



**Research and Recommendation Report for Energy
Conversion Strategy in Türkiye
Second Quarter-2023**

Government Relations Department

Developments for Second Quarter of 2023 cover the period of April-July.

1. Introduction	4
Current Developments in the Field of Renewable Energy Sources.....	5
1.1. Renewable Energy Sources Future Projection	7
1.2. Licensed Electricity Production Investments License (Preliminary License and Production License) Process.....	8
1.3. Information and Documentation Required to be Submitted to Apply for Preliminary License for GES and RES.....	8
1.4. Procedures Required to be Completed During the Preliminary License Period	10
1.5. Documentation Required to be Submitted to Apply for Production License for GES and RES	12
1.6. Processes for Permit and Approval for Electricity Production from Renewable Sources	13
1.7. Process for Unlicensed Electricity Production through Solar and Wind Energy Sources	14
1.7.1. EIA Process	15
1.8. Agricultural Land Investment Permit	17
1.9. Forestry Land Investment Permit	17
1.10. Public Land Investment Permit	18
1.11. Zoning Plan Process.....	19
1.12. Environmental Permit and License Process	19
1.13. Incentives for Renewable Energy Sources	20
2. GES and RES as part of EMRA Activity Report for 2020	21
3. GES and RES Regulations	23
3.1. Applicable Laws	23
3.1.1. Electricity Market Law Nr. 6446	23
3.1.2 Law Nr. 5446 on Use of Renewable Energy Sources for Electric Power Production Purposes....	24
3.1.3. Law Nr. 6408 on Amendment to the Electricity Market Law and the Special Consumption Tax Law	24
3.2. Applicable Regulations.....	25
4. Energy Storage in Türkiye	26
4.1. Regulation on Energy Storage in Türkiye	31
5. Statutory Regulations of Foreign Countries Regarding Energy Storage	34
5.1. Current Developments in Energy Storage.....	34
5.2. Regulations, Financing Models and Strategies of Leading Countries in Energy Storage Sector.....	35
5.3. Statutory Regulations of Other Foreign Countries Regarding Energy Storage	48
6. Hydrogen and Hydrogen Production	49
6.1. Foreign Country Strategy Regarding Hydrogen Energy	52
6.1.1 United Kingdom Hydrogen Energy Strategy.....	52
6.1.2. European Union Hydrogen Energy Strategy	53
6.2. Green Hydrogen and Blue Hydrogen Energy	54
7. Carbon Capture and Carbon Pricing and Tax	55
7.1. Carbon Border Adjustment Mechanism (SKDM)	55
7.2. Carbon Capture and Carbon Pricing and Tax in Türkiye	58
8. Reference Links	62

List of Abbreviations

CCUS	: Carbon Capture, Utilization and Storage
COP	: Climate Change Conference
CED	: Environmental Impact Assessment
DSI	: General Directorate of State Hydraulic Works
EIGM	: General Directorate of Energy Enterprises
EMRA/Authority	: Energy Market Regulatory Authority
EPLUUY	: Regulation on Unlicensed Electricity Production in Electricity Market
ETS	: Emission Trading System
GES	: Solar Power Plant
Board	: Energy Market Regulatory Board
PTD	: Project Introduction File
RES	: Wind Power Plant
SAYEM	: Industry Innovation Network Mechanism
TEIAS	: Turkiye Elektirik İletim Anonim Sirketi
TOE	: Tons of Oil Equivalent
IEA	: International Energy Agency
YEK	: Renewable Energy Law
YEKDEM	: Renewable Energy Sources Support Mechanism
YEK-G	: Renewable Energy Sources Guarantee System

List of Tables

Table.1 Licensed Electricity Production Investments License (Preliminary License and Production License) Process

Table.2 Preliminary License Process

Table.3 Process for Unlicensed Electricity Production through Solar and Wind Energy Sources

Table.4.1. Wind Energy Sources EIA Process

Table 4.2. Solar Energy Sources EIA Process

Table.5 Environmental Permit and License Process

Table.6 Applicable Regulations

Table.7 Applicable Communiqués

Table.8 Global Investments in Energy Storage

1. Introduction

The developing/changing energy platforms and regulatory developments regarding the sustainability and energy conversion are closely monitored by SOCAR Türkiye Public Relations Group Directorate. This report has been drawn up by the Public Relations Group Directorate as part of the energy conversion strategy.

The legal basis for renewable energy in Türkiye has been established through the YEK Nr. 5346 that has been issued in 2005. The renewable energy sources, examples of which have been seen around the world since the 1980s, are now widely operating in Türkiye, and they are used at a rate above the world average. Based on the installed capacity report, which is published by TEIAS, and which includes the year-end data for 2022, there is 9,425.4 MW GES and 11,396.2 MW RES installed power in Türkiye. The investments in the renewable energy sources have increased worldwide, as in Türkiye, and this has also revealed the need to regulate the renewable energy market.

By examining the relevant laws, regulations and communiqués under the umbrella of the renewable energy regulations, the draft regulatory guide, governing the Solar Energy Power Plants "GES" and Wind Power Plants "RES" and "Energy Storage" activities, is provided for your information as follows. During preparation of this study, a detailed literature review has been conducted, especially the "Energy Sector Investment Processes Guide", which has been drawn up by the Presidential Investment Office in 2020 along with the relevant regulations, and which has been updated by taking our opinions. It is required to fulfill the terms and conditions, as specified by the EMRA, in order to establish the production sites that produce electricity from the renewable sources. The facilities, which will produce electricity from the renewable sources, may operate with or without a license. While the facilities, which produce electricity from the conventional sources, may not operate without a license, the activities for production of electricity from the renewable energy sources may also be carried out without a license.

Accordingly, in accordance with the Presidential Decree Nr. 30770, dated 10.05.2019, the unlicensed electricity production from the renewable energy sources may be carried out for the projects whose installed power is up to 5 MW. Thus, the electricity production activities, which have low production capacity, however, which are obtained from the renewable energy sources, are encouraged.

Q2 (covers the period of April 2023-July 2023.)

Also, the term "hybrid facility" has been regulated as the "United Renewable Electricity Production Facility" under our regulations in accordance with the Regulation on Amendment to the Electricity Market License Regulation as promulgated on the Official Journal, dated 08/03/2020.

Based on the relevant regulation, it is possible to establish the hybrid facilities, which can produce electricity from multiple energy sources, provided that they are connected to the grid at the same connection point. Accordingly, the "United renewable electricity production facility (Hybrid Energy Facility)" means "a single electricity production facility established in order to produce electricity from multiple energy sources, all of which are of renewable nature, and which are connected to the grid at the same connection point."

It is possible to convert the facility, which is subject to the production license, into a multi-source electricity production facility in accordance with the provision 24/17/a as prescribed under the Electricity Market License Regulation. It has been regulated under these regulations that the area, which has been incorporated in the license, is required not to be exceeded as per the application for amendment to license. Thus, it is possible to build another renewable energy facility on the area in which the energy site is located.

In consequence of the license applications to be filed to the EMRA, the companies that will perform production are licensed upon the approval of the EMRA. The terms and conditions, which are determined by the contracting entity, are required to be fulfilled in order to produce electricity from the renewable sources under the license. The licenses, which are issued by the EMRA, are regulated under the Electricity Market Law Nr. 6446, and they are audited as per the other regulatory mechanisms. In addition to such law, the regulatory procedures are carried out under the Law Nr. 5346 on Use of Renewable Energy Sources for Electric Power Production Purposes, which will also be included in the guide.

Q2 (covers the period of April 2023-July 2023.)

Current Developments in the Field of Renewable Energy Sources

Based on the IEA report for 2023, the global renewable capacity additions are expected to increase, by 107 gigawatts, (GW) to above 440 GW, which constitutes the largest absolute increase ever, in 2023. This figure is equivalent to more than the total installed power capacity of Germany and Spain. This unprecedented growth occurs through the expanding policy support, the increasing energy security concerns, and improving the competitiveness against the fossil fuel alternatives.

Solar Energy

The solar capacity, including both large- and small-scale distributed systems, constitutes the two-thirds (2/3) of the increase that is estimated in the global renewable capacity this year. In response to the high electricity prices caused by the global energy crisis, the alternates to the fossil fuels imported, which may increase the energy security, are sought in many countries, especially in Europe. Such changing focus has created a favorable environment for Photovoltaic (PV) solar energy, especially for residential and commercial systems, that may be installed rapidly in order to meet the increasing demand for renewable energy.

Wind Energy

After two consecutive years of decrease in the wind power, the onshore wind capacity additions are about to increase 70% and to reach 107 GW, which is the all-time record, in 2023. The main reason thereof is commissioning of the projects, which have been postponed in China following the Covid-19 restrictions in previous years. The faster expansion is also expected in Europe and the United States in consequence of the supply chain challenges that drive commissioning of the projects from 2022 to 2023. On the other hand, the offshore wind growth is not expected to recapture the record growth, which has been achieved two years ago, due to the low volume of the projects that are under development outside China.

In case of being accelerated globally, the global renewable capacity additions may reach 550 GW, which almost 20% higher than the main estimate, in 2024. This is primarily resulted from faster deployment of the residential and commercial PV installations, by assuming that the latest policies and incentives are implemented more rapidly. In respect of the outlook for the Renewable Energy, a new market update has been published by the IEA in 2023 and 2024. While determining the grid scale, the positive side of the onshore wind and solar energy projects is considered to be the fact that the projects, which are under development, are mostly dependent on receipt of permit, construction and timely connection to the grid connection.

Biofuels

The biofuels will prevent the consumption of 2 million barrels of oil equivalent per day (mboe/d) in 2022. This figure is equivalent to 4% of the oil demand of the global transportation sector. Argentina, India and Indonesia have accelerated the use of biofuels in 2022. However, although the biofuels offer energy security advantages, their prices are increasing faster than gasoline and diesel in many countries. Such countries as Brazil, Sweden and Finland have postponed the increases, intended, in the biofuel blending obligations in 2022 in order to reduce the increases in the transportation fuel costs. An 11% increase in demand is expected for biofuels, which are supported through the existing policies that include the energy security targets, until 2024. Only Indonesia and Brazil accelerate the deployment until 2024. It is unlikely for the new policies to impact the production in the advanced economies until after 2024 due to the fact that the high prices, raw material concerns and technical restrictions limit the potential for additional growth.

China

The contribution of China to the global renewable capacity additions is expected to increase in 2023 and 2024, and to reinforce the position thereof as the undisputed leader in the global deployment. In 2022, China has constituted almost half of the entire new renewable energy capacity throughout the world. Until 2024, the share of the country is expected to reach a record of approximately 55% with respect to the global annual renewable capacity deployment. Until 2024, China will complete almost 70% of the entire new offshore wind projects throughout the world, as well as more than 60% of the onshore wind projects and 50% of the solar PV projects.

Europe

It is estimated that European Union electricity consumers will save approximately 100 billion Euros during the period of 2021-2023, thanks to the solar energy and wind capacity that has been installed recently. The steps taken in order to accelerate deployment of the renewable energy in Europe since 2021 have mitigated the economic impact of the energy crisis. The low-cost wind and solar energy will replace the expensive fossil fuel production during the period of 2021-2023, and it will help the wholesale electricity prices to be reduced in any and all European markets. Without such capacity additions, the average wholesale price of the electricity in the EU would be 8% higher in 2022, and it would cause damages to the consumers, businesses and governmental budgets.

India

The renewable capacity additions of India are expected to increase again in 2023 and 2024, thanks to deployment of the wind, hydroelectric and distributed solar energy. However, the public-service-scale solar projects, which constitute the largest renewable electricity growth element in India, are expected to slow for a short period of time this year due to the supply chain difficulties, lower bidding volumes and commercial policies. While the large-scale PV production occurs in India, the import tariffs cause the short-term demand and supply inconsistencies.

1.1. Renewable Energy Sources Future Projection

- The Strategic Plan of the Ministry of Energy and Natural Resources for 2019-2023 has been published by the Ministry in 2019, and the renewable energy sources have been included significantly in the plan. The first target of the plan is "to ensure the sustainable energy supply security", and the next target thereof is "to increase the ratio of the installed power for electricity, which is based on the domestic and renewable energy sources, to the total power from 59% to 65%". 25% of the relevant target constitutes the installed power that is based on the solar energy, and the other 25% constitutes the installed power that is based on the wind energy. Thanks to the projection, as determined by the Ministry, the installed capacity of the solar energy, which has been 5,063 MW in 2019, is intended to be 10,000 MW in 2023.

In addition, the target of the installed power for wind energy, which has been 7,005 MW in 2019, has been determined as 11,883 MW in 2023. Based on the year-end installed power report of TEIAS for 2022, the data of which is provided herein above, it is seen that such purposes have been achieved on a very large scale. The fifth target, as determined as part of the first target within the plan, is related to the energy storage. The first regulatory arrangement regarding the electricity storage activities have entered into force following promulgation thereof on the Official Journal in May 2021 as per the Regulation on Storage Activities in Electricity Market. The risk, as specified under the plan with respect to such target, is specified as "The sector does not show sufficient interest due to the fact that the storage systems are currently overcosting." The licensed electricity production investments license (Preliminary License and Production License) process are provided in the following diagram.

1.2. Licensed Electricity Production Investments License (Preliminary License and Production License) Process

Application, in writing, to the EMRA for the Electronic Application Official or the License Official Designation, and Registration to the EMRA Application System	Obtaining the Production License for 10-49 Years	Power Plant Construction for 10-49 Years
Application to EMRA for Preliminary License (EMRA Review of 20 Business Days)	Application to EMRA for Production License (EMRA Review of 10 Business Days)	Obtaining the Non-Sanitary Enterprise License (GSM)
Obtaining the Preliminary License for 24-36 Months	Procedures Required to be Completed During the Preliminary License Period	Acceptance by the Ministry of Energy and Natural Resources and Authorized Institutions/Legal Entities

1.3. Documentation Required to be Submitted to Apply for Preliminary License for GES and RES

- Letter of Application for Preliminary License
- Articles of Association
- Documents Required for the Production Facility (Information Form, Project for Layout of the Production Facility, Statement of Susceptible Localities, Certificate of Zoning Status, Statement of Zoning Status, Statement of Restricted Area, Single Line Diagram, EIA Certificate)

- Certificate of Measurement (In respect of the projects of 1 year, which are based on the wind energy, and which are in compliance with their regulations, and which have been obtained within the last 8 years based on the date of the application for preliminary license, and which is located on the power plant site where the facility will be established and/or at a place that will represent the site; the Wind Measurement Station Installation Report and the Wind Measurement Result Report. In respect of the projects which are based on the solar energy; the Solar Measurement Station Installation Report and the Solar Measurement Result Report)
- Statement of Non-Prohibition (Information about the full name and Republic of Türkiye ID number of the chairman/members of the board of directors and managers is required to be entered in the statement of non-prohibition, which is available on the page of statements of the EMRA application system)
- Partnership Structure Documentation (Information revealing the partnership structure by specifying the share ratios and amounts of the real and legal persons, who have direct or indirect shares in the legal entity, is requested)
- Control Statement/Documents (The statement, which indicates whether there is a relationship based on the control definition as provided under the Regulation, and the documents, which indicate the relationship in case of any relationship as part of the definition of the control, are requested)
- Certificates Indicating the Capital Amount of the Legal Entity (The company capital is required to correspond to at least 5% of the total investment amount estimated by the Authority for the production facility)
- Certificate of Guarantee (The original copy of the bank guarantee letter and the confirmation letter stating that the letter has been issued by the relevant bank branch are required to be submitted to the Authority in a manner to be attached to a petition within a period of 5 business days following the application)
- Preliminary License Fee

Installed power value, “P(MW)” Application Fee (₺)

0 < P ≤ 10 MW 32.200 ₺

10 < P ≤ 25 MW 62.560 ₺

25 < P ≤ 50 MW 93.840 ₺

50 < P ≤ 100 MW 156.390 ₺

100 < P ≤ 250 MW 312.750 ₺

250 < P ≤ 500 MW 625.190 ₺

500 < P ≤ 1000 MW 937.630 ₺

P > 1000 MW 1.573.700 ₺

- The Certificate To Be Obtained from the Competent Authority for the Production Facilities to be Established in the Regions Established as per the Special Law, such as Organized Industrial Zones, Free Zones, Industrial Zones, etc., Regarding Absence of Any Objection to Establish an Electricity Production Facility
- File with KML or KMZ Extension for the Production Facility Subject to the Application for Preliminary License (must state the power plant area, switch center, unit/panel layouts for the wind and solar energy-based facilities)
- Certificate of Ownership of the Site (Certificate stating the ownership of the title in the event that the entire area, in which the production facility will be established for the wind or solar energy-based sources, is subject to the ownership of the legal entity which will file an application)

The certificates, as provided herein above, are submitted completely to the EMRA for the preliminary license application, and EMRA completes the document review within a period 20 business days, at the latest. In the event that any deficient document is determined during the review, then the applicant will be granted with a period of 15 business days in order to complete the deficient documents, and to submit the same to the Authority. The capital amount of the legal entity in the title is required to correspond to at least 5% of the total investment amount, as estimated by the EMRA for the production facility, of the company capital. The preliminary license fee is determined by the list announced annually by the EMRA based on the production capacity of the facility to be established. Once the preliminary license is approved by the Authority, it will be valid for a period of 24 to 36 months, and during such period of time, there are certain obligations required to be fulfilled by the company that will produce electricity from the renewable sources. The tasks and procedures required to be performed during the preliminary license period are provided as follows.

1.4. Procedures Required to be Completed During the Preliminary License Period

The tasks and procedures required to be completed by any and all preliminary license holders, both as GES and RES, who produce electricity from the renewable sources, during such process are provided as follows:

- Obtaining an EIA Decision,
- Applying to TEIAS or the Relevant Distribution Company for the Connection Agreement;
- Implementing the Master and Practical Zoning Plans;
- Acquiring the Project Area Property;
- Obtaining the Preliminary Project Approval Before the Construction;
- Obtaining the Building Permit.

In addition to the procedures as provided herein above, the procedures required to be completed with respect to the RES within the relevant period constitute execution of TEIAS and RES Contribution Agreement and obtainment of the favorable opinions from the Ministry of National Defense regarding the Regulation on Military Forbidden Zones and Security Zones and the Military Fire Areas and Exercise Zones.

Additionally, as part of the RES, execution of the TEIAS and RES contribution agreement constitutes a process required to be completed within the preliminary license period. As a note for such procedures, the GES/RES Contribution Agreement executed with TEIAS is not made obligatory for any and all projects. It is an obligation required only for the legal entities, who have obtained a preliminary license by winning the competition performed based on the contribution.

Q2 (covers the period of April 2023-July 2023.)

The GES may be established in the channel surfaces of floating GESs or hydroelectric sources-based facilities in the reservoir area, or in the locations between the maximum water level and the operating level. In respect of such units, the rental agreement, executed with DSI, is required to be completed.

After any and all procedures, required to be completed within the preliminary license period, the companies, which will produce electricity from the renewable energy sources, may apply for a production license. The production licenses are granted to the companies, which meet the terms and conditions required for the production license after the EMRA process is completed. Continuation of the projects, which do not have a production license, and whose preliminary license period has expired, is not allowed by EMRA. The information and documentation required for the production license are provided as follows. The application for preliminary license, which is assessed, is announced on the EMRA website, and it is open for objection to be raised by any third party for a period of 10 business days.

Any third party may raise an objection, in writing, to EMRA only in terms of breach of the personal rights.

- The list has been drawn up based on the joint stock companies. Therefore, the phrase "articles of association" is required to be understood as "agreement" for the limited liability companies.
- The method to calculate the guarantee amount is determined and announced upon the resolution to be adopted by the EMRA. You can find such Board Resolution on the website of the Authority.
- Any documentation, which will be obtained from abroad regarding the foreign partners, are issued, and attached to the application, in accordance with the provisions as provided under the "Convention, Abolishing the Requirement of Legalization for Foreign Public Documents", which is drawn up by the competent authorities of the relevant country, or by the consulate of Türkiye in the relevant country, or in accordance with the Hague Conference on Private International Law. The translations performed by the certified translation offices with respect to the documentation may also be requested, if and when required.

	Obtaining the Preliminary License	
Obtaining an EIA Decision,	Applying to TEIAS or the Relevant Distribution Company for the Connection;	Approving the Master and Practical Zoning Plans;
Acquiring the Project Area Property;	Obtaining the Preliminary Project Approval Before the Construction;	Obtaining the Building License;
Contribution Agreement with TEIAS for Wind Energy and Approval of the Ministry of National Defense for Project Area;	Contribution Agreement with TEIAS for Solar Energy.	

1.5. Information and Documentation Required to be Submitted to Apply for Production License for GES and RES

- Letter of Application for License
- Certificate of Authorization
- Articles of Association
- Partnership Structure Documentation (Information revealing the partnership structure by specifying the share ratios and amounts of the real and legal persons, who have direct or indirect shares in the legal entity)
- Control Statement/Document (The statement, which indicates whether there is a relationship based on the control definition as provided under the Regulation, and the documents, which indicate the relationship in case of any relationship as part of the definition of the control)
- Certificates Indicating the Current Capital Amount of the Legal Entity (The company capital is required to correspond to at least 20% of the total investment amount estimated by the EMRA for the production facility)
- License Fee

Installed power value, "P(MW)" Application Fee (₺)

$0 < P \leq 10$ MW 32.200 ₺

$10 < P \leq 25$ MW 62.560 ₺

$25 < P \leq 50$ MW 93.840 ₺

$50 < P \leq 100$ MW 156.390 ₺

$100 < P \leq 250$ MW 312.750 ₺

$250 < P \leq 500$ MW 625.190 ₺

$500 < P \leq 1000$ MW 937.630 ₺

$P > 1000$ MW 1.573.700 ₺

- Deadline Schedule

(It is drawn up in accordance with the template as determined by the Authority in a manner to include the period until the date of completion of the plan, by taking into account the characteristics of the electricity production facility project subject to the production license.)

- Certificate of Guarantee (The original copy of the bank guarantee letter and the confirmation letter stating that the letter has been issued by the relevant bank branch are required to be submitted to the Authority in a manner to be attached to a petition within a period of 5 business days following the application)
- Documentation for Tasks and Procedures Required to be Completed During the Preliminary License Period
- Statement of Non-Prohibition (Information about the full name and Republic of Türkiye ID number of the chairman/members of the board of directors and managers is required to be entered in the statement of non-prohibition, which is available on the page of statements of the EMRA application system)

- During the process for investments in the unlicensed electricity production from the renewable sources, the production facilities up to 5 MW may apply to the EMRA for the unlicensed production. The procedures are monitored as per the "Regulation on Unlicensed Electricity Production in Electricity Market" during the process for investment in unlicensed projects, with the limited installed power, in order to produce the electricity needed, in accordance with the Presidential Decree Nr. 1044.

1.6. Processes for Permit and Approval for Electricity Production from Renewable Sources

As an additional provision for the companies, which produce the unlicensed electricity from the renewable sources through the GES and RES, the application is required to be sent to the EIGM for technical assessment purposes within a period of 10 days. The process is carried out in consequence of obtaining a favorable report with respect to service of a notification to the relevant network operator of the technical assessment upon conclusion thereof by EIGM within a period of 30 days. The common steps regarding the works to be carried out and the permits to be obtained during the pre-investment, investment and operation periods of the facilities intending to produce electricity from the renewable resources through GES and RES are provided as follows.

- Company Incorporation Process

- CED Process

- Land Allocation Permit Processes

(Whatever land the project covers, the Non-Agricultural Use Permit Process, Forestry Land Allocation Process, Pasture Land Allocation Process, Public Land Allocation Process, Industrial Zone Investment Permit Process, Organized Industrial Zone Site Allocation Process, Industrial Area Site Allocation Process, Free Zone Investment Permit Process)

- Connection Agreement

(This is the process for execution of a connection agreement with TEIAS/Relevant Distribution Company, which is one of the studies required to be completed within the process of preliminary license for electrical energy production projects)

- Zoning Plan Process

It is issued in compliance with the provisions, as prescribed under the "Convention, Abolishing the Requirement of Legalization for Foreign Public Documents", which is drawn up in accordance with the Conference on Private International Law, and it is attached to the application. The translations performed by the certified translation offices with respect to the documentation may also be requested, if and when required.

- Obtaining the Building License and Occupancy Permit;

- GSM/Workplace Opening and Operation License;

- Capacity Report;

(It is applied to the relevant Chambers of Industry for the report determining the capacity of the facility intended to be established)

- Environmental Permit and License Process.

1.7. Process for Unlicensed Electricity Production through Solar and Wind Energy Sources

Application as part of the Paragraph-1 of Article-7 of the EPLEUY	The Documentation Is Collected Within a Period of 10 Business Days	Documentation Is Reviewed by the Relevant Network Operator Within the Period of First 15 Days of the Following Month
The Applicant Accepts the Connection Opinion of the Relevant Network Operator	Application is filed to the EIGM for Technical Assessment within a period of 10 Days, and It Is Concluded Within a Period of 30 Days, and A Notification Thereof Is Served, Accordingly	Call, by the Relevant Network Operator, for Connection Agreement Upon the Positive Conclusion of the Report
Grant of a Period of 180 Days to the Person/Company Receiving the Letter of Call	Following the Period of 180 Days, the Connection Agreement is Executed in consequence of the EIA Assessment	Notification for the Criteria Defined and the Compliance with the Connection Agreement to be Connected to the Network by a Real/Legal Person
Completing the Zoning Plan Process and Obtaining the Building Permit	Executing the System Usage Agreement Upon Acceptance by the Competent Authority	Putting the Production Facility into Operation in consequence of Obtaining the GSM License

Table.3 Unlicensed Electricity Production Process with Solar and Wind Energy Sources

Q2 (covers the period of April 2023-July 2023.)

The real or legal persons, which produce the electrical energy in the type of activity as regulated under the Regulation on Unlicensed Electricity Production in Electricity Market, are allowed to operate the electricity production activities without obtaining a license or incorporating a company. Accordingly, the unlicensed production facilities, which are based on the renewable energy sources, may be established up to 5 MW in accordance with the Presidential Decree Nr. 09.05.2019.

This model intends that:

- The consumers meet their electricity needs from their own production facility, which is closest to the point of consumption, in the electricity market (self-consumption model); and also that
- The small-scale production facilities are introduced into the economy of the country in order to ensure the supply security; and also that
- The transmission/Distribution costs and the quantities of losses are reduce in the electricity network through the distributed production method.

The general principles for the unlicensed production activity are provided as follows:

- The real or legal persons, who will establish an unlicensed production facility, are required to possess at least one electricity subscription (consumption facility). (In the event that a consumption facility is not available during the application, then the consumption facility, which is intended to be associated with the production facility, is required to be completed by the date, on which the production facility is put into operation)
- The unlicensed production facilities are connected to the distribution system, except for the exceptions as specified under the relevant Regulation.
- The EMRA will not take any action regarding acquisition of the real estate ownership and limited real rights with respect to the production facilities to be established as per the relevant Regulation.
- The production facilities, which are based on the renewable energy sources established at the same or different measurement point as the consumption facility of the industrial facilities, may produce the energy without obtaining a preliminary license or license, provided that they are limited to twice the contractual power under the connection agreement.
- The production facility or facilities may be established by combining the consumptions for the electrical energy consumed in the facilities, which are owned by one or multiple real and/or legal persons, and which are included in the same tariff group, and which are connected to the same connection point, or whose electrical energy consumption may be measured through a single common meter.

The excess electrical energy, which is provided to the grid by the unlicensed producers - based on any and all renewable energy sources, regardless of the source type - in each billing period in consequence of monthly netting, is purchased by the supply company, which is assigned in the region, on the basis of the retail one-time active energy prices of the subscriber group, for a period of 10 years. Such period is calculated as of the date, on which the relevant production facility starts to provide energy to the grid.

1.7.1. CED Process

In accordance with Section 10 of the Environmental Law Nr. 2872, the institutions, organizations and enterprises, which might cause the environmental problems in consequence of the activity planned, are obliged to draw up an EIA report or PTA. Unless the decision "EIA Favorable" or "EIA Not Required" is adopted, no approval, permit, incentive, building or occupancy license may be granted for such projects, and the investment may not be started for the project, and no tender may be made.

In accordance with paragraph (e) of Section 20 of the Environmental Law, an administrative fine of 2% of the project cost is imposed those who start the construction or operations without starting or completing the EIA process.

As per the relevant Regulation, the "Communiqué on Certificate of Qualification for Environmental Impact Assessment" has been promulgated on the Official Journal, dated 29.11.2019 with the issue number 30963, and it has entered into force, accordingly, in order to regulate the procedures and principles for the institutions and organizations that will draw up the PTD, EIA Application File, EIA report and project progress report. EIA Certificate of Qualification is issued by the Ministry of Environment, Urbanization and Climate Change in consequence of the application filed by the institutions and organizations that meet the terms and conditions as required under Article 5 of the Communiqué. The institutions and organizations, which possess the Certificate of Qualification, have been published on the website of the Directorate General for EIA Authorizations and Inspections of the Ministry of Environment, Urbanization and Climate Change, and the EIA decision may be adopted through the agency of such companies during preparation of the PTD or EIA report.

In respect of the projects which are or are not below the threshold value of the Annex-2 list as specified under the EIA Regulation, an EIA out-of-scope/exemption decision may be adopted by the provincial office of governor in which the project is carried out. In accordance with the Regulation on Assessment of Environmental Impacts, the provincial office of governor, in which the project is carried out, decides that "EIA is not required/EIA is required" regarding the projects as provided under the Annex-2 list, while the Ministry of Environment, Urbanization and Climate Change decides that "EIA is favorable." /EIA is non-favorable" regarding the projects as provided under in the Annex-1 list.

Solar and Wind Energy Sources EIA Process

Based on the Number of the Wind Energy Turbines or Installed Power	EIA Obligation for Number of Turbines x 20 or ≥ 50 MWm ANNEX-1
	PTD Obligation for Number of Turbines ≥ 5 or installed power 10 MWm and installed power < 50 MW EK-2
	Out of EIA Scope for Number of Turbines < 5 and < 10 MWm

Table 4.1. Wind Energy Sources EIA Process

Based on the Solar Energy Project Area or Installed Power	EIA Obligation for ≥ 20 hectares or ≥ 10 MWm EK-1
	PTD Obligation for ≥ 2 hectares or ≥ 1 MWm EK-2
	Out of EIA Scope for < 2 hectares and < 1 MWm

Table 4.2. Solar Energy Sources EIA Process

1.8. Agricultural Land Investment Permit

The "Law Nr. 5403 on Soil Protection and Land Use" has been promulgated on the Official Journal, dated 19.07.2005 with the issue number 25880, and it has entered into force, accordingly, in order to determine the procedures and principles that will ensure protection and development of the soil, and classification of the agricultural lands, and planned use of the agricultural lands in compliance with the principle of sustainable development with priority on the environment. Classification of the agricultural lands based on the Annex 2 "Implementing Instruction on Protection, Use and Planning of Agricultural Lands", the agricultural lands have been classified as the absolute agricultural land, special crop land, planted agricultural land, marginal agricultural land, irrigated agricultural land and non-agricultural areas.

The applications filed as part of the non-agricultural use of the agricultural lands are filed through the public institutions and organizations authorized to make plans or through the EMRA. The real or legal persons request to use the agricultural land through the requests that are filed by the public institutions/organizations, which will carry out the planning, and/or by the plan authors, which/who are authorized by such institutions/organizations, for use for non-agricultural purposes. The applications filed to the municipalities, in the event that the land, which constitutes the subject matter of the request, is within the municipal borders, or to the special provincial administrations or other organizations authorized to make plans, in the event that the land is outside the municipal borders, are forwarded to the Provincial Directorate of Agriculture and Forestry by the relevant institutions/organizations through the Agricultural Land Assessment (TAD) Portal.

1.9. Forestry Land Investment Permit

The forests are a natural resource that provides the humanity with many economic, ecological and sociocultural benefits , such as food, fuel, shelter, clean air and water, medicine, source of income, employment, recreation and landscaping. The applications are filed to the relevant Regional Directorates of Forestry regarding the forest land investment permits.

Following the application;

- The relevant Regional Directorate of Forestry primarily reviews the application on the basis of the documents.
- In case of any deficiency, it notifies the applicant of such matter within a period of 10 business days.
- The request will not be assessed until the deficiencies are completed.
- In the event that the documents are complete, then the committee carries out the necessary inspections on the land, and it draws up a preliminary permit or final permit report regarding the portions, corresponding to the state-owned forests, of the request.
- Subsequently, the applicant will be notified of the permit granted. The guarantee, fees and approved deed of undertaking are received from the permit holder within a period of maximum 3 months as of the date of the notification. In the event that the fees are not paid within such period of time, then the guarantee or the approved deed of undertaking is not granted, and the site delivery will not be performed, and the permit will be canceled without any requirement for service of any notification thereto. The relevant person is notified of the cancellation process.
- The request for permit for the same location is considered as a new request for permit.
- The date of commencement of the permit is the date on which the permit approval is granted, unless the date of commencement of the permit is specified separately under the permit approval. In the event that the permit approval is extended, then the date of commencement of the permit is the date on which the first permit is granted.

1.10. Public Land Investment Permit

The process for allocation of public lands is carried out by the Directorate General of National Real Estate of the Ministry of Environment, Urbanization and Climate Change. During such process, the method, which is generally preferred in Türkiye, is to provide the public lands through the incentives.

The investor personally determines the real estate, which is suitable for the investment that s/he/it wishes to make, by filing a petition to the Ministry of Environment, Urbanization and Climate Change or the Provincial Directorate of Environment, Urbanization and Climate Change (Directorates of Real Estate, Directorates of National Real Estate, Offices of Chief of National Real Estate) in which the real estate is located. Thereafter, s/he/it may file a request for establishment of the right of easement in her/his/its favor, or for grant of occupancy permit, regarding such real estate. The investor may also file a request for establishment of the right of easement in her/his/its favor, or for grant of occupancy permit, regarding the immovable property, which is suitable for the investment that s/he wishes to make, among the immovable properties determined and announced by the Provincial Directorate of Environment, Urbanization and Climate Change.

The investor, who is deemed to be suitable by the Commission, and who is approved by the Ministry of Environment, Urbanization and Climate Change, is granted with a 1-year preliminary permit regarding preparation and approval of the plans and projects, and such period may be extended for a period of maximum of 1 further year, if and when required. No fee is collected from the investor during the preliminary permit period. An independent and permanent "right of easement" of 49 years is established in favor of the investor, who meets the terms and conditions for preliminary permit, against a fee to be calculated on the basis of the property tax values. A 49-year "occupancy permit" is granted for the immovable properties, for which the easement rights may not be established due to the fact that they are of the state-owned nature and that they may not be registered in the land registry, against a fee assessed on the basis of the property tax value of the immovable property.

1.11. Zoning Plan Process

Following adoption of the decision for investment as part of the project to be planned, the 1/5,000-scaled master and 1/1.000-scaled practical zoning plans are required to be drawn up. Such zoning plans can may be drawn up by the Directorate General of Spatial Planning of the Ministry of Environment, Urbanization and Climate Change or by the relevant Municipalities, and the applications are filed to the Ministry of Industry and Technology for the areas, which are of state-owned nature, regarding the Organized Industrial Zones and Private Industrial Zones. Such institutions as the Ministry of Environment, Urbanization and Climate Change, the Directorate General of Protection of Natural Assets, the Ministry of Culture and Tourism, the Privatization Administration, the Provincial Private Administrations, the Housing Development Administration of Türkiye (TOKI), and the İller Bankası (İlbank) are also authorized to draw up/cause to draw up and approve the zoning plans within the processes as defined under the relevant regulations.

1.12. Environmental Permit and License Process

The Regulation on Environmental Permit and License, which has entered into force upon being promulgated on the Official Journal, dated 10.09.2014 with the issue number 29115, defines the facilities, which are required to obtain an environmental permit or environmental permit and license during the operation period, and it includes two lists as Annex-1 and Annex-2 based on their environmental impacts. The investments in the energy sector are assessed under the Annex-1 and Annex-2 lists of the Regulation on Environmental Permit and License. Although the main activity is energy production, in the event that the domestic wastewater, which is generated in the facility, is treated in the package wastewater treatment facility, and that it is discharged to the receiving environment, then it is subject to the environmental permit under the Article-10/8 of the Annex-2 list in accordance with the relevant Regulation. In order for the enterprise to start operating/production, it is primarily required to obtain the interim operating certificate in accordance with the said Regulation, and to obtain the environmental permit and license certificate, which constitutes the final permit, within a period of maximum one year as of the date of obtainment of the interim operating certificate.

Filing an Application through the Letter of Conformity of the Provincial Directorate	Compliance Audit Performed by the Office of the Governor	It is required to obtain an Interim Operating Certificate (GFB) within a Period of One Year through the Letter of Conformity.	Submission of the Trial Burning Plan to the Environmental Management GM
Review, by the Competent Authority, of the File	Preparation of the Information and Documentation As Attached to the Regulation, and Submission Thereof to the Competent Authority	Review of the File within a Period of 30 Days	Issuance of GFB
The Enterprise Starting the Operation, and Applying for the Permit-License No later than the 180th Day	Review of the File within a Period of 60 Days	Completion within a Period of 90 Days in Case of Deficiency	Certificate of Environmental Permit/License

1.13. Incentives for Renewable Energy Sources

The Domestic Parts and YEKDEM incentives, which are provided by the Ministry of Energy and Natural Resources, are important for companies that intends to produce electricity from the renewable sources through the GES and RES. Also, the Supports for Efficiency Enhancing Projects ("VAP") are provided by the relevant Ministry regarding the investments with a maximum investment value of 5 million Turkish lira excluding VAT. Again, in accordance with the Voluntary Agreement Supports, provided by the Ministry of Energy and Natural Resources, the cash incentives, are provided as support which the 30% of the energy expenses within the same year does not exceed 1 million Turkish lira. YEKDEM payment rate varies based on the energy source. In accordance with the protocol, the monthly payments are performed to the facilities, whose production is recorded based on the EPIAS data, under the YEKDEM. Based on the statement made by the Ministry, it has been announced that the mechanism be extended in a manner to start as of 01.07.2021 until 31.12.2025. Considering the changes in the new period compared to the past, the payments have been performed on the basis of the exchange rate per energy produced (kWh), in the previous period. Payment of 7.3 cents kWh for RES and payment of 13.3 cents kWh for GES have been deposited monthly into the accounts of the facilities by the mechanism. However, the payments to the facilities, which will file an application in the new period after 01.07.2021, will be performed in Turkish lira.

The production facilities, which can benefit from YEKDEM, are specified under the Law Nr. 5346 on Use of Renewable Energy Sources for Electric Power Production Purposes, while the facilities, which will produce electricity through the wind and solar energies, are also included in the scope.

Based on the project approval to be provide by the Ministry of Energy and Natural Resources, the facilities, which are designed in a manner to performed in the existing manufacturing industry facilities with a minimum annual energy consumption of 500 TOE and to provide minimum 20% energy savings compared to the current situation, are included. The investments in the energy efficiency, with a maximum return on investment of 5 years through the energy savings, avail of the incentives provided for the investments to be made in the 5th region (VAT exemption, customs duty exemption, tax reduction, insurance premium employer share support, interest support and allocation of the investment location), regardless of the region in which they will be made.

The projects and companies, which will produce electricity from the solar and wind energy sources are supported as part of the "Technology-Driven Industrial Move (MOVE) program announced by the Ministry of Industry and Technology, are supported. The projects, which will increase the efficiency through the new ideas as part of digitalization of the sector, are assessed under the relevant incentive program. The Decree on State Aids for Investments, and the Project-Based Incentive System (Decree Nr. 9495, dated 2016, on Providing Project-Based State Aid for Investments), and the incentives for Private Sector R&D and Design Centers are also programs carried out by the Ministry of Industry and Technology.

The incentives, which are provided by the Ministry of Industry and Technology, consist of the General Investment Incentive Practices, the Regional Investment Incentive Practices, the Large-Scale Investment Incentive Practices and the Strategic Investment Incentive Practices.

Also, there are some incentive and grant programs provided by the Scientific and Technological Research Council of Türkiye (TUBITAK) under the care of the Ministry of Industry and Technology. These are provided as follows:

- Venture Capital Support Program (Tech-InvesTR)
- Pioneering R&D Laboratories Support Program
- Support Program for Capacity Increasing in the Fields of Innovation and Entrepreneurship
- Industry Innovation Network Mechanism (SAYEM)
- TUBITAK Patent Support Program
- Call to Support the Patent-Based Technology Transfer
- International Industrial R&D Projects Support Program

2. GES and RES as part of EMRA Activity Report

The elements included in the activity report as part of the GES and RES are provided as follows.

Q2 (covers the period of April 2023-July 2023.)

- Section 7 of the Electricity Market Law Nr. 6446 has been supplemented, through the Law on Amendment to the Law Nr. 7417 on the Government Officials and to the Certain Law and to the Decree Law Nr. 375, as promulgated on the Official Journal, dated 05.07.2022 with the issue number 31887, as follows: "Any legal person, who warrants that it shall establish an electricity storage facility, shall be granted with a preliminary license by the Authority regarding establishment of the electricity production facility based on the wind and/or solar energy up to the installed power of the electricity storage facility warranted to be established." It has been regulated that any legal person, who holds a wind and/or solar energy-based electricity production license, and who warrants that it shall establish an electricity storage facility from the production facilities that are partially or fully in operation, is allowed to increase the capacity in the event that the areas, which are specified under its license, are not exceeded up to the installed power of the electricity storage facility warranted to be established, and that the power, which is supplied to the system at the time of operation, does not exceed the installed power as specified under its license, and that the connection opinion received from TEIAS and/or the relevant distribution company as part of the amendment is favorable.
- The provision 7/9 of the Regulation on Use of Connection and System in Electricity Market has been amended, through the Amendment Regulation, as promulgated on the Official Journal, dated 11.01.2022 with the issue number 31716, as follows.

"The contractual delivery power of the production license holders must be the same as the installed power value included in their licenses. Any change in the contractual delivery power of the production license holders are carried out in accordance with the amendments to the license, without being limited to the periods as specified herein. However, the coal or natural gas-based electricity production license holders may request any change at most twice within a calendar year in order to change their contractual delivery power, provided that it does not exceed the installed power included in their licenses. Accordingly, the request for change in the contractual power may not be lower than the installed power before the last amendment to the license regarding the installed power."

- The provision 20/4/(ç) of the Electricity Market License Regulation has been amended, through the Amendment Regulation, as promulgated on the Official Journal, dated 10.03.2022 with the issue number 31774, as follows.

"Any legal person, who files an application for a supply license, shall file an application to the Authority as stated in the first paragraph in the event that it wishes to add a self-contained electricity storage facility to its license. In the event that an application is filed accordingly, then the provision, as prescribed under the second paragraph of Article 15, shall apply regarding the connection of such independent electricity storage facility to the system and the use of the system. The capital adequacy and guarantee obligation are not required for the facility thereunder. In the event that the request is deemed appropriate by the Board, and then the information about the storage facility will be included in the supply license by the relevant main service unit, provided that the decision, which is required in accordance with the Regulation on Assessment of Environmental Impacts, is submitted to the Authority within the period as specified under the resolution of the Board."

- The Electricity Distribution System Regulation, whose purpose is to provide the users with the high-quality, safe and continuous electricity, has been promulgated on the Official Journal, dated 15.04.2022 with the issue number 31810, and the Electricity Market Distribution Regulation, which has been promulgated on the Official Journal, dated 02.01.2014 with the issue number 28870, has been abolished.

- The provision 26/13 of the Regulation on Unlicensed Electricity Production in Electricity Market has been amended, through the Amendment Regulation, as promulgated on the Official Journal, dated 01.10.2022 with the issue number 31970, as follows.

"In the event that a production facility or facilities are established in a manner to be connected to the system within the borders of the different distribution regions, as part of the subparagraph (h) of the first paragraph of Article 5, then the electrical energy consumption amounts of the consumption facility or facilities and the delivery amounts of the production facility, if available, at the same measurement point are determined on an hourly basis through the meter data, which is installed in the location as specified in the connection agreement, and they are reported by the relevant network operator to the relevant supplier assigned or to the relevant market operator until the third business day of each month. In the event that it is requested to establish multiple production facilities for one or multiple consumption facilities as part of this article, then the production facility may also be established within the borders of the region of the different supplier assigned. In the event that the production and/or consumption facilities are within the borders of the regions of the different distributor or supplier assigned, then the netting procedures are carried out by the market operator."

3. GES and RES Regulations

3.1. Applicable Laws

3.1.1. Electricity Market Law Nr. 6446

- Provisional Section 17 (Insertion: 12.7.2013-section 6495/58) In the event that any legal person, whose license applications have been deemed appropriate upon the resolution of the Board, among the license applications made for the wind energy-based production activities, however, whose license applications have been rejected before the effective date of this article due to the fact that it has failed to fulfill its obligations as specified in the approval decision, files an application to the Authority within a period of 1 months as of the effective date of this article, and that it is certified, by TEIAS or the electricity distribution companies, that the favorable connection opinions are maintained, then the application of any legal person, which is included in such scope, are deemed to be a preliminary license, and any relevant legal person is granted with the preliminary license, provided that it completes the obligations as specified under this Law. The guarantees, which have previously been recorded as income, of any legal person, who files an application in accordance with this article, will not be refunded.
- As part of the change, the grievances caused by TEIAS regarding the license and preliminary license applications, which have previously been rejected by the EMRA, have been eliminated. Based on such approach, it is seen that the Authority provides convenience to the RES.
- Based on the statements as provided under the Article 5/4 (a), (b), (c), (d), the ownership problems regarding the areas, in which the solar energy and wind energy production facilities will be established, have been resolved. A preliminary license practice has been introduced in order to eliminate the problems of the relevant legal persons regarding their project areas. Also, the updates have been introduced to the solar energy and wind energy projects as part of the provisions regarding the YEK Support Mechanism.
- Based on the Article 14/6-7, the share transfer of the production facilities, which constitute the subject matter of the application, has been abolished until they are approved as part of activities that may be carried out without a license. Also, any matter that might arise within the partnership have been eliminated upon the provision stating that any legal person may not file an application for the wind and solar energy-based production activities in the distribution region of the relevant distribution company and in the distribution region, in which the relevant distribution company is a shareholder, in accordance with this article.

• Article 10 (Section 56 of the Law Nr. 7417, dated 01.07.2022) (10) Any legal person, who warrants that it shall establish an electricity storage facility, shall be granted with a preliminary license by the Authority regarding establishment of the electricity production facility based on the wind and/or solar energy up to the installed power of the electricity storage facility warranted to be established. The provisions as provided under the fourth paragraph of Section 7 of the Law do not apply to the production facilities within this scope. In respect of the facilities to be established within the scope of this paragraph, the procedures and principles for the implementation, including the terms and conditions for granting the preliminary license and license, and any amendment thereto and the cancellation thereof, and recording the guarantee as revenue in case of failure to fulfill the obligations, and delivering the electrical energy, which is produced within this scope, to the system through the storage facility, is regulated by the Authority in accordance with the regulation. The facilities, which will be established based on this paragraph, may avail of the provisions as provided under Section 6 of Law Nr. 5346.

(11) Any legal person, who holds a wind and/or solar energy-based electricity production license, and who warrants that it shall establish an electricity storage facility from the production facilities that are partially or fully in operation, is allowed to increase the capacity in the event that the areas, which are specified under its license, are not exceeded up to the installed power of the electricity storage facility warranted to be established, and that the power, which is supplied to the system at the time of operation, does not exceed the installed power as specified under its license, and that the connection opinion received from TEIAS and/or the relevant distribution company as part of the amendment is favorable. In respect of the capacity increases within this framework, the provision as provided under the first sentence of the second paragraph of Section 6/C of Law Nr. 5346 does not apply. Accordingly, the procedures and principles for the implementation, including the delivery of the electrical energy, produced, to the system through the storage facility, are regulated by the Authority in accordance with the regulation.

3.1.2. Law Nr. 5446 on Use of Renewable Energy Sources for Electric Power Production Purposes

In accordance with the relevant law, the sections in relation to wind energy and solar energy are provided under the heading "EMRA Capacity Report for 2020". In addition to such articles, the other provisions such as the unit prices, which will be applied to the GES and RES in relation to facility types based on the renewable energy source, are provided in the Schedule I. Also, the domestic contribution unit prices of the GES and RES are provided in the Schedule II.

3.1.3. Law Nr. 6408 on Amendment to the Electricity Market Law and the Special Consumption Tax Law

There is no separate provision regarding the GES and RES.

3.2. Applicable Regulations

Regulation on Capacity Mechanism in Electricity Market

The wind- and solar-based power plants, which cannot perform any production uninterruptedly, may not participate in the capacity participation mechanism.

Regulation on Use of Connection and System in Electricity Market

In respect of the requests for connection to the wind or solar energy-based production facilities, there is a provision stating that an unfavorable opinion shall be provided by the Authority in case of the existence of a connection point, which is more economically suitable, and which provides the lower system loss, compared to the connection point as requested.

Q2 (covers the period of April 2023-July 2023.)

Regulation on Amendment to the Regulation on Technical Assessment for Solar Energy-Based Electricity Production Applications (17.03.2023)

The procedures and principles regulating the technical assessments, which will be carried out in accordance with the preliminary license and production licenses, and the terms and conditions and scope of the technical review to be carried out, and the circumstances in which the technical assessment will not be carried out, and the terms and conditions regarding assessment of the requests for amendment to be performed regarding the applications which have already been licensed, have been regulated through such regulatory amendment. The terms and conditions for the Flash Analysis carried out in accordance with the GES licensing have been repealed and excluded from the Regulation. It has been regulated that, in respect of assessment of the requests for integration of a GES, which has a preliminary or production license, into an electricity storage facility, the area, in which the electricity storage facility will be established, is required to be within the power plant site.

Regulation on Amendment to the Regulation on Unlicensed Electricity Production in Electricity Market (02.03.2023)

Such regulations have included that, in the event that an unlicensed electricity production facility is established at the same facility site as the licensed production facilities, then the connection and system usage agreements regarding the relevant production facilities are required to be zero delivery, and there is any energy flow from the production facilities to the grid. Accordingly, it has been regulated, through such regulatory amendment, that such energy will not be subject to any settlement or netting in accordance with the relevant regulations, and that the energy, which is delivered to the system, will be considered as a free contribution to the Electricity Market Renewable Energy Sources Support Mechanism. In the event that an application is filed by any person, whose production facility has not been accepted yet, and whose netting procedures will be carried out as part of the monthly netting practice, within a period of 60 days as of 02.03.2023, then a one-time reduction of more than 10% from the installed power, as specified under the letter of call to connection agreement and connection agreement, may be performed.

Electricity Market License Regulation

The measurement units, especially for GES, have been determined under the relevant Regulation. In addition, there is a provision stating that the production capacity is required to be reported to the Authority each year until October 1 for RES and May 1 for GES. The measurement standard for the preliminary license applications based on the wind and solar energy has been determined under the such regulation. The information and documentation, as required for the preliminary license applications for RES and GES, have also been determined within the provisions as provided under the relevant Regulation. Finally, in respect of the wind and solar energy-based preliminary license applications, the applications are regulated through the provision stating that any legal person, who have been entitled to connection in consequence of the competition held by TEIAS, waives its preliminary license application, or its preliminary license application is rejected, for any reason other than the force majeure and any justifiable reason that is not arising from the applicant. It has been stated that, in the event that multiple applications are filed to the market at the same time, then the applications based on the wind and solar energy sources, respectively, following the other renewable source production facilities, will be prioritized. Upon the regulatory amendment performed on 19.11.2022, the production facilities based on the renewable energy sources have been defined.

Accordingly, the wind, solar, geothermal, biomass, wave, current and tidal production facilities as well as the channel type production facilities or the hydroelectric production facilities with a reservoir area of less than fifteen square kilometers have been included in the regulations. Also, in the light of the amendment performed on the same date, the fees corresponding to the mechanical installed power based on the wind or solar energy and the capacity of the electricity storage unit are added and assessed together in order to determine the obligations for the preliminary license applications as part of the storage electricity production facility. Based on the amendment performed on the same date, the technical qualifications and terms and conditions for electricity storage facilities that will work integrated with the wind and solar energy facilities have been determined.

Regulation on Competition to Apply for Preliminary Licenses for Establishment of Production Facility based on Wind or Solar Energy

It is the regulation, which regulates the relevant competition in accordance with the provision stating that a competition is held in order to determine those who will be connected to the system based on the capacity announced for the connection area among the applications in the event that there are more applications than the capacity, which is announced in order to be connected to the same connection zone, among the preliminary license applications filed in order to establish a production facility based on the wind or solar energy, and/or that there are applications for the overlapping/intersecting power plant area.

Regulation	Provision	
Electricity Market Balancing and Settlement Regulation	<i>GES and RES are among the facilities which are exempt from the obligation to be a balancing unit.</i>	There is no separate provision regarding the GES and RES.
Electrical Network Regulation	<i>There are provisions containing the technical qualifications and obligations for the GES and RES activities.</i>	
Regulation on Certification and Support of Renewable Energy Sources	<i>There is a provision stating that GESs and RESs are covered by the Domestic Parts and YEKDEM.</i>	

Regulation on Unlicensed Electricity Production in Electricity Market	<i>There are provisions stating that EIGM carries out the audit, detection and other activities with respect to the applications based on the wind or solar energy.</i>	There is no separate provision regarding the GES and RES.
Regulation on Certificate of Warranty for Renewable Energy Sources in Electricity Market	<i>There is a provision stating that GES and RES may be included in the YEK-G certifiable facilities.</i>	
Energy Market Reporting Regulation	x	
Regulation on Demand Forecasting in Electricity Market	x	
Regulation on Ancillary Services in Electricity Market	x	
Regulation on Tariffs in Electricity Market	x	
Regulation on Import and Export in Electricity Market	x	
Regulation on Organizational Structure and Operating Principles of Enerji Piyasalari Isletme Anonim Sirketi	x	
Regulation on Measures for Distribution and Supply Licenses in Electricity Market	x	
Regulations on Measures for Reduction of Losses in Distribution System	x	
Regulation on Amendments and Transfer of Transmission Activity and Activities Waived	x	
Electricity Market Distribution Regulation	x	
Implementing Regulation on Purchase and Sales of Electricity Distribution Companies	x	
Regulation on Quality for Distribution and Retail Activities in Electricity Market	x	
Regulation on Storage Activities in Electricity Market	x	

4. Energy Storage in Türkiye

The energy storage is a field, which is currently developing, and whose importance is expected to increase in the energy sector in the future. While the energy storage activities have generally been carried out by using the lead batteries until today, the balanced use of the energy, which is obtained, has become important in consequence of the depletion of conventional energy sources, and the damages to the nature, and the increase in investments in renewable energy sources. Accordingly, the lead batteries have been replaced by the lithium ion batteries recently, and they have become integrated into the human life. The second field of use of the lithium ion batteries, especially used in the electric cars, is energy storage systems. The lithium-ion batteries arise from the efforts to integrate the renewable energy sources into the energy storage. Also, since the solar energy and wind energy production varies seasonally on an annual basis and cyclically on a daily basis, it will be a very costly process to supply this energy to the grid in direct proportion to the demand of the grid, with the expectation that the renewable energy sources will constitute a very significant portion of the energy consumed in the near future. At this point, use of the energy storage systems intends to store the energy, which is obtained by the solar power plants with high production capacity in the summer, and to provide it to the grid in the winter in which the production is lower. In respect of the wind energy, it is intended to store the energy that is produced in the periods, in which the wind is strong, and to provide it to the network based on the supply, compared to the electricity production that changes cyclically on a daily basis.

As it is known, the primary source of the energy storage is electrical energy. Accordingly, the energy storage is defined as the systems, which can store the electrical energy by converting it into a different type of storable product, and which they can then return the electricity to the grid. The energy storage ensures the balancing capacity, and satisfaction of the need for rapid load-on-load shedding, and distribution of the load that the demand side will bring to the grid, and use of the flexibility sources. Another matter reviewed in the relevant panel is that the production capacities of the conventional sources will be reduced in the near future due to the environmental factors. In consequence of such anticipated capacity reduction, the renewable energy sources will be used in the most efficient manner. Connection of the energy, which is obtained from the solar energy and wind energy sources, to the grid in the most efficient manner may be achieved by working in a manner to be integrated with the energy storage systems. The other advantages of the energy storage systems, which enable the seasonal and cyclical changes in production amounts of the renewable energy sources to be balanced, are to facilitate the energy trading, and to provide the energy frequency control, and to balance the energy in real time. In addition, the electricity market transmission and distribution actors make high-cost investments annually in order to meet the needs of the grid. Thanks to the energy storage systems, the necessary energy can be provided to the regions in which the demand increases without such costly investments. Thus, the electricity/energy will be transferred even when the consumption is high.

Since the energy storage activities need the high technology systems, the relevant innovation systems are primarily required to be established in our country. Since the new high-tech systems to be used in the energy storage will bring about a change process at the sectoral level, the sectoral policy mechanisms must be established by correctly analyzing the deficiencies/risks that might arise in such technological change process. In order to determine and implement the sectoral policies efficiently, a "participatory" approach must be adopted with the joint work of the public institutions, NGOs, private sector and universities, and accordingly, it must be determined in which sectors the energy storage technologies will be used primarily and how they will be disseminated and developed. Another important issue regarding creation and correct use of the energy storage technologies in Türkiye is to correctly determine the national standards and to ensure their compliance with the international standards. Also, the compliance with the international standards will enable our country to become an exporter in the energy storage in the future. In addition, the incentive systems and programs, which will be established by the public, are of critical importance for investors due to the fact that the energy storage systems, which require the high technology, need the R&D studies, and that the high costs of such R&D studies are considered. Accordingly, it will ensure the correct implementation of the incentive systems and programs, which will be created in order to determine the link between the public and private sector, and to establish the legal infrastructure accordingly, and to disseminate the R&D studies, and to direct the investors to the energy storage.

As part of the R&D studies to be carried out, the energy storage techniques vary based on the information provided in the Energy Storage Technologies Report published by the Turkish Academy of Sciences (TUBA) in 2020. Such energy storage techniques consist of the Underground Storage, Thermal Energy Storage, Ice Energy Storage (BED), Heat Pump Integrated Energy Storage, Pumped Energy Storage and Battery Technology.

Apart from the energy storage techniques specified when the global sources and projects are scanned, the battery technologies come into prominence in order to increase the efficiency of the renewable energy sources. Although no investment or project has been carried out regarding the battery technology (lithium ion batteries) in Türkiye so far, the R&D studies are followed by the leading academics of the sector.

During the meeting of the Presidential Science, Technology and Innovation Policies Board in September 2019, determination of the 12 primary technological areas for Türkiye, and inclusion of the "energy storage" in such determined 12 areas indicate the importance, which our country attaches to the energy storage sector, and the primary place of the energy storage in the future road map. Accordingly, the targets, which have been set by the EMRA regarding the energy storage regulations in 2021, have been achieved. In 2022, the electricity storage regulation has entered into force upon promulgation thereof on the Official Journal, dated 19.10.2022 with the issue number 32018. It has been announced, by the EMRA, that such total application investment cost has reached 110 billion dollars, and it has been stated that 40-45 billion dollars of such amount will be reflected in the field.

These current developments indicate that both public administrations and private sector actors will undertake the greater studies regarding the energy storage systems in the near term. Even though Türkiye has some deficiencies in production of the systems on a global scale, the investment volume in Türkiye will reach very serious levels in terms of the efficiency of the energy that is obtained from the renewable energy sources.

In order to better understand the current international investment scale of the energy storage, which is included in the future projection of our country, the following table, which contains the capacities of the companies, countries and factories that make global investments, is provided.

OEM	Country/Region to be Established	Declaration of Additional Facility Capacity (GWh/year)
Panasonic	United States of America	35 (GWh/year) (2020)
CATL	China	24 GWh/year ve 18 GWh/year (2020)
	Europe	14 GWh/year (2021) and 98 GWh/year (date of establishment)
BYD	China	24 GWh/year (2019) 20 GWh/year and 30 GWh/year (2023) 10 GWh/year (date of establishment not specified)
LG Chem	Europe	15 GWh/year (2022)
	China	32 GWh/year (2023)
SK Innovation	China	7.5 GWh/year (2020)
	Europe	7.5 GWh/year (2021)
	United States of America	9.8 GWh/year (2022)
LIBCOIN/BHEL	India	30 GWh/year (2025 – 2027)
Samsung SDI	Europe	1.65 GWh/year (2020)
Northvolt	Europe	32 GWh/year (2023)
Lithium Werks	China	8 GWh/year (2021)

Table.8 Global Investments in Energy Storage

Based on the data regarding the website "Utility Dive", the energy storage investments in 2022 have increased by 55%, compared to 2021. Accordingly, the total investment amount, which has been 8.8 trillion dollars in 2021, has increased to 26.4 trillion dollars in 2022. (Link-22)

4.1. Regulations on Energy Storage in Türkiye

The first comprehensive regulatory work regarding the energy storage is the Regulation on Storage Activities in Electricity Market as promulgated on the Official Journal, dated 09.05.2021 with the issue number 31479. The energy storage market in Türkiye has begun to be regulated through the relevant Regulation.

Based on the provisions, as determined under the "Regulation on Storage Activities in Electricity Market", the energy storage systems may be used in four different manners.

- In a manner to be integrated into a licensed production facility
- In a manner to be integrated into a consumption facility
- Self-contained (In a manner to be directly connected to the grid)
- By the network operators

As per the relevant Regulation, the electricity storage sector, which is a new field, and which has no previous regulations, has been regulated. The target to start the regulatory studies of the electricity storage sector, which is included in the plan of the Ministry of Energy and Natural Resources, has been put into practice, accordingly. The Regulation regulates the electricity storage unit and facilities as well as installation and connection procedures, and the procedures and principles for integrated electricity storage units with respect to the production and consumption facility.

As per Article 5 of the Regulation, it is stated that the legal persons, who hold a production license for the electricity storage unit integrated in the production facility, may install an integrated electricity storage unit, which does not exceed the electrical installed power, as incorporated in the license of the production facility that performs licensed or unlicensed production. As per the relevant article, the way of the electricity storage activities has been smoothed, and the Ministry has facilitated development of the sector. In the other paragraph of the relevant article, it is stated that the legal persons, who have the production licenses, and who have benefit from YEKDEM or any other support mechanism which is paid or warranted to be paid for the energy that they produce, may establish an integrated electricity storage unit at the same measurement point, and in a manner not to exceed their electrical installed power.

In respect of the integrated electricity storage facilities based on the consumption facility, there is a provision stating that an electricity storage facility may be established by the consumers, provided that a favorable opinion for connection is provided by the relevant network operator, and that the installed power thereof does not exceed the contractual power of the relevant consumption facility under the connection agreement, and that it is located at the same measurement point. Based on the provision, the conveniences, which are granted for installation of the integrated electricity storage units as the production facilities, continue to be provided in the units to be established for the consumption facilities. It has been stated that an integrated electricity storage facility may be installed in the consumption facility based on the needs of the consumption facilities;; accordingly, in the event that the energy is provided to the grid, then such energy is has been covered by the Regulation, in which the reconcilable delivery amounts of the relevant supplier will not be taken into account, either. Also, it has been stated that the project design, installation, connection to the system, acceptance and operation of the electrical storage units and facilities, and the testing activities, if and when required, will be carried out as defined under the relevant technical regulations, relevant standards and technical criteria.

In consequence of such provisions, the Regulation creates a framework based on the most basic elements of the sector in terms of scope. In fact, it is stipulated that the Authority may not take any action regarding the land acquisition, or establishment of the right of use for the electricity storage and connection facilities, which will be established as per this Regulation, except for the electricity storage units integrated into the production facility. The relevant Regulation regulates the order, in which the facilities may be established, and the criteria regarding the applications to be filed for the electricity storage units or electricity storage facilities.

The list of regulations containing the provisions for energy storage, other than the Regulation on Storage Activities in Electricity Market as promulgated on the Official Journal, dated 09.05.2021 with the issue number 31479, is provided as follows. Upon the amendment to the Electricity Market Law Nr. 6446 on 21.03.2018, a provision, which covers the market activities carried out as part of the electricity storage and demand side participation, has been added within the limits and procedures and principles to be determined by the Board, by taking the opinion of the Ministry of Energy and Natural Resources. Also, the energy storage systems are defined in the Electrical Network Regulation, which has entered into force upon promulgation thereof on the Official Journal, dated 28.05.2014 with the issue number 29013. In addition, the provisional article 1 of the second section of the relevant Regulation states that the procedures and principles for use of the energy storage systems as part of the ancillary services will be drawn up by TEIAS until 31.12.2014, and that they will be submitted for the approval of the Authority. However, the relevant procedures and principles have not been regulated by TEIAS yet. Another regulation, which contains the provisions for the energy storage, is the Regulation on Ancillary Services in Electricity Market, which has entered into force upon promulgation thereof on the Official Journal, dated 26.10.2017 with the issue number 30252. The energy storage is defined in the provisions as prescribed under the relevant Regulation, and it is stated that it may be used to supply the ancillary services. Also, it has been stated that the energy storage facilities may be included in the certificates of ancillary service, and the ancillary service market participant registration, and the ancillary service agreement.

The energy storage regulatory framework in Türkiye has been established under the Regulation on Technical Criteria for Connecting Electricity Storage Facilities to the Grid and Using Thereof in Ancillary Services, as published by TEIAS on 21.09.2021. As per the relevant regulation, the technical basis of the energy storage facilities to be established has been regulated.

Considering the provisions, the facilities, which have a transmission agreement with TEIAS, may include the exchange information about their installed power information into the system in consequence of execution of a connection agreement regarding the energy storage facilities. The self-contained electricity storage facilities, which are connected to the transmission system that meet all terms and conditions for technical criteria, may participate in the ancillary services. It has been determined that such technical terms and conditions consist of holding a supply license, and possessing the technical equipment that may switch from consumption of the energy from the system with the amount of active power at the installed power level to delivery of the energy to the system at the installed power level within a period of 2 seconds.

It has been regulated that Another technical requirement is to process the technical equipment, which may switch to consumption of energy from the system with active power of 0 (zero) MW within a period of 1 second, and which may switch to delivery of energy to the system with active power of 0 (zero) MW within a period of 1 second. The facilities, which meet such technical terms and conditions, may participate in the primary frequency control service after they have met the requirement that they possess the installed power of at least 10MW, and that the requirement that the proportion of the energy capacity to the reserve capacity is 1.25. In order for the relevant energy storage facilities to participate in the secondary frequency service, they are required to possess at least 10 MW installed power. The qualified electricity storage facilities are obliged to participate in the reactive power control service. Accordingly, it has been technically stipulated that the electricity storage facilities are required to have a reactive power capacity, which may consume or deliver the reactive power to the system up to 40% of the installed power, in order to participate in the reactive power control service.

Finally, the testing procedures regarding participation of the electricity storage facilities, which are connected to the transmission system, in the primary frequency control, secondary frequency control, reactive power control and black start service, are included in the regulatory provisions to be published on 15.11.2021.

5. Statutory Regulations of Foreign Countries Regarding Energy Storage

Q2 (covers the period of April 2023-July 2023.)

5.1. Current Developments in Energy Storage

• Energy Storage Systems Summit

The Energy Storage Systems Summit, in which the best practical examples of energy storage systems throughout the world, and the latest business models, and the steps to be taken in our country in the coming period have been discussed, has been held in Istanbul on June 8, 2023. The summit, which has been sponsored by Huawei and Partner EGS, and which has been held in the strategic partnership with the Harvard Business Review Türkiye and the Association for Digitalization in Energy (EDIDER), has been held under the theme of "Overview for Energy Storage in the Perspective of Local and Global Markets, Developing Technologies and New Business Models".

• Energy Storage Global Conference

The Energy Storage Global Conference, which will be held between October 10 and 12, 2023 in Brussels, the capital of Belgium, and which is organized by the European Energy Storage Association in cooperation with the Joint Research Center of the European Commission, will cover the three topics that represent the entire value chain of the energy storage. It will also provide the industry, researchers and policy makers with great opportunities in order to exchange the opinions regarding the main problems encountered by the energy storage sector. The representatives from around the world will gather for a period of three days in order to discuss the regulatory and policy frameworks, and the future energy storage market, and the latest developments in the energy storage technologies.

• COP 28

COP 28 will be held in Dubai, United Arab Emirates (UAE) between November 30 and December 12, 2023. It can be said that the expectations from COP 28 are quite high, and that the agenda is quite busy. The 7 most important items that will constitute the main agenda are provided as follows:

- Loss and Damage Fund
- Climate Finance
- Just Energy Transition Partnerships
- Early Warnings
- Global Situation Assessment
- Global Target for Adaptation
- Food Systems

During the previous COP, a Loss and Damage Fund has been established in order to assist the low-income countries facing the impacts of the climate change. The transition committee, which is established specifically for this fund, will make recommendations at COP 28 regarding how the fund will be operated. This fund, which is one of the financial pillars of the anti-climate change, is of critical importance in terms of achievement of the rapid results in the short term. COP 28 is also important in terms of the \$100 billion harmonization fund that has been determined during COP 15 held in 2009. This fund target has not been met by the high-income countries yet. Despite the daily loss of more than 200 million dollars due to the adverse climatic conditions, the COP 27 negotiators have unfortunately not been able to take the necessary steps regarding the adaptation financing yet. It is expected that the COP 28 will be an extremely important meeting in terms of creation of a framework for the global adaptation target.

Also, the fact that the COP28 is hosted by the UAE can be considered as the result of the efforts of the administration of the UAE to convert the economy of the country into an economy, which is fed by the clean and renewable energy sources as well as by the technological developments and climate-smart solutions.

Sultan Ahmed Al Jaber has been appointed as the Presidential Candidate of COP28. While Al Jaber is the Minister of Industry and Advanced Technology of the UAE, he is also best known as the CEO of ADNOC, which is the national oil company in the UAE, and which is one of the largest oil and gas producers .in the world.

5.2. Regulations, Financing Models and Strategies of Leading Countries in Energy Storage Sector

At the international level, the statutory regulations of the countries have not drawn a comprehensive framework for the energy storage, and the authorities have generally allowed the storage to be licensed only by being considered as part of the "production". However, the COP'26 meetings, which have been held in Glasgow, the capital of Scotland, in 2021, and the COP'27 meetings, which have been held in Sharm El-Sheikh, in Egypt, in 2022, have increased the importance of the energy conversion.

The target for net zero carbon emission in 2050 and the target for increase by a maximum 1.5 degree in atmospheric temperature until 2035, as announced in consequence of the conferences, have brought a number of new responsibilities, especially to the developed countries. Accordingly, the feverish studies have been started in the countries, which are reviewed hereunder, especially in the European countries, which are the pioneers in the energy conversion through their investments, regulations, financing models and strategies. However, it is also required to note that many countries discuss the energy storage through expansion of the electricity regulations. The statutory regulations/programs regarding the energy storage of the countries, which are considered as the pioneers in the sector, are provided as follows. In addition, the financing models and strategies of the leading countries will also be reviewed. The energy storage regulations, which are established in Türkiye, have been placed in a more inclusive framework, compared to the regulations of the leading countries in the energy storage sector.

European Commission Energy Storage Directives

The way to use the energy, which is obtained from the renewable energy sources, not only at the time of the production but also simultaneously with the demand is through the energy storage systems. As part of the target for 0 (zero) carbon in 2050 under the European Union Green Deal, the regulatory provisions, which will be implemented across the continent, are gathered under the umbrella of the directives of the European Commission. The energy storage intends to increase the energy efficiency by balancing the electrical grids and by saving the excess energy. Thus, a concrete way to integrate more renewable energy sources into the electricity system is created. The second intention of the Directive and the Commission is to increase the European energy security, and to create an internal market consisting of the lower prices for the consumers.

The directives nr. 2019/944/EU2009/125/EC and 2010/30/EU regulate conversion of the energy in order to increase the energy efficiency, and they include the nuclear energy, carbon capture and storage and early action plans, such as energy saving potential, and the changes in import and export of the energy, and development of all renewable energy sources, which affect the primary energy consumption. Also, the topics of the directive nr. 2018/2001/EU (Link-1) "About Promotion of Use of Energy from Renewable Sources" consist of the general target of the European Union for 2030, and the support programs for energy from the renewable sources, and the support programs for electricity production from the renewable sources, and the stability of financial support, and the calculation of the share of the energy produced from the renewable sources.

The directive covers the detailed provisions regarding how the financial support to be provided for the energy storage systems will be calculated, and it regulates the support mechanisms to be applied throughout the continent of the market.

The directives regarding the regulations of the energy storage sector are in effect, especially in the examples of Germany, the Netherlands and Sweden. There are the significant difficulties to store the electricity in terms of limited access to the grids and excessive prices. In order to discuss these problems and to determine how to further develop the energy storage technologies, the Commission has published the guidance documents regarding the definitions and principles, as proposed, in June 2016, and regarding the role of the electricity in the energy storage, as of February 2017. (The Energy Union Report: The Annex regarding the Energy Incentives consists of the headings "Internal Energy Market", "Clean Energy Competitiveness Report", "Progress Report for Energy Efficiency" and "Renewable Energy Report".) The European Commission has defined the energy storage systems as a strategic value chain that enables acceleration of the investment and innovation in order to strengthen the industrial policy strategy of the European Union.

The "European Battery Alliance" platform has been established under "The Batteries Europe", which is the program that qualifies the batteries produced in Europe. The Batteries Europe platform includes a broad representation of the stakeholders, and it has a well-defined governance structure, including the six thematic working groups which have been built on a work implemented before the 7th Action Plan regarding the batteries, "The Strategic Energy Technology Plan" (SET). Also, SET 7th Action Plan includes the headings consisting of integration of the renewable technologies into the energy systems, and reduction of the costs of the technologies, and new technologies and services for the consumers, and flexibility and security of the energy systems, and new raw materials and technologies for the buildings, and energy efficiency for the industry, and competitiveness in the global battery sector, and e-mobility, renewable fuels and bioenergy, and carbon capture and storage, and nuclear security. The relevant plan constitutes one of the cornerstones of the energy and climate policy of the European Union. There are 10 key actions under the plan, and it focuses on the competitiveness in the global battery sector. The research priorities for batteries include a range of research and innovation activities, as detailed in the implementation plan, which has been published in November 2017, and which intends to make the battery value chain in Europe more competitive. Within the scope as determined in accordance with the provisions as prescribed under the directive, the several member states come together for the important projects of the common "European Interest" (IPCEI) regarding the battery research and the innovation of the sector, and a technological value is created for the energy storage facilities, which operate across the continent, through the work carried out. As per the directive, the sectoral culture is created through the studies organized and the platforms created. Thus, the projects/facilities for the energy storage sector may be put into practice rapidly.

German Energy Storage Regulations

Germany is one of the leading countries in the European continent in terms of increasing the efficiency of the energy obtained from the renewable energy sources and switching to the sustainable energy. This judgment is stated in many reports reviewing the energy storage investments, activities and projects in Germany.

For example, based on the report, which has been published by Germany Trade and Invest with the support of the Federal Ministry for Economic Affairs and Energy in 2019, the energy storage facility capacity throughout Germany has been intended to be 371 MW in 2018. The target for 2021 has been set as 604 MW, and this target constitutes one of the largest energy storage facility capacities in Europe. Also, the turnover of the German energy storage industry has been calculated as 7 billion euros in 2020 (Link-2) under the sectoral publications. Based on the IEA 2021 data, the total energy storage capacity in the world is 6.4 GW. When the global capacity and the energy storage installed system capacity in Germany are compared, it becomes clear that Germany is a leading country in terms of the energy storage.

Considering the energy storage sector in Germany as per the regulations, based on the report "Germany 2020" as published by the IEA, Germany has reformed the electricity market regulation in order to ensure the system integration of the variable renewable production, especially upon adoption of the Law on Further Development of Electricity Market in 2016. As per the relevant regulations, the matter for electricity conversion has been described as the final phase of the transition to the renewable energy. Such report, which is published by the IEA, underlines that Germany is on a cost-effective, fair and sustainable path in the energy storage sector through its policy and regulatory reforms.

The German regulations consider the electricity storage facilities as the consumers of the electricity. However, the energy storage facilities in Germany encounter the various statutory and commercial difficulties. The reason for this is that the storage facilities are considered as the consumers when they consume the electricity, and as the producers when they deliver the electricity to the grid. Such difference in status means that the storage facilities are required to pay any and all fees that are normally associated with the electricity consumption when they consume the electricity from the distribution or transmission system for storage purposes.

Based on the German energy storage regulations, there are also various regulations intending to facilitate use of the storage facilities. Accordingly, the German Federal Energy Industry Law (EnWG) exempts the storage facilities, which have been built after 31.12.2008, and which have been put into operation on 04.08.2011 or within 15 years after such date, from the obligation to pay the grid tariffs for a period of 20 years when they consume the electricity from the grid. However, such exemption only applies in the event that the electricity consumed is stored in an electrical, chemical, mechanical or physical storage facility, and that the electricity is reintroduced to the same distribution or transmission system with delay. Also, the German Law on Renewable Energy Sources (EEG) includes the following headings: connection, acceptance to the system, transmission and distribution provisions, market premium and feed-in tariff payment, compensation mechanism and tender provisions. The law exempts the electricity, which is kept for temporary storage in an electrical, chemical, mechanical or physical electrical storage facility, from the EEG tax in the event that the electricity stored is consumed only in order to be returned to the grid.

Based on the current Electricity Tax Regulation in Germany, there is no need to pay the electricity tax based on the electricity production. The pump hydroelectric storage facilities are also included in this scope, and since they are considered as the electricity generators, they are also exempt from the obligation to pay the electricity taxes. The German Energy Law also provides the various other exemptions specifically for the operators of the battery storage facilities. Most of these rules are intended to ensure that electricity store does not trigger the additional or other charges, compared to a scenario in which the path from the electricity production to the electricity consumption is not interrupted by the storage. For example, use of the electricity for the electrolysis of the water or other storage methods does not create an obligation to pay the grid charges. In addition to such incentives, the German state-owned Development Bank (Kreditanstalt für Wiederaufbau, KfW) has various programs in order to encourage development of the battery storage capacity. The Development Bank has distributed funds of 11 billion Euros worldwide in 2020. (Link-3)

There have been important recent developments regarding the renewable energy regulations in Germany. The EEG, as provided herein above, has been updated and promulgated the Federal Gazette, dated 28.07.2022. Accordingly, a comprehensive regulatory work has been carried out in order to comply with the resolutions, which have been adopted during the COP meetings, and to fulfill the targets determined, based on the EEG 2023, which has entered into force as of 01.01.2023. Upon such new regulations entered into force, it has been ensured that the investments in renewable energy sources have been increased, and that their efficiency have been enhanced, and that the financing models have been diversified. The federal government will provide innovative projects in many areas of energy conversion, ranging from the energy storage systems to the hydrogen-based electricity production storage activities. However, the GES projects become prominent as the field in which the greatest incentives will be provided. It has also been intended to meet 80% of need of Germany for electricity from the RES and GES until 2030, and it has been included in the EEG 2023. (Link-23)

German Energy Storage Financing Models and Strategies

Germany, which intends to increase the solar and wind energy production to 80% in 2030, needs the energy storage systems more and more in order to maintain the seasonal and daily efficiency of the energy produced from the solar and wind energy. Based on the reports (Link-4, 5, 6, 7) and strategies, which are published by **Bundesnetzagentur** (Federal Network Agency), the energy storage sector will grow rapidly in parallel with the renewable energy systems until 2050. Germany is a country, which is very experienced in the energy storage sector, and which has established **Huntorf CAES**, the first air-pressurized energy storage in the world, in 1976, and which has increased its capacity to 321 MW in 2006.

Germany, which has made serious investments in battery technologies by keeping up with the world in consequence of the future projections and technological developments in the recent years, continues to be a leading country in its region in terms of the energy sector. Accordingly, an energy network has been established between Norway and Germany through the **NordLink** Project, which is a cable line with a capacity of 1,400 MW, and which has been opened on 27.05.2021. In addition to this critical cable network project, a memorandum of cooperation has been executed with Japan regarding the energy storage systems, based on the reports published by the Federal Ministry for Economic Affairs and Energy.

Based on the European Union Green Deal, the target for 0 (zero) carbon emission in 2050 is of serious importance for the member countries, including Germany. The countries determine their programs and strategies in order to reduce their carbon footprint based on this target. Germany, which is the locomotive of the European Union in the industry, technology and energy sectors, increases the allowance for energy storage investments, which is of strategic importance in order to reduce the carbon emissions, each year. An allowance of 50 million euros has been allocated only for the energy storage systems to be installed in a manner to be integrated with the solar energy systems, and these funds will be transferred to the facilities, which currently operates, in direct proportion to their production capacities, while the support programs for new projects are periodically announced by the government. As part of these support programs, Germany tries to become one of the leading countries in battery cell production with "**The European Battery Alliance** "EBA" (European Battery Alliance), which has been established in 2017. 1 billion euros have been provided from the Energy and Climate Fund until 2022 in order to provide the support to the companies that constitute a part of the alliance. As part of the EEG 2023, the financing models have been diversified, and the investors are intended to be encouraged.

Since modernization of the energy storage systems is costly, one of the most important contributions to the growth of the sector is the support programs and incentives of the governments. Apart from the financing models implemented nationally in Germany, there are also programs implemented throughout the European Union. One of these is **The Batstorm Project** (2016-2018). (Link-8) This project, which is funded by **Horizon 2020**, has been established in 2016 in order to identify and support the research and development needs in the field of battery-based energy storage. The final report has described the battery technologies, which are used in the stationary storage, and their strengths and weaknesses, and the different uses for battery storage across the energy system, and the main research priorities, and the accompanying measures in order to enable the storage, for the purpose of rapid development of the battery-based stationary storage. Additionally, the battery-related policies, which are applicable in the member states selected, have been analyzed, and a non-exhaustive list of good practices and practices to avoid has been shared with the countries selected. Both financial and sectoral development are intended through such financing models as The Batstorm Project, specifically for Germany and the European Union.

United Kingdom Energy Storage Regulations

The United Kingdom regulations regulate the licensing, production, transmission and distribution of electricity in detail as per **The Electricity Act 1989**. Upon the amendment to the relevant law in 2008 (The Electricity Act 2008), the obligations have been introduced in order to produce electricity from the renewable sources, and a program has been determined in order to decommission the nuclear facilities. The terms and conditions, which are applicable for licensing the energy storage activities, are also regulated within the **Electricity Generation License: Standard Conditions**, which are covered by the relevant law. Accordingly, the projects over 100 MW (only existing pump hydroelectric power plants fall into this category currently) are required to have a production license. Also, the headings, as provided in the section "Additional Standard Terms and Conditions for Electricity Storage" (Link-9) of such regulations, consist of the Obligations for Storage Sector, Characteristics of Technological System Used, Integration of Electricity Stored into Transmission Lines, and Approval by Electricity Supply Mechanisms.

Based on data obtained from the **Office of Gas and Electricity Markets "Ofgem"**, there are 43 companies operating their energy storage activities through a license in the United Kingdom as of 2023. These companies and the other companies, which will receive new licenses, are also regulated subject to the general terms and conditions for electricity production license. It should be particularly noted that the energy storage sector companies have been included in the regulations based on the specific terms and conditions under the heading "Additional Standard Terms and Conditions for Electricity Storage". In addition to the basis for general licensing regulations, the comprehensive technical reports have been published by the government for the purpose of localization of the energy storage battery systems. Based on these technical reports, which are published by the Department for Business, Energy and Industrial Strategy, the dangers, which might arise from the storage systems that have many areas of use, have also been identified. The United Kingdom, which includes the energy storage in detail under its regulatory studies, also applies the international standards regarding the subject matter.

Based on the reports, regulations and information, as provided on the website of the Ministry, standards have been determined by the National Fire Protection Association (NFPA) due to the fact that it is easy for the domestic batteries to cause fire. The relevant standards also regulate such matters as installation, loading, commissioning, operating process, maintenance and decommissioning of the systems. As a second national standard, the "Energy Storage Systems: Parameters, testing methods, practices and performance testing standards" become prominent.

The most important matter here is that, in addition to the national standards as published in the United Kingdom, the international standards are also included. Based on the information provided in the studies as published by the Ministry, the energy storage standards, which are determined by the **International Electrotechnical Commission (IEC)** are also applied. In addition to these standards, the international standards (**Standard for Energy Storage Systems and Equipment**, etc.) (Link-10, 11) of the US-based **Underwriters Laboratories (UL)**, which is a global safety science leading company, and the standards of England-based BSI Group, which is an international standards company, are also practices accepted by the energy storage industry in the United Kingdom.

United Kingdom Energy Storage Financing Models and Strategies

The investments in energy storage sector, which will significantly increase the efficiency of the energy obtained from the renewable energy sources, are encouraged as part of the road maps, as published by the British government in the recent years, and the target for 0 (zero) carbon emission in 2050, and the green energy studies. (Link-12) As specified herein above, while there are currently 43 licensed companies operating in the energy storage sector, the government has a target to increase this number and to reduce the carbon emissions by 85% until 2030. On the other hand, as specified under the strategies as published by the Department for Business, Energy and Industrial Strategy, one in every three cars in the United Kingdom will be electric in 2030. Accordingly, there is a serious need for investment in order to meet the energy needs for such vehicles powered by lithium-ion batteries. Thus, the largest lithium-ion battery factory in Europe, the foundation of which has been laid in 2020, has become operational in Manchester in 2022. The different financing models are encountered in the United Kingdom, which has such a near-future energy storage strategy. (Links-13, 14, 15, 16)

As an example of the competitions, which are opened by the Ministry, and which consist of the detailed criteria, the financial support is provided to the sector elements through the Longer Duration Energy Storage competition, which is organized as part of the Net Zero Innovation Portfolio. The companies and projects, which best comply with the criteria specified, are funded through the competition. The criteria consist of the potential CO2 saving volume, and activation of the renewable energy increased on the grid, and the total export potential increased, and reduction in the energy consumption, and the unit/year energy savings, and the unit energy cost reduction, and the additional investment amount received. In addition to the criteria specified, there are also many assessment criteria determined as part of the competition. The companies/projects intend to obtain the highest score, and to benefit from the funding source determined per competition. The financial support, which is provided specifically for this competition, amounts to 1 million pounds for the mobilization of the projects, and to 11 million pounds for the construction phase. In the second phase of the competition, the financial support of 150 thousand pounds is provided for the feasibility studies, and 9 million pounds for the construction and operation process.

Following completion of the assessment performed by the Ministry in consequence of the subjective criteria of each competition, it is determined which companies will be provided with the incentives at what rate. Considering the criteria of the competitions, such criteria as the contribution of the investments/projects to the sustainability, their measurability, and the return intended are noteworthy. Another financing model is the Energy Storage Component Research and Feasibility Study Support Program. The relevant program intends to increase the efficiency of the energy storage, and to provide the support, by the government, for the feasibility studies of facilities/projects.

Apart from this support program, which has its own unique characteristic and operation, the energy entrepreneurs fund may be reviewed as a financing model. Such fund consists of the successive phases, and it intends to provide the financial support to the smaller-scale investments, which have a new idea in the energy storage sector, as well as to provide the company-based incentives. In addition to the direct financial support, there are also academy programs in order to train the specialist for the purpose of increasing the efficiency of the renewable energy sources throughout the country through the specialization training.

The British Government, which also includes the new and creative ideas in its financing model, supports the market in many ways by applying the VAT rate of 20% to 5% in some energy storage systems, apart from the matters as specified herein above. In summary, the periodic strategies have been announced as part of the target for 0 (zero) carbon in 2050 throughout the country, and it is intended to provide 1 billion pounds of incentives for the energy entrepreneurs and green finance between 2021 and 2025.

Dutch Energy Storage Regulations

In accordance with the legislation and regulation, the European Union directives regarding the energy storage are accepted in the Netherlands. The European Union, which allows the member countries to implement the specific regulatory practices in line with their own strategies and goals, has determined the statutory bases, which are applicable across the continent on general basis, and the relevant statutory provisions also cover the member country Netherlands.

Based on the comprehensive report for Integrated National Energy and Climate Plan 2021-2030 as published by the Ministry of Economic Affairs and Climate Policy in 2019, the Netherlands is a member of The North Seas Energy Cooperation. The members of the Cooperation are Germany, Belgium, France, Luxembourg, Denmark, Ireland, Norway, Sweden, the United Kingdom and the European Commission. Thus, the Netherlands are included in both national and international studies in order to increase the efficiency of the renewable energy sources. Thanks to such cooperation, the studies are carried out regarding the renewable energy source potential of the member countries of the cooperation by creating annual programs. As specified under the relevant report, the regulatory basis for sustainable energy, including the energy storage, is the Dutch National Climate Law adopted in 2019. The targets set as per such law also play a key role in the future projections. The climate law includes the multiple provisions regarding the renewable energy sources (savings in the primary energy sources in order for the renewable energy to reach the share intended, and encouraging the savings regarding use of the primary energy). The energy and climate plan for 2021 and 2030 discusses the matter of energy storage under the heading "Increasing the Flexibility of National Energy System through Domestic Energy Sources, Demand Effect and Energy Storage". Accordingly, it has been put forward that the flexibility of the energy storage market will increase upon being regulated in the next few years, and that it will be an attractive sector in terms of investment. The infrastructure of the energy conversion has been specified as the most important project for conversion of the electrical energy, and it has been stated that the energy conversion projects will constitute most of the energy investments in 2030-2050. Based on the report, minimum 23 municipalities across the Netherlands will have 0 (zero) emissions in the urban transport until 2030. It is underlined that the most critical sector in terms of the relevant target is the energy storage systems and hydrogen energy.

A law draft, which combines and improves the current Electricity and Gas Law that is also known as "STROOM", and which includes the R&D studies regarding the energy storage, has been drawn up. STROOM consists of such headings as the self-supply of energy, and the tariff regulation, and protection of the markets against the external factors, and granting and cancellation of the production guarantees. The draft law largely consists of the measures, which are described in the Dutch Energy Report for 2011, and which intends to eliminate some concrete constraints as identified in the report. Not all of the action points, which are specified under the report, and which require the regulatory amendments, are included in the draft law. For example, the law draft does not contain the provisions, which facilitate privatization of the minority shares in the national (gas and electricity) transmission system operators, or which make the same mandatory. Although such law draft has been considered to be comprehensive and sustainable, it has been rejected by the Dutch Senate on December 22, 2015 in consequence of a public-private sector dispute within the country. It is also known that this law draft is reconsidered by the Ministry of Economic Affairs and Climate Policy, especially in order to facilitate the experimental storage projects. The reason for selection of the method to facilitate the experimental storage projects is that the Ministry of Economic Affairs and Climate Policy intends to regulate the Dutch regulations based on the results of the R&D and experimental projects. It is also known that the companies, which have an important place in the energy storage sector, such as Solar Turbines and AEP International, intend the statutory studies, which will regulate the energy storage activities in the Netherlands.

Dutch Energy Storage Financing Models and Strategies

The sustainable energy strategy, as published by the Ministry of Economic Affairs and Climate Policy, intends to produce 100% energy from the sustainable energy sources in 2050. In the Netherlands, it is intended to reduce the carbon emissions by 95% in 2050, compared to 1990. It is anticipated that the Netherlands, which could not reach the target set for 2020 regarding the renewable energy sources, will increase its investments in energy storage systems in order to achieve the targets adopted as part of 0 (zero) carbon emissions. In accordance with the Climate Law adopted in the Netherlands, the emissions of Shell, which is the leading energy company in the country, have been reduced, and the studies regarding the renewable energy sources have been increased in consequence of the other sectoral actors affected by such practice. Both companies and countries have short-, medium- and long-term plans regarding the energy storage systems, which are one of the most critical fields in order to produce sustainable energy.

The Netherlands intends to provide benefit for the various forms of energy storage, upon introduction of a number of other changes that will regulate the sector in the short term. The net metering plan for domestic uses regarding the systems, which can convert the electrical energy, has been completed in the end of 2021. This development is expected to accelerate the domestic energy storage systems market. It is estimated that such regulations as introduction of a labeling system for the energy used at homes as of 2023, and introduction of the obligation for homes, which are built recently, to be built without connection to the gas network will play an important role in development of the energy storage sector. Thanks to these new practices, it is expected that the local people will self-supply their energy, and that they trigger the additional demand for energy storage systems for electrification purposes.

Also, the Fourth National Energy Efficiency Action Plan for the Netherlands (Link-17), as published on 30.04.2017, contains many provisions regarding the energy storage systems. Accordingly, in 2011, the "Incentives for Sustainable Energy Production" (SDE+) program (Link-18) has emerged under this action plan. The cash supports, which are provided as part of the SDE+ program, are funded by a flat tax collected by the government since 2013; thus, it is intended to transfer the sources to the programs in a stable manner. The action plan also regulates the tax rates regarding storage of the energy produced from the renewable energy sources. Considering the SDE+ incentive program, the companies, which meet such criteria as the feasibility studies, permits, approval by the owner of the location in which the facility will be established, and transmission capacity indicators, may file an application for the program.

Based on the report "Incentive Regulation of the Gas and Electricity Networks in the Netherlands", as published by The Netherlands Authority for Consumers and Markets "ACM" in 2017, the regulations have three targets regarding the incentives. Accordingly, such targets are to provide incentives to the network operators in order to operate efficiently, and to prevent the network operators from implementing the tariffs above the tariffs as determined, and to reduce the cost level, and to provide a suitable investment return to the network operators, and to promote an optimum safe transportation.

The “2019 National Action Plan-5 for Energy Storage and Conversion”, as published by the Dutch Industry Group for Energy Storage, identifies the various matters, which negatively affect the accelerated deployment of the storage projects at different levels in the energy system, and which are required to be addressed under the national regulatory framework. The plans of the Ministry includes that this national action plan will provide guidance regarding the changes required to achieve the target for Climate Law. (Link-19) The Energy Storage NL platform, which is established by the leading market players and entrepreneurs of the energy storage industry, carries out the energy conversion studies. Such platform carries out the joint work with the Dutch solar energy association and battery manufacturers, and it concurrently continues to implement the projects across the country. (Link-23)

Swedish Energy Storage Regulations, Financing Models and Strategies

Sweden, which hosts Northvolt that is one of the most important companies in the European continent in the field of energy storage systems, has comprehensive national strategies for energy obtained from the sustainable energy sources. Based on the IEA's report "Energy Policies of IEA Countries: Sweden 2019 Review", Sweden obtains the most of its electricity needs from the nuclear energy. Sweden, which intends to meet all of its electricity needs from the renewable energy sources in 2040, implements a 30% aid incentive in order to install the energy storage systems. This incentive means provision of the financial support of 915 million Swedish crowns (90 million euros on the basis of the current average exchange rate) for a facility that will increase its capacity by 0.5 GW.

In addition to the tax deductions in production of the batteries that consist of the energy storage systems, the companies, which are engaged in the production with incentives, are included in the certification system, and they are professionalized within the sector. Based on the report, these practices intend to increase the efficiency of installed power by encouraging the sector actors to make new investments. It is stated in the report that the subsidy opportunities are provided to the houses, which intend to self-supply electricity, and that the industrial consumers are also exempted from the network charges required to be paid while purchasing the energy from the energy storage systems.

The directives, as determined by the European Commission, also regulate the sector in Sweden. As in the examples of Germany and the Netherlands, the energy storage directives, which are determined by the European Commission, constitute the provisions, which the energy storage facilities will comply with before and after the construction and throughout their operation. The strategy for energy storage systems as part of the target of Sweden for 0 (zero) carbon in 2045 has been published and implemented by the Minister for Business, Industry and Innovation. Based on the text as published on the website of the Ministry in 2018, it has been intended, since the relevant years, that Sweden becomes the European center in terms of production of the lithium-ion batteries which constitute the leading element for the energy storage systems. The text also underlines that the demand for electric vehicles and systems, which can be used in the renewable energy sources in terms of production of the sustainable batteries, will increase, especially after 2030. It has also been stated that the projects and new facilities, which will be implemented within the country, will be funded, with the expectation that the demand for the relevant systems will be much higher than the supply in the near future. Under these circumstances, it has been announced that Northvolt will commission an energy storage capacity of 32 GW in 2023.

The report "The Nordic Battery Value Chain", which is jointly draw up by Sweden, Norway and Finland, has been published in February 2023. (Link-24) The report has stated the potential of Sweden, Norway and Finland regarding the energy storage systems. Those who become prominent with respect to the most important matters, on which the potential is based, consist of the previous investments made by the relevant countries in renewable energy sources, and the regulations implemented in order to reduce the carbon footprint, and the heavy schedule of governments regarding the sustainable energy. It is underlined that the Scandinavian countries can take advantage of the cold climate with respect to such matters as fires and systems affected due to the rapid heating of the energy storage systems. It has been stated that the fact that the raw materials, which will be used in the battery production, are less costly in the Scandinavian countries, compared to the other European countries, will facilitate the rapid growth of the energy storage companies in the country. The representatives of the companies, which own the leading energy storage facilities of the countries, have stated that the electric vehicles will be used by 58% in 2040, and that this factor will trigger the demand for batteries. It has been anticipated that the largest battery demand in the world in 2030 will be in China, and that the European continent will be second. Also, the report estimates that the battery demand in Europe will increase by 29% annually until 2030. It has been intended to create the financing models, which will attract the foreign investors to Sweden and Scandinavian countries through the Foreign Direct Investment (FDI). The national criteria required to be observed by the new investors through the FDI are provided as follows: The report underlines regulation of the internal market by ensuring the efficiency, and increasing the cooperation through initiation of the joint marketing activities and establishment of the alliances, and monitoring the developments of the European Union regulations regarding the energy storage.

Swiss Energy Storage Regulations, Financing Models and Strategies

In the Swiss electricity sector, the main law is The Electric Supply Law (ESL) published in 2008. The relevant law has been revised based on the 2050 climate change and the energy strategies and targets. The regulatory revision, which is approved upon the public participation, has entered into force in 2018. Thus, it has become easier for the large capitalists to invest in the market. The biggest obstacle for the electricity companies, which will operate the pump storage facilities as an energy storage system, is that it is very difficult to obtain the construction licenses and concessions that are granted for a maximum period of 80 years. Despite the targets of the Swiss government, as defined in the "Energy Strategy 2050", there is currently no direct support by means of subsidies for the pump storage operators in Switzerland. However, since the electricity storage technology is required to be improved in order to achieve the targets for "Energy Strategy 2050", the studies for research and development of the different storage methods are funded by the Swiss Government.

Based on the report "Energy Policies of IEA Countries: Switzerland 2018 Review", as published by the IEA, Switzerland is the country that allocates the most resources to the energy efficiency R&D studies in the world after South Korea and Israel.

Therefore, the energy storage systems, which are important for the energy efficiency, are also being developed. Based on the report, the R&D studies for electricity transmission, distribution and storage, which has grown more than three times from 2011 to 2017, has constituted 14.2% of the general budget. The electricity consumers in Switzerland use the electricity at a higher cost than the other countries of the European Continent. Compared to the low taxes in the IEA member countries, this situation is slightly different in Switzerland, and the Swiss industry, which uses the electrical energy, have paid taxes, amounting to 123 million dollars, in 2017. The tax rate of 12% also becomes prominent as the eighth highest tax rate among the IEA member countries. Based on an analysis performed under the report, it has been underlined that execution of an electricity agreement between the European Union countries and Switzerland will be very beneficial for the parties. The reason for such matter is that the electricity demands, which arise from the investment made by the neighboring European countries in the battery systems, has increased, and that satisfaction of such demand may cause the positive results for the parties.

On 26.02.2020, the Swiss Federal Council has approved the "Swiss Energy Research For The Energy Transition" (SWEET) fund program, which will start in 2021, and which will be implemented until 2032. As part of the program, which is drawn up by the Swiss Federal Energy Office, the government support has been intended for the investments which will reduce the carbon footprint. Based on the 2050 Swiss Energy Strategy, which has previously been determined and implemented, the companies are encouraged to make investments in this field under a comprehensive fund program that also covers the energy storage systems.

As part of the program, the government calls and receives the applications, and then, the financial support, which will be provided in accordance with the criteria, is determined. As part of the program, the first call has been performed regarding "Integration of Renewables into a Sustainable and Resilient Swiss Energy System". It is intended to increase the efficiency of the incentives that are provided in consequence of filtering the funds, which will be provided by the government, by subject matters. Considering the calls performed as part of the SWEET program, the prominent heading and subject matters consist of the combination of renewable energy, heat conversion and storage for medium- and high-temperature heating as well as cooling, and the actual energy conversion of a specific area in Zurich, and the analysis of long-term and comprehensive pathways and associated uncertainties, and the assessment of sustainable and flexible configurations of the energy system in an integrated manner, and the sustainability and resistance on cantonal, urban and industrial basis through strategy and roadmap recommendations and case studies, by taking into account the political environment and regulatory elements. The headings, as specified in the calls performed under the program, are reviewed, and the studies are carried out accordingly, and the financial support is provided to the projects or facilities. Considering the calls, it is expected that the budget, which is needed under the projects, will be detailed and divided into the items, and that they will be entered in the application form. The applicant's own contribution (personnel, etc.) and third party contributions for the project research expenses, management expenses, R&D studies expenses and other expenses are clearly entered in the form, and they are expected to be included in the financial support calculations as requested or required as part of the SWEET program.

5.3. Statutory Regulations of Other Foreign Countries Regarding Energy Storage

Austria: The energy storage is not separately defined under the Austrian regulations. Despite this, it is referred to the pump hydroelectric power plants in the Electricity Law and state laws, and these plants are considered to be energy producers. Also, it is regulated that these power plants, as the energy producers, are required to comply with the Electricity Law, and that they may operate under a production license. In addition, the certain exemptions for energy storage projects are granted in Austria. The temporary exemption from the network usage fees and exemption from the electricity tax for projects, which are put into operation after 07.08.2013, can be provided as examples thereof.

People's Republic of China: The second largest energy storage system capacity in the world is located in China, after the United States. The total capacity of 1.9 GW in China constitutes a significant portion of the global capacity of 6.4 GW in total. Based on the information obtained from the research, the largest battery demand in the near future belongs to China, and the largest vanadium redox flow battery in the world has been commissioned in June 2022. 400 MWh of energy can be stored in the facility, which is known to have a total capacity of 100 MW. Based on the statements made by Chinese official sources in 2021, 35 GW of energy storage capacity will be put into operation until 2035. However, the national policy and grid policy of 2 China state-owned grid companies indirectly support the participation of energy storage in the end-user consumption and electricity usage demand management practices.

Italy: Although the electricity storage market is growing rapidly in Italy, the statutory framework does not fully cover the main features of the market. In the past, Italian regulations have included only pump hydropower and no other types of energy storage.

However, the increase in solar cell installation has required the regulation in order to ensure that Italian grids could meet the demand. Therefore, in accordance with the Decree Law Nr.28/2011, the transmission system operators may develop the storage systems in order to increase the intermittent production shipment. Also, the transmission system operators may develop and manage the distributed storage facilities through the batteries in accordance with the relevant regulations.

In addition, the same process may be performed by the distribution system operators in their own networks. While the regulations, as described herein above, are the main statutory framework in Italy with respect to the electricity storage sector, the subsidiary regulations, which are adopted by the Italian Electricity, Gas and Water Regulatory Authority (AEEG), also ensures the statutory framework with respect to the grid-connected storage solutions by the non-regulated parties such as energy producers or end users.

Russia: There are no specific regulations or programs in order to support the energy storage in Russia. The pump hydroelectric power plants may operate under a common regulation that is applicable to the power plants in Russia. Despite this, the National Technology Initiative (NTI), which is implemented in accordance with the decision of Vladimir Putin, the President of Russia, has been created in order to research a number of modern energy production, distribution and consumption technologies (EnergyNet), including the energy storage applications. The purpose of the NTI is to provide an advantage for the Russian industry in the developing sectors in the medium term, and the EnergyNet initiative, which constitutes a part of this program, intends to determine the need and scope of the changes to be performed in the Russian regulations for the purpose of development of the energy storage projects.

Q2 (covers the period of April 2023-July 2023.)

Spain: Spain is the industry leader in storing the molten salt energy in the solar power plants with a capacity of approximately 6.8 GW. The energy storage is not separately regulated within the Spanish statutory framework, and the electricity can currently be produced for licensing purposes under the "Electricity Law 2013". In conclusion, the energy storage projects connected to the hydroelectric power plant projects are required to have a permit or license in order to operate. Holding a production license imposes certain obligations on the license holder, such as complying with the safety regulations, providing any information to the public institutions, paying the electricity system tolls, or discharging the energy produced. No specific subsidies or State commitments are expected for a particular level of distribution of electricity storage.

6. Hydrogen and Hydrogen Production

The hydrogen ensures the connection between the intermittent wind and solar energy production and traditional energy-consuming sectors, and it creates a field that will play an important role in the future energy system based on the renewable energy. However, implementation of the hydrogen, including its production, transportation, distribution and use, requires governmental support as well as the beneficial policy and regulatory environment which ensure a positive economic outlook for the industrial distribution. Based on the International Hydrogen Strategies Report, as published by the International Energy Council in September 2021, an average of 70-100 million tons of hydrogen is produced in the world. Based on the information, as provided in the relevant report, 3,500 vehicles have been available on the roads in Japan, which announced its hydrogen strategy in 2017, by using the hydrogen energy, as of the end of 2019. While Japan has made significant progress within a period of two years, China, which has developed the hydrogen for twenty years in order to be used in the cars, based on the information provided in the report, would have built a 3,000 km hydrogen transportation pipeline until 2050, and it intends to build 5,000 hydrogen refueling stations until 2030.

Apart from these countries, the European Union, Germany, France and South Korea have determined and developed the public strategies regarding the hydrogen energy, and they use high levels of hydrogen energy compared to other countries.

In accordance with the Paris Climate Agreement, the renewable energy sources, which reduce the carbon emissions with a target for 0 (zero) carbon, and the hydrogen energy, which produces energy by reducing the carbon from the renewable energy sources, become prominent. Based on the report issued by the International Energy Council, such countries as Portugal, Morocco and Ukraine are in the preparation phase for the public strategies regarding the hydrogen energy. There is no strategy yet announced by Türkiye regarding the hydrogen energy, which is closely monitored globally, and which continues to be developed with high investment. The countries, as specified herein above, implement their hydrogen-related regulations efficiently, and accordingly, they reduce their carbon footprint day by day.

The study "Hydrogen: a Sustainable Pathway to a Renewable Energy Future", as published by Deloitte, has stated that the electrolysis technologies, which are required to produce the hydrogen energy, require the high-cost investments. The reason why these technologies are high-cost is the need for electrolysis of the renewable energy sources in order to produce the green hydrogen, which will keep the carbon emissions at the lowest level. The relevant states that the hydrogen energy, which is specified as the energy of the future, is environmentally friendly, and that it will be a type of energy which will be imported and used by the developed countries in the near future. Based on the information provided in the report "Priority Fields for National Hydrogen Strategy in Türkiye", as published by SHURA Enerji Donusumu Merkezi (Energy Conversion Center), almost all of the global hydrogen energy production is performed by means of reformation of the natural gas, through the gray hydrogen production. Also, it is stated that the gray hydrogen production causes the emission of approximately 10 kilograms of carbon dioxide per 1 kilogram of hydrogen. A large portion of this production is used in the refinery, chemical and transportation sectors. The graph, which indicates the sectoral distribution, management, demand and resources of hydrogen energy, is obtained from the report, and it shared as follows:

INDUSTRIAL SECTOR	IMPORTANT PRACTICES	PERCENTAGE OF GLOBAL Hz DEMAND	HYDROGEN SOURCES
CHEMICALS	•Ammoniac	65%	4%
	•Polymer		18%
REFINERY	•Hydroracking		30%
	•Hydrotreating		48%
IRON AND STEEL	•Annealing	25%	Natural gas
	•Blanketing gas	10%	Oil
	•Forming gas		Coal
GENERAL INDUSTRY	•Semi-Conductive		Electrolysis
	•Propellant		
	•Glass Production		
	•Hydrogenation of Oils		
	•Cooling of Generators		

Copyright: Hancio 2016

In respect of the hydrogen energy, which is anticipated that it will have a strategic importance in the near future, especially in the petrochemical, refinery and transportation sectors, the article "Hydrogen Energy and Hydrogen Potential in Türkiye", which has been carried out by the collective work of the academicians serving at Technical Education Faculty of Gazi University, states that our country has a significant potential as part of the hydrogen energy. Such study also states that the Black Sea is especially rich in hydrogen sulfide, which is an element that is valuable in order to obtain the hydrogen in consequence of the electrolysis process. Since the Black Sea, which has been a lake in ancient times, has been filled with salt water in consequence of formation of the Bosphorus, the freshwater creatures have lost their life forms, and they have been stored as fossils in chemical form on the bottom of the Black Sea until today. The article draws attention to such matter, and it points out that the reason for high potential in hydrogen energy in Türkiye is the hydrogen sulfide richness of the Black Sea. In consequence of the calculations, it has been stated that the value of the hydrogen, which will emerge from the electrolysis process of the hydrogen sulfide found in the bottom waters of the Black Sea, is approximately 715 billion dollars.

Considering the regulations regarding the hydrogen in our country, we observe three different Regulations:

- Regulation on Increase in Energy Sources and in Efficiency for Use of Energy
- Regulation on Approval of Type of Hydrogen-Powered Motor Vehicles
- Communiqué on Implementing Measures for the Regulation on Approval of Type of Hydrogen-Powered Motor Vehicles

Regulation on Increase in Energy Sources and in Efficiency for Use of Energy

The provisions as prescribed thereunder regarding the hydrogen are provided as follows:

Scope

Article-2 – (1) This Regulation covers procedures and principles for authorization of the universities, professional chambers and energy efficiency consultancy companies to direct and disseminate the services and studies regarding the energy efficiency, as well as for the energy management practices, and the duties and responsibilities of the energy managers and energy management units, and the training and certification activities regarding energy efficiency, and the studies and projects, and the project supports and voluntary agreement practices, and the demand side management, and the increase in energy efficiency in the production, transmission, distribution and consumption of the electrical energy, and the benefit from the waste heat, and the open area lighting, and the encouragement for use of the alternative fuels such as biofuel and hydrogen, and the administrative sanctions.

Miscellaneous

Article-29 - (6) The public institutions and organizations, which carry out and/or support the research and development projects, shall prioritize the projects regarding the following subject matters. They shall provide the technical support along with the promotional activities in order to implement the projects completed successfully.

c) The economical hydrogen production techniques by using the renewable energy sources such as water, wind, solar and geothermal.

The "Regulation on Approval of Type of Hydrogen-Powered Motor Vehicles", which has entered into force upon promulgation thereof on the Official Journal, dated 07.06.2011 with the issue number 27957, has been regulated in terms of the communiqué based on the relevant communiqué, which has entered into force upon promulgation thereof on the Official Journal, dated 14.05.2020 with the issue number 31127. Such regulations are related to use and dissemination of the hydrogen energy in the transportation sector, and there is no comprehensive regulations in Türkiye regarding the hydrogen energy production. Also, considering the strategy reports issued by the Ministry of Energy and Natural Resources, there are no provisions regarding the hydrogen energy.

6.1. Foreign Country Strategy Regarding Hydrogen Energy

6.1.1. United Kingdom Hydrogen Energy Strategy

Based on the statement "UK Government Launches Plan for a World-Leading Hydrogen Economy", which has been first published by the Department for Business, Energy and Industrial Strategy on 17.08.2021, and which has been updated on 13.12.2023, the hydrogen energy strategy has been determined. As part of the declaration, the United Kingdom intended to create an economy that will lead the world in terms of the hydrogen energy. It is intended that the government will provide 4 billion pounds of financial support to the hydrogen energy sector until 2030. It is underlined that the employment may be created for 9 thousand persons, who will be included in the hydrogen energy production, consumption and other activities, through the new investment fields to be created. Also, the hydrogen energy capacity across the country is intended to be 30 GW until 2030. (Link-25) As part of the strategy determined, a separate fund of 105 million pounds has been allocated in order to reduce the emissions of the sectors that are at the forefront of the carbon emissions. The prediction of the strategy, which has been created in detail as part of the studies carried out by the Prime Minister of the United Kingdom regarding the hydrogen energy, is that the energy needs of 3 million houses will be met through the hydrogen in 2030. This strategic planning points out as the most comprehensive strategy in the world, by intending to use the hydrogen in the houses to this extent. After the 2030 targets have been achieved, the strategies have been determined for 2050. Accordingly, 13 billion pounds of governmental support will be provided for the hydrogen energy economy until 2050. The employment target has been set as 100 thousand, which clearly indicates that the targets set will make the hydrogen energy significantly important in the coming years. The United Kingdom Government, which has established one of the most critical pillars of its target for 0 (zero) carbon in 2050 on hydrogen energy, spends a great deal of time regarding the hydrogen economy.

In addition to use of the hydrogen in the industrial, domestic and industrial fields, it is intended to meet the energy, which is needed by the transportation vehicles, from the hydrogen. The most important basis and experience of the government with respect to such matter is indicated as its previous success in becoming a leading country in the world thanks to its "Offshore Wind Plants" strategy. The success of the Offshore Wind Plants strategy is demonstrated by the Contracts for Difference (CfD) program, which encourages the investment in renewable energy by providing the developers with direct protection from the variable wholesale prices and protecting the consumers from the increasing payments, in order to support construction of the offshore wind plants. Therefore, the United Kingdom Government has initiated a public consultation regarding a preferred hydrogen business model, which will be designed in order to overcome the cost gap between the low-carbon hydrogen energy and fossil fuels, and which helps the lower carbon hydrogen costs. The financial support, which is determined as part of the strategy, has been allocated by the Government based on its subject matters, and it has been intended to reach the most local users. Thus, a fund of 55 million pounds has been allocated for replacement of the vehicle fuels. Such fund is divided into two, and a fund of 40 million pounds is intended to abandon the red diesel while a fund of 10 million pounds is intended to increase the industrial efficiency. Such strategy will be continued by the Prime Minister of the United Kingdom, then by the Department for Business, Energy and Industrial Strategy, and by "Ofgem", which is responsible for regulating the market.

Q2 (covers the period of April 2023-July 2023.)

6.1.2. European Union Hydrogen Energy Strategy

The hydrogen will play a key role regarding the transition of the European Union to the climate neutrality until 2050, as well as regarding its target to become independent from the Russian fossil fuels well before 2030. The hydrogen is also one of the highly important fields of the New Industrial Strategy, as published by the European Commission on 11.05.2021, and it has a critical potential to create a high-quality employment. The European Hydrogen Strategy, as published in 2020, has set the target to produce up to 10 million tons of renewable hydrogen across the continent. The REPowerEU plan intends to complete this target by facilitating the import of 10 million tons of renewable hydrogen until 2030.

The European Commission has proposed the binding quotas for consumption of the renewable hydrogen in the industry and transport, as well as a full-fledged statutory framework for production, consumption, infrastructure development and market rules for a future hydrogen market. While some regulatory proposals are still being negotiated between the relevant institutions, it is clear that the European Union will be the most advanced region in the world regarding creation of a forward-looking, predictable and comprehensive regulatory framework in order to promote the rapid extraction of the renewable and low-carbon hydrogen on a continental scale. At the international level, the win-win partnerships are developed with the third countries through the free trade agreements and as part of the Global Gateway Strategy. The main purpose of this strategy is to create opportunities for hydrogen regarding the green energy transitions, and to support the local added-value development efforts.

A political agreement has been reached on the revision of the European Union ETS Directive in December 2022. In accordance with the agreement, it has been agreed to create the free allocations for hydrogen-producing electrolyzers, and to increase the amount of the allowances that have been allocated to the innovation fund, and to ensure performance of the auctions throughout the European Union as part of the innovation fund.

In parallel with the regulatory progress, the European industry has already developed a strong project line consisting of the hydrogen projects. The European Clean Hydrogen Alliance has identified 840 hydrogen projects across all parts of the value chain. Thus, Europe hosts the first hydrogen-based steel production projects in the world.

The Ursula von der Leyen, the President of the European Commission, has announced, in the speech regarding the Status of Europe on September 14, that the European Hydrogen Bank has been established. The purpose of the bank is to close the investment gap, and to combine future renewable hydrogen supply with a demand target of 20 million tons of renewable hydrogen. The European Hydrogen Bank will facilitate both production and import of the renewable hydrogen within the European Union, and it will contribute to the RepowerEU targets and the transition to the climate neutrality.

The European Hydrogen Bank supports the targets of the Green Deal Industrial Plan and the Net Zero Industry Act. Scaling up the production of the electrolyzers for the renewable hydrogen production will contribute to the competitiveness and resistance of the European industry, including the steel and fertilizer production and the marine industry. Scaling up the European hydrogen market will also enable the European companies to play a leading role in the developing global hydrogen market which creates new growth opportunities and high-quality employment. This Communiqué on Hydrogen Bank accompanies a legislative proposal for the Net-Zero Industry Act.

The Hydrogen Bank will be an instrument, which consists of two new financing mechanisms in order to support production of the renewable hydrogen within the union and internationally, and which is implemented by the European Commission. It will also ensure the greater transparency regarding the hydrogen demand, supply, flows and prices, and it will play a coordination role, and it will facilitate to blend with the existing financial instruments in order to support the hydrogen projects.

6.2. Green Hydrogen and Blue Hydrogen Energy

The hydrogen energy is a type of energy characterized by the green, blue, grey, brown and yellow. The hydrogen specified is expressed in different colors based on the source, from which the energy is obtained, without actually being compatible with the raw material itself. The brown hydrogen is obtained from the coal, and the yellow hydrogen is obtained through the electrical decomposition by using the nuclear energy, and the gray hydrogen is obtained through decomposition of methane. The green hydrogen, which has the lowest carbon emissions, and which is highlighted by the energy world, is the type of energy that is obtained by splitting the water into molecules as oxygen and hydrogen. The blue hydrogen, which is another low-emission hydrogen energy, is obtained by burning the carbon dioxide, which is released in consequence of reformation of the natural gas with the steam.

Based on the report "Green Hydrogen Cost Reduction", as published by the International Renewable Energy Agency "IRENA" in 2022, the green hydrogen production is three times more costly than the blue hydrogen. (Link-26) In order to reduce the green hydrogen costs, the electrolysis technologies and production are required to be increased in the near future. Based on the report, the hydrogen energy constitutes one of the most critical energies for the decarbonization target.

The report states that the resulting energy will be used all over the world in the future upon the decrease in the costs of the green hydrogen energy, due to the fact that the costs of storage of such energy is high, and that it takes up a lot of space. Based on IRENA, 95% of the hydrogen, which is currently produced in the world, consists of the gray hydrogen; this increases the carbon emissions more than the green and blue hydrogen.

The blue hydrogen energy is a type of energy, which is obtained through decomposition of the natural gas, and based on the current studies, whose carbon emissions are higher than the green hydrogen, however, whose production costs are lower. Although it is anticipated that the zero-carbon green hydrogen will become prominent in the future in consequence of the increase in the impact of the environmental factors, it is considered that the blue hydrogen may be used as transition energy due to the high electrolysis costs of the green hydrogen. Based on the articles provided regarding the hydrogen energy on the website of IRENA, the gray, green and blue hydrogen types will all form a part of the hydrogen energy in the future. At this point, the growth rate of the green and blue hydrogen will be shaped based on the market demand, production costs and government regulations.

7. Carbon Capture and Carbon Pricing and Tax

Q2 (covers the period of April 2023-July 2023.)

7.1. Carbon Border Adjustment Mechanism (SKDM)

One of the main tools to achieve the greenhouse gas emission reduction target, as set by the European Union in accordance with the Green Deal, is the Carbon Border Adjustment Mechanism (SKDM). Thanks to this mechanism, the European Union intends to preserve the competitiveness of Europe against the costs of the green conversion, on the one hand, and to increase the effort to fight against the climate change at the global level, on the other hand.

The SKDM Regulation has officially entered into force on the date following promulgation thereof on the Official Journal of the European Union on May 16, 2023. The SKDM itself will enter into force in the transition phase on October 1, 2023, and the first reporting period for importers will end on January 31, 2024. Accordingly, the Registration, Evaluation, Authorization and Restriction of Chemicals (“REACH”) studies have been accelerated throughout the world, especially in the European Union, and it is intended to include the chemicals, manufactured and imported, in the registration system. As part of the compliance with the EU-REACH, the Registration, Evaluation, Authorization and Restriction of Chemicals (“KKDIK”) regulations have been issued in Türkiye, and the process for harmonization with EU-REACH is managed. Since the majority of the chemicals that are in circulation in the Turkish market constitute the products imported, there are problems regarding the compliance with EU-REACH. This also exists in the United Kingdom, which has left the European Union with through Brexit. In order to receive the demands of the chemical industry in Türkiye, and to discuss the solution suggestions, a meeting has been held on July 5-6, under the leadership of the Ministry of Environment, Urbanization and Climate Change, with the participation of the representatives of the Turkish Chemical Manufacturers Association (TKSD) and the European Chemical Industries Council (CEFIC) and industry actors. Our Company has also been represented at such meeting, and our solution suggestions have been shared. In addition, in the context of the carbon border adjustment, and in the first phase as part of the SKDM, there are 6 sectors posing a high risk of carbon leakage: Cement, iron and steel, aluminum, fertilizer, hydrogen and electricity.

In accordance with the Agreement Reached, the following 6 articles constitute the the Main Implementing Principles of SKDM:

- Implementation Schedule
- Product and Greenhouse Gas Scope
- Scope of Emission Calculations
- Reporting Obligations During Transition Period
- Implementation Period After January 1, 2026
- Distribution of Authority among Competent Authorities of Commission/Member State under SKDM

The carbon capture means a chain of different technologies that can prevent the carbon dioxide, as produced by the large factories and power plants, from reaching the atmosphere and contributing to the global warming. The first step regarding the carbon capture is to install the solvent filters, which trap the carbon before it is emitted, on the factory chimneys. These filters are used in large-scale power plants globally.

The gas trapped through the filters, and the other mechanisms may be transferred to the locations in which it may be used or stored later. Most of the carbon dioxide is pumped underground so as not to affect the climate change. In the event that the purpose of the carbon captured is not to be stored, however, that it is used by being converted into another product, then this method is called as the Carbon Capture and Utilization. Currently, the carbon emissions of the large power plants and factories are reduced through the carbon capture in 30 facilities around the world.

Based on the IEA, the Carbon Capture, Utilization and Storage "CCUS" project may reduce the carbon dioxide emissions by almost one-fifth, and it may reduce the cost of fight against the climate crisis by 70%. This carbon captured may be used as fertilizer in the greenhouses, as feed, as raw material for fuels, and as raw material in the construction industry. The governmental support programs and incentives in relation to the CCUS project are available in the USA, European Union countries and England.

Based on the IEA, the annual global carbon dioxide demand is around 230 million tons. While the fertilizer sector is the largest consumer with 130 million tons, the carbon dioxide-based improved oil production sector is in the second place with 70-80 thousand tons. The carbon dioxide is currently used extensively in the greenhouses in order to increase the plant production and to produce the food and feed. The other possible CCUS methods, which are currently developed, include the carbon dioxide-based chemicals and fuels, and use of the carbon dioxide as a plastic raw material or construction material. However, the carbon dioxide is a thermodynamically very stable molecule, therefore, there are energy-intensive phases in the reactions with carbon dioxide. In the energy-intensive stages, the companies, which are considered as the global giants in the automotive industry, pursue projects in order for conversion of the carbon, as captured, into the fuel. Although the opportunities in the carbon capture sector in Southeast Asia are highlighted, the sector in question is more important, especially in countries such as the USA and the European Union, where there are government support programs and incentives.

While the matter regarding the carbon capture is included in the environmental and climate regulations in the European Union, there is no brisk sector yet in Türkiye, which emits almost the same greenhouse gas emissions as the European Union.

The carbon pricing is one of the most important mechanisms in order to reduce the amount of the carbon released into the atmosphere with respect to the anti-climate change and the global warming, the effects of which are seriously observed today. The carbon pricing is a mechanism used in order to ensure that the organizations with high carbon emissions to switch to a low-carbon economy. The direct carbon pricing instruments, which are currently implemented mainly, include the carbon taxation and the Emission Trading System (ETS). The carbon taxation is a mechanism, which is determined by adding the amount of the carbon to the carbon emissions, and which is monitored by determining a direct price for emissions. ETS is a system, which sets an upper limit for emissions, and which imposes the penalties on the organizations that exceed such ceiling limit. Based on the information provided in the report "Global Carbon Account 2022", as published by I4CE - Institute of Climate Economics in 2022, more than 75% of the emissions, which are regulated through the carbon pricing, occur above 10 dollars (8 euros). This price has been pointed out by the report as too low level in order to support the transition to a low-carbon economy in both the public and private sectors. (Link-27)

Q2 (covers the period of April 2023-July 2023.)

The Eleventh Development Plan for 2019-2023 issued by the Ministry of Development (currently the Presidential Department of Strategy and Budget), includes a provision "Investigating the carbon capture and storage opportunities and costs" in the short term. Considering the activities carried out by the Ministries, apart from the following studies as specified, the "Technical Assistance Project for Development of Solution-Based Strategy and Action for Low Carbon Development" with a budget of approximately 4 million Euros, which is carried out between the Ministry of Environment, Urbanization and Climate Change and the European Union in 2017-2020, becomes prominent. Based on the reports as published as part of the project, it is stated that Türkiye could not reduce its carbon emissions, despite the measures taken, due to the fact that it is a developing country. The efficiency expected from the 0 (zero) carbon studies, which are initiated across the continent with the target for 0 (zero) carbon in 2050 as part of the European Union Green Deal, has not been achieved. Based on the report "About CCUS", as published by the IEA, it is intended to capture 2.1 GtCO₂ in the fields of energy and heavy industry until 2050 as part of the "Sustainable Development Plan" for 2019-2070 as determined by the IEA. However, only 13% of the target for annual storage capacity of 300 MtCO₂ by developing 100 large-scale CCUS projects by 2020 has been achieved today. The cost of giant projects, and the uncertainty in the statutory regulations, and the reactions to storage of the carbon captured within the EU borders have been effective to create such situation. Considering the carbon pricing and tax, the carbon taxation, which is intended to be implemented in the border, is of great interest to the exporters in our country. The steel and cement sectors, which are critical for our exports, may be negatively affected by carbon pricing and taxes, due to the fact that the high heat is required in the production. Accordingly, based on the study for Country Risk Assessment for Carbon Border Tax Practice (Link-21), as performed by the Institute for Advanced Sustainability Studies (IASS), Türkiye is indicated in the category of countries with the highest risk of this practice. The reason for this is that, based on the study performed by the European Commission, Türkiye is ranked sixth among the countries, which have exported the most to Europe in 2020, and that the majority of the exports has constituted the sectors with high carbon emissions. Based on the studies carried out by TUSIAD, the new regulation will affect the exports of Türkiye to the European Union with a serious tax increase. The calculations indicate that, based on the scenario in which the carbon price is 30 €/ton, Türkiye will be required to pay 1.074 billion Euros annually to the European Union, while, in the event that it is 50 €/ton, the estimated figure is expected to be 1.7 billion Euros.

In the event that the regulatory basis to be created in Türkiye is carried out as part of the requests and suggestions of the steel and cement sectors, which have high carbon emissions, and which play a key role regarding the exports to the EU, then this may lead to a negative impact on the other sector actors, which are of critical importance for the economic wheels of our country. Since a large portion of our exports is performed to the EU, legislation and regulation studies are required to be implemented in Türkiye before the carbon tax in the border is implemented in the near future. Based on the following chart, which is included in the research article "Applicability of Carbon Tax in Türkiye", as published in 2019, it is observed that the amount of emission in Türkiye has increased over the years, although it is required to have been reduced.

CHART

Quantity of greenhouse gas emission (mtCO%)

Chile / Colombia / Denmark / Estonia / Finland / Germany / Iceland / India / Ireland / Japan / Latvia / Mexico / Netherlands / Norway / Poland / Portugal / Slovenia / Sweden / Switzerland / Turkey / United Kingdom

Countries

The green package draft "Fit for 55", as published in July as part of the carbon tax in the border, which will be implemented by the European Union, is in a position to pave the way for a climate neutral economy, and to include the practices determined for the target for net 0 (zero) carbon. Among the relevant practices, the carbon border adjustment mechanism will be gradually implemented, by starting from 2023 and continuing until 2026. Initially, the carbon taxation will only be implemented regarding import of the products, such as cement, iron and steel, aluminum, fertilizer and electricity, from the energy-intensive facilities abroad with a high risk of carbon emissions to EU countries; thereafter, the EU Commission will excise import of the iron and steel, cement, aluminum, fertilizer and electricity, by combining the same with a tariff equivalent to what EU producers pay under the domestic carbon market. The list of sectors included in the draft green package will be expanded in a manner to include the other sectors later. It should also be noted that, based on the sectoral CO2 emission charts in Türkiye, as published by TUSIAD, it is anticipated that the carbon emissions of the petrochemical sector will increase in 2025-2030. Accordingly, it may be considered that the carbon tax regulations to be established in Türkiye may be determined as part of the sectors on which the carbon tax will be imposed in the first place.

As part of the possible impacts of establishment of the regulation studies, which will be established regarding the carbon tax, under the steel and cement sectors, on our sector, since there will be an additional tax burden on the exports in Türkiye, especially to the European Union, the direction of our sectoral exports may change, and our operations in the European Union may be negatively affected. Since the carbon emissions of the energy sector are high, it is anticipated that the projects and investments, which will contribute to reduce the carbon emissions and to ensure the energy conversion, will increase, considering that it may be included in the next Green Package Draft.

As seen in the chart above, it may be observed that the carbon emissions of the European Union countries, which implement the carbon taxes, have decreased. Another of the most important points provided under the article "Applicability of Carbon Tax in Türkiye" is that the carbon tax is required to be implemented as a neutral tax in Türkiye. To explain, it is specified that the financial obligations, which are imposed by the carbon tax, are implemented by being deducted from the other taxes, which are implemented without being reflected in the labor force or the price of goods and services. Thus, as part of the 'Pay As You Use' logic, the other tax burdens of the enterprises, which reduce the carbon use, will also decrease at the same rate, which will increase the employment, and which will ensure a sustainable future. In consequence of such valuable academic studies, guides and international sectoral developments regarding the carbon capture, carbon pricing and tax in Türkiye, the legislative studies are required to be initiated urgently. Accordingly, the regulatory studies are carried out by the Ministry of Environment and Urbanization and Climate Change regarding ETS and carbon border practice. Although there is no regulations on carbon capture and carbon pricing and tax in our country yet, the regulatory and other studies regarding the subject matter are shared below.

Considering the carbon capture regulations in Türkiye, we confront the "Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions", which has entered into force upon promulgation thereof on the Official Journal, dated 22.07.2014 with the issue number 29068.

Definitions and abbreviations

Article 4 – (1) The following terms hereunder shall have the following meanings ascribed to them hereunder:

(Insertion:OG-5/2/2021-31386) Transferred CO₂: shall mean the carbon dioxide, which is formed in the facility, however, which is not emitted due to its capture, transportation and storage for long-term geological storage.

Other Practices for Carbon Capture and Carbon Pricing and Tax in Türkiye

- International regulations have been introduced to the domestic market by publishing the "European Union Carbon Capture and Storage Directive" 2019 by the Ministry of Environment, Urbanization and Climate Change. There is no practice regarding the carbon capture in Türkiye based on the directive yet.
- The project "Taking the Inventory of the Carbon Dioxide Emissions from the Thermal Power Plants and Industrial Facilities in Türkiye and Determining the Storage Potential of the Carbon Dioxide in the Underground Geological Environments", which are jointly carried out by the Ministry of Energy and Natural Resources, METU Petroleum Research Center (PAL) and TPAO, has been published in 2009. No concrete information has been found under the research that is carried out on the websites of METU and TPAO regarding the status of the project.
- The cooperation is established regarding the "Partnership of Market Readiness" upon the partnership declaration executed by and between the Ministry of Environment, Urbanization and Climate Change and the World Bank. As part of such partnership, it is intended to carry out the regulatory studies regarding establishment, regulation, inspection and execution of the carbon market mechanisms in Türkiye.
- Although no binding practice has been determined in Türkiye regarding the carbon pricing and taxation yet, the first phase studies for the Program for Partnership of Market Readiness (PMR) in Türkiye, which is supported by the World Bank, have been concluded in 2018. As part of such program, the economic, financial and sectoral impact modeling and carbon tax preliminary studies have been completed. As part of PMR Türkiye, the first draft of the communication strategy regarding the "Carbon Pricing in Türkiye" has been published in February 2020.

8. Reference Links

Link-1 2018/2001 EU Directives

<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32009L0028&from=EN>

Link-2 Germany Trade and Invest Report

<https://www.downtoearth.org.in/blog/energy/learn-ings-from-the-german-storage-modelhow-it-is-helping-stabilise-the-grid-78145>

Link-3 German Development Bank (Kreditanstalt für Wiederaufbau, KfW) Report

<https://www.kfw.de/KfW-Group/Reporting-Portal/KfW-Development-Bank/>

Link-4 Grid Connection

https://www.bundesnetzagentur.de/EN/Areas/Energy/Companies/-NetworkAccess_Metering/GridConnection/start.html

Link-5 First tendering round for capacity reserve completed:

https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilun-gen/EN/2020/20200228_KapRes.html

Link-6 SmartMarket

<https://www.bundesnetzagentur.de/EN/Areas/Energy/Comp-anies/GridDevelopment/SmartGridMarket/start.html>

Link-7 Energy of the Future:

https://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/Ar-eas/ElectricityGas/Special%20Topics/MonitoringEnergyOfTheFuture/FirstProgressReport2013.pdf?__blob=publicationFile&v=2

Link-8 The Batstorm Project:

https://ec.europa.eu/energy/sites/ener/files/documents/bat-storm_expertmeetingip_report.pdf

Link-9 Additional Standard Requirements for Energy Storage:

<https://epr.ofgem.gov.uk/Content/Documents/Smart%20DCC%20Lim-ited%20-%20Smart%20Meter%20Communication%20Consolidated%20Licence%20Conditio ns%20-%20Current%20Version.pdf>

Link-10 Energy Storage – International Standards:

<https://www.ul.com/services/battery-and-energy-storage-testing-and-certification>

Link-11 Energy Storage – International Standards:

<https://www.ul.com/news/ul-9540-energy-storage-sys-tem-ess-requirements-evolvingmeet-industry-and-regulatory-needs>

Link-12 Energy Storage in the UK (An Overview):

<https://www.r-e-a.net/wp-content/uploads/2019/10/Energy-Storage-FINAL6.pdf>

Link-13 Battery Storage and Financial Models:

<http://www.apse.org.uk/apse/assets/File/James%20Mill-er%2C%20Green%20Acorn%20Energy%20Solutions.pdf>

Link-14 Funding for Innovative Smart Energy Systems:

<https://www.gov.uk/guidance/funding-for-innovative-smart-ener-gy-systems#funding-forflexibility-markets-feasibility-studies>

Link-15 Longer Duration Energy Storage Demonstration:

<https://www.gov.uk/government /publications/longer- duration- en- ergy-storage -demonstration>

Link-16 Storage at Scale Competition Project Winner:

<https://www.gov.uk/government/publications/storage-at-scale-competition-project-winner>

Link-17 Fourth National Energy Efficiency Action Plan for the Netherlands:

<https://climate-laws.org/geographies/netherlands/policies/na-tional-energyefficiency-action-plan>

Link-18 SDE+ 2020 Report:

<https://english.rvo.nl/sites/default/files/2020/11/Brochure%20SDE%20plus%20plus%202020.pdf>

Link-19 Integrated National Energy and Climate Plan:

https://ec.europa.eu/energy/sites/ener/files/documents/nl_final_necp_main_en.pdf

Link-20 Border Carbon Text Application Country Risk Assessment:

https://publications.iass-potsdam.de/rest/items/item_6001199_3/component/file_6001200/content

Link-21 Dive Brief Global energy storage investment jumped 55% in 2022 as funds shifted from private equity to public markets

<https://www.utilitydive.com/news/energy-storage-investment-mercom-report-2022-private-equity/640703/#:~:text=Corporate%20funding%20for%20energy%20storage%20grew%2055%25%20in%2022%20to,the%20most%20funding%20in%202022.>

Link-22 EEG 2023

<https://www.bundesregierung.de/breg-de/themen/kli-maschutz/amendment-of-therenewables-act-2060448>

Link-23 Energy Storage NL

<https://www.energystoragenl.nl/?lang=en>

Link-24 The Nordic Battery Value Chain

https://businitiativewebsites.blob.core.windows.net/nor-dics-battery-collaboration/assets/Nordic_Battery_Value_Chain_2023_Report_March_bd0eb33538.pdf

Link-25 UK Hydrogen Strategy

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1011283/UK-Hydrogen-Strategy_web.pdf

Link-26 Green Hydrogen Cost Reduction

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Green_hydrogen_cost_2020.pdf?rev=4ce868aa69b54674a789f990e85a3f00

Link-27 Global Carbon Accounts In 2022

<https://www.i4ce.org/en/publication/global-carbon-accounts-2022-climate/>

