First German-Turkish GreenTech Compass

Working Together for Environment, Climate Action and Economic Development

TECHNOLOGIES.
MARKETS.
PEOPLE.
PARTNERSHIPS.



On behalf of:

Federal Ministry
for the Environment, Climate Action,
Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

IKI INTERNATIONAL CLIMATE INITIATIVE

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On behalf of
Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)

GreenTech Compass Türkiye

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TÜRKİYE
A GREENER TOMORROW
TOGETHER

Partnership
Innovation Sustainability
Growth



Preface

The green transition has moved from principle to implementation. Climate objectives, technological innovation, evolving regulation and changing market expectations are reshaping industries worldwide. Germany and Türkiye enter this phase with a solid foundation for green technology solutions. Germany with long-standing strengths in engineering, environmental technologies and industrial efficiency, Türkiye with a growing manufacturing base, for example in renewable energy components, and strong implementation capacity. This offers an opportunity to strengthen competitiveness, deepen economic cooperation and jointly develop solutions for a sustainable future.

The First German-Turkish GreenTech Compass stands at this intersection.

It brings together policy and market analysis, technological capabilities, companies, institutions and innovation ecosystems in both countries. It identifies where German technological expertise and Turkish industrial capabilities, market knowledge and implementation capacity can complement one another and translate into tangible business opportunities, partnerships and international cooperation. Türkiye is advancing its transition towards more circular and resource-efficient production, while pressure on water, land and other natural resources is accelerating the need for sustainable and climate-resilient solutions. New requirements are driving demand in emissions reduction, resource recovery, water efficiency, digital monitoring, precision agriculture and climate-resilient land and forest management. The Compass therefore looks not only at what needs to change, but also at where solutions already exist and where markets are emerging.

As AHK Türkiye we build bridges between these opportunities and the companies and institutions that can turn them into reality. We connect expertise with demand, bring the right partners together and support cooperation that reaches beyond the exchange of knowledge. The most promising models often combine technological excellence with local engineering, industrial expertise, implementation capacity and long-term service. The sector analyses contained in the Compass precisely demonstrate this potential for complementary German – Turkish partnerships.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH builds on a long-standing partnership between Türkiye and Germany, grounded in trust and a shared commitment to sustainable development. GIZ works closely with public institutions, civil society, the private sector on climate action and environmental action as well as inclusive economic development supporting climate resilience, environmental sustainability and a just transition that benefits communities and local economies.

The First German-Turkish GreenTech Compass is a starting point for dialogue, new partnerships, pilot projects, investment and scalable solutions. We invite you to use this Compass to explore opportunities, discover potential partners and take the next steps from orientation to cooperation, and from cooperation to implementation.

The Compass was developed within the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN).

Driving Green Innovation for a Sustainable Future

Bringing together innovative ideas, technologies and expertise from Germany and Türkiye to accelerate the green transition and turn shared opportunities into real progress. Through international collaboration, knowledge exchange and new partnerships, sustainable industries can grow, new business opportunities emerge and skilled jobs be created – paving the way for a greener, more resilient future.



Executive Summary

Global GreenTech Growth Potential

The GreenTech market provides products and services for climate and environmentally friendly solutions in the areas of circular economy, renewable energy and energy efficiency, air and soil quality, sustainable forestry, agriculture and water management as well as green mobility. This market is growing by over 7% annually and is expected to reach 12 trillion euros (EUR) by 2030[1], creating significant opportunities for businesses and investors. The 1st Turkish-German GreenTech Compass highlights opportunities for cooperation and investment.

Turning German Expertise and Turkish Dynamism into GreenTech Growth

Germany and Türkiye can combine their strengths and are complementary to accelerate business opportunities, skilled jobs and economic value across the GreenTech sectors.

Türkiye offers industrial scale, a young workforce and strong links to European value chains[2]. For example, renewables account for 62% of its total power capacity of more than 122 gigawatts (GW)[3]. Around 3.34 billion US dollars (USD) is being invested in decarbonising key industries and small and medium-sized enterprises (SMEs) through the national Green Transformation Program[4]. Türkiye also ranks fourth for electric vehicle sales in Europe, the Middle East and Africa region (EMEA)[5].

Germany's GreenTech sector generated EUR 314 billion in gross value added and employed around 3.4 million people in 2023. It is growing faster than traditional sectors and exported EUR 132 billion in GreenTech goods.

With an improved exchange, government support German and Turkish companies can jointly scale up the development, finance and implementation of the GreenTech sector while integrating the latest cross-cutting digital technology such as Artificial Intelligence (AI) to optimise their processes and advance key climate and environmental goals.

Opportunities

Policymakers:
Enable GreenTech market growth!

Development and improvement of predictable regulatory frameworks and public procurement will support the GreenTech market growth. Targeted German-Turkish cooperation including regular GreenTech exchanges, for example alongside the German-Turkish Climate and Environment Steering Committee (KUMLA), will increase the connection of all relevant partners including companies, financiers, and researchers. The cooperation should include innovative formats to share best practice such as joint hackathons and a network of bilateral GreenTech hubs[6].

Financiers:
Invest in a growing sector!

Innovative GreenTech investments need flexible and innovative finance partners to derisk and scale up innovative solutions. The finance sector needs instruments for SMEs and start-ups. Formats connecting SMEs, start-ups with banks, funds and investors should be increased. Guarantees, blended finance and leasing can help projects move from pilots to investment. Projects Projects with verified energy, water or material savings can offer an attractive basis for assessing investment potential.

Companies and entrepreneurs:
Access a fast-growing market!

Increased exchange, cooperation and investments of German-Turkish companies can scale up iinnovative and competitive GreenTech solutions. Companies should actively search for suitable business partners, support programs and investments. International programs like the Export Initiative Environmental Protection (EXI) of the German government can support eligible pilot and demonstration projects for resource efficiency, water management and circular economy[7].

1 Roland Berger 2023.
2 TÜİK 2026.
3 MENR 2026.
4 MoIT 2026.
5 EMEA Electric Vehicle Market Intelligence 2026.
6 BMUKN n.d.-a; BMUKN 2026.
7 BMUKN n.d.-c.

1.

GreenTech Markets Technologies and Transformation

GreenTech is reshaping industries and creating new markets worldwide. With growing investments and demand for sustainable solutions, the sector offers significant economic opportunities for Germany and Türkiye, from expanding trade to strengthening business partnerships.



GreenTech is one of the big growth markets of this decade. The figures below show its scale worldwide, its weight in Germany and the opportunity it opens for Türkiye and for German-Turkish business.

GreenTech in figures

USD 1.2 tn

Global clean-tech market 2025

up from-USD 700 bn in 2023 (IEA)

3.4 m

GreenTech jobs in Germany

about 3x the vehicle industry (2023)

16.5 %

Of global GreenTech patents

Germany ranks 3rd worldwide

EUR 314 bn

German GreenTech value added

9% of German GVA (2023)

USD 47 bn

Türkiye net energy imports 2025

oil, gas and coal (Ember)

EUR 54.9 bn

German-Turkish trade 2025

Turkiye ranks 14th among partners

Sources: IEA, ETP 2024 and ETP 2026; UBA GreenTech Atlas 2025; Ember; Destatis. Full references in the footnotes.

• The International Energy Agency (IEA) estimates in its Energy Technology Perspectives (ETP) series that the global market for key clean energy technologies reached nearly USD 1.2 trillion in 2025, up from around USD 700 billion in 2023[8].

• German GreenTech employs 3.4 million people, about three times as many as the vehicle industry, and generates EUR 314 billion in gross value added (GVA), 9% of the German total. The graphic draws on the GreenTech Atlas of the German Environment Agency (UBA). In the graphic, million (m), billion (bn) and trillion (tn) are used as scale labels[9].

• Germany holds 16.5 % of global GreenTech patent filings and ranks third worldwide[10].

• Türkiye covers today 62% of its power capacity with renewable energy but still paid USD 47 billion for net energy imports in 2025. Every additional domestic gigawatt of renewable power keeps part of this money in the country and helps to grow the Turkish GreenTech market[11].

• Türkiye aims to reduce primary energy consumption by 16 % until 2030 with planned investments of USD 20.2 billion in energy-efficient technologies, management systems and implementation services.

• Türkiye invests around USD 3.34 billion in decarbonising key industries and SMEs through the national Green Transformation Program. Türkiye is also the EMEA region's fourth-largest electric vehicle sales market.

• German-Turkish trade reached EUR 54.9 billion in 2025, which makes Türkiye Germany's 14th-largest trading partner[12].

8 IEA 2026; IEA 2024.
9 UBA 2025b, pp. 7-8, 19 and 22; UBA 2025a.
10 UBA 2025b, pp. 7-8.
11 Ember 2026.
12 Destatis 2026.

Seven Lead Markets

The seven lead markets provide the structure for this Compass. Energy efficiency and renewable energy systems remain separate markets, following the GreenTech Atlas taxonomy[13].



Circular Economy
sustainable raw materials, waste treatment, recycling and secondary raw-material supply - closing material loops.



Energy Efficiency
energy-efficient buildings and efficient production processes and technologies - doing more with less energy.



Renewable Energy Systems
wind and solar generation, intelligent grids and storage - clean power and its smart integration.



Mitigation and Protection Technologies
air- and noise-pollution control, soil protection and climate-adaptation services.



Sustainable Forestry & Agriculture
wood-based materials, sustainable forestry and environmentally friendly agricultural technologies.



Green Mobility
e-mobility, clean drive technologies, intelligent traffic management and low-impact logistics.



Water Management
water supply and wastewater treatment, flood protection and water reclamation.

13 UBA 2025b, Chapter 3.2, pp. 18-22, Figs. 3-6.

Germany and Türkiye - a strong base for GreenTech cooperation

Germany and Türkiye are connected by a longstanding and multifaceted partnership. In some GreenTech areas, including circular economy and waste prevention, Germany and Türkiye have closely collaborated for more than 25 years including related ministries, agencies, science, private sector and civil society. A flagship example was the cooperation. With the German Environmental Protection Agency in the field of circular economy cooperation, environmental legislation and protected area management via the German "Beratungshilfeprogramm".

In 2006, Türkiye and Germany established an annual governmental steering committee for environmental cooperation, the Umweltlenkungsausschuss (UMLA); in 2024 it was transformed into KUMLA.

n 2012, Türkiye and Germany established a joint Energy Partnership aiming to promote Energy transition, energy efficiency and eenewable energy cooperation.

Also within the private sector Germany and Türkiye have outstandingly strong ties: **More than 8,000 German and German-affiliated companies are active in Türkiye, creating over 100,000 jobs** and together with the **more than 100,000 companies with Turkish heritage in Germany** have created one of the most dynamic economic relationships between Europe and its neighbouring regions.

With bilateral trade volumes of over USD 52 billion in 2025, Germany is one of Türkiye's most important trading partners and Türkiye is amongst Germany's largest trading partners. Already today the GreenTech sector plays an important role in the bilateral economic and political cooperation; however, with the 31st United Nations Climate Change Conference (COP31) and further green transition the launch of the 1st GreenTech Compass is opening an important new chapter of cooperation, reflecting the growing demand and competitiveness for innovative technologies, sustainable infrastructure, and resource-efficient industrial solutions.

Türkiye offers a strong industrial base for GreenTech investment. Its priorities include efficient production, renewable electricity, storage, modern grids and resource security. The sector chapters in this GreenTech Compass distinguish installed capacity, policy targets and announced projects, and identify the technologies and partners needed for delivery[14].

Germany's GreenTech sector has more than 40 years of broad experience and solid technological solutions. Today it generates more than EUR 314 billion in gross value added (2023), around 9 % of the national total. It employed 3.4 million people, about 7.5% of all workers. Germany also accounted for 16.5% of international GreenTech patent applications over 2010-2023, placing it third worldwide[15-16].

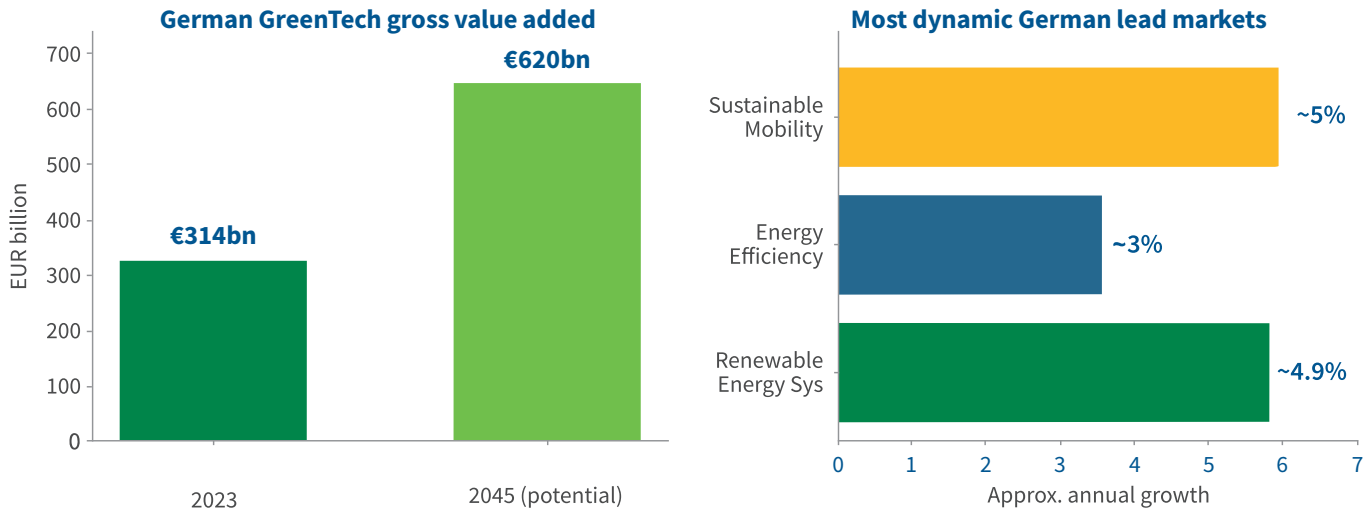


Figure 1. German GreenTech value added and its most dynamic lead markets.[17]

14 Ministry of Trade 2026, Chapter 5, p. 13.
15 UBA 2025b, Chapter 3.2, pp. 18-22, Figs. 3-6.
16 UBA 2025b, Chapter 3.4, pp. 34-35, Fig. 16.
17 UBA 2025b.

Europe - growth through industrial transformation

The European Commission places industrial competitiveness and sustainability at the centre of its economic agenda. The European Green Deal sets the growth strategy. Fit for 55 develops the measures for the 2030 climate target of reducing emissions in the European Union (EU) by 55% by 2030 compared to 1990. The Clean Industrial Deal links decarbonisation with competitive industry, affordable energy and stronger demand for clean products.[18]

These priorities connect the growing Turkish, German, European and global demand with German and Turkish technology and production. For companies, this is an opportunity to cut resource costs, diversify products and strengthen their position in European and global value chains. Large EU programmes support these priorities with tangible financial commitments. The Innovation Fund, Horizon Europe and NextGenerationEU have provided over €40 billion of funding in areas such as electrification, carbon storage and low-carbon energy alternatives for the period 2020 – 2030.

Replacing and greening energy imports show the economic potential from action in GreenTech sectors. The research division of Kreditanstalt für Wiederaufbau (KfW) calculates that **Germany's net fossil-fuel imports cost around EUR 76 billion in 2024,** using Destatis trade statistics. Türkiye's official annual economic report records **USD 65.6 billion (EUR 58,6) in energy imports for the same year.** The measures differ and are not a like-for-like comparison.[19-20] Yet they both demonstrate that investment in GreenTech sectors such as energy efficiency and renewable energy can bring billions of euros in benefits via reduced exposure to imported fuels. In addition, decentralised projects can direct more spending towards local construction, engineering, operations and maintenance. The retained value depends on the domestic share of each project's supply chain; it is not equal to the full import bill.[21-22]



18 European Commission 2019; European Commission 2021; European Commission 2025.
19 Rode 2025, p. 1.
20 SBB 2025, p. 71.
21 Rode 2025, p. 1.
22 DEG 2026.

2.

Strategic Partners for German-Turkish Cooperation

AHK Türkiye and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH are the principal authors of the GreenTech Compass Türkiye. Together, they bring bilateral market knowledge and international cooperation expertise to the study's analysis and recommendations. Strategic partners complement this work with sector knowledge, institutional networks, technical references and financing expertise.



Principal Authors AHK Türkiye and GIZ

AHK Türkiye and GIZ jointly lead the study's content and editorial development. Their complementary perspectives connect German technology and engineering expertise with Türkiye's industrial strengths, market opportunities and implementation needs.

Auslandshandelskammer Türkiye (AHK Türkiye)

As a principal author of the GreenTech Compass Türkiye, AHK Türkiye contributes bilateral market intelligence, company perspectives and practical market-development expertise. Through DEinternational, it implements export-promotion activities, identifies local partners and supports business matchmaking. Its network connects German technology providers with Turkish institutions, companies and project owners, grounding the study's analysis and recommendations in business needs and cooperation opportunities.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

As a principal author of the GreenTech Compass Türkiye, GIZ contributes its expertise in international cooperation and the implementation of climate and environmental projects. Having opened its Country Office in 1999, GIZ has been a committed partner to Türkiye for more than 25 years. Working with a range of partners on behalf of multiple commissioning parties, its Türkiye portfolio covers a broad range of topics, including the EU Carbon Border Adjustment Mechanism (CBAM), the monitoring, reporting and verification (MRV) of greenhouse gas emissions, and further measures for climate and biodiversity protection. This experience informs the study's perspective on implementation and bilateral cooperation.

POLICY & FUNDING	MARKET INTELLIGENCE	MARKET ACCESS & MATCHMAKING	SECTOR EXPERTISE	FINANCE	IMPLEMENTATION
BMUKN · bilateral programmes	UBA · GIZ	AHK Türkiye	RETech · GWP · specialist networks	KfW · development and commercial finance	Companies · project owners · public partners

Strategic Partners

The BMUKN, UBA, KfW, RETech, GWP and Near and Middle East Association (NUMOV) are strategic partners within the cooperation framework presented in this Compass. Their roles relate to sector networks, knowledge, policy interfaces and financing; overall authorship and editorial leadership of the study rest with AHK Türkiye and GIZ.

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)

The BMUKN administers the federal government's environmental export promotion. It administers the Export Initiative Environmental Protection (EXI), through which mainly SMEs carry out market-preparation projects in target countries. By 2026, more than 200 projects in 97 countries had received funding.[23] For cooperation with Türkiye, the Turkish-German Climate and Environment Steering Committee held in Ankara and the Advisory Assistance Programme are available. Türkiye benefits from over €50 million in climate-related multilateral and bilateral projects via the International Climate Initiative.

German Environment Agency (UBA)

The German Environment Agency (UBA) provides an important knowledge base for the Compass through its GreenTech Atlas 2025. The Atlas defines the seven lead markets used to structure the sector analysis. UBA is presented here as a strategic knowledge partner; use of the Atlas as a reference does not imply authorship of this study.

Kreditanstalt für Wiederaufbau (KfW)

KfW is included as a strategic financing partner in the cooperation framework. Its role connects the discussion of GreenTech opportunities with development finance and investment. The completed programme "Energy Efficiency in Public Buildings in Türkiye" (2014–2020), which combined GIZ advisory services with KfW investments, illustrates how the two institutions' distinct roles can complement one another.

German RETech Partnership e.V. (RETech)

RETech emerged from an initiative of the Federal Environment Ministry launched in 2007 and was established as an association in 2011. Today it has more than 60 members from the waste management and recycling sector.[24] Since November 2021, RETech has been a strategic partner of the BMUKN in the EXI field of action "Circular Economy", supporting German SMEs through advice, networking and market-preparation activities.[25]

German Water Partnership e.V. (GWP)

GWP was founded in 2008 and brings together around 300 companies, professional associations and research institutions from the water sector.[26] Its recent activities in Türkiye include the 2024 business delegation trip with nine participating German companies and the German Pavilion at IFAT Eurasia, the environmental technologies trade fair, in Istanbul in May 2025, where ten GWP members exhibited.[27]

Near and Middle East Association (NUMOV)

NUMOV was founded in Berlin in 1934 and promotes economic relations between Germany and the countries of the Near and Middle East. It offers country information, specialist seminars and delegation trips and cooperates with federal ministries and embassies.[28] Unlike RETech and GWP, NUMOV works across sectors, which allows it to reach suppliers that are not organised in one of the specialist networks.

Turkish Business and Implementation Interfaces

The Union of Chambers and Commodity Exchanges of Türkiye (TOBB) and its network of local chambers help international suppliers find the right contacts in Türkiye. The chambers can put suppliers in touch with local companies and institutions and help them identify potential customers and project partners.

The seven sector chapters identify the key organisations in each market and explain where they can support market entry and project development. Ministries shape policy and regulation, industry associations connect businesses within their sectors, and organised industrial zones provide access to clusters of manufacturers. Utilities are potential customers and implementation partners, while research institutions can support testing, technology development and pilot projects.

23 BMUKN n.d.-c.
24 RETech 2025a.
25 RETech 2025b.
26 GWP n.d.
27 GWP 2025.
28 NUMOV n.d.

Financing Partners

Financing and Risk-Mitigation Instruments

Financing needs change as a GreenTech project moves from concept to implementation. At an early stage, Germany's Export Initiative Environmental Protection (EXI) can support eligible feasibility studies, pilot projects and technology demonstrations. These activities help German suppliers and their partners in Türkiye test solutions under local conditions and assess whether they can be deployed on a larger scale.

For larger investments, the institutions within KfW Group serve different purposes. KfW Development Bank implements Germany's financial cooperation with partner countries. In Türkiye, it has channelled development finance through Türkiye Kalkınma ve Yatırım Bankası for municipal infrastructure, including water supply, wastewater treatment and waste management. **KfW IPEX-Bank** provides export and project finance, for example by arranging a loan that enables a buyer in Türkiye to purchase German equipment. **Deutsche Investitions- und Entwicklungsgesellschaft (DEG)** supports private-sector investment through long-term loans, equity and advisory services. **The European Bank for Reconstruction and Development (EBRD)** also works through local financial institutions. Its credit line to Türkiye Sınai Kalkınma Bankası (TSKB), for example, enables the bank to lend to businesses investing in energy efficiency, renewable energy and climate resilience.

Enerjisa Üretim's YEKA-2 wind power project shows how these instruments can work together. KfW IPEX-Bank, DEG and Türkiye's Akbank were among the lenders in the financing consortium. KfW IPEX-Bank coordinated the buyer-credit tranche, which was backed by a German federal export credit guarantee and supported the purchase of Enercon turbines. This illustrates how several lenders can share the financing while a federal guarantee covers specified payment risks on the export transaction. Germany's separate investment guarantees can protect eligible German direct investments abroad against political risks.

On a national level, these state-backed networks act as primary market catalysts. In Germany, the KfW Group serves as a central financing engine, deploying over EUR 61 billion annually in domestic environmental and climate finance. Concurrently, in Türkiye, the state agency Small and Medium Enterprises Development Organization of Türkiye (KOSGEB) works alongside international institutions to channel over USD 176 million through targeted initiatives like the Türkiye Green Industry Project. By offering subsidised, low-interest loans, public guarantees, and blended finance frameworks, these institutions effectively derisk large-scale sustainability projects.



Source: DEG/Photographer: Andreas Huppertz.



Source: www.ebrd.com

Together, these instruments form part of a broader support ecosystem that combines technology cooperation, technical assistance, risk mitigation and long-term financing. This is particularly relevant in sectors requiring significant capital expenditure, including renewable energy, water infrastructure, industrial modernisation, energy efficiency and circular economy solutions.

Finance belongs in project development from the start. DEG's July 2026 financing for Enerjisa Üretim illustrates a practical model. A USD 180 million syndication arranged by the Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (FMO), the Dutch development bank, includes USD 80 million from DEG for three planned wind projects in Muğla, using German Enercon turbines. Turkish project ownership, German technology and international finance work together in one investment.[29]

Team Europe coordinates the external action of the European Union (EU), its Member States and their development agencies and public banks, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD). The EU can provide grants and guarantees, while Member States can contribute bilateral financing and technical expertise through their own institutions. The EIB and the EBRD finance individual projects or programmes under their respective mandates.

The response to the February 2023 earthquakes in Türkiye illustrates this division of roles. The **EIB**, through EIB Global, signed a **EUR 400 million loan** with Türkiye to restore water and wastewater infrastructure. The **EU** guaranteed the loan and allocated a further **EUR 35 million in grant funding** to accompany it. Türkiye's **Ministry of Treasury and Finance** signed on behalf of the country, and **İller Bankası (İLBANK)** acts as the financial intermediary for the municipal investments.

The **EBRD** provided **EUR 195 million in separate financing** for wastewater and stormwater projects in Adıyaman and Hatay. Here, İLBANK acts as the implementing agency for Adıyaman Municipality and provides oversight to the Hatay Water and Sewerage Administration. For suppliers, the practical entry point is the tender issued for each project by the responsible contracting authority.[30]

Role of private and commercial banks

Private, commercial and cooperative banks from both partner countries form the backbone of sustainable finance. Serving as central conduits for capital, they effectively connect GreenTech companies with targeted financing solutions and facilitate local investments. In Germany, major commercial banks such as Deutsche Bank and Commerzbank complement the regional savings banks (Sparkassen), which specialise in financing local enterprises and decentralised energy transition projects. In Türkiye, leading institutions like Garanti BBVA and Akbank are systematically expanding their financing for renewable energy and low-carbon industrial transformation. Consequently, these banks play a crucial role in scaling sustainable solutions from pilot projects into widespread market implementation.

29 DEG 2026.
30 European Commission n.d.-c; EIB n.d.

Recommendations for Investment and Cooperation

Investing in GreenTech is a high-yield business opportunity, outperforming traditional tech markets in growth and resilience. German-Turkish collaboration serves as a direct commercial pipeline, uniting companies, financiers and policymakers to capture these lucrative green markets. By establishing a level playing field and ensuring regulatory predictability, this partnership can help reduce investment risks and strengthen investor confidence. Together, stakeholders can build a shared pipeline of investment-ready projects with clear ownership, measurable outcomes and pathways to international financing.

Create the conditions for growth:

• Provide a predictable market environment: Establish clear regulatory frameworks and use public procurement to reward verified resource efficiency.

• Make cooperation practical: Use regular German-Turkish GreenTech exchanges—for example, alongside the German-Turkish Climate and Environment Steering Committee (KUMLA)—to connect companies, business associations, researchers, financiers and hubs.

• Turn dialogue into a project pipeline: Link exchanges to information-sharing, joint hackathons and a bilateral GreenTech hub network. Use EXI and complementary instruments to help move promising ideas towards demonstration and investment.

Turn market potential into projects:

• Partner across borders: Combine German and Turkish expertise, industrial capacity and market access to develop and scale commercially viable GreenTech solutions.

• Connect business and innovation: Bring companies and business associations together with universities, applied research teams and GreenTech hubs to turn industrial challenges into tested solutions and commercial partnerships.

• Use EXI to pilot and demonstrate: Eligible organisations can explore the Export Initiative Environmental Protection (EXI) for investment-oriented projects and derisking in international markets. Focus areas include water and wastewater management, the circular economy, waste management, resource efficiency and environmental technologies.

• Design for local impact: Use pilots to test solutions, develop local services and training, and demonstrate measurable resource savings. Business associations can help identify shared needs and bring them to joint exchanges and hackathons.

Help solutions reach scale:

• Connect the finance ecosystem: Bring SMEs, banks, development financiers, investors and business associations together to improve access to GreenTech finance.

• Bridge the gap from pilot to investment: Combine project-preparation support with guarantees, blended finance and leasing to help SMEs scale proven solutions.

• Make projects investment-ready: Link financing to verified energy, water or material savings. Pool smaller projects, standardise due diligence, and consider local-currency and risk-sharing options.

3.

Innovative Solutions
The Seven GreenTech Pillars

The GreenTech Compass revolves around seven pillars of the green transition. Each pillar not only reflects one aspect of a low-carbon, resource-efficient economy but also promises very strong economic momentum. Turkish and German green tech companies by leveraging these innovative growth potentials and expanding strategic partnerships between each other can position themselves as key players in the global transformation. Each of these seven pillars will be introduced below including an overview of the regulatory landscapes in both countries alongside market potentials and best practice examples of German-Turkish business cooperation.







3.1 Circular Economy

Circular production keeps materials valuable and reduces demand for primary resources. Product design, reuse, repair and high-quality recycling create business across the value chain. German-Turkish partnerships can connect these technologies with industrial material flows and reliable buyers for recovered products.

Turning Resources into Opportunities

Policy & Regulatory Framework

Türkiye - From Waste Policy to Circular Production

Türkiye's National Circular Economy Strategy and Action Plan (NCESAP) 2025-2028 sets 53 actions across seven priority sectors. It links waste prevention and circular products with industrial transformation, material recovery and monitoring.[31]

Türkiye's National Circular Economy Strategy and Action Plan - at a glance

2025-2028	6	53	7	≈400,000
implementation period	strategic areas	actions	priority sectors	firms in priority sectors

Seven priority sectors

Packaging	Batteries & vehicles	Construction & buildings	Electronics & ICT	Food & biomass	Plastics	Textiles

Policy estimates: >100,000 jobs; TRY 210-350 bn annual added value; TRY 110-180 bn annual resources for production-technology and waste-management transformation.

Figure 2. Türkiye's National Circular Economy Strategy and Action Plan at a glance. Information and communication technology (ICT) and Turkish lira (TRY). [32]

Climate Law No. 7552 provides an additional legal framework for circular-economy objectives, secondary-material use and climate finance. For suppliers, the opportunity is to connect compliant collection and treatment with circular production and reliable material quality. [33]

Instrument	Primary function	Market signal
NCESAP 2025-2028	Industrial transformation	53 actions across seven priority sectors, including prevention, circular products and secondary materials
Waste, Zero Waste and packaging rules	Collection and Producer responsibility	Separate collection, treatment quality, packaging systems and return infrastructure
DYS/DOA and DBYS	Deposit return and data	Return systems, logistics, verification, maintenance and data interfaces
EU product rules for exporters	PPWR, ESPR and battery rules	Packaging design, recyclability, traceability and product-specific data requirements

Table 1. Main implementation levers for circular-economy cooperation.[34]

31 MoEUCC 2025b.
32 MoEUCC 2025b, policy estimates shown in the figure.
33 Law No. 7552.
34 Information from the official websites of MoEUCC, TÜÇA (DBYS) and EUR-Lex.

Germany and the EU - The Reference Framework

Germany's five-step waste hierarchy puts prevention first, supported by product design that avoids waste. Preparation for reuse, recycling, other recovery and disposal follow in that order. Section 6 of the Circular Economy Act also requires assessment of life-cycle impacts.[35]



Waste hierarchy under Section 6 of the Circular Economy Act and Article 4 of Directive 2008/98/EC. Prevention is the highest priority.[36]

Germany built its circular-economy system over decades. The first federal waste law dates from 1972. The 1991 Packaging Ordinance strengthened Collection and producer responsibility and separate collection. This development helped build the technology base behind EUR 22.9 billion in circular-economy exports in 2023.[37]

For Turkish exporters, EU packaging, ecodesign and repair rules create demand for circular design and reliable product information. The ESPR establishes the framework for product-specific digital product passport requirements; implementation follows the relevant delegated acts.[38]



35 KrWG, § 6; Directive 2008/98/EC, Art. 4.
36 KrWG, § 6; Directive 2008/98/EC, Art. 4.
37 UBA n.d.-a; BMUKN n.d.-b; UBA 2025b, Chapter 4.1, pp. 41-44, Figs. 20-22.
38 Regulation (EU) 2025/40; Regulation (EU) 2024/1781; Directive (EU) 2024/1799.

Market Relevance

Türkiye combines substantial industrial material flows with investment in collection, recovery and circular production. The indicators below cover different parts of the system. They must not be combined into one recovery rate. [39]



Türkiye's circular-economy baseline-what the official 2024 datasets measure

120 Mt	32.3 Mt	195 Mt	56 Mt	2.456 Mt
waste generated	municipal waste collected	waste treated	waste recovered	secondary raw materials
TURKSTAT survey scope	municipalities	disposal/recovery facilities	within treatment-facility date	sorted-material recovery

Important methodological caveat Generation and treatment datasets have different sectoral and temporal coverage; the figures must not be combined into a national recovery rate.

Figure 3. Türkiye's circular-economy baseline - what the official 2024 datasets measure. Generation and treatment datasets have different coverage and must not be combined into a single recovery rate. The chart uses data from the Turkish Statistical Institute (TÜİK, also known as TURKSTAT). Values are in million tonnes (Mt) 40 [40]

Manufacturing generated 24.4 million tonnes of waste in 2024, including 4.2 million tonnes of hazardous waste. Some 70.1 % was sold or transferred to licensed treatment facilities. Cleaner separation, traceability and consistent secondary-material quality create opportunities for higher-value recovery.[41]

39 TÜİK 2025a; generated- and treated-waste data differ in sectoral and temporal coverage.
40 TÜİK 2025a; TÜİK 2025b.
41 TÜİK 2025a, manufacturing waste.

Priority Sectors and Technology Demand

Instrument	Market-relevant fields
Packaging and plastics	Return systems, sensor sorting, washing, decontamination, compounding and recycled-content quality
Textiles	Automated sorting, fibre-to-fibre recycling, traceability and links to reliable fibre buyers
Batteries, vehicles and electronics	Diagnostics, repair, safe dismantling, critical-material recovery and battery data
Construction and buildings	Selective demolition, mineral sorting, recycled aggregates and material documentation
Food and biomass	Prevention, separate collection, composting, anaerobic digestion and residue use

Table 2. The seven national priority sectors grouped by shared technology requirements.[42]

High-Potential Circular Economy Sectors

Battery circularity requires diagnostics, traceability, safe dismantling and high-purity material recovery. EU battery rules connect market access with product data and recovery requirements. Technology partners should define material quality and offtake before choosing the recycling process.[43]

Electronics create opportunities in collection, testing, repair, refurbishment and valuable-material recovery. The Global E-waste Monitor reports around 1.08 million tonnes generated in Türkiye in 2022, with around 187,000 tonnes formally collected. Diagnostics and digital tracking can complement investment in dismantling and treatment.[44]

Construction creates demand for selective demolition, mineral sorting, recycled aggregates and material documentation. Türkiye's circular-economy plan identifies construction and buildings as a priority sector. Standards, certification and transport economics determine viable markets for secondary materials.[45]

42 MoEUCC 2025b, priority sectors.
43 Regulation (EU) 2023/1542, Arts. 8 and 77 and Annex XII; MoEUCC 2025a.
44 UNITAR/ITU 2024, Türkiye country data for 2022; MoEUCC 2025a.
45 MoEUCC 2025a; UBA 2025b, Chapter 4.1, pp. 39-46, Figs. 19-23.

German Technology and Innovation

Germany's circular-economy lead market employed around 1.125 million people and generated EUR 87.9 billion in gross value added in 2023. It exported EUR 22.9 billion in circular-economy goods. The Atlas identifies Türkiye as an important and dynamic destination for these technologies.[46]

Germany accounted for around 18 % of global circular-economy patents and ranked second. Strong fields include circular processes, waste treatment and recovery, measurement and control, and plastics recycling.[47]

Germany - Circular Economy reference market

1.125 m	€87.9 bn	€22.9 bn	€252.6 bn	18%
people employed	gross value added	exports (2023)	world market (2022)	global CE patents
+1.0% p.a. since 2010	+2.3% p.a. since 2010	+2.7% p.a. since 2010	+4.8% p.a. since 2010	#2 worldwide

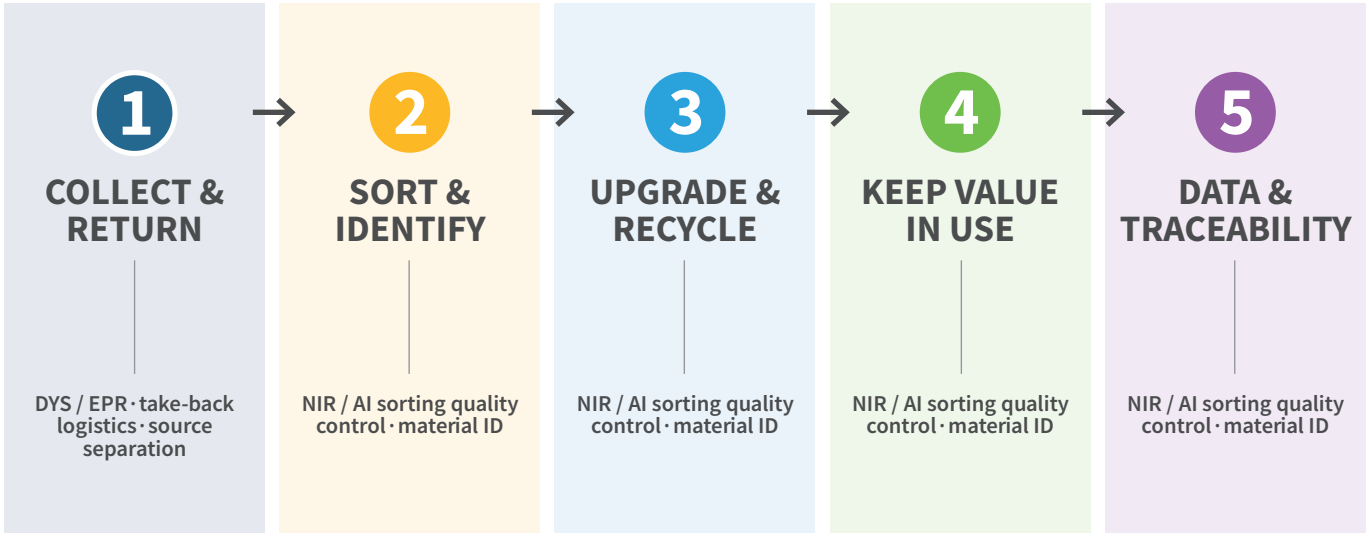
Source: UBA GreenTech Atlas 2025, ch. 4.1, figs 20-22.

Figure 4. Germany - circular-economy reference market. Circular economy [48]



46 UBA 2025b, Chapter 4.1, pp. 39-46, Figs. 20-22..
47 UBA 2025b, Chapter 4.1, pp. 39-46, Figs. 20-22.
48 UBA 2025b, Chapter 4.1, pp. 39-46, Figs. 20-22.

German-Turkish Cooperation: Moving from Waste Management to Circular Value Chains



The strongest German contribution is typically high-value technology, engineering, automation, quality assurance and data integration - combined with Turkish feedstock, operators and industrial scale.

Figure 5. Circular value creation - priority technology interfaces for bilateral cooperation (own illustration). Extended producer responsibility (EPR), near-infrared (NIR), artificial intelligence (AI), identification (ID) and digital product passport (DPP).

Türkiye's circular-economy agenda is gradually expanding from waste management towards resource efficiency, secondary raw materials and circular production. The implementation of the National Circular Economy Strategy and Action Plan, the Zero Waste Initiative and the Deposit Return System is expected to increase demand for resource-efficient solutions across key industrial sectors.

This development is creating new interfaces for German-Turkish cooperation along the circular value chain. Relevant areas include recycling and recovery technologies, circular solutions for the textile sector, resource-efficient production processes and digital applications supporting material traceability and compliance with emerging sustainability requirements.

German expertise in recycling technologies and circular production can complement Türkiye's industrial base and export-oriented manufacturing sectors. Technology partnerships, pilot projects and applied research cooperation may support the implementation and scaling of circular solutions.

Develop Projects Around Materials and Buyers

- Define the material stream, required output quality and a committed buyer for the recovered product. These decisions should guide the technology and business model.

- Combine equipment with local engineering, commissioning, training, spare parts and maintenance. Include data integration and applicable EU-market requirements in the specification.

- Use a demonstrator to verify output quality, operating performance and economics under Turkish conditions. Replicate successful systems across plants and organised industrial zones.

Connect Research and Regional Ecosystems

TÜBİTAK MAM's circular-economy research and the Türkiye Circular Economy Platform provide links to material-flow expertise, industrial symbiosis and applied innovation. They offer practical interfaces for German research organisations, clusters and start-ups.[49]

GreenTech can create skilled work beyond major industrial centres. Testo is based in Titisee-Neustadt in the Black Forest and STADLER in Altshausen. Regional partnerships in Türkiye can similarly connect manufacturing, training and service.[50]


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Bauhaus Erde *— Project Bauhaus Earth — building with bio-based, circular materials to transform the construction sector from a climate burden into a carbon sink.*

49 TÜBİTAK MAM n.d.-a; EBRD/SKD Türkiye n.d.
50 Testo n.d.; STADLER n.d.

SUMMARY

Recommendations for Circular Economy

Türkiye's shift towards **circular production** creates opportunities for German and Turkish partners to improve product design, material recovery and the supply of **secondary raw materials.**

1

Circular production links national industrial transformation with demand for better collection, recovery and product design. **Packaging, plastics and textiles** provide immediate interfaces; **batteries, electronics and construction** add specialised opportunities.

2

Successful projects require consistent feedstock, specified material quality, reliable buyers and local service. Keep the statistical coverage of market indicators separate and distinguish policy targets and project announcements from **operating facilities.**

3

Use German-Turkish demonstrators to prove performance and build reference cases. Connect these projects with regional hubs, applied research and finance so that successful solutions can be **replicated.**

4

Compare indicators with equivalent coverage and distinguish **operating facilities** from policy targets and announced projects.

5

Use **German-Turkish demonstration projects** to verify performance and build local references. Involve regional hubs, applied research teams and financiers early so that successful projects can be **replicated.**

Market Players and Stakeholders

Akademi Çevre Entegre Atık Yönetimi Endüstri A.Ş.

Since 2005, Akademi Çevre has provided integrated waste management and environmental management services in Türkiye. It specialises in recycling waste electrical and electronic equipment (WEEE), applying advanced recycling technologies and producing refuse-derived fuel (RDF). The company uses its processing infrastructure and engineering expertise to recover secondary raw materials and produce alternative fuels from waste. Its activities also include work under Türkiye's Deposit Management System (DYS).

www.akademicevre.com
Orta Mahalle, Demokrasi Caddesi No. 92/1,
34956 Tuzla, İstanbul, Türkiye
Ümit Deveci, General Manager
umit.deveci@akademicevre.com
+90 534 226 66 00

Burkasan Plastik Atık Yönetimi ve Çevre Danışmanlık

Burkasan provides waste management services and produces high-quality recycled plastic raw materials from post-consumer recycled (PCR) and post-industrial recycled (PIR) sources. The company also produces refuse-derived fuel (RDF) and processes waste electrical and electronic equipment (WEEE).

www. burkasan.com
Ahmet Vefik Paşa Mahallesi, Hünkar OSB
Caddesi No. 14, Kestel, Bursa, Türkiye
Birhan Denktaş, General Manager
info@burkasan.com
+90 224 372 60 01

DEMCORE

DEMCORE recovers copper and precious metals, including gold, silver, palladium and platinum, from electronic waste, printed circuit boards and copper-bearing scrap. The recovered metals can be reused as secondary raw materials.

other fields

www.demcore.com
Tuzla, İstanbul, Türkiye
Furkan Demirkıran, Founder and Chief Executive Officer (CEO)
fd@demcore.com
+90 507 045 19 26

Fazla Gıda A.Ş.

Fazla is an impact-driven company that helps businesses prevent waste through technology. It works with retailers, manufacturers and hospitality businesses to redirect surplus products through donation, resale and recycling, including biogas production and packaging recycling. Its smart weighing system helps hotels and food service operators measure and reduce food waste. Fazla is a certified B Corp operating in Türkiye and Spain and reports having saved more than 150,000 tonnes of products and reached over 1.5 million people in need.

other fields

www.fazla.com
Levent Mahallesi, Gazeteci Ümit
Deniz Sokak No. 11, 34330 Beşiktaş,
İstanbul, Türkiye
Berat İnci, Commercial Operations Lead, Türkiye
berat@fazla.com
+90 534 777 46 22

The following overview shows selected German and Turkish companies active in the circular economy and their potential for innovation and German–Turkish cooperation.

GAPP Geri Dönüşüm Çözümleri A.Ş.
(GaPP.green)

GaPP.green provides turnkey waste recovery solutions using gasification, pyrolysis and plasma treatment to convert composite waste into energy, green hydrogen and recoverable raw materials. The company combines technology, financing and legal support to help clients develop and deploy waste recovery plants that meet regulatory requirements.

other fields

www.gapp.green
Palmiye Evleri Sitesi, Üsküdar, İstanbul, Türkiye
M. Kayhan Ural, Chief Operating Officer (COO) and Project and Operations Coordinator
info@gapp.green, kayhan.u@gapp.green
+90 533 608 66 83

Hamburger Recycling Türkiye Atık Yönetimi A.Ş.

Hamburger Recycling Türkiye is part of Austria-based Prinzhorn Holding and provides integrated waste management services through three licensed facilities in İzmir. The wider group combines recycling operations with paper mills and packaging plants, linking recovered materials with the production of paper and cardboard packaging.

www.hamburger-recycling.com
Naldöken Mahallesi, 1237/2 Sokak No. 10, 35050 Bornova, İzmir, Türkiye
Ebru Tunç Akbulut, General Manager
office.turkey@hamburger-recycling.com
+90 232 478 15 15

REMONDIS

REMONDIS is an international environmental services company specialising in waste management, recycling, water management and resource recovery. It uses recycling and recovery technologies to turn waste into secondary raw materials that can be used in new products. The company reports recovering around 30 million tonnes of waste annually worldwide, with more than 1,000 facilities and over 200,000 employees. REMONDIS has operated in Türkiye since 2007.

other fields

www.remondis.com
Egemenlik Mahallesi, Aydınlar Caddesi No. 108, Işıkkent, Bornova, İzmir, Türkiye
Gizem Özbaş, Chief Sales Officer
gizem.ozbas@remondis.com.tr
+90 533 693 42 69

THE GREEN BRIDGE
Ingenieurgesellschaft mbH

THE GREEN BRIDGE (TGB) connects existing IT systems so people and artificial intelligence (AI) can work with the same information. Its CLUSTWINO™ suite combines operational, environmental and geospatial data in an Analytical World Model that links data by subject, location and time. The modular software helps companies and public authorities make informed decisions, automate workflows and identify where they can reduce resource consumption, emissions and operational losses.

other fields

www.the-green-bridge.com
Lauterbachstraße 5a, 82538 Geretsried, Germany
Prof. Dr. Roman Brylka, Managing Partner and Chief Executive Officer (CEO)
bry@the-green-bridge.com
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3.2 Energy Efficiency

Energy efficiency lowers the energy needed for a product or service. It improves industrial processes, buildings and energy systems while reducing operating costs. German-Turkish cooperation can combine technology, audits and implementation services to capture these gains.

Türkiye's second National Energy Efficiency Action Plan provides a clear investment framework. Buildings, industrial processes and energy services offer complementary opportunities for suppliers and implementation partners.

Less Energy.
More Possibilities.

Policy & Regulatory Framework

Türkiye's two national action plans define priorities for efficiency investment. The first provides implementation experience; the second sets the next investment horizon. German and European instruments offer a concise reference for project design.

Türkiye has developed two NEEAPs. The first achieved its core objectives, with primary energy consumption reduced by around 14 % compared with a reference scenario, USD 8.5 billion invested, ~70 million tonnes of CO_2 emissions avoided, ~45,000 new jobs created,[51] and energy intensity falling.

The Second NEEAP (2024-2030)

Through its "Energy Efficiency 2030 Strategy" and second National Energy Efficiency Action Plan (NEEAP), Türkiye has significantly raised its ambitions. The plan comprises 61 measures across buildings, industry, transport, energy supply and agriculture. These measures aim to mobilise USD 20.2 billion in investment by 2030, reduce primary energy consumption by 16 %, achieve cumulative savings of 37.1 million tonnes of oil equivalent (Mtoe) and avoid around 100 million tonnes of CO_2 equivalent (CO_2e).[52]

According to Energy Minister Alparslan Bayraktar, around USD 7.6 billion in energy efficiency investments was mobilised in 2024 and 2025 alone.[53]



Solar panels on a private household in Ankara promote renewable energy and improve energy efficiency.



Solar-powered residential buildings in Freiburg demonstrate sustainable architecture and energy-efficient design.

51 MENR 2024a, buildings and industry measures.
52 MENR 2024a, buildings and industry measures.
53 MENR 2024a, buildings and industry measures.

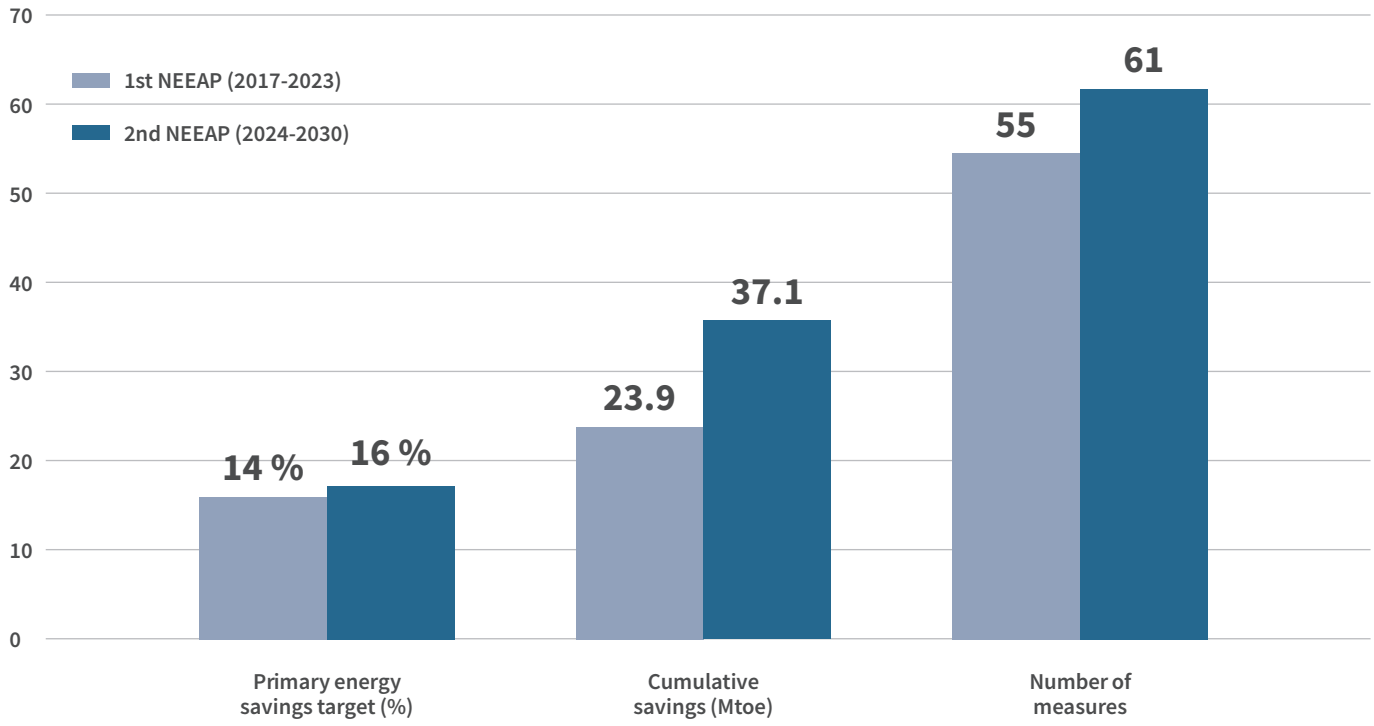


Figure 7. NEEAP at a glance - first versus second plan.[54]

The German and European Policy Counterpart

On the German side, energy efficiency is embedded in the European framework through the EU Energy Efficiency Directive and the broader "Fit for 55" package. The directive sets binding energy-saving obligations that Member States must transpose into national law.[55] Germany implements these through two central instruments - the Energy Services Act (Energiedienstleistungsgesetz, Energy Services Act, in force since 2010), which obliges companies that are not SMEs to carry out regular energy audits, and the Energy Efficiency Act (Energieeffizienzgesetz, Energy Efficiency Act, adopted in 2023), which requires large energy consumers to introduce energy and environmental management systems and to publish plans for end-use energy savings.[56]

Why this matters for Türkiye

The Turkish Enerji Verimliliği (ENVER) portal and the planned Energy Efficiency Obligation Scheme (EEOS) mirror mechanisms that Germany and the EU have already operationalised. As the regulatory frameworks in Germany and Türkiye become increasingly aligned, German experience in energy audits, energy management systems and energy efficiency certificates ("White Certificates"), which document verified energy savings, can be applied to the further development and implementation of Türkiye's energy efficiency policies.[57]

54 MENR 2024a, buildings and industry measures.
55 UBA 2025b, Chapter 2, p. 13, Figs. 3-18.
56 UBA 2025b, Chapter 2, p. 13, Figs. 3-18.
57 UBA 2025b, Chapter 2, p. 13, Figs. 3-18.

Market Relevance

Buildings and industrial processes create demand for efficient equipment and energy services. The following analysis connects Turkish investment priorities with German technology and implementation experience.

Market Segment Buildings: Insulation and Heat Pumps

Buildings offer demand for insulation, efficient heating and controls. Türkiye's Energy Efficiency 2030 Strategy and second action plan include buildings and heat pumps among the areas for action.[58]

Local supply is already established. Baymak's product portfolio includes air-source heat pumps for buildings, hot water and pools. Projects can connect equipment suppliers with qualified installers and building owners.[59]

Buildings - practical investment fields

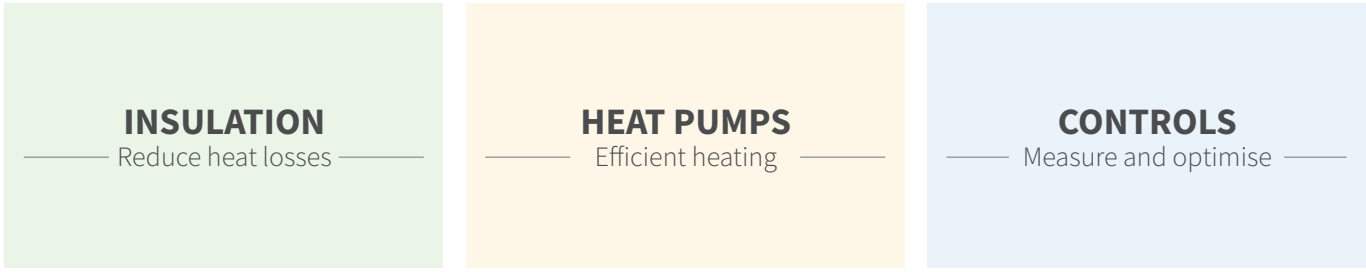


Figure 8. Building efficiency opportunities under Türkiye's second National Energy Efficiency Action Plan.[60]

The German reference market

Energy efficiency is one of the fastest-growing lead markets of the German GreenTech sector. In 2023, it employed ~413,800 people (+3.0 % p.a. since 2010) and generated ~EUR 38.9 billion in gross value added, growing at 5.6 % per year - well above the wider economy.[61] The market comprises two main segments that align with Türkiye's priorities. These are energy-efficient and resilient buildings, including insulation and building technology, and energy-efficient production processes and technologies.[62] German exports of efficiency technologies reached roughly EUR 19.7 billion in 2023, covering ~12 % of a world market that itself grew by more than 10 % per year to ~EUR 158 billion in 2022.

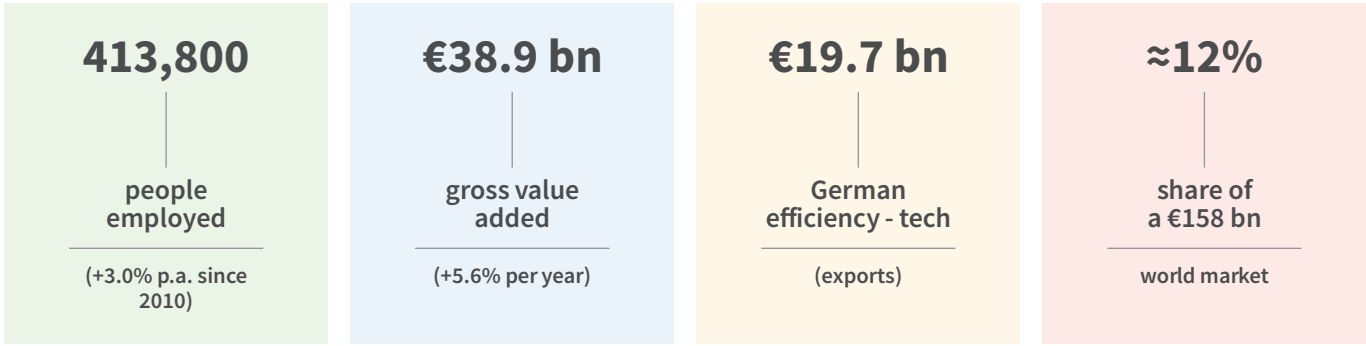


Figure 9. The German energy efficiency lead market - key figures.[63]

58 MENR 2024a, buildings and industry measures.
59 Baymak n.d.
60 MENR 2024a, buildings and industry measures.
61 UBA 2025b, Chapter 4.2, p. 48, Fig. 25.
62 UBA 2025b, Chapter 4.2, p. 48, Fig. 25.
63 UBA 2025b, Chapter 4.2, p. 48, Fig. 25.

Key Regulatory Points with Market Relevance in Türkiye

Buildings.
From 2026, all new public buildings must be built to certified "green" standards; the mandatory share of renewable energy in new buildings rises from 5 % to 10 %, and the minimum standard of the energy performance certificate (EKB, Enerji Kimlik Belgesi) from Class C to Class B.[64]

Street lighting.
The Ministry of Energy and Natural Resources has targeted 500,000 additional light-emitting diode (LED) luminaires by the end of 2025 and 3.75 million nationwide by 2028, with projected annual savings of around USD 20 million. The conversion runs as a 2025-2029 programme with targets set per distribution company; official confirmation of the 2025 figure is not yet available.[65]

Heat pumps.
The Ministry is developing a potential map using a geographic information system (GIS) for heat pump locations, with a focus on the Mediterranean and Aegean regions.[66]

Industry.
Under Energy Efficiency Law No. 5627, large energy consumers must register on the Ministry's "ENVER portal" and submit annual energy-consumption declarations. Registration is mandatory for.

- industrial enterprises with an annual energy consumption of 1,000 tonnes of oil equivalent (toe) or more;
- public buildings with an annual energy consumption of 250 toe or more, or a total construction area of 10,000 m^2 or more;
- owners and/or management bodies of commercial and service buildings with an annual energy consumption of 500 toe or more, or a total construction area of 20,000 m^2 or more.

An EEOS modelled on the EU approach is envisaged for the second NEEAP, but was one of the two measures not implemented in the first NEEAP.[67]

German parallel

Germany's experience in implementing similar obligations can help Türkiye address practical challenges and apply lessons learned as it introduces new requirements.[68]

German innovation strengths

Germany ranks second worldwide (behind the United States) in efficient-production patents, with a share of roughly 14 % of global filings. Its clear strength lies in process control and measurement, control and regulation (MCR) technology, which accounts for more than half of German patents in this lead market, and in "Smart Factory" applications, where Germany leads globally with a share of about 30 %.[69] Siemens is the pivotal industrial player in the efficient-production segment; Bosch and building-technology specialists are strong in the buildings segment.[70] These are the competences - industrial energy management, process efficiency and building technology - that align with the modernisation needs of Turkish industry driven by the EU Carbon Border Adjustment Mechanism (CBAM), as set out below.[71]

German-Turkish Cooperation: From Energy Efficiency Targets to Industrial Competitiveness

With the adoption of the second NEEAP, energy efficiency has become one of the most investment-driven fields of Türkiye's green transformation. Planned investments of USD 20.2 billion by 2030 are expected to accelerate demand for energy-efficient technologies, management systems and implementation services.

As implementation progresses across buildings, industry and public infrastructure, opportunities for bilateral cooperation are emerging in areas such as industrial efficiency solutions, building technologies and energy-management approaches.

Particular relevance can be observed in export-oriented sectors seeking to improve resource efficiency and industrial competitiveness. In this context, German implementation experience and Turkish industrial capabilities provide a strong basis for practical cooperation.

64 MENR 2024a, buildings and industry measures.
65 MENR 2024a, buildings and industry measures.
66 MENR 2024a, buildings and industry measures.
67 EYODER n.d.
68 UBA 2025b, Chapter 4.2, p. 49, Figs. 24-28.
69 UBA 2025b, Chapter 4.2, p. 49, Figs. 27-28.
70 UBA 2025b, Chapter 4.2, p. 49, Figs. 24-28.
71 UBA 2025b, Chapter 4.2, p. 49, Fig. 6.

Starting Points for German-Turkish Cooperation

Energy audits, implementation of the International Organization for Standardization's energy management standard (ISO 50001) and energy management systems for export-oriented, CBAM-relevant industries (steel, cement, textiles, chemicals).

Contracting models (Energy Performance Contracting) for municipalities, public buildings and industrial operations - barely established in Türkiye so far, which opens up market opportunities for experienced German energy service companies (ESCOs).

Building technology, insulation systems, building management technology and heat pump technology for the upcoming tightening of EKB requirements.

Advisory support in establishing an EEOS, drawing on European experience with White Certificate schemes (for example France's certificats d'économies d'énergie (CEE) and Italy's titoli di efficienza energetica (TEE)) and on Germany's contrasting alternative-measures approach under the EU Energy Efficiency Directive.

Technology partnerships for the further modernisation and digitalisation of public street lighting (LED retrofitting, intelligent lighting systems and smart-city applications).

Selected Current German-Turkish Cooperation Projects

Bosch Home Comfort Group (Germany) - Bosch Termoteknik, Manisa (Türkiye).

At its Manisa plant, operated under Bosch Termoteknik Isıtma ve Klima Sanayi Ticaret A.Ş., the German Bosch Home Comfort Group develops and manufactures wall-hung boilers, floor-standing boilers, hot-water systems, heat pumps and ventilation and air-conditioning products, positioning the site as an R&D, production and export hub for the group.[72] The site is embedded in the group's wider heat pump strategy. Bosch Home Comfort Group is investing more than EUR 1 billion in its European heat pump development and production network by 2030.[73] The Bosch production and R&D hub in Manisa illustrates how German technology and local manufacturing capabilities can be combined to support the growing market for energy-efficient heating and heat pump solutions.



© Bosch

72 Bosch Türkiye n.d.
73 Bosch Home Comfort Group n.d.

Siemens Türkiye (Siemens A.Ş., Germany) × Koç University (Türkiye) - Internet of Things (IoT) Edge Research Laboratory.

Siemens established the "Koç University-Siemens IoT Edge Research Laboratory" at Koç University's Manufacturing and Automation Research Center (Rumelifeneri Campus, Istanbul), making the SINUMERIK Edge platform available to researchers for digital-manufacturing and production-optimisation applications such as predictive and preventive maintenance.[74] The IoT Edge Research Laboratory demonstrates practical cooperation in industrial digitalisation, predictive maintenance and process optimisation, highlighting the role of digital technologies in improving industrial energy performance. Open to researchers and companies and technically supported by Siemens' Kartal R&D Center, the laboratory illustrates the industrial-digitalisation and process-efficiency competences that underpin German-Turkish cooperation on energy-efficient production.[75]



© Siemens

74 Siemens n.d.
75 Koç University n.d.

GIZ × Ministry of Energy and Natural Resources and Ministry of Environment and Urbanization (Türkiye) - “Energy Efficiency in Public Buildings in Türkiye”.

Funded by Germany’s IKI under the German Climate Technology Initiative (DKTI) with some EUR 6.5 million and implemented by GIZ from 2014 to 2020, this project supported Turkish ministries in strengthening the legal, technical and administrative framework for energy efficiency in public buildings, including the design of a data management system (DMS) to monitor building energy consumption.[76] Its results directly support the building-efficiency agenda discussed above. A primary school in Kırıkkale underwent an energy retrofit as a pilot project, incorporating mechanical ventilation, structural strengthening for earthquake safety and a 57 kilowatt-peak (kWp) rooftop photovoltaic (PV) system. The accompanying retrofit guideline was developed as a template for potential use in up to 60,000 school buildings across Türkiye. In addition, more than 200 professionals were trained on the revised Turkish building energy certification tool Binalarda Enerji Performansı (BEP-TR 2), alongside bilateral German-Turkish academic cooperation on energy-efficient buildings.[77] The project Energy Efficiency in Public Buildings in Türkiye demonstrates how bilateral cooperation can support capacity building, regulatory development and pilot implementation in the public building sector.



© Giz

76 IKI n.d.
77 IKI n.d.

Recommendations for Energy Efficiency

Energy efficiency is among the **most advanced areas** of Türkiye's green transition in regulatory terms, with **specific deadlines** that create clear opportunities for German providers.

1

Prioritise projects that address the **second NEEAP's building requirements** and planned **LED street-lighting upgrades.**

2

Target energy-intensive public and commercial buildings for retrofits. Use consumption data to select upgrades and **verify the savings** after installation.

3

Draw on German and European experience to help design the planned **EEOS**, including methods for verifying energy savings.

4

Pilot **energy performance contracts with municipalities** to finance public-building upgrades and link payments to verified savings.

5

Help **export-oriented manufacturers** reduce energy use through audits, **energy management systems** and targeted upgrades to production processes.

Market Players and Stakeholders

Arçelik A.Ş.

Arçelik manufactures home appliances with a focus on energy and resource efficiency in product design and manufacturing. The company operates its own waste electrical and electronic equipment (WEEE) recycling facilities, where it recovers valuable materials from end-of-life appliances and other electrical equipment for use as secondary raw materials.

other fields

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EGESIM Elektrik San. Tic. A.Ş.

EGESIM provides electrical engineering and industrial automation services backed by more than 30 years of experience. It designs low- and medium-voltage power distribution and control systems, manufactures control panels, and integrates and commissions equipment on site. Its projects include geothermal and biomass power plants, waste heat recovery systems and wastewater treatment facilities.

other fields

www.egesim.com
İzmir Serbest Bölgesi, Atatürk Bulvarı No. 4,
35560 Menemen, İzmir, Türkiye
Ahmet İlhan, General Manager
ahmet.ilhan@egesim.com
+90 549 430 08 74
+90 232 842 60 85

Exitcom Recycling Atık Taşıma Toplama Depolama Elektronik ve Gemi San. Tic. Ltd. Şti.

Exitcom Recycling operates facilities in Türkiye and Germany for electronic waste management and battery recycling. It recovers materials from discarded electrical and electronic equipment and end-of-life batteries so they can be reused in industrial production. The company also participates in Horizon Europe projects and works with international research and development partners to improve recycling processes and return more recovered materials to industrial supply chains.

other fields

www.exitcom.com.tr
Çepni Mahallesi, Suadiye Bağdat Caddesi No.
40, Kartepe, Kocaeli, Türkiye
Esra Eken Torunoğlu, Vice President
e.eken@exitcom.com
+90 530 402 83 94
Halil Kayak, Energy Systems Executive
h.kayak@exitcom.com
+90 533 031 85 36

The following overview shows selected German and Turkish companies active in energy efficiency and their potential for innovation and German–Turkish cooperation.

Kampmann GmbH & Co. KG

Kampmann is a family-owned building services company based in Lingen (Ems), Germany, with more than 1,000 employees worldwide. It develops energy-efficient heating, cooling and ventilation systems for commercial, industrial and public buildings. Its portfolio includes air heaters, trench convectors, heat pumps, chillers and ventilation units with heat recovery. Kampmann also offers networked controls and supports the planning of international building projects.

www.kampmanngroup.com
Friedrich-Ebert-Straße 128–130,
49811 Lingen (Ems), Germany
Leo Eckart, Manager
International Projects
leo.eckart@kampmann.de
+49 591 7108-0

ODE Yalıtım

Founded in 1985, ODE Yalıtım manufactures building and technical insulation products at eight production facilities. It offers more than 4,000 products and exports to over 80 countries across six continents. It ranked first in the insulation materials export category of the Turkish HVAC-R Exporters' Association (İSİB) awards from 2022 to 2025. The company has invested in solar power at its Çorlu and Eskişehir facilities, holds Zero Waste certificates and publishes Environmental Product Declarations (EPDs).

www.ode.com.tr
Ortadoğu Plaza, 12th Floor,
Piyalepaşa Bulvarı, 34384
Okmeydanı, Şişli, İstanbul, Türkiye
İpek Koç, Corporate
Communications Officer
i.koc@ode.com.tr
+90 537 475 69 92
+90 212 210 49 06 (ext. 2218)

Vaillant Isı Sanayi ve Ticaret Ltd. Şti.

Established in 1992, Vaillant Türkiye is a wholly owned subsidiary of the Vaillant Group, headquartered in Remscheid, Germany. It serves customers through offices in İstanbul, İzmir, Adana and Ankara and a nationwide dealer and service network. The group offers heat pumps, solar thermal and photovoltaic systems, ventilation for low-energy buildings, conventional heating and combined heat and power systems, supported by smart controls and after-sales service.

www.vaillant.com.tr
Atatürk Mahallesi, Meriç Caddesi
No. 1/4/4, Ataşehir, İstanbul, Türkiye
Dilek Polat Gül, Executive Assistant
dilek.polat-gul@vaillant-group.com
+90 850 222 28 88





3.3 Renewable Energy Systems

Renewable energy creates electricity and heat from replenishable sources. Grids, storage and digital controls connect that generation with reliable supply. German-Turkish partnerships can develop these systems and retain more value through local production, construction and service.

Türkiye's renewable-energy agenda creates demand across generation, grids, storage and service. The chapter connects Turkish policy priorities and investment opportunities with German technologies and operating experience.

Clean Energy for a
Brighter Tomorrow.

Policy & Regulatory Framework

Türkiye's legislation and 2035 targets provide the investment framework for renewable energy. The German and European comparison highlights relevant experience in auctions, permits and grid integration.

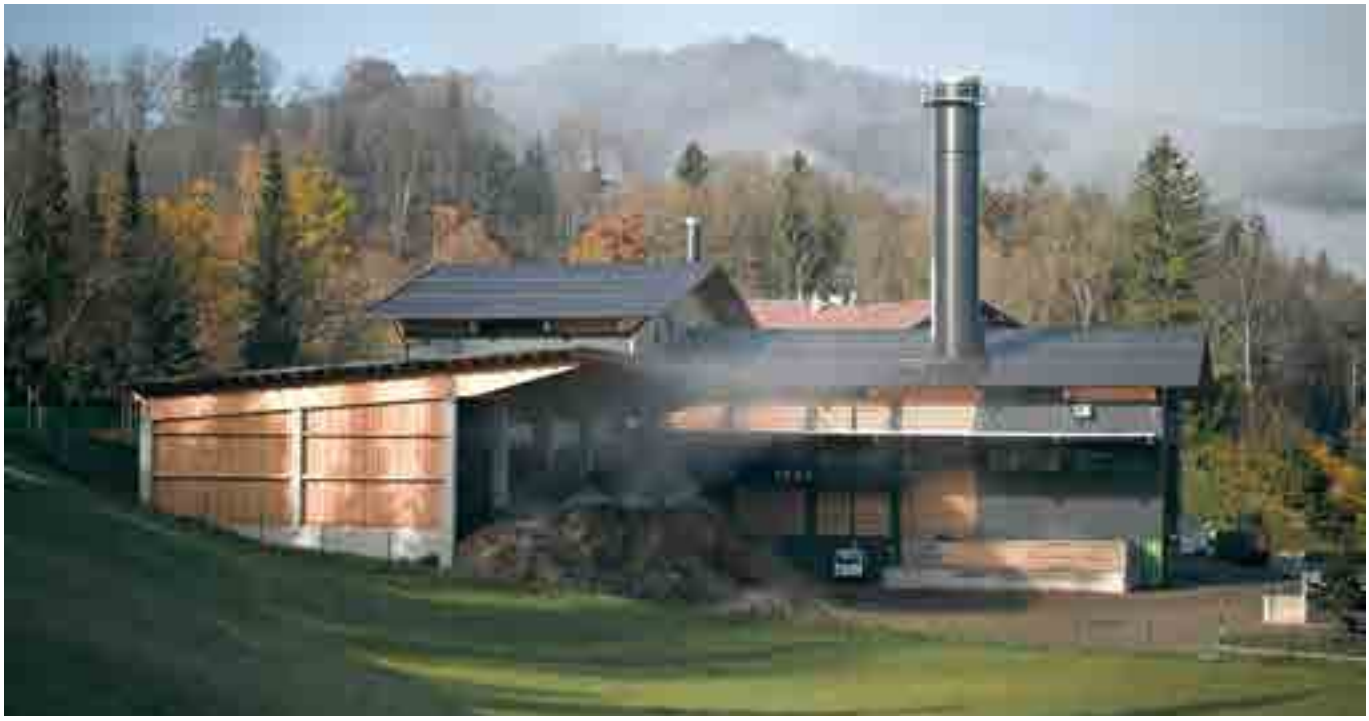
Türkiye's Renewable-Energy Framework and 2035 Targets

Türkiye's renewable-energy policy rests on Law No. 5346 on the Use of Renewable Energy Sources for Electricity Generation (2005, revised in 2011), which established the Renewable Energy Resources Support Mechanism (YEKDEM, Yenilenebilir Enerji Kaynakları Destekleme Mekanizması) - a purchase guarantee that gave investors long-term price certainty and accelerated the build-out of solar, wind, geothermal and hydropower.[78]

Since 2016, large-scale investment has been channelled through the Renewable Energy Resource Areas (YEKA, Yenilenebilir Enerji Kaynak Alanları) model. Under this model, the state allocates land and grid capacity and offers long-term offtake contracts through competitive reverse auctions, with domestic-content and local-manufacturing commitments. By the end of 2024, approximately 5.8 GW had been tendered, comprising 3 GW of solar and 2.8 GW of wind capacity. Auctions in early 2025 added a further 2 GW.

The National Energy Plan and the Renewable Energy 2035 Roadmap set a target of 120 GW of combined wind and solar capacity by 2035. Regular YEKA tenders, a regulatory framework for battery energy storage systems (BESS) and reforms aimed at shortening permitting procedures support this expansion and create opportunities for technology suppliers, project developers and investors.[79]

Türkiye's role in the international climate policy agenda is particularly relevant in the context of COP31. Türkiye holds the COP31 Presidency and has placed "Clean Energy Transition" among the ten priority themes of its COP31 Action Agenda, with a headline goal of raising the global electrification rate to 35 % by 2035.[80-81] Türkiye's updated Nationally Determined Contribution (NDC) commits to a 41 % reduction in greenhouse gas (GHG) emissions against a business-as-usual baseline by 2030 (695 Mt CO_2e), on the way to a 2053 net-zero target. The accompanying Climate Change Mitigation Strategy and Action Plan (2024-2030) sets sector-specific 2030 installed-capacity goals of 32.9 GW solar, 18.1 GW wind, 35.1 GW hydropower and 5.1 GW geothermal / biomass, and aims to lift the share of renewables in primary energy consumption to 20.4 %.[82]



Biomass power plant, Germany *Source: KfW-Bildarchiv / Rüdiger Nehmzow*

78 Law No. 5346; YEKDEM Yönetmeliği 2013; Ember 2025a.
79 MENR 2026.
80 UNFCCC n.d.
81 COP31 Presidency n.d.
82 MoEUCC 2024a.

The German and European Policy Counterpart

Germany and the EU pursue the same expansion through the same instruments - binding capacity targets, competitive auctions and a statutory push on land designation and permitting. This structural convergence is what makes German project-development, turbine, storage and grid experience transferable to Türkiye's reform agenda. The core points of the German framework, kept deliberately brief, are as follows.

Headline target. 80 % renewable electricity by 2030, anchored in § 1 of the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, Renewable Energy Sources Act 2023).

Capacity paths. 215 GW of solar PV, 115 GW of onshore wind and 30 GW of offshore wind by 2030 (§ 4 Renewable Energy Sources Act 2023).

Allocation. competitive auctions run centrally by the Federal Network Agency (Bundesnetzagentur), the functional equivalent of Türkiye's YEKA tenders.

Land and permitting. the Onshore Wind Area Requirement Act (Windenergieflächenbedarfsgesetz, Wind Energy Area Requirements Act) obliges the federal states to designate 1.4 % of the national land area for wind by 2027 and 2 % by 2032 - the German answer to the "super permit" acceleration in Türkiye.

European anchor. the entire framework transposes the EU's revised Renewable Energy Directive (RED III), Directive (EU) 2023/2413.

Türkiye and Germany at a Glance

Türkiye couples its auctions with domestic-content obligations and a permitting reform, while Germany works through a binding land-designation mechanism and a market-premium model.

Dimension	Türkiye	Germany / EU
Core law	Law No. 5346 (2005, rev. 2011); YEKA regime since 2016	Renewable Energy Sources Act 2023; Wind Energy Area Requirements Act; Offshore Wind Energy Act (Offshore Wind Energy Act) - under EU RED III (2023/2413)
Headline target	120 GW wind + solar by 2035; 64.7 % renewables in installed capacity	80 % renewable electricity by 2030 (§ 1 Renewable Energy Sources Act 2023)
Solar PV target	Part of the 120 GW wind and solar goal (2035)	215 GW by 2030 (§ 4 Renewable Energy Sources Act 2023)
Wind target	Part of the 120 GW wind and solar goal (2035); first offshore tender announced	115 GW onshore + 30 GW offshore by 2030 (§ 4 Renewable Energy Sources Act 2023)
Allocation mechanism	Competitive YEKA reverse auctions with domestic-content rules; ≥ 2 GW per year	Competitive auctions via the Bundesnetzagentur
Land / permitting	"Super permit" reform aimed at reducing permitting times from approximately four years to under two.	German Wind Energy Area Requirements Act (Wind Energy Area Requirements Act), requiring 1.4 % of Germany's land area to be designated for wind energy by 2027 and 2 % by 2032.
Support model	YEKDEM purchase guarantee (feed-in / offtake)	Market-premium auctions (sliding feed-in premium)

Table 3. Renewable-energy frameworks in Türkiye and Germany / EU at a glance.[83]

83 Law No. 5346; YEKDEM Yönetmeliği 2013; MENR 2023a; MENR 2024b; EEG 2023, §§ 1 and 4; WindBG; WindSeeG; Bundesnetzagentur n.d.; Directive (EU) 2023/2413.

Market Relevance

Market Relevance for Türkiye

Türkiye's renewable energy capacity is expanding rapidly. The following figures illustrate the scale of the market and highlight the technologies driving this growth.

Türkiye's official expansion agenda targets 120 GW of combined wind and solar capacity by 2035. This is a policy target, creating a clear direction for investment in generation, grids and system integration.[84]

In 2024, solar power clearly overtook wind in new additions, reaching a capacity of 20 GW. This was driven in particular by the expansion of hybrid plants, which use existing grid connection points more efficiently through a permitted overallocation of 30 %. Despite rising module prices caused by currency fluctuations and tariffs, it was above all state auctions and industrial companies' desire for self-supply that fuelled the solar boom.[85]

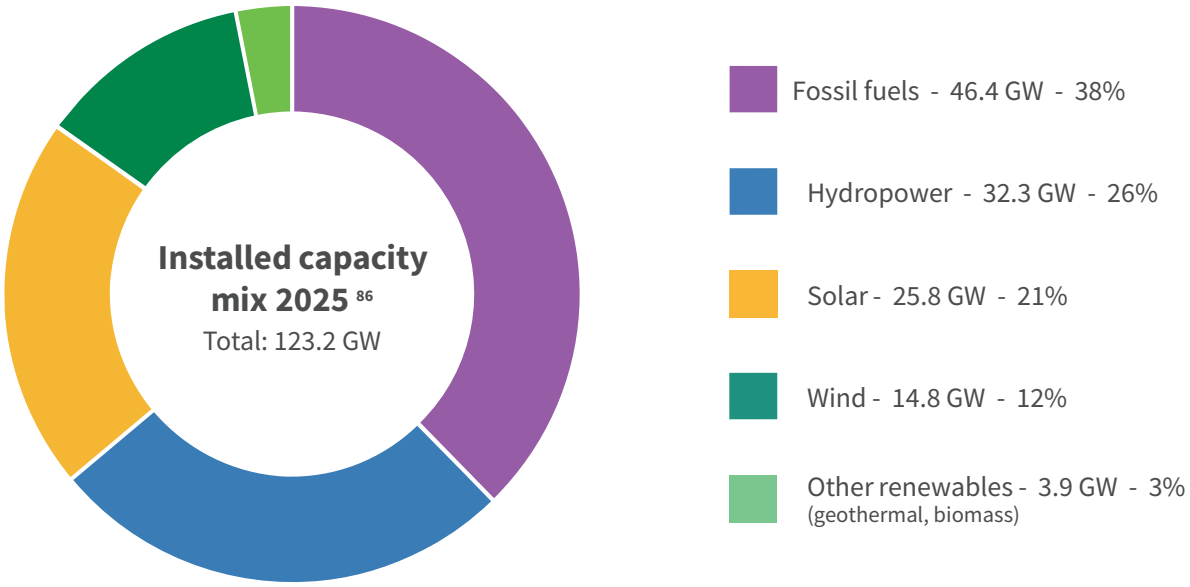


Table 3. Renewable-energy frameworks in Türkiye and Germany / EU at a glance.

Storage, Floating Solar and New Market Segments

Storage, floating solar and integrated power projects extend the opportunity beyond standalone generation. These segments combine equipment demand with engineering, grid integration and long-term service.

Ember's Türkiye Electricity Review 2026 reports a 33 GW allocated battery-project pipeline. This shows strong demand for storage integration, equipment and project services.[87]

The project pipeline signals strong developer interest. Allocated or pre-licensed storage capacity is not operating capacity. The national target also specifies a two-hour storage duration.[88]

A regulation adopted in May 2024 also opened Türkiye's more than 800 reservoirs and inland waters to floating solar installations; the identified potential stands at around 53 GW - one of the largest floating solar potentials worldwide, with the added benefit of hybridisation with existing hydropower infrastructure.[89]

Kontrolmatik and Harbin Electric announced a wind-plus-storage project in Tekirdağ with 1 gigawatt-hour (GWh) of storage capacity. The announcement identifies a project opportunity; it does not establish that the facility is operating.[90]

84 MENR 2026.
85 Ember 2025b; Ember 2025c.
86 Ember 2026.
87 Ember 2026 (allocated capacity, not yet in operation); MENR 2023a.
88 Ember 2026 (allocated capacity, not yet in operation); MENR 2023a.
89 Ember 2025a.
90 Investment Office 2024 (announced project, not confirmation of operation).

Battery storage - project pipeline and policy target

33 GW
Allocated battery pipeline
Reported by Ember, 2026

7.5 GW
Storage power
National target for 2035

Figure 11. Battery storage pipeline reported in 2026 and national 2035 target. Pipeline allocation is not operating capacity. The 2035 target assumes two hours of storage.[91]

Records and Key Figures 2025

The following overview brings together the most important figures for Türkiye's renewables sector and shows how close the current level of deployment already is to the medium-term targets.

Metric	Value	As of
Installed wind capacity	> 13 GW	2025
Installed solar capacity	≈ 25 GW	2025
Target capacity wind and solar	120 GW	2035

Table 4. Records and key figures of Türkiye's renewables sector.[92]



Nine European countries, including the United Kingdom, Germany, and the Netherlands, are preparing to develop offshore wind energy projects in the North Sea with a combined capacity of 100 GW. Source: donanimhaber.com

91 Ember 2026 (allocated capacity, not yet in operation); MENR 2023a.
92 Ember 2026.

German-Turkish Cooperation: From Renewable Energy Expansion to System Integration (and Industrial Value Creation)

Starting Points for German-Turkish Cooperation

The rapid expansion of renewable-energy capacity is increasingly shifting attention from generation assets alone towards storage, grids and system integration. Türkiye's target of 120 GW of combined wind and solar capacity by 2035 will require significant investments across the wider energy system.

As the energy transition advances, German-Turkish cooperation can support the deployment and integration of renewable-energy systems throughout the value chain. Relevant fields include generation, storage, grids and system integration.

• German experience in renewable-energy integration, storage technologies and grid management can complement Türkiye's expanding project pipeline and industrial capabilities, particularly in areas requiring greater flexibility and system reliability. **Project development, engineering, procurement and construction (EPC) and operations and maintenance (O&M)** for solar, onshore and offshore wind projects under the annual YEKA tenders.

• **Battery storage and hybrid solutions** (solar / wind + storage); the storage pairing liberalised in 2022 provides a clear regulatory framework for this.

• **Turbine and equipment technology** through localisation partnerships, as German manufacturers already implement with Turkish partners (for example Nordex / Enerjisa, Energie Baden-Württemberg (EnBW) / Borusan).

• **Floating solar** on Türkiye's more than 800 reservoirs and inland waters (potential of around 53 GW), as well as grid-integration and forecasting solutions for an increasingly variable generation portfolio.

• **Grid modernisation and transmission infrastructure create demand for system integration, high-voltage equipment, digital controls and flexibility. Project-specific tenders and financing decisions define the addressable contracts.**

Near-term market opportunities for green hydrogen in Türkiye are limited. Its main potential lies in the longer term, particularly in reducing industrial emissions and helping integrate variable renewable generation. Türkiye's Hydrogen Technologies Strategy and Roadmap sets electrolyser capacity targets of 2 GW by 2030, 5 GW by 2035 and 70 GW by 2053. In the near term, the Green Hydrogen Task Force of the Turkish-German Energy Partnership provides a forum for technical exchange and for assessing where future projects could be viable.[93]

Selected Current German-Turkish Cooperation ProjectsTurkish Cooperation

Nordex Group (Germany) × Enerjisa Üretim (Türkiye) - 750 megawatts (MW) of projects under the 2024 wind power plant tender (YEKA WPP-2024). Enerjisa Üretim, a joint venture between the German utility E.ON and Türkiye's Sabancı Holding, was the main winner of the YEKA WPP-2024 auction. For its Edirne (410 MW) and Balkaya (340 MW) wind farms, the Nordex Group will supply and install a total of 108 N163/6.X turbines. Turbine components will be produced mainly in Türkiye to meet the YEKA requirement of a minimum local-content rate of 55%.[94] Completion is scheduled for 2027.[95]

Germany (EnBW) × Borusan Holding (Türkiye) - Borusan EnBW Enerji joint venture. Founded in 2009 as a 50/50 joint venture between the German utility EnBW and the Turkish Borusan Group, Borusan EnBW Enerji has commissioned around 725 MW of renewable capacity in Türkiye - predominantly onshore wind, complemented by hydropower and solar parks - and continues to expand its onshore wind portfolio. It illustrates the project-development and operations model of long-term German-Turkish cooperation in renewables.[96-97]

93 MENR 2023b; Turkish-German Energy Partnership n.d.
94 Nordex 2025a.
95 Nordex 2025b.
96 EnBW n.d.-a.
97 EnBW n.d.-b.

SUMMARY



Recommendations for Renewable Energy Systems

Türkiye's renewable energy expansion is creating opportunities for German and Turkish partners in power generation, **storage and grid integration.**

1

Use Türkiye's target of **120 GW of combined wind and solar capacity by 2035** to identify complementary investments in generation, grids, storage and system integration.

2

Assess opportunities in solar alongside wind, taking into account that **solar led new capacity additions in 2024.** Partner with **Turkish suppliers and developers** to deliver and service projects locally.

3

Develop **storage partnerships** around integration, controls and project services. Confirm project status and storage duration, and distinguish allocated projects and national targets from **operational capacity.**

4

Screen floating solar, agrivoltaics and offshore wind for joint pilots. Treat the estimated **53 GW of floating-solar potential** and the announced **first offshore-wind tender** as starting points for feasibility assessment.

5

Test **grid integration and sector coupling** as the share of renewables rises. Assess how **AI and other control technologies** can improve system stability.

Market Players and Stakeholders

Aydem Yenilenebilir Enerji

Aydem Renewables helped pioneer renewable energy in Türkiye in 1995, when it began construction of the country's first privately owned hydroelectric power plant. Today, the company operates 25 power plants across Türkiye, with a portfolio spanning hydropower, wind, hybrid solar and geothermal energy. With 1,216 MW of installed capacity, it ranks first by installed capacity among Türkiye's electricity producers that generate power exclusively from renewable sources.

www.aydemyenilenebilir.com.tr
Adalet Mahallesi, Hasan Gönüllü Bulvarı
No. 15/1, Merkezefendi, Denizli, Türkiye
Erdem Uysal, Director of Investment and Business Development
erdem.uysal@aydemenerji.com.tr, +90 531 724 61 56

Borusan EnBW Enerji

A joint venture of Borusan Holding and Germany-based EnBW, the company produces and sells renewable energy, mainly wind energy.

www.borusanenbw.com.tr
Ataşehir, İstanbul, Türkiye
Canan Coşkun Güleç, Corporate Communications Manager
cgulec@borusanenbwenerji.com, +90 530 667 47 12

CW Enerji

Founded in Antalya in 2010, CW Enerji manufactures photovoltaic cells and modules, with 275,000 m^2 of production space and an annual module production capacity of 1.8 gigawatts (GW). In 2025, its CW SolarCell facility began slicing ingots into wafers and producing solar cells. The company supplies grid-connected, off-grid and hybrid solar systems, inverters, battery storage for homes and industry, and solar-powered irrigation systems for agriculture. Its services include project development, engineering, financing advice, turnkey installation, operation and maintenance for projects ranging from rooftop installations to utility-scale solar farms.

other fields

www.cw-enerji.com
Antalya Organize Sanayi Bölgesi, 1. Kısım, Atatürk Bulvarı No. 20, Döşemealtı, Antalya, Türkiye
Gamze Arık, Assistant to the Chair of the Board
asistan5@cw-enerji.com, asistan1@cw-enerji.com
+90 549 471 12 99

Enerjisa Üretim

Enerjisa Üretim generates and trades electricity and invests in renewable energy in Türkiye. It operates 36 power plants with a combined installed capacity of more than 4,700 megawatts (MW) across wind, solar, hydropower, natural gas and domestic lignite. The company continues to expand its renewable energy portfolio, which exceeds 2,600 MW of installed capacity, including more than 1,250 MW of wind power.

www.enerjisauretim.com.tr
Ataşehir, İstanbul, Türkiye
Enes Battal, Corporate Communications Lead
enes.battal@enerjisauretim.com, +90 542 387 11 20

Galata Wind

Galata Wind generates electricity exclusively from renewable sources, operating Gold Standard-certified wind and solar power plants across Türkiye. The company has 354.2 megawatts (MW) of installed capacity in Türkiye and develops battery energy storage solutions. It plans to expand through investments in Europe and new energy storage projects.

www.galatawindenerji.com
Üsküdar, İstanbul, Türkiye
Mehmet Ali Gürpınar, Chief Operating Officer (COO)
alig@galatawind.com.tr, +90 533 446 54 02

The following overview shows selected German and Turkish companies active in renewable energy systems and their potential for innovation and German–Turkish cooperation.

Grawindy Yenilenebilir Enerji Teknolojileri Yatırım İşletme A.Ş.

Grawindy is a Türkiye-based deep-tech start-up developing patented wind energy technology for urban environments, transport infrastructure and other applications. Its technology has reached Technology Readiness Level 6 (TRL 6). The company is pursuing pilot projects and strategic partnerships to bring the technology to market.

www.grawindy.com
Kızılırmak Mahallesi, Dumlupınar Bulvarı,
Workinton Next Level, Çankaya, Ankara, Türkiye
Atilla Öztürk, Chief Executive Officer (CEO)
atilla@grawindy.com, +90 541 727 10 49

INTEC Engineering GmbH

Founded in 1995, INTEC Engineering GmbH is a family-owned, globally active company based in Bruchsal, Germany. It designs, manufactures and supplies customised plants and components for industrial process heat and renewable power generation, including commissioning and after-sales service. Its subsidiary INTEC produces key components, including tube coils and waste heat boilers, in-house.

other fields

www.intec-energy.de
John-Deere-Str. 43, 76646 Bruchsal, Germany
Oliver Lauer, Sales Director
info@intec-energy.de, +49 7251 93243-39

Smart Güneş Enerjisi Teknolojileri Araştırma Geliştirme Üretim Sanayi ve Ticaret A.Ş.

Smart Güneş Teknolojileri is a renewable energy company manufacturing solar technologies at its Gebze and Aliağa facilities in Türkiye and exporting to over 20 countries. Its activities include wafer, solar cell and module production, solar project development, engineering, procurement and construction (EPC), as well as operation and maintenance. The company also develops solar projects with energy storage and EV charging solutions. Its annual production capacity reaches 2.4 GW for solar panels, 2.2 GW for solar cells and 1.5 GW for wafers.

www.smartsolar.com.tr
Energy Plaza, Rüzgarlıbahçe Mahallesi, Feragat Sokak
No. 2, 6th Floor, 34805 Beykoz, İstanbul, Türkiye
Filiz Avşar Aktaş, Chief Sustainability Officer
filiz.aktas@smartsolar.com.tr, +90 216 225 72 00

Soliterm Group GmbH

The Soliterm Group designs, manufactures, installs and maintains turnkey industrial high-temperature solar systems based on parabolic trough collector (PTC) technology. These provide solar heat for cooling, process steam, heating, power generation and desalination. Initially producing collectors in Ankara, Soliterm now manufactures at a fully automated facility in the Aachen region, combining German engineering with Turkish market experience. It supports clients throughout the project lifecycle, from feasibility studies and planning to construction, operation and asset management.

other fields

www.solitermgroup.com
Rutherford 108, 52072 Aachen, Germany
Dr. Ahmet Lokurlu, CEO
info@solitermgroup.com, +49 241 9809060

Zorlu Enerji

Zorlu Enerji is one of Türkiye's leading independent power producers, investing in, developing and operating renewable power plants across geothermal, wind, hydroelectric and solar energy. The company continues to expand its clean energy investments in Türkiye and internationally.

www.zorluenerji.com.tr
Büyükdere Caddesi No. 199, Levent, Şişli, İstanbul, Türkiye
Oğuzhan Haholu, Business Development and
Investments Manager. oguzhan.haholu@zorlu.com,
+90 539 559 85 95





3.4 Mitigation and Protection Technologies

Mitigation and protection technologies support cleaner air, safer soils and resilient infrastructure. Monitoring, treatment and process control improve environmental performance and operational reliability. German-Turkish cooperation connects these capabilities with industrial modernisation and infrastructure investment.

The chapter covers air-pollution and noise control, soil protection and remediation, and related climate-adaptation services.

Cleaner Air. Healthier Living.
Stronger Resilience.

Policy & Regulatory Framework

The Turkish policy framework is entering a more integrated phase. While continuous emissions monitoring and media-specific rules already existed, the new Industrial Emissions Management Regulation (EEYY, Endüstriyel Emisyonların Yönetimi Yönetmeliği) and the Industrial Green Transformation (SYD, Sanayide Yeşil Dönüşüm) certification system create a common compliance architecture based on best available techniques (BAT), known in Türkiye as Mevcut En İyi Teknikler (MET), with time-bound milestones through 2030.

Türkiye. Integrated Industrial Emissions and Green Transformation

The EEYY was published on 14 January 2025 and entered into force on **1 December 2025**. Six sector-specific BAT / Best Environmental Practices communiqués (MET communiqués) became effective at the same time. The Ministry states that the framework covers **around 6,000 industrial installations** across energy generation, metals, minerals, chemicals, waste management and other production activities. [98]

SYD grades installations from A (highest) to F (lowest). New installations must be designed and commissioned to meet at least SYD grade D requirements. Existing installations must obtain at least **grade F by 31 December 2028,** progressing to at least **grade D by 31 December 2030**. The certificate is therefore not merely a label; it creates a multi-year plant-upgrade cycle covering process optimisation, pollution-control equipment, monitoring, documentation and resource performance. [99]



Carbon Market Board Decision KPK / 2026 / 1 of 3 September 2026 confirms the pilot scope and timetable.

Figure 12. Key Turkish regulatory milestones for industrial emissions and carbon-market preparation. Türkiye Emissions Trading System (TR ETS) and Carbon Market Board (KPK, Karbon Piyasası Kurulu). [100]

Existing Measurement and Media-Specific Rules

Türkiye's framework for continuous emission monitoring systems (CEMS) was established before the EEYY. The Continuous Emission Measurement Systems (SEÖS, Sürekli Emisyon Ölçüm Sistemleri) Communiqué has been in force since 2011 and provides the basis for continuously measuring emissions from industrial stacks and transmitting the resulting data. Separate regulations also govern contaminated sites and environmental noise. The 2025 Climate Law established the legal basis for national carbon-market governance, followed by the TR ETS Regulation, which entered into force on 27 August 2026. The subsequent Carbon Market Board decision of 3 September 2026 confirmed a pilot phase covering the 2026 and 2027 emission years for Category B and C installations in electricity generation, cement, iron and steel, aluminium and fertilisers. In 2026, covered installations are subject to reporting obligations only, while the pricing mechanism is scheduled to start in 2027. The Carbon Market Board also set the free-allocation rate for the pilot period at 100 %, reinforcing the near-term emphasis on monitoring, reporting and verification (MRV) and operational readiness.[101]

98 MoEUCC 2025c.
99 MoEUCC 2026a.
100 MoEUCC 2026b.
101 MoEUCC 2011; MoEUCC 2010; MoEUCC 2022; Law No. 7552; MoEUCC 2026b; MoEUCC 2026c.

The German and European Policy Counterpart

Germany implements the revised EU Industrial Emissions Directive (IED) through the Federal Immission Control Act (Bundes-Immissionsschutzgesetz, BImSchG), the Technical Instructions on Air Quality Control (TA Luft, Technische Anleitung zur Reinhaltung der Luft) and sector-specific ordinances(Bundes-Immissionsschutzverordnungen, BImSchV). European Standard 14181 (EN 14181) governs quality assurance of automated measuring systems (AMS). The Bundestag adopted the federal transposition law for the 2024 IED revision on 9 July 2026. [102-103]

Direct Policy Comparison

Dimension	Türkiye	Germany / EU	Cooperation relevance
Regulatory architecture	EEYY + sectoral MET; SYD performance classification	IED / Federal Immission Control Act + BAT conclusions and permit conditions	German BAT implementation and retrofit experience
BAT / technical norm	Six sector-specific MET / BAT communiqués	EU BAT reference documents / binding BAT conclusions	Transfer of implementation, engineering and documentation practice
Compliance horizon	New plants ≥ D; existing plants ≥ F by 2028 and ≥ D by 2030	Continuous permit / BAT cycles; revised IED raises requirements	Türkiye offers unusually visible near-term retrofit milestones
Monitoring & QA	SEÖS since 2011; online monitoring and QA	CEMS / AMS + EN 14181 QA	Strong fit for certified instrumentation, QAL / annual surveillance tests (AST), calibration and data acquisition and handling systems (DAHS)
Carbon / MRV layer	Climate Law + TR ETS Regulation in force; 2026-2027 pilot phase introduced, with 2026 focused on reporting and pricing starting in 2027	EU Emissions Trading System (EU ETS) established; CBAM administered through EU / German systems	Strong relevance for MRV, verification, emissions-data management and carbon-market readiness; near-term demand is likely to focus particularly on reporting, data quality and compliance systems

Table 5. Policy comparison Türkiye - Germany / synthesis by the German-Turkish Chamber of Industry and Commerce, AHK Türkiye, based on official Turkish, EU and German sources (EU).

102 Deutscher Bundestag 2026.
103 Directive (EU) 2024/1785; BImSchG; TA Luft; BImSchV; UBA n.d.-b; EN 14181.

Market Relevance

There is no official Turkish market-size series that captures this environmental technology segment in full. Market relevance therefore has to be assessed using a combination of official environmental-expenditure data, installed monitoring infrastructure and concrete regulatory upgrade requirements. This approach provides an indication of market potential without treating broader environmental expenditure as a direct valuation of the technology market.

Official Market Proxy. Environmental-Protection Expenditure

TÜİK reports total environmental-protection expenditure of TRY 441 billion in 2024, including TRY 82 billion in environmental-protection investment. Total expenditure equalled 0.99 % of gross domestic product (GDP). Ambient air and climate represented 1.7 % of total expenditure.[104]

Industrial Emissions. A Multi-Year Compliance Cycle

The most direct near-term opportunity comes from the roughly 6,000 installations entering the SYD classification cycle. The value chain extends from plant screening and engineering through abatement equipment and measurement to digital documentation and long-term service. This favours providers that can combine equipment with commissioning, calibration, data integration and local after-sales support rather than stand-alone hardware sales. [105]

The addressable value chain extends beyond equipment: engineering, accredited QA,, data integration and recurring service are part of compliance.

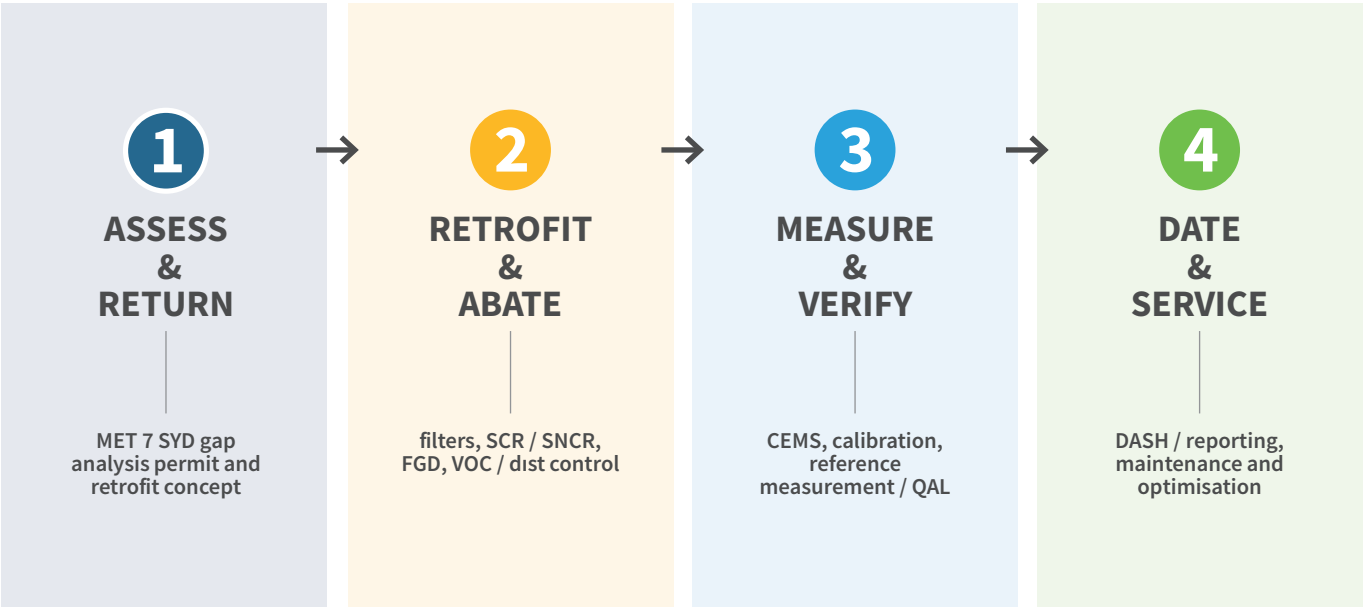


Figure 13. Compliance-to-market pathway for industrial emissions. Selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), flue-gas desulphurisation (FGD) and volatile organic compounds (VOC).

104 TÜİK 2025c.
105 MoEUCC 2025c; MoEUCC 2026a.

Air Quality and Environmental Monitoring

Türkiye already operates a sizeable national air-quality monitoring infrastructure. The existing network creates recurring demand for measurement equipment, calibration and reference methods, data-quality assurance, maintenance services and the gradual modernisation of monitoring systems. For German suppliers, this points less to a one-off infrastructure build-out than to an ongoing market for high-quality instrumentation, technical services and system upgrades. At the end of 2024, the national network comprised 382 stations measuring particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3) and carbon monoxide (CO). [106] Domestic technological capacity is also increasing. TÜBİTAK MAM lists a domestically developed continuous flue-gas analyser at Technology Readiness Level 9 (TRL 9) and a next-generation air-quality monitoring system at TRL 8. This raises the bar for German suppliers, whose edge lies in certified high-accuracy instrumentation, calibration systems, difficult measurement tasks and joint development with Turkish partners. [107]

Additional Specialist Niches

- **Contaminated sites and soil protection.** existing regulation already creates demand for site assessment, remediation planning, monitoring and specialised treatment technologies.
- **Noise.** strategic mapping, acoustic measurement and mitigation remain relevant for municipalities, transport infrastructure and industrial sites.
- **Industrial ambient / fence-line monitoring.** denser sensor networks can complement reference stations and stack monitoring around industrial sites.
- **Carbon capture and utilisation (CCU) and carbon capture and storage (CCS).** For hard-to-abate sectors, carbon capture is a medium-term adjacent technology field; the UBA Atlas also identifies it as an important German patent theme within this lead market.

The German Reference Market

The UBA GreenTech Atlas 2025 places Germany in a strong position in this lead market, whose global volume grew by an average of 8.5 % per year between 2010 and 2022. [108]

People employed (2023)	Gross value added (2023)	German exports (2023)	Global market (2022)
183,600	EUR 18.1 billion	EUR 6.6 billion	EUR 39.0 billion

Table 6. Key figures of the German mitigation and protection lead market. [109]

German Innovation Strengths

The Atlas identifies a particularly strong German specialisation in air-pollution control. Germany accounts for around 18 % of global patents in air-pollution control, 21 % in maintaining and improving air quality, 36 % in exhaust-flow regulators and 20 % in noise protection. These strengths overlap closely with the Turkish demand fields created by BAT / MET implementation, CEMS QA and monitoring-network development.[110]

German-Turkish Cooperation: From Compliance Requirements to Industrial Modernisation

EEYY, SYD and the TR ETS create a long-term upgrade cycle across Turkish industry. Partnerships that combine German technology with Turkish integration and long-term service are best placed to serve it.

106 MoEUCC 2025d.
107 TÜBİTAK MAM n.d.-b.
108 UBA 2025b, Chapter 4.4, pp. 60-62, Figs. 34-38.
109 UBA 2025b, Chapter 4.4, pp. 60-62, Figs. 34-38.
110 UBA 2025b, Chapter 4.4, pp. 60-62, Figs. 34-38.

Starting Points for German-Turkish Cooperation

• **CEMS, DAHS and measurement quality assurance.** certified gas, dust and flow measurement; QAL / AST processes; calibration and auditable data acquisition. Typical entry model is original equipment manufacturer (OEM) technology combined with a Turkish integrator and service partner.

• **Industrial air-pollution control and BAT implementation.** filters, catalysts, SCR and SNCR, FGD, control of VOCs and odours, and process-integrated optimisation. Typical entry model is an engineering package with local installation and maintenance.

• **Ambient and fence-line monitoring.** reference-grade measurement of PM and gases, smart sensor networks, analytics and data interfaces for industrial and municipal applications. Typical entry model is a pilot project with data integration and reference validation.

• **MRV systems and ETS readiness.** emissions-data management, verification workflows, plant-level documentation and integration with existing monitoring systems. Typical entry model is an audit or data project linked to plant integration.

• **Local integration, calibration, maintenance and technical services.** training, maintenance, calibration, joint demonstrations and cooperation with Turkish EPC firms, laboratories, clusters and research institutions.

2026 - 2027
POSITION & PILOT
MRV / reporting (2026) → pricing starts in 2027

→

2027 - 2028
PREPARE TO SCALE
Build capacities, optimise processes, ensure compliance

→

2028 - 2030
SCALE RETROFITS
Implement abatement measures, access carbon finance opportunities

Incentive measures and sectoral scope will be further specified based on implementation details and subsequent Carbon Market Board decisions. [111]



111 MoEUCC 2026b.

SUMMARY

Recommendations for Mitigation and Protection Technologies

Türkiye's **phased industrial emissions rules** are creating opportunities for German and Turkish partners to modernise plants and improve **environmental monitoring.**

1

Plan retrofit projects around the **EEYY and SYD compliance milestones.** The framework covers roughly **6,000 industrial installations.** Prioritise the upgrades existing plants need to achieve at least **grade F by 2028 and grade D by 2030.**

2

Build on the existing **SEÖS monitoring infrastructure** and the national ambient-air network, which reached **382 stations** at the end of 2024. Prioritise upgrades, QA, integration and maintenance alongside new installations where needed.

3

Combine German strengths in **certified instrumentation, air-pollution control and noise protection** with Turkish engineering, accredited measurement and local service. Use the UBA's export and patent data and partnerships such as **DURAG and Set Teknik** to identify where joint offers are most competitive.

4

Phase market entry around compliance milestones. Start with TR ETS pilot compliance, CEMS, QA, MRV and data readiness in **2026–2027.** Build engineering and service partnerships in 2027–2028, then scale retrofits and recurring services in 2028–2030.

5

Explore medium-term projects in **MRV and ETS data systems**, AI, industrial ambient and fence-line monitoring, **soil remediation**, noise protection and selected **CCU or CCS** applications.





3.5 Sustainable Forestry & Agriculture

Sustainable forestry and agriculture protect productive land, water and biological resources. Efficient machinery, precision systems and resource management help farms and forestry businesses improve output and resilience. These technologies create opportunities for German-Turkish partnerships across rural regions. With both countries' policy frameworks converging around the sustainability objectives of the European Green Deal, and with Germany's own Forest Strategy 2050 and Common Agricultural Policy (CAP) Strategic Plan providing a stable reference framework, German-Turkish cooperation in this sector has a clear and durable policy foundation on which to build over the coming years.

Healthy Ecosystems for Generations to Come.

Policy & Regulatory Framework

Türkiye's policy framework for agriculture and forestry is guided by two Strategic Plans (2024-2028) by Ministry of Agriculture and Forestry and the General Directorate of Forestry (OGM, Orman Genel Müdürlüğü). Together, these plans set measurable targets to promote sustainable and efficient agricultural production and the sustainable management and development of Türkiye's forests. In parallel, Türkiye is working with the Food and Agriculture Organization of the United Nations (FAO), to develop Türkiye's first National Agroecology Strategy. The draft strategy aims to establish a national framework for scaling up agroecological production systems, strengthening sustainable natural-resource management and integrating agroecology into agricultural policy for climate resilience, biodiversity protection and ecosystem-based agricultural practices. As of September 2026, the strategy remains under preparation and has not been officially adopted.[112]

Both plans are implemented under the coordination of the Ministry of Agriculture and Forestry, with the OGM responsible for forest-specific targets, and progress is monitored annually against these baselines.

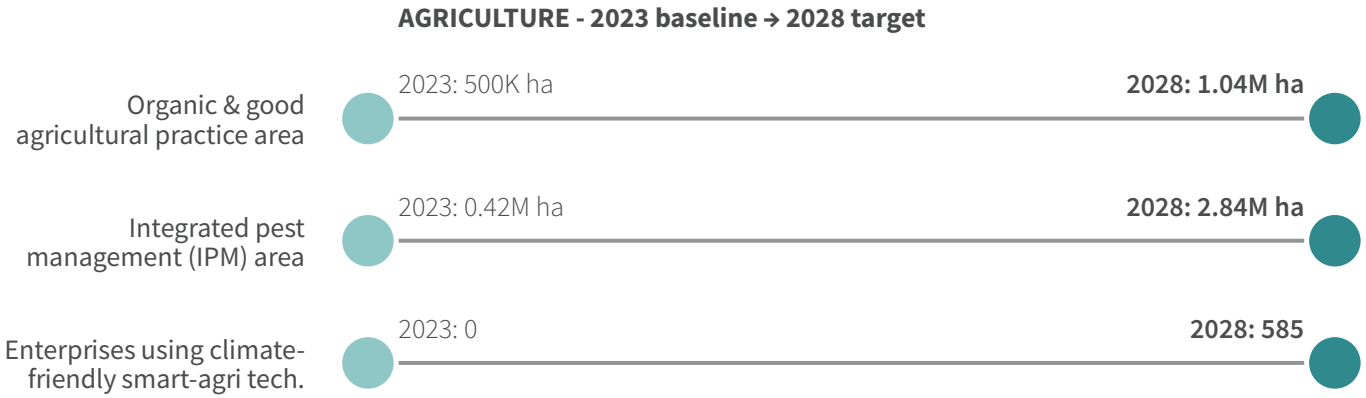


Figure 21. Selected agricultural targets, 2023 baseline to 2028. Integrated pest management (IPM), hectares (ha).[113]

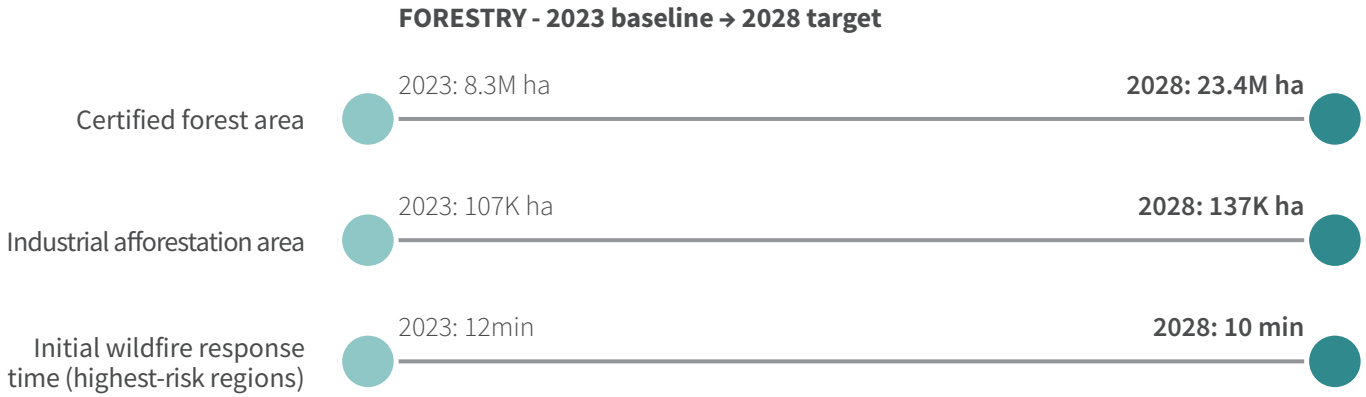


Figure 22. Selected forestry targets, 2023 baseline versus 2028. [114]

112 MoAF 2026.
113 MoAF 2024, pp. 44, 51, 61.
114 OGM 2024, p. 4.

Climate Change Mitigation Strategy and Action Plan (2024-2030)

With agriculture and land use, land-use change and forestry (LULUCF) among the key sectors, Türkiye's current climate policy framework promotes low-carbon and resource-efficient agricultural production, stronger carbon sequestration, sustainable forest management, research and development (R&D), digital technologies, ecosystem monitoring and early-warning systems to improve the climate resilience of agriculture and forestry. Türkiye's Climate Change Mitigation Strategy and Action Plan and Climate Change Adaptation Strategy and Action Plan cover 2024-2030. The mitigation plan addresses seven main sectors, including agriculture and LULUCF, while the adaptation plan covers agriculture and food security as well as biodiversity and ecosystem services. [115-116] Both plans are currently (Sept. 2026) being updated for the 2026-2035 period with support from the IKI Policy Interface Türkiye project, implemented by GIZ in cooperation with Türkiye's Directorate of Climate Change. The revision process is intended to translate Türkiye's updated climate commitments into more concrete sectoral actions, targets, indicators, institutional responsibilities and monitoring arrangements. The 2024-2030 strategies remain the formally published reference documents until the revised plans are approved.[117]

Türkiye Green Deal Action Plan (2021)

The Action Plan links Türkiye's transition towards sustainable agriculture with the objectives of the European Green Deal, particularly the Farm to Fork and Biodiversity Strategies. It promotes the reduction of pesticides, antimicrobials and chemical fertilisers, the expansion of organic agriculture and more resource-efficient production and supports closer alignment and cooperation with the EU on sustainable agricultural practices.[118]



Drone spraying fertilizer vegetable green plants agriculture technology farm automation

115 MoEUCC 2024a, Sections 3.6 and 3.7.
116 MoEUCC 2024b, Sections 4 and 5.
117 MoEUCC 2024b, Sections 4 and 5.
118 Ministry of Trade 2021, pp. 29-30.

EU & Germany Policy Context

The EU is one of Türkiye's most important markets for agri-food producers and it records a trade surplus in agri-food products, with key exports including fruit, vegetables and preparations of fruit and vegetables.[119] For continued market access, competitiveness and the transition towards sustainable agriculture and forestry, alignment with EU sustainability objectives and standards is of great relevance for Turkish producers.

Key EU Policy Frameworks

- European Green Deal - Europe's roadmap to climate neutrality by 2050.[120]
- Farm to Fork Strategy - building a fair, healthy and environmentally friendly food system.[121]
- EU Biodiversity Strategy for 2030 - protecting and restoring biodiversity and ecosystems.[122]

These plans provide the context against which Germany's domestic agricultural and forestry policy is set.

The German and European Policy Counterpart

Germany translates EU agricultural objectives into national policy, notably through its CAP Strategic Plan 2023-2027.[123] In forestry, the Forest Strategy 2050 (Waldstrategie 2050) sets out priorities for climate protection and adaptation, biodiversity, sustainable wood production, and forest development and management.[124]

Germany - Forest Strategy 2050 (Waldstrategie 2050), Selected Action Areas

Action area	Focus
Climate protection & adaptation	Adapting forests to climate impacts while contributing to climate-change mitigation
Biodiversity & forest conservation	Maintaining and enhancing forest biodiversity and ecosystem services
Wood production & use	Sustainable forest management and the use of wood as a renewable raw material
Forest management & resilience	Supporting climate-resilient, site-adapted and species-rich forests through sustainable management

Table 10. Selected action areas of Germany's Forest Strategy 2050 (of ten in total, with 59 milestones to 2030). [125]

Market Relevance

Large Sector under Sustainability and Climate Pressure

Türkiye's agricultural and forestry sectors combine a large natural resource base with growing sustainability and climate-related pressures. The country has around 38.5 million hectares of agricultural land, while sustainable farming practices still cover only a limited share of cultivated land.[126] At the same time, Türkiye's forest land covers approximately 23.2 million hectares, of which around 9.5 million hectares are classified as degraded forest land increasingly exposed to drought, fires and climate-related productivity losses.[127] These pressures highlight a growing need for more efficient, climate-resilient and sustainable technology-supported land and forest restoration and management.

119 European Commission n.d.-a.
120 European Commission n.d.-b.
121 Ministry of Trade n.d.-a.
122 Ministry of Trade n.d.-b.
123 European Commission 2022.
124 BMEL 2021, p. 7.
125 BMEL 2021, p. 7.
126 MoEUCC 2024a, pp. 105-106.
127 MoEUCC 2024a, pp. 105-106.

Agricultural Water-Use Efficiency

Türkiye's agricultural irrigation water-use efficiency remains comparatively low. The Water Efficiency Strategy and Action Plan (2023-2033) targets a rise to 60 % by 2030[128] - indicating significant potential for more efficient water use in agricultural production and a direct link to the water-technology market discussed in Chapter 3.7.

Agricultural Irrigation Water - Use Efficiency

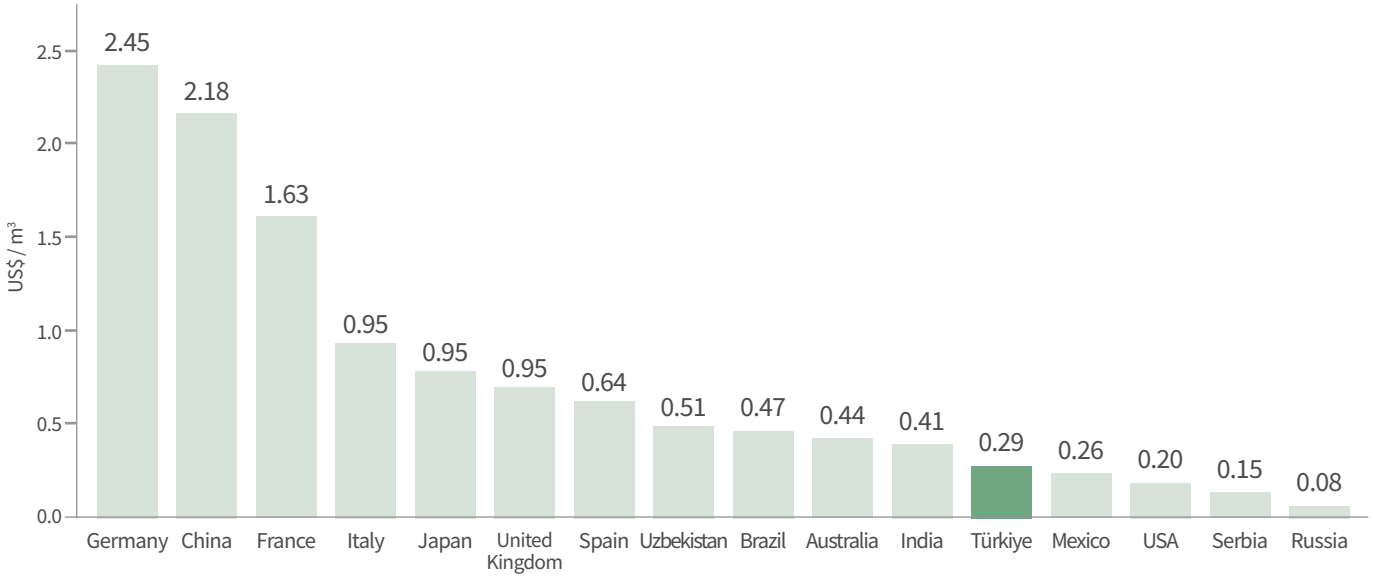


Figure 23. Agricultural water productivity in selected countries (USD of agricultural value added per cubic metre (m^3) of water used; own illustration).[129]

Growing Demand for Technology and Modernisation

Türkiye is actively advancing the technological transformation of its agricultural and forestry sectors. The Twelfth Development Plan (2024-2028) calls for the expansion of smart agriculture through digitalisation, AI and data-based applications, and greater use of precision agriculture and modern irrigation technologies.[130] In forestry, priorities include climate-resilient forest management, sustainable afforestation and strengthened wildfire prevention and response capacities.[131] These developments create growing opportunities for advanced technologies and expertise that support more efficient and resilient agricultural and forest management.

Germany. Growing Market in Sustainable Agriculture

The GreenTech Atlas identifies sustainable agriculture as an increasingly important driver of the overall market. Germany's sustainable agriculture and forestry market[132] employed around 294,600 people and generated EUR 21.1 billion in gross value added in 2023. Since 2010, employment has grown by an average of 1.8 % per year, while real GVA increased by 3.7 % annually, with sustainable agriculture being a particularly dynamic segment, recording average annual employment growth of 4.0 % since 2010. Over the same period, environmentally-friendly technologies for agriculture employment grew by 3.2 % per year. Agro-PV offers new segments of combined agriculture and energy.

128 MoAF 2023, p. 49.
129 MoAF 2023, p. 49.
130 SBB 2023a, pp. 102, 106-108.
131 SBB 2023a, pp. 102, 106-108.
132 UBA 2025b, pp. 66-67.

Strong Innovation Capabilities in Forestry-Related Technologies

Germany demonstrates specialised innovation strength in sustainable forest landscape restoration, fire management, forestry, wood processing and wood-based materials. The country accounts for 36 % of worldwide innovations in this central market segment and registered around four times as many patents as second-ranked Italy. German companies are especially prominent in veneer-related technologies, accounting for 74 % of innovations in veneer wood utilisation and 62 % in the processing of veneer and pressboard. Patent activity also extends to protective measures for tree cultivation, illustrating technological capabilities beyond wood processing itself.[133]



Figure 24. Germany's innovation strength in wood processing and wood-based materials, 2010-2023 (own illustration).[134]

German-Turkish Cooperation: From Resource Efficiency to Climate Resilience

Climate resilience and resource efficiency are becoming increasingly important priorities in Türkiye's agriculture and forestry sectors. Strategic plans and climate-policy objectives place growing emphasis on efficient resource management, digital technologies and resilient production systems.

This transition is creating demand for more resource-efficient and digitally supported approaches in agriculture and forestry. These priorities closely align with ongoing modernisation efforts across rural regions.

• German experience in digital farming, efficient water management and forestry technologies can support these objectives. Locally adapted technologies, pilot projects and applied research cooperation may contribute to strengthening climate resilience and resource productivity. Combining German expertise in digital and resource-efficient agricultural technologies with Türkiye's growing demand for precision agriculture, automation and data-based farming.

• Cooperation in modern irrigation, monitoring and smart water-management technologies can support improvements in agricultural water-use efficiency, with particular attention to affordable, low-threshold solutions adapted to Türkiye's smallholder farming context.

• German technological expertise can contribute to Türkiye's goals in sustainable forest management, ecosystem resilience and climate adaptation.

• There is potential for cooperation in remote sensing, GIS, digital monitoring and early-warning technologies to strengthen wildfire prevention and response.

• Joint solutions in resource-efficient agriculture, sustainable materials and environmentally friendly production can support Türkiye's alignment with European sustainability objectives.

133 UBA 2025b, pp. 66-67.
134 UBA 2025b, pp. 66-67.

SUMMARY

Recommendations for Sustainable Forestry and Agriculture

Climate pressures on Türkiye's farms and forests are creating opportunities for German and Turkish partners to improve **resource efficiency and resilience.**

1

Align projects with Türkiye's **2024–2028 plans** for resource efficiency and climate resilience. Prioritise technologies and practices that support **forest certification, landscape restoration, fire management and integrated pest management.**

2

Test German and Turkish solutions where both countries' expertise and priorities overlap, including ecological wood-based materials, **precision farming, smart irrigation, wildfire early warning and agrivoltaics.**

3

Adapt equipment, services and financing to **farm size and budgets.** Test affordability, ease of use and maintenance needs with **small and medium-sized farms** before scaling up.

4

Develop markets for **ecological products and technologies** through local value chains and **credible certification.**

5

Link sustainable farming and forest management with **agritourism, ecotourism** and regional marketing of sustainably produced goods to create **income in rural areas.**





3.6 Green Mobility

Sustainable mobility connects cleaner vehicles with efficient transport systems. Charging, public transport, rail, digital traffic management and logistics all contribute to the market. German-Turkish partnerships can build on established vehicle and component supply chains to develop these solutions.

Moving People.
Protecting Our Planet.

Policy & Regulatory Framework

The policy framework is the foundation on which the market dynamics described below rest. This section first traces Türkiye's e-mobility policy and then sets it briefly against the German and European framework.

Turkish Policy and Regulatory Framework

Türkiye's Long-Term Climate Strategy names transport as a priority sector for the 2053 net-zero target; the sector accounted for 16.5% of national GHG emissions in 2022.[135] The strategy promotes the sector's decarbonisation by shifting freight and passenger traffic from road to rail and maritime transport, improving transport efficiency, expanding the use of sustainable and clean energy sources, and developing the necessary infrastructure. The 2053 Transport and Logistics Master Plan operationalises the first pillar with 8,554 kilometres (km) of new railway lines and an expansion of port facilities from 217 to 255 by 2053.[136] On electrification, a high-growth scenario of the Energy Market Regulatory Authority projects an electric vehicle (EV) fleet of around 4.2 million vehicles and a public charging network of roughly 348,000 sockets by 2035 - more than nine times the ~ 37,600 sockets in place in November 2025.[137]

Türkiye's e-mobility policy supports its overarching goal of climate neutrality by 2053. The regulatory framework is based on Electricity Market Law No. 6446, amended in 2021, and the Regulation on Charging Services (Şarj Hizmeti Yönetmeliği), published on 2 April 2022. The regulation governs the expansion of the public charging network. Operators must obtain a Charging Network Operator (CNO) licence from the Energy Market Regulatory Authority (EPDK, Enerji Piyasası Düzenleme Kurumu), meet minimum requirements for the share of direct current (DC) fast-charging points and register their stations in the official Şarj@TR system.[138]

The infrastructure rollout is flanked by building- and tax-law instruments. Under the amended Parking Regulation (Otopark Yönetmeliği), minimum requirements for EV-charging parking spaces for building-and mall car parks were introduced. On the tax side, a Special Consumption Tax (ÖTV, Özel Tüketim Vergisi) taxes EVs with a motor power below 160 kilowatts (kW) at 25% up to a price threshold of TRY 1,650,000 (55% above it), against 65-75% for vehicles of 160 kW or more. This favours lower-powered, locally manufactured models such as those of Togg - a central lever behind the domestic OEM's market success.[139-140-141]

Electrification is also central to Türkiye's international climate agenda. As holder of the COP31 Presidency, Türkiye has made the clean energy transition and electrification priorities of its COP31 Action Agenda. Its target to increase electricity's share of final energy consumption to 35% by 2035 gives e-mobility a prominent role in this agenda.[142-143]
.
Complementing Türkiye's e-mobility policy, the National Urban Cycling Transport Strategy Plan 2030 was developed in cooperation with public-sector partners and presented in March 2022),[144] while the 2053 Transport and Logistics Master Plan targets a shift of freight from road to rail and sea.[145] Together, these instruments extend the country's green-mobility policy beyond vehicle electrification into cycling, smart traffic management and green logistics.



MAN ADASTEC Passenger Service: ADASTEC enables SAE Level 4 automated driving for MAN's electric bus in Munich's MINGA project, alongside SWM and MVG.

131 European Commission n.d.-a.
132 European Commission n.d.-b.
133 Ministry of Trade n.d.-a.
134 Ministry of Trade n.d.-b.
135 European Commission 2022.
136 BMEL 2021, p. 7.
137 BMEL 2021, p. 7.
138 MoEUCC 2024a, pp. 105-106.
139 MoEUCC 2024a, pp. 105-106.



TOGG Teknoloji Kampüsü, Gemlik

The German and European Policy Counterpart

Germany and the EU pursue the same mobility transition but steer it more through regulation - via binding fleet and infrastructure mandates rather than selective local-content incentives. The core points of the German and European framework are as follows.

• **Fleet regulation.** the EU CO_2 fleet standards (Reg. (EU) 2019/631 as amended by Reg. (EU) 2023/851) mandate zero emissions for new passenger cars and light commercial vehicles from 2035 - effectively the end of new combustion engines.[146]

• **Charging infrastructure.** the Alternative Fuels Infrastructure Regulation (AFIR), Regulation (EU) 2023/1804, sets binding national rollout targets - the EU counterpart to Türkiye's charging regulation.[147]

• **Buildings.** the Building Electromobility Infrastructure Act (Gebäude-Elektromobilitätsinfrastruktur-Gesetz, Building Electromobility Infrastructure Act; in force since 2021, tightened as Building Electromobility Infrastructure Act from 2026) requires conduits and charging points in new builds and renovations - the equivalent of Türkiye's parking-space rule.[148]

• **Support logic.** the greenhouse gas reduction quota (Treibhausgasminderungsquote, GHG reduction quota; §§ 37a ff. Federal Immission Control Act) makes EVs and public charging points economically attractive through tradeable quota revenues - instead of a purchase-price tax break like Türkiye's ÖTV.[149]

• **Climate anchor.** the entire framework serves the goal of climate neutrality by 2050 enshrined in the European Climate Law (Reg. (EU) 2021/1119). [150]

• **Smart and sustainable mobility.** the EU's Sustainable and Smart Mobility Strategy additionally targets doubling cycling infrastructure and shifting freight towards rail and inland waterways,[151] complemented by the EU-wide deployment of digital and intelligent transport systems (ITS) under Directive 2010/40/EU.[152] Cycling alone represents a market that the European Cyclists' Federation (ECF) values at roughly EUR 150 billion a year.[153]

Türkiye and Germany at a Glance

Both regulatory frameworks aim to decarbonise road transport through charging-infrastructure rules, requirements for new buildings and financial incentives. Türkiye places greater emphasis on domestic value creation through incentives for local manufacturing and national battery-production targets. Germany and the EU focus more strongly on binding vehicle-fleet emissions targets and charging-infrastructure requirements.

146 Regulation (EU) 2019/631; Regulation (EU) 2023/1804; Regulation (EU) 2021/1119.
147 Regulation (EU) 2023/1804.
148 GEIG.
149 THG-Quote (BImSchG/38. BImSchV).
150 Regulation (EU) 2021/1119.
151 European Commission 2020.
152 Directive 2010/40/EU.
153 ECF 2018.

Dimension	Türkiye	Germany / EU
Climate target	Net zero by 2053	Net zero by 2050 (European Climate Law, Reg. (EU) 2021/1119)
Core transport regulation	Electricity Market Law No. 6446 (amended in 2021); Regulation on Charging Services (Official Gazette of 2 April 2022, No. 31797	EU CO_2 fleet regulation, Reg. (EU) 2019/631 as amended by Reg. (EU) 2023/851
Combustion-engine phase-out	No statutory end date; steered via incentives	Zero emissions for new cars / vans from 2035 (Reg. (EU) 2023/851)
Charging infrastructure	EPDK licence for CNOs; DC minimum quotas; Şarj@TR register	AFIR (Reg. (EU) 2023/1804). binding national rollout targets; Building Electromobility Infrastructure Act for buildings
New-build obligation	5-10 % of parking spaces in new buildings and car parks must be charging-ready	Building Electromobility Infrastructure Act. conduit / charging-point obligation for new builds and renovations (since 2021; Building Electromobility Infrastructure Act from 2026)
Purchase incentive	ÖTV favours locally manufactured EVs	Greenhouse gas reduction quota (GHG reduction quota) under Sections 37a et seq. of the German Federal Immission Control Act (Federal Immission Control Act), providing revenue opportunities for electric vehicle owners and charging-point operators.
Industrial policy	Domestic battery manufacturing and supplier development	Market-driven within the EU state-aid and single-market framework

Table 11. E-mobility frameworks in Türkiye and Germany / EU at a glance. [154]

Market Relevance

The framework creates opportunities beyond batteries and e-mobility, including rail and port technology, vehicle and traffic-management systems, charging and grid solutions, and digital transport infrastructure. Vehicle electrification is the most visible and best-quantified segment, but it forms only part of a broader mobility transition (transport transition) that also includes intelligent traffic management, cycling infrastructure and green logistics, which are covered later in this section.

Türkiye's automotive industry is strongly export-oriented. In 2024, 74 % of vehicles produced in the country were exported. Access to European customers gives manufacturers and suppliers a direct commercial reason to develop electric vehicles, batteries and charging capabilities. [155]

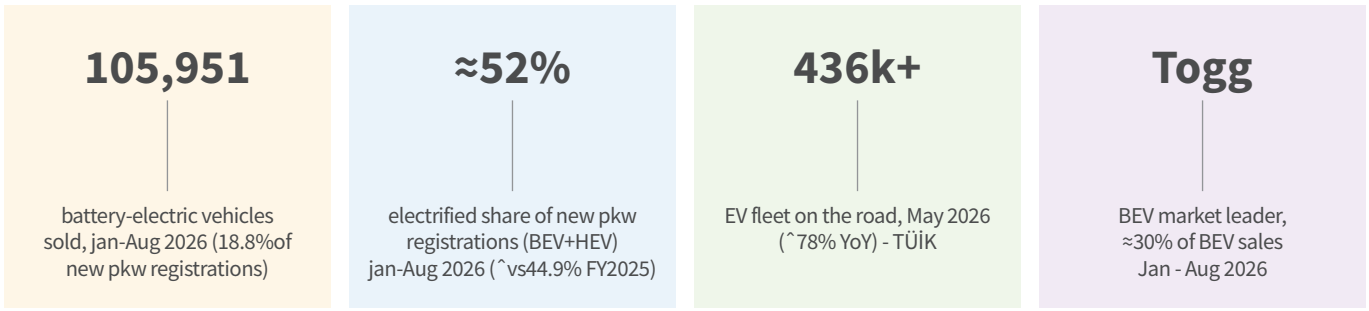


Figure 25. E-mobility in Türkiye - key figures, January–August 2026. Battery electric vehicle (BEV), hybrid electric vehicle (HEV), passenger car (PKW, Personenkraftwagen) and full year (FY). [156]

154 Law No. 6446; EPDK 2022; EPDK n.d.; Regulation (EU) 2019/631; Regulation (EU) 2023/1804; Regulation (EU) 2021/1119; GEIG; THG-Quote (BImSchG/38. BImSchV).
155 OSD 2025.
156 ODMD 2026.

Public charging network growth

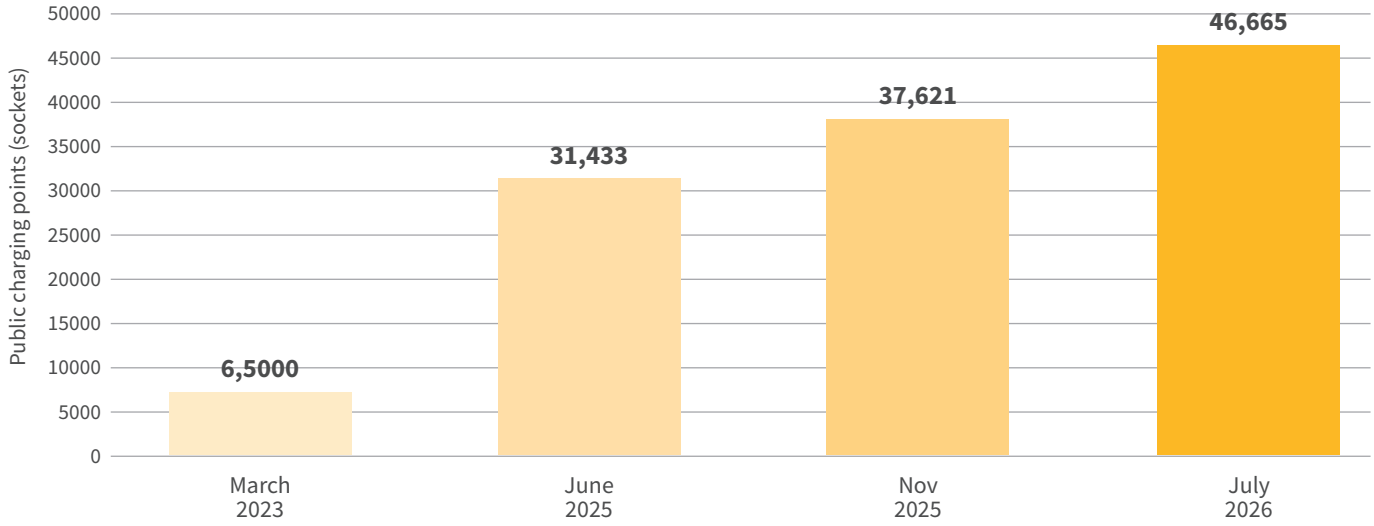


Figure 26. Public charging network growth, March 2023 to July 2026.[157]

Green mobility also includes intelligent traffic management, cycling infrastructure and logistics. These applications extend the opportunity beyond vehicles and batteries.

Battery & Supplier Industry

Battery value creation is becoming the second pillar of Türkiye's e-mobility strategy, alongside vehicle assembly. The joint venture SIRO between Togg and the battery manufacturer Farasis Energy (Germany / China / USA) began series production of battery modules and packs at the Gemlik plant in March 2023 - initially with an annual capacity of 3 GWh, to be expanded to 20 GWh by 2031.

Battery projects create demand for production equipment, quality control, safety systems and recycling. Project announcements and operating capacity should be assessed separately.

In parallel, the defence-focused battery manufacturer ASPİLSAN Enerji in Kayseri produces cylindrical lithium-ion cells (type 18650) at a capacity of around 24,000 cells per day - evidence of the growing domestic supplier base beyond pure EV manufacturing.[159]

Battery partnerships across the value chain



Figure 28. Battery value chain. Distinguish operating plants from announced expansion projects. [160]

157 EPDK 2025.
159 ASPİLSAN 2023.
160 ASPİLSAN 2023.

Charging Infrastructure

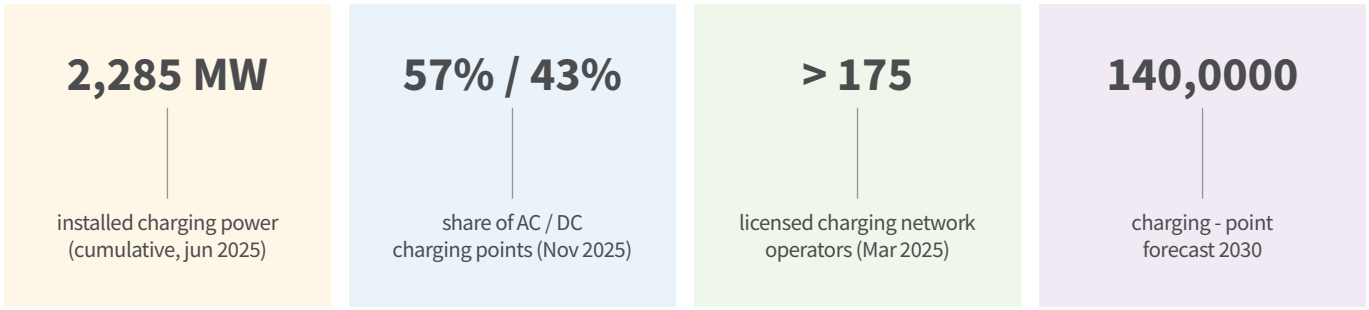


Figure 29. Charging infrastructure in Türkiye - key figures. Alternating current (AC).[161]

German-Turkish Cooperation: From Vehicle Manufacturing to Integrated Mobility Systems

Türkiye's mobility transition increasingly extends beyond vehicle manufacturing towards integrated mobility systems. Alongside the growth of electric mobility and battery production, investment is expanding into charging infrastructure, public transport, logistics and digital mobility solutions.

These developments are generating new demand for infrastructure, systems integration and mobility services throughout the transport value chain. Relevant cooperation fields include charging infrastructure, battery technologies, public transport electrification, rail systems, logistics solutions and intelligent transport systems.

Building on established industrial partnerships and closely integrated supply chains, German and Turkish companies are well positioned to develop and deploy sustainable mobility solutions jointly.

Starting Points for German-Turkish Cooperation

- **Charging infrastructure and grid integration.** AC and DC charging and grid connection for the still strongly growing network - the legal requirement to make parking spaces in new buildings EV-ready creates additional demand.
- **Battery technologies and recycling.** including cell and module production, testing, quality assurance and circular-economy solutions.
- **Digital mobility and intelligent transport systems,** including traffic-management solutions, data platforms and smart-city applications.
- **Sustainable logistics and rail transport,** supporting modal shift objectives under Türkiye's 2053 Transport and Logistics Master Plan.
- **Component and supplier cooperation,** building on existing German-Turkish partnerships in commercial vehicles, drivetrains, battery systems and mobility technologies.

Selected Current German-Turkish Cooperation Projects

Karsan (Türkiye) × BMW Group (Germany) - electric drivetrain supply agreement. Under a supply agreement with the BMW Group, the Turkish commercial-vehicle maker Karsan electrifies its buses with BMW electric-motor and battery technology - the first product being the Karsan Jest Electric, powered by BMW high-voltage lithium-ion batteries. According to Karsan, the cooperation is intended to continue across further EV projects.[162]

Mercedes-Benz Türk (Daimler Truck, Germany / Türkiye) - eActros e-truck development. The truck R&D team of Mercedes-Benz Türk played a major role in developing Daimler Truck's first battery-electric heavy-duty truck, the Mercedes-Benz eActros - several of its systems were developed entirely by the R&D team in Türkiye - and the company installed Türkiye's first high-voltage charging stations for electric trucks, underlining the country's integration into German commercial-vehicle electrification.[163-164]

161 EPDK 2025.
162 Karsan n.d.
163 Mercedes-Benz Türk 2022.
164 Mercedes-Benz Türk 2022.

SUMMARY



Recommendations for Sustainable Mobility

Türkiye's rapidly growing **electric vehicle market** and established automotive supply chains create opportunities for German and Turkish partners to develop **vehicles, components and charging services.**

1

Assess market opportunities using both **new registrations and fleet size**. EV sales reached **166,665** in the first eleven months of 2025, more than double the comparable 2024 figure, and the EV fleet passed **341,000** in November 2025. EVs accounted for **17.5 %** of new passenger car sales that month.

2

Develop joint products and components that build on **Togg's domestic market position** and can compete with established international brands such as Tesla and BYD.

3

Partner with one of Türkiye's more than **175 licensed operators**, such as ZES, Eşarj, Trugo and Voltrun, to expand charging services. Use local utilisation and coverage data to select sites in a network that grew from around 6,500 charging points in March 2023 to more than 37,600 in November 2025.

4

Build **battery partnerships** that connect cell and pack manufacturing with production equipment, testing and recycling. Use **SIRO and ASPİLSAN** as reference points for different parts of the value chain.

5

Cooperate on technical standards and components for **electric commercial vehicles**. Use **Karsan** as a reference. It led the European electric minibus and midibus segments from 2020 to 2024, with 2024 market shares of **37%** for the e-JEST in electric minibuses and **29%** for the e-ATAK in electric midibuses.

Market Players and Stakeholders

ADASTEC
Automated. Shared. Connected.



ADASTEC

ADASTEC is a US-based provider of Level 4 automated driving technology for full-size buses and commercial vehicles. Its flowride.ai platform supports automated public transport and has been deployed in more than 35 cities across Europe and North America. ADASTEC conducts research and development in Istanbul, Türkiye, and supports its European projects from its office in Germany.

www.adastec.com
BUDOTEK Teknopark, Durulu OSB, DES 2. Caddesi No. 8/108, 34776 Umraniye, Istanbul, Türkiye
Yasemin Us, Growth Marketing Management Team Lead
press@adastec.com,
yasemin@adastec.com
+90 539 724 62 67

ANADOLU ISUZU



Anadolu Isuzu

Anadolu Isuzu is a commercial vehicle manufacturer that is expanding its product range with vehicles powered by lower-emission combustion engines and electric drivetrains.

www.anadoluisuzu.com.tr
Sonay Ulusa, Intellectual and Industrial Property Rights and Incentives Manager
sonay.ulusa@isuzu.com.tr,
+90 850 200 15 52

Duesenfeld



Duesenfeld GmbH

Duesenfeld develops low-temperature recycling processes for lithium-ion batteries, recovering graphite, electrolytes, lithium and other metals for reuse as raw materials. Its technologies include low-temperature drying, deep discharge, direct recycling and hydrometallurgy. The processes are designed to minimise CO_2 emissions and achieve high material recovery rates. Duesenfeld licenses its technology to automotive manufacturers, battery cell producers and recycling companies worldwide.

www.duesenfeld.com
Rotthergstraße 8, 38176 Wendeburg, Germany7
info@duesenfeld.com,
+49 5303 508280
other icons: Circular Economy

The following overview shows selected German and Turkish companies active in eco-friendly mobility and their potential for innovation and German–Turkish cooperation.

Eşarj Elektrikli Araçlar Şarj Sistemleri A.Ş.

Eşarj, a subsidiary of Enerjisa Enerji, operates a nationwide network of electric vehicle charging stations in Türkiye. Its network serves drivers on both urban and intercity journeys.

www.esarj.com
Barbaros Mahallesi, Begonya Sokak, Nidakule Ataşehir Batı No. 1/1, 34746 Ataşehir, İstanbul, Türkiye
Öznur Meydan, Assistant Project Management Office (PMO) and Performance Specialist
oznur.meydan@esarj.com
+90 541 653 93 96

Gersan Elektrik Ticaret ve Sanayi A.Ş.

Gersan develops and manufactures electrical power distribution, cable management, lighting and electric vehicle charging systems. Its portfolio includes G-Bus busbar systems for power distribution, Led-Bus lighting solutions and G-Charge systems for electric vehicles. The company focuses on energy efficiency, ecodesign and resource efficiency in its research and product development.

other fields

www.gersan.com.tr
İstanbul Anadolu Yakası Organize Sanayi Bölgesi, Gan Buhan No. 35, Tuzla, İstanbul, Türkiye
Eylem Akpınar, Integrated Management Systems Manager
eylem.akpinar@gersan.com.tr
+90 530 867 25 29
info@gersan.com.tr,
+90 216 593 00 60

Türkiye'nin Otomobili Girişim Grubu Sanayi ve Ticaret A.Ş. (Togg)

Founded in Türkiye in 2018, Togg develops connected battery-electric vehicles and related services, including charging through Trugo and digital services through Trumore. Its first model, the T10X, went on sale in Türkiye in 2023, followed by the T10F in 2025. Both models went on sale in Germany in September 2025. Togg aims to produce one million vehicles designed from the outset as electric vehicles by 2032.

www.togg.com.tr
Bilişim Vadisi, Maalimköy Mahallesi, Deniz Caddesi, Bilişim Vadisi T.G.B. Sitesi, Block 1.3.A, No: 143/9, Unit 105, Gebze, Kocaeli, Türkiye





3.7 Water Management

Water management secures a critical input for households, agriculture and industry. Efficient networks, treatment and reuse protect supply and reduce resource losses. German-Turkish partnerships can combine advanced equipment with local engineering and utility expertise.

Water for Life.
Today and Tomorrow.

Policy & Regulatory Framework

Water management protects productive capacity in Türkiye. Municipalities, industry and agriculture need efficient infrastructure, reliable monitoring and stronger reuse systems.

Water Efficiency Strategy and Action Plan (2023-2033)

The strategy sets measurable, sector-wide targets to improve water-use efficiency and forms the foundation of Türkiye's water policy. Implementation and progress-monitoring are coordinated by the Ministry of Agriculture and Forestry's General Directorate of Water Management (SYGM, Su Yönetimi Genel Müdürlüğü), and the General Directorate of State Hydraulic Works (DSİ, Devlet Su İşleri) as the core executing agency for infrastructural and technical projects.

Water Efficiency Strategy and Action Plan - Key Targets

Target	Horizon
25 % reduction of municipal water losses	by 2033
120 litres per capita and day of municipal water use	by 2030
60 % irrigation efficiency	by 2030
Up to 50 % water recovery in industry	by 2033
15 % reuse rate for treated wastewater	by 2030

Table 12. Selected targets of the Water Efficiency Strategy and Action Plan (2023-2033).[165]

Twelfth Development Plan (2024-2028)

The Plan embeds water management within Türkiye's broader development framework, with a strong focus on modernising water-related infrastructure and improving its efficiency. Priorities include reducing municipal water losses, improving wastewater treatment, strengthening digital information and decision-support systems, and expanding alternative water sources such as rainwater harvesting and greywater reuse.[166]

National Water Plan (2026-2035)

This plan sets Türkiye's long-term framework for integrated and climate-resilient water management. It drives a digital transformation of water management through technologies such as IoT-based monitoring, remote sensing, AI, digital twins, supervisory control and data acquisition (SCADA) and decision-support systems, supporting increasingly data-driven water management.[167]

Türkiye Green Deal Action Plan (2021)

The Action Plan - adopted in 2021 and coordinated by the Ministry of Trade - addresses water efficiency and circular water use by promoting the wider reuse of treated wastewater and the integration of water-footprint considerations into sectoral water planning. It also highlights the potential of remote sensing, sensors and information-technology applications for more efficient water-resource management [168] and provides a framework for cooperation with EU Member States on sustainable water management.[169]

165 MoAF 2023, pp. 40-41, 49-50, 63.
166 SBB 2023b, pp. 221-222.
167 MoAF 2025, pp. 92-97.
168 Ministry of Trade 2021, pp. 17-19.
169 Ministry of Trade 2021, pp. 17-19.

The German and European Policy Counterpart

As an EU Member State, Germany operates within the European sustainability framework, which increasingly influences Türkiye's green transition and creates shared priorities for sustainable water management. Germany's National Water Strategy builds on this framework and guides its national approach.[170] The Strategy sets out ten strategic issues until 2050, with concrete measures reviewed against the horizon of 2030.[170]



Brandenburger Liner: UV-cured GRP liner for trenchless sewer rehabilitation

Selected Strategic Aims of the National Water Strategy

- Protect and restore a near-natural water balance for the long term.
- Ensure that land use is compatible with water bodies and adapted to the climate.
- Further develop the sustainable management of water bodies and preserve their good status.
- Mitigate risks caused by pollutants.
- Further develop climate-adapted water infrastructure, protect against extreme events and ensure supply.
- Strengthen efficient administrations, improve data flows and optimise legal frameworks.

Relevance for the Water Technology Sector

For the water technology sector, this translates into the continued modernisation and climate-resilient adaptation of existing infrastructure, alongside a stronger role for smart, green and nature-based solutions. Long-term water infrastructure planning is also expected to respond to changing water availability and climate-related risks, while measures such as rainwater retention and groundwater recharge contribute to more resilient water systems.[172]

International & Bilateral Cooperation

Germany's National Water Strategy explicitly recognises international and bilateral cooperation as an important element of sustainable water management, promoting the exchange of expertise, experience and data as well as cooperation in innovation, capacity development, governance and financing.[173] Against this background, the policy frameworks of both countries provide a supportive basis for strengthening German-Turkish cooperation.

Market Relevance

Water infrastructure, efficient irrigation and reuse create clear investment opportunities in Türkiye. Equipment suppliers and service providers can address demand across municipal, industrial and agricultural users.

170 BMUV 2023, p. 12.
171 BMUV 2023, p. 12.
172 BMUV 2023, p. 12.
173 BMUV 2023, p. 12.

Increasing Pressure on Water Resources

Türkiye's total annual usable water potential is estimated at around 112 billion m^3. Annual usable water per capita stood at 1,313 m^3 in 2022 - placing the country in the internationally recognised "water stress" category (below 1,700 m^3 per capita) and approaching the "water scarcity" threshold of 1,000 m^3. [174] Considering climate change and population growth, per-capita water availability is projected to decline further to around 1,200 m^3 by 2030, 1,116 m^3 by 2040 and 1,069 m^3 by 2050; projection studies indicate that Türkiye's water availability may decrease by up to 25 % due to climate change. [175]

Agricultural Irrigation Water - Use Efficiency

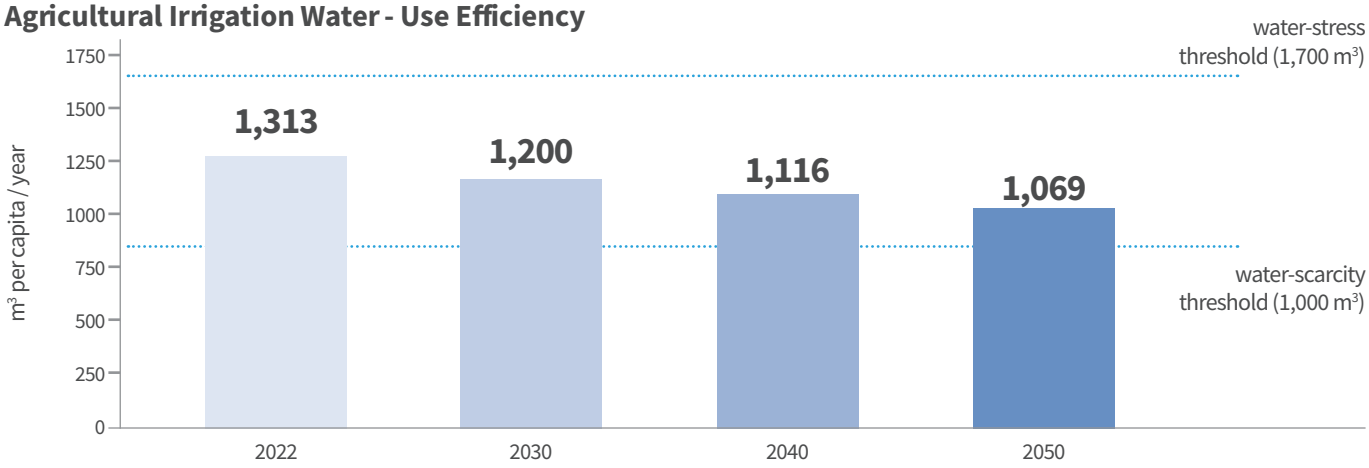


Figure 30. Türkiye's usable water availability per capita, current and projected (m^3/year; own visualisation). [176]

Sectoral Water Use. Agriculture Dominates

In 2022, total water use in Türkiye amounted to some 57 billion m^3. Agriculture accounted for around 44 billion m^3, or 77 % of the total, while the remaining 23 % was used for drinking, municipal and industrial purposes.[177]

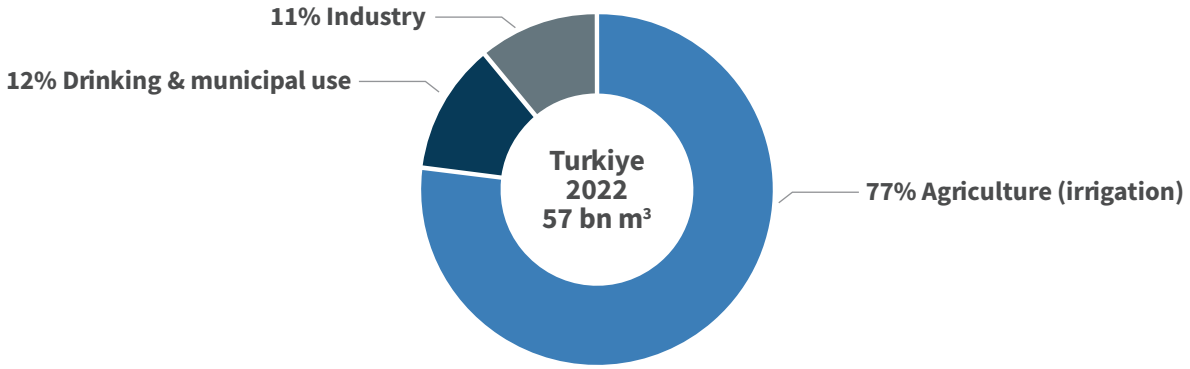


Figure 31. Sectoral water use in Türkiye, 2022 (share of 57 billion m^3 in total). [178]

Infrastructure and Technology Demand

DSİ places a strong emphasis on smart irrigation technologies and digital solutions to enhance water management, investing in AI-supported irrigation automation, soil-moisture sensors, weather stations, plant sensors, cloud-based data processing and real-time irrigation control to increase irrigation efficiency and reduce water losses.[179] The National Water Plan (2026-2035) further highlights the need to expand monitoring capacities, modernise water and wastewater infrastructure, and promote sustainable sectoral water use through investment and financing.[180] Efficient water use, wastewater reuse and reliable monitoring strengthen supply for industry, agriculture and municipalities. These applications provide practical entry points for technology partnerships and investment.

174 MoAF 2023, p. 19.
175 MoAF 2023, p. 19.
176 MoAF 2023, p. 19.
177 MoAF 2023, p. 19.
178 MoAF 2023, p. 19.
179 DSİ 2025.
180 MoAF 2025, p. 15.



Key Areas Where Technology Demand Is Emerging

Field	Description
Agricultural water efficiency [181]	Improving irrigation efficiency and reducing losses through smart irrigation, automation and remote sensing
Monitoring and infrastructure [182]	Expansion of monitoring capacity and further development of water and wastewater infrastructure
Industrial water efficiency [183]	Improving efficiency through measurement, monitoring and automation, plus wastewater recovery and reuse
Alternative and circular water use [184]	Promoting industrial symbiosis and alternative sources, including treated wastewater, rainwater and greywater

Table 13. Key areas of emerging technology demand in Türkiye's water sector (own compilation).

181 MoAF 2023, p. 48.
182 MoAF 2025, p. 15.
183 MoAF 2025, p. 15.
184 MoAF 2025, p. 15.

Germany. Water Technology & Innovation Profile

Germany combines technological excellence, innovation strength and practical experience across the water sector, offering solutions that are applicable in the Turkish market. Its capabilities range from water infrastructure and digital management to advanced treatment and purification technologies.

German companies offer a broad portfolio of advanced solutions - from infrastructure and networks to smart management and efficient treatment.[185]

Segment	Components
Infrastructure for water, wastewater and flood protection	Efficient water use; water and wastewater networks
Monitoring and analysis methods, water and wastewater management	Water Management 4.0 (measurement, analysis, control and regulation)
Water extraction, treatment and wastewater treatment	Wastewater treatment; water extraction and treatment

Table 14. German technology capabilities across the water value chain.[186]

Innovation Strength

Water extraction, purification and wastewater treatment is the most innovative segment of Germany's water sector, accounting for 64% of German patent applications worldwide in the field between 2010 and 2023. German companies hold a 16% share of the global market for biological wastewater-treatment patents, and - jointly with the United States - around 20% of global patents in chemical and technical water purification; in water and wastewater network infrastructure, Germany accounts for 30% of global innovations. German expertise in this field includes advanced filtration, water disinfection, and increasingly connected monitoring and control systems, supporting efficient and reliable water treatment. [187]

German water technologies hold a significant position in international markets, with future growth potential particularly concentrated in emerging and developing economies outside Europe, where demand for advanced water infrastructure is expected to increase - including Türkiye.

€8.6 bn	+3.9% p.a.	~15%
Exports 2023	Export growth 2010-2023	Global export share 2022

Table 14. German technology capabilities across the water value chain. [188]

185 UBA 2025b, p. 76.
186 UBA 2025b, p. 76.
187 UBA 2025b, p. 76.
188 UBA 2025b, p. 76.

German-Turkish Cooperation: From Water Security to Resource Efficiency

Growing pressure on water resources is reinforcing the importance of efficiency, resilience and sustainable water use in Türkiye. National strategies prioritise loss reduction, wastewater reuse, digital management systems and improved resource efficiency across municipalities, industry and agriculture.

As implementation moves forward, demand is expected to increase for solutions supporting water efficiency, infrastructure modernisation and resource resilience.

German expertise in water treatment, infrastructure, monitoring and digital water management can complement Türkiye's ongoing modernisation efforts. Existing cooperation initiatives in wastewater treatment and reuse provide a practical foundation for further bilateral partnerships. Starting Points for German-Turkish Cooperation

•German expertise in monitoring, sensors, control systems and "Water Management 4.0" can support Türkiye's transition towards increasingly digital and data-driven water management.

•Türkiye's need to modernise water and wastewater infrastructure and reduce water losses creates cooperation potential for German technologies in water networks, treatment and infrastructure management.

•Germany's strong innovation position in water extraction, purification and wastewater treatment aligns with Türkiye's plans to improve treatment capacities, efficiency and water reuse.

•With agriculture accounting for the largest share of Türkiye's water use, cooperation can focus on smart irrigation, monitoring, automation and efficient water-use technologies.

•Türkiye's targets for industrial water recovery, wastewater reuse and alternative water sources provide opportunities for German solutions in measurement, treatment, recycling and process optimisation.

•Both countries' policy frameworks support stronger cooperation through technology exchange, expertise, innovation and capacity building in sustainable water management.

Selected Current German-Turkish Cooperation Project

German Water Partnership (GWP) promotes bilateral and multilateral cooperation by connecting the German water sector with associations, institutions, ministries and international partners. A concrete example is the German-Turkish business development mission on wastewater management and water supply held in Istanbul on 11-14 November 2024, jointly organised by GWP and DEinternational Servis Hizmetleri A.Ş. (AHK Türkiye) under the Environmental Protection Export Initiative and attended by nine German companies. The mission addressed Türkiye's ambition to increase the wastewater reuse rate from around 5 % to 15 % by 2030 and connected German companies with Turkish businesses and institutions in membrane technology, water treatment and sustainable water management. [189]

189 GWP 2024.

Market Players and Stakeholders

ARTAŞ Endüstriyel Tesisler Taahhüt ve Ticaret A.Ş.

Founded in 1962, ARTAŞ designs and builds systems for industrial water and wastewater treatment, process water purification, desalination and water reuse. Its turnkey and modular plants use membrane technologies and resource-efficient processes to help industrial customers recover water for reuse. ARTAŞ combines engineering and manufacturing in Türkiye with international technology partnerships through its German subsidiary, ARTAS Umwelt Technologien GmbH.

www.artas.com.tr
Bosporus Sokak No. 8/3-4, 34022
Beşiktaş, Istanbul, Türkiye
Özgür Kavalcı, Sales Manager
info@artas.com.tr, ozgurkavalci@artas.com.tr
+90 530 209 64 80

other fields

Boreal Light GmbH

The company designs and manufactures affordable solar water desalination systems for off-grid communities around the globe. Systems manufactured by Boreal Light are capable of delivering high quality hygiene drinking, irrigation, fish farm and sanitation water from any kind of high saline and polluted water resources.

www.boreallight.com
Dr. Hamed Beheshti, CEO
beheshti@boreallight.com,
+49 176 709 240 68

other fields

Brandenburger Liner GmbH & Co. KG

For over 30 years, Brandenburger Liner GmbH & Co. KG, based in Landau/Pfalz, has specialised in developing and manufacturing customised UV light-curing glass fibre-reinforced plastic (GRP) pipe liners for trenchless sewer and manhole rehabilitation. Its patented winding technology produces seamless liners that renew damaged sewer pipes from the inside without excavation, reducing construction time, costs, traffic disruption and resource consumption compared with open-trench replacement.

www.brandenburger-liner.com
Taubenstuhlstraße 6, 76829
Landau/Pfalz, Germany
Yavuz Unal, Sales Manager
y.unal@brandenburger.de,
+49 (0)6341 5104 0

Dikkan Gemi ve Endüstriyel Vana Sanayi Ticaret A.Ş.

Dikkan develops and manufactures flow control valves for water and wastewater infrastructure, industrial plants and marine systems. The group also operates metal foundries and recycles scrap metal for reuse in manufacturing.

www.dikkan.com
*Kemalpaşa Organize Sanayi Bölgesi,
İzmir Kemalpaşa Asfalti Caddesi No: 30,
Üni. İ. Kemalpaşa, İzmir, Türkiye
Onur Beyoğlu, Group Business
Development Manager
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+90 532 055 57 26
+90 232 877 17 14

other fields

The following overview shows selected German and Turkish companies active in water management and their potential for innovation and German–Turkish cooperation.

Flottweg

www.flottweg.com
Industriestraße 6–8, 84137 Vilsbiburg, Germany
mail@flottweg.com,
+49 8741 301-0



Flottweg SE

Flottweg develops and manufactures equipment for mechanical solid–liquid separation. Its decanter centrifuges and separators are used in municipal and industrial wastewater treatment, sewage sludge dewatering and thickening, and plastics recycling. These systems help customers recover valuable materials, reduce residual waste and improve process efficiency.

other fields



TENOKS

www.tenoks.com
Makine İhtisas Organize Sanayi Bölgesi Mahallesi, 14. Sokak No: 3/1, Dilovası, Kocaeli, Türkiye
Cem Ünal, Project and Implementation Manager
cem@tenoks.com, +90 544 828 74 50



TENOKS Arıtma Teknolojileri Sanayi ve Ticaret A.Ş.

TENOKS develops water and wastewater treatment for municipalities and industries such as textiles and shipping, with in-house equipment and membranes and turnkey plants. Its portfolio includes greywater reuse, treatment of ship bilge water and RO concentrate, and compact municipal biofilm systems. Its proprietary Energized Air System (EAS) uses advanced oxidation to degrade organic pollutants, decolourise, disinfect and, if suitable, cut chemical use. The company reports recovery rates of 85–98% for textile wastewater, depending on the application.

other fields



wilo

www.wilo.com
Wilopark 1, 44263 Dortmund, Germany
Duygu Samuray, GPA & Project Office Coordinator
duygu.samuray@wilo.com,
+90 549 837 2944



WILO SE

Dortmund-based Wilo is a leading global provider of intelligent, sustainable water solutions for building services, water management and industry. Under its "Pioneering WATER AI for You" strategy, it offers energy-efficient pumping systems, digital monitoring and AI-enabled automation for drinking water, wastewater and municipal infrastructure. By combining sustainability and digitalisation, Wilo addresses water scarcity, energy efficiency and urban resilience worldwide.

other fields



SUMMARY

Recommendations for Water Management

Growing water stress and Türkiye's water-efficiency targets are creating opportunities for German and Turkish partners in **irrigation, infrastructure modernisation and water reuse.**

1

Prioritise **water efficiency in areas under stress.** Focus first on improving irrigation, given that agriculture accounts for **more than three-quarters** of national water use and per-capita availability is projected to decline.

2

Use Türkiye's **Water Efficiency Strategy and Action Plan,** Twelfth Development Plan and National Water Plan to identify joint projects in **loss reduction, infrastructure modernisation, digital monitoring and water reuse.**

3

Share implementation experience through **KUMLA** and use German and Turkish **reference projects** to compare approaches to managing catchments and reducing water losses.

4

Test **smart metering, digital controls and energy-efficient pumps** in municipal and industrial water networks.

5

Pilot **membrane and biological treatment** for water reuse, matching treatment to the intended use and local operating conditions.



4.

Opportunities for German-Turkish GreenTech Cooperation

Germany and Türkiye share a long tradition of economic and industrial cooperation, built on mutual trust, technological expertise and strong partnerships. Building on this foundation, both countries can combine their complementary strengths in green technologies and sustainable solutions. By connecting established partnerships with new ideas, innovative technologies and joint investments, Germany and Türkiye can further strengthen their economic ties, create new business opportunities and accelerate the transition towards more competitive, resource-efficient and climate-friendly economies.

Türkiye's industrial dynamism and young population meet Germany's advanced technology and established engineering base. Together, they offer a strong platform for efficient production, secure energy supply and new industrial value chains. The sector analyses above identify practical opportunities for joint investment and technology partnerships. [190,191]

Bilateral goods trade reached around USD 52 billion in 2025 according to TÜİK. German investment adds a substantial operating base. As of the end of 2024, the Bundesbank reports 521 investment enterprises in Türkiye, around 189,000 employees, EUR 59.746 billion in annual turnover and a direct-investment stock of EUR 14.779 billion. These figures cover the Bundesbank's reporting population classified by the first operational unit abroad, not every company with German capital. [192,193]

Automotive and components anchor the goods relationship. In 2025, road-vehicle trade amounted to USD 5.023 billion from Türkiye to Germany and USD 8.950 billion in the opposite direction. Other interfaces include machinery and electrical equipment, chemicals, pharmaceuticals, plastics and consumer goods such as clothing. Tourism belongs to the services relationship and is reported separately from goods trade. [194]

Industrial Investment and Competitive Production

A major shared opportunity lies in the modernisation and decarbonisation of Türkiye's industrial base. The Climate Law, adopted in July 2025, establishes an overarching framework for emissions reduction, adaptation and green growth. At the plant level, the Industrial Emissions Management Regulation and the Industrial Green Transformation (SYD) certification system introduce a phased, performance-based compliance pathway for approximately 6,000 installations. The SYD system grades installations from A (highest) to F (lowest) according to their environmental performance, assessed against best available techniques and associated emission limits. Existing plants covered by the regulation must obtain at least SYD grade F by the end of 2028 and grade D by the end of 2030. New installations must meet at least grade D requirements. [195]

Industrial modernisation creates demand for integrated systems. Efficiency, process electrification, emissions monitoring, filtration and environmental data management work together at plant level. German suppliers and Turkish engineering, procurement and construction companies can combine technology, installation and long-term service.

EU market requirements reinforce this trend. Since 1 January 2026, the EU Carbon Border Adjustment Mechanism (CBAM) has applied requirements to selected imports in cement, iron and steel, aluminium, fertilisers, electricity and hydrogen.[196] For Turkish exporters, competitiveness in these sectors will increasingly depend both on reducing the carbon intensity of production and on producing reliable, auditable emissions data. This creates a direct cooperation interface for German efficiency technologies, monitoring systems, MRV solutions and industrial engineering.

Energy Systems, Grids and Strategic Raw Materials

Türkiye's combined wind and solar capacity reached 40.689 GW in January 2026, while the government is targeting 120 GW by 2035. [197] Reaching that target will require investment not only in generation, but also in transmission and distribution grids, storage, digital control, flexibility and system integration. These are areas in which German technology providers and Turkish manufacturers, utilities and project developers can combine complementary capabilities.

The bilateral framework is moving in the same direction. At the seventh German-Turkish Energy Forum in Ankara in June 2026, both countries agreed to develop the existing Energy Partnership into a broader Energy and Raw Materials Partnership, with cooperation covering renewable energy, flexible and digitalised grids, storage, hydrogen and new energy carriers, energy efficiency, critical minerals and resilient supply chains. [198]

190 TÜİK 2026.
191 UBA 2025b, Chapter 3.2, pp 18-22, Figs. 3-6.
192 Ministry of Trade 2026, Chapter 5, p. 13.
193 Deutsche Bundesbank 2026, Table II. 1.b, p. 89.
194 Ministry of Trade 2026, p. 14.
195 MoEUCC 2025e; MoEUCC 2026a.
196 European Commission 2026
197 MENR 2026.
198 BMWE 2026.

Circularity, Resource Efficiency and Industrial Symbiosis

Türkiye's National Circular Economy Strategy and Action Plan 2025-2028 sets out six strategic areas and 53 actions across seven priority sectors. These cover packaging, batteries and vehicles, construction and buildings, electronics and ICT, food and biomass, plastics, and textiles.[199] Its emphasis on industrial symbiosis, secondary raw materials, resource efficiency and circular products creates opportunities that go beyond conventional waste management.

German strengths in sorting and material-recovery technology, recycling-plant engineering, measurement and control, high-quality plastics processing, circular product design and digital traceability can be combined with Türkiye's large industrial material flows and production clusters. Particularly promising models include high-quality plastics and textile recycling, industrial by-product exchange, secondary-material upgrading, deposit-return infrastructure and closed-loop solutions in metals, glass, cement and manufacturing.

From Technology Exports to Scalable Partnerships

The strongest long-term cooperation model is not a one-off technology sale, but a combination of German technology and implementation know-how with Turkish engineering, installation, service and manufacturing capacity. Pilot and demonstration projects can verify technical performance and economics under Turkish operating conditions, create local reference cases and provide a basis for replication across plants, municipalities and industrial zones. .

This approach can generate benefits in both directions. German SMEs gain a lower-risk route into a large and dynamic market through local partners, while Turkish companies gain access to specialised technology and high-value engineering. Joint development and localisation can also create solutions for third markets in Southeast Europe, the Black Sea region, Central Asia and the Middle East, turning bilateral cooperation into a broader export platform.

Türkiye is moving from strategic commitments towards implementation across climate policy, industrial emissions, renewable energy and circular economy, while EU regulation is increasingly shaping the investment decisions of Turkish exporters. Germany, in turn, has a substantial GreenTech supplier base and implementation experience in many of the fields now gaining importance in Türkiye. COP31 in Antalya (November 2026) adds further visibility to this transformation and creates a timely platform for showcasing concrete bilateral reference projects. [200]

Artificial Intelligence (AI) - a Cross-Cutting Digital Technology

Artificial intelligence (AI) is a cross-cutting digital technology that can support several GreenTech lead markets. It contributes to the GreenTech market where its use demonstrably advances environmental or climate goals.

AI can help optimise energy and water consumption, integrate renewable energy into grids more effectively, predict maintenance needs and analyse environmental or emissions data. In agriculture, for example, it can support needs-based irrigation; in the circular economy, it can help manage material flows and sorting processes.

However, there are potential downsides: AI systems require energy and digital infrastructure. Poor-quality data, inaccurate results, data-protection and cybersecurity risks, or dependence on technology providers can also limit their benefits. Projects should therefore assess their environmental contribution using appropriate metrics and take their energy and resource requirements into account.

Promising opportunities for German-Turkish cooperation include joint pilot projects in industry, energy, water management and agriculture. German expertise in sensors, automation and system integration can be combined with Türkiye's industrial and implementation capacity. Examples include the Siemens-Koç University IoT Edge Research Laboratory for digital manufacturing and predictive maintenance, as well as AI-supported irrigation and wildfire detection solutions developed by Turkish and German projects and companies.

199 MoEUCC 2025a.
200 UNFCCC 2026.

5.

GreenTech Ecosystem: Institutions, Networks & Policy Actors

The following overview shows key German and Turkish institutions, associations, financial institutions, networks and policy actors that are relevant to the green transformation as cooperation partners, financing partners, multipliers or regulatory bodies.



Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
KfW IPEX-Bank GmbH	DE		KfW IPEX-Bank provides international project and export finance for German and European companies, with a focus on energy, mobility, infrastructure, industries and commerce. In the GreenTech sector, it finances projects in energy efficiency, renewable energy, emission reduction and sustainable mobility. Through its representative office in Istanbul, the bank is active in Türkiye, where it has financed wind farm projects under the YEKA wind auctions.	Representative Office Istanbul, Kanyon Ofis Blok Kat: 7, Esentepe Mah. Büyükdere Cad. No. 185, 34394 Şişli, İstanbul, Türkiye **Contact Person:** Yasemin Kuytak **Position:** Office Director Istanbul **E-Mail:** yasemin.kuytak@kfw.de **Website:** kfw-ipex-bank.de
DZ BANK AG	DE		DZ BANK AG is the central institution of the German Cooperative Financial Network and one of Germany's leading commercial banks. It offers corporate banking, structured finance, export finance, capital markets and advisory services. The bank supports companies in their green transition with tailored financing and is interested in cross-border partnerships that promote sustainable investments, GreenTech solutions and climate-friendly infrastructure.	Platz der Republik, 60325 Frankfurt am Main, Germany **Contact Person:** Pınar Ersoy **Position:** Executive Director/Chief Representative **E-Mail:** pinar.ersoy@dzbank.com.tr Phone: +90 212 249 77 44 **Website:** www.dzbank.com

Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
Agora Verkehrswende **Agora Verkehrswende**	**DE**		Agora Verkehrswende is an independent think tank that develops strategies and studies for climate-neutral transport.	Anna-Louisa-Karsch-Str. 2, 10178 Berlin, Germany **Organisation phone:** +49 30 700 14 35-000 **Contact person:** Dr. Philipp Prein Position: Head of Communications **E-mail:** philipp.prein@agora-verkehrswende.de **Phone:** +49 30 700 14 35-305 **Website:** www.agora-verkehrswende.de
Turkish Packaging Manufacturers Association	**TR**		The association is the umbrella organisation of Türkiye's packaging industry. It supports the industry's development, its international competitiveness and its sustainable transformation. Its work covers the circular economy, sustainable packaging, recyclability, eco-design and resource efficiency.	Koşuyolu, Katip Salih Sok. No: 13, Kadıköy, İstanbul, Türkiye **Organisation phone:** +90 216 545 49 48 **Contact person:** Nurlan İdemen **Position:** Secretary General **E-mail:** nurlanidemen@ambalaj.org.tr **Phone:** +90 216 545 49 48 **Website:** www.ambalaj.org.tr/en
On behalf of: Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety of the Federal Republic of Germany **Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)**	**DE**		The BMUKN develops and coordinates Germany's federal policies on environmental protection, climate action, nature conservation and nuclear safety. Its responsibilities include promoting the circular economy, the sustainable use of natural resources, reducing emissions and environmental pollution, protecting air and water quality, and preserving biodiversity. The Ministry also establishes the relevant legal and policy frameworks and supports research, innovation and the market introduction of environmentally friendly technologies.	Stresemannstraße 128–130, 10117 Berlin, Germany **Organisation phone:** +49 30 18305-0 **E-mail:** poststelle@bmukn.bund.de **Website:** www.bundesumweltministerium.de
BSW GERMAN SOLAR ASSOCIATION **Bundesverband Solarwirtschaft e.V. – German Solar Industry Association**	**DE**		Representation of companies active in Germany, EU and keymarkets worldwide.	EUREF-Campus 16, 10829 Berlin, Germany Organisation phone: +49 30 2977788-0 **Contact person:** David Wedepohl **Position:** Managing Director, International Affairs **E-mail:** info@bsw-solar.de **Phone:** +49 30 2977788-51 **Website:** www.solarwirtschaft.de

Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
Federal Association for Secondary Raw Materials & Waste Management	**DE**		bvse represents small and medium-sized recycling and waste management companies and promotes the use of secondary raw materials.	Fränkische Str. 2, 53229 Bonn, Germany **Organisation phone:** +49 228 98849-0 **Contact person:** Eric Rehbock **Position:** Chief Executive Officer **E-mail:** weber@bvse.de **Phone:** +49 228 98849-25 **Website:** www.bvse.de
Foundation – Environmental Protection and Packaging Waste Recovery and Recycling Foundation	**TR**		The ÇEVKO Foundation is a non-profit organisation that has supported the separate collection, recycling and recovery of packaging waste in Türkiye for more than 35 years. It is a pioneer of Extended Producer Responsibility (EPR) in Türkiye and runs the Green Dot system.	Cenap Şahabettin Sok. No: 94, Koşuyolu, 34718 Kadıköy, İstanbul, Türkiye **Organisation phone:** +90 216 428 78 90–94 **Contact person:** M. Mete İmer **Position:** Secretary General **E-mail:** meteimer@cevko.org.tr **Phone:** +90 533 760 83 52 **Website:** www.cevko.org.tr
dena – German Energy Agency (Deutsche Energie-Agentur)	**DE**		dena – the German Energy Agency develops practical solutions for the energy system of the future. As a public company and project agency, it works towards a climate-neutral society. It supports the German Federal Government in achieving its energy and climate policy goals and brings together partners from politics, business, science and all parts of society, both nationally and internationally. Founded in 2000, dena today employs more than 700 people from around 30 countries, working on around 100 projects at any given time.	Chausseestr. 128a, 10115 Berlin, Germany Organisation phone: +49 30 66777-0 **Contact person:** Lilia Mass **Position:** Head of the International Cooperation Unit, Project Manager of the German-Turkish Energy and Raw Materials Partnership **E-mail:** lilia.mass@dena.de **Phone:** 49 30 66 777 - 335 **Website:** www.dena.de
Fachverband Biogas e.V. - German Biogas Association	**DE**		The German Biogas Association (Fachverband BIOGAS e.V. – FvB) brings together biogas plant operators, manufacturers, planners, and researchers. Founded in 1992, the association has over 4,700 members. It is the world's largest biogas association.The FvB promotes the use of biogas technology. It represents the industry's interests in political discussions. It also supports knowledge sharing and cooperation within the sector. Its annual BIOGAS Convention & Trade Fair attracts up to 9,000 participants. It is one of the world's largest international events in the biogas industry.	Angerbrunnenstraße 12, 85356 Freising, Germany **Organisation phone:** +49(0)8161 984660 **Contact person:** Marc Reinhard **Position:** International Affairs **E-mail:** international@biogas.org **Phone:** +49(0)8161 9846815 **Website:** www.biogas.org/

Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
German Water Partnership **German Water Partnership e. V.**	**DE**		German Water Partnership (GWP) is the network of around 300 German companies, utilities, research institutions and associations across the water sector. GWP promotes international partnerships, facilitates market access and fosters knowledge exchange. By connecting German water expertise with international partners, GWP supports the development and implementation of innovative solutions to global water challenges.	Invalidenstraße 91 D-10115 Berlin, Germany **Organisation phone:** +49 (0)30 3988722 0 **Contact person:** Julia Ciric-Betz **Position:** Advisor for International Programs **E-mail:** ciric-betz@germanwaterpartnership.de **Phone:**+49 (0)30 3988722 35 **Website:** www.germanwaterpartnership.de
İZODER ISI SU SES ve YANGIN YALITIMCILARI DERNEĞİ **Association for Thermal Insulation, Waterproofing, Sound Insulation and Fire Stopping Materials Producers Traders and Appliers.**	**TR**		It conducts training and awareness-raising activities to improve building performance and energy efficiency through insulation.	Şerifali, Hendem Cd No:58, 34775 Ümraniye/ İstanbul, Türkiye **Organisation phone:** +90 216 415 74 94 **Contact person:** Timur Diz **Position:** General Manager **E-mail:** timur@izoder.org.tr **Phone:** +90 216 415 74 94 **Website:** www.izoder.org.tr
İSKİD **Air-Conditioning & Refrigeration Manufacturers Assoc.**	**TR**		Türkiye's air conditioning and refrigeration industry emerged in the 1950s and has grown rapidly since then. İSKİD was established in 1992 as a non-profit organization (NPO) by leading companies and professionals to support the sector's sustainable and accelerated development.	Şerifali Mah. Kızkalesi Sok. No.1, Elite Plaza B-6, Ümraniye 34775 İstanbul, Türkiye **Organisation phone:** +90 (216) 469 44 96 **E-mail:** iskid@iskid.org.tr **Phone:** +90 544 3274584 **Website:** www.iskid.org.tr
NUMOV NAH- UND MITTELOST-VEREIN E.V. GERMAN NEAR AND MIDDLE EAST ASSOCIATION **Nah- und Mittelost-Verein e.V.**	**DE**		NUMOV is Germany's oldest and largest organization promoting economic relations with the Near and Middle East, a dynamic and diverse region offering significant business opportunities. For over 90 years, NUMOV has supported its members in developing business relationships and bilateral cooperation. It works closely with regional and German embassies, federal ministries, and the German Federal Foreign Office. Through conferences, forums, and seminars, NUMOV provides its members with access to institutional experts and their expertise.	Kronenstraße 1, 10117 Berlin, Germany Organisation phone: +49 (0)30 / 2064100 **Contact person:** Alexander Klaß **Position:** Member of the Executive Management **E-mail:** numov@numov.de **Phone:** +49 (0)30 / 2064100 **Website:** www.numov.de

Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
PAGEV **Turkish Plastics Industrialists' Foundation**	TR		PAGEV is a sector foundation supporting the development of Türkiye's plastics industry through research, education, and international cooperation. It focuses on recyclable product design, the use of recycled materials, and resource efficiency in production. PAGEV also promotes cooperation between industry, public institutions, and academia in the circular economy.	Ofis Florya Plaza, Şenlikköy Mah., Eski Halkalı Cad. No: 3/8, Bakırköy, 34153 İstanbul, Türkiye Organisation phone: +90 212 425 13 13 **Contact person:** Nagihan Kul **Position:** Certification and Training Manager **E-mail:** nagihan.kul@pagev.org.tr **Phone:** +90 549 425 18 10 **Website:** www.pagev.net
SHURA **Energy Transition Center**	TR		SHURA Energy Transition Center is an independent, non-profit think tank dedicated to supporting Türkiye's transition towards a low-carbon, secure, and sustainable energy system. Operating under the Istanbul Policy Center at Sabancı University, SHURA conducts evidence-based research and analysis on the technological, economic, and policy dimensions of the energy transition and develops policy recommendations.	Bankalar Cad. No.2 Minerva Han, Karaköy, İstanbul, Türkiye **Organisation phone:** +90 212 292 49 39 **Contact person:** Esra Eğilmez **Position:** Communications Coordinator **E-mail:** esra.egilmez@shura.org.tr **Phone:** +90 539 663 92 72 **Website:** www.shura.org.tr/en
skdTürkiye **Business Council for Sustainable Development Türkiye – BCSD Türkiye**	TR		Established in 2005, BCSD Türkiye (Business Council for Sustainable Development Türkiye) is one of Türkiye's leading business associations driving sustainable development and green transformation. Bringing together 195 member companies across 14 major sectors and 45 sub-sectors, its membership represents approximately 25% of Türkiye's GDP and 1.4 million employees, demonstrating its significant influence on the national economy.	Kolektif House Levent, Esentepe, Talatpaşa Cad No: 5/1, 34394 Şişli/İstanbul **Organisation phone:** +90 212 807 02 05 **Contact person:** Ceylan Hünal Garih **Position:** Deputy Secretary General **E-mail:** ceylan.garih@skdturkiye.org **Phone:** +90 212 807 02 05 **Website:** www.skdturkiye.org
TURKISH WATER INSTITUTE SUEN TÜRKİYE SU ENSTİTÜSÜ **Turkish Water Institute**	TR		Develops science-based sustainable water policies at national and international levels.	Libadiye Cad. No:52/1, Üsküdar, İstanbul, Türkiye **Organisation phone:** +90 216 325 49 92 **Contact person:** Mustafa Salih Sarıkaya **Position:** Project Development and Implementation Coordinator **E-mail:** mustafa.sarikaya@suen.gov.tr **Phone:** +90 216 325 4992 **Website:** www.suen.gov.tr

Logo and Organisation	Ctry	Type	Focus / Offering	Adress, Contact & Website
Turkish Association of Agricultural Machinery & Equipment Manufacturers	TR		TARMAKBİR is the national industry association representing Türkiye's agricultural machinery and technology sector. It promotes sustainability, innovation, and international cooperation in agricultural mechanization, precision farming, efficient irrigation, digitalization, and smart farming technologies.	Meşrutiyet Caddesi No:31/6, 06420 Kızılay / Ankara, Türkiye **Organisation phone:** +90 312 419 37 94 **Contact person:** M. Selami İleri **Position:** Secretary General **E-mail:** selami@tarmakbir.org **Phone:** +90 532 476 25 99 **Website:** www.tarmakbir.org
Türkiye Electric & Hybrid Vehicles Association	TR		Works on zero-emission transportation, charging infrastructure, and electric vehicle regulations. Promotes the electrification of transport through innovative approaches that reduce Türkiye's dependence on foreign energy sources, raise awareness, and strengthen sustainable competitiveness.	Fulya M. Hakkı Yeten C. Selenium Plaza, No:10/C, K:6, Fulya – Beşiktaş/ İstanbul, Türkiye **Organisation phone:** +90 212 381 8 666 **Contact person:** Berkan Bayram **Position:** Founder **E-mail:** berkan@tehad.org **Phone:** +90 532 713 7 493 **Website:** www.tehad.org
Association of Recyclable Waste Materials Industry	TR		Representation of Türkiye's waste collection, sorting, recycling, machinery and equipment manufacturers; promotion of circular economy, secondary and alternative raw materials, resource efficiency and sustainable waste management; policy advocacy, sectoral networking and international cooperation.	TOBB İkiz Kuleler Sosyal Tesisleri, Dumlupınar Bulvarı No:252 OZK03, Mustafa Kemal, 06530 Çankaya/Ankara, Türkiye **Organisation phone:** +90 530 885 68 86 **Contact person:** Murat Körük **Position:** Secretary General **E-mail:** tudam@tudam.org.tr **Phone:** +90 530 885 68 86 **Website:** www.tudam.org.tr
Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT	DE		Fraunhofer UMSICHT supports industries and society in the transfer to a climate-neutral and circular economic system. Our research focuses on Circular Economy, Green Hydrogen, Carbon Management and Local Energy Systems.	Osterfelder Straße 3, 46047 Oberhausen, Germany **Organisation phone:** +49 208 8598-0 **Contact person:** Dr. Sebastian Stießel **Position:** Global Business Development **E-mail:** sebastian.stiessel@umsicht.fraunhofer.de **Phone:** +49 208 8598-1525 **Website:** www.umsicht.fraunhofer.de/en.html

List of Abbreviations

AC	Alternating current
AFIR	Alternative Fuels Infrastructure Regulation
AHK Türkiye	German-Turkish Chamber of Industry and Commerce (Deutsch-Türkische Industrie- und Handelskammer)
AI	Artificial intelligence
AMS	Automated measuring system(s)
AST	Annual surveillance test
BAT	Best available techniques
BCSD Türkiye	Business Council for Sustainable Development Türkiye (SKD Türkiye)
BEP-TR	Binalarda Enerji Performansı (Turkish building energy performance calculation tool)
BESS	Battery energy storage system(s)
BEV	Battery electric vehicle
BImSchG	Bundes-Immissionsschutzgesetz (Federal Immission Control Act)
BImSchV	Bundes-Immissionsschutzverordnung (Ordinance implementing the Federal Immission Control Act)
BMEL	Federal Ministry of Food and Agriculture (until 2025)
BMLEH	Federal Ministry of Agriculture, Food and Regional Identity
BMUKN	Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety
BMUV	Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (until 2025)
BMWE	Federal Ministry for Economic Affairs and Energy
C&I	Commercial and industrial
CAP	Common Agricultural Policy
CBAM	Carbon Border Adjustment Mechanism
CCS	Carbon capture and storage
CCU	Carbon capture and utilisation
CE	Circular economy
CEE	Certificats d'économies d'énergie (French energy savings certificates)
CEMS	Continuous emission monitoring system(s)
CEN	European Committee for Standardization
CNO	Charging Network Operator
COP31	31st United Nations Climate Change Conference (Conference of the Parties)
CPO	Charge-point operator
DAHS	Data acquisition and handling system(s)
DBYS	Depozito Bilgi Yönetim Sistemi (Deposit Information Management System)
DC	Direct current
DEG	Deutsche Investitions- und Entwicklungsgesellschaft
dena	Deutsche Energie-Agentur (German Energy Agency)
Destatis	Statistisches Bundesamt (Federal Statistical Office of Germany)
DKTI	Deutsche Klimatechnologie-Initiative (German Climate Technology Initiative)
DMS	Data management system
DOA	Depozitosu Olan Ambalajlar (deposit-bearing packaging)
DPP	Digital product passport
DSİ	Devlet Su İşleri Genel Müdürlüğü (General Directorate of State Hydraulic Works)
DYS	Depozito Yönetim Sistemi (Deposit Management System)
EBRD	European Bank for Reconstruction and Development
ECF	European Cyclists' Federation
EEG	Erneuerbare-Energien-Gesetz (Renewable Energy Sources Act)
EEOS	Energy Efficiency Obligation Scheme
EEYY	Endüstriyel Emisyonların Yönetimi Yönetmeliği (Industrial Emissions Management Regulation)
EIB	European Investment Bank
EKB	Enerji Kimlik Belgesi (energy performance certificate)
EMEA	Europe, the Middle East and Africa
EN	European Standard (Europäische Norm)
EnBW	Energie Baden-Württemberg AG
ENVER	Enerji Verimliliği (energy efficiency portal)
EPC	Engineering, procurement and construction
EPDK	Enerji Piyasası Düzenleme Kurumu (Energy Market Regulatory Authority)
EPR	Extended producer responsibility
ESCO	Energy service company
ESPR	Ecodesign for Sustainable Products Regulation
ETICS	External thermal insulation composite system(s)
ETP	Energy Technology Perspectives (IEA report series)
ETS	Emissions Trading System
EU	European Union
EUR	Euro
EV	Electric vehicle
EXI	Exportinitiative Umweltschutz (Export Initiative Environmental Protection)
EYODER	Enerji Yöneticileri ve Verimlilik Derneği (Association of Energy Managers and Efficiency)
FAO	Food and Agriculture Organization of the United Nations
FGD	Flue-gas desulphurisation
FMO	Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (Dutch entrepreneurial development bank)
FY	Full year
GDP	Gross domestic product
GEIG	Gebäude-Elektromobilitätsinfrastruktur-Gesetz (Building Electromobility Infrastructure Act)
GHG	Greenhouse gas
GIS	Geographic information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GPS	Global Positioning System
GVA	Gross value added
GW	Gigawatt
GWh	Gigawatt-hour
GWP	German Water Partnership e.V.
HEV	Hybrid electric vehicle
HJT	Heterojunction technology
HPC	High-power charging
HVAC	Heating, ventilation and air conditioning

HVDC	High-voltage direct current
ICT	Information and communication technology
ID	Identification
IEA	International Energy Agency
IED	Industrial Emissions Directive
IKI	Internationale Klimaschutzinitiative (International Climate Initiative)
İLBANK	İller Bankası A.Ş. (Bank of Provinces)
IoT	Internet of Things
IPM	Integrated pest management
IPP	Independent power producer
ISO	International Organization for Standardization
ITS	Intelligent transport systems
ITU	International Telecommunication Union
KfW	Kreditanstalt für Wiederaufbau
KOSGEB	Small and Medium Enterprises Development Organization of Türkiye
KPK	Karbon Piyasası Kurulu (Carbon Market Board)
KrWG	Kreislaufwirtschaftsgesetz (Circular Economy Act)
KUMLA	German-Turkish Climate and Environment Steering Committee
kWp	Kilowatt-peak
LED	Light-emitting diode
LULUCF	Land use, land-use change and forestry
MAM	Marmara Research Center (TÜBİTAK)
MBR	Membrane bioreactor
MCR	Measurement, control and regulation
MENR	Ministry of Energy and Natural Resources of the Republic of Türkiye
MET	Mevcut En İyi Teknikler (best available techniques)
MoAF	Ministry of Agriculture and Forestry of the Republic of Türkiye
MoEUCC	Ministry of Environment, Urbanisation and Climate Change of the Republic of Türkiye
MoIT	Ministry of Industry and Technology of the Republic of Türkiye
MoTI	Ministry of Transport and Infrastructure of the Republic of Türkiye
MRV	Monitoring, reporting and verification
MW	Megawatt
NCESAP	National Circular Economy Strategy and Action Plan
NDC	Nationally Determined Contribution
NEEAP	National Energy Efficiency Action Plan
NIR	Near-infrared
NUMOV	Nah- und Mittelost-Verein e.V. (Near and Middle East Association)
O&M	Operations and maintenance
ODMD	Otomotiv Distribütörleri ve Mobilite Derneği (Automotive Distributors and Mobility Association)
OEM	Original equipment manufacturer
OGM	Orman Genel Müdürlüğü (General Directorate of Forestry)
OIZ	Organised industrial zone
OSD	Otomotiv Sanayii Derneği (Automotive Manufacturers Association)
ÖTV	Özel Tüketim Vergisi (Special Consumption Tax)
PET	Polyethylene terephthalate
PKW	Personenkraftwagen (passenger car)
PM	Particulate matter
PPP	Public-private partnership
PPWR	Packaging and Packaging Waste Regulation
PRODCOM	PRODuction COMmunautaire (EU statistics on industrial production)
PV	Photovoltaic(s)
QA	Quality assurance
QAL	Quality assurance level
R&D	Research and development
RED III	Renewable Energy Directive (EU) 2023/2413
RETech	German RETech Partnership e.V. (German Recycling Technologies and Waste Management Partnership)
RTO	Regenerative thermal oxidiser
SBB	Strateji ve Bütçe Başkanlığı (Presidency of Strategy and Budget)
SCADA	Supervisory control and data acquisition
SCR	Selective catalytic reduction
SEÖS	Sürekli Emisyon Ölçüm Sistemleri (Continuous Emission Measurement Systems)
SMEs	Small and medium-sized enterprises
SNCR	Selective non-catalytic reduction
SYD	Sanayide Yeşil Dönüşüm (Industrial Green Transformation)
SYGM	Su Yönetimi Genel Müdürlüğü (General Directorate of Water Management)
TA Luft	Technische Anleitung zur Reinhaltung der Luft (Technical Instructions on Air Quality Control)
TEE	Titoli di efficienza energetica (Italian energy efficiency certificates)
THG-Quote	Treibhausgasminderungsquote (Greenhouse Gas Reduction Quota)
TOBB	Türkiye Odalar ve Borsalar Birliği (Union of Chambers and Commodity Exchanges of Türkiye)
TR ETS	Türkiye Emissions Trading System
TRL	Technology Readiness Level
TRY	Turkish lira
TSKB	Türkiye Sınai Kalkınma Bankası A.Ş. (Industrial Development Bank of Türkiye)
TÜBİTAK	Scientific and Technological Research Council of Türkiye
TÜÇA	Türkiye Çevre Ajansı (Turkish Environment Agency)
TÜİK	Türkiye İstatistik Kurumu (Turkish Statistical Institute, TURKSTAT)
TÜV	Technischer Überwachungsverein (Technical Inspection Association)
UBA	Umweltbundesamt (German Environment Agency)
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research
USD	US dollar
VOC	Volatile organic compounds
WindBG	Windenergieflächenbedarfsgesetz (Wind Energy Area Requirements Act)
WindSeeG	Windenergie-auf-See-Gesetz (Offshore Wind Energy Act)
WRI	World Resources Institute
YEK-G	Yenilenebilir Enerji Kaynak Garanti Belgesi (renewable energy guarantee of origin)
YEKA	Yenilenebilir Enerji Kaynak Alanları (Renewable Energy Resource Areas)
YEKDEM	Yenilenebilir Enerji Kaynakları Destekleme Mekanizması (Renewable Energy Resources Support Mechanism)
ZLD	Zero liquid discharge

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