

A large solar panel array is shown in the foreground, angled towards the right. The panels are blue with a grid of white lines. In the background, there is a green field and a bright blue sky with scattered white clouds. The sun is visible as a bright spot behind the clouds, creating a lens flare effect.

Doing Solar Energy Projects in Turkish Electricity Market

Potential & Bottlenecks

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❖ Solar Energy Potential

❖ Solar Energy Generation in Turkey: Licenced & Unlicensed

❖ Challenges & Solutions for Solar Energy Projects



☀ WHY DO YOU INVEST FOR SOLAR ENERGY IN TURKEY?

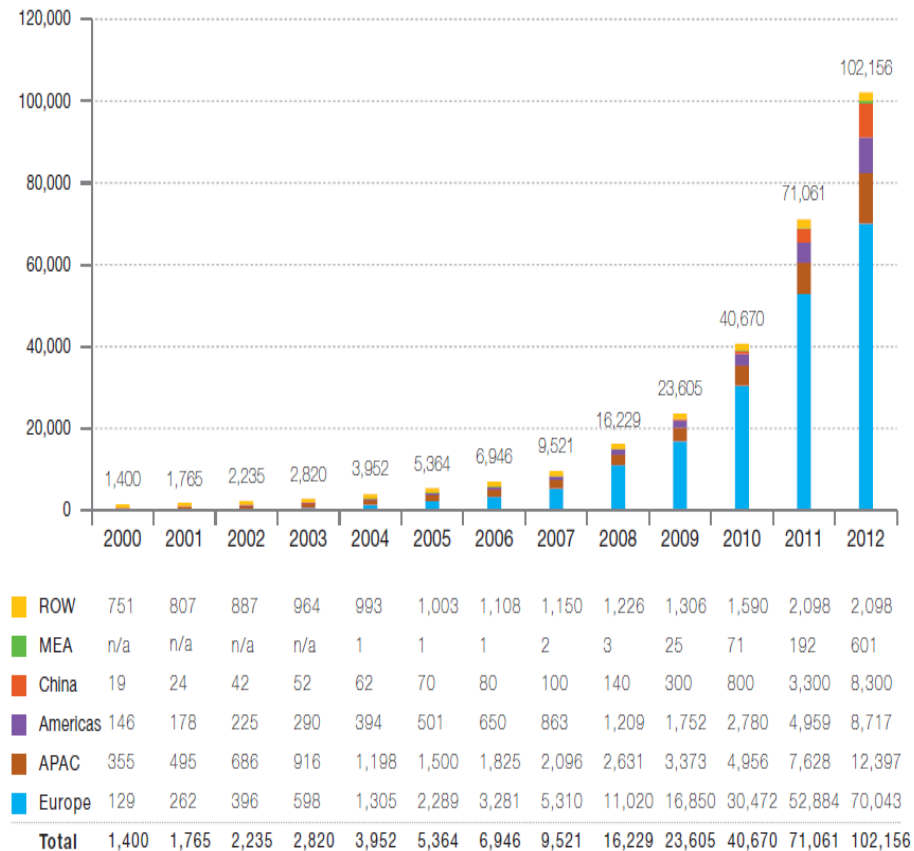


Global Perspective

- **World:** 31.1 GW of PV systems were installed in 2012
 - ❖ The World's Cumulative Installed Capacity:
 - ❖ In **2009**: ~ 24 GW
 - ❖ In **2010**: ~ 40 GW
 - ❖ In **2011**: ~ 71 GW
 - ❖ In **2012**: > 100 GW
- **Saturated European Market:**
- **Europe:** 17.2 GW of PV capacity were connected to the grid in 2012, compared to 22.4 GW in 2011
 - ❖ In **2011**: 74% of the world's new PV installations
 - ❖ In **2012**: 55%
- **Germany:** Top market with 7.6 GW of newly connected system
- **But!!!**
 - ❖ No More Market Place + Lowering of Incentives
 - ❖ New PV capacity ➡ Outside of Europe



Figure 1 - Evolution of global PV cumulative installed capacity 2000-2012 (MW)



ROW: Rest of the World. MEA: Middle East and Africa. APAC: Asia Pacific.

Source: EPIA (European Photovoltaic Industry Association)

☀ WHY DO YOU INVEST FOR SOLAR ENERGY IN TURKEY?

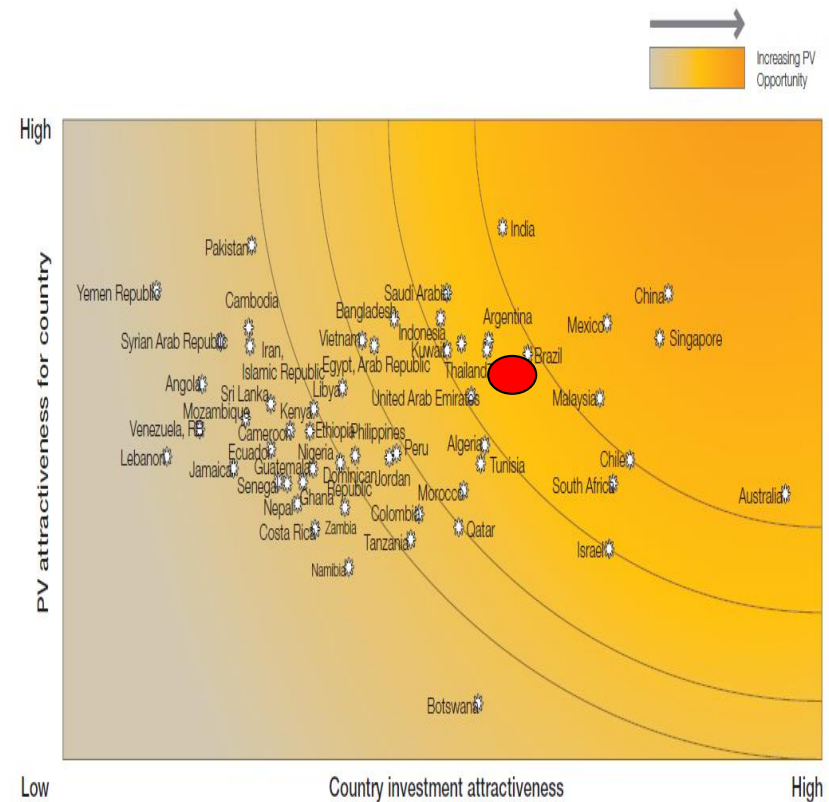


Turkish Solar Market

New Market = New Opportunities

- High **Solar Potential** of Turkey
- Renewable **Energy Policies** of the Government
 - **2023 Strategy Paper**: at least 30% Renewable Energy
 - Incentives
 - ❖ Purchase of Surplus Energy for 10 years period
 - ❖ Domestic Product Usage
- **New Legislation = New Era**
- 4628 (2001)
 - ❖ **(6446) Electricity Market Law** (March 30, 2013)
 - ❖ Regulation on the **Unlicensed Electricity Generation** on the Electricity Market
 - ❖ Communication concerning the Application of Regulation on the Unlicensed Electricity Generation on the Electricity Market (October 2, 2013)

Future PV Markets



Source: EPIA, Unlocking the Sunbelt Potential of Photovoltaics, 2010



What are the ways for generating electricity in Turkish Electricity Market?



SOLAR ENERGY GENERATION IN TURKEY- *Legislation*



Licensed Generation

- License Regulation
- Communication for Wind and Solar Energy Measurements
- Communication related to Competition

Unlicensed Generation

- Unlicensed Regulation
- Communication on Implementation of the Regulation related with Unlicensed Electricity Generation in Electricity Market

➤ Electricity Market Law (6446)

➤ Law on Utilization of Renewable Energy Sources for the Purpose of Generating Electrical Energy

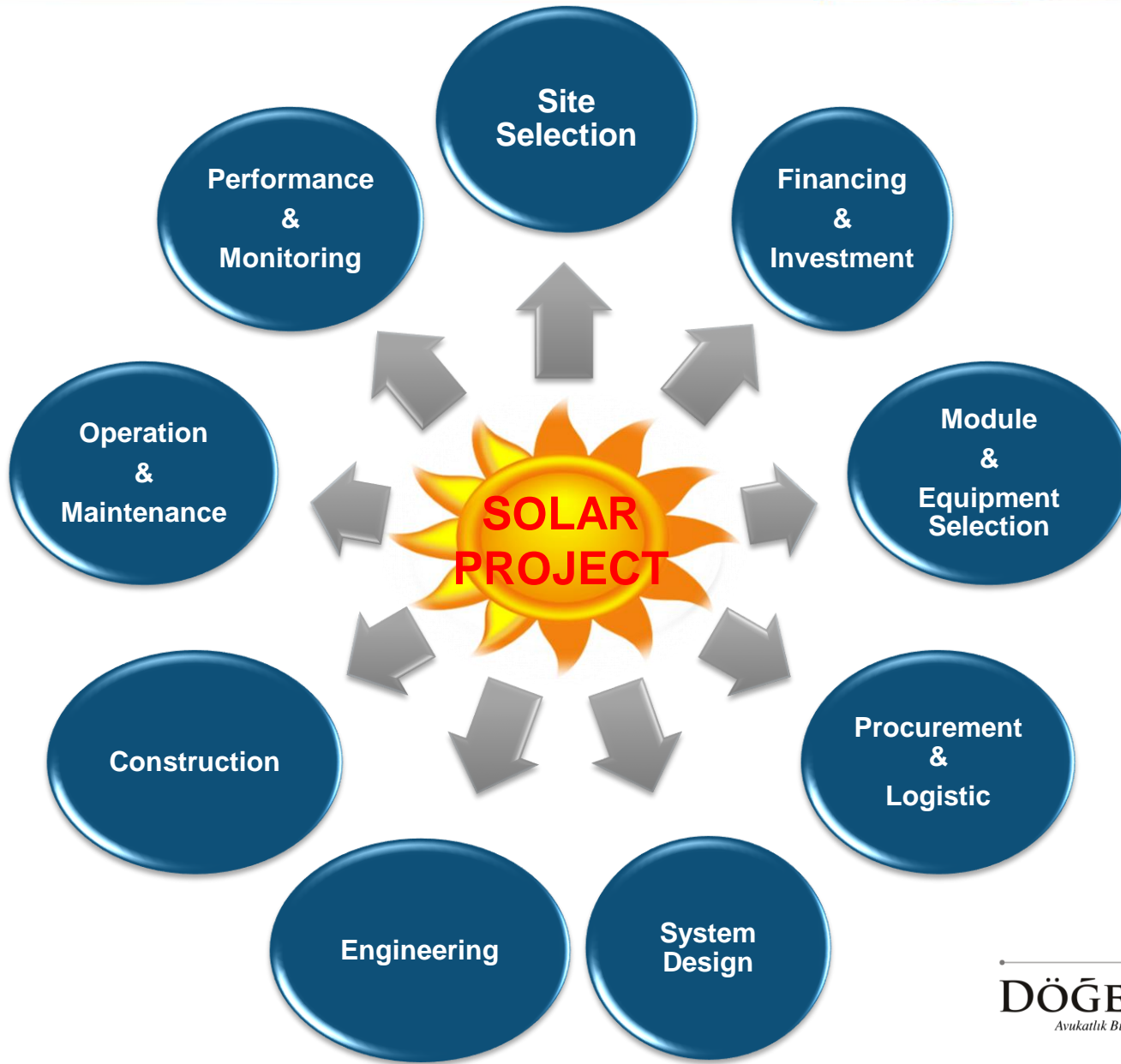
➤ Regulation on Documentation & Promotion of the Use of Renewable Energy Sources for Electricity Generation

SOLAR ENERGY GENERATION IN TURKEY



	LICENSED	UNLICENSED
APPLICATION PERIOD	<i>Only on the Date Announced by EMRA</i>	<i>No Restriction about Application Date</i>
BUREAUCRACY	<i>≥ 25 Institution</i>	<i>≤ 10 Institution</i>
CAPACITY	<i>No Capacity Limit</i>	<i>Up to 1 Megawatt</i> ➤ <i>Council of Minister Decision</i> ➤ <i>Without Selling to the Sytem -- Unlimited Capacity</i>
EXPROPRIATION	<i>Possible</i>	<i>Not Possible</i>
FINANCING OF PROJECT	<i>Possible</i>	<i>Willingless of Banks</i>
INCENTIVES	➤ <i>Purchasing Guarantee of State</i> ➤ <i>Domestic Product Contribution</i>	➤ <i>Possibility of Selling Surplus Energy</i> ➤ <i>Domestic Product Contribution</i>
MEASUREMENT	<i>Compulsory</i>	<i>No Need</i>
PROCEDURE	➤ <i>Limited Liability or Joint Stock Company</i> ➤ <i>Pre-License/ License Requirement</i> ➤ <i>Minimum Capital Requirement</i> ➤ <i>Competition</i>	➤ <i>Any Real or Legal Person</i> ➤ <i>No Need of Obtaining a License and Establishing a Company</i> ➤ <i>No Competition</i>
SHARE TRANSFER	<i>Forbidden (directly/indirectly) for the Pre-License</i>	<i>Transfer of Generation Facility (Article-29)</i>
TRADING OF ELECTRICITY	<i>Possible</i>	<i>Forbidden</i>

STAGES FOR SOLAR ENERGY PROJECTS



CHALLENGES FOR SOLAR ENERGY PROJECTS



Lack of connection among related legislations

Theoretically possible – Practically impossible / problematic regulations

Licensing for medium & large scale projects

Bureaucratic barriers & Lack of coordination among official institutions

Land allocation issue

Issue of financing

Lack of grid and system integration

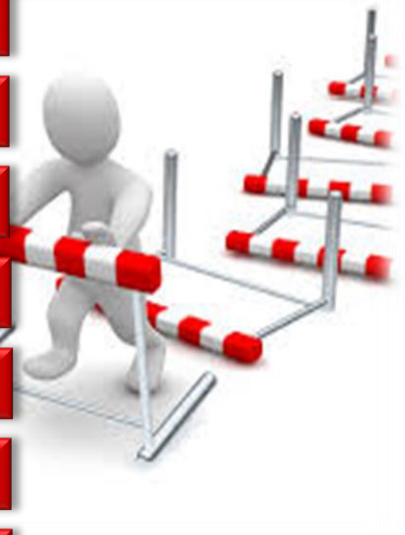
Adaptation problem for frequently changing legislations

Distance from timely realizable/achievable targets

Highly technical jargon of legislations

Inadequate support mechanisms

Lack of credible data and key specialist



☀ LACK OF CONNECTION AMONG RELATED LEGISLATIONS



CHALLENGE

❖ Multi-Directional Nature of Energy Projects

- ❖ Engineering
- ❖ Finance
- ❖ Technique
- ❖ Legal
- ❖ Environment
- ❖ ...

❖ Energy Laws / Regulations / Communiques / Strategies are NOT enough merely !!!

❖ Need for harmonization with;

- ❖ Construction Law
- ❖ Property Law
- ❖ Regulation on the Energy Performance of Buildings



☀ DIFFERENCE BETWEEN THEORY & PRACTICE



Theoretically Possible – Practically Impossible / Problematic Regulations



SOLAR ENERGY

❖ Theoretically:



Right to Sunlight ???

❖ Practically:



Transfer of Generation Facility

- ❖ Theoretically: Regulation on the Unlicensed Elec. Gen. (Article–29)
 - ❖ Single Condition: Temporary Approval
 - ❖ Sale / Transfer / Any other agreement

❖ Practically:



☀ LICENSING FOR MEDIUM & LARGE SCALE PROJECTS



Barriers

- ❖ **Lifting permitting barriers for SMALL-SCALE projects such as;**
 - ❖ Obtaining a license
 - ❖ Establishing a company
- ❖ **BUT !!!**
- ❖ **Licensing requirements for LARGER projects**
 - ❖ Licensing fees and issuance
- ❖ **Solar Energy based Electricity Generation Systems:**
 - ❖ Announced **LIMIT** for Licensed Project: **600 MW** total installed capacity until the end of 2013
 - ❖ ~ 1.700 MW expected application
 - ❖ ~ **9.000 MW application**



BUREAUCRACY



- ❖ Ministry of Environment and Urbanization
- ❖ Regional Directorate of Forestry
- ❖ Ministry of Food Agriculture and Livestock
- ❖ Regional Directorate of State Hydraulic Works
- ❖ TEDAŞ (Turkish Electricity Distribution Corporation)
- ❖ TEİAŞ (Turkish Electricity Transmission Company)



- ❖ Ministry of Forestry and Water Affairs
- ❖ Directorate of Nature Conservation and National Parks
- ❖ Türk Telekom General Directorate
- ❖ BOTAŞ- Petroleum Pipeline Corporation
- ❖ Provincial Directorate of Environment and Urban Planning



- ❖ Regional Directorate of Highways
- ❖ The Office of Commander in Chief
- ❖ General Directorate of Mining Affairs
- ❖ Environmental Impact Assessment (General Directorate of Planning)
- ❖ General Directorate of Cultural and Natural Heritage



- ❖ General Directorate of Cultural Heritage and Museums
- ❖ General Directorate of State Airports Operations
- ❖ Ministry of Culture and Tourism
- ❖ Special Provincial Administration
- ❖ Related Metropolitan & Local Municipality

SELECTION OF PROJECT SITE



- ❖ **Site Location & Grid Connection Point**
- ❖ **Land in Turkey**
 - ❖ Approximately 35 % used for agriculture
 - ❖ 27 % forest
 - ❖ 18 % pasture
- ❖ **The EMRA Committee Decision (24 May 2012 - numbered 3842)**
 - ❖ No license application for solar energy generation facilities shall be accepted for areas which would disrupt the integrity of agricultural usage in agricultural lands (absolute, private, cultivated, irrigated) and surrounding lands.
- ❖ **Law on Utilization of Renewable Energy Sources for the Purpose of Generating Electrical Energy - 5346 (YEK Law)**
 - ❖ Lease or Easement Opportunities
 - ❖ BUT !!!
 - ❖ Prime Ministry Notice numbered 2012/15: Approval of the Prime Ministry



☀ ISSUE OF FINANCING



- ❖ International Energy Agency – Renewable Energy Market Trends and Projections to 2017
- ❖ Financing ➡ constraint for renewable energy development over the medium term
- ❖ High up-front financing cost
- ❖ Lack of financing mechanisms & institutions
- ❖ Concerns over high inflation



Investors prefer projects with **short payback times** and demand high internal **rates of return!**



☀ LACK OF GRID & SYSTEM INTEGRATION



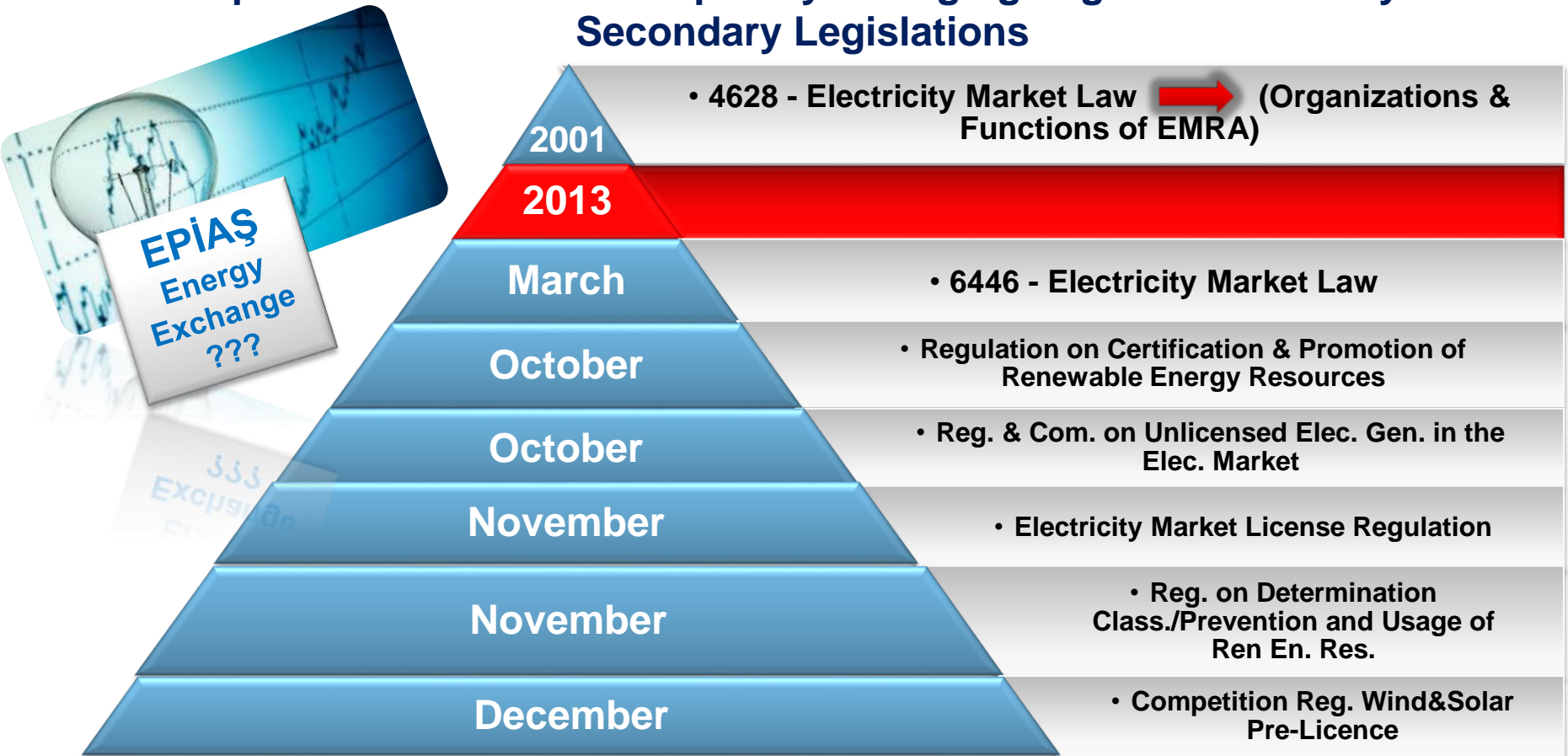
- ❖ By law, the Turkish System Operator (TEİAŞ) must give priority to grid connection requests from renewable generation facilities.
- ❖ System integration of renewable electricity medium term challenge for Turkey
- ❖ Turkey requires;
 - ❖ Increased transmission capacity,
 - ❖ Grid connections ,
 - ❖ Better grid management.



FREQUENTLY CHANGING LEGISLATIONS



Adaptation Problem for Frequently Changing Legislations: Delay in Secondary Legislations



☀ DISTANCE FROM TIMELY ACHIEVABLE TARGETS



❖ (2004) Strategy Paper on Electricity Market Reform and Privatization

❖ Reduction for limits of eligible consumers

❖ 100 % market openness ratio until 2011

❖ **However !!!**

❖ According to Turkey 2013 Progress Report (by European Commission)

❖ 85 % market openness ratio for 2013

❖ Action plan for Privatization of Distribution Companies

❖ Completion target was 2006

❖ Realized in 2013

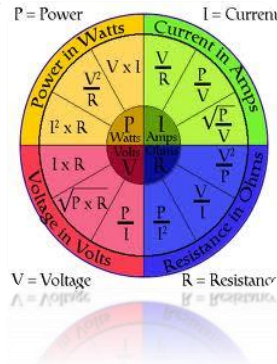


☀ HIGHLY TECHNICAL JARGON OF LEGISLATIONS



- ❖ Frequently changing legislations
- ❖ Highly technical content of energy laws / regulations / communiques

- ❖ Technical & complicated criteria
- ❖ Different interpretations
- ❖ Misperceptions
- ❖ Risks
- ❖ Contradiction
- ❖ Uncertainty



EXAMPLE

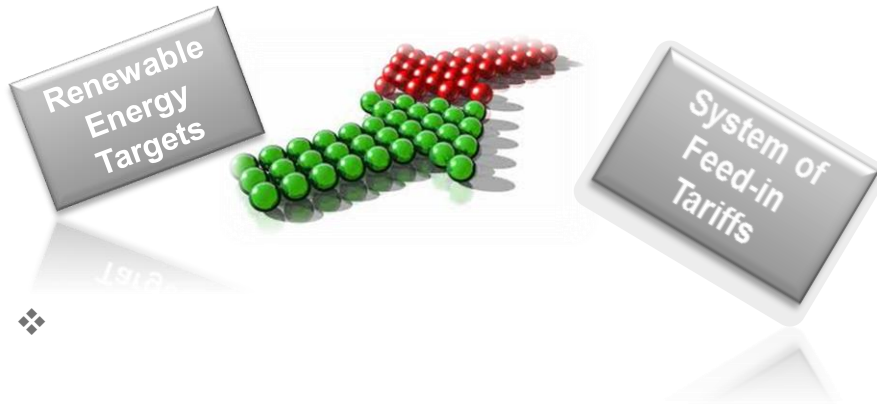


- ❖ Abolishment of Communique on **Measurement Standards** for Wind & Solar Energy based License Applications
 - ❖ 1 year measurement obligation ???
- ❖ **Link Center** (*İrtibat Merkezi*) limitations for Unlicensed Projects

☀ INADEQUATE SUPPORT MECHANISMS



- ❖ Financial support levels are insufficient to spur more rapid growth !!!



- ❖ Purchase Guarantee for 10 years
- ❖ Feed-in tariffs in other markets typically last for 20 years
- ❖ **Low level** and relatively **short duration** of feed-in tariffs as insufficient to spur development in line with the government's long-term planning goals !!!



☀ LACK OF CREDIBLE DATA & KEY SPECIALIST



Excessive
Number of
Employee



Lack of
Key
Specialist

❖ Multi-directional nature of energy projects
require different specialization

❖ But ??? In Turkey ???

❖ IEA (2013) Energy Policy Highlights

❖ Weaknesses in the infrastructure of energy
consultancy firms



SUMMARY



Harmonization among related legislations



Theoretically & Practically applicable laws and regulations



Streamlining licensing requirements / Reducing procedures / Increasing exemptions for Ren. En. Licenses



Eliminating bureaucratic barriers & Increasing coordination



Reducing project site-based problems (leasing, expropriation, etc.)




Financing facility for solar energy investments through support mechanisms, finance institutions and project finance



SUMMARY



Strengthening transmission capacity, grid connections & better grid management



Lasting legislation changes / accelerating the secondary legislation adaptation process/ high level of participation of sector players



Setting duly realizable targets & Consolidating an environment of mutual trust (government & private sector)



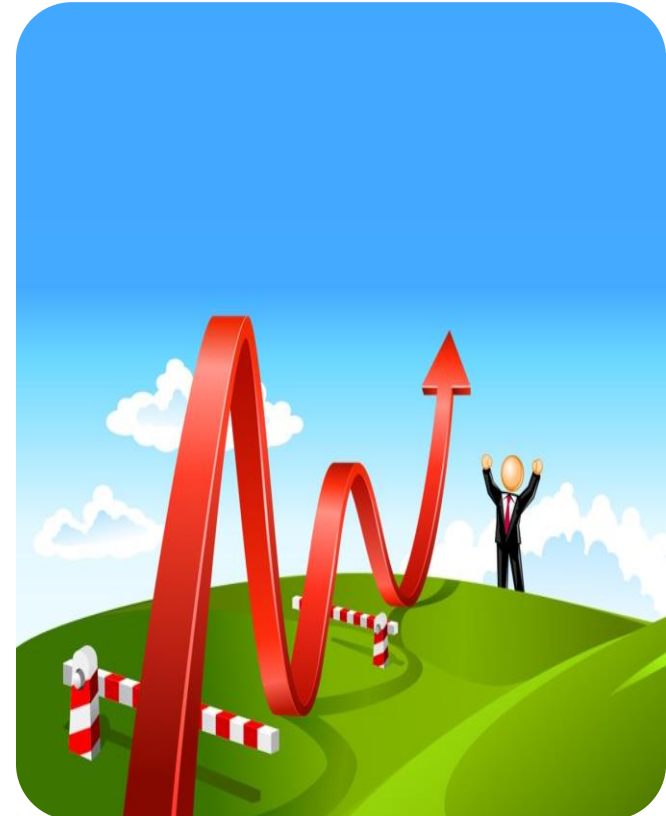
**Simplifying highly technical jargon of legislations
&
Reducing contradictory statements**



Increasing level and term of feed-in tariffs



**Defining area of specialization
&
Creating data systems with rapid access**



☀ WE BELIEVE that “The sun will be
the fuel of the future”



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