GÜYAD
Enerji Yatırımcıları Derneği

RENEWABLE ENERGY IN TURKEY

ABOUT GUYAD

- It is 5 years old Non-Government Organization, established in 2017.
- It has currently 37 members.
- All of its members are private sector legal persons.
- Its members are energy companies of the industrial groups that are among the first fifty in size in Turkey.

GUYAD MEMBERS

ABOUT GUYAD

- Our members, therefore, GUYAD represent approximately 90% of the private sector capacity in our country's renewable energy investments.
- Almost all of our members have investments abroad, too. For this reason, GUYAD closely follows the developments in the renewable energy sector abroad.
- Many of our members also cooperate with foreign direct investors in Turkey. Therefore, GUYAD has also become the voice of foreign direct investors in renewable energy.

FOUNDING PURPOSE OF GUYAD

- Compared to EU countries, Turkey and our region have an extremely favorable position in terms of all renewable energy sources, especially solar energy potentials. GUYAD was established in order to bring renewable energy investments to the place they deserve in our region.
- In this direction, for renewable energy investments, GUYAD is closely interested in creating an investment climate for both national and international investors.

FOUNDING PURPOSE OF GUYAD

- GUYAD; aims to develop environmentally compatible, predictable, innovative, competitive, concrete and applicable solutions for innovative energy technologies and green energy investments; and to contribute to the support of investments in regional energy markets, especially in Turkey, with technology, efficiency and competent human resources.
- GUYAD, contributes to the creation of renewable energy policies by making the best use of regional and sectoral potentials. It aims to create a unity of thought and action on issues such as low carbon economy, resource efficiency, waste management and combating climate change, by communicating the opinions and suggestions formed in this framework with public institutions and organizations and the public directly or indirectly through the press and other means.

FOUNDING PURPOSE OF GUYAD

- It acts as an opinion leader in the construction and protection of the investment environment for legal entities operating as an active or potential investor and operator.
- It aims to contribute to the formation, development and strengthening of exchange, derivatives and other markets that will play a role in the development of renewable energy.
- In line with the Climate Change and sustainable development goals, it aims to increase the power of renewable energy investors.

GUYAD ACTIVITIES

- It examines the sector-related studies and best practices in the world, and carries out studies on transferring the ones deemed appropriate and informing the stakeholders about these issues.
- It is in communication, joint work and cooperation activities with countries that have similar studies in the world.
- It carries out studies on energy, especially renewable energy, efficiency, alternative energy use, information generation, awareness, etc. throughout the country, and cooperates with relevant stakeholders, public and private sector organizations and non-governmental organizations.

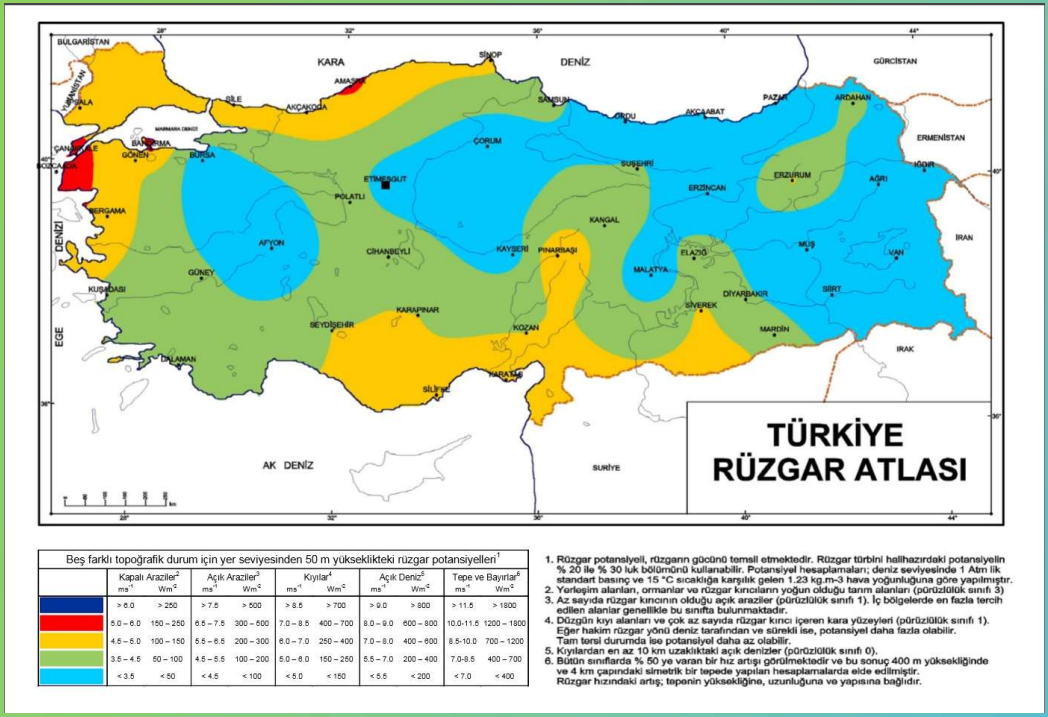
GUYAD ACTIVITIES

- It acts with the aim of establishing equitable and fair competition in the sector.
- It studies to contribute to development of and suggests new legislation within framework of a sustainable investment climate,
- In order to protect the rights and interests of investors, sector, and the public; it does all kinds of work and takes legal initiatives to eliminate deficiencies to be determined in the legislation, to improve current legislation, and even to ensure its repeal, when necessary.

WIND ENERGY

ÜLKEMİZDE ÜRETİLEN RÜZGAR ENERJİSİ VE TOPLAM ÜRETİM İÇİNDEKİ PAYLARI													
2020 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
RÜZGAR	2,400.2	2,263.9	2,164.7	2,000.3	1,544.0	1,279.8	2,662.5	2,475.7	2,108.1	1,138.5	2,338.4	2,452.3	24,828.2
TOPLAM	27,018.0	24,425.4	27,997.5	26,019.4	25,260.8	26,913.2	31,038.1	32,784.6	27,910.6	25,675.0	25,931.7	27,624.3	306,703.1
%	8.88	9.27	7.73	7.69	6.11	4.76	8.58	7.55	7.55	4.43	9.02	8.88	8.10
2021 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
RÜZGAR	2,739.6	2,498.6	2,500.9	2,323.6	2,114.7	1,627.8	3,187.7	2,717.8	2,933.0	2,662.3	2,560.6	3,460.0	31,326.6
TOPLAM	27,018.0	24,425.4	27,997.5	26,019.4	25,260.8	26,913.2	31,038.4	32,784.6	27,918.9	26,369.9	26,724.3	28,916.9	331,387.4
%	10.14	10.23	8.93	8.93	8.37	6.05	10.27	8.29	10.51	10.10	9.58	11.97	9.45

WIND ENERGY



Beş farklı topoğrafik durum için yer seviyesinden 50 m yüksekliktekı rüzgar potansiyelleri[1]

	Kapalı Araziler[2]		Açık Araziler[3]		Kıyılar[4]		Açık Deniz[5]		Tepe ve Bayırlar[6]	
	ms^{-1}	Wm^{-2}	ms^{-1}	Wm^{-2}	ms^{-1}	Wm^{-2}	ms^{-1}	Wm^{-2}	ms^{-1}	Wm^{-2}
	> 6.0	> 250	> 7.5	> 500	> 8.5	> 700	> 9.0	> 800	> 11.5	> 1800
	5.0 – 6.0	150 – 250	6.5 – 7.5	300 – 500	7.0 – 8.5	400 – 700	8.0 – 9.0	600 – 800	10.0-11.5	1200 – 1800
	4.5 – 5.0	100 – 150	5.5 – 6.5	200 – 300	6.0 – 7.0	250 – 400	7.0 – 8.0	400 – 600	8.5-10.0	700 – 1200
	3.5 – 4.5	50 – 100	4.5 – 5.5	100 – 200	5.0 – 6.0	150 – 250	5.5 – 7.0	200 – 400	7.0-8.5	400 – 700
	< 3.5	< 50	< 4.5	< 100	< 5.0	< 150	< 5.5	< 200	< 7.0	< 400

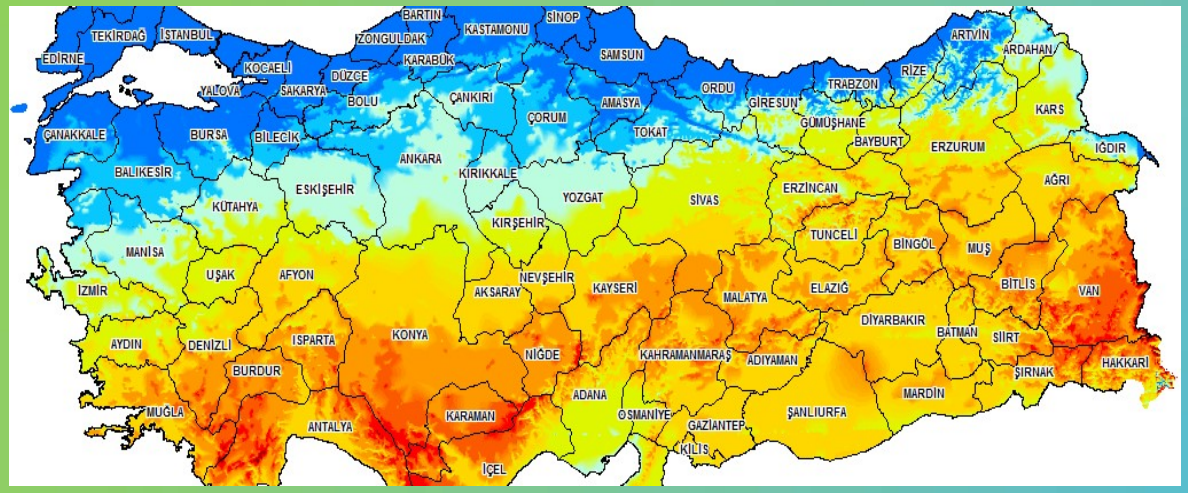
1. Rüzgar potansiyeli, rüzgarın gücünü temsil etmektedir. Rüzgar türbini hallhazırdeki potansiyelin % 20 ile % 30 luk bölümünü kullanabilir. Potansiyel hesaplamaları; deniz seviyesinde 1 Atm lik standart basınç ve 15 °C sıcaklığa karşılık gelen 1.23 kg.m-3 hava yoğunluğuna göre yapılmıştır.
2. Yerleşim alanları, ormanlar ve rüzgar kırıcıların yoğun olduğu tarım alanları (pürüzlülük sınıfı 3)
3. Az sayıda rüzgar kırıcının olduğu açık araziler (pürüzlülük sınıfı 1). İç bölgelerde en fazla tercih edilen alanlar genellikle bu sınıfta bulunmaktadır.
4. Düzgün kıyı alanları ve çok az sayıda rüzgar kırıcı içeren kara yüzeyleri (pürüzlülük sınıfı 1). Eğer hakim rüzgar yönü deniz tarafından ve sürekli ise, potansiyel daha fazla olabilir. Tam tersi durumda ise potansiyel daha az olabilir.
5. Kıyılardan en az 10 km uzaklıktaki açık denizler (pürüzlülük sınıfı 0).
6. Bütün sınıflarda % 50 ye varan bir hız artışı görülmektedir ve bu sonuç 400 m yüksekliğinde ve 4 km çapındaki simetrik bir tepede yapılan hesaplamalarda elde edilmiştir. Rüzgar hızındaki artış; tepenin yüksekliğine, uzunluğuna ve yapısına bağlıdır.

- Within the framework of the “Electricity Energy Market and Supply Security Strategy Document” prepared by our Ministry, it was aimed to increase our wind energy installed power to 20,000 MW by 2023. Later on, this target was revised and reduced to 10,000 MW.
- As of the end of January 2022, generation capacity has reached 10,682 MW.

GUYAD AIMS TO HAVE THE PUBLIC ASSUME AGAIN ITS PREVIOUSLY ANNOUNCED TARGET IN THE ELECTRIC ENERGY MARKET AND SECURITY OF SUPPLY STRATEGY DOCUMENT.

SOLAR POWER PLANTS

ÜLKEMİZDE ÜRETİLEN GÜNEŞ ENERJİSİ VE TOPLAM ÜRETİM İÇİNDEKİ PAYLARI													
2020 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
GÜNEŞ	514.1	554.9	817.9	982.3	1,113.9	1,137.6	1,264.0	1,242.6	1,068.9	940.7	728.6	584.6	10,950.2
TOPLAM	27,131.9	25,010.2	24,754.1	20,363.3	20,937.8	23,537.4	28,650.8	29,343.5	27,743.0	25,675.0	25,931.7	27,624.3	306,703.1
%	1.89	2.22	3.30	4.82	5.32	4.83	4.41	4.23	3.85	3.66	2.81	2.12	3.57
2021 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
GÜNEŞ	744.3	910.4	1,036.0	1,146.3	1,498.7	1,367.0	1,454.2	1,438.1	1,320.9	1,245.5	926.8	788.3	13,876.5
TOPLAM	27,018.0	24,425.4	27,997.5	26,019.4	25,260.8	26,913.2	31,038.4	32,784.6	27,918.9	26,369.9	26,724.3	28,916.9	331,387.4
%	2.75	3.73	3.70	4.41	5.93	5.08	4.69	4.39	4.73	4.72	3.47	2.73	4.19



Turkey is advantageous compared to most countries in terms of solar energy potential due to its geographical location.

The solar energy potential map of Turkey has been revealed on the side, based on the studies carried out by the General Directorate of Renewable Energy, using the measured sunshine duration and radiation intensity data.

Distribution of Turkey's total annual solar energy potential by regions

Below is the distribution of Turkey's total annual solar energy potential by regions. While South East Anatolia shows the highest energy potential, Black Sea shows the lowest potential. However, even the values seen in the Black Sea are higher than the regions with the highest potential in Germany. Turkey's solar energy potential and sunshine duration values by months are given in Table 3. The region that receives the most solar energy in Turkey is the Southeastern Anatolia Region, followed by the Mediterranean Region.

Bölge	Toplam Güneş Enerjisi (kWh/m²-yıl)	Güneşlenme Süresi (h/yıl)
G. Doğu Anadolu	1460	2993
Akdeniz	1390	2956
Doğu Anadolu	1365	2664
İç Anadolu	1314	2628
Ege	1304	2738
Marmara	1168	2409
Karadeniz	1120	1971

TURKEY'S MONTHLY AVERAGE SOLAR POWER POTENTIAL

Aylar	Aylık Toplam Güneş Enerjisi (kcal/cm²-ay)	(kWh/m²-ay)	Güneşlenme Süresi (h/ay)
Ocak	4,45	51,75	103
Şubat	5,44	63,27	115
Mart	8,31	96,65	165
Nisan	10,51	122,23	197
Mayıs	13,23	153,86	273
Haziran	14,51	168,75	325
Temmuz	15,08	175,38	365
Ağustos	13,62	158,4	343
Eylül	10,6	123,28	280
Kasım	5,23	60,82	157
Aralık	4,03	46,87	103
Toplam	112,74	1311	2640
Ortalama	308 kal/cm²-gün	3,6 kWh/m²-gün	7,2 h/gün

Compared to EU countries, Turkey is 3 times more advantageous than most European countries in terms of solar potential due to its geographical location.

GES INSTALLED CAPACITY (MW) AND GENERATION VALUES (GWh) IN POWER GENERATION BETWEEN THE YEARS 2014 and 2021

	GENERATION (GWh)			INSTALLED POWER (MW)			
	Licensed	Non-license	TOTAL		Licensed	Non-license	TOTAL
2014		17.4	17.4	2014		40,2	40,2
2015		194.1	194.1	2015		248.8	248.8
2016	1,043. 1	1,043. 1	1	2016		832.5	832,5
2017	24.6	2.889.3	2.913.9	2017	14,0	3.406.7	3.420.7
2018	65,6	7.604,0	7.734.2	2018	81,7	4.981,2	5.062.9
2019	194,3	9.425,9	9.620,2	2019	169,7	5.825,5	5.995,2
2020	417	10.825,5	11.242,5	2020	409,8	6.257,6	6.667,4
2021*			13.877	2021		6.907,8	7.815,6

*Temporary values as of the end of December

Source: EPİAŞ and TEİAŞ

JEOTERMAL ENERJİ

ÜLKEMİZDE ÜRETİLEN JEOTERMAL ENERJİSİ VE TOPLAM ÜRETİM İÇİNDEKİ PAYLARI

2020 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
JEOTERMAL	904.4	828.4	902.5	855.7	841.9	789.4	743.4	748.4	752.5	832.0	885.0	944.1	10,027.7
TOPLAM	27,131.9	25,010.2	24,754.1	20,363.3	20,937.8	23,537.4	28,650.8	29,343.5	27,743.0	25,675.0	25,931.7	27,624.3	306,703.1
%	3.33	3.31	3.65	4.20	4.02	3.35	2.59	2.55	2.71	3.24	3.41	3.42	3.27

2021 YILI	OCAK	ŞUBAT	MART	NİSAN	MAYIS	HAZİRAN	TEMMUZ	AĞUSTOS	EYLÜL	EKİM	KASIM	ARALIK	TOPLAM ÜRETİM (GWh)
JEOTERMAL	906.0	815.5	923.3	859.9	838.2	788.5	751.0	738.2	775.7	881.8	882.1	935.8	10,096.0
TOPLAM	27,018.0	24,425.4	27,997.5	26,019.4	25,260.8	26,913.2	31,038.4	32,784.6	27,918.9	26,369.9	26,724.3	28,916.9	331,387.4
%	3.35	3.34	3.30	3.30	3.32	2.93	2.42	2.25	2.78	3.34	3.30	3.24	3.05

JEOTERMAL ENERJİ

Since 2008, a total of 101 fields, 16 of which are suitable for electricity generation, have been transferred to the investors through tender. With the investments made in geothermal resources transferred to the investor by tender procedure by MTA, geothermal resources have become the sector that makes the biggest contribution to the economy and employment.

GEOTHERMAL ENERGY

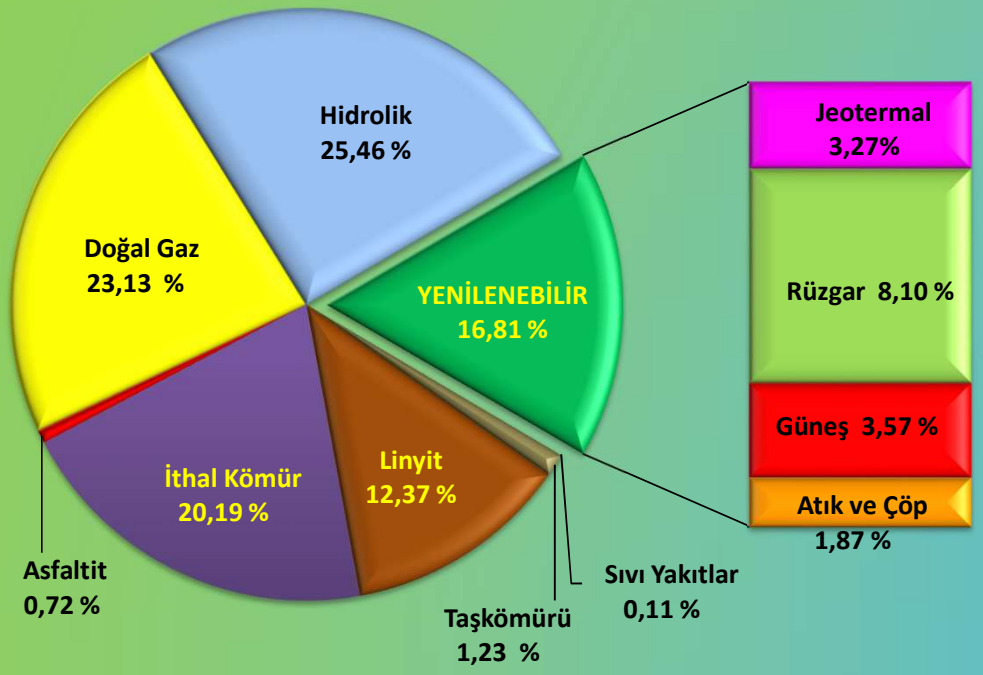
Geothermal energy is the internal heat of the earth. This heat spreads from the hot zone in the core towards the earth. According to MTA records in Turkey, it is known that there are geothermal formations in 277 areas throughout the country.

JEOTERMAL ENERJİ

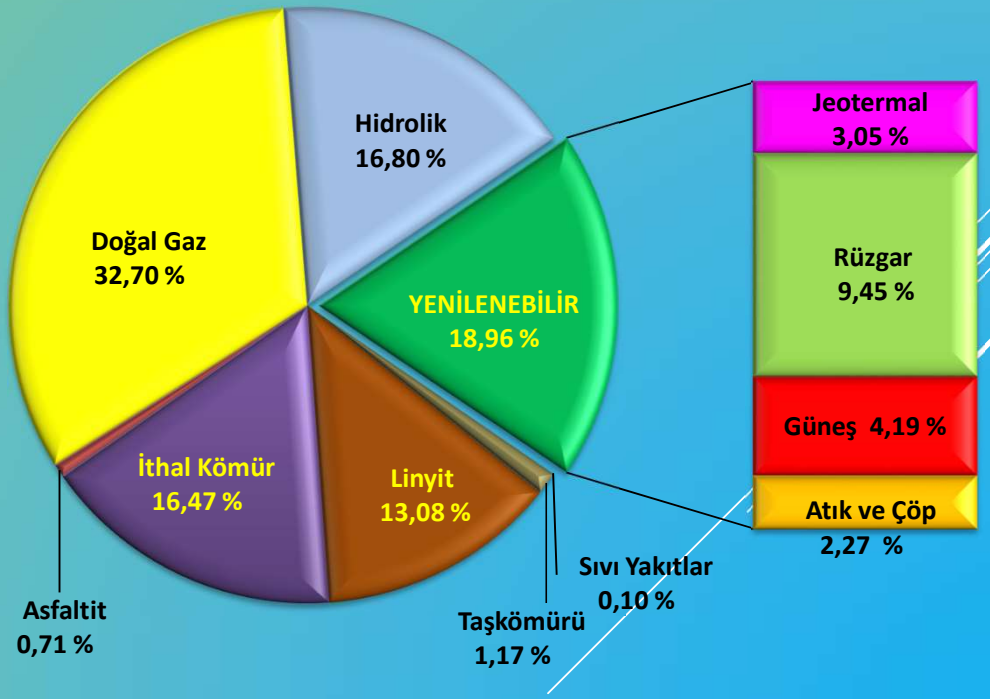
Legislation gap in this area has been eliminated after the Law No. 5686 entered into force, new incentives have been introduced, exploration works have been intensified, and as a result of this, the new fields have been transferred to the investors by the MTA General Directorate with the tender procedure, and since 2008, it has participated in the exploration works in the private sector. After these developments, there has been a great increase in geothermal investments recently.

DISTRIBUTION OF ELECTRIC ENERGY GENERATION IN OUR COUNTRY BY RESOURCES

END OF DECEMBER 2020 GENERATIONS (GWh)



END OF DECEMBER 2021 GENERATIONS (GWh)



ENERGY IN TURKEY

Total Installed Capacity of Our Country According to TEİAŞ Data as of the End of January 2022

GÜYAD
Enerji Yatırımcıları Derneği

Ocak ayı sonu itibariyle Ülkemizin Birincil Kaynaklara göre Elektrik Enerjisi Kurulu Güç Gelişimi

KAYNAKLAR	2021 YILI OCAK AYI SONU KURULU GÜÇ (MW)	2022 YILI OCAK AYI SONU KURULU GÜÇ (MW)	ARTIŞ (%)
AKARSU	8.059,9	8.217,7	1.95
ASFALTİT KÖMÜR	405,0	405,0	0.00
ATIK ISI	369,6	390,9	5.76
BARAJLI	22.933,9	23.280,3	1.51
BİYOKÜTLE	1.146,1	1.658,0	44.66
DOĞALGAZ	25.687,9	25.305,3	-1.49
FUEL OİL	305,9	251,9	-17,66
GÜNEŞ	6.805,8	7.881,1	15.79
İTHAL KÖMÜR	8.986,9	8.993,8	0.07
JEOTERMAL	1.623,9	1.676,2	3.22
LİNYİT	10.119,9	10.142,5	0.22
LNG	2,0	2,0	000
MOTORİN	1,0	1,0	0.00
NAFTA	4,7	4,7	0.00
RÜZGAR	9.007,4	10.682,8	18.60
TAŞKÖMÜR	810,8	840,8	3.70
TOPLAM	96.270,6	99.734,0	3.59

RENEWABLE ENERGY

Energy generation is made by the public and private sectors

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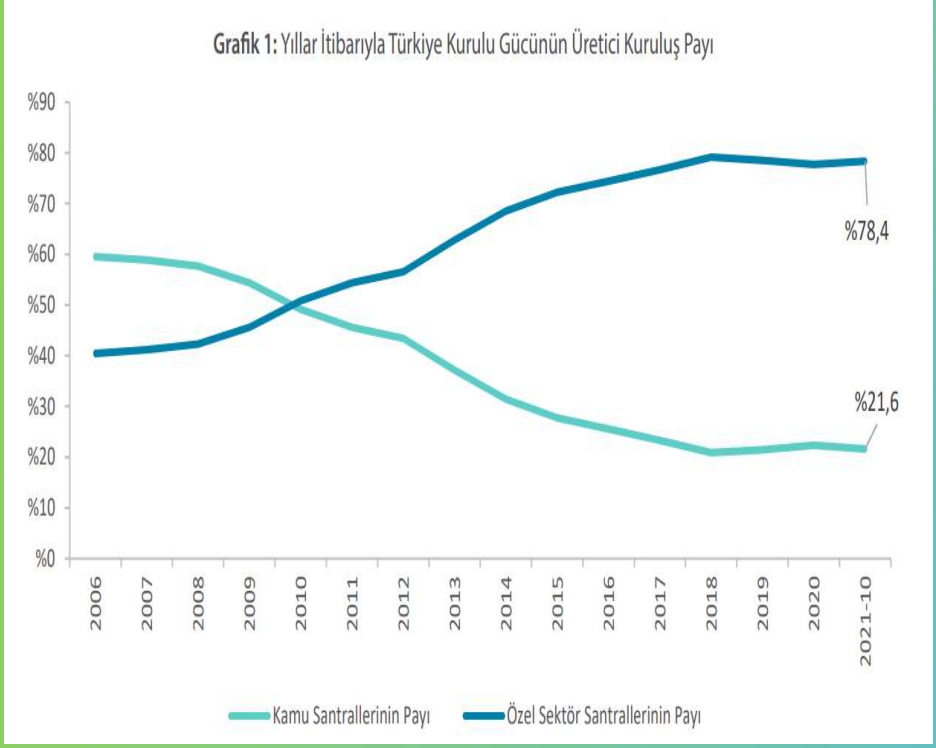
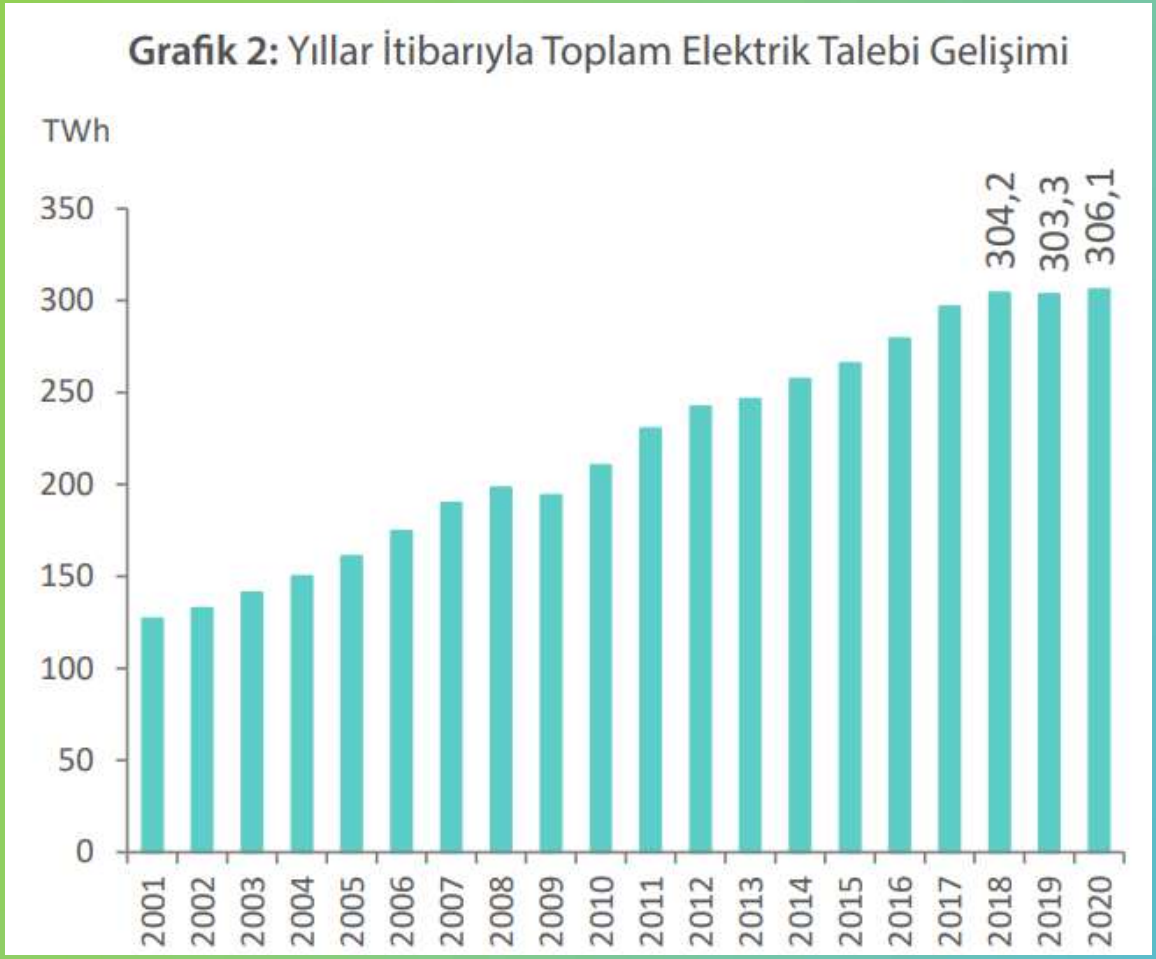


Law No. 5346 on "Use of Renewable Energy Resources for Power Generation Purposes" entered into force on May 18, 2005 in order to expand the use of renewable energy resources for the purpose of electricity generation, to bring these resources to the economy in a reliable, economical and high quality manner, to increase diversity of resources, to reduce greenhouse gas emissions, to evaluate waste, to protect the environment and to develop manufacturing sector needed for the realization of these goals.

POWER DEMAND



Turkey's total electricity demand has continuously increased between 2000-2020, except for 2001, 2009 and 2019.

While the total electricity demand was 304,2 terawatt hours (TWh) in 2018, it became 303.3 TWh as of the end of 2019.

In 2020, when the Covid-19 pandemic came to the fore,
electricity demand rose to 306.1 TWh with a limited increase of 0.9% compared to 2019.

BY THE END OF 2021, 329,633.8 (TWh) generation has been realized.

POWER GENERATION

At the end of 2021, when demand and generation records were broken, the share of electricity generated from renewable energy sources was around 36%.
The generation of 118,515 GWh was from renewable energy.

TÜRKİYE BRÜT ELEKTRİK ÜRETİMİNİN BİRİNCİL ENERJİ KAYNAKLARINA GÖRE AYLIK DAĞILIMI

Birim (Unit): GWh

2021	OCAK JANUARY	ŞUBAT FEBRUARY	MART MARCH	NİSAN APRIL	MAYIS MAY	HAZİRAN JUNE	TEMMUZ JULY	AĞUSTOS AUGUST	EYLÜL SEPTEMBER	EKİM OCTOBER	KASIM NOVEMBER	ARALIK DECEMBER	TOPLAM TOTAL
Taşkömürü + İthal Kömür+Asfaltit Hard Coal + Imported Coal	5.973,5	5.887,8	5.097,3	3.902,0	3.957,5	4.484,7	5.274,8	6.012,2	4.692,5	3.199,6	5.914,5	6.405,3	60.801,6
TERMİK THERMAL	18.322,3	16.193,3	17.337,1	13.630,5	14.999,2	18.612,6	20.597,7	23.064,4	20.026,8	18.305,7	19.249,4	20.255,1	220.594,1
Sıvı Yakıtlar Liquid Fuels	25,9	25,2	28,4	26,7	28,7	29,8	30,8	26,7	29,0	31,7	27,2	26,7	336,7
Doğal Gaz +Lng Naturl Gas +Lng	8.332,2	6.638,3	8.149,3	5.650,9	6.949,9	9.885,5	11.023,3	12.573,9	10.805,7	10.689,3	8.681,8	9.058,7	108.438,7
Yenilenebilir + Atık Renew and Wastes	559,8	547,8	601,0	593,3	621,655	617,592	637,822	669,6	670,9	701,1	695,1	701,0	7.616,6
HİDROLİK HYDRO	4.306,3	4.007,6	6.200,2	8.059,1	5.810,0	4.517,3	5.047,6	4.826,1	2.862,5	3.274,7	3.110,3	3.673,6	55.695,2
JEOTERMAL + RÜZGAR+GÜNEŞ GEOTHERMAL + WIND +SOLAR	4.389,5	4.224,5	4.460,2	4.329,8	4.451,7	3.783,4	5.393,1	4.894,1	5.029,6	4.789,6	4.372,8	5.084,5	55.202,6
BRÜT ÜRETİM GROSS GENERATION	27.018,0	24.425,4	27.997,5	26.019,4	25.260,8	26.913,2	31.038,4	32.784,6	27.918,9	26.369,9	26.732,5	29.013,2	331.491,9
DIŞ ALIM IMPORTS	65,6	83,8	91,3	88,8	213,5	222,1	115,4	197,0	223,8	362,6	298,2	366,9	2.329,0
DIŞ SATIM EXPORTS	164,3	224,4	367,5	301,7	333,9	324,1	459,2	440,1	472,6	414,0	354,7	330,6	4.187,1
BRÜT TALEP GROSS DEMAND	26.919,4	24.284,8	27.721,3	25.806,4	25.140,4	26.811,2	30.694,6	32.541,6	27.670,2	26.318,5	26.676,0	29.049,5	329.633,8

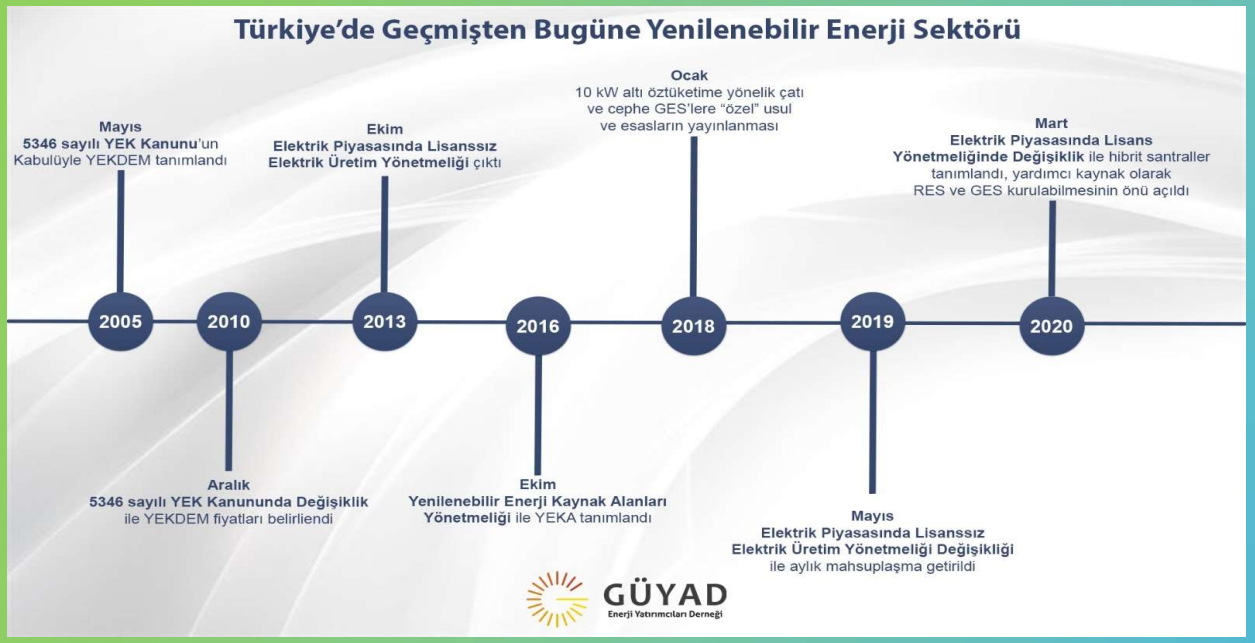
*2021 yılına ilişkin miktarlar kesinleşmemiş geçici verilerdir.

POWER GENERATION

As of the end of December 2021, it has become 99,819 MW in total according to the source and installed power.

BİRİNCİL KAYNAKLARA GÖRE SANTRAL ADETLERİ VE KURULU GÜÇ		
BİRİNCİL KAYNAK	SANTRAL ADEDİ	KURULU GÜÇ (MW)
AKARSU	604	8.212,2
ASFALTİT KÖMÜR	1	405,0
ATIK ISI	94	390,9
BARAJLI	141	23.280,4
BİYOKÜTLE	380	1.644,5
DOĞALGAZ	352	25.573,6
FUEL OİL	9	251,9
GÜNEŞ	8.389	7.815,6
İTHAL KÖMÜR	15	8.993,8
JEOTERMAL	63	1.676,2
LİNYİT	47	10.119,9
LNG	1	2,0
MOTORİN	1	1,0
NAFTA	1	4,7
RÜZGAR	355	10.607,0
TAŞKÖMÜR	4	840,8
TOPLAM	10.457	99.819,6

▸REGULATORY DEVELOPMENT OF THE RENEWABLE ENERGY SECTOR IN TURKEY



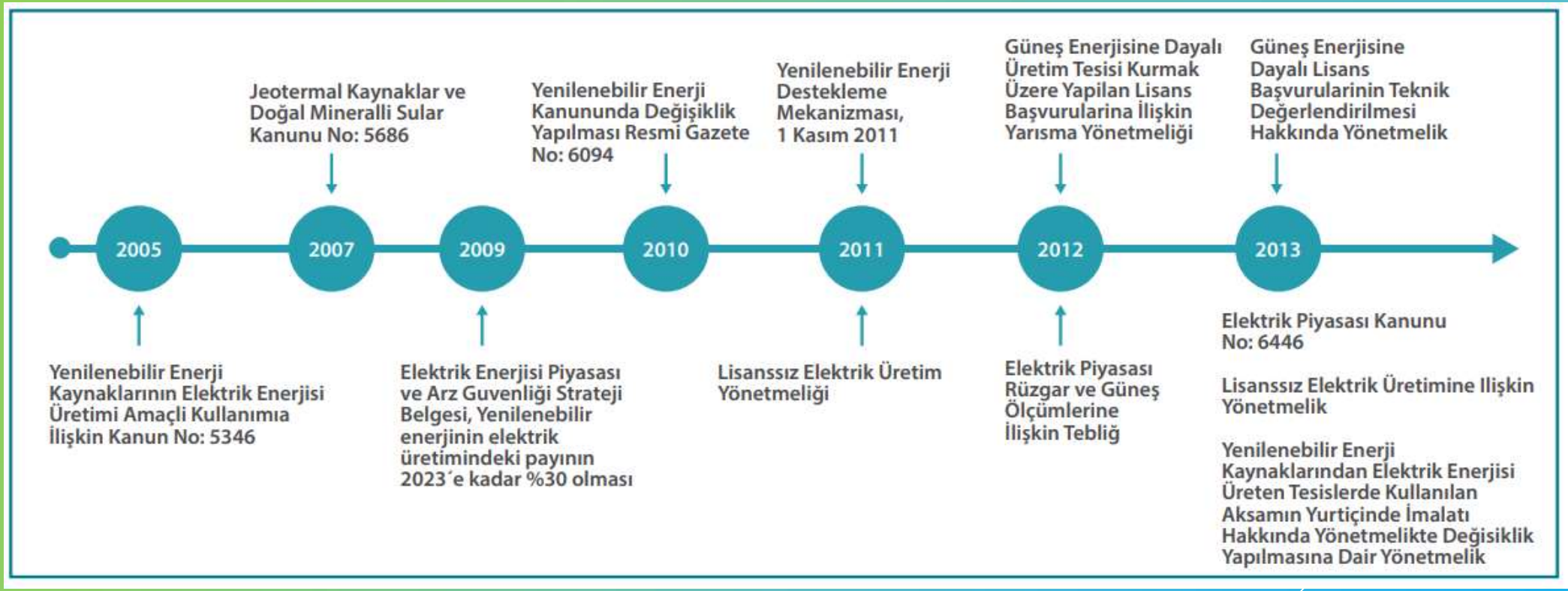
▸Renewable energy generation is made through two different types of generation, licensed and unlicensed.

▸

Licensed generation is for energy trade, and unlicensed generation is for self-consumption.

▸Hybrid installations are also permitted in licensed production.

▸Hybrid installations are done by connecting an auxiliary source to the main source in order to use the same line and infrastructure more efficiently.


2005
Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçli Kullanımıa İlişkin Kanun No: 5346
2007
Jeotermal Kaynaklar ve Doğal Mineralli Sular Kanunu No: 5686
2009
Elektrik Enerjisi Piyasası ve Arz Guvenliği Strateji Belgesi, Yenilenebilir enerjinin elektrik üretimindeki payının 2023´e kadar %30 olması
2010
Yenilenebilir Enerji Kanununda Değişiklik Yapılması Resmi Gazete No: 6094
2011
Yenilenebilir Enerji Destekleme Mekanizması, 1 Kasım 2011
Lisanssız Elektrik Üretim Yönetmeliği
2012
Güneş Enerjisine Dayalı Üretim Tesisi Kurmak Üzere Yapilan Lisans Başvurularina İlişkin Yarısma Yönetmeliği
Elektrik Piyasası Rüzgar ve Güneş Ölçümlerine İlişkin Tebliğ
2013
Güneş Enerjisine Dayalı Lisans Başvurularinin Teknik Değerlendirilmesi Hakkında Yönetmelik
Elektrik Piyasası Kanunu No: 6446
Lisanssız Elektrik Üretimine Ilişkin Yönetmelik
Yenilenebilir Enerji Kaynaklarından Elektrik Enerjisi Üreten Tesislerde Kullanılan Aksamın Yurtiçinde İmalatı Hakkında Yönetmelikte Değisiklik Yapılmasına Dair Yönetmelik

RENEWABLE POWER GENERATION

Applications to EMRA to generate electricity from renewable resources have increased significantly after the Law No.
5346 on the Use of Renewable Energy Resources for the Purpose of Electricity Generation (REL Law) came into force in 2005. REL Law introduced some conveniences in land acquisition and use of public goods, as well as purchase guarantee of electrical power generated from renewable resources at a fixed price for 10 years.

The REL Law has been amended 5 times since 2005, the most comprehensive of which is the Law No. 6094 dated 8 January 2011. With this amendment, different support prices were determined on the basis of resources, and the transition year of the production facilities to be supported was postponed to the end of 2015.

Furthermore, in addition to the current purchase guarantee figures, raising the guaranteed purchase price in case the electro-mechanical components to be used in the said facilities are manufactured in Turkey is also defined as a separate incentive element.

LICENSED RENEWABLE POWER GENERATION
Installed Power of Licensed YEKDEM Plants by Years (MW)

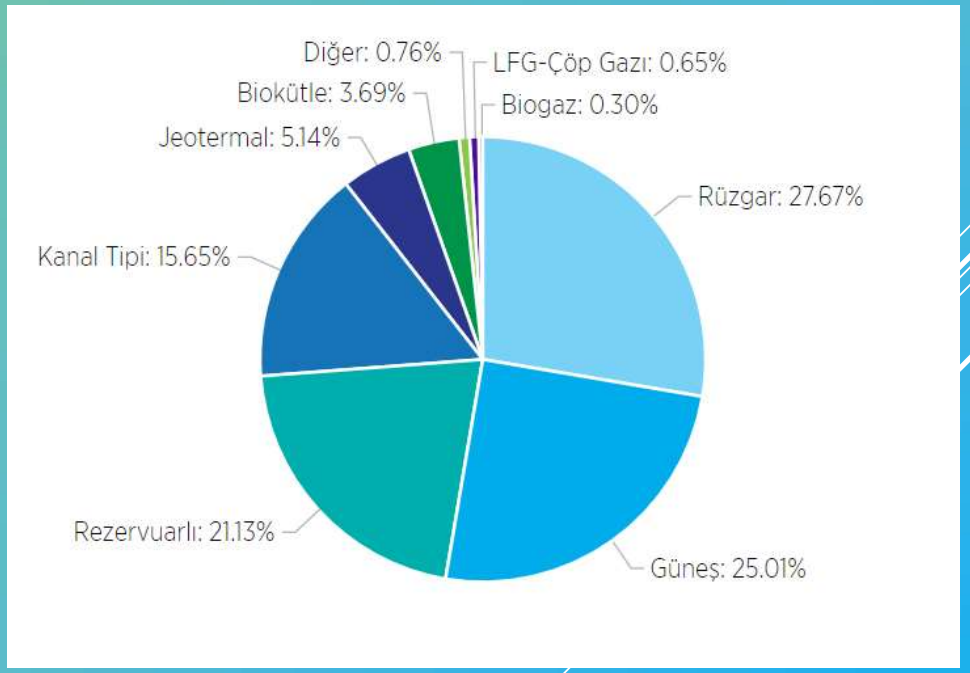
Type	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Solar	-	-	-	-	-	-	12.9	13.9	81.7	162.7
Hydraulic	21	930	217	598	2,116.3	9,960.0	11,096.3	11,706.4	12,588.5	12,434.7
Wind	469	685	76	825	2,732.1	4,319.8	5,238.7	6,200.0	6,495.6	6,440.0
Geothermal	72	72	140	228	389.9	599.2	752.1	996.8	1,252.7	1,437.5
Bio-mass	45	73	101	147	185.2	203.7	300.0	349.2	503.1	671.2
Grand Total	**608**	**1,760**	**534**	**1,798**	**5,423.6**	**15,082.7**	**17,399.9**	**19,266.3**	**20,921.5**	**21,146.1**

Annual Generation Figures of YEKDEM Participants by Years (MWh)

Type	2013	2014	2015	2016	2017	2018	2019	2020
Solar	-	-	-	-	24269	39,140	159,961	375,476
Unlicensed	884	29,316	223,537	1,134,023	2,997,551	8,078,418	9,830,849	11,229,723
Hydraulic	528427	1,072,832	5,651,215	16,212,717	17,213,394	27,369,727	36,961,886	29,671,021
Wind	223243	2,378,819	8,275,992	14,163,402	16,765,418	19,002,863	19,900,973	20,658,797
Geothermal	857527	1,436,579	2,710,856	3,706,764	4,503,345	5,968,202	6,997,209	7,816,509
Bio-mass	750,715	957,223	1,082,913	10,613,594	8,992,792	2,047,082	2,817,209	3,730,699
Grand Total	**2,360,795**	**5,874,769**	**17,944,514**	**45,830,502**	**50,496,769**	**62,505,431**	**76,668,087**	**73,482,227**

Installed Power of Licensed-Unlicensed YEKDEM Plants as of 15.02.2022 (MW)

Kaynak	Lisanslı Kurulu Güç(MW)	Lisanssız Kurulu Güç(MW)	Toplam(MW)
Rüzgar	8.461,10	52,72	8.513,82
Güneş	935,29	6.762,16	7.697,46
Rezervuarlı	6.501,70	0,00	6.501,70
Kanal Tipi	4.800,98	14,66	4.815,64
Jeotermal	1.581,96	0,00	1.581,96
Biokütle	1.098,55	36,74	1.135,29
Diğer	0,00	235,37	235,37
LFG-Çöp Gazı	199,96	0,00	199,96
Biogaz	60,33	33,02	93,36
Toplam	23.639,88	7.134,68	30.774,56



▸UNLICENSED GENERATION

KAYNAK	KURULU GÜCÜ (MW)
GES	6907.78
DG	237.06
BİYOKÜTLE, ATIK ISI	315.10
RES	73.08
HES	13.98
TOPLAM	7547

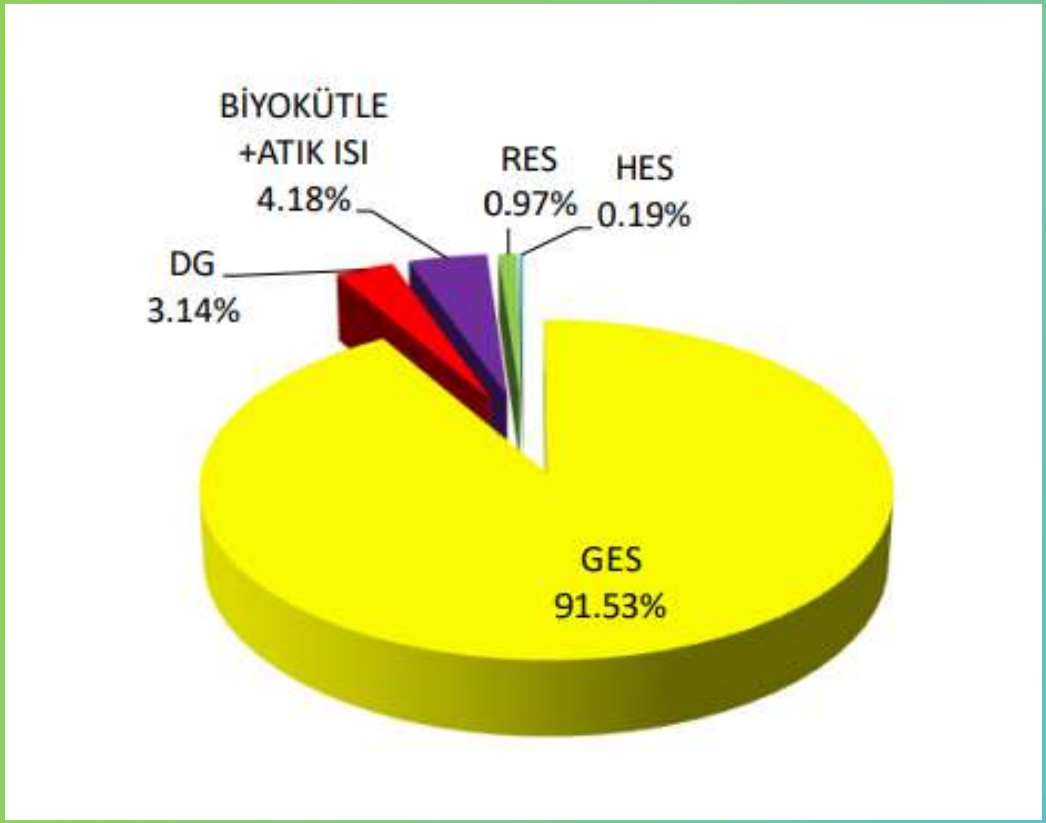
▸Unlicensed electricity generation regulation, which came into effect at the end of 2010, allowed establishment and operation of unlicensed power plants at the upper limit of 500 kilowatts (kW) and regardless of the consumption or power of the associated consumption facility.

▸In March 2013, the upper limit was increased to 1 MW. Although there is a guarantee of purchasing for the excess energy generated for 10 years at a fixed price, expropriation and use of public goods are not possible.

▸This accelerated unlicensed investments and enabled them to be established in a distributed manner in many regions.

▸In May 2019, with the Presidential Decision, the upper limit of installed power of generation facilities based on renewable energy sources that can operate without a license was increased from 1 MW to 5 MW.

▸UNLICENSED GENERATION



Capacity ratios of unlicensed power plants

Within scope of the Decree, the principle that the installed power is limited to the power of the connection agreement of the consumption facility and that the production and consumption are at the same measurement point has been adopted.

Accordingly it has been decided to apply the retail one-time active energy price of its own subscriber group, announced by EMRA, for the surplus electricity produced in the electricity generation facilities based on solar and other renewable energy sources with roof and facade application, for a period of 10 years from the date of operation of the facility.

11. DEVELOPMENT PLAN TARGETS

Tablo 27: Enerji Sektörü Hedefleri

	2018[1]	2023
Birincil Enerji Talebi (BTEP)	147.955	174.279
Elektrik Enerjisi Talebi (TWh)	303,3	375,8
Kişi Başı Birincil Enerji Tüketimi (TEP/Kişi)	1,81	2,01
Kişi Başı Elektrik Enerjisi Tüketimi (kWh/Kişi)	3.698	4.324
Doğal Gazın Elektrik Üretimindeki Payı (%)	29,85	20,7
Yenilenebilir Kaynakların Elektrik Üretimindeki Payı (%)	32,5	38,8
Yerli Kaynaklardan Üretilen Elektrik Enerjisi Miktarı (TWh)	150,0	219,5
Elektrik Kurulu Gücü (MW)	88.551	109.474

Kaynak: 2018 yılı verileri Enerji ve Tabii Kaynaklar Bakanlığı ve TEİAŞ'a aittir. 2023 yılı verileri On Birinci Kalkınma Planı tahminleridir.
Not: TEP: Ton Eşdeğer Petrol, BTEP: Bin TEP, kWh: Kilowatt-saat, TWh: Milyar Kilowatt-saat, MW: Megawatt.
(1) Elektrik kurulu gücü haricindeki 2018 yılı verileri gerçekleşme tahminleridir.

11. In accordance with the Development Plan, it is planned to increase the share of renewable energy in production to 38.8%.

Considering that the share of renewable energy in production is approximately 30% in 2021 data, intensive investment is needed to reach this target for approximately 2023.

GUYAD; IS WORKING TO ACHIEVE THE OBJECTIVES OF THE 11TH DEVELOPMENT PLAN.

YEAR 2022 – ANNUAL PRESIDENCY PLAN

ÜRETİM	**GWh**	**211 208**	**261 783**	**303 898**	**306 703**	**324 528**	**334 253**
TERMİK	**GWh**	**155 370**	**177 608**	**170 518**	**177 066**	**210 990**	**201 796**
Yerli Kömür	GWh	40 515	36 180	52 499	43 306	49 722	50 571
İthal Kömür	GWh	14 532	39 986	60 395	62 506	61 759	70 410
Doğal Gaz	GWh	98 144	99 219	57 288	70 931	99 189	80 451
Diğer (3)	GWh	2 180	2 224	336	323	320	363
YENİLENEBİLİR	**GWh**	**55 838**	**84 175**	**133 379**	**129 637**	**113 538**	**132 457**
Hidrolik	GWh	51 795	67 146	88 823	78 094	53 053	66 867
Rüzgâr	GWh	2 916	11 652	21 731	24 828	29 137	30 643
Güneş	GWh	0	194	9 250	10 950	13 211	15 680
Diğer (4)	GWh	1 126	5 183	13 576	15 764	18 137	19 267
İTHALAT	**GWh**	**1 144**	**7 136**	**2 212**	**1 890**	**1 290**	**2 303**
İHRACAT	**GWh**	**1 918**	**3 194**	**2 789**	**2 484**	**3 317**	**2 303**
TÜKETİM	**GWh**	**210 434**	**265 724**	**303 320**	**306 109**	**322 501**	**334 253**

Kaynak: Enerji ve Tabii Kaynaklar Bakanlığı
(1) Gerçekleşme Tahmini
(2) Program
(3) Fuel-Oil, Motorin, LPG, Nafta vb.
(4) Biyokütle, Jeotermal, Atık Isı

Considering that 329,633.8 (GWh) production has been realized by the end of 2021 and the growth forecasts are 5% according to the annual program of the presidency, it will be revealed that we need approximately 347,000 GWh of energy for 2022.

Intense investment is needed.

GUYAD IS WORKING ON INVESTMENTS TO ACHIEVE THE DESIRED LEVEL.

YEAR 2022 – ANNUAL PRESIDENCY PLAN

d) Hedefler

Performans Göstergeleri	Birim	2020	2021 (1)	2022 (2)
Birincil Enerji Talebi	BTEP	145 500 (1)	152 000	156 000
Elektrik Enerjisi Talebi	TWh	306,1	322,5	334,3
Kişi Başı Birincil Enerji Tüketimi	TEP/Kişi	1,74 (1)	1,79	1,82
Kişi Başı Elektrik Enerjisi Tüketimi	kWh/Kişi	3 661	3 798	3 891
Doğal Gazın Elektrik Üretimindeki Payı	Yüzde	23,1	30,6	24,1
Yenilenebilir Kaynakların Elektrik Üretimindeki Payı	Yüzde	42,3	35	39,6
Yerli Kaynaklardan Üretilen Elektrik Enerjisi Miktarı	TWh	174,8	165,4	185
Elektrik Kurulu Gücü	MW	95 891	100 607	102 423

Kaynak: Enerji ve Tabii Kaynaklar Bakanlığı
Not: TEP: Ton Eşdeğer Petrol, BTEP: Bin TEP, kWh: Kilowatt-saat, TWh: Milyar Kilowatt-saat, MW: Megawatt.
(1) Gerçekleşme Tahmini
(2) Program

In order to produce approximately 40% of the required energy from renewable sources, approximately 139,000 GWh of energy must be produced from renewable energy sources.

According to this calculation, approximately 20,000 GWh of renewable energy generation will be needed for 2022, which will be considered to have produced 118,513 GWh in 2021.

This necessitates the commissioning of new capacities.

GUYAD IS WORKING TO CREATE NEW CAPACITIES.

TURKEY;

IS A COUNTRY WHOSE ECONOMIC GROWTH DATA IS IN A PROMISING POSITION, ACCORDING TO ITS DEMAND AND TARGET DATA.

RENEWABLE ENERGY INVESTMENTS ARE THE BASIS OF A SUSTAINABLE ECONOMY.

GÜYAD
Enerji Yatırımcıları Derneği

THANK YOU