MEDREG

"Impact of Smart Grids in the Mediterranean Region"

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CEER-ECRB-MEDREG Workshop on "Consumer Empowerment"

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Mediterranean Energy Regulators (MEDREG)

27 regulators (electricity & gas) from 22 countries

Objectives

To promote a harmonized, compatible, and non-discriminatory regulatory framework with a view to ensuring a secure, sustainable and competitive Mediterranean energy market.

- Fostering cooperation, information exchange and sustainable developments among members
- Providing capacity development activities through tailor-made trainings, study visits, workshops and seminars
- Developing peer review reports, conducting benchmarks, and case studies

MEDREG focuses on five areas of activities through its working groups: **Electricity**, **Gas**, **Institutional**, **Renewable Energy** and **Consumer**

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MEDREG's Long term Strategy (2020-2030)

A sound institutional regulatory framework

Objectives:

- An independent regulator with clear powers and competences exists in each Mediterranean country.
- National legal and regulatory frameworks are improved.
- Common network codes/standards developed on a common understanding.

Optimal conditions for infrastructure investments

Objectives:

- All countries are interconnected. Gas and electricity infrastructures are operated effectively.
- New incentives for efficient investments in RES generation and energy efficiency are in place.
- The share of electricity produced from RES is increasing and Barriers to investment are minimized.

Functioning, a competitive electricity and gas markets

Objectives:

- There is a market for electricity and gas in each country. Cross border trade is in place on all interconnections.
- Transparency and access to information is increasing.
- The regulator efficiently monitors market developments and improvements in transparency.

Efficient consumers protection; vulnerable consumers

Objectives:

- Consumers can choose between different suppliers.
- They have access to necessary information regarding billing and their rights.
- Vulnerable consumers are efficiently protected.

Intensified regional cooperation and setting up of pilot projects

Objectives:

- Regional coordination and cooperation is intensified.
- Common principles for market integration are defined
- Pilot projects are set up to test implementing them.

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General Trends in the Mediterranean Region

- Population in the South Mediterranean is expected to grow more than **85 Million** by 2040 (+45% in 2017)
- A **stagnating energy demand** in the North Mediterranean, an **energy-intensive development** in the South & East Mediterranean
- South & East Mediterranean electricity demand to **double** by **2040**; an extra-capacity of **185 GW** needed, most of which from **RES**
- More than **$400 Billion** investments is required

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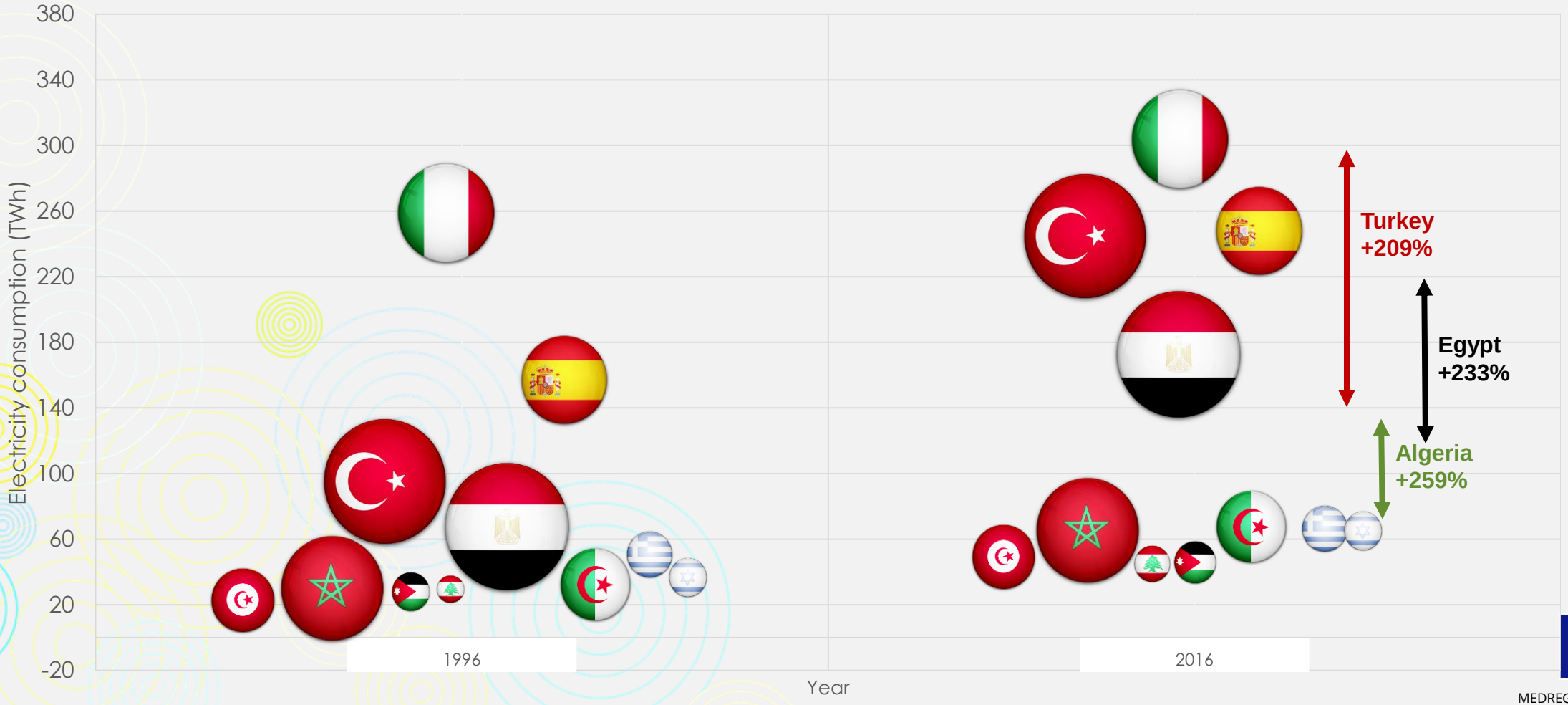
Source: *OME*

Evolution of Electricity Demand in the Region

Evolution of electricity demand and population in selection of Mediterranean countries, 1996/2016



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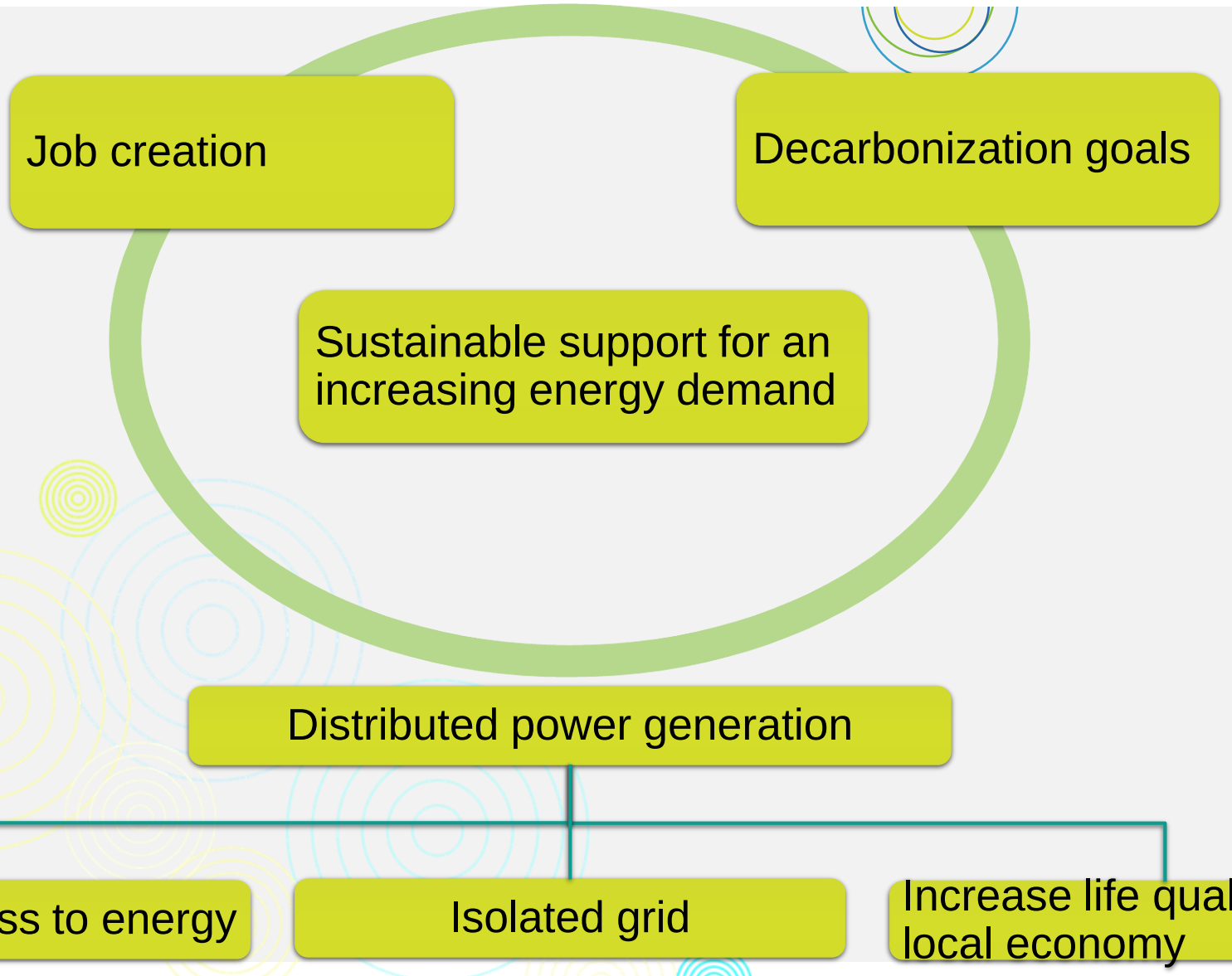
Benefits of Renewable Energy Sources (RES)



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Smart Grids in the Mediterranean Countries

- **Smart Grids (SGs)** are electricity networks that can intelligently integrate the actions of all users connected to system to efficiently deliver sustainable, economic, and secure electricity supplies.
  - can facilitate the connection and operation of **generators** of all sizes and technologies
  - allow **consumers** to play a role in optimizing the system operation

- These based in **huge amount of data elaboration** (IT)

- **SG** are expected to allow bi-directional flows of **electricity and information**

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Smart Grids in the Mediterranean Countries

Technologies/Topics		Country 1	Country 2
Smart metering	- roll-out (deployment) - functionalities - remote management by DSO	Montenegro	Greece
Demand side management	- hourly metering - information of prices in advance - voluntary management of consumption - automatic control of consumption - retail company - participation on ancillary services (aggregator)	Egypt	Spain
Self-generation	- net self-consumption - net metering (energy) - net billing (money) - communities of energy	Egypt	Cyprus
Distributed generation	- Renewables – cogeneration - small and large scale	Greece	Cyprus
Storage	- Batteries – flywheel - molten salt	Jordan	Portugal
Electric vehicles	- individual charge - collective charge	Italy	Turkey
Distribution System Operator regulatory oversight	- integration all distributed equipment - contribution of DSO to innovation and deployment of Its - cost coverage and incentives	France	Israel

Smart Meters

Montenegro: DSO will establish the Smart Meter System by January 2022, with a coverage of 72%.

Greece: Country's conventional meters will be replaced with smart meters, a total number of 7,5 million smart meters will be installed by 2020.

Conclusion: smart meters' deployment have several benefits such as *reducing reading costs*, *network losses* and *electricity fraud……*

Smart meters reduced network losses from **21%** to **15%** after **72%** of deployment in Montenegro.

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Demand Side Management (DSM)

Egypt: Distribution companies must provide free DSM studies to consumers and EgyptERA reviews these studies

Spain: Mature wholesale market, high number of new retail companies (unbundling with distribution companies) with offers, and the smart meter deployment, permit DSM

Conclusion: In **Egypt**, distribution companies are obliged to provide free DSM studies to consumers, which are supervised by the regulator, resulting in most consumers applying the suggested solutions.

In Spain, the high number of new entrants and offers along with time based Tariffs (access tariffs that promote consumption during certain hours) set the grounds for the development of DSM with a growing base of consumers, adopting time discrimination tariffs (more than 1,5 million in 4 years).

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Self and Distributed Generation

Egypt: New legal framework (Law) allows private generation of electricity for self-consumption as well as trade surplus electricity through bilateral agreements

Cyprus: Electricity from renewable sources is promoted through subsidies (“feed-in tariff”) combined with a net metering scheme (for the sole purpose of own consumption)

Greece: Rooftop PV plants are promoted.

Conclusion: Self and distributed generation along with net metering schemes have already created new jobs, enhanced economic growth and reduced electricity costs for thousands of residential, commercial and industrial consumers both in Egypt Greece and Cyprus.

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Electric Vehicles and Storage

Italy: Regulator launched a first public consultation on EV charging infrastructures

France: Network systems are replaced with smart grids and equipment, including EV charging stations

Turkey: Regulator has initiated studies for establishing the necessary infrastructure for EV stations.

Jordan: The country expects to sign a contract with the aim of establishing an electricity storage station (30 MW)

Portugal: A pilot storage project was launched to supply electrical energy to a University Campus.

Conclusion: Regulators have already started promoting storage and electric charging stations

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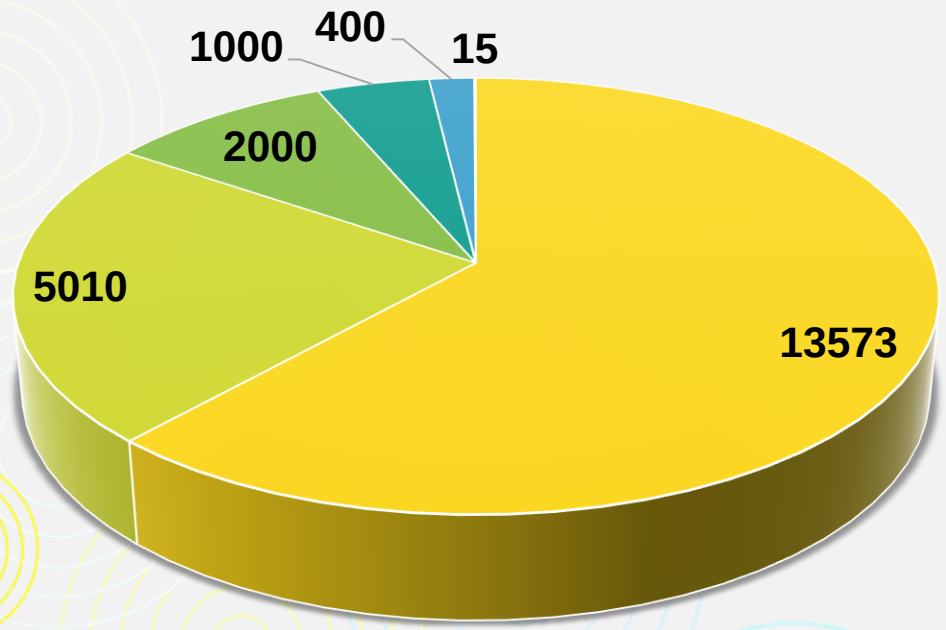
Algeria: RES policy targets

Algerian RES program: allocation of 22-GW target in MW by 2030



Feed-in Tariffs

Granted for **20 years** with different rates for the first **5 years** and the following **15 years**

The Government aims to **install 22 GW** of renewable capacity by 2030, which will represent **37%** of the Algerian installed capacity

The 22 GW target includes **62% from solar PV**, **23% from wind**, **9% from Solar Thermal**, **4% from Biomass** and **2% from cogeneration**

The 22 GW of installed renewable capacity should **cover 27% of the country's electricity needs** in 2030

The State will support the development of new capacities with the **National Fund for Renewable Energies** and Cogeneration

Source: *ENERDATA*

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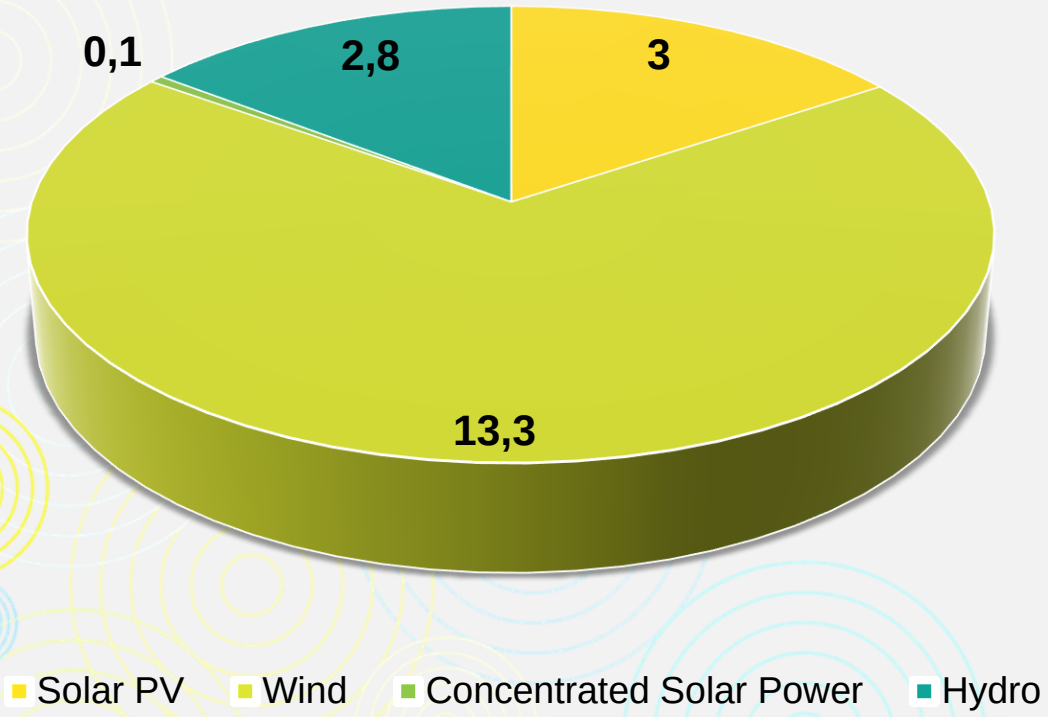
Egypt: RES Policy Targets

Installed capacity of 19.2GW RES by 2022



Source: *ENERDATA*

Feed-in Tariffs

The government set the target to supply **20%** of **generated electricity** from renewable sources by **2022**

The government set the target to **supply 42%** of generated electricity from renewable sources by **2035**

The total installed capacity of RES is expected to reach **19.2 GW** by 2021/22 and increase to **49.5 GW** and **62.6 GW** in years 2029/30 and 2034/35 respectively

Tariffs for projects btw **0-0.2MW, 0.2-0.5MW, 0.5-20MM, 20-50 MW**

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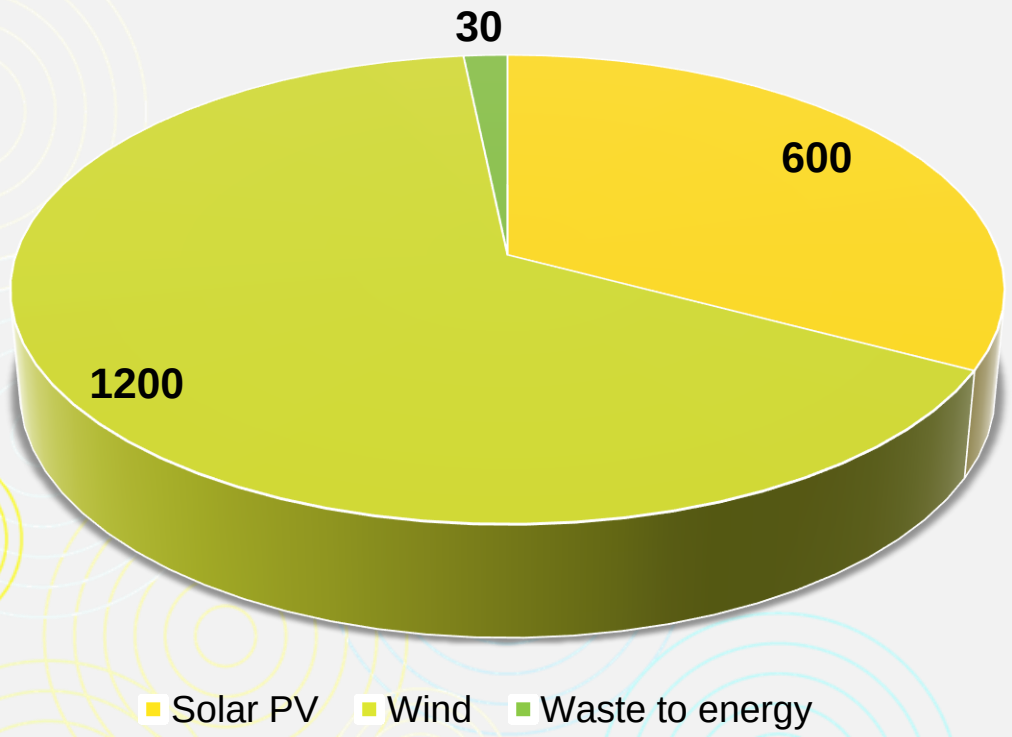
Jordan: RES Policy Targets

Installed capacity of 1830 MW by 2020



The RE Law (2012) aims for **10%** of the Jordan's **energy mix** to come from renewables in **2020**

The target of **10%** RES will mainly come from wind (**1200 MW**), solar (**600 MW**) and waste to energy (**20-30 MW**)

Source: *ENERDATA*

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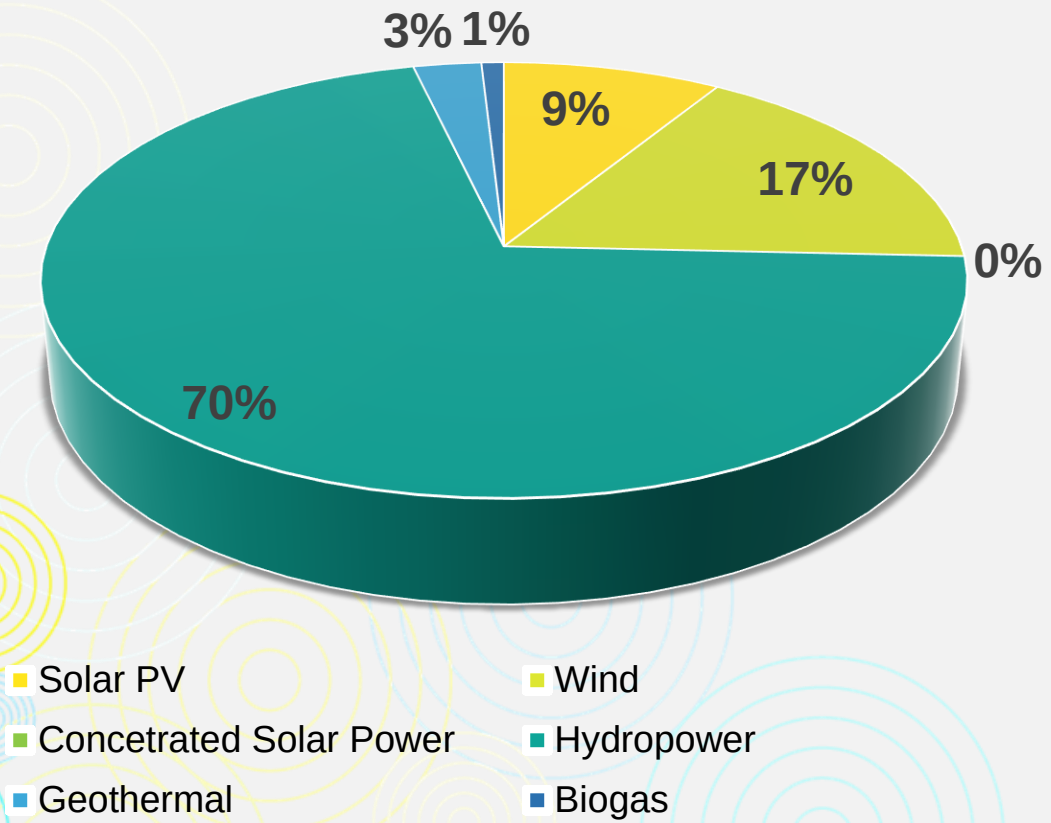
Turkey: RES policy targets

RE installed capacity as of 2017



Turkey aims at a national renewable energy target of **30%** of the total electricity generated from renewable source by 2030

Source: *ENERDATA*

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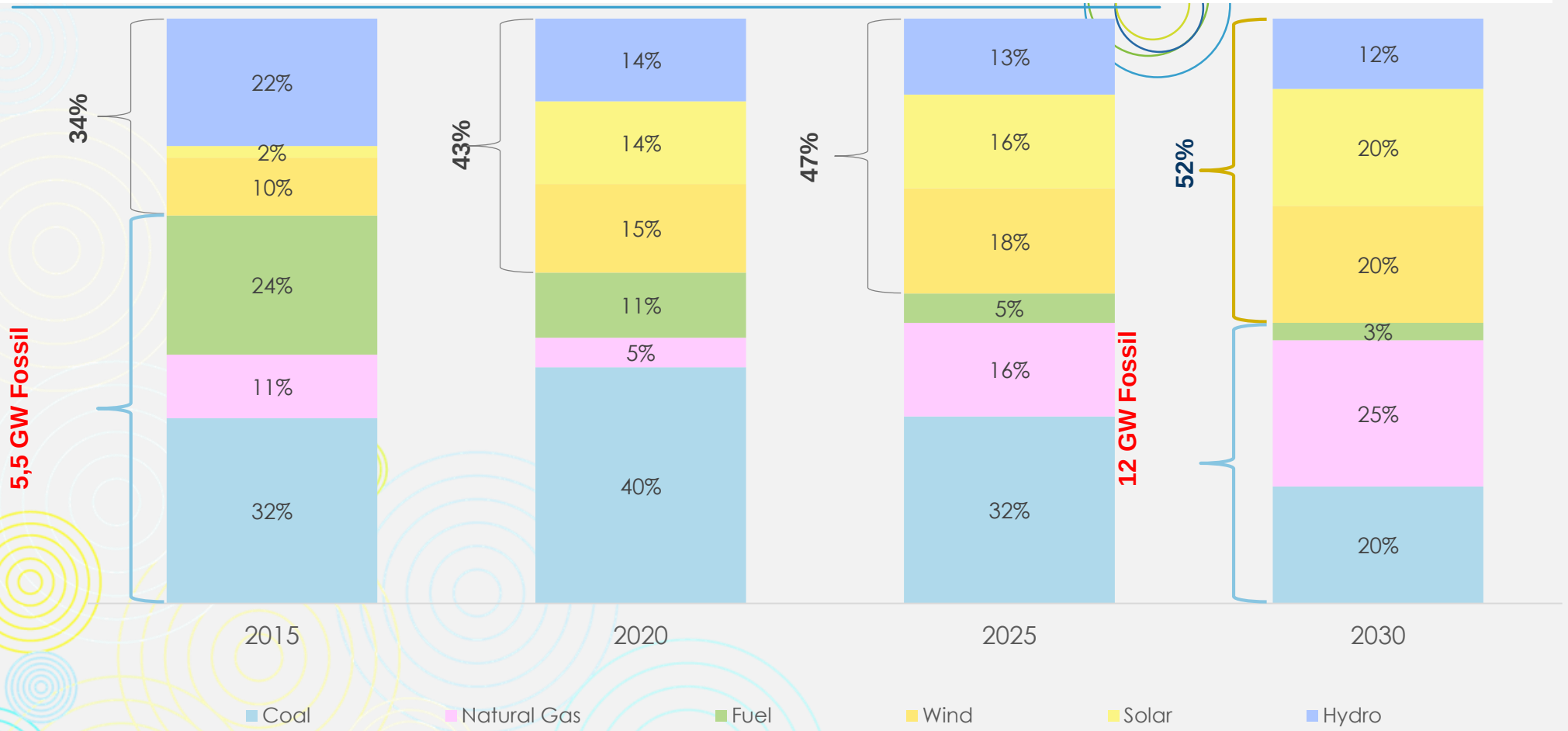
Morocco: RES policy targets



Morocco has a bold target of sourcing more than **half (52%) of its electrical energy** from renewable sources by **2030** and a plan to have **2,000** MW of wind and **2,000** MW of solar power plants by 2020, looking to add **1.5GW** renewable capacity annually.

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Conclusions- New Roles and Responsibilities

- NRAs can play an important role in promoting SG technologies and systems; paving the way for investors and business model developers
- Developments are still in the initial phase and different in many countries
- Smart Meters (SM), Demand Side Management (DSM), Self-generation (SG), Storage, Electric Vehicle (EV)
- New role of Regulators, Distribution System Operators (DSO) and Consumers/Prosumers
- New smart technologies (SM, PV, batteries, EV, etc.) will allow consumers to play an important role; “Prosumers”,
- Promotion of smart grid developments such as regulatory sandbox can significantly shorten transition period towards decarbonizing markets

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Conclusions- Consumers

Consumers will play an increasingly important role

- new technologies (SM, PV, batteries, EV, etc.) can allow consumers to play a new role
- role of the aggregator / retail companies: represent to the consumers to manage their self-generation, storage and consumption
- new role of consumers: “prosumers”

Conclusion: At the same time, consumers should keep some freedom to choose their level of involvement and data privacy and protection have to be ensured. As a complement, communication is crucial since it is imperative to ensure that consumers have trust in and understanding of the complete smart grid process and receive clear tangible benefits

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