

Analysis of key factors for successful auction programs: experiences outside of Europe

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Head of Business Development Middle East



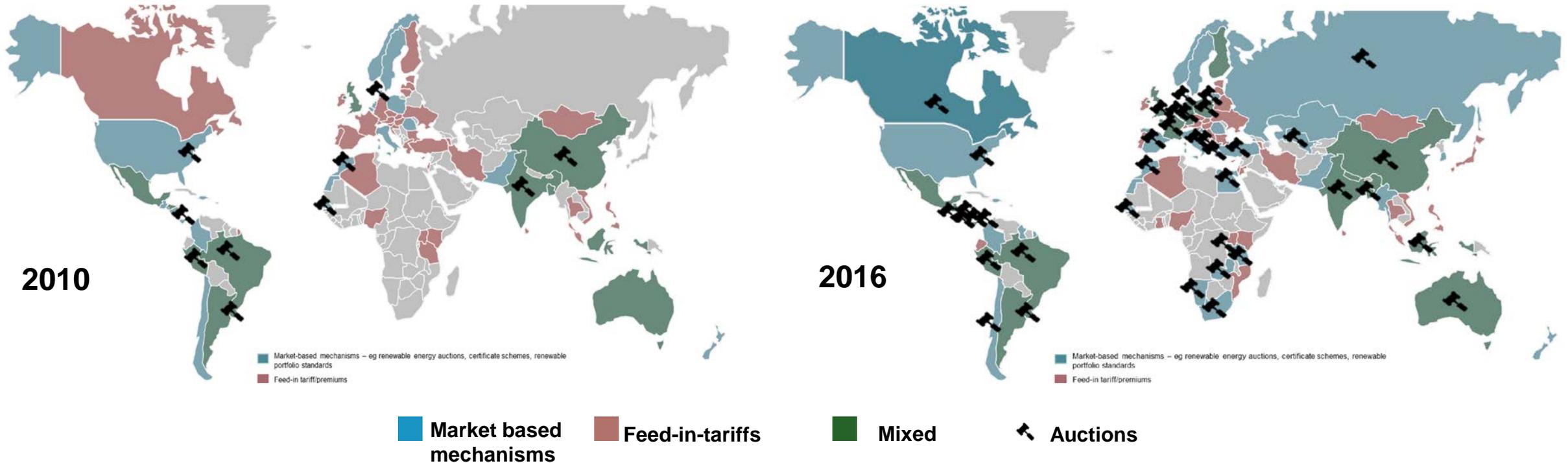
Agenda



- ✓ RES Market overview
- ✓ A typical Tender process
- ✓ Main characteristics of a Tender:
 - Project selection
 - Financing
 - Awarding mechanism
- ✓ Tender agreements

RES Market overview

From tariffs to competitive mechanisms



**Feed in tariffs have initially boosted a critical mass of RES investments.
Due to the recent success of competitive market-based mechanisms, RES costs have dropped.
The bulk of subsidy programs is expected to cease to operate from 2020**

RES Market overview

Feed In Tariffs vs. Auctions



Advantages

Disadvantages

Feed in Tariffs

e.g.:

- ✓ Italy (till 2012)
- ✓ Germany
- ✓ Greece

- ✓ Attractive even for **low-risk investors**
- ✓ Impressive **capacity boost** generated by this solution
- ✓ Simple structure, applicable to mass market technologies: E.g. **decentralize energy**

- ✓ **No meritocratic approach**
- ✓ **Wrong tariff setting** can lead to RES under- or over-development vs. target
- ✓ **Limited adaptability**: in case of technology rapid evolution, many changes required
- ✓ In case of large premium offered, **high system cost**

PPA through Auctions

e.g.:

- ✓ Brazil
- ✓ South Africa
- ✓ Mexico

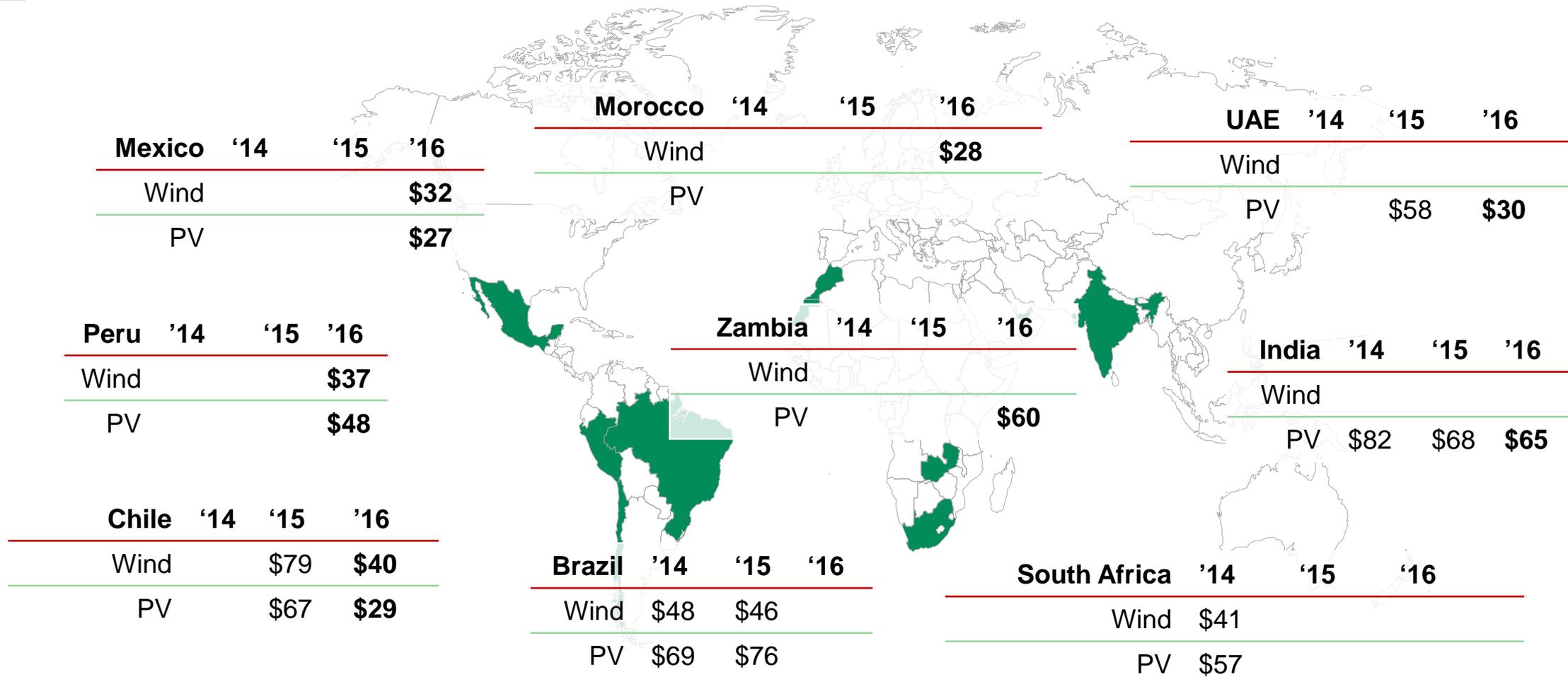
- ✓ Effective use of **budget**
- ✓ **Specific capacity targets** can be set in short span of time
- ✓ **Meritocratic mechanism** with cheapest and higher quality projects selected
- ✓ **Learning effect** over time for both parties

- ✓ **Risk of not prequalified players** to under-bid disrupting competition
- ✓ Remuneration value strongly linked to **competition level**
- ✓ **Not pre-defined** when a player decides to enter
- ✓ **Not** adequate for **small size** projects

Two different approaches to develop renewables were selected globally with substantial different effects on the national energy systems

RES Market overview

Tenders are spreading worldwide



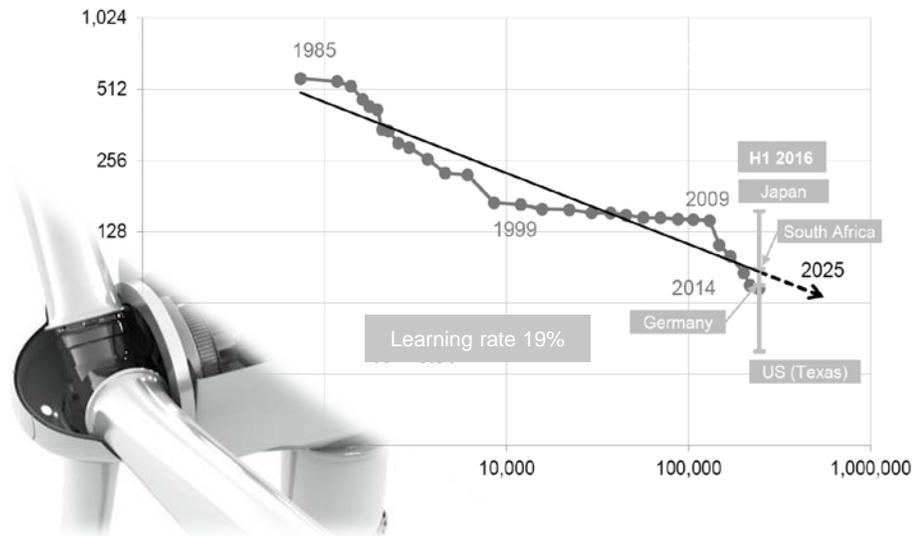
Prices are bottoming because of increasing competition

RES Market overview

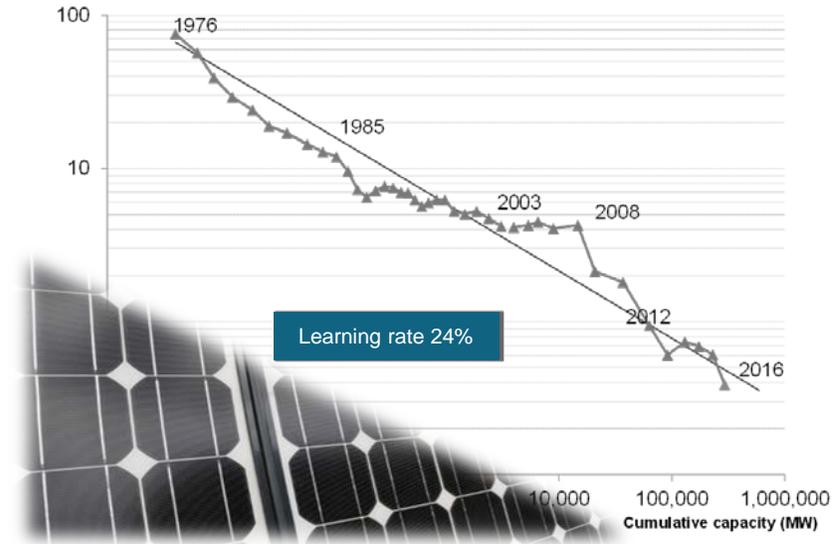
Technology costs



Wind



Solar



Technology improvements and competition are pushing down module and turbine costs



Renewables from alternative to mainstream generation sources

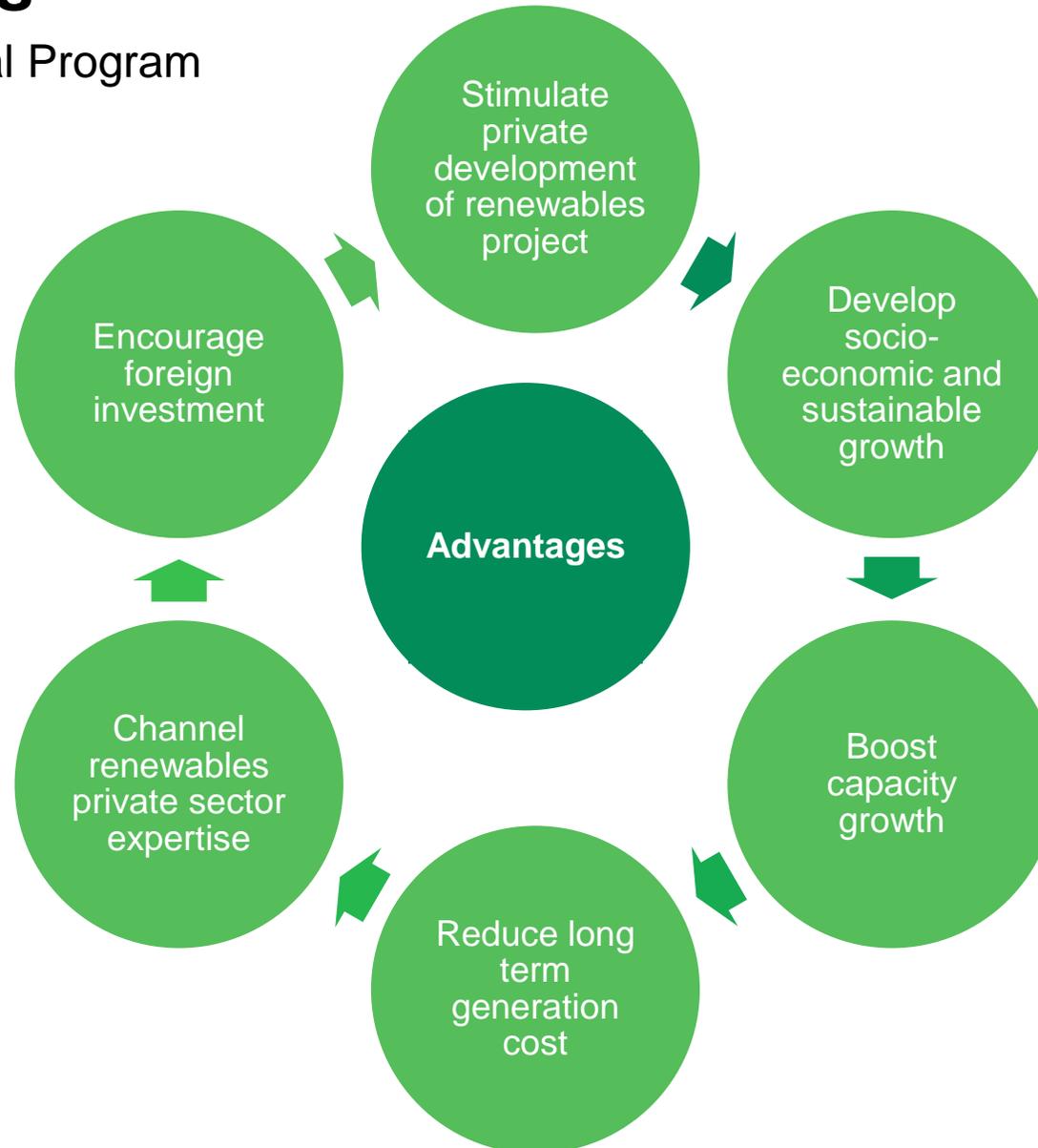
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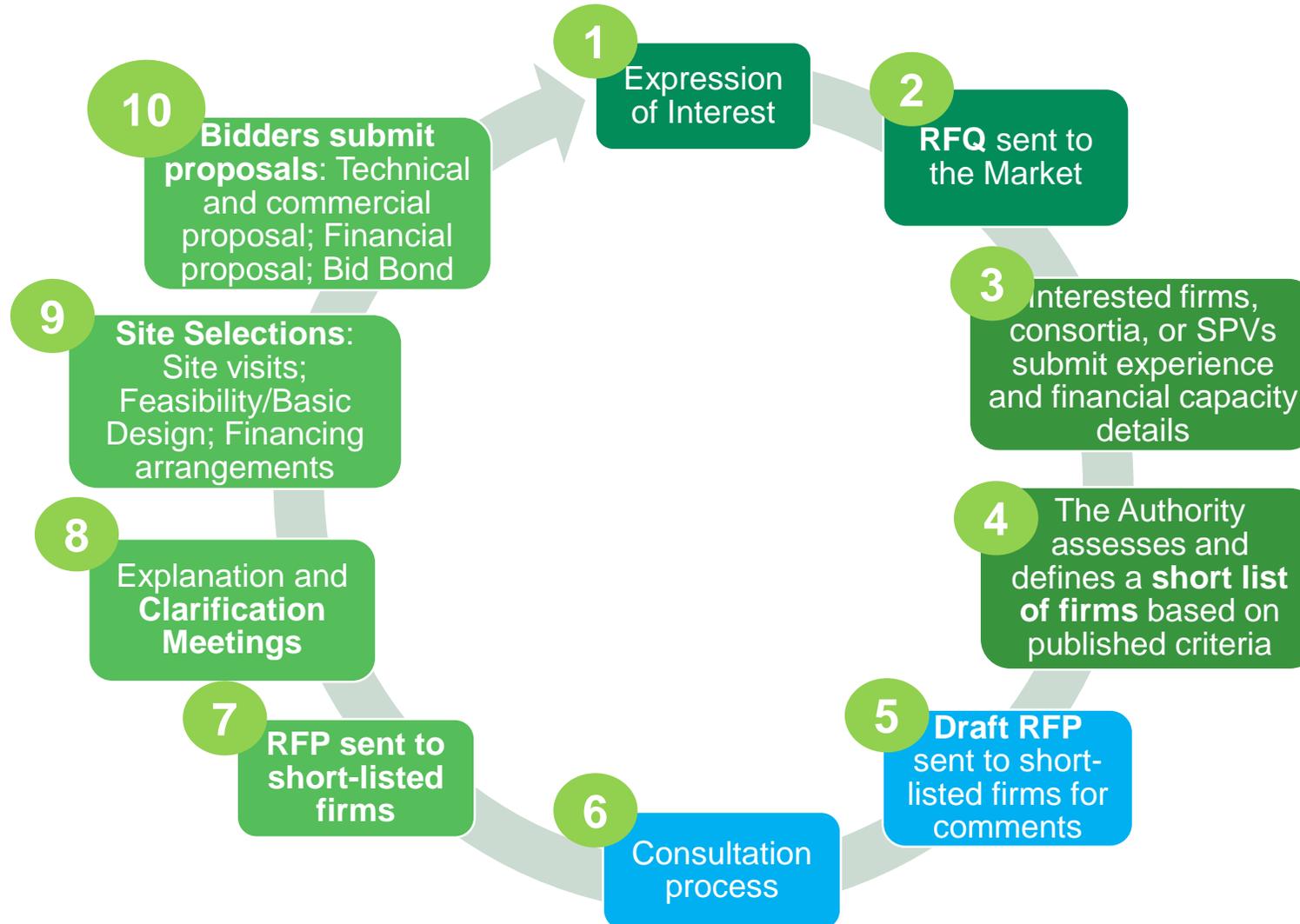
Tender process

Long term Governmental Program



Tender process

From Expression of Interest to Bid Submission



Tender process

Technical, commercial and financial proposal

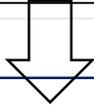


Proposals assessment

Technical and
commercial Part

+

Financial Part



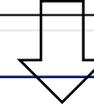
- Bidders submit **Technical Proposals**, showing main technical aspects of the project;
- Bidders provide :
- **commercial information** on the projects, **information on financial ability** to realize the project;
 - Bidders declare **local content** of proposal
 - Proposals assessed using **minimum “technical evaluation criteria** (suppliers track record, local content, technical design aligned with RFP requirements etc.)”
 - **Technical scoring** contributes to final Bidders ranking.

Proposals assessment

Technical and
commercial Part

+

Financial Part



Financial Criteria can be very simple:

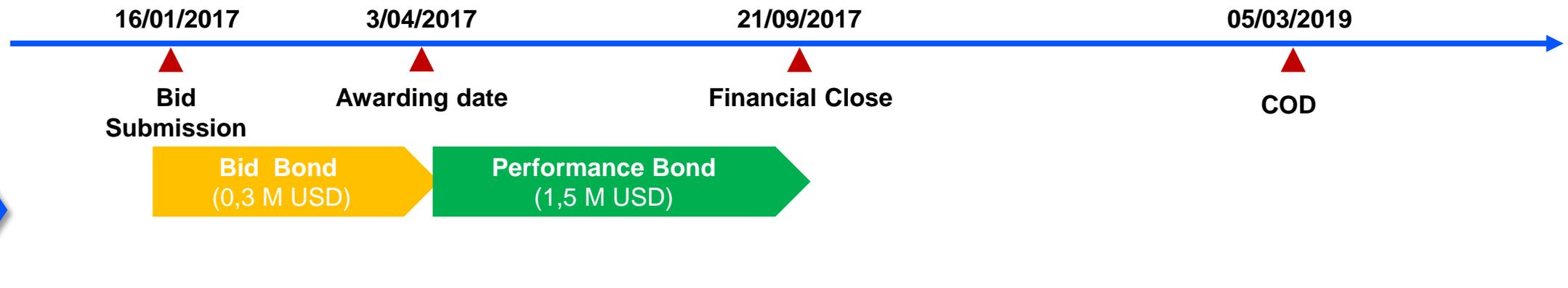
- Bidder proposing for **lowest tariff**
- Bidder to explain the **main assumptions** behind the proposed tariff and relevant economic impact

Bidders exposure after Bid Submission

Ethiopia – Metehara 100 MW PV Tender



| Guarantee | Set-up day | Amount | Duration |
|------------------|----------------|----------|---------------------------------------|
| Bid bond | Bid Submission | 0,3 MUSD | 12 months |
| Performance Bond | Awarding date | 1,5 MUSD | From awarding date to Financial Close |



* Text taken from the first draft of the Form of Bid Proposal Security, included in the RfP.



Bidders exposure after Bid Submission

Zambia – Scaling Solar Tender 2x50MW r1

| Guarantee | Set-up day | Amount | Duration |
|-------------------------|-------------------------------------|---------------------------------------|---|
| Bid bond per 2 projects | Bid Submission | 1,3 MUSD | 6 months |
| Decommissioning Bond | one year before the PPA termination | 4,4MUSD (100 kUSD/MWp) | 2 years: from 1y prior to the expiry of PPA to 1y after the expiry of PPA |
| Performance Bond | PPA | 15 MUSD | 26 years: from PPA effective date to 210 days after COD |
| Credit Support Letter | NTP | Amount equal to the Investor's Equity | ~ 1 year: from signing of SHA to COD |



Bidders exposure after Bid Submission

Kingdom of Saudi Arabia – AlJouf and Rafha PV Tender



| Guarantee | Set-up day | Amount | Duration | Case of Bond withdrawn |
|----------------------|----------------|----------|---|---|
| Bid Bond | Bid Submission | 5.3 MUSD | 9 months + 21 days (to be replaced by Development Security at PPA signature) | a) Bidder withdraws its Proposal during the Validity Period; b) Bidder is awarded and: <ul style="list-style-type: none"> • fails to enter into any or all of the Project Agreements or fails to execute them; • breaches its obligations under the PDA; • does not provide the Development Security. |
| Development Security | PPA | 12 MUSD | Until COD | - the Project Company fails to satisfy all Conditions Precedent to the Closing Date within the Scheduled Closing Date (i.e. 90 days from the PPA Effective Date); - the Project Company fails to pay any LDs payable pursuant to the terms of the PPA; - the Project Company does not comply with the insurance obligations under the PPA; - the Project Company fails to extend the duration of the Development Security upon a notice from SEC within 14 days from the notice or 30 days prior to the expiration of the Bond, in case of delay in the scheduled COD. |



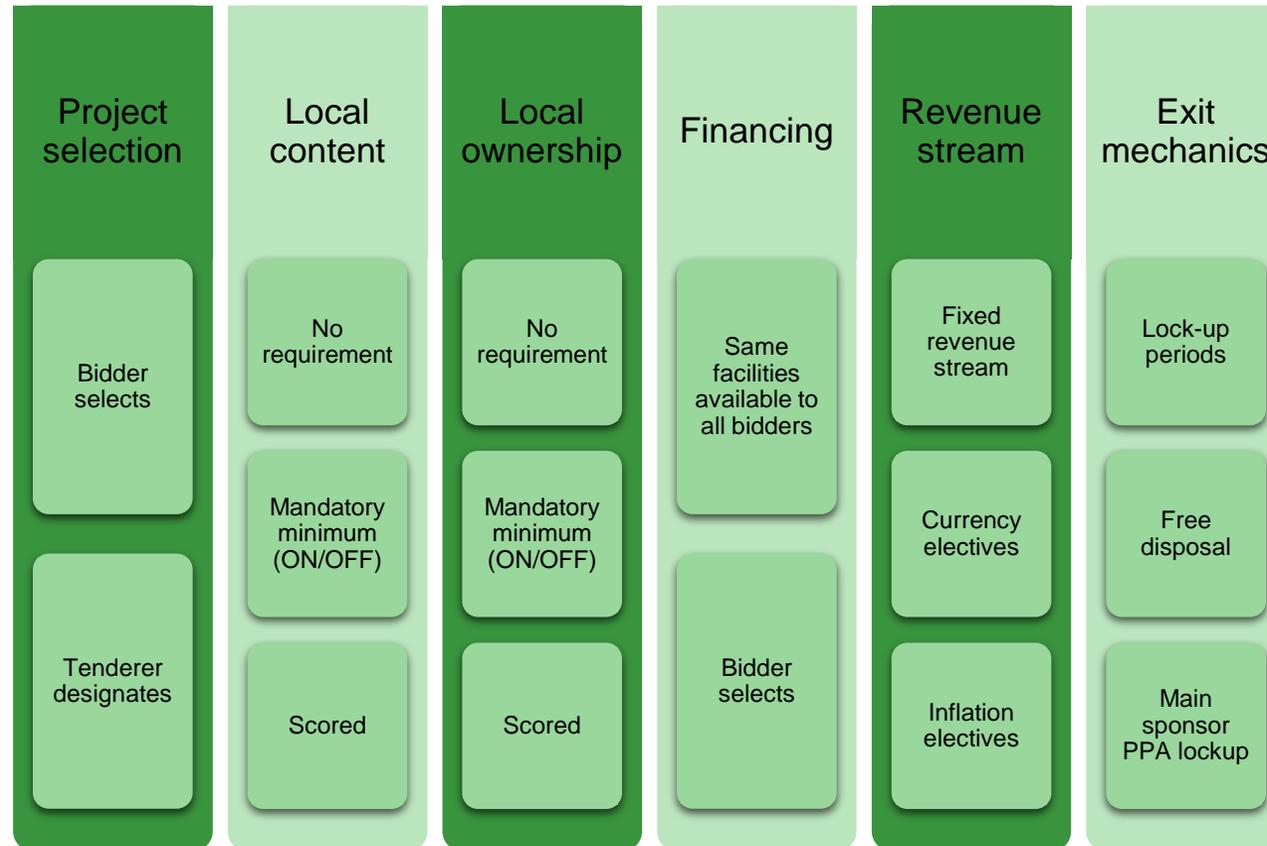
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Main characteristics of a Tender

Auction types



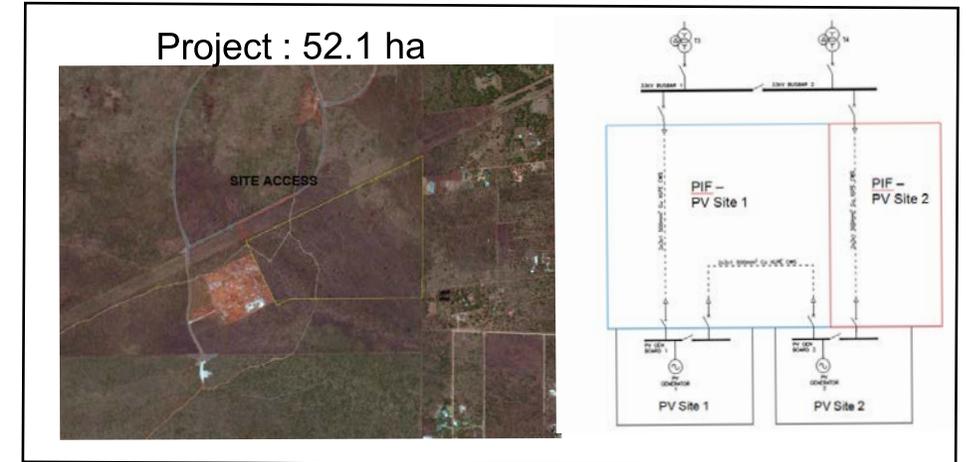
Project Selection

Preselected site and connection

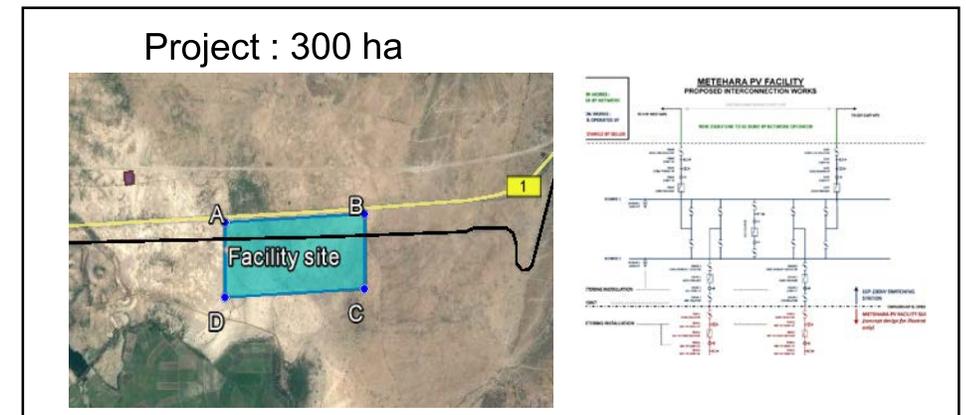
- **Site specific information are provided to the Bidders by the authority in the RFP:**
 - boundary coordinates of the site area including CAD files;
 - grid connection solution including details on connection works, costs and responsible party;
 - geotechnical, hydrological and topographical reports;
 - site specific road map of permits, including timeline and responsible party;
 - resource measurement data (at least 12 months for wind plant).
- **Bidders are allowed to perform site visit**
- **Bid Submission is usually 3-4 months after RFP issuing**



Zambia: Scaling Solar r1



Ethiopia: Metehara PV Tender



Project Selection

Site and connection to be selected by Bidders



South Africa: Tom Burke PV Plant

- **Bidders are required to develop their own projects:**
 - define the site boundaries;
 - obtain land permits;
 - find grid connection solution including details on connection works, costs and responsible party;
 - obtain all required permits for bid submission (as for RFP requirements) and for PV Plant construction;
 - perform at least 12 months of measurement campaign (for wind projects);
- **RFP or a Renewable Governmental Program is published at least 12 months before Bid Submission.**



Financing

Different options



Same facilities available for all the Bidders (Zambian case)

Bank Termsheet included in RFP

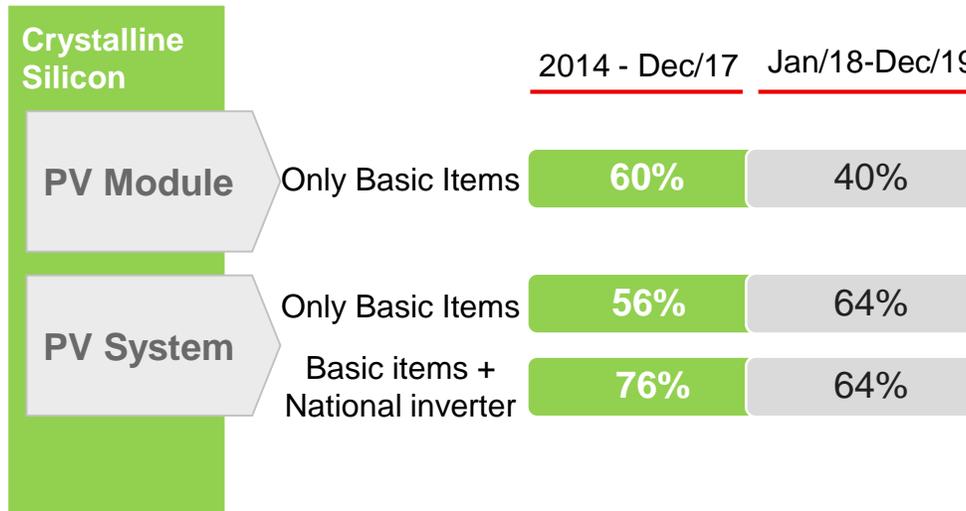


INDICATIVE TERMS AND CONDITIONS

This Term Sheet is a summary of the principal terms that would apply to an IFC investment in the Projects that may be offered to each Winning Bidder and only where the Operating Period Energy Charge of that Winning Bidder is less than US\$16/RWh and that Winning Bidder has executed a mandate letter with IFC within 2 weeks of signing the Shareholders Agreement ("SHA"). It is intended to serve as a basis for discussion only. All figures, terms and conditions are subject to change and there will be additional terms (including covenants, representations and warranties and other provisions) contained in the formal legal agreements should a mutually satisfactory arrangement be concluded. Unless otherwise stated, all defined terms have the same meaning as in the Request for Prequalification ("RFQ"), Request for Proposal ("RFP"), Power Purchase Agreement ("PPA"), Government Support Agreement ("GSA") and the SHA.

This Term Sheet is only for review by Prequalified Bidders and only for their consideration of the financing described herein and shall not be reproduced or used, in whole or in part, for any purpose whatsoever without the prior consent of IFC.

The National Bank offers financing for RES projects at very attractive conditions, no comparable with other sources of financing. The level of financing that can be obtained depends on the % of LC (Brazilian case)



Financing solution to be selected by each Bidder (South African case)

Bank scouting by each Bidder in order to find optimal solutions.

| | | |
|-----|------------------------------------|---|
| ZAR | Short term debt (commercial banks) | <ul style="list-style-type: none"> Leverage Tenor Interest rate DSCR |
| | Medium term (DFIs) | <ul style="list-style-type: none"> Leverage: Tenor Interest rate DSCR |
| USD | Long term | <ul style="list-style-type: none"> Leverage: Tenor Interest rate DSCR |

Awarding mechanism

Ethiopia Metehara PV Tender



5 Stages evaluation process

- Evaluation of Responsiveness**
(documentation completeness and compliance with min technical and commercial info required like COD, project layout, contracted capacity, generation forecast, availability)

Responsive **Bid Proposals**¹ shall be assessed on a total score of 100 marks

- Evaluation of Technical and Commercial Proposal**

- Evaluation of Financial Responsiveness**
(compliance with min financial info required like financial model, price, cost data, USD denomination)

- Evaluation of Financial Proposal**

- Successful Bidder selection**

| Score (Max = 100) | Criteria |
|-------------------------|---|
| 70 | Price |
| 30⁽²⁾ | 10 Technical Capability and Bidder's Experience |
| | 5 Track Record of Module |
| | 5 Track Record of Inverter |
| | 5 Local Content in CAPEX (mandatory minimum threshold: 15% (0 points), max score (5 points) if >35%) |
| | 5 Local Ownership (max score (5 points) if >10%) |

- The **Bid Proposal is valid for 365 days** from the Bid Submission Date
- 21 points is the threshold** to be a Technical Qualifying Bidder and qualify for the third stage of the evaluation process

Awarding mechanism

Saudi Arabia AlJouf and Rafha PV Tender



A-Tariff Evaluation-Primary Ranking Criteria

$$\text{Levelized Electricity Cost (SAR/MWh)} = \frac{\text{NPV}_p \text{ [NPV of Total Payments (Al Jouf + Rafha) for net electricity of SEC to Company (SAR)]}}{\text{NPV}_E \text{ [NPV of net electricity assumed to be delivered (Al Jouf + Rafha) (MWh)]}}$$

B-Secondary Evaluation Criteria (No Scoring mechanism is defined for this criteria)

- Saudization: Saudi Arabian content of goods and services used in the construction and O&M. The developer will be liable for the custom duties and no 'increased costs' or similar indemnity will be given by SEC if a Project Company fails to obtain a customs duty exemption in respect of equipment/materials that can be sourced in Saudi Arabia; participation of Saudi Arabian nationals in O&M; and long term training plan for KSA nationals
- Level of project development (degree of development of project design and engineering, completeness of proposed EPC and O&M arrangements)
- Financial Criteria (timing and amount of equity funding, level of committed facilities, proposed financial structure, terms and conditions of the committed facilities and degree of commitment of financing parties, completeness of term sheet, proportion of energy charge rate not indexed to USD)
- Mark-up of the draft agreements
- Technical Aspects (use of national and international standards, technical performance, local content, environmental impacts, operating characteristics. Adequacy of cost estimate)
- Practicability of project implementation schedule

Awarding mechanism

South Africa Tender: scoring system



Tender score mechanism



| 7 PILLARS | Weight |
|-------------------------------|------------------|
| 1. Job creation | 25% |
| 2. Local content | 25% |
| 3. Ownership | 15% |
| 4. Management control | 5% |
| 5. Preferential procurement | 10% |
| 6. Enterprise development | 5% |
| 7. Socio-economic development | 15% |
| TOTAL | 100% |
| TOTAL POINTS | 30 points |

In RES sector South African government is attempting to address social issue. Local content is pushed by tender rules but it is up to investors to decide where and what

The REIPPP contribution to national objectives

Evidence from the South African government*



- The program has been designed to contribute to **the development of a local green industry and creation of green jobs**
- **A total of ~ 2,13 Bn USD local content spend** has been achieved in IPP programs up till the end of March 2016
- **At least twelve new industrial facilities have been established in the country** in direct response to the renewable energy program
- Since the IPP program started, **a significant increase of South African based product exports can be observed** on the export data as reported by South African revenue services
- Although coming off a low base, **these exports create and sustain valuable jobs as well as to contribute to the country's foreign reserves** – crucial in the current economic climate

* Data includes BW 1, 2, 3, 3.5, 4 and smalls totaling 6376 MW procured. Source: South Africa Energy Department, exchange rate ZAR/US\$ used as of 15 December 2016, 1 ZAR = 0.0708849 USD

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Tender Agreements



| | Signing Parties | Duration | Scope |
|------------------------|---|---|---|
| PPA | <ul style="list-style-type: none"> •Project Company •Buyer | 25y from COD, with possibility of extension | Purchase of power by Buyer from the Project Company based on agreed prices and conditions |
| GSA* | <ul style="list-style-type: none"> •Project Company •Government | The same of PPA | Providing assistance, support and certain concessions to the Project Company including guarantees related to the Seller obligations, with particular reference to the liquidity support balance |
| SHA** | <ul style="list-style-type: none"> •Bidder •Governmental SPV | The same of PPA | Define the terms of conduct and development of the business |
| Lease Agreement | <ul style="list-style-type: none"> •Project Company •Lessor | The same of PPA | Grant access rights and use of the property |

* GSA: Government Support Agreement

**SHA: Shareholders' Agreement

Tender Agreements

Key points for a bankable PPA



- **Energy charge currency:** Energy charge paid in US \$ or in local currency equivalent of the amount payable in US \$ (based on the relevant date of payment as notified by the Central Bank on the day before such payment is made).
- **Energy charge Indexation:** adjusted annually to US or local CPI.
- **Liquidity Guarantee:** provide a liquidity support mechanism, such as an escrow account or an on-demand guarantee issued by acceptable bank, based on foreign currency, to be used in case of Buyer's insolvency or any other Buyer's event of default.
- **Compensation on termination in case of Buyer's default:** in case of termination for a Buyer's event of default, the Buyer shall provide a termination payment to compensate the Seller's debt, equity and taking into account the expected return on investment. The amount to be valued by a reputable Independent Third-party Evaluator agreed by the Parties.
- **Change in Law and economical contest:** include provisions of price adjustment in the case of law, tax regime or economical contest changing after the date of the effective date of the PPA, adversely affecting the expected return on investment.
- **Expert:** an independent person, with appropriate qualifications and experience, to be nominated either by the parties or by the International Centre for Expertise of the International Chamber of Commerce that in case of disputes.
- **Arbitration:** any dispute (not resolved through an Expert determination) to be solved under rules generally acceptable to the International Community (e.g. UNICATRAL or ICC), the seat or place of arbitration shall be London or Paris or Zurich.

Tender Agreements

Key points for a bankable PPA



PPA:

- **Deemed energy payment:** payments of deemed energy to be guaranteed whatsoever in case of COD delays due to the Buyer, Curtailment and post COD Grid Unavailability (both planned and forced).
- **Force Majeure:** to excuse the Seller from performing its obligations if a Force Majeure Event (an event beyond the reasonable control of such Party) prevents such performance.
- **Term:** the duration of the PPA shall be 25 years, extendible.

Tender Agreements

Key points for Government Support Agreement



- **Liquidity Guarantee:** Government to ensure the liquidity support mechanism by topping up the escrow account or the on-demand guarantee, in case of Buyer's default;
- **Coverage for Buyer's default:** Government to ensure, in case of Buyer's default, the payment of the Compensation on Termination;
- **Conversion Guarantee:** Government to procure the free transfer of funds (whether within the Country or cross border) of local currency or US Dollars and permit the conversion of local currency into US Dollars on market terms and make US Dollars available for conversion upon request;
- **Development rights and support:** Government to ensure the right to develop the project and benefit of land rights and facilitate the liaison with Government Related Parties;
- **Seller costs:** In case the PPA Effective Date is not met due to Buyer breach, the Seller Costs shall be reimbursed by the Government.

Tender Agreements

Key points for Shareholders' Agreement



- **Governance:** SPV Board of Directors to be defined in accordance with law and shares ownership in order to catch benefit coming from all the shareholders’;
- **Dividend distribution policy:** dividends to be distributed according with law and with resolutions of SPV Board of Directors’ decisions on a pro-rata basis;
- **Construction funding:** each Shareholder shall take all actions required in order to ensure that the project is funded through to completion including strategy funding;
- **Governing law:** the Shareholders’ Agreement and any non-contractual obligations arising out of or in connection with it shall be governed by and construed in accordance with international law approved by International Funding Institutions;
- **Shares transferring, Shareholder Reserved Matters and Anticorruption Closes:** to be clearly defined.



Closing Remarks

Auctions

Best practices and lessons learnt



- 1 **Structured pre-qualification** helps to assign remuneration to solid projects and investors
 - Tools to filter out speculators: upfront commitments (bid bond), penalties in case of project delays, constraints on project property before commercial operations
 - Important to predict unfair competitive behaviors (e.g. ways to by-pass pre-qualification criteria)
- 2 **Guarantees on energy offtake** are a critical aspect, in particular for project bankability
 - Long term PPAs (either with regulator or private) a key requirement from financial institutions; energy sales towards spot market without hedging are too volatile for such projects
 - Critical to boost RES PPA market, either via quota obligations or auctions, with capacity targets aligned with available project pipeline
- 3 **Local content constraints** should be set consistent with local ability to provide service
 - High local content target implies buying locally equipment with strong effect on performance
 - Local content requirements can be balanced-off by incentivizing other items of the investors' cost structure (e.g. financing, fiscal)
 - Brazilian National Bank offers favorable financing (low interest rates) if 60% local content is achieved
- 4 **Communication with players** when setting rules and during implementation a success factor
 - So. Africa had frequent consultations when designing auctions, direct channels during auctions

Closing Remarks

1

The dramatic drop in technology costs and efficiency increase is turning renewables from alternative to mainstream generation sources

2

RE prices are bottoming also because of increasing competition

3

A well-planned tender with well-defined capacity installation program over the years in order to make the country attractive to foreign investors - Clear Instructions to bidders and selection criteria based on predefined scoring tables

4

Bankable PPA (including third party guarantee, liquidity guarantee, adequate compensation on termination in case of buyer's default, etc.) is crucial to foster competitiveness

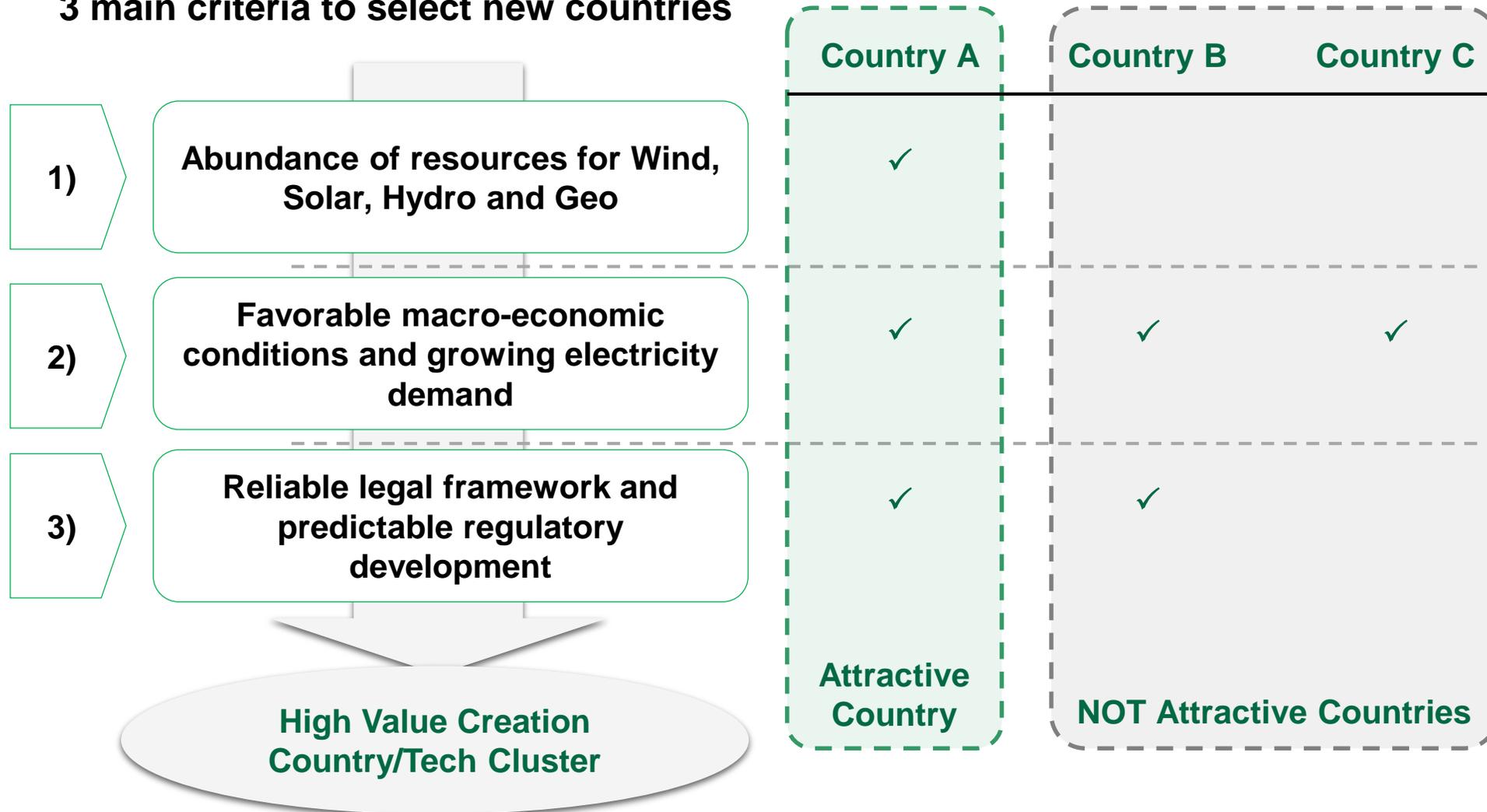


BACK UP

Growth

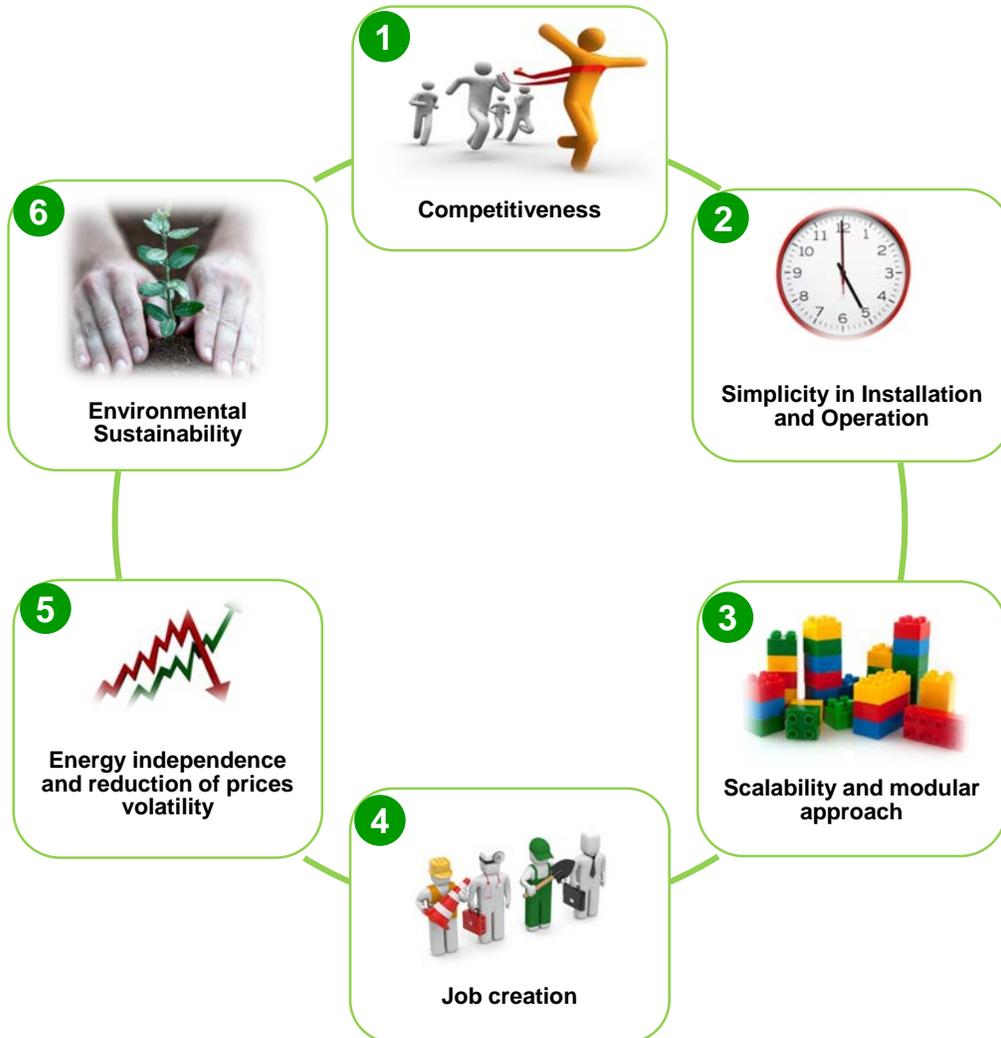
Approach to new markets

3 main criteria to select new countries



RES success factors

Key strenghts



Strengths of Renewable Technologies

- 1) RES technologies are more and more **competitive**. In case of abundant resource they can compete with fossil fuel generation
- 2) RES have a shorter construction time, and offer a **fast and flexible response to growing demand**
- 3) RES are modular and their flexibility allows the **reduction of costs thanks to scale economies**
- 4) Investment in RES can create **new local jobs** from the preliminary phase of studies (when engineers, surveyors and local specialist are requested) to the construction and the maintenance phases
- 5) **RES mitigate the energy dependency and contribute to secure the energy supply**, reducing the exposure of power prices to commodities market fluctuations
- 6) RES are a **environmentally-friendly** option to solve air and water pollution issue and to fight the climate change

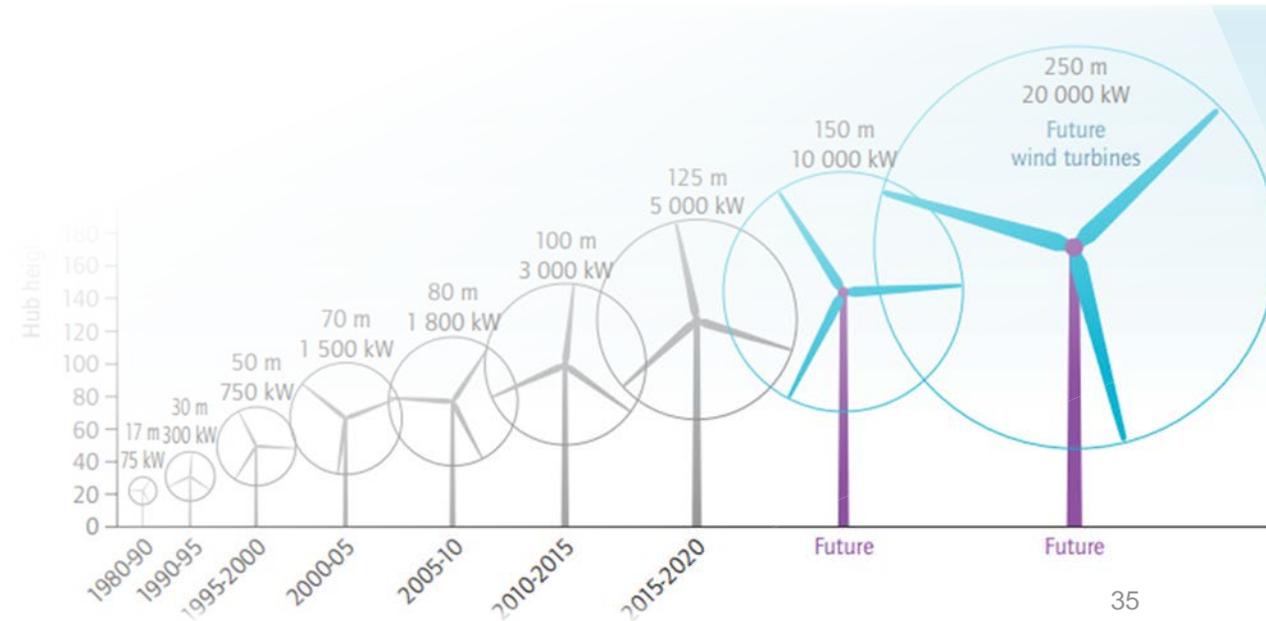
Where does the renewable escalation come from?

The improvement of wind technologies



- **Bigger turbines (more MW/wtg)** in the first phase of the technology evolution **have led to an increase of the capacity factor (more MWh/wtg)** in the second phase
- **Increased efficiency** has contributed to **LCOE decrease**
- Nowadays we are able to **increase the power 3 times in comparison to an “old” wind farm site, reduce the numbers of turbines to 1/8 and to multiply the energy produced by 5 times**

| | 15 years ago | Now | |
|----------------------------|--------------|-------|-------|
| Nominal Power (kW) | 300 | 3000 | 3300 |
| Rotor Diameter (m) | 30 | 125 | 130 |
| Hub height (m) | 30 | 100 | 100 |
| Power Control | Stall | Pitch | Pitch |
| Rotor spin (r.p.m.) | 34 | 9-15 | 7-13 |
| Occupation (MW/km)* | 3.3 | 8.0 | 8.5 |
| WTG Units (WF 50 MW) | 167 | 17 | 15 |
| Grid connection features | no | yes | yes |
| Energy Yield increase (%)* | - | 65% | 64% |



* Production factor increase with respect to an old site of the same capacity

Where does the renewable escalation come from?

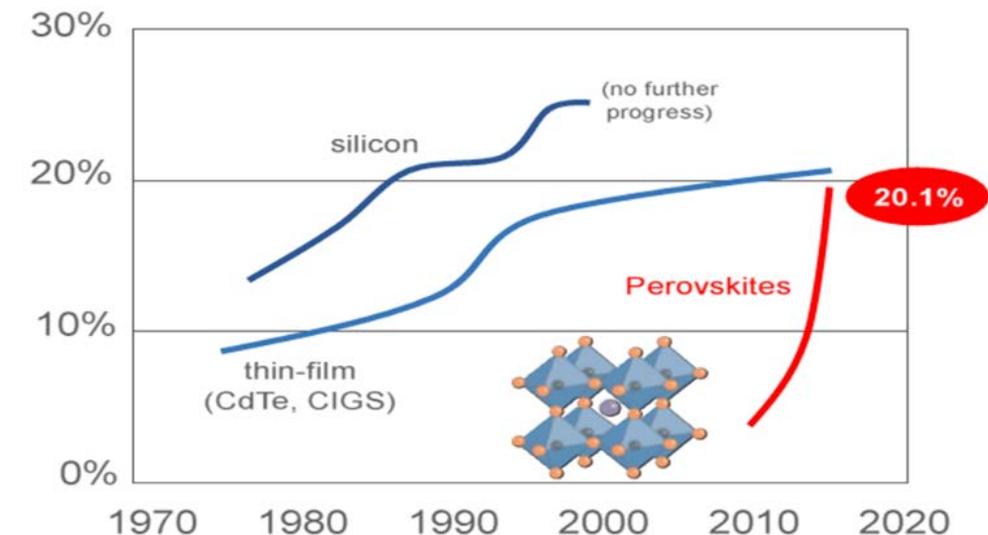
The improvement of solar technologies



- **Modules:** increased efficiency, duration and producibility as key drivers of the technological improvement
- **Inverter:** increased efficiency, maximum power point tracker (MPPT) to make modules work at their best, increased reliability and duration, increased size (from KW to MW) and possibility to offer ancillary services to the grid
- **BOP (balance of plant):** evolution driven by design to cost activities and by the emergence of more reliable materials

| <u>Key factors</u> | <u>2000</u> | <u>2016</u> |
|---|-------------|-------------|
| <u>Average Module Efficiency</u> | 10,4% | 16,0% |
| <u>Average European Inverter Efficiency</u> | 97,6% | 98,6% |
| <u>Average Central Inverter Nominal AC Power kW</u> | 100 | 1200 |
| <u>Module/Inverter DC Voltage V</u> | 600 | 1500 |

Photovoltaic cell efficiency records



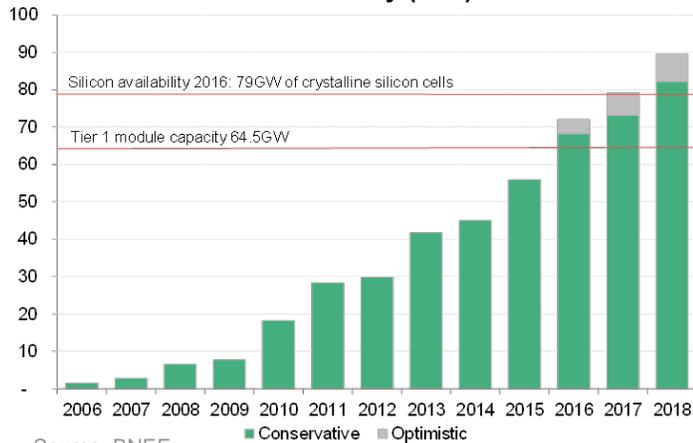
PV technology prices are bottoming

Contingent vs. structural causes



Contingent cause 2016-2018

Global PV new build, 2006-2015 and forecast to 2018, and availability (GW)

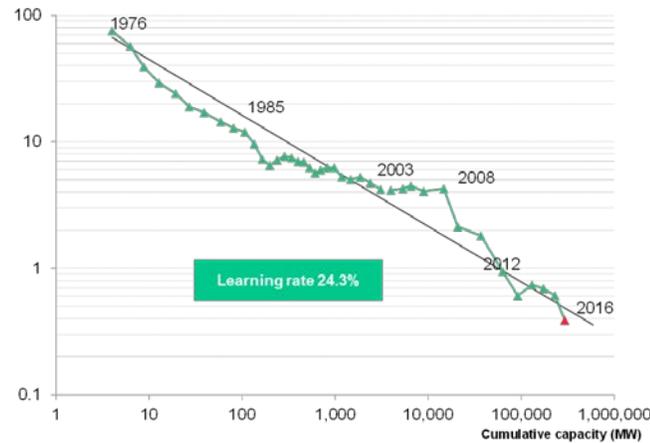


Oversupply along the whole module production value chain (silicon, wafer, cells and modules) **despite the strong market growth** (2016-2018 mainly China and USA).

Silicon cost: 2007 >150\$/kg
2016 = 16 \$/kg

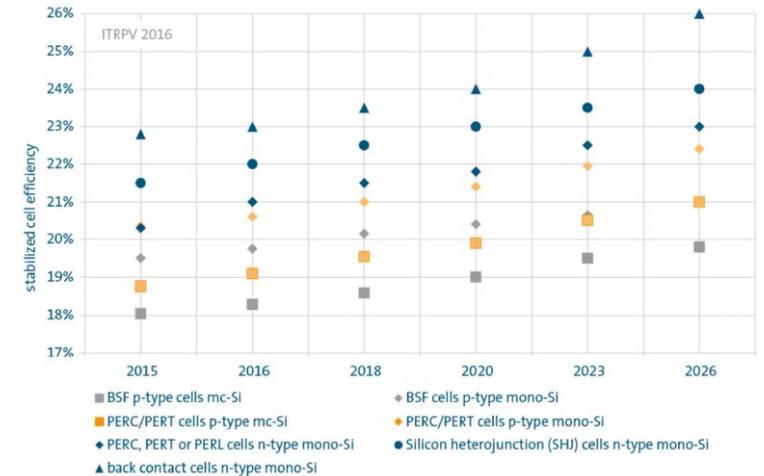
Structural causes

PV learning curve (c-Si and TF)



The industrial production of PV cells, modules and inverter is concentrated in **hub of big dimensions with consequent economies of scale** that can be reached.
Max size big factories:
2000 = 50 MW
2016 = 5.000 MW

PV cells efficiency prediction 2015-2026



Further potential cost reduction driven by:

- **Increased cell efficiency with consequent cost/Wp reduction**
- **Production process optimisation** (Kerf losses reduction and wafer thickness) and > throughput.

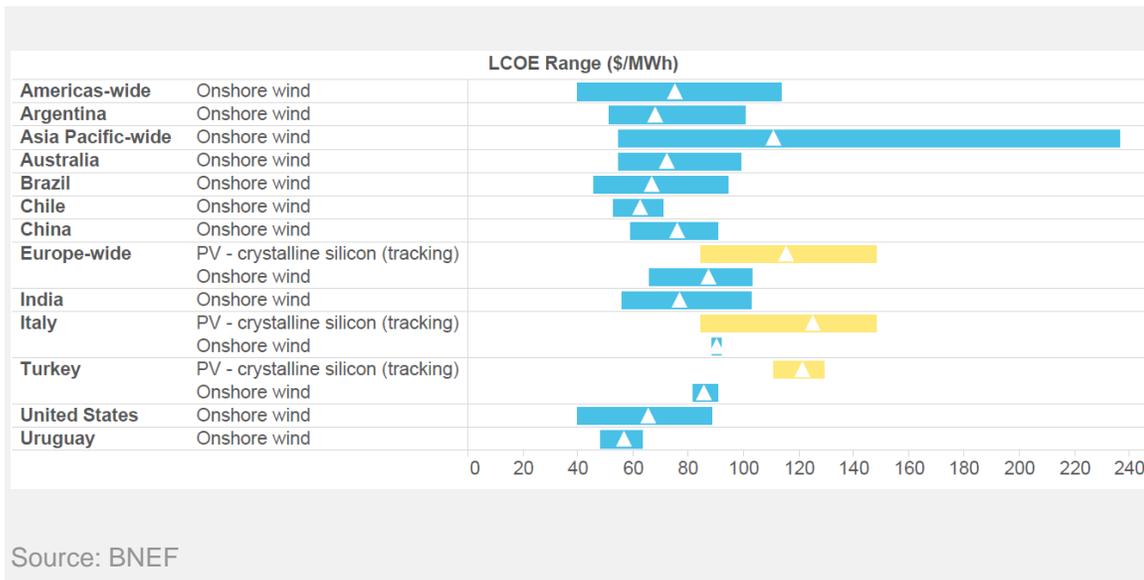
Further robust LCOE reduction foreseen for the next 10 years

The repercussions on the wind sector

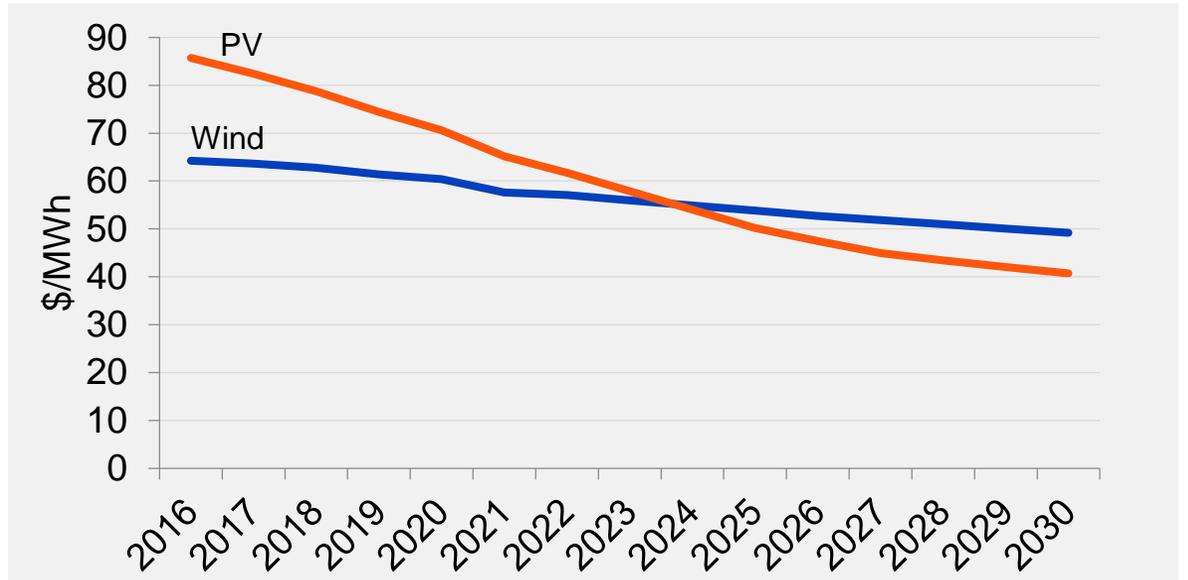
Wind under attack



Levelized cost of electricity – 1H 2016



Trend LCOE PV vs. Wind: the US case



As of now solar is on average less competitive than wind with exceptions for countries particularly abundant in solar resource...

...But solar learning curve is at the moment steeper than the one of wind.

High Pressure on the wind supply chain

11 key factors fundamental for Regulator

To ensure stability and attract investors



Sale of electricity

Guarantee of energy off-take (e.g. PPA) is critical, in particular for project bankability

Guarantee on energy dispatching in congested grids takes out the risk of curtailment

Remuneration

Stability of cash flow is key for investors: instability has a cost that is paid by the system

Mechanism where remuneration premium is based on **target vs. actual RES capacity** or **penalty** requires continuous adjustments and generate volatility

Project risk / discount rate

Stability of regulator's agenda and consistency of energy policy attract investors

Stability of RES strategy and scheme rules is key – smart adaptive mechanisms needed

Long-term targets (with short and medium term action plan) show RES commitment

Pre-defined budget & funding a must to guarantee stable remuneration over proj life-time

Transmission grid requirements need to be defined together with RES strategy

Scheme access

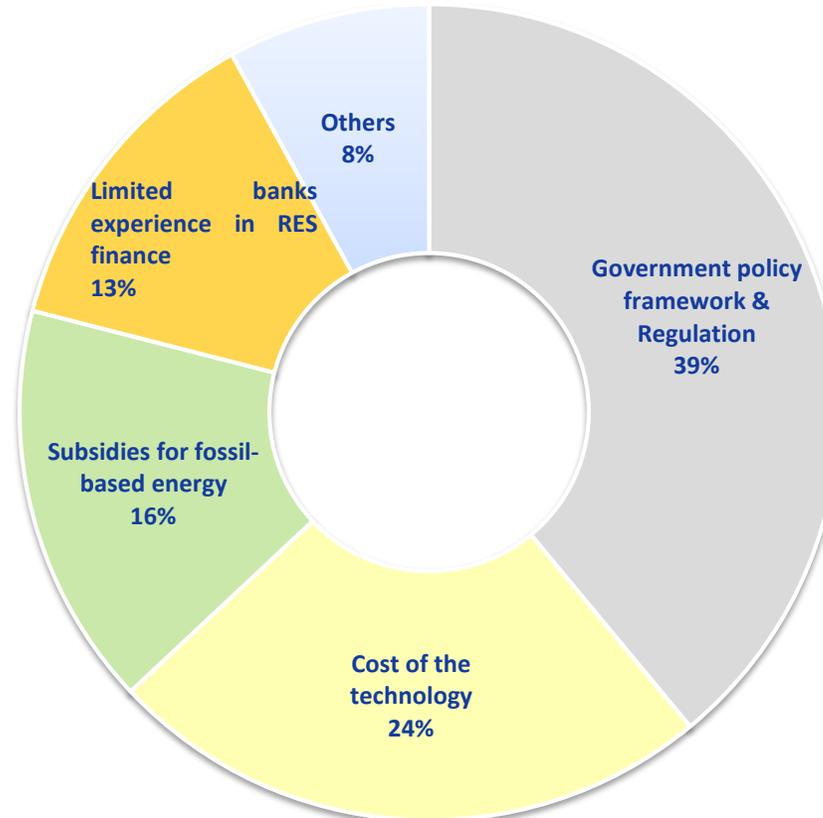
Schemes with **competitive access-to-remuneration** show higher efficiency for system costs

Structured pre-qualification helps to assign remuneration to solid projects and investors

A sound regulatory framework is a booster for RES development

Final Remarks

Main barriers to the deployment



- › **Local Governments can address up to 75% of the key identified barriers**
- › **The renewable industry is continuously reducing Capex and O&M costs accounting for the remaining 24%**
- › **Long term development programs envisaged by the Governments bolters investors trust and confidence**