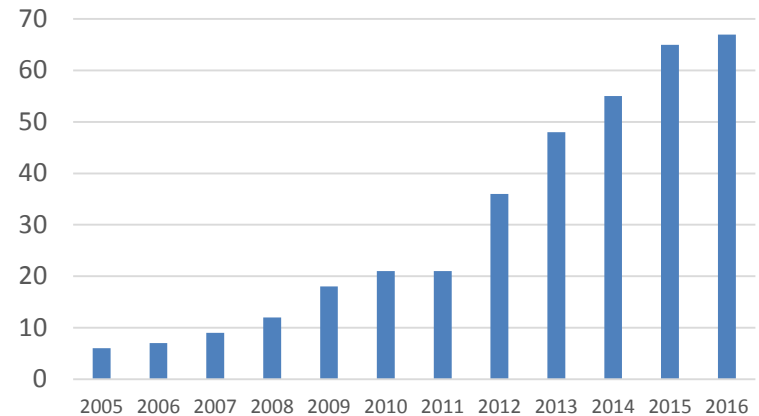
Enable commitments and transparency

Weaknesses

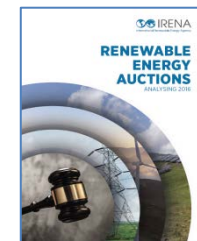
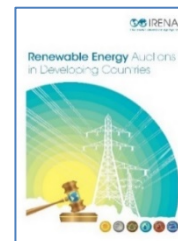
Are associated with relatively high transaction costs for both developer and auctioneer

Risk of underbidding and delays

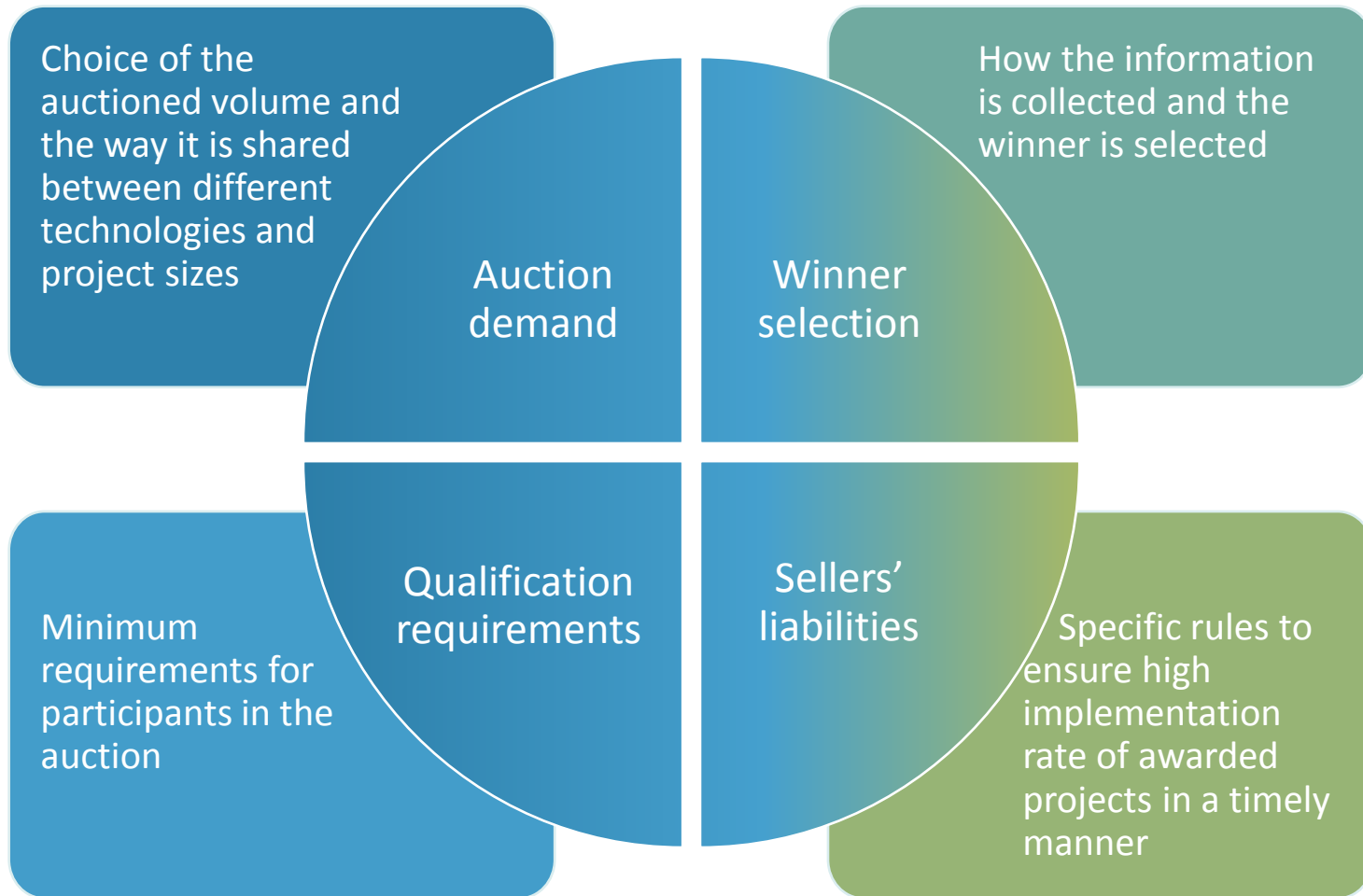
Number of countries that have adopted auctions



Based on REN21 Global Status Report (2005 to 2016)



Auction design elements



1- Auction Demand

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

Auction demand

Specific demand bands

Related to the partitioning of renewable energy demand based on different criteria (technology, size, location, *etc.*):

- » Exclusive demand bands
- » Competitive demand bands
- » Partially competitive demand bands

Periodicity and commitments

- » Standalone auctions – used to achieve economies of scale, mainly in smaller countries with less mature technologies
- » Systematic auctions – may attract a larger number of bidders, leading to gradual renewable energy penetration

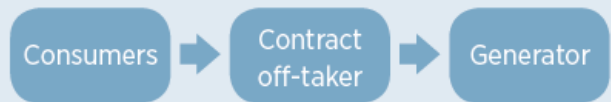
Volume auctioned

Key input in the auction process, consistent with the renewable energy policies and electricity system's technical capabilities:

- » Fixed auctioned volume
- » Price-sensitive demand
- » Multi-criteria volume setting

Demand-side responsibilities

- » Allocation of costs
- » Contract off-taker
- » Contracting schemes



2- Qualification requirements

Minimum requirements for participants in the auction

Qualification requirements

Reputation requirements

Usually based on the following information regarding the bidding company itself:

- » Legal requirements
- » Proof of financial health
- » Agreements and partnerships
- » Past experience requirements

Socio-economic development instrument

Maximising the socio-economic benefit through:

- » Empowerment and employment requirements mainly focused on the local community
- » Local content requirements - aimed to promote the local industry

Technological requirements

Supply-side constraints:

- » Renewable energy generation source
- » Equipment specifications
- » Project size constraints

Production site selection

The following aspects must be defined

- » Site selection responsibility
- » Location constraints
- » Site documentation requirements

Securing grid access

Defines how the physical access to the electric grid will be ensured

3- Winner Selection

How the information is collected and the winner is selected

Winner selection

Bidding procedure

Collecting supply side information:

- » Sealed bid process - all bid info is directly provided to the auctioneer
- » Iterative process including descending clock auction - bid info is disclosed gradually during the auction
- » Hybrid process

Requirements of minimal competition

- » Maximum awarded capacity constraint - prevents a single player from becoming dominant in the auction
- » Ceiling price mechanisms - “anti-monopoly” mechanism, preventing dominant players from bidding high
- » Other mechanisms

Winner selection criteria

- » Minimum-price auctions
- » Adjusted minimum-price auctions - using a “correction factor”
- » Multi-criteria auctions

Clearing mechanisms and marginal bids

Clearing the auction's supply and demand through flexible demand schemes, price-quantity bidding or ex-post adjustments

Payment to the winner

- » Pay-as-bid pricing - most common implementation, despite the dependence of one's bid on its remuneration
- » Marginal pricing schemes - encourage disclosure of real project development costs
- » Nonstandard pricing schemes

4- Sellers' liabilities

Sellers' liabilities

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

Commitment contract signing

The choice of requiring bid bonds or not

Contract schedule

- » Lead time - lag for plant construction
- » Contract duration - commitment length
- » Post - contract provisions - plant's ownership at the contract's end

Remuneration and financial risks

Aims to avoid financial risks (usually inflation) that might affect the remuneration:

- » Straightforward escalation
- » Hybrid contract indexation
- » Variable remuneration profile

Nature of quantity liabilities

Defines the nature of commitment assumed by the project developer, which is directly related to the allocation of risk: capacity-, energy- or financial oriented agreements

Settlement rules and underperformance penalties

Critical obligations with an effect on the plant's remuneration, addressed as:

- » Temporal aggregation clauses
- » Over- and underperformance penalties
- » Revisions of contracted quantity

Delay and underbuilding penalties

Critical rules for a high implementation rate of the awarded projects:

- » Completion bon
- » Delay specific penalties
- » Contract resolution clauses

Liabilities for transmission delays

The liabilities can be assigned to the project developer or to another agent (TSO, the central planning agency, etc.)

Key considerations in designing and implementing auctions

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 socio-economic development 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

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

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

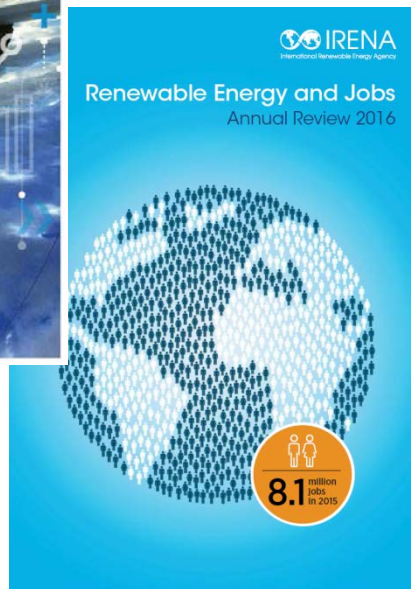
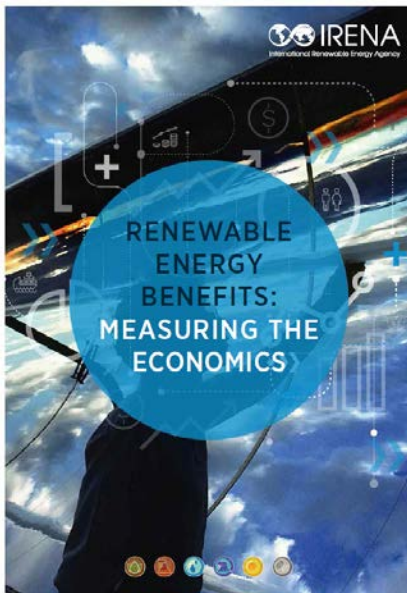


- Ensure feasibility of integrating renewable electricity into the grid
- Avoid delays due to grid expansion

Ensuring global and local goals

Socio-economic impacts

- Qualification requirements
- Multi criteria selection



- In 2015, the global renewable energy sector employed 9.4 million people
- Doubling the share of renewables in the energy mix by 2030 would:
 - increase global GDP by up to 1.1 per cent
 - improve welfare by up to 3.7 per cent and
 - support over 24 million jobs in the renewable energy sector

Key messages

Policy makers may want to consider the following:

- ◆ Different policy options are not mutually exclusive and each type can be used to address different technologies, capacities, markets and objectives.
- ◆ Auctions play an important role in the new generation of policies and they have become increasingly sophisticated in their design
 - Account for the trade-offs between different design elements
 - Tailor the design of auctions to the specific context and objectives
- ◆ Mobilising the scale of investment necessary requires an environment that is built on an enabling policy and regulatory framework that can catalyse private investments into the energy sector



IRENA

International Renewable Energy Agency

Thank you!