



TÜRKİYE RÜZGAR ENERJİSİ BİRLİĞİ  
TURKISH WIND ENERGY ASSOCIATION



# BETTER Project

## Opportunities and Barriers for RES Investment TURKEY

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# AGENDA

- RES Targets in Europe and Turkey
- RES Contribution to the Energy Mix in Turkey
- Opportunities in Turkey for RES Investments
- Barriers in Turkey for RES Investments
- Future Possible Barriers for RES Integration
- Conclusion



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## EU Directive (2009/28/EC)

2020	<b>Binding Target</b> RES Share in GFEC	<i>Expected Development</i> <i>RES Share in GFEC</i>	<b>Corresponding</b> <i>RES-E</i> Target
Germany	18.0%	19.6%	38.6%
Italy	17.0%	16.2%	26.4%
Spain	20.0%	22.7%	40.2%

Source: EREC

## Electricity Market and SoS Strategy Paper, Turkey (21.05.2009)

By 2023	Hydro	Wind	Geothermal	Solar	RES-E Share (Electricity Production)
<i>Target</i>	Entire available resources will be utilized.	20 GW	600 MW	3 GW	30%

Turkey **2013** Electricity Production = 239.3 TWh and **28.3 %** RES-E Share.

Source: TEİAŞ

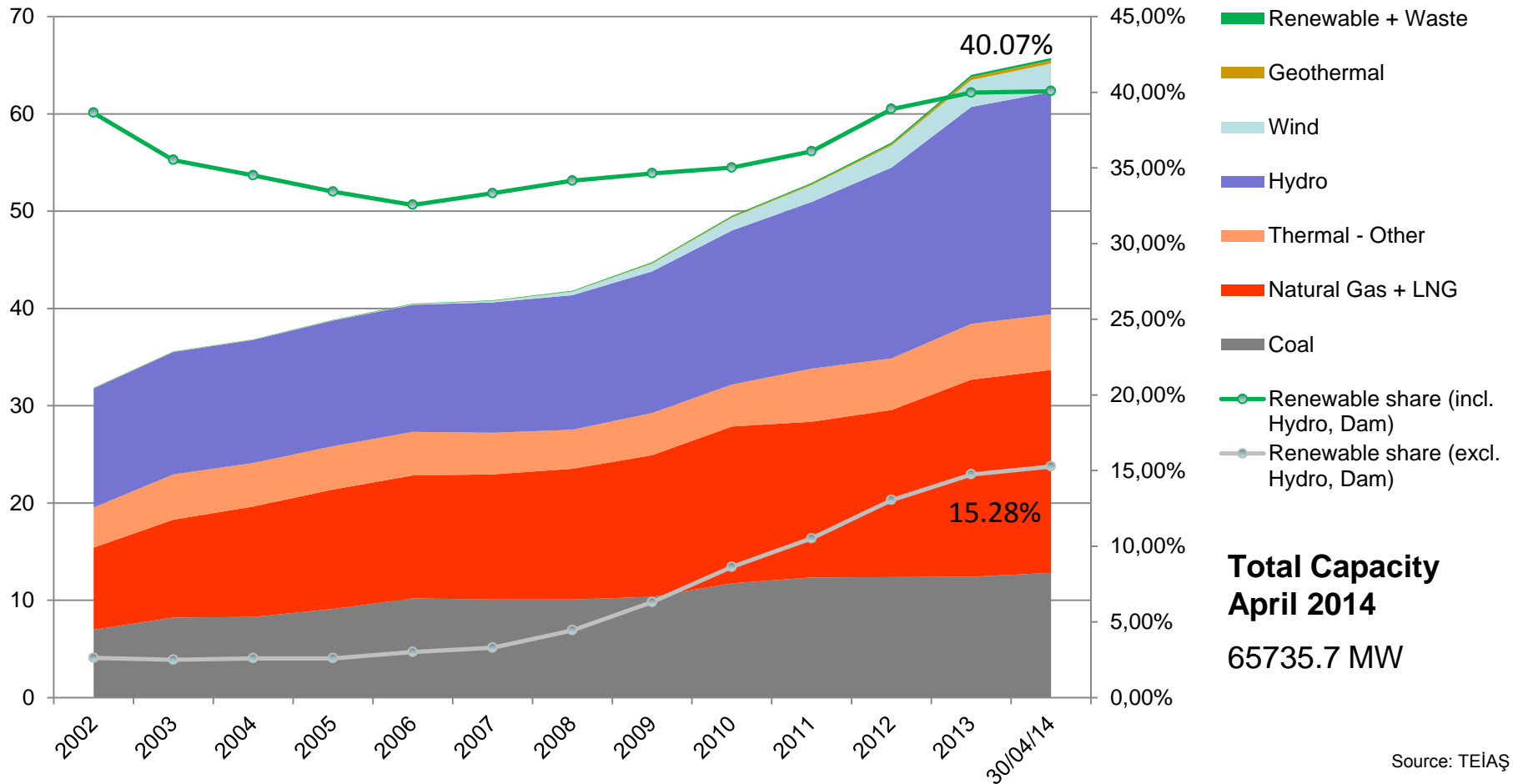


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## Development of Installed Capacities and RES Share, Turkey

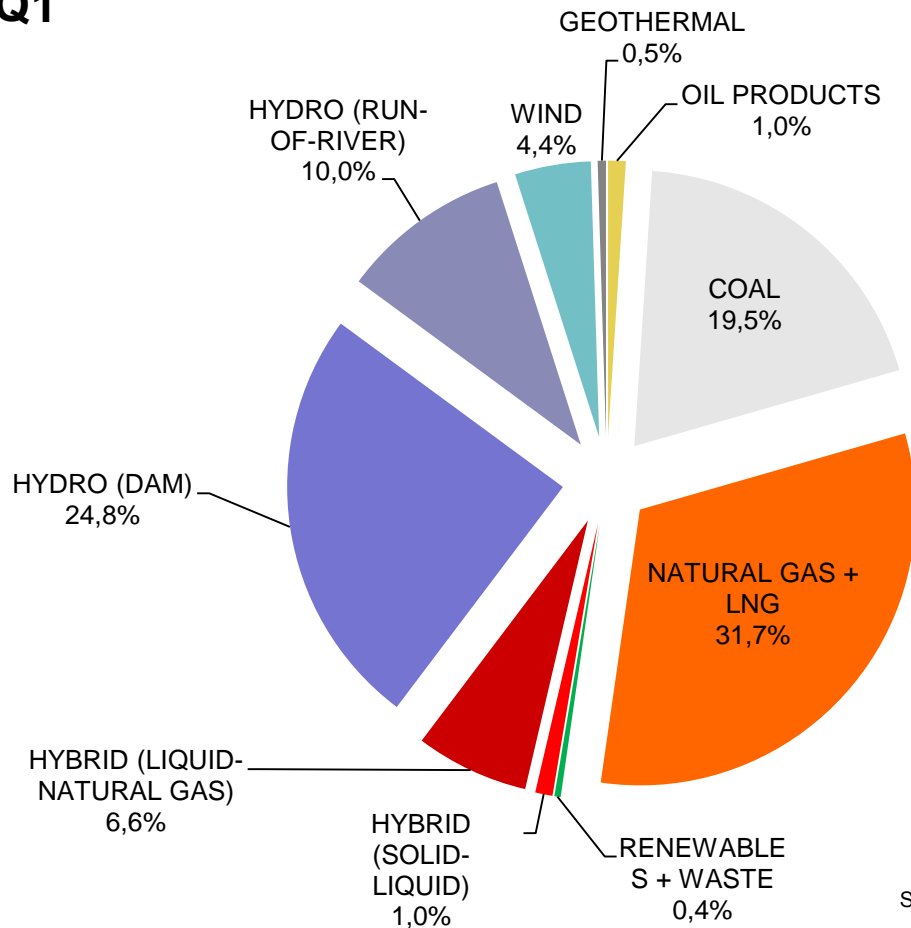
GW





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## Installed Capacity Distribution Turkey 2014, Q1



### Wind Power Status (2014)

In operation **2958.45 MW**

Under construction **980.9 MW**

Licensed **5776 MW**

Unlicensed Application **115 MW**  
(LI-DER)

### Solar Power Status (2014)

496 (7873 MW) license applications

Unlicensed Application **375 MW**  
(LI-DER)

Source: TEİAŞ



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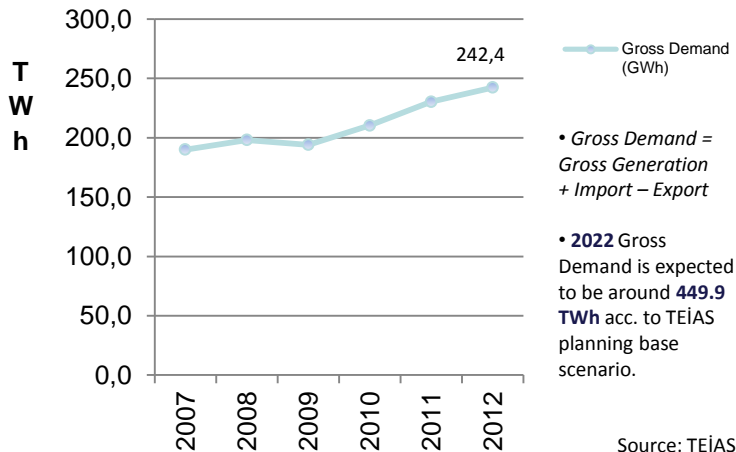


## Opportunities for RES Investment in Turkey

- 2023 goals for RES development
- Growing economy and growing demand for electricity  
(due to Industrial Progress + Population Growth)



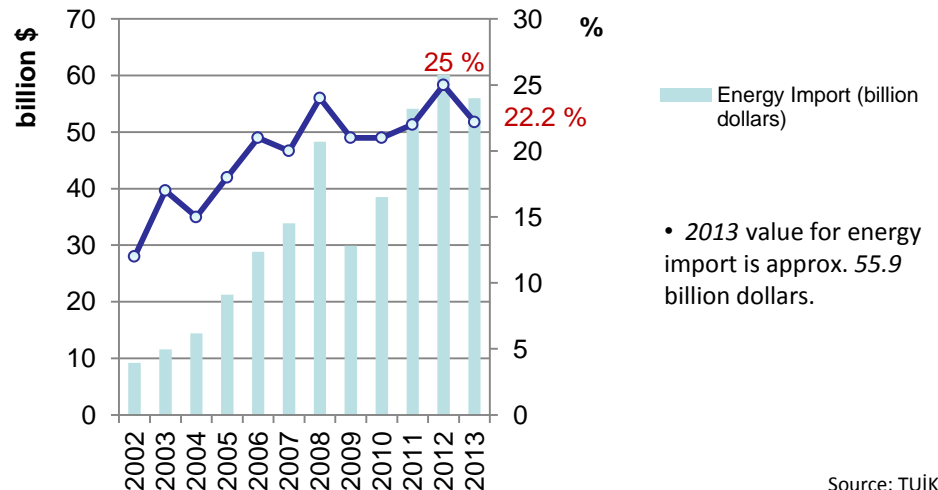
Annual Development of Gross Electricity Demand



- Energy dependence of the country and the necessity to lessen the dependency on foreign resources
- Targets of declining natural gas contribution



Turkey Energy Import Share





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## Opportunities for RES Investment in Turkey

- Immature market w/ significant potential  
(Ex. *One of the highest for solar in EU*)
- Decline in equipment costs (*especially for PV case*)
- Recently updated legislation by EMRA and Renewable Energy Authority (2013)
  - Licensed projects regulation and communicate
  - Unlicensed projects regulation and communicate
  - Related secondary legislation from the other governmental bodies
- Increased awareness and support to the necessity of RES integration



## Opportunities for RES Investment in Turkey

- All-inclusive FIT mechanism for different RES technologies
- Guaranteed 10-year rates provide financial security
- Additional incentives for local content (first 5 years)
- Regarding wind energy, market is improving based on wholesale market

RES Technology	FIT (US Dollar Cent / kWh)	FIT + Local Content (max. possible)
Hydro	7.3	$7.3+2.3=9.6$
Wind	7.3	$7.3+3.7=11.0$
Geothermal	10.5	$10.5+2.7=13.2$
Biomass	13.3	$13.3+5.6=18.9$
PV	13.3	$13.3+6.7=20.0$
CSP	13.3	$13.3+9.2=22.5$





## Barriers for RES Investment in Turkey

- Weakness of communication among the directorates of different ministries
  - online communication system has to be established
- Long lasting procedures
  - more than 8 months for met mast installation permission (in case of public land)
  - zoning application 6 months (formal opinion requested from different bodies)
  - EIA should be 5 to 6 months, but takes 10 months in practice due to the additional requirements during the process
  - forestry permission lasts more than 1 year
  - technical interaction analysis takes 6 months (regarding radar interaction)
- Cap for the certain technologies and fixed license application periods
  - 600 MW cap for solar
  - license applications are received every October



## Barriers for RES Investment in Turkey

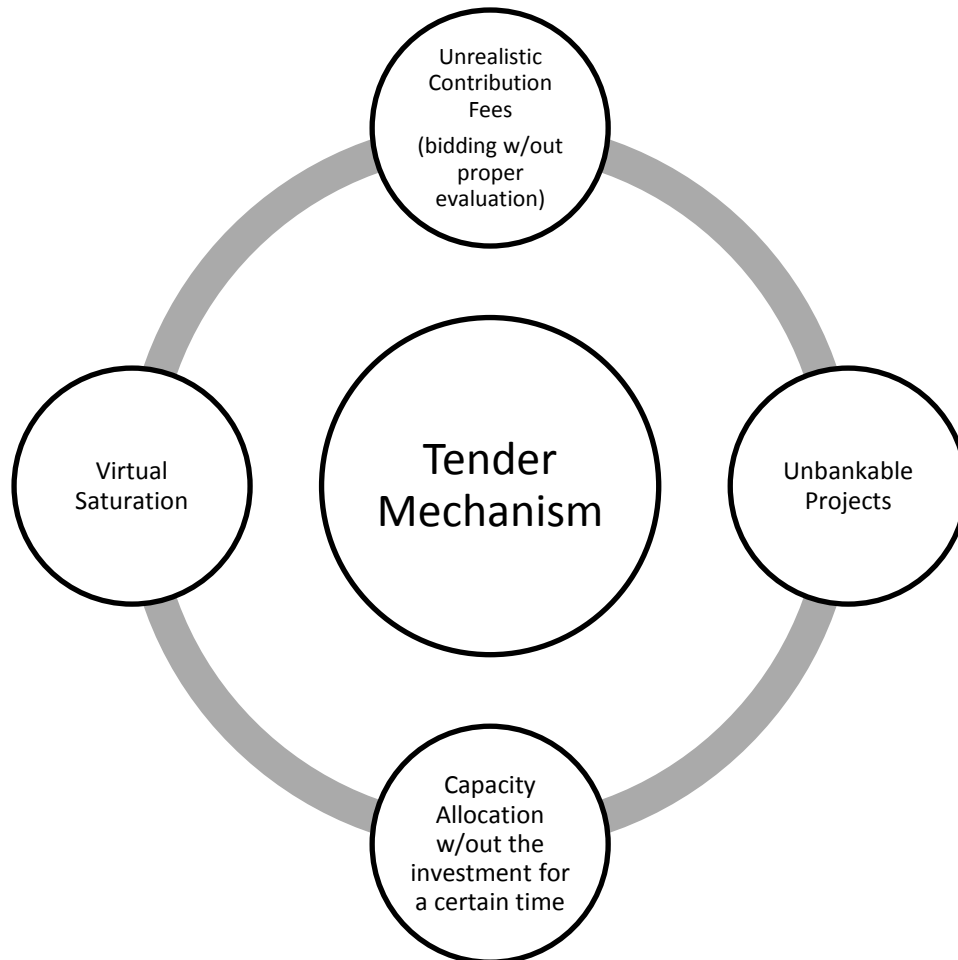
- Public land acquisition and its costs to investor (in case of *forestry*)
  - Recent regulation for energy investments on forestry land (18.04.2014/28976)
  - Solar plants are forbidden on the property of Ministry of Forestry and Water Affairs
  - Significant land lease fees for wind power plants built on forestry land

### Ex. WPP in Kocaeli Province w/ 50 MW

Project Details			Forestry Land Lease Charges		
Area subjected to Forestry Permission	60	ha	Forestration Fee (one-time payment)	2,667,168.00 TL	942,462.19 EUR
Unit Forestration Fee	11113.2	(TL / ha)	Annual Land Rent (Year 0 to 10 - 15 %)	238,044.74 TL	84,114.75 EUR
Closeness Ratio Coeff. (41 - 70 %)	1.7		Annual Land Rent (Year 10 to 20 - 100 %)	1,586,964.96 TL	560,765.00 EUR
Province Coeff. (Kocaeli)	2.8		TOTAL (w/out any annual increase on the unit fee and calculated for 20 years time)	20,917,265.04 TL	<b>7,391,259.73 EUR</b>
Permission Type Coeff. (Wind Power)	0.5		(1 € = 2.83 TL)		



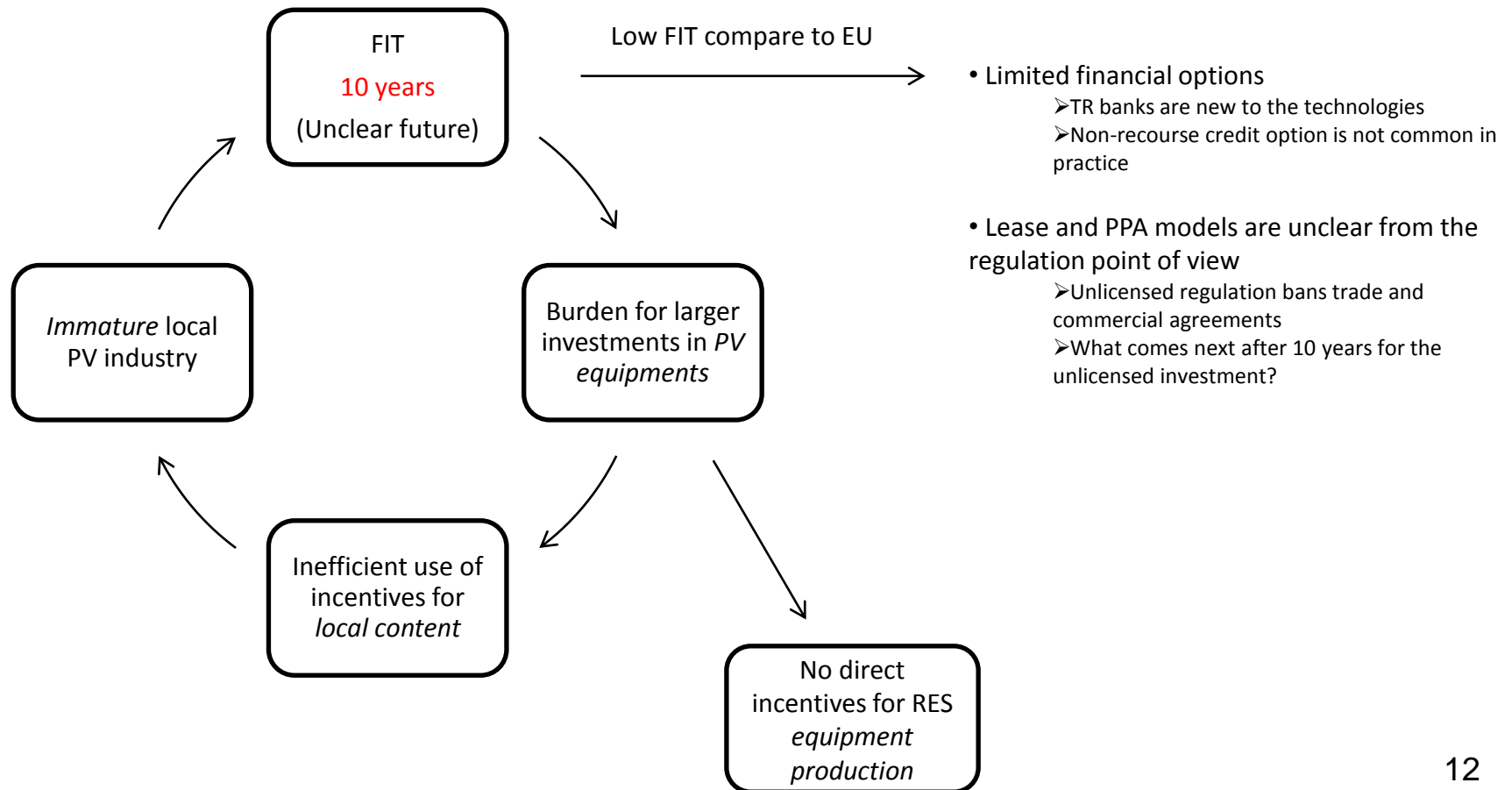
## Barriers for RES Investment in Turkey



- Couple of WPP licenses returned to EMRA in April 2013 (which has > 5 krs/kWh contribution fee)
- First solar tender was completed on 12.05.2014 and the winner in Elazig region had proposed 827.000 TL / MW for 8 MW in total. (≈ 290.000 €/MW)



## Barriers for RES Investment in Turkey





## **Future Possible Barriers for RES Integration – Security of Supply Concerns**

- If the network system development does not adapt the continuous RES development accordingly,

➤ GRID CURTAILMENTS (by TSO)

➤ HOSTING CAPACITY ISSUES

due to,

- high level of RES deployment expected
- high PV deployment expected (especially for unlicensed at distribution level)
- regions of high RES existence and low demand cases



## Conclusion

- The level of RES investments in Turkey is still below than the potential
- The regulative and financial barriers have to be removed for the maximum deployment possible
  - Increase in foreign investment and technical know-how
  - Maximum contribution and development of local industry
- The opportunity of parallel development of RES and grid structure has to be performed for the SUSTAINABLE GROWTH
  - Actions on Smart Grids, Storage and Network Development in order not to face with future problems



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# THANK YOU!

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