Electric Vehicle Charging Regulations: Türkiye Case Study

ICER Technology & Innovation Virtual Working Group
in collobaration with
RETA

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Education

2019 - 2021 (Postdoc)	Energy Geopolitics	University of Oxford, UK
2010 - 2016 (Ph.D.)	Finance	Hacettepe U., TR
2013 - 2015 (LL.M.)	Law	Penn State U., USA
2008 (Executive P.)	Economics of Regulation, Public Ut.	Michigan State U., USA
1999 - 2004 (B.Sc.)	Petroleum and Natural Gas Eng.	METU, TR

Work Experience

2021 - cont.	Head of Digital Transformation Group, Energy Transition Department, EMRA
2019 - 2021	Researcher, University of Oxford, UK
2018 - 2019	Energy Expert, Petroleum Market Department, Regulations Group, EMRA
2015 - 2018	Energy Expert, Electricity Market Department, Organized Wholesale Market Grp, EMRA
	Energy Expert, Electricity Market Department, Consumer Group, EMRA
2010 - 2013	Energy Expert, Tariff Department, Natural Gas Tariffication Group, EMRA
2006 - 2010	Asst. Energy Expert, Natural Gas Market Dpt., Tariffication / Network Code Grp, EMRA
	Expertise dissertation on oil and natural gas prices
2004 - 2006	Reservoir Engineer, Perenco (a French originated IOC)

Other

Lecturer (Middle East Technical University, Bilkent University, Hacettepe University, Hungary - ERRA, Kosovo, China…)

Member of Energy Transition Task Force, ERRA

Energy Market Regulatory Authority (EMRA)

- Established in 2001
- Financially and administratively autonomous
- Governed by 7 board members
- Responsible for liberalisation and regulation of the Turkish energy market
- Regulates electricity, natural gas, oil, LPG and EV charging service markets
- Main functions:
  - *Issuing secondary legislation*
  - *Licensing market participants*
  - *Determining or approving tariffs*
  - *Monitoring, supervising and auditing markets and market players*
  - *Accelerating energy transition*

Markets Regulated by EMRA

LPG

Key Regulatory Focus Areas to Accelerate Energy Transition:

1- Renewable Energy Support Mechanism

- Türkiye offers **10-year FIT** under support mechanism (so-called YEKDEM).
- Investors have a **right to sell under FIT regime or to the marke**t (have to decide before the start of the year)
- YEKDEM mechanism has **additional feed-in premiums** for the use of domestically manufactured equipment.
- Türkiye also promotes **large-scale renewable energy designated areas** (so-called YEKA) to be tendered by way of auctions (with the obligations of R&D and domestic manufacturing).
- The **share of total installed capacity for renewables** (including licence-exempted power plants) is ca **53%**.
- EMRA is imposing a cap on revenues earned by renewable power plants due to **windfall profit** since 2H 2022.

YEKA-1 solar power plant has 1.35 GW installed capacity. The project includes a factory annually producing 2 GW PV modules and R&D Center.

Key Regulatory Focus Areas to Accelerate Energy Transition:

2- Promoting Storage Investments

- EMRA has introduced new rules for energy storage in the 2H of 2022.

- The new rules allow storage facilities to operate in combination with renewable power plants.

Ratio of the installed capacity of the generation unit to the installed capacity of the storage unit must be equal to one;

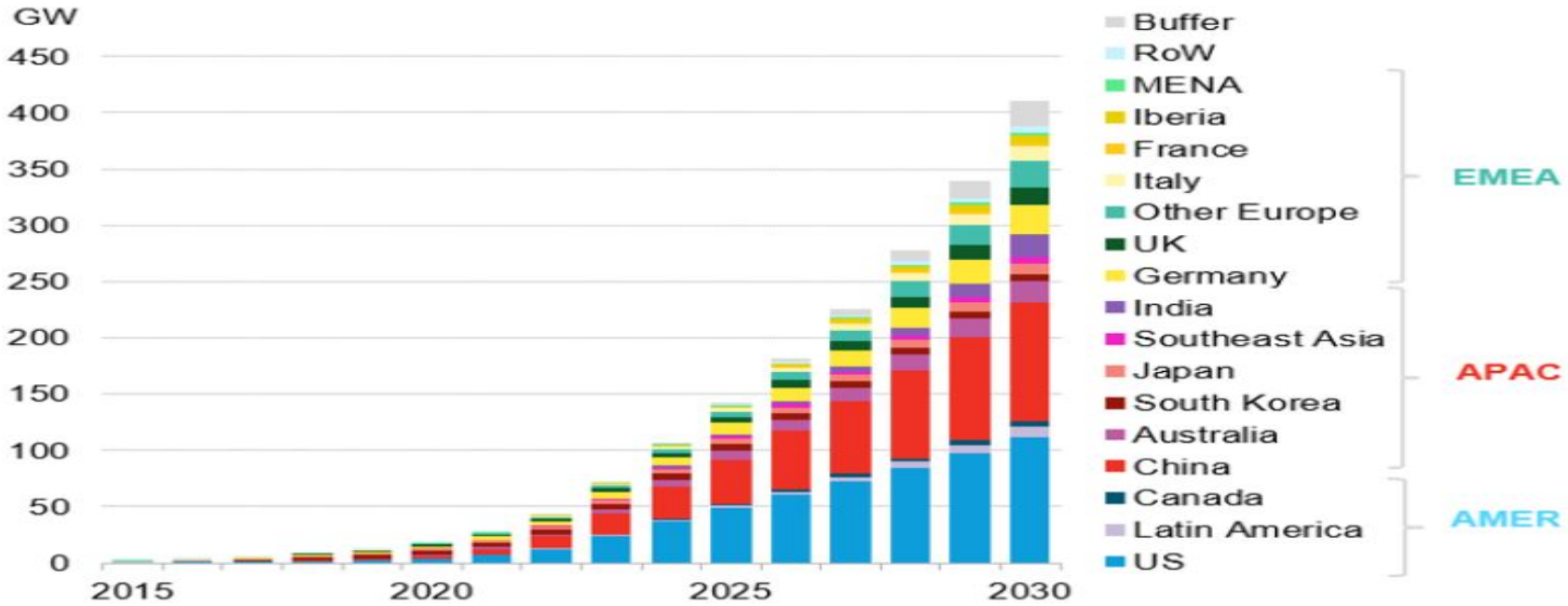
For the wind power plant applications, the installed capacity must be minimum 20 MWe, whereas for the solar power plant applications, the installed capacity must be minimum 10 MWe and maximum 250 MWe;

The electricity storage unit should be located within the boundaries of the power plant

Türkiye is planning +30 GW storage facility installation with this newly implemented mechanism. In this context, investors have applied to EMRA for 300 GW up until now (first come first serve)!!!

Storage

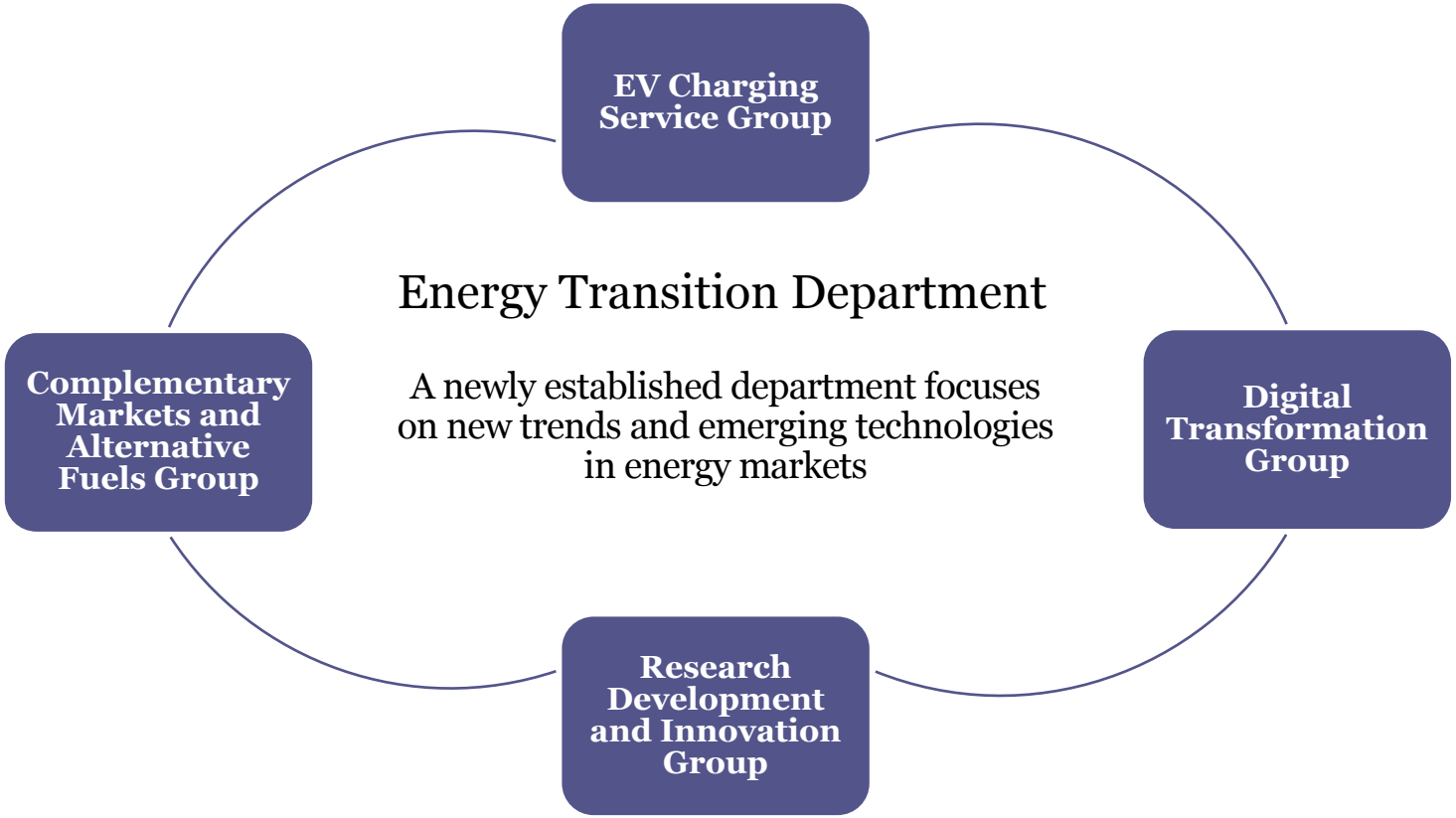
Global cumulative energy storage capacity installations



Source: BloombergNEF
Notes: 'MENA' refers to the Middle East and North Africa; 'ROW' refers to the rest of the word; 'EMEA' refers to the Europe, Middle East and Africa; 'APAC' refers to the Asia-Pacific; 'AMER' refers to the North, Central and South America; 'Buffer' represents markets and use cases that BNEF is unable to forecast due to lack of visibility.

Key Regulatory Focus Areas to Accelerate Energy Transition:

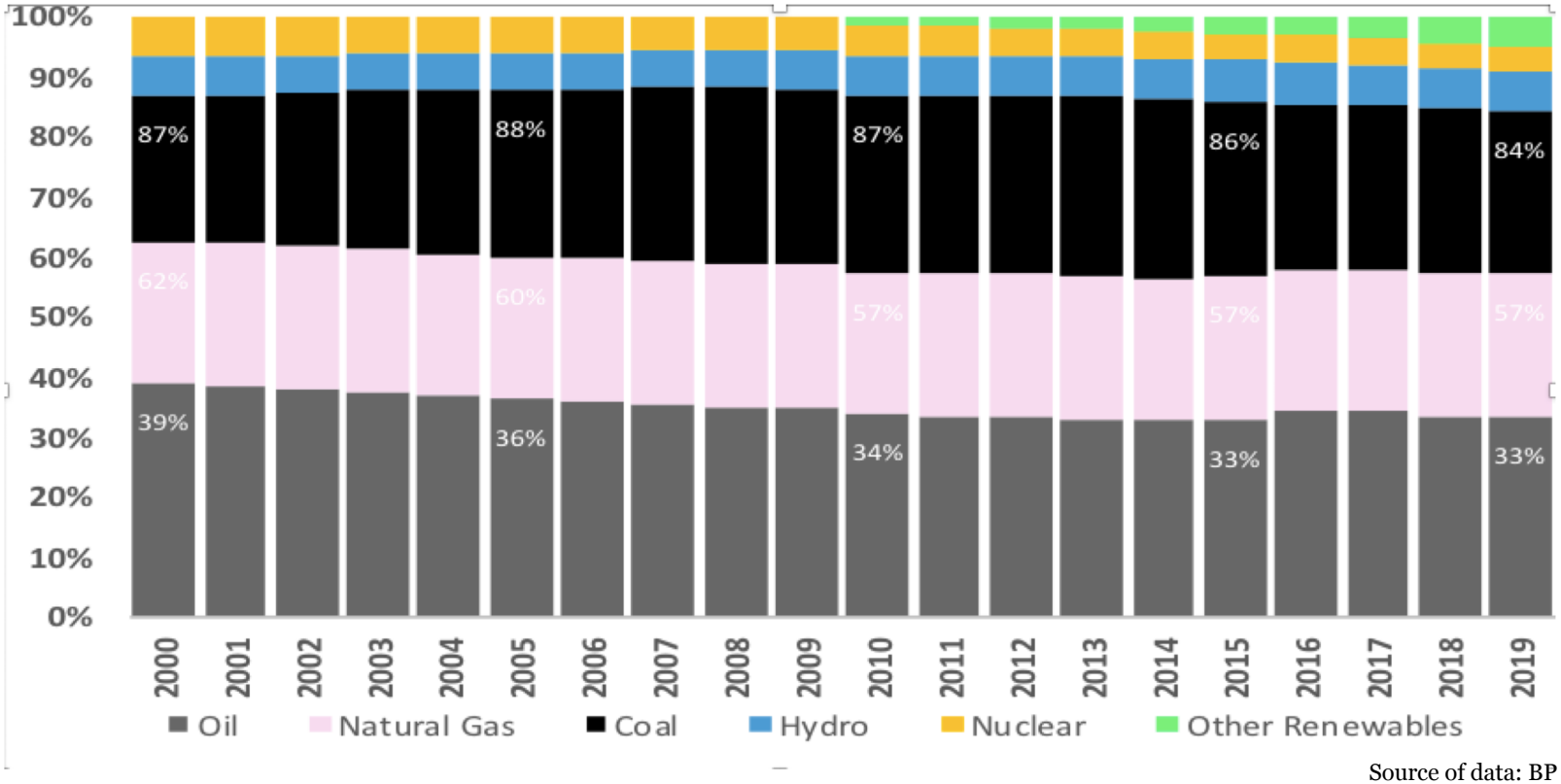
3- Regulations on EV Charging Infrastructure, Alternative Fuels, Carbon Markets, R&D Activities, Digital Transformation…



Mini Survey

http://etc.ch/QP03

Global Primary Energy Consumption by Source



Source of data: BP

EVs (1840s - 2023)

EV Charging Service – Legislative Steps

1- Law Amendment

- (With the Additional Article added to the Electricity Market Law No. 6446 on December, 2021) In line with the goal of creating an electric vehicle ecosystem, the law was amended to establish an EV charging service market with an adequate and sustainable charging infrastructure.

2- Charging Service Regulation

- Charging Service Regulation has been prepared within the scope of establishment and operation of charging points and charging stations, establishment of charging network, licensing of charging network operators (Mobility Service Providers, MSPs), regulation of MSPs' activities, rights and obligations and establishment/operation of Free Access Platform.

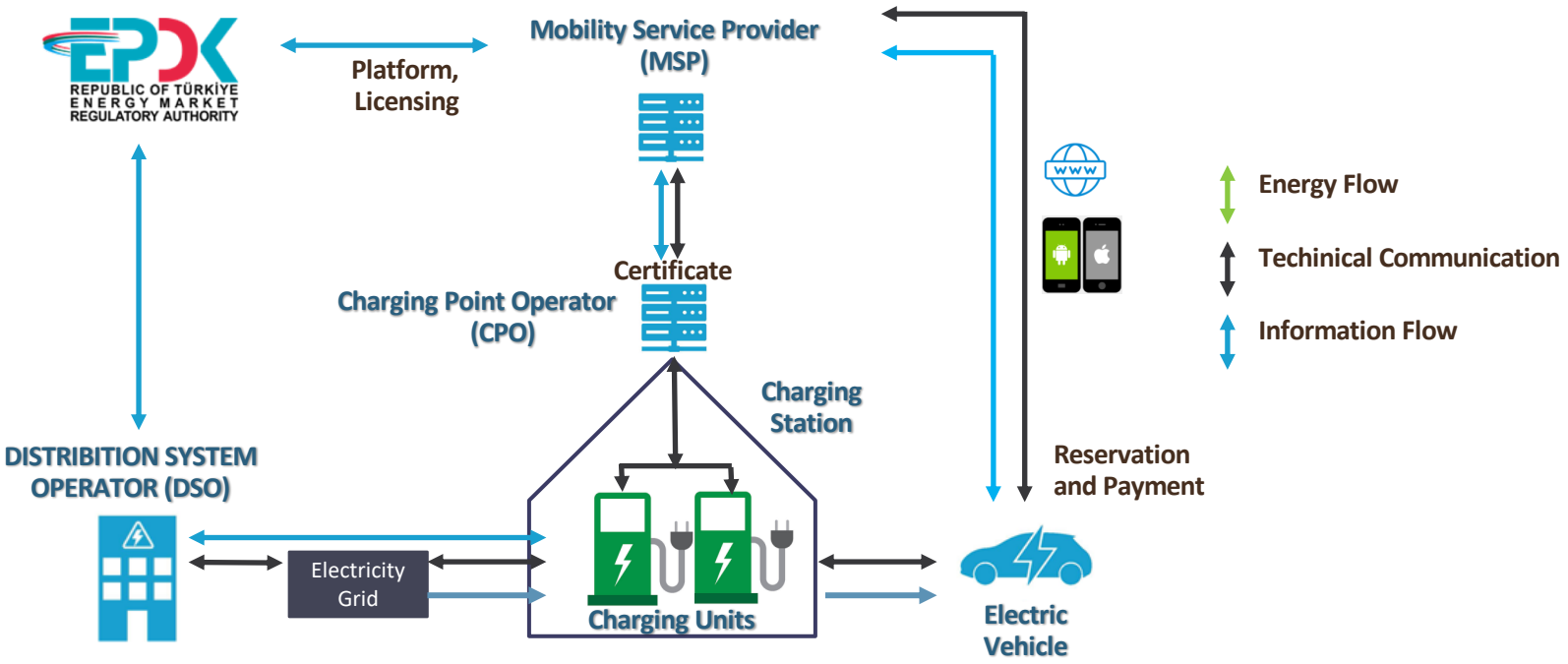
3- Procedures and Principles of Licence Application

- Requirements (licence fee, etc.) for applications

Projections (just before the law amendment)

	2023	2025	2030
Electric Vehicle	• Electric vehicle sales market share to reach **3%** • Electric vehicle stock to reach approximately **45 thousand vehicles**	• Electric vehicle sales market share to reach **6%** • Electric vehicle stock to reach approximately **160 thousand vehicles**	• Electric vehicle sales market to reach **25%** • Electric vehicle stock to reach approximately **1.6 million vehicles**
Infrastructure	• Having a total of **12,500 public charging points** (30% DC) installed	• Having a total of **30,000 public charging points** (30% DC) installed	• Having a total of **160,000 public charging points** (35% DC) installed

Topology of EV Charging Service



Rights and Responsibilities of a License Holder (MSP)

Mobility Service Provider

RESPONSIBILITIES

- To provide charging service continuously and in high quality,
- To provide charging service to everyone (all EVs) without discrimination,
- To determine, announce and apply the charging service fee in accordance with the legislation,
- Not to apply an extra fee within the scope of the charging service,
- To establish and keep the necessary management, audit and registration system in operation,
- To set up and operate the charging station in accordance with technical requirements,
- A charging network consisting of at least 50 charging points shall be established within 6 months from the effective date of the license,
- At least 5% of the charging points in the charging network and at least 50% of the charging points on the highways and state roads shall be DC 50 kW charging points.

RIGHTS

- To establish and operate a charging station connected to its own charging network throughout the country,
- To permit a certificated CPO to establish or operate a charging station connected to MSP's charging network,
- To offer loyalty agreements to EV users (price discount is regulated - max. 20%)

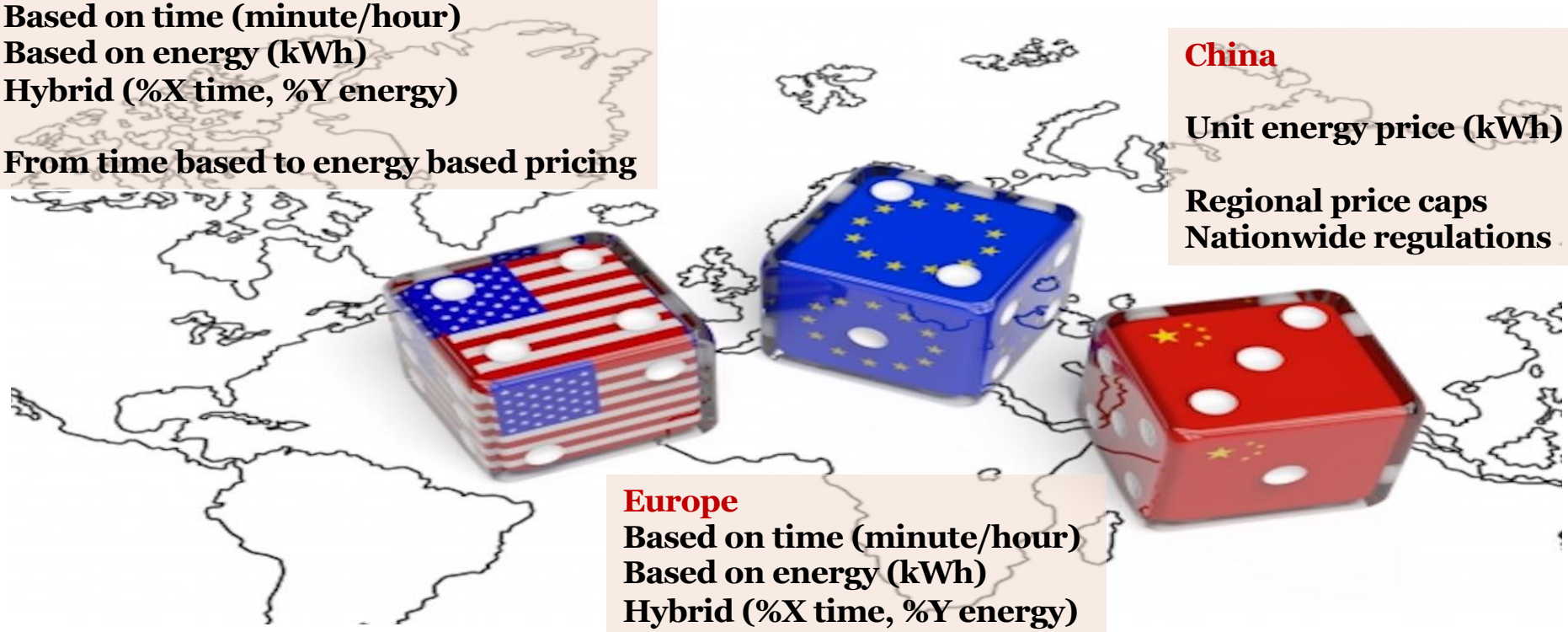
Prices

- Prices shall be presented and announced in a simple, clear and easily comparable way.
- Standard unit energy price (TL/kWh) shall be used as a pricing format.
- Not to apply an extra fee within the scope of the charging service.
- Different prices may be applied according to the types and power of charging connectors.
- It is mandatory to provide charging service to all EVs, and the licensee can apply price discounts up to 20% to the users with whom they have signed a loyalty agreement.
- At least one of the mobile payment system options has to be provided for all EV users.

Pricing

North America
Based on time (minute/hour)
Based on energy (kWh)
Hybrid (%X time, %Y energy)

From time based to energy based pricing



China

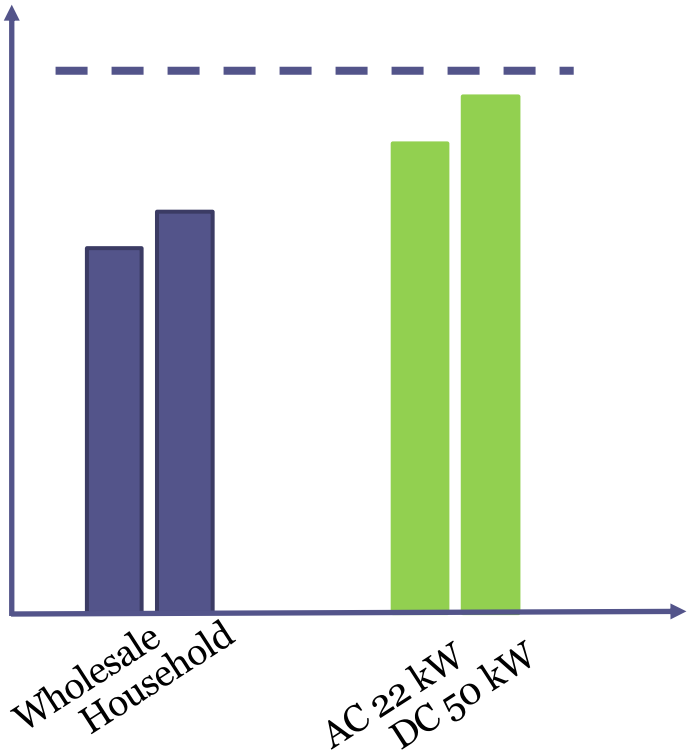
Unit energy price (kWh)

Regional price caps
Nationwide regulations

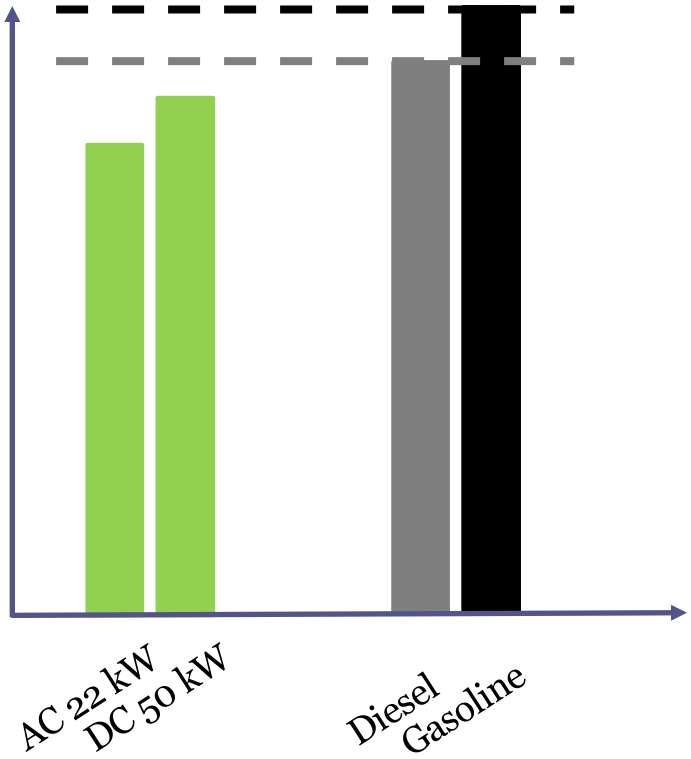
Europe
Based on time (minute/hour)
Based on energy (kWh)
Hybrid (%X time, %Y energy)

Monitoring of Prices

METHOD - 1
(Comparison of charging fees with electricity prices)



METHOD - 2
(Comparison of charging fees with fuel prices)

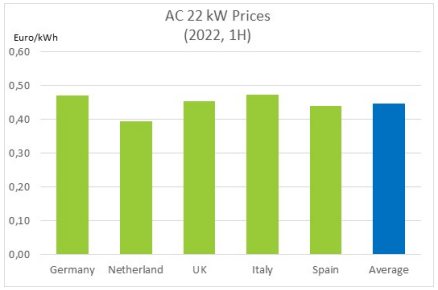


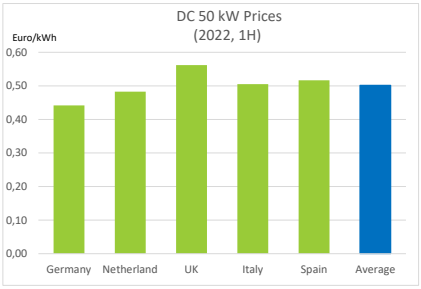
Monitoring of Prices

METHOD - 3
(Setting tariffs based on the costs)

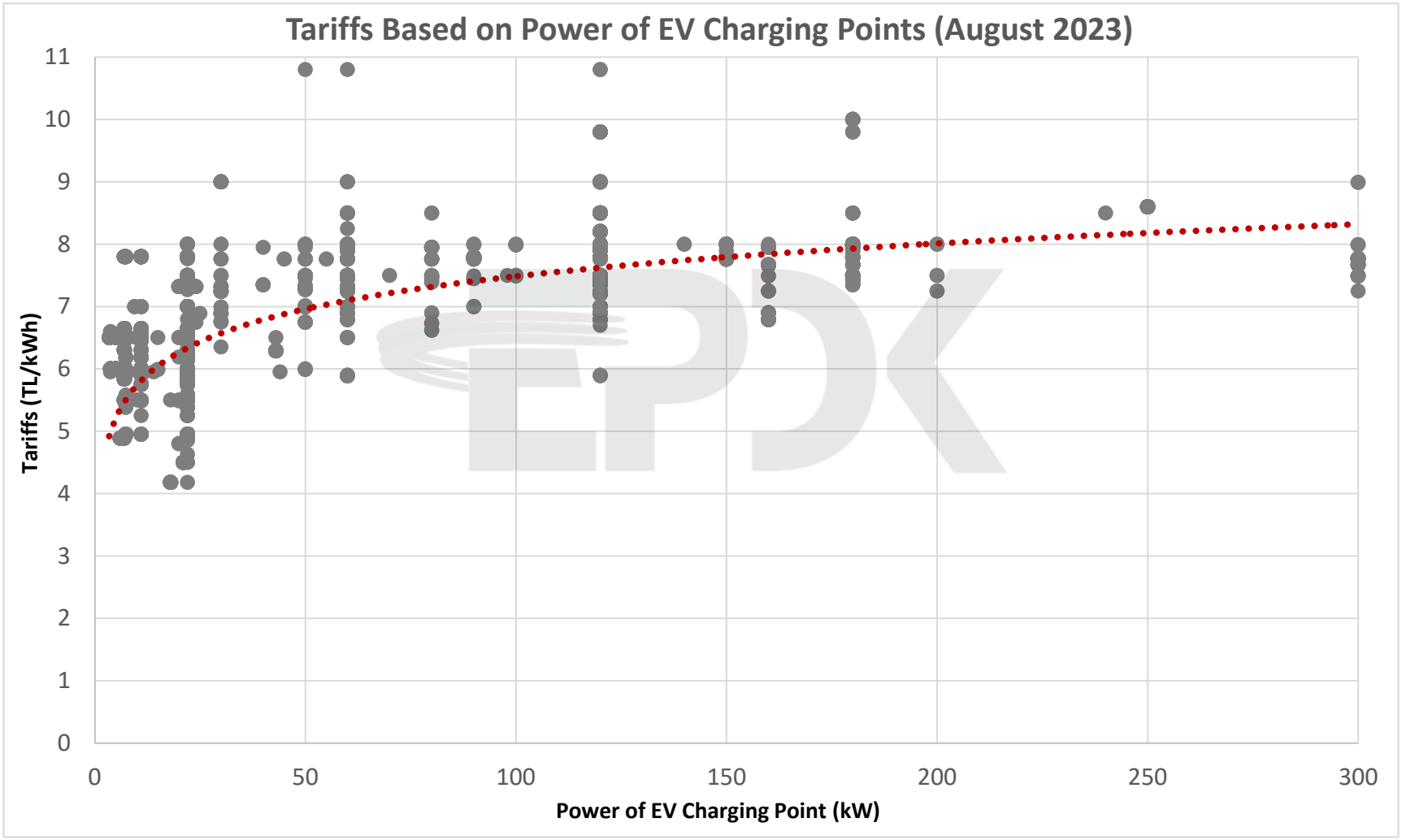
AC 22 kW
CAPEX
Ekipman Maliyeti (Euro)
Ekipmana Yönelik Kurulum Maliyeti (Euro)
Bağlantıya Yönelik Kurulum Maliyeti (TL)
Kur (Euro/TL)
Toplam Ekipman ve Kurulum (TL)
Lisans Bedeli (TL)
Ünite Başına Bedel (TL)
Yazılım Maliyeti (TL)
Ünite Başına Bedel (TL)
Ünite Başına CAPEX (TL)
OPEX
Aylık Toplam Personel Gideri (TL)
Genel Yönetim
Satış
Proje
Montaj
Lojistik
Yazılım
Çağrı Merkezi
Diğer
Yıllık Toplam Personel Gideri (TL)
Ünite Başına Yıllık Personel Gideri (TL)
Aylık Araç-Ofis Gideri (TL)
Araç Kira
Yakıt
Telekom
Ofis
Diğer
Yıllık Toplam Araç-Ofis Gideri (TL)
Ünite Başına Yıllık Araç-Ofis Gideri (TL)
Ünite Başına Diğer Giderler (TL)
Ünite Başına Yıllık Kontrol - Bakım Gideri (TL)
Ünite Başına Yıllık Sigorta Bedeli (TL)
Ünite Başına Yıllık Lisans Bedeli (TL)
Ünite Başına Roaming Maliyeti (TL)
Ünite Başına Yıllık Yazılım Maliyeti (TL)
Ünite Başına Diğer Maliyet (TL)
Ünite Başına Yıllık OPEX (TL)
TARİFE
AOSM
İtfa (TL)
Makul Getiri (TL)
Ünite Başına Yıllık Gelir Gereksinimi (TL)
Üniteden Yıllık Hizmet Verilen Enerji (kWh)
Elektrik Tarifesi (TL/kWh)
Şarj Ağı İşletmecisi Makul Pay (TL/kWh)
Makul Şarj Hizmet Bedeli (TL/kWh)
Şarj Ağı İşletmecisi Payı / Elektrik Tarifesi

METHOD - 4
(Comparison of applied charging fees with the fees in other countries)

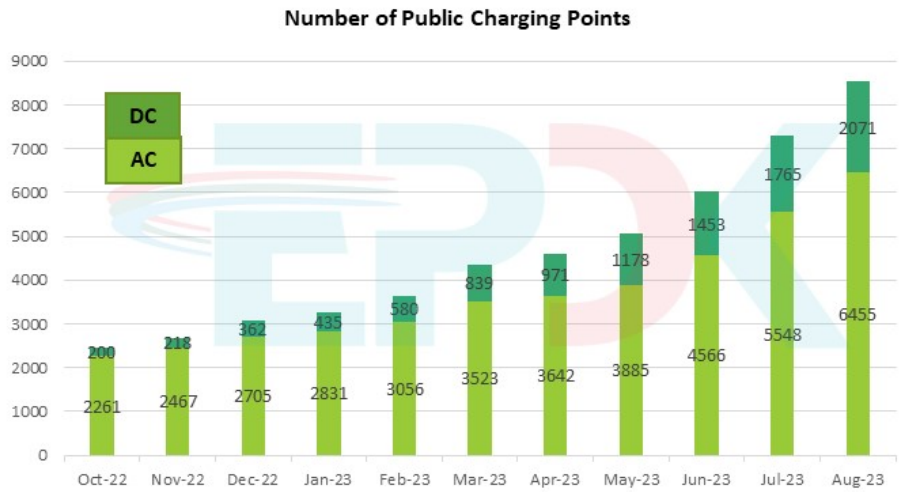


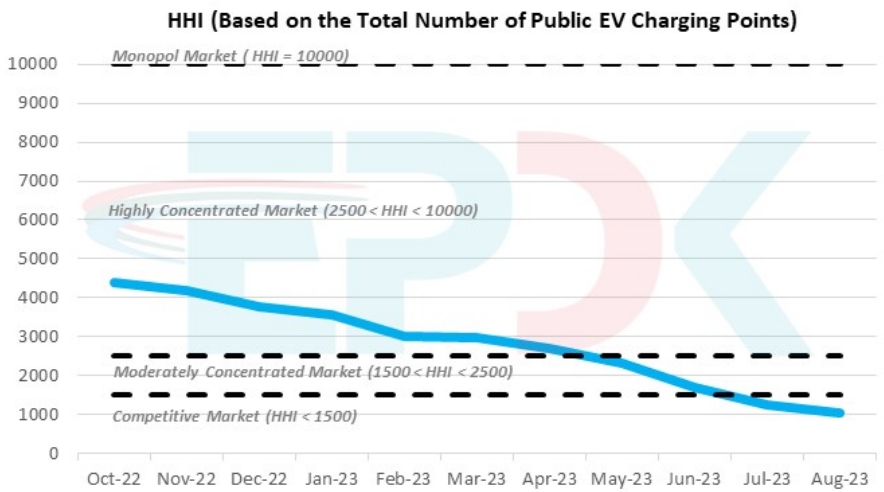


Tariffs (Türkiye)

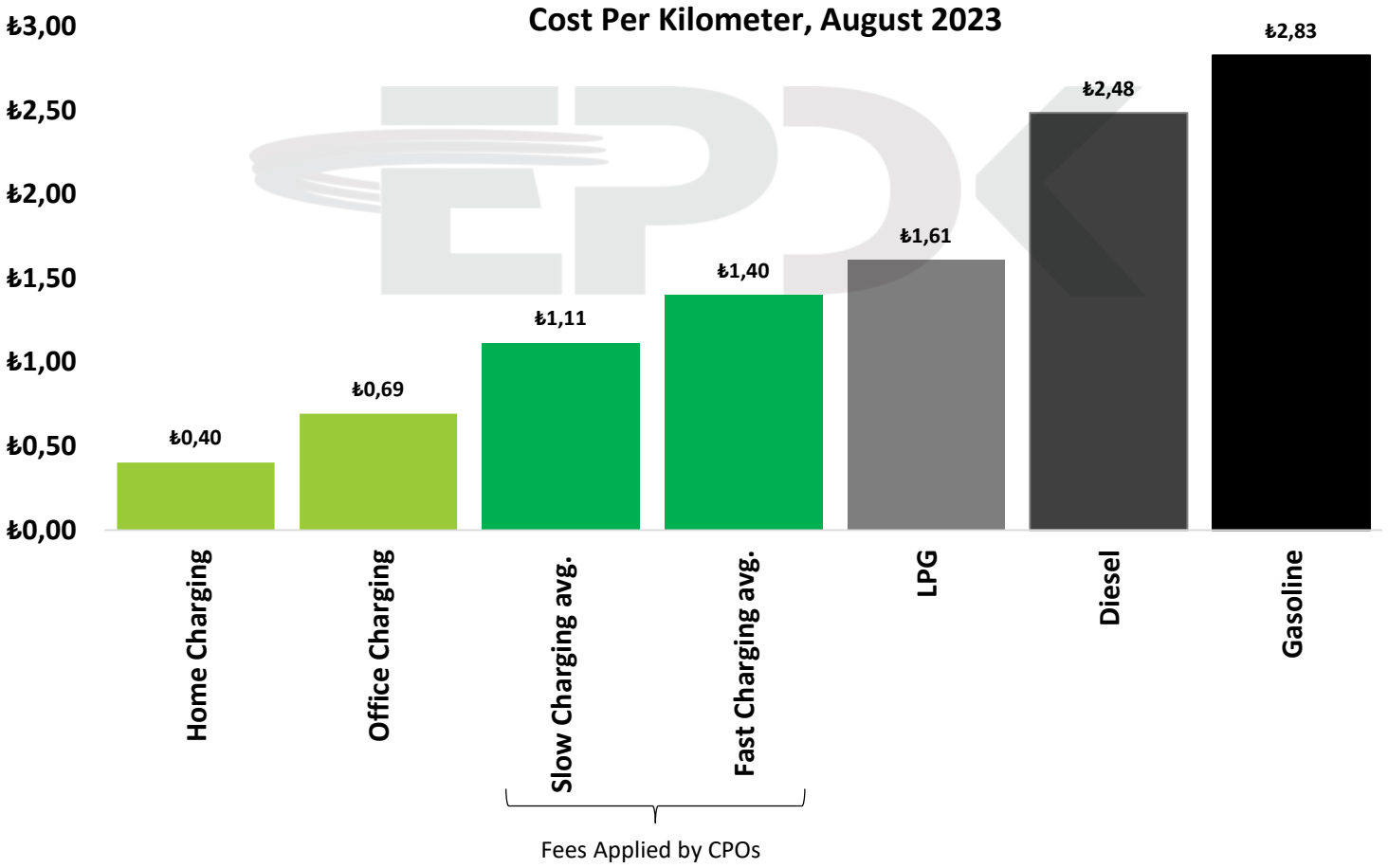


Number of Charging Points and Level of Competition

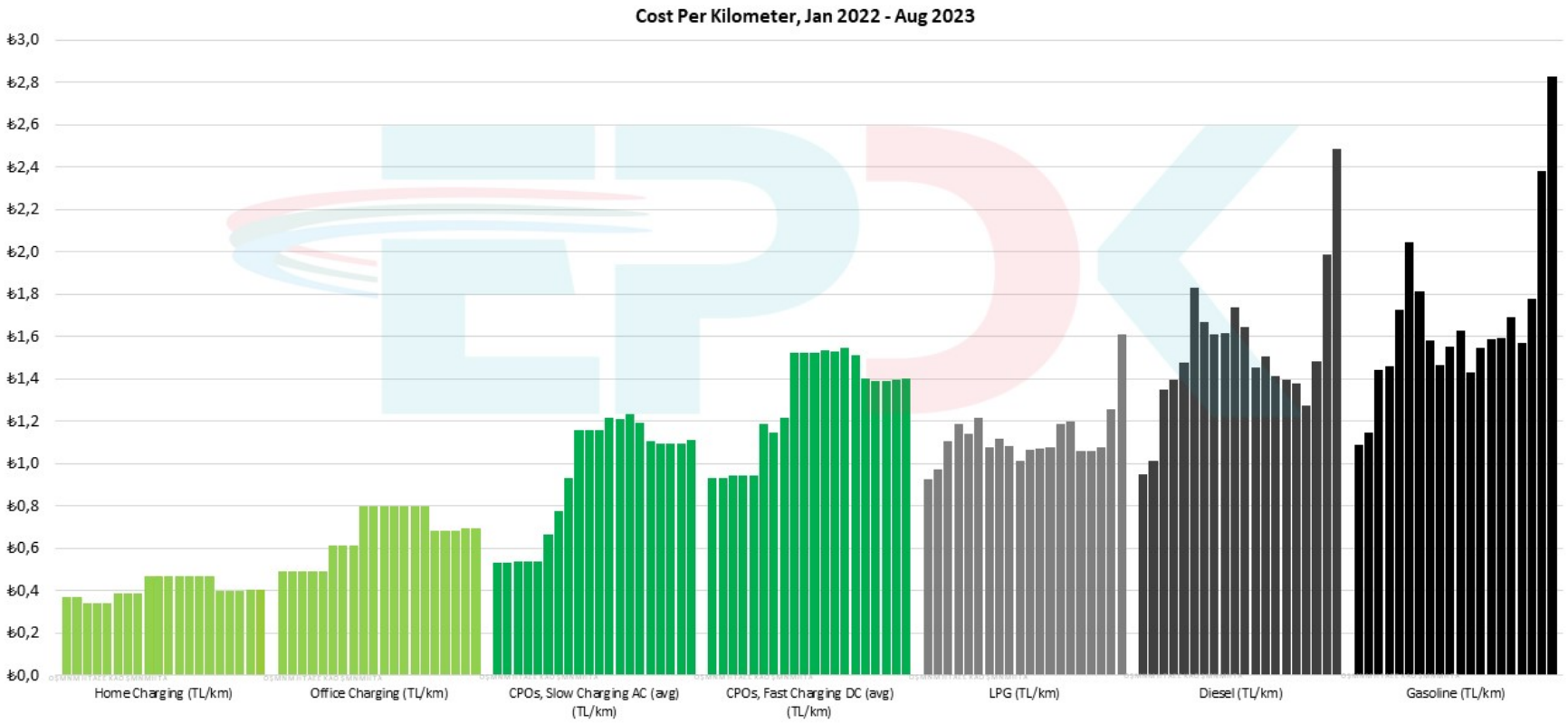




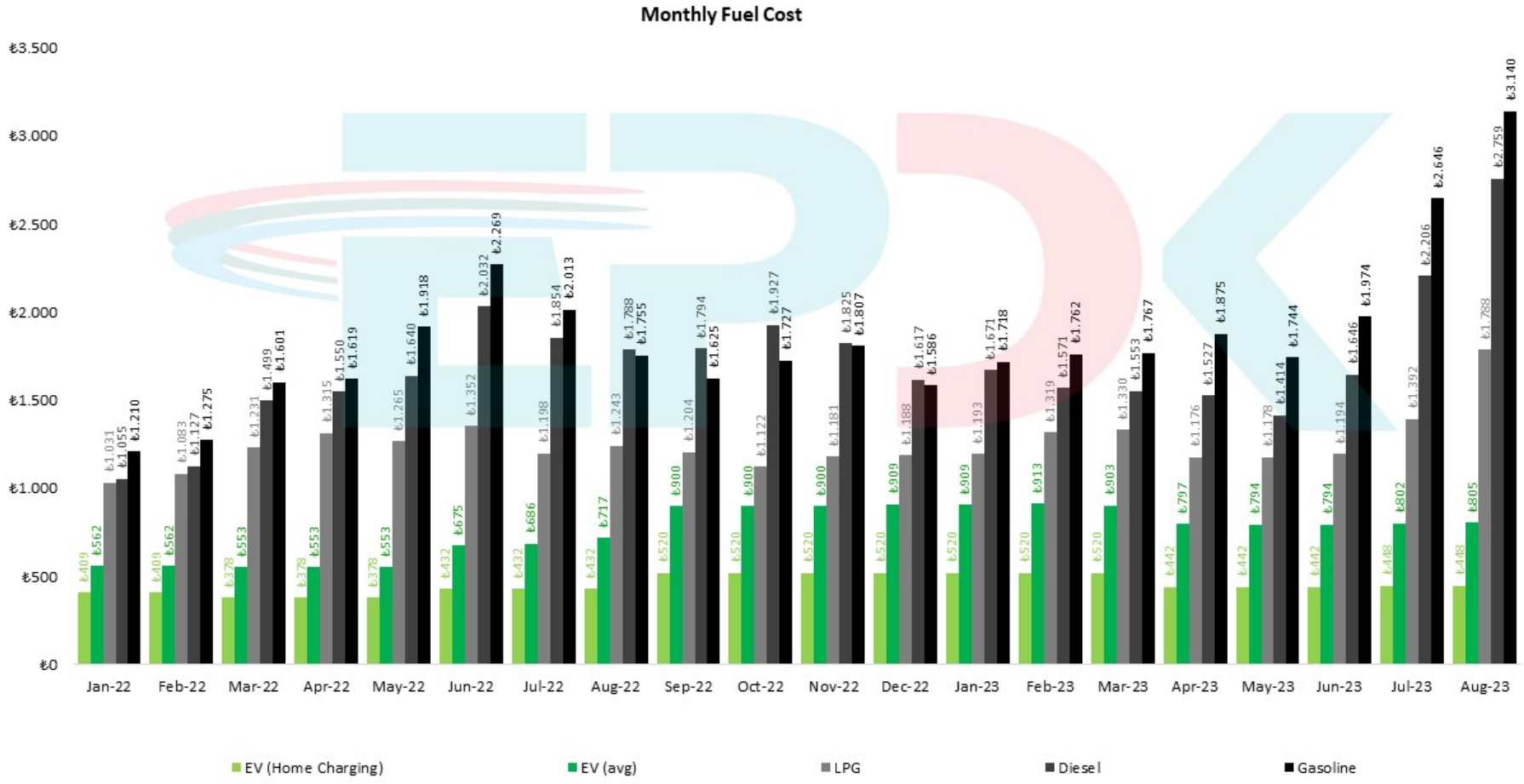
Cost per kilometer



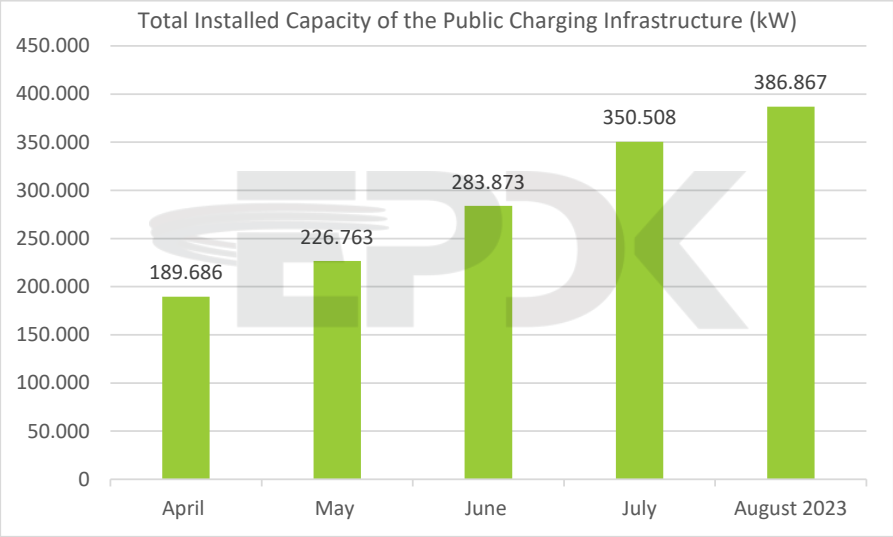
Cost per kilometer

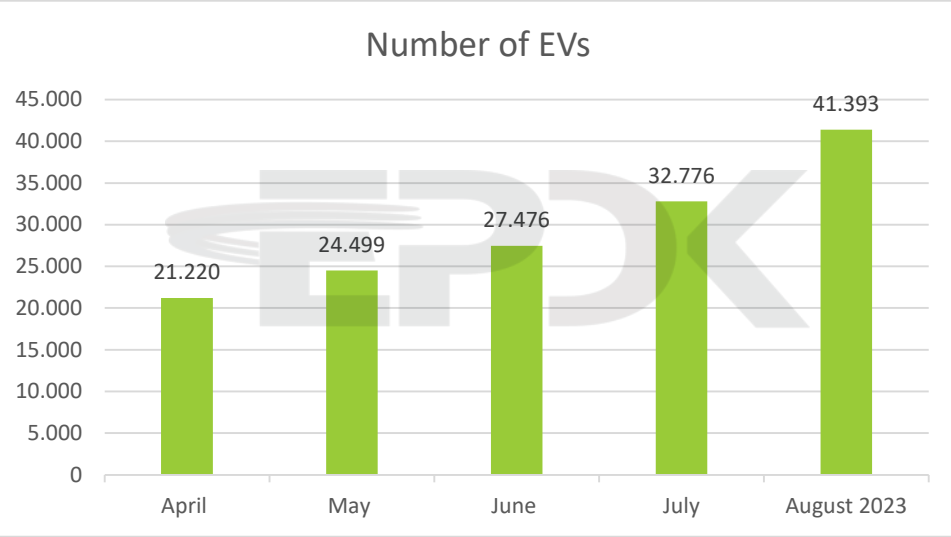


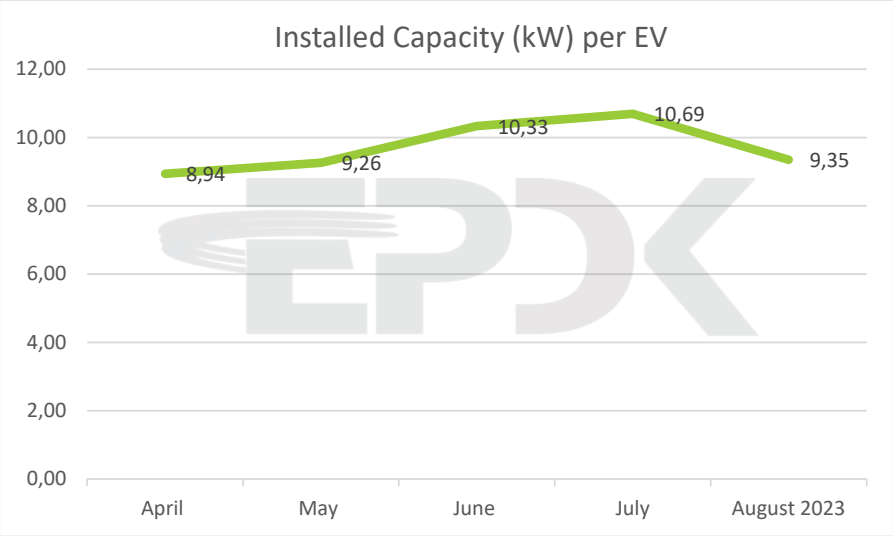
Monthly Fuel Costs



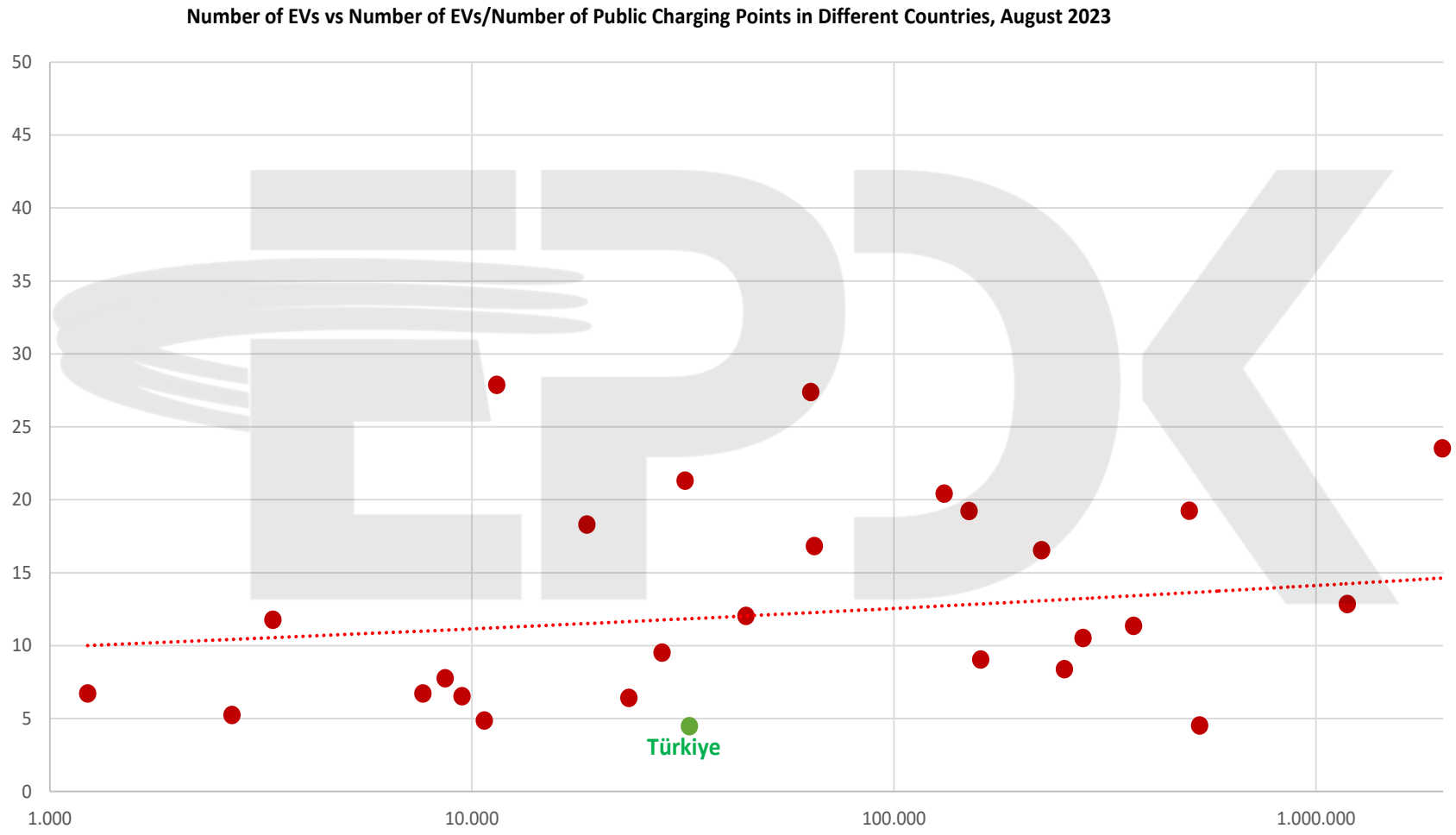
Adequacy of Infrastructure







Adequacy of Infrastructure



App. Developed by EMRA (Free Access Platform)

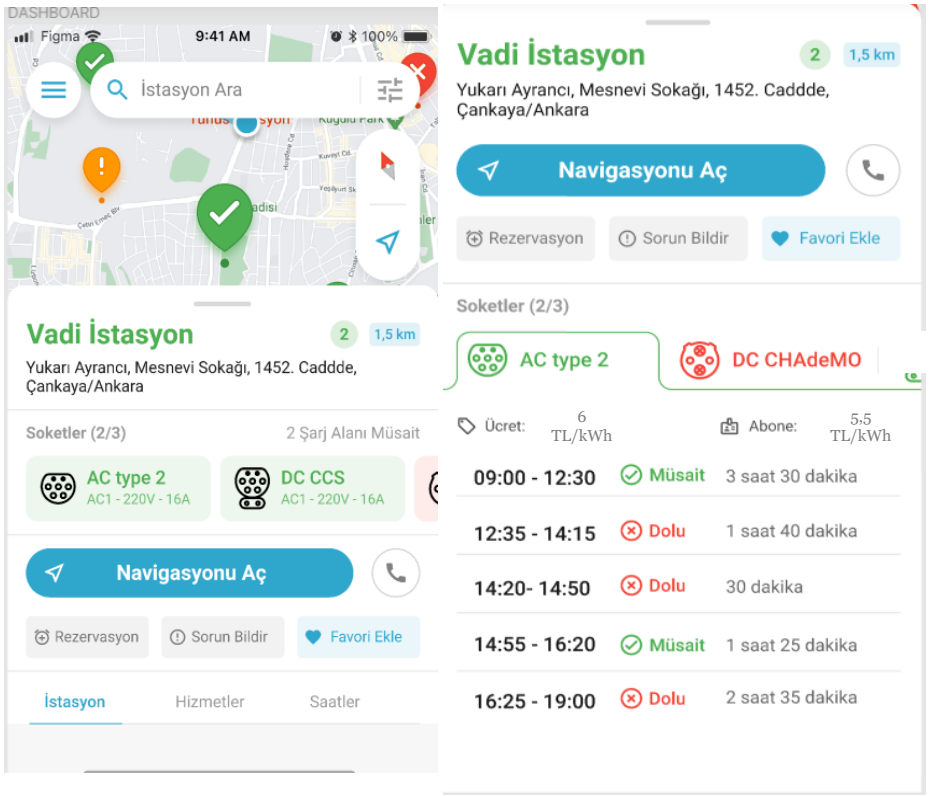
➢ For Public Charging Stations;

- Static Data

  Geographical locations charging stations, number of connectors, types and powers of connectors, payment methods

- Dynamic Data

  Availability and charging service prices within a 24-hour period displayed on the platform.



Not mandated as a protocol, but the regulations have led to the use of OCPP
Data transfer to EMRA by JSON (please see more on the guidance – in Turkish)

Recent study on green charging points!!!

THANK YOU FOR YOUR ATTENTION!

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