A Roadmap for Photovoltaic Auctions in Israel

Targets and vision

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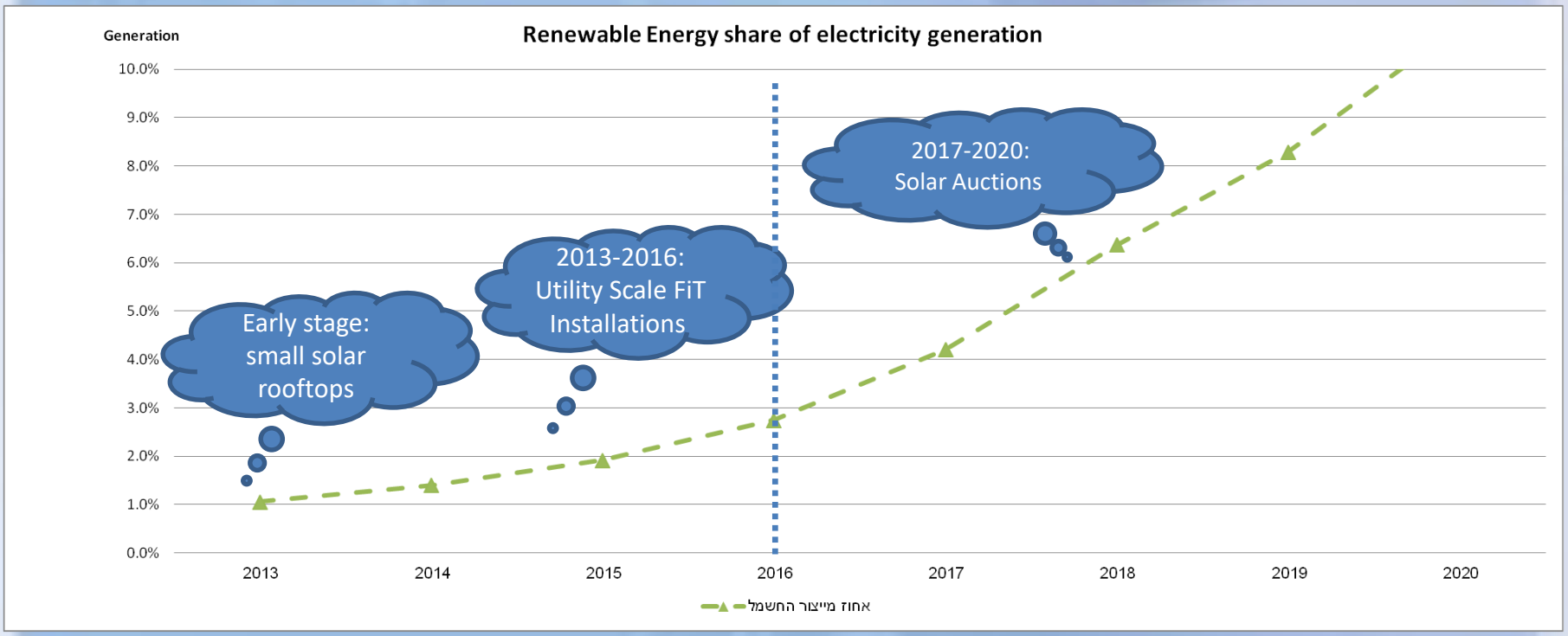
The evolution of Israel's Renewable Energy Scheme…



A total capacity of 3.5 GW is needed in 2020 to reach the target, comparing to ~ 1 GW installed currently

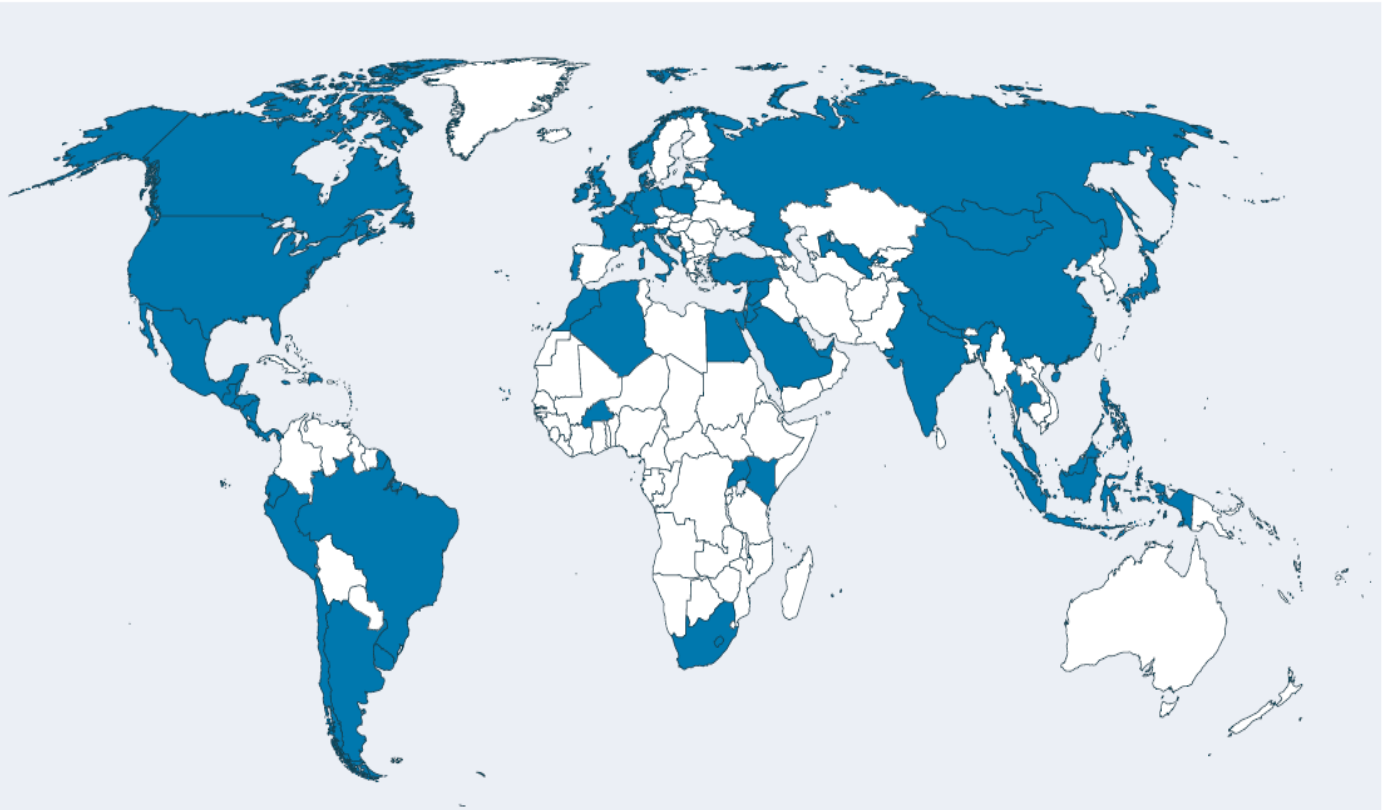
The roadmap for 10% RES by 2020

- **Installations in the existing scheme until 2020:**
  - **Existing: ~1GW** (940 MW PV, 21 MW Wind, 30 MW other)
  - 180 MW of former CSP projects shifted to PV
  - ~350 MW of Wind
  - 400 MW of Net Metering (quota is expected to increase to 700 MW)
  - 240 MW CSP Ashalim
- **The rest of the gap: 2017-2018 PV Auctions (400-850 MW each year)**
  - Four auctions for Utility Scale systems connected to the distribution grid (x<16 MW)
  - Two auctions for Utility Scale systems connected to the transmission grid (x>16 MW)

רשות לשירותים ציבוריים

The world is shifting to auctions (1)

Figure 1.1: Countries that have implemented renewable energy auctions by early 2015 (in blue)



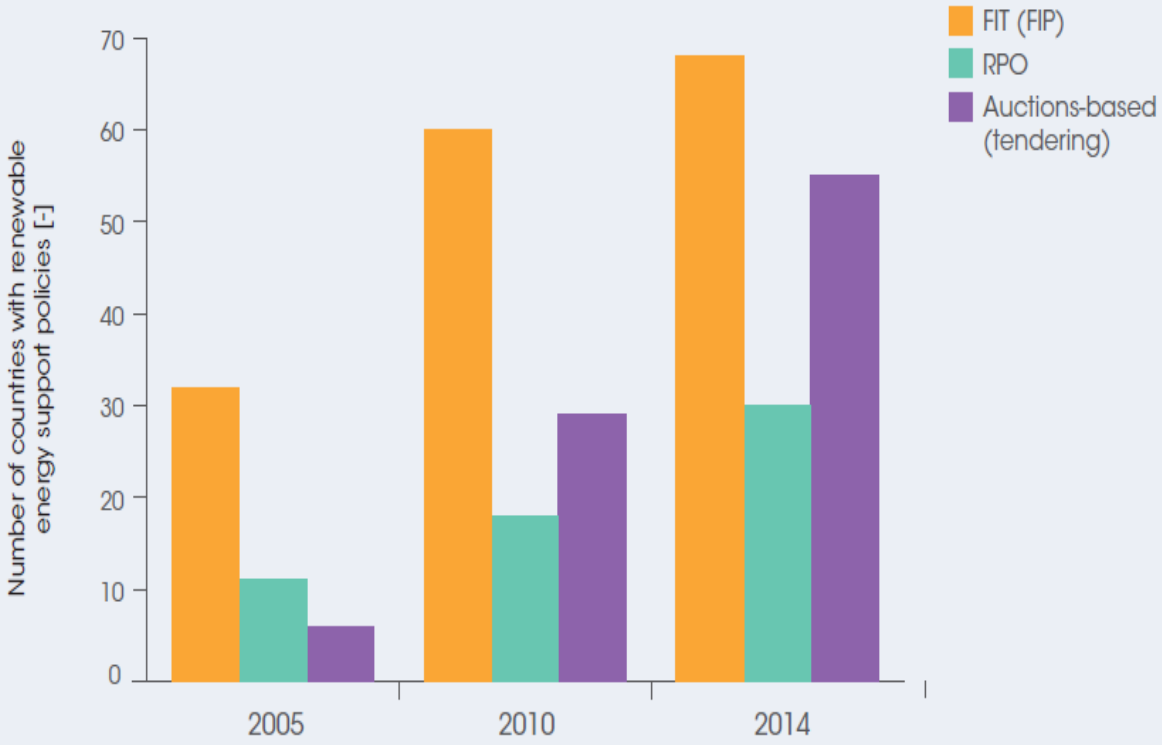
Source: Based on data from REN21, 2015

The designations employed and the presentation of material in this map do not imply the expression of any opinion on the part of IRENA concerning the legal status of any region, country, territory, or area, or concerning the delimitation of frontiers or boundaries.

The world is shifting to auctions (2)

Figure 2.1 indicates the number of countries adopting policies in the three main categories – tariff-based, quantity-based and hybrid – in 2005, 2010 and 2014.

Figure 2.1: Number of countries with renewable energy policies, by type



Source: (REN21, 2014).

PV auctions: minimum regulation

- Not only a shift in the incentive mechanism, but a shift in regulatory perspective:

Command and control: Out

Performance demands and bonds: In

Licensing

Milestones

"Financial Closer" Approval

Permits

Tariff, Quota, Binding Schedule

Proposed principles of PV auctions

- Two auctions (2017-2018) for transmission system connected projects, each auction 100-250 MW
- Four auctions (2017-2018) for distribution system connected projects, each auction 150-300 MW
- An auction bid will include: tariff, quota, and bid-bond (replaced by a performance-bond later - for the auction winners)
  - **No additional requirements are needed to participate in the auction**
  - No specific project is committed by the bidder in the auction

The bidder is committed to deliver PV projects the size of his winning bid – within the binding timetable

Penalties for delays in delivery

- **Delay in quota delivery will result:**
  - A gradual bond forfeiture of the delayed quota over 60 days
  - Over 60 days – the tariff guarantee for the unused quota will be canceled
- In the course of this process we expect to hear frequently the following statement: “I was delayed and it’s not my fault”

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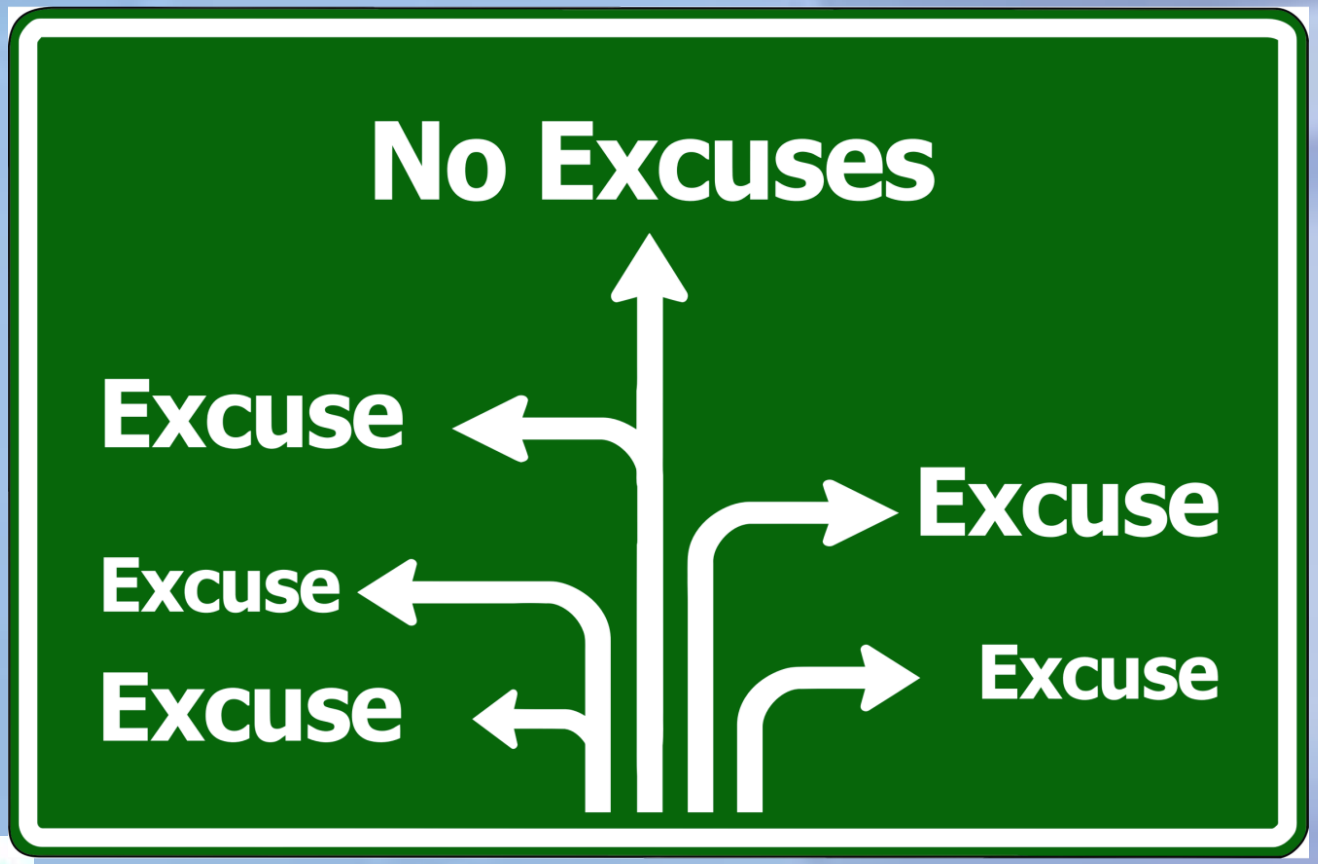
No extensions, no exemptions: deliver the project



No IEC delays, no statutory difficulties, and not any other reason can extend the binding schedules…

The winner selection method: Clearing Price

- **The winner selection criteria: by tariff bid (lowest bidders are declared winners up to the auctioned quota)**
- **All winners receive the same tariff: the tariff of the bidder under the last winning bid – that tariff is the auction's "Clearing Price"**
- **The above described mechanism eliminates incentive for "Strategic Bidding"…**

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Clearing Price – an illustration

- **For a 150 MW auction, the following results were received in the auction:**

Bid order by tariff level	Bidder	Capacity	Auction Tariff Bid
(1)	A	30 MW	22
(2)	B	10 MW	23
(3)	C	60 MW	24
(4)	A	70 MW	25
(5)	D	50 MW	26
(6)	B	60 MW	27
(7)	C	30 MW	28
(8)	B	20 MW	29

The Winners

The Clearing Price

Bidder A wins 100 MW, bidder B 10 MW, bidder C 60 MW: all bidders receive the Clearing Price - 26

Possible additions for future auctions: a premium system

- The regulator supports the promotion of policy-objectives by considering a differential system of <u>premiums:</u>
  - Storage
  - Rooftop installations
  - System proximity to consumption/demand
  - Location
  - Voltage
- A premium system – in contrary to a sub-quota allocation is supporting the regulator's objectives while maintaining a high level of competition



What do we expect from a REmap analysis for Israel?

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IRENA
International Renewable Energy Agency

External overviews of our policies improve their efficiency

- IRENA, OECD, World Bank, or any other international institution – helps us to get a clearer perspective on the effectiveness of our policies

REmap – micro VS macro level analysis

- A “macro” REmap analysis – focuses on overall RES potential in the country
- A “micro” level analysis – focuses on policies, regulations, best practices
- Some critical “micro” level policy issues are currently in progress:
  - Solar auctions
  - Storage
  - The effectiveness of regulation

Solar auctions: best practices

- IRENA recently published a six volume guide to renewable energy auction design
- Israel is on the verge of a two-year series of PV auctions

Premiums for rooftops, storage, voltage…?

Internalization of grid connection costs

Winner selection process

Qualification requirements

Storage: how much do we need?

- An energetic island – no interconnections to other grids
- Reaching 10% of **intermittent** RES by 2020 and 17% by 2020 (no hydro, little biomass and biogas)
- Available technological alternatives?
  - Pumped storage
  - Batteries
  - Curtailment
  - Other?

The effectiveness of regulation

- The statutory process:
  - How efficient is the process of construction permitting compared to other countries?
  - How efficient is the process of land permitting compared to other countries?
- The grid connection process - How efficient is it compared to other countries?
- The licensing process - How efficient is it compared to other countries?

Summery: IRENA's REmap of Israel

- Initiated and coordinated by the Electricity Authority, emphasis on micro-policy analysis
- Stakeholder involvement:
  - Industry
  - Government
  - NGO's
  - Academy
- Another part in a process of collaboration with international institutions (MEDREG, U.S Task Force) in policy reviews