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DISCLAIMER

This document constitutes an institutional assessment and vision statement for the future of the TufanbeyliEnergy Base, prepared from a Just Transition perspective. The analyses, projections, and scenarios presented herein have been developed based on current data, scientific methodologies, and internal expert evaluations, and are provided solely for informational purposes. The content does not represent investment advice, binding commitments, or regulatory disclosures. The plans and objectives outlined in this report are subject to change depending on energy market dynamics, regulatory amendments, technological advances, environmental considerations, and stakeholder feedback. The company reserves the right to revise these strategies in response to evolving circumstances. The organization cannot be held liable for any outcomes arising from decisions made by users based on the information contained within this document. When sharing this report with third parties, it is essential that relevant sections be evaluated in their complete context without selective interpretation. This report should be considered valid for a period of one (1) year from the date of its issuance.



SUMMARY

As an integrated energy production facility with 450 MW of lignite and 14.3 MW of solar energy capacity, the TufanbeyliEnergy Base has embarked on a comprehensive transformation process in line with Enerjisa Üretim's low-carbon future vision. This process is designed not only as a technological transformation but also as a multi-dimensional Just Transition initiative that includes local communities, employees, and suppliers.

Launched in 2024, the interdisciplinary Just Transition research process has been supported by field observations, interviews, and surveys to analyze the social impacts of the technological transformation in energy production. Within this scope, the reskilling of the existing workforce, opportunities for rural development, and regional potential have been assessed, and recommendations have been shaped through collaboration among public institutions, the private sector, and civil society. Field analyses have revealed Tufanbeyli's potential in agriculture, livestock, tourism, and entrepreneurship, and have ident fied related social risks. In this context, two strategic pillars have been defined for the Just Transition process: "Green Jobs and Skills-Oriented Employment Policies" and "Rural Development and Economic Diversification." These pillars have been supported by concrete project proposals aimed at diversifying the local economy and strengthening social cohesion. The potential project themes identified through the research are not final investment decisions but rather analyzed alternative options. Projects to be implemented will be selected based on stakeholder engagement, technical feasibility, and social dialogue processes.

The coordination of the Just Transition process is carried out through an integrated governance system, designed at the institutional level to ensure the alignment of various internal and external stakeholders. Several implementation projects that address the identified needs and recommendations have already been initiated. To date, implemented activities include strengthening irrigation infrastructure, supporting integrated livestock farming, establishing a pulse processing facility, and cultivating walnut and sage saplings. All initiatives are implemented in a structure that is traceable, assessable, and aligned with the Sustainable Development Goals. Upcoming priorities include expanding academic training capacity and establishing nature-based production zones.

Today, Tufanbeyli is no longer just an energy facility; it is becoming a living laboratory of regional development, just transition, and an integrated sustainability approach. Every step in this ransformation is planned within a strategic timeline to ensure that no one is left behind.



1. TUFANBEYLİ ENERGY BASE: A RESPONSIBLE TRANSITION JOURNEY

TufanbeyliEnergy Base is an integrated electricity generation facility with a production capacity comprising 450 MW from lignite and 14.3 MW from hybrid solar energy. Additionally, it serves as the operational center for Enerjisa Üretim's training Academy, innovation initiatives, and socially beneficial projects. Having played a significant role in Türkiye's energy infrastructure and contributed substantially to regional development, TufanbeyliEnergy Base is now embarking a new transformative phase. This phase is envisioned not merely as technological modernization, but as an inclusive transformation addressing social impacts and encompassing employees, suppliers, and the local community.

1.1. **VISION 2040**

At to center of our roadmap is the restuctioning of TufanbeyliEnergy Base into a low-emission, multifunctional, and advanced technology-oriented facility by 2040. This vision encompasses not only renewal production techniques but also transformation of the facility into a data-driven, digital, environmentally friendly and highly socially engaged structure. The transformation process will gain further momentum with increasing renewable energy investments; in parallel, different sectors and interdisciplinary application areas will continue to be explored. In this context, the technological transformation topics that stand out in TufanbeyliEnergy Base are as follows:



Solar power generation investments constitute the strategic priority driving technological advancement. With the projects realized within this framework, the total installed solar energy capacity has reached 14.3 MW. In the coming period, it is planned to rehabilitate open mining sites that have completed their operational life and increase the installed capacity of these areas as solar power plant areas. This approach aims to both re-functionalize existing land assets and increase renewable energy capacity at the power plant site. This model, which addresses environmental sustainability and resource optimization in a holistic manner, reflects a long-term transformation vision.



As part of our MadenNEXT initiative, the electrification process at the Tufanbeyli lignite open pit mine was initiated with the aim of completely replacing diesel-fueled equipment with electric equivalents. Initial implementations include the commissioning of five electric trucks and two electric excavators, each with a battery capacity of 564 kW. Ongoing efforts further encompass installing a solar power plant and energy storage system to support mining operations, as well as integrating autonomous operation technologies.



A prototype carbon capture and treatment system is planned for the Tufanbeyli Thermal Power Plant, designed to capture SO₂, NOx, and COx emissions and convert them into organomineral liquid fertilizers. Scheduled to begin in 2025, this initiative aims to reduce flue gas pollution while creating value-added products.

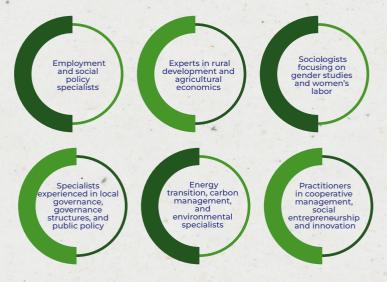


Going beyond energy production, this transformation process aims to transform the plant into a hub for data analytics, digitalization and innovative applications. In this context, a structure that integrates advanced data monitoring technologies, artificial intelligence-supported decision systems and R&D activities is being designed, thus aiming to transform the facility into a regional innovation and knowledge base in the field of energy technologies in the long term.



1.2. AN INTERDISCIPLINARY PREPARATION PROCESS BASED ON SCIENTIFIC DATA

The energy transition at Tufanbeyli is envisaged not solely as a technological shift, but also as a fair ,transition encompassing employees and the broader community. The approach is methodically designed and rooted in scientific principles. Preliminary activities aimed at ensuring responsible progress and accurate formulation of long-term strategies for a just transition have already commenced. Central to this approach is recognizing that the transformation involves more than technical modifications; it represents a journey significantly impacting personnel, local communities, and suppliers. To enrich the theoretical framework of the transition process and underpin applied strategies through an interdisciplinary perspective, collaboration has been established with a highly qualified team of researchers who bring academic expertise and extensive field experience. The profiles and specializations of the contributing experts include:



The methodologies employed in this scientific inquiry, the identified social implications, unique regional potentials and requirements, and opportunities for alternative projects are detailed within sections 2 through 6 of this report. These sections highlight practical opportunities for achieving a just transition across socio-economic, societal, environmental, and cultural dimensions. Several proposed projects have entered the implementation phase, while others remain in preliminary assessment stages. Clearly presented project proposals within this document reflect potential solutions rather than final decisions. In accordance with the principle of multi-stakeholder governance, ultimate project implementations will be coordinated collaboratively with public institutions, local governments, universities, and development agencies that possess socio-economic intervention capabilities.





1.3. A DYNAMIC, PARTICIPATORY, AND IMPLEMENTATION-ORIENTED PROCESS

This study on potential areas of activity is not a final plan; rather, it is a dynamic and evolutionary framework shaped by scientific research, local observations, and field experience. A dedicated working group within Enerjisa Üretim evaluates recommendations presented by expert teams with a holistic perspective. As a result of internal coordination and collaborations with external stakeholders, fieldwork has commenced for the feasible proposals.

The initial implementations of this process are detailed in Chapter 7. This chapter explains concrete applications under various headings, including social projects carried out so far, support mechanisms for rural development, capacity-building activities, promotion of local employment, and women producer organizations. Additionally, the institutional structure overseeing the fair transition process is defined in this section, with future goals and plans transparently shared.

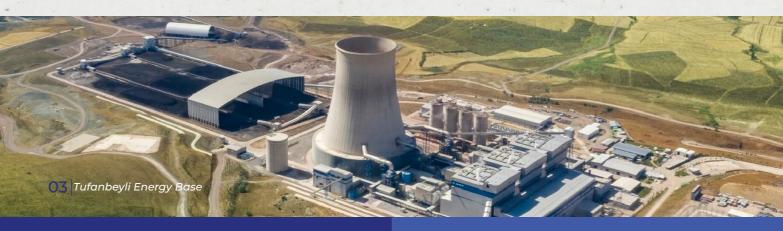
1.4. VISION FOR CREATION SHARED VALUE

The transformation process of the TufanbeyliEnergy Base offers an opportunity for shared value creation not only for the organization but also for regional communities, public authorities, employees, and local entrepreneurs. This process is fundamentally grounded in respect for past contributions, responsibility towards the present, and a collective commitment to shaping the future. Rooted in sustainability within energy production, inclusivity in employment, and cooperation in societal development, this approach underscores that a just transition represents more than a technical change, it embodies a human-centered journey imbued with potential.

1.5. TUFANBEYLİ ENERGY BASE

Commissioned in 2016, the Tufanbeyli Domestic Lignite Power Plant is a pioneering energy production facility, recognized as the largest private sector domestic coal investment in Türkiye. Located between the villages of Yamanlı, Kayarcık, and Taşpınar in Tufanbeyli, Adana, this integratedEnergy Base stands out not only for its high production capacity but also for its sustainability, technology, environmental compliance, and social value creation.

The power plant, with an installed capacity of 450 MW, operates with advanced circulating fluidized bed boiler systems designed to minimize environmental impact and consists of three units. The facility features a low water consumption design based on a dry cooling system, distinguishing it from similar plants in Türkiye. Additionally, it has a quarry infrastructure supplying limestone for use in the wet system integrated into its flue gas desulfurization (FGD) system. This setup enables the addition of limestone to both the furnace and wet FGD system for effective SO₂ emissions control.



With a lignite consumption rate of 1,8 tons per MWh, the plant generates approximately 3,705 GWh of electricity annually, meeting around 2% of Türkiye's total electricity demand and supplying energy equivalent to 1.6 million households. Operating with an annual capacity factor of 91%, it ranks among the most efficient lignite power plants in Türkiye.

The Akademi at TufanbeyliEnergy Base is an internal educational and developmental institution established to enhance the technical and professional competencies of Enerjisa Üretim employees. Akademi ensures continuous updating of technical knowledge, adaptation to emerging technologies, and reinforcement of workplace safety culture through structured training programs based on reskilling and upskilling methodologies. Educational modules include practical training in energy production technologies, maintenance and operation processes, digital systems, and occupational health and safety.

TufanbeyliEnergy Base contributes extensively to the regional and national economy beyond electricity generation. By utilizing local low-calorific lignite, the facility prevented USD 231 million in energy imports in 2024, thereby reducing Türkiye's reliance on foreign energy sources. It also contributed USD 53 million directly to public finances through taxes. Local economic contributions through the supply chain amounted to USD 16 million, providing employment for 1,407 people, with 70% sourced locally. Additionally, the plant holds the distinction of being Türkiye's first lignite facility certified under the ISO 55001 Asset Management System, indicative of its systematic lifecycle management practices and decision-making driven by data analytics, thus optimizing performance, cost, and risk balance in alignment with international standards.

The facility has obtained the Zero Waste Certificate from Türkiye's Ministry of Environment, Urbanization, and Climate Change. All waste materials are recycled, reintegrating them into the economic cycle. The plant ensures zero direct discharge of industrial wastewater to the environment by treating and reusing all wastewater internally. Emissions are continuously monitored via Continuous Emission Monitoring Systems (CEMS). All six official environmental inspections conducted in 2024 resulted in zero non-compliance.



Mining activities in the Tufanbeyli lignite field are carried out according to the principles of open pit mining and production is based on the extraction of near-surface lignite reserves using large construction equipment by step excavation method (there are no closed underground pits). Field safety is continuously monitored through real-time digital slope stability monitoring systems, geotechnical sensors, and unmanned observation technologies; potential deformations are detected via early warning systems. All operations are conducted in an integrated manner with advanced ccupational health and safetyprotocols, machine-assisted excavation techniques, and remote monitoring infrastructure.







Mining operations at the Tufanbeyli lignite site employ open-pit extraction techniques, utilizing arge-scale machinery and phased excavation for near-surface lignite reserves. Site safety is continuously monitored through real-time digital slope stability monitoring systems, geotechnical sensors, and unmanned observation technologies. Early warning systems detect potential slope deformations, and operations adhere strictly to advanced occupational health and safety protocols and remotely monitored excavation techniques.

The TufanbeyliEnergy Base implements numerous sustainability initiatives aimed at rural development and social welfare, collaboratively developed with local communities. These activities reflect an integrated development approach aligned with the United Nations Sustainable Development Goals (UN SDGs). Projects enhancing regional irrigation infrastructure, promoting sustainable agricultural practices, rehabilitating pasturelands, and managing natural resources directly contribute to **SDG 2** (Zero Hunger), **SDG 6** (Clean Water and Sanitation), and **SDG 15** (Life on Land). To date, the planting of **170,000** saplings has bolstered ecosystem services and biodiversity conservation. Moreover, infrastructure and equipment support provided to educational institutions in rural areas have improved educational conditions, contributing to **SDG 4** (Quality Education) and **SDG 10** (Reduced Inequalities). These initiatives form part of a long-term, holistic vision incorporating both environmental sustainability and social inclusiveness.

Overall, TufanbeyliEnergy Base exemplifies a comprehensive transformation model for Türkiye, encompassing energy production, economic growth, environmental stewardship, and social inclusion. Leveraging domestic resources strategically, the facility continues evolving in alignment with future-oriented strategies including just transition, carbon footprint reduction, and regional development.











2. FOSSIL FUELS AND JUST TRANSITION IN THE WORLD AND TÜRKIYE

2.1. GLOBAL PERSPECTIVE AND THE PROCESS OF TRANSFORMATION

Since the Industrial Revolution, fossil fuels have predominantly satisfied global energy demands, becoming essential drivers of economic growth. However, surpassing environmental thresholds, climate change, and ecological disruptions have prioritized energy system transformations internationally (Meadows et al., 1972; UNEP, 1972). Environmental movements gained momentum from the 1960s onward, with scholars such as Boulding advocating for the consideration of economic systems within ecological limits. The 1972 Stockholm Conference underscored the connection between environmental sustainability and human welfare, laying foundations for sustainable development (UNEP, 1972). Subsequently, the Brundtland Report (1987) articulated the necessity of meeting current needs without compromising future generations.

One pivotal step in addressing climate change was the 1992 United Nations Framework Convention on Climate Change (UNFCCC). The subsequent Kyoto Protocol (1997) and Paris Agreement (2015) introduced binding commitments aimed at limiting global greenhouse gas emissions and became foundational frameworks guiding energy transitions. Specifically, the Paris Agreement targets limiting global temperature rise to well below 2°C, preferably 1.5°C, compared to pre-industrial levels.



- Social dimensions of energy transitions, as highlighted by the International Labor Organization (ILO, 2015), involve safeguarding employment, reskilling workers, and generating new opportunities. Türkiye ratified the Paris Agreement in 2021, subsequently updating its Nationally Determined Contribution (NDC) in 2023, aiming to reduce emissions by 41% by 2030 (ÇŞİDB, 2023).
- Transitions away from fossil fuels vary significantly across nations. Developing countries often experience complex transitions due to their infrastructure, employment, and economic characteristics. Nations such as China, India, and Indonesia continue to be prominent in coal production (IEA, 2020; TKİ, 2024). In China, the presence of 3.2 million coal mine workers necessitates careful planning of social aspects in transitioning to a low-carbon economy.
- Globally, employment in fossil fuel sectors is declining, exemplified by a 50% reduction in coal mining employment in the USA between 2010 and 2020 (Bulmer et al., 2021). This underscores the risk of deepening global inequalities through energy transitions (Christiansen et al., 2022). Just transition policies thus become critically important. The World Bank (2021) recommends five core policy areas including social protection, reskilling, employment support, regional development investments, and public-private partnerships. These strategies aim to achieve environmental objectives while maintaining social cohesion and economic stability.



Globally, strategies for just transitions vary according to social, economic, and political contexts. "Germany exemplifies proactive strategies, targeting the closure of coal plants by 2038 supported by comprehensive social policies such as retraining, voluntary retirement packages, and regional development programs (Kittel et al., 2020; Oei et al., 2020). Germany's "Energiewende" strategy serves as a leading example. Similarly, France and the UK have advanced or completed their coal phase-out processes (Oei et al., 2020; Kaizuka, 2024). However, the UK's transformation in the 1980s, lacking sufficient social protections, led to increased vulnerabilities in some regions (Kaizuka, 2024). Poland emphasizes artificial intelligence-supported employment reallocation and regional development projects aligning with EU objectives (Sokolowski et al., 2022). Greece and North Macedonia implement just transition programs with EU technical and financial support (Pavloudakis, 2021; Siontorou, 2023). Colombia is developing strategies to reduce the environmental and social impacts of its coal export-dependent economy, whereas the USA accelerates its energy transition with comparatively slower progress in social policy implementation (Cardoso and Turhan, 2020; Dahl et al., 2022). Australia follows a structured transition plan encompassing early retirement, social security, and employment reassignment initiatives (Quiggin, 2020).



2.2. THE SITUATION IN TÜRKİYE

The processes of energy transition and just transition in Türkiye are becoming increasingly important in line with climate change mitigation and sustainable development goals. Türkiye has intensified its efforts towards renewable energy transition and begun developing holistic approaches that consider the economic, social, and environmental impacts of this transformation. In this context, just transition aimsnot only to reshape energy infrastructure but also to minimize the impact of this transformation on society, providing workers and local communities with a more sustainable future.

Coal mining in Türkiye dates back to the 19th century Ottoman era, when it began in Zonguldak Ereğli. During that period, coal was a critical resource for meeting the Ottoman navy's energy needs and supporting industrialization. Following the proclamation of the Republic, coal production was incentivized through state-supported industrialization policies in the 1930s, highlighting regions such as Zonguldak, Soma, and Tunçbilek (TKİ, 2024; Erol, 2007). The establishment of the Turkish Coal Enterprises (TKİ) in 1957 played a significant role in institutionalizing state-led coal production. The oil crises of the 1970s accelerated the shift towards domestic resources, leading to increased investments in thermal power plants based on vast lignite reserves, such as the Afşin-Elbistan basin (Ediger, Berk & Kösebalaban, 2014). In the post-1980 period, the integration of imported coal and natural gas into the energy system diversified energy production while gradually reducing coal's share in total generation.

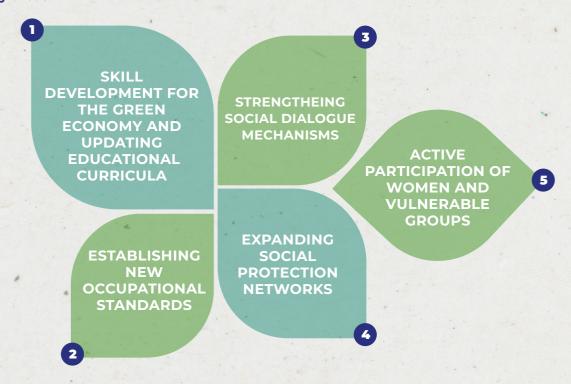
Today, coal accounts for approximately **42.13 million tons** of oil equivalent (Mtoe) in Türkiye's total primary energy supply, making it the third-largest resource after oil and natural gas (EiGM, 2023).

Domestic coal production reached 19.63 Mtoe as of 2022. Türkiye's largest coal reserves consist primarily of lignite, with a total reserve of 20.53 billion tons, of which 429 million tons are located in the Adana-Tufanbeyli basin (TKi, 2024). Imported hard coal is used in industrial applications and high-efficiency power generation facilities, with total imports amounting to 22.86 Mtoe of hard coal and 0.79 Mtoe of coke coal. While the share of domestic sources in energy supply increased to 32.2% in 2022, dependency on imports remains high.

The private sector has expanded its role in lignite production in recent years, accounting for 64.3% of total lignite output in 2023, highlighting its growing influence in the energy transition process.



The just transition process in Türkiye is shaped not only by technical and economic factors but also by the goals of reducing social inequalities and protecting workers. The ratification of the Paris Agreement in 2021 and the announcement of the 2053 net-zero emissions target were turning points in institutionalizing this transition. The National Just Transition Strategy, developed under the 2024–2030 Climate Change Mitigation Strategy and Action Plan published by the Ministry of Environment, Urbanization, and Climate Change, is structured around seven core themes and summarized into the following five key areas:



The role of businesses in the just transition is crucial due to the private sector's substantial production and investment capacities. A report by Global Compact Turkey (2024) underscores the necessity for businesses to transparently share transition plans, uphold employee rights, and inclusively engage with local communities. Supporting workforce transitions to emerging renewable energy sectors and equipping employees with relevant skills are critical contributions expected from businesses. According to Türkiye's long-term energy projections, coal's share in energy production is anticipated to gradually decline, yetexisting plants will likely remain operational until their technical lifespans conclude. Therefore, a planned, socially balanced, and economically feasible transition is imperative.

Prioritizing domestic production capacity preservation and regional development support is essential for transition success. The energy transition represents not only carbon reduction but also protection for vulnerable groups, creation of new opportunities, and promotion of social equity. Ultimately, Türkiye's just transition is shaped by government policies, private sector investments, civil society oversight, and labor organization participation. Its success depends on coherent cooperation among stakeholders and the formulation of transition models sensitive to local realities.



3. RESEARCH PROCESS AND METHODOLOGY

The just transition planning for the TufanbeyliEnergy Base is not merely a technical transformation but also involves a comprehensive analysis covering socio-economic, cultural, and environmental dimensions. Therefore, the research process underpinning this plan has been designed with a multilayered, interdisciplinary, and participatory approach. The foundation of the just transition planning consists of secondary data and field research. The aim of this study is to understand the priorities and sensitivities of all regional stakeholders, ensuring that the transition process is fair, feasible, and sustainable.



3.1. RESEARCH TEAM

The study conducted in 2024 was carried out by three key units that brought together field experience and academic expertise: the Rural Development Unit, the Labor Relations Unit, and the Green Jobs & Green Economy Unit. Each unit collected data, performed analyses, and integrated their findings in a holistic structure. This framework allowed for the simultaneous evaluation of diverse topics, such as regional development, employment transformation, and environmental adaptation.

3.2. RESEARCH APPROACH: THREE-STAGE MULTI-METHOD

This research was conducted using a multi-method approach, combining three main data collection techniques: participant observation, in-depth qualitative interviews, and quantitative surveys. This methodological diversity enabled both deep qualitative insights and highly representative findings through large-scale numerical data.





3.2.1. PARTICIPANT OBSERVATION TECHNIQUES

In the first phase of the study, systematic field observations were conducted in the town center, surrounding neighborhoods, and production facilities to analyze the socio-cultural structure, working conditions, and environmental aspects of the region. The observations focused on strategic locations, including the mine site of the power plant, settlements within the impact area, and cultural heritage sites (such as Şar Ruins). This phase was critical for understanding the research context in-depth and ensuring that the recommendations aligned with local realities.

3.2.2. QUALITATIVE RESEARCH: INTERVIEWS AND FOCUS GROUP DISCUSSIONS

In the second phase, qualitative data collection techniques were employed to gain deeper insights. A total of 30 semi-structured individual interviews were conducted with various employee groups, residents, and civil society representatives. In addition, 10 focus group discussions were held with worker representatives, public institutions, suppliers, and NGOs.

Through qualitative methods, participants' perceptions regarding energy transition, livelihoods, and social life were thoroughly analyzed. Furthermore, to broaden stakeholder engagement, 10 additional stakeholder meetings were organized. These meetings provided a foundation for building mutual trust and fostering a sustainable social dialogue environment.



3.2.3. QUANTITATIVE SURVEY

In the third phase of the research, a comprehensive survey was conducted involving a total of 288 participants employed by Enerjisa Üretim and its subcontractors. The questionnaire was developed based on the World Bank's "Skills and Preferences Survey" and adapted specifically to the local context. This application enabled a systematic quantitative analysis of the workforce's existing skill sets, employability levels, occupational orientations, and educational needs. The collected data facilitated analyses across multiple variables, including age, educational attainment, professional experience, income distribution, social security status, as well as technical and social competencies.



3.3. PARTICIPATION AND FEEDBACK MECHANISMS

The findings obtained through the Advisory Board, which was established during the research process, were periodically communicated to local stakeholders and subject matter experts. Final outputs were subsequently reviewed and refined in line with received feedback. To strengthen the participatory approach, a total of four workshops were organized in Adana, Istanbul, and Tufanbeyli, where evaluations and ecommendations from diverse stakeholders were solicited. These mechanisms ensured that the process proceeded transparently, inclusively, and sensitively to local contexts, while also fostering mutual learning and trust-building among participants.

4. TUFANBEYLI: CURRENT SITUATION AND FUTURE PROSPECTS



Tufanbeyli district is situated in southern Türkiye, northeast of the Taurus Mountains, at an elevation of 1,450 meters above sea level. The district's relative remoteness from major urban centers such as Adana, Kayseri, and Kahramanmaraş has significantly influenced its socio-economic development, limiting access to basic public services due to transportation challenges. The region experiences a continental climate characterized by severe winters and dry, cool summers. Vegetation predominantly comprises steppe, with scattered forested areas.

Geographically positioned with robust agricultural infrastructure and abundant natural resources, Tufanbeyli holds substantial potential for regional development. Approximately one-third of the district's land area is arable; however, irrigation capacity is limited to just 12%, reducing agricultural productivity. Crops such as wheat, barley, and chickpeas are widely cultivated, while irrigated lands support sugar beets, beans, and potatoes. Fruit production is minimal, mainly limited to small-scale, family-run operations.

Prior to the establishment of the power plant, agriculture and livestock farming constituted the primary economic activities in the district. Sugar beet production peaked at 28,000 tons in 1998, involving approximately 1,300 farmers. Livestock farming involved small-scale family enterprises maintaining approximately 9,610 cattle and 14,500 small ruminants. However, limited modernization in agricultural practices and inadequate infrastructure constrained sectoral development.



The commissioning of the Tufanbeyli Energy Base significantly transformed the district's economic landscape. Initiated in the 2000s with the exploitation of local coal reserves, the 450 MW power plant became commercially operational in 2015, positioning the region as a key player in energy production. This development positively

gional labor and contributing directly to the economy.

Nevertheless, the migration

impacted on local employment, prioritizing re-

of younger populations to urban centers continues, exacerbating the elderly dependency ratio. This migration is driven primarily by deficiencies in educational, cultural, and social infrastructure. According to Turkish Statistical Institute (TÜİK) data, the aging population's increasing needs highlight the importance of strengthening social security

networks. Social projects led by Enerjisa Üretim have contributed significantly by improving educational infrastructure, providing equipment support to public institutions, assisting farmers through agricultural subsidies, and delivering post-disaster aid. These initiatives have trengthened the company's positive relationship with the local community.

A walnut grove in Tufanbeyli

Currently, energy production and mining activities are major sources of employment in Tufanbeyli. Educational data indicates that 45% of the plant workforce completed primary or secondary education, 38% are high school graduates, and only 16% possess associate or undergraduate degrees. Emphasizing the principle of leaving no one behind, targeted interventions must be developed for workers with basic education levels, who face higher social vulnerability risks, in addition to those directed at higher education graduates. Considering these factors, three core elements are crucial for Tufanbeyli's future development:

ECONOMIC DIVERSIFICATION

It is essential to create new employment opportunities in agriculture, livestock farming, rural tourism, and entrepreneurship.

SOCIAL EMPOWERMENT

Investments aimed at enhancing education and living standards should be prioritized to encourage youth retention in the region.

PARTICIPATORY TRANSFORMATION

Ensuring active involvement of local stakeholders during the power plant's transformation process is vital to enhance social cohesion.

Tufanbeyli, with its abundant local resources, cultural heritage, and harmonious natural environment, has the potential to pioneer not only energy production but also a productive, resilient, and green economic model. Enerjisa Üretim's commitment to managing this transformation responsibly and inclusively represents a significant step toward contributing to the region's sustainable future.



5. VISION

The Just Transition process initiated by Enerjisa Üretim for the TufanbeyliEnergy Base is not solely an energy transformation program; it also constitutes a social transformation initiative centered on employees, suppliers, and the local community. The vision articulated within this context aims to implement a transformation scenario that prioritizes social integrity, sustainable development, and inclusivity, ensuring no individual is left behind.

5.1. CORE OBJECTIVE

The Just Transition aligns with Enerjisa Üretim's goal of achieving net-zero emissions by 2040. In accordance with the company's long-term targets, a targeted technological transformation program is underway to repurpose existing thermal power plant assets. This technological transition progresses along two primary axes.

The first axis involves expanding renewable energy production at the site through solar energy investments integrated into the existing electricity infrastructure. Utilizing current grid connections and decommissioned mining sites, renewable production capacity will be expanded without requiring additional land. Energy storage systems will further enhance system flexibility, provide ancillary services, and facilitate the integration of variable renewable resources.

The second axis explores the site's potential for alternative uses through low-emission, value-added solutions. Opportunities to repurpose existing electrical and cooling infrastructure into data processing and computing centers are under evaluation. This strategy aims to generate new economic value while minimizing land-use impacts. Additionally, should carbon capture technologies mature and scale appropriately, purified production processes may emerge as viable long-term alternatives.

Advanced technologies play a critical role in this context. According to the International Energy Agency (IEA, 2021), nearly half of the cumulative CO_2 emissions reductions anticipated by 2050 will depend on technologies currently in prototype or demonstration stages. However, substantial uncertainties remain regarding the maturity timing, scalability, and systemic impacts of these technologies. Existing probabilistic models inadequately capture the complete range of variability and potential mitigation outcomes. Therefore, a cautious yet opportunity-oriented approach is adopted, incorporating a flexible strategic planning perspective closely aligned with technological developments.

This technological transformation extends beyond physical infrastructure, encompassing a comprehensive shift in workforce composition and competencies. To effectively implement renewable energy production technologies, energy storage solutions, digital infrastructures, and carbon reduction strategies, workforce reskilling and upskilling initiatives are crucial.

Ensuring the success of this transition involves detailed efforts in technical training programs, transitioning workers into new occupational categories, and strengthening regional employment infrastructure. Structural shifts in production methodologies might necessitate gradual workforce reconfiguration. In response, uncertainties within the process are transparently managed, with continuous dialogue and collaborative planning involving employees and stakeholders.



The transformation of TufanbeyliEnergy Base aims not only to reduce carbon emissions but also to evolve into a new center of energy and technology characterized by strategic flexibility, digital capacity, and regional development potential. A human-centric and inclusive approach is fundamental to this journey, positioning employees as essential participants who not only adapt to but actively shape the transformation.

5.2. IMPLEMENTATION MECHANISMS

Four primary implementation mechanisms have been identified to ensure that the targeted transformation achieves tangible social and environmental outcomes.

STRENGTHENING PARTICIPATORY PROCESSES

The success of the just transition process depends significantly on the active involvement of a broad range of stakeholders, including local communities, labor unions, public institutions, civil society organizations, and academic institutions. To this end:

- Feedback has been collected from various loca actors starting at the neighborhood level, and integrated into the planning process
 - Workshops, consultation meetings, and focus group discussions have been conducted to enhance awareness and gather comprehensive insights.
 - A participatory governance approach has been adopted to identify needs and develop responsive solutions.

3. ALIGNINGTHE TRANSITION PROCESS WITH A STRATEGIC TIMELINE

Effectively managing the impacts of the transitior process on local communities and employees requires a coordinated and structured timeline.

Thus, the transition process

Has been structured to align with carbon reduction targets through 2040.

Plans are being developed for workforce transformation, skill development, re-employment, and supply chain adjustments.

Short-term, medium-term, and long-term action plans are being tested under various scenarios, and comparative impacts are analyzed.

This structured approach aims to ensure a step-by-step, transparent, and adjustable transition process.

MECHANISMS **MPLEMENTATION**

2. ENHANCING ACCESS TO GREEN FINANCING

Financial sustainability is crucial for the long-term viability of investments within the just transition framework. Consequently:

Strategies have been developed to access green financial instruments such as green bonds, carbon credits, and sustainable development funds, to finance Enerjisa Uretim's just transition initiatives

Plans include directing financial resources not only to transformative technologies but also to social support mechanisms.

Collaboration opportunities with national and international financial institutions are being explored.



4 SOCIAL PROTECTION POLICIES IN THE TRANSITION PROCESS

The future of the workforce is a critical factor in ensuring the social legitimacy of the plant's transformation. In this regard:

- Training programs and professional development opportunities will be provided to equip current employees with new skills.
 - Strategies for re-employment will be assessed in integration with new investment areas in the region (such as agriculture, tourism, renewable energy, and digital services).
 - Social policies will emphasize gender equality, youth skill development opportunities, and social equity.

This approach ensures the practical application of the principle "no one left behind.

The strategy developed specifically for Tufanbeyli serves as a model for Türkiye's just transition practices. The objective extends beyond transforming a single power plant; it encompasses the holistic evolution of economic, social, and cultural dimensions into an integrated development plan. This vision aims to construct a sustainable structure compatible with future energy systems, environmentally respectful, human-oriented, and economically viable.



6. NEEDS, DIRECTIONS, AND RECOMMENDATIONS FOR JUST TRANSITION PROCESS

This section outlines the recommendations developed for Tufanbeyli's just transition process, structured around two main strategic axes: "Green Jobs and Skill-Oriented Employment Policies" and "Rural Development-Oriented Transformation and Economic Diversification." These axes emphasize the dimensions of employment creation and economic diversification, placing the labor market and local entrepreneurial potential at the core. Two critical dynamics in just transition processes, employment and entrepreneurship, have been adapted to align with Tufanbeyli's socio-economic characteristics and regional requirements. The first axis focuses on policies, skill development programs, and re-employment opportunities designed to facilitate the local workforce's adaptation to a green economy, addressing both current and future labor market needs. The second axis explores models that can be implemented in agriculture, tourism, digital services, and entrepreneurship based on local resources, aiming to support rural development and achieve economic diversification. These strategic directions complement each other, forming the foundational elements of a comprehensive development roadmap that ensures economic sustainability and social inclusiveness throughout Tufanbeyli's transformation process.

6.1. GREEN JOBS AND SKILL-ORIENTED EMPLOYMENT POLICIES

6.1.1. CURRENT SITUATION, POTENTIAL CONDITIONS AND NEEDS

Labour Organization (ILO, 2022), green jobs encompass employment areas that emerge from environmental sustainability objectives, providing economic, social, and environmental benefits. These jobs are classified as direct, indirect, and induced, supporting environmental protection alongside economic development through transformations in energy, agriculture, industry, tourism, and construction sectors. Green employment not only reduces carbon emissions but also promotes sustainable economic growth and social equity. For developing countries, green jobs enhance energy security, diversify local economies, and foster resilient structures (ILO, 2019; Skills for a Greener Future, 2019). Coupled with just transition strategies, these jobs support social cohesion by facilitating workforce inclusion of women and disadvantaged groups.

Renewable energy and circular economy sectors are rapidly expanding (Nikas, 2016). Investments in solar and wind energy create diverse employment opportunities, ranging from production to maintenance. Energy efficiency projects stimulate employment in industry and construction, while sustainable agriculture increases farmer income and mitigates environmental impacts (ILO, 2019). The workforce in Tufanbeyli primarily occupies low- to medium-skilled roles, necessitating skill transformation programs for integration into green sectors. Technical staff at the power plant partly comprise residents returning due to family ties and others attracted by favorable working conditions from nearby cities.

Agriculture continues to represent one of the primary economic activities in Tufanbeyli. However, due to the predominantly low value-added nature of production, the agricultural sector does not generate the desired level of income. Income levels remain generally low, and despite possessing relevant knowledge and experience, many agricultural workers can only engage in subsistence-level farming.



Consequently, transforming agricultural production into a market-oriented, high value-added, and attractive employment field constitutes a critical necessity.



Türkiye's ongoing energy transition necessitates increased renewable resource utilization. As of 2022, approximately 42% of energy supply relied on fossil fuels, with renewable sources around 15% (TKİ, 2023). This share continues to grow, revealing significant solar and wind energy potential. Türkiye, with an average of 2,737 hours of sunshine, has a solar energy potential of 56 GW and a wind energy potential of up to 48 GW (Renewable Energy Potential, 2024). Additionally, Türkiye ranks fourth globally with a geothermal capacity of 1.6 GW. Crucial to this successful transition is integrating workers exiting coal and thermal plant sectors into renewable energy fields such as solar panel production and wind turbine maintenance (Portakal, Tamcı, and Acar, 2024). The participation of women and disadvantaged rural groups in these initiatives significantly promotes social equity. Green jobs also indirectly create employment opportunities through associated supply chains (Ozsoy, 2016).

The TufanbeyliEnergy Base represents a crucial employment and economic component locally. In linewith Türkiye's low-carbon economic goals, the plant's transformation must adhere to principles of social and economic sustainability. Tufanbeyli's significant solar and wind resources can become meaningful projects, enhanced through workforce skill transformation programs. The Tufanbeyli Vocational and Technical Anatolian High School can play a pivotal role through technical training programs. Projects by Çukurova Development Agency, SYDV, Tufanbeyli Municipality, and UNDP provide considerable opportunities for strengthening local capacity. Supporting agriculture and livestock, particularly involving women and youth in cooperative-based production, will enhance economic diversity and resilience.

Tufanbeyli's natural beauty and historical wealth offer potential for ecotourism, generating supplementary income for residents. Furthermore, disaster management experience gained by workers during the 2023 earthquakes constitutes a strategic area for enhancing community resilience. Risks such as job losses during the energy transition must be managed via social protection mechanisms and effective dialogue. Comprehensive skill transformation programs should be implemented to support local employment in renewable energy, agriculture, livestock, and tourism sectors.



6.1.2. RECOMMENDATIONS

This section presents a range of recommendations and alternative approaches designed to support Tufanbeyli's transition towards a green workforce. Each suggestion is tailored to local potential, requirements, and areas for development, with the applicability of these ideas subject to collaborative assessment involving regional stakeholders. Covering areas from education and entrepreneurship to agricultural production and the service sector, these recommendations aim to encourage diverse developmental pathways. The presented options should be viewed not as a rigid roadmap but as adaptable components contributing to Tufanbeyli's just transition process.



ENERJISA ÜRETİM ACADEMY

Enerjisa Üretim Academy, operating within the TufanbeyliEnergy Base with substantial infrastructure, provides an institutional learning environment designed to enhance employee competencies, facilitate access to current technologies, and promote innovative perspectives. The Academy's role can extend beyond internal training, addressing regional workforce needs by adapting its educational programs to include sustainable energy, green finance, and digital competencies. Initiatives such as "Green Energy Transformation Ambassadors" could further foster active employee engagement in the transformation process. By integrating education, research and development, and certification processes through collaboration with universities, vocational high schools, and international partnerships, the Academy has the potential to evolve into an exemplary regional and national training center.



DEVELOPMENT OF AGRICULTURAL PRODUCTION AND FOOD PROCESSING

Tufanbeyli's economy, significantly based on agriculture with **300,000 decares of arable land**, possesses considerable potential to generate added value through processing local products. Approximately **50.4%** of the workforce has indicated openness to developing technical skills, offering substantial advantages for agriculture-based industries. Integration of current agricultural products into regional and national supply chains could be strategically planned. Encouraging the production, processing, and packaging of legumes, particularly Tufanbeyli beans, medicinal and aromatic plants, and fruits could enhance employment and export opportunities. Establishing circular systems linking agriculture and livestock through waste recycling initiatives may be beneficial. Local authorities could strategically monitor these developments, identify leading sectors, and align planning with central support mechanisms, promoting economic diversification and employment growth.



3

STRENGTHENING INDUSTRIAL INFRASTRUCTURE AND ECONOMIC DIVERSIFICATION

Developing non-agricultural economic activities could significantly enhance economic diversity and employment opportunities in Tufanbeyli. Machinery industries, manufacturing, and service sectors could develop to support agricultural output processing. For instance, establishing a technologically equipped packaging facility and planning for feed machinery production related to livestock could be explored. The regional flora supports profitable medicinal and aromatic plant production, presenting opportunities to expand significantly. Enhancing value-added activities such as medicinal and aromatic oil extraction, packaging, and branding may also be feasible. Additionally, producing processed food items like fruit juice and yogurt could further increase economic returns. While initially sourced externally, industrial kitchen equipment could eventually be locally manufactured. These initiatives could generate short-term employment and support long-term regional industrialization aligned with local demands.

4

DEVELOPMENT OF THE SERVICES SECTOR

About 40% of employees at TufanbeyliEnergy Base engage in non-production-related services such as cleaning, catering, security, and transportation. This demographic structure presents an opportunity for developing the services sector, leveraging experienced labor and addressing unmet local demands. Limited social infrastructure in Tufanbeyli forces residents to seek essential services externally. Initiatives in catering and transportation could quickly generate employment and improve local living standards. Small-scale businesses employing skilled chefs, servers, and cleaners could be established, supported by KOSGEB funding targeting female entrepreneurs. Transport cooperatives between central and peripheral neighborhoods could boost economic activity and facilitate access to social services. Recreational and sports facilities, along with cultural and artistic investments, could further enhance community engagement and regional appeal.

5

ENTREPRENEURSHIP SUPPORT AND ENHANCED ECONOMIC DIVERSIFICATION

Considering Tufanbeyli's natural and human resources, entrepreneurship opportunities tailored for small and medium-sized enterprises could be established. Foundational entrepreneurial skills appear open to development, suggesting immediate support for skill enhancement, medium-term business sustainability, and long-term economic diversification through effective local resource utilization. Promoting entrepreneurial culture via knowledge sharing and best practices dissemination as well as facilitating training and financial access through cooperation among KOSGEB, local authorities, and development agencies, could significantly enhance entrepreneurial capacity. Supporting pilot initiatives, addressing challenges faced by small enterprises, and developing risk management strategies may further foster entrepreneurship.



SOCIO-ECONOMIC SOLIDARITY AND DEVELOPMENT THROUGH COOPERATIVES

In economies with limited entrepreneurial experience, such as in Tufanbeyli, individual entrepreneurship may entail certain risks, which could further escalate in the long term due to declining profitability. In this context, cooperatives can be considered as community-based, secure, and collaborative alternatives. Cooperatives, which can be established by at least seven individuals, operate based on principles of democracy, equality, honesty, and self-help. Their organizational potential spans numerous sectors including agriculture, irrigation, forestry, apiculture, transportation, and food processing.

In line with this perspective, successful cooperative examples from Türkiye, particularly those active in agricultural production, irrigation, forestry, beekeeping, and food processing, could be visited for experiential knowledge sharing. Furthermore, initiatives supporting existing cooperatives, such as the Saimbeyli Women's Cooperative and Tufanbeyli Women's Cooperative, may be undertaken, while new cooperatives can be established with interested local farmers. Additionally, institutions like Public Education Centers may provide structured training programs aimed at enhancing cooperative practices, promoting institutionalization, and increasing membership among local farmers in Tufanbeyli.

Women's cooperatives specifically can play a critical role in fostering female employment. To ensure the sustainability of cooperatives, supporting financial literacy and developing digital infrastructure are essential. Over time, successful cooperatives may expand their reach through e-commerce platforms, thus offering their products to broader markets.



ENHANCING ENTREPRENEURSHIP THROUGH ALTERNATIVE FINANCIAL SUPPORT

Microcredit programs could effectively facilitate market integration and entrepreneurship among small-scale producers in Tufanbeyli. Manageable, low-value loans could support the involvement of disadvantaged groups in production processes, especially at initiation stages. Identifying suitable economic activities and conducting risk analyses could refine credit strategies. Collaboration between public and private sectors can define application criteria, target groups, loan limits, and repayment schedules. Comprehensive community outreach, targeted training, regular monitoring, and technical assistance for high-risk entrepreneurs could optimize outcomes. The program's impact and sustainability should be periodically assessed and revised accordingly.



DEVELOPING A JUST TRANSITION AND ECONOMIC DIVERSIFICATION MODEL FOR FOREST VILLAGES

Forest villages, constituting 44% of Tufanbeyli, can strategically contribute to the just transition process leveraging their biodiversity, forest products, and traditional production skills. Establishing micro-workshops for non-timber forest products such as resin, thyme, sage, and cones; supporting women-focused cooperatives in goat milk, wool processing, beekeeping, and carpet weaving; and implementing regional clustering for furniture-compatible raw material processing could be explored. Ecotourism, cultural heritage routes, and nature-based education programs may significantly boost tourism revenues. Modular vocational training combined with ecosystem-preserving production techniques could ensure both environmental sustainability and economic resilience. Annual monitoring could systematically evaluate success metrics and guide ongoing adjustments.

6.2. TRANSFORMATION AND ECONOMIC DIVERSIFICATION FOCUSED ON RURAL DEVELOPMENT

For Tufanbeyli, the energy transition signifies more than merely altering energy sources; it encompasses rethinking the region's production structure, livelihoods, and social resilience. Developing a new economic approach grounded in rural development can foster a more inclusive growth process beneficial for both current residents and future generations.

6.2.1. CURRENT SITUATION, POTENTIAL CONDITIONS AND NEEDS

Tufanbeyli, established as a district in 1958, had a population of 17,258 as of 2023. The population peaked at 19,184 in 2014, followed by a 10% decline due to migration and aging. However, a 5.2% increase was recorded between 2022 and 2023. Seasonal population increases occur, particularly in the summer due to highland practices (CKA, 2023; Enerjisa Üretim Social Action Plan, 2024). Approximately 36% of residents live in the district center, with the remainder in rural neighborhoods. The elderly dependency ratio stands at 29%, nearly double the national average of 15%. Youth proportion decreased from 15% in 2013 to 12% in 2023, mainly due to migration to cities like Adana, Kayseri, and Kahramanmaraş for employment and education.

Most residents of five rural neighborhoods near the TufanbeyliEnergy Base work in the plant or mining activities, providing a secure income and resulting in an above-average household size of 4.3. Seasonal migrations to the highlands temporarily increase rural household numbers.

Educational infrastructure comprises 21 schools and 150 classrooms. Despite technological enhancements under the FATİH project, deficiencies persist in equipment such as tablets and cameras (Tufanbeyli MEM Strategic Plan, 2024–2028). Teachers are generally young and dynamic. Classroom sizes average 18 students in primary and secondary schools but rise significantly to 31 in high schools. Limited social amenities, including only one school with an indoor sports facility, have weakened student attachment to education, leading to the closure of several schools due to low enrollment. The Vocational College of Tufanbeyli highlights its Electrical and Energy Department. Healthcare infrastructure is limited, featuring a single state hospital with restricted services, and no healthcare centers in rural areas. Enerjisa Üretim has addressed some of these gaps by providing specialized 4x4 vehicles for home care and dialysis patients (Enerjisa Üretim Social Impact Report, 2020).

According to the Socio-Economic Development Ranking Study by the Ministry of Industry and Technology (SEGE 2022), Tufanbeyli ranks 10th among 15 districts in Adana and 651st among 924 districts nationally, categorized within the lower development tier. Social facilities remain inadequate, with limited social spaces apart from cafés for rural youth. The district center lacks cinemas, cultural centers, or theaters. Enerjisa has partially addressed this issue by building sports and social areas within its facilities. Although TOKi housing projects have commenced, the district continues to be viewed as a temporary assignment location for civil servants, negatively affecting institutional continuity.



Tufanbeyli's economy heavily relies on agriculture and livestock, facing significant challenges such as fragmented land ownership, inadequate irrigation infrastructure, and market distance. Cultivated crops on 300,000 decares include barley, wheat, chickpeas, beans, and potatoes. Sugar beet production has declined due to quota restrictions (Pişkin, 2022). Potato production has recently increased, positively influencing local employment (Yücel & Oğuz, 2020). Livestock numbers have significantly decreased over the past two decades, particularly sheep, although milk yields have risen. Women's involvement in livestock is notable, contributing significantly through traditional cheese production. Reviving sheep wool processing and buffalo breeding presents potential opportunities.

Enerjisa Üretim supports local agriculture through walnut seedlings, aromatic plant seedlings, forage seed distribution, repairs of community buildings, and establishing vocational high schools. Tufanbeyli Agriculture Chamber and Dairy Producers Union actively engage local producers. Female farmer participation ranges between 10–15%, notably higher in certain neighborhoods. Festivals promoting local products such as "Tufanbeyli Beans" indicate successful branding initiatives.



The district contains reservoirs with a total capacity of 14 million m³, supporting irrigation over 2,000 hectares. The Göksu River, tributaries, and groundwater sources are vital for agriculture (DSİ, 2021). However, maintenance issues have rendered some irrigation systems non-functional. Grazing regulations and pasture improvement remain urgent needs (Çınar et al., 2018). The district's brown forest soils are fertile and responsive to climatic conditions (Karaosmanoğlu, 2020).

Recently established women's cooperatives and encouraged producer organizations signify progress. Women particularly express interest in reviving traditional crafts such as rug weaving. Promoting local production offers sustainable development potential. Tufanbeyli possesses significant tourism potential, featuring the ancient city of Şar, hiking trails, and opportunities for nature tourism. However, obstacles include transportation difficulties, insufficient promotion, and inadequate accommodation infrastructure. Local geographic indication products and traditional handicrafts offer opportunities for agritourism development.

Tufanbeyli has substantial foundations for rural development, leveraging natural resources, traditional knowledge, and social structures. Preventing youth migration, making agriculture attractive, enhancing social infrastructure, and increasing women's active participation in production require comprehensive support programs. Strengthening irrigation, storage, agricultural education, and marketing infrastructure will retain local economic value and facilitate integration of youth, women, and retirees into economic activities. Tufanbeyli's future relies on activating its full potential through integrated, fair, and sustainable transformation.



6.2.2. RECOMMENDATIONS

Tufanbeyli's historical production culture, traditions of solidarity, and nature-oriented lifestyle provide unique potential for regional transformation. Appropriately harnessing this potential requires an approach that respects local realities and effectively adapts sustainable development goals to the regional context. Recommendations developed within this framework represent a comprehensive strategy structured around the needs and tendencies of the local community, aiming for long-term value creation.



INTEGRATION OF TRADITIONAL AGRICULTURAL PRACTICES WITH MODERN TECHNOLOGIES

To revitalize Tufanbeyli's agricultural potential, addressing irrigation and marketing issues must be prioritized, accompanied by technical training in good agricultural practices and digital applications, supported by technological infrastructure. This approach would enhance ecological compatibility, diversify production with value-added products, encourage youth to return voluntarily, and establish an environmentally sustainable agricultural model. Such a transformation could integrate the district strongly with regional and national economies.

2

DEVELOPMENT OF BASIN-BASED VITICULTURE

Recent interest in indigenous grape varieties and experimentation within the wine industry offers Tufanbeyli's Evci and Taşpınar neighborhoods opportunities in viticulture and winemaking. Identifying existing and abandoned vineyards and local grape types, creating DNA records, and potentially developing breed improvements could foster a viticulture-based rural development model that encourages cooperative work between women and men farmers.

3

EXPANSION OF MEDICINAL AND AROMATIC PLANT CULTIVATION

Tufanbeyli's climate and soil conditions are favorable for cultivating medicinal and aromatic plants such as St. John's Wort, thyme, rosehip, and sage, which grow naturally in the region. Supporting their production, processing, and marketing could enhance sustainable agricultural practices, employment opportunities, and economic diversity. Utilizing family labor efficiently and generating high income per hectare, this model offers substantial export potential and regional development opportunities.



ENHANCEMENT OF DAIRY FARMING AND DAIRY PRODUCTS

According to TÜİK data from 2023, approximately 35,000 small ruminants exist in Tufanbeyli, a resource that can be optimized for sustainable dairy and meat production. Expanding livestock farming and improving milk and meat production quality through relevant training sessions and good agricultural practices could significantly enhance the sector. Reviving neglected practices like buffalo breeding and wool processing into value-added products could further boost local economic development. Special emphasis should be placed on involving women producers and revitalizing local culinary heritage with products of gastronomic and touristic potential, supported by integrated marketing strategies.



CONVERSION OF MINING SITES INTO AGRICULTURAL LANDS

Post-mining areas could be rehabilitated environmentally and transformed into viable living spaces. These regions could be redesigned according to the district's economic, social, and cultural context, utilized for educational, cultural, tourism, or good agricultural purposes. Strengthening regional and national connectivity could turn these areas into attractive hubs. Local agricultural expectations and economic benefits derived from this transformation could be reinvested into rural development projects conducted in collaboration with community stakeholders.

6

AGRIVOLTAIC APPLICATIONS

Agrivoltaic systems, initially introduced in Germany in the 1980s and first implemented in Türkiye by ODTÜ-GÜNAM in 2023, offer combined benefits for agricultural productivity, water management, and renewable energy generation. Enerjisa Üretim's pioneering agrivoltaic projects at Komşuköy and BandırmaEnergy Base position the company as a national leader in this domain. Tufanbeyli could leverage this expertise to implement integrated solutions that enhance farmer incomes and support sustainable development.

7

DEVELOPMENT OF RURAL TOURISM ACTIVITIES

Increasing global and national interest in rural tourism positions Tufanbeyli, particularly areas around the power plant, to capitalize on activities such as nature tourism, highland tourism, mountaineering, cycling, bird watching, and photography. The presence of Çukurova University's Tourism and Hotel Management Vocational School further supports this development. Such initiatives could significantly contribute to rural economic growth.

8

CULTURAL TOURISM DEVELOPMENT CENTERED ON ŞAR ANCIENT CITY

The well-preserved traditional lifestyle of Şarköy presents opportunities for promoting sustainable and culturally compatible tourism. Developing tourism to attract diverse age groups and socioeconomic segments, while preserving and integrating archaeological sites within the existing architectural context, could significantly enhance cultural tourism appeal. Local participation would ensure inclusive social and economic development.





CONVERSION OF LOCAL CULINARY HERITAGE INTO ECONOMIC VALUE

Tufanbeyli's culinary traditions, bolstered by proximity to renowned gastronomic centers like Adana, Kayseri, and Kahramanmaraş, provide considerable potential. Leveraging rising national interest in gastronomy, local products with geographical indication potential, and culinary expertise could attract visitors and stimulate regional economic growth. Integrating local gastronomy into tourism could sustainably enhance economic development through broad community involvement.

10

STRENGTHENING RURAL DEVELOPMENT PLANS THROUGH WOMEN PRODUCER ORGANIZATIONS

The successful increase of women producer initiatives through cooperatives in Türkiye over the past decade could inspire similar approaches in Tufanbeyli. Integrating cooperatives or unions into regional and national social procurement networks could improve product diversity and marketing strength. Overcoming previous experiences of mistrust through transparent, locally supported management systems focused on women's economic needs could enhance gender-sensitive rural development.



EXPANSION OF CONTRACTED AND PRE-SALE PRODUCTION MODELS

Increasing emphasis on social procurement practices by metropolitan municipalities and institutions provides opportunities for Tufanbeyli. Establishing a production and marketing organization under municipal auspices could utilize local cooperative products according to social procurement principles, providing new market opportunities and economic development. Collaborative stakeholder engagement and participatory planning could strengthen fair trade and community benefits.



STRENGTHENING LOCAL TECHNICAL REPAIR INFRASTRUCTURE

Addressing the difficulties local agricultural producers face with equipment repairs, essential for sustainable local production, could be achieved by establishing technical support centers and training programs. Reviving traditional kilim production through vocational training could offer new economic and cultural opportunities, ensuring sustained local production and heritage preservation.

7. INTEGRATED GOVERNANCE AND APPLICABLE STRATEGIES IN THE JUST TRANSITION PROCESS

7.1. GOVERNANCE STRUCTURE FOR THE JUST TRANSITION

Enerjisa Üretim has structured the Just Transition process specifically for the TufanbeyliEnergy Base, supported by a multi-stakeholder, professionally managed governance framework at the institutional level. Within this scope, the internal Just Transition Working Group operates directly under the Sustainability Management Committee, ensuring strategic coordination throughout the process.

7.1.1. STRUCTURE OF THE WORKING GROUP

The Just Transition Working Group includes specialists from diverse departments to provide a comprehensive perspective and adopt a holistic approach to decision-making processes. Committee membership comprises representatives from the following areas:



This structure facilitates the integration of field realities and organizational priorities into a unified platform, ensuring the transformation process is robustly supported at technical, social, and governance levels.

Depending on the requirement, national and international consultants experienced in just transition, rural development, social impact, and reskilling initiatives

6

7.1.2. OBJECTIVES OF THE JUST TRANSITION WORKING GROUP

The Working Group focuses on the following six objectives to enhance institutional ownership of the just transition process, minimize social impacts while enhancing regional resilience, and establish a proactive framework for managing risks associated with the transformation:



Conduct a holistic analysis of the technical, social, and economic impacts of transition plans based on multiple scenarios



Develop social support mechanisms, skill enhancement programs, and re-employment strategies.



Strengthen institutional cooperation with local stakeholders, including municipalities, public institutions, professional associations, unions, and NGOs



Establish partnerships with development agencies, ministries, and financial institutions by developing projects aligned with public and private sector support frameworks



Monitor performance with indicators that ensure transparency and traceability throughout the transformation process



Conduct knowledge-sharing, training, and consultancy activities based on global best practices to enhance institutional capacity



7.1.3. METHODOLOGY

In its activities, the Working Group references the European Union Just Transition Mechanism, the ILO Guidelines for a Just Transition, and the World Bank's social risk management practices. The operational framework is structured around four core principles:



Field-to-Strategy Approach:
Findings from field analyses,
focus group discussions, and
workshops are systematically integrated into decision-making processes



ALTERNATIFLI YOL HARITASI

Alternative Scenario Roadmaps: The power plant transformation is evaluated through multiple technological and economic scenarios, each with corresponding employment, social impact, and infrastructure requirements



DİNAMİK GERİ BILDİRİM DÖNGÜSÜ

Dynamic Feedback Loop: Progress is monitored through defined indicators in areas such as education, women's participation, youth employment, social inclusion, and economic diversification, with dynamic updates based on received feedback



Science-Policy Collaboration: Regular support is sought from national and international experts in policy formulation, rural development, green workforce transformation, and social impact assessment

To implement proposed projects within the just transition process, a transparent, participatory, and systematic framework has been established. This framework is structured around a seven-stage model covering idea generation, prioritization, social acceptance, partnership development, implementation, and monitoring. The model integrates the internationally recognized Stage-Gate approach with the PDCA (Plan–Do–Check–Act) cycle and stakeholder participation mechanisms. *Project proposals are evaluated and managed according to the sequential steps detailed below:*



Annually, project ideas are compiled by an expert committee based on local requirements, socio-economic data analyses, employment potential, and environmental opportunities.



FEASIBILITY ASSESSMENT

Projects undergo multi-criteria analysis, evaluating economic, technical, environmental, and social impacts to establish prioritization.



SOCIAL ASSESSMENT

Social acceptance of projects is evaluated through stakeholder dialogues, surveys, and working groups, employing an inclusive approach sensitive to community needs.



PARTNERSHIP DEVELOPMENT

Strategic partnerships with public institutions, private sector entities, universities, and non-governmental organizations are formed to enhance resource availability and implementation capacity.













Prioritized projects are finalized with detailed budgets, timelines, esponsibility matrices, risk management frameworks, and permit processes.



Projects are executed and continuously monitored using performance indicators. Flexible intervention mechanisms are activated as necessary.



Projects are regularly updated based on collected data and stakeholder feedback, integrating lessons learned into future initiative

This comprehensive framework ensures that projects developed within the just transition process are not limited to planning, but are implemented effectively, transparently, and sustainably.

7.1.4. STRATEGIC PARTICIPATION AND ENGAGEMENT

The Working Group systematically manages external relations, extending beyond internal stakeholders, to enhance social and sectoral acceptance of the transition process. *Within this framework:*



Collaborative platforms are established with institutions such as the Ministry of Labor and Social Security, Ministry of Energy and Natural Resources, Ministry of Environment, Urbanization and Climate Change, Ministry of Agriculture and Forestry, Çukurova Development Agency, Tufanbeyli Municipality, Tufanbeyli District Governorship, KOSGEB, provincial and district directorates of public institutions, universities, and Vocational Training Centers.



Interactive project development aligned with national development strategies, Green Deal commitments, and sustainable_financing mechanisms is promoted.



Processes aimed at establishing sustainable business models are carried out in collaboration with local communities, producer groups, women's cooperatives, and young entrepreneurs.

7.2. INITIATIVES IMPLEMENTED IN PRACTICE

In Tufanbeyli, numerous initiatives have been successfully implemented, demonstrating that the just transition process has advanced beyond the planning phase into tangible actions reflected on the ground. The realized projects detailed below align directly with the thematic priorities recommended in Section 6, contributing significantly to the transformation in areas such as agriculture, animal husbandry, rural infrastructure, value-added production, market integration, and social inclusion. Each intervention has been carefully designed considering the region's existing socio-economic structure and natural resource potential, contributing simultaneously to short-term improvements and ong-term resilience strategies. These initiatives encompass not only physical investments but also social components such as technical training, field consultancy, community awareness, and human capital development. Thus, they correspond with the thematic headings identified in Section 6 both conceptually and methodologically, embodying a holistic approach.





The implemented practices detailed below correspond explicitly to thematic areas outlined in Section 6, including "Development of Agricultural Production and Food Manufacturing," "Advancement of Dairy Farming and Dairy Products," "Expansion of Medicinal and Aromatic Plants," "Integration of Traditional Agricultural Practices with Modern Technologies," "Transformation of Local Food Heritage into Economic Value," and "Strengthening the Rural Development Plan through Women's Producer Organizations." Furthermore, they demonstrate a strong and measurable alignment with multiple targets of the UN Sustainable Development Goals (SDGs).





7.2.1. ENHANCEMENT OF ACCESS TO IRRIGABLE AGRICULTURAL LANDS AND IRRIGATION INFRASTRUCTURE

The rehabilitation of agricultural access roads and irrigation canals in Tufanbeyli constitutes a multidimensional rural transformation initiative that transcends mere physical infrastructure improvements and aligns with long-term development goals.

Rehabilitation of a 7-kilometer agricultural road facilitated improved access to 1,500 decares of irrigable farmland, directly benefiting approximately 300 local producers. By the end of 2024, the scope of this initiative is projected to expand, contributing to enhanced irrigation efficiency across an additional 1,700 decares, thus benefiting a total of approximately 400 farmers. These infrastructure investments not only boost agricultural productivity but also foster increased rural income by facilitating market access for farmers. Furthermore, the clearing of a 3-kilometer irrigation canal has improved water-use efficiency and resilience against drought risks for around 150 hectares of agricultural land.

This initiative closely aligns with the transformation priorities described under the headings "Development of Agricultural Production and Food Manufacturing" and "Economic Diversification Model for Forest Villages," as presented in Section 6. Additionally, it corresponds strongly with the United Nations Sustainable Development Goals (SDGs), particularly Goal 2 (Zero Hunger), Goal 6 (Clean Water and Sanitation), and Goal 13 (Climate Action).





7.2.2. STRUCTURAL TRANSFORMATION THROUGH INTEGRATED LIVESTOCK INFRASTRUCTURE AND ENHANCEMENT OF RURAL RESILIENCE

Livestock-focused infrastructure and production projects implemented in Tufanbeyli and surrounding regions represent not merely temporary interventions, but a comprehensive transformation vision aimed at ensuring long-term agricultural sustainability, input autonomy, and climate adaptation capacity. The triple-initiative framework—comprising Insulated Livestock Shelters, Pasture Improvement, and Alfalfa Seed Distribution—has produced significant impacts in critical areas such as animal welfare, feed security, and income stability for producers. Under the Rural Development and Climate Adaptation Project (KDAKP), supported by IFAD and UNDP, the Livestock Shelter Project has provided thermally insulated and durable structures, securing stable shelter conditions for 120 cattle and 700 small ruminants, thus guaranteeing uninterrupted livestock production. Energisa Üretim contributed by completing the concrete flooring of these structures, exemplifying an effective public-private-international partnership model ensuring high-quality infrastructure. Consequently, spatial and economic stability for livestock producers has been sustained, establishing an exemplary model for modern livestock practices. Complementing this structural transformation, pasture rehabilitation has been undertaken to enhance grazing conditions for approximately 602 cattle, thereby reducing feed costs and alleviating economic pressure on 145 households. The rehabilitation process was designed not merely as a physical adjustment but also incorporated science-based, nature-compatible solutions that respect the biological carrying capacity of the soil. The third component of the initiative involved distributing a total of 9,750 kg of alfalfa seeds, creating a cultivated area of 3,220 decares and ensuring feed security for approximately 265 producers. By the end of 2024, approximately 15 tons of harvested dry hay facilitated the local fulfillment of roughage needs, thus reducing external dependency.



Promoting high-protein and perennial forage species such as alfalfa constitutes crucial measures for enhancing climate resilience and animal health. This tripartite framework aligns closely with the "Development of Dairy Livestock and Dairy Products" thematic area outlined in Section 6. Furthermore, the initiative exhibits strong compatibility with multiple United Nations Sustainable Development Goals (SDGs), specifically Goal 1 (No Poverty), Goal 2 (Zero Hunger), Goal 12 (Responsible Consumption and Production), Goal 13 (Climate Action), and Goal 15 (Life on Land).



7.2.3. VALUE-ADDED AGRICULTURE

The Walnut Sapling Support Program implemented in Tufanbeyli contributes significantly to the district's long-term rural development vision, transcending simple agricultural incentives by integrating agro-ecological compatibility, income diversification, climate adaptation, and transition to high-value-added agricultural production. **During the three-year implementation period, a total of 21,200** walnut saplings were distributed to 270 producers, resulting in a planting area of 650 decares with an adaptation success rate of approximately 99%. The first harvest yielded 60.3 tons of walnuts, generating approximately 9 million Turkish Lira in revenue for producers based on the projected 2024 unit price of 150 TL/kg. This initial revenue illustrates only the beginning of the potential social and economic returns from orchards consisting of long-lived, climate-resilient species.

The scope of the program extends beyond sapling distribution, encompassing technical consultancy, agricultural equipment support, and continuous field monitoring mechanisms. Additionally, tailored technical practices for 45 medium- to large-scale producers facilitated the introduction of modern horticultural standards to the region. A demonstration orchard established with 1,000 hawthorn saplings serves as an exemplary model for disseminating low-water-use and value-added production techniques aligned with climate adaptation goals. Moreover, the distribution of 35,000 sage saplings has supported aromatic plant cultivation, laying foundations for a new, export-oriented product line.

This initiative aligns closely with thematic areas outlined in Section 6, specifically "Expansion of Medicinal and Aromatic Plants," "Integration of Traditional Agricultural Practices with Modern Technologies," "Strengthening Rural Development through Women's Producer Organizations," and "Enhancing Local Technical Repair Infrastructure" (particularly regarding support equipment and field advisory components). Furthermore, it demonstrates robust alignment with multiple United Nations Sustainable Development Goals (SDGs), including Goal 1 (No Poverty), Goal 2 (Zero Hunger), Goal 8 (Decent Work and Economic Growth), Goal 12 (Responsible Consumption and Production), and Goal 13 (Climate Action).





7.2.4. MARKET INTEGRATION OF LOCAL AGRICULTURAL PRODUCTION

The establishment of an 88-ton capacity legumes processing and packaging facility in Tufanbeyli represents a strategic investment significantly enhancing regional development by facilitating market integration and augmenting the value-added potential of local agricultural outputs. By incorporating locally cultivated staple legumes such as beans and chickpeas into the value chain with increased efficiency, this infrastructure expanded its sorting and processing capacity to 133 tons by the end of 2024, directly benefiting 102 producers. Functioning beyond mere processing, the facility serves as a pivotal center enabling rural agricultural products to attain professional, hygienic, and market-competitive standards.

Complementing this production infrastructure, the Tufanbeyli Bean Festival has been strategically implemented as a communication platform to enhance both product visibility and the recognition of local producers' efforts. The festival, attended by approximately 1,000 participants in 2023, contributed significantly to elevating the brand value of geographically distinctive legume products and strengthening producer-community relationships.

This comprehensive initiative aligns with the thematic areas outlined in Section 6, notably "Development of Agricultural Production and Food Manufacturing" and "Transformation of Regional Culinary Heritage into Economic Value." Additionally, the project demonstrates strong compatibility with multiple United Nations Sustainable Development Goals (SDGs), including Goal 2 (Zero Hunger), Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation, and Infrastructure), and Goal 12 (Responsible Consumption and Production).

7.2.5. SOCIAL EQUALITY AND STRENGTHENING RESILIENCE IN RURAL AREAS WITHIN JUST TRANSITION PROCESS

The just transition process extends beyond economic and environmental transformations, necessitating a holistic approach that encompasses multiple social dimensions such as reducing societal inequalities, enhancing human capital, and fostering social cohesion. Within this context, various social investment initiatives implemented by Enerjisa Üretim in Tufanbeyli and surrounding districts, although not directly categorized within the primary themes outlined in Section 6, significantly contribute complementary benefits supporting the region's ocio-economic transformation.

In vocational education, internship opportunities and workshop inventory support provided to 186 students at Enerjisa Vocational and Technical Anatolian High School have facilitated the development of workforce competencies aligned with regional employment needs. Moreover, infrastructure improvements in 26 schools across Göksun, Elbistan, Ekinözü, Kahramanmaraş, and Kozan districts have directly benefited 9,248 students, while career-day events have strengthened vocational awareness among youth, thereby reinforcing foundational human capital for rural communities.

From the perspective of social integration and child rights, basketball training camps organized in Tufanbeyli and Elbistan have engaged 300 children, and art and educational camps at the Elbistan container settlement have provided essential psychosocial support following regional disasters. Additionally, theatre performances aimed at cultural engagement have reached approximately 1,100 children.

In terms of healthcare accessibility, the allocation of a 4x4 vehicle to Tufanbeyli State Hospital for five years has ensured uninterrupted health services for 94 home-care and 30 dialysis patients. Concurrently, medical equipment support extended to Göksun, Saimbeyli, and Tufanbeyli state hospitals has contributed significantly to strengthening the regional healthcare infrastructure.

Efforts in animal welfare, such as sterilization programs for 341 street animals and the provision of 825 kg of animal food to shelters, complement these social initiatives by integrating ecosystem-based approaches.



Collectively, these actions align closely with the just transition principles of "social justice", "equitable service access," and "social cohesion." Furthermore, they demonstrate strong coherence with multiple United Nations Sustainable Development Goals (SDGs), specifically Goal 3 (Good Health and Well-being), Goal 4 (Quality Education), Goal 10 (Reduced Inequalities), Goal 11 (Sustainable Cities and Communities), and Goal 17 (Partnerships for the Goals).

7.3. SUBSEQUENT STEPS

The just transition process implemented around the TufanbeyliEnergy Base is guided by an innovative, forward-looking development vision that surpasses existing social practices. This vision encompasses not only energy transformation but also the reconstruction of the socio-economic fabric, sustainable management of natural resources, and strengthening local capacities in alignment with the green economy. Accordingly, the primary strategic area of focus for the forthcoming period is the implementation of integrated investment planning in cooperation with local governments, public institutions, universities, and development agencies at local, regional, national, and international levels. This approach directly aligns with the strategies proposed in Section 6, including institutional collaboration, participatory governance, and activation of local capacities. The two priority initiatives outlined below embody this strategic vision and are currently undergoing preparatory assessments.

7.3.1. INITIATIVE FOR WILD FRUIT AND MEDICINAL PLANTS FOREST

A preliminary assessment and feasibility study has been initiated for the establishment of a sustainably managed forest focusing on wild fruits and medicinal-aromatic plants to support the just transition process through nature-based solutions. This initiative represents a comprehensive, long-term development approach aimed at ecological restoration, biodiversity conservation, and diversification of local livelihood sources.

The project is currently at an early evaluation stage, involving detailed analysis of land allocation, technical feasibility, economic viability, and potential cooperation models. The assessment is carried out in collaboration with the Faculty of Forestry at Sütçü İmam University under the supervision of Prof. Dr. Fatih Mengeloğlu. The project envisions establishing a cultivation model adapted to climate conditions, prioritizing indigenous plant species with low water requirements. The planned forest will cover approximately 600 decares, with the planting of approximately 160,000 trees and shrubs, including wild fruit species and medicinal-aromatic plants such as rosehip, sumac, clary sage, St. John's wort, mahaleb, and juniper. Additional economic activities such as beekeeping, essential oil extraction, and sustainable harvesting of natural products are also envisaged. Securing land through a 10-year lease agreement with the Directorate General of National Property constitutes the initial step, incorporating social infrastructure (such as pools, fences, roads, and gazebos) to ensure community integration. Potential collaboration frameworks and operational structures are currently under review.

This initiative aligns closely with thematic areas identified in Section 6, particularly "Promotion of Medicinal and Aromatic Plants" and "Economic Diversification Model in Forest Villages,"enhancing these categories by incorporating climate-adaptive agricultural practices. Furthermore, it strongly aligns with United Nations Sustainable Development Goals, including Goal 13 (Climate Action), Goal 15 (Life on Land), and Goal 8 (Decent Work and Economic Growth).



7.3.2. TRAINING ALIGNED WITH JUST TRANSITION AT TUFANBEYLI ACADEMY

A feasibility assessment has been initiated to expand the existing internal training infrastructure of Tufanbeyli Academy, currently serving Enerjisa Üretim employees, into a multifunctional and inclusive skills transformation center accessible to the wider regional community. The primary objective of this initiative is to establish a sustainable learning framework enabling various segments of society, particularly women, youth, and existing employees, to acquire vocational qualifications, technical competencies, and digital skills aligned with the green economy.

Within this ongoing feasibility study, the Academy's current physical and technical resources may be restructured according to lifelong learning principles. The proposed model incorporates integrated approaches involving certified technical training programs, practical vocational workshops, entrepreneurship support initiatives, and digital learning platforms. Consequently, the regional workforce would attain greater adaptability and resilience regarding evolving employment structures, yielding measurable benefits in terms of social inclusion and economic diversification.



This initiative closely intersects with priorities outlined under the headings of Academy, Support for Entrepreneurship and Economic Diversification, Strengthening of Local Technical Repair Infrastructure, and Reinforcement of Rural Development through Women Producers' Organization as detailed in Section 6. Among its long-term objectives are enhancing women's productive skills and employment access, increasing youth retention within the region, and disseminating technical capabilities broadly across the community. The initiative aims to deliver measurable outcomes in the short term through fostering social cohesion and skill enhancement; in the medium term via workforce transformation; and in the long term by promoting economic resilience. Accordingly, this initiative directly supports the United Nations Sustainable Development Goals, particularly Goal 4 (Quality Education), Goal 5 (Gender Equality), Goal 8 (Decent Work and Economic Growth), and Goal 13 (Climate Action).



8. CONCLUSION

The work carried out at the TufanbeyliEnergy Base has provided an evaluative foundation that documents the multi-dimensional implications of the energy transition on the ground and presents a comprehensive Just Transition framework. The Just Transition Plan developed specifically for the TufanbeyliEnergy Base clearly demonstrates that energy transition in Türkiye requires a multi-layered transformation not only in environmental and technical aspects but also at social, economic, and governance levels.

The findings of the study offer concrete recommendations across a broad spectrum—from green work-force transformation and rural development policies to social equity and next-generation technologies—while testing the practical applicability of these recommendations through on-the-ground implementations. Shaped by participatory research processes, this document also serves as a pioneering model that combines institutional learning with a culture of local solidarity.

At Enerjisa Üretim, this plan is considered not only for Tufanbeyli, but as a scalable and adaptable road-map that can be applied to other energy regions across Türkiye. This approach, which ensures strategic flexibility in the face of future uncertainties, proposes a social model that works in integration with technological advancements.

The success of a just transition depends not only on internal corporate initiatives but also on the collective wisdom of public authorities, financial institutions, universities, local governments, and all segments of society. The steps taken through this document aim to provide a response that is inclusive, sustainable, and promising—not only to today's challenges but also to the needs of the future.



9. REFERENCES

- **1.** Ayhan, S., & Çelik, C. (2024). Unveiling the Just Transition: Policy Implications and Descriptive Data Insights for Coal Miners in Türkiye. İstanbul: IPC-MERCATOR.
- **2.** United Nations Development Programme (UNDP) Türkiye. (2022). Young Women Neither in Education nor Employment: Current Situation and Needs Analysis Research. Ankara: UNDP Türkiye.
- **3.** Brundtland Commission. (1987). Our Common Future: Report of the World Commission on Environment and Development. Oxford University Press.
- **4.** Bulmer, E. R., et al. (2021). Global perspective on coal jobs and managing labor transition out of coal: Key issues and policy responses. Washington, DC: World Bank. http://hdl.handle.net/10986/37118
- **5.** Ministry of Environment, Urbanization and Climate Change. (2023). Türkiye's Updated First Nationally Determined Contribution (NDC). Accessed: 9 October 2024
- **6.** Christiaensen, L., et al. (2022). Towards a Just Coal Transition: Labor Market Challenges and People's Perspectives from Wielkopolska. Washington, DC: World Bank.
- 7. Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Sage Publications.
- **8.** Dahl, C., et al. (2022). Pathways to achieving a 2030 coal phase-out in the United States. Center for Global Sustainability.
- **9.** Ediger, V. Ş., Berk, I., & Kosebalaban, A. (2014). Lignite Resources of Türkiye: Geology, Reserves, and Exploration History. International Journal of Coal Geology, 132, 13–22.
- 10. Enerjisa Üretim Inc. (2023). Soçial Impact Report.
- 11. Enerjisa Üretim Inc. (2024). Tufanbeyli Power Plant Social Progress Report: January-April 2024.
- **12.** Erol, E. (2007). Historical Development of Electrical Energy in Türkiye: 1902–2000 [Doctoral dissertation, İstanbul University, Institute of Social Science].
- **13.** Günaydın, D. (2015). Green Jobs and Their Impacts on the Labor Market Journal of Management and Economics Research, 13(3), 503–525. https://doi.org/10.11611/JMER707
- **14.** IEA (2021). Net Zero by 2050: A Roadmap for the Global Energy Sector. Paris: International Energy Agency. *https://www.iea.org/reports/net-zero-by-2050*
- **15.** ILO (International Labour Organization). (2022). Just Transition Policy Brief: Skills Development for a Just Transition. Geneva: ILO.
- **16.** IPCC (Intergovernmental Panel on Climate Change). (2021). Climate Change 2021: The Physical Science Basis. In: Contribution of Working Group I to the Sixth Assessment Report (AR6). https://www.ipcc.ch/report/ar6/wg1/



9. REFERENCES

17. Kaizuka, S. (2024). Politics of a Just Transition: Lessons from the UK coal mines. Contemporary Social Science, 19(1), 154–177.

https://doi.org/10.1080/21582041.2024.2337672

- **18.** Kittel, M., et al. (2020). Scenarios for Coal Exit in Germany—A Model-Based Analysis and Implications in the European Context. Energies, 13(8), 2041.
- **19.** Kolde, L., & Wagner, O. (2022). Governance Policies for a "Just Transition": A Case Study in the Rhineland Lignite Mining District. Journal of Sustainable Development of Energy, Water and Environment Systems, 10(1), 1080383.
- **20.** Majekolagbe, A. G. (2022). Towards a Just Transition Impact Assessment Framework (Doctoral dissertation). Dalhousie University.
- **21.** Oei, P.-Y., Brauers, H., & Herpich, P. (2020). Lessons from Germany's Hard Coal Mining Phase-Out: Policies and Transition From 1950 to 2018. Climate Policy, 20(8), 963–979.
- **22.** Pavloudakis, F., et al. (2021). Energy Transition and the Future of Lignite Mining in the Region of Western Macedonia, Greece. University of Western Macedonia Conference Proceedings.
- **23.** Quiggin, J. (2020). Getting Off Coal: Economic and Social Policies to Manage the Phase-Out of Thermal Coal in Australia. The Australia Institute.
- **24.** Rigg, K. (2024). Just Transition and Renewable Energy Business Briefing Report. İstanbul: Global Compact Network Türkiye.
- **25.** Siontorou, C.G. (2023). Fair Development Transition of Lignite Areas: Key Challenges and Sustainability Prospects. Sustainability, 15(16), 12323. https://doi.org/10.3390/su151612323
- **26.** Sokołowski, J., et al. (2022). Hard coal phase-out and the labour market transition pathways: The case of Poland. Environmental Innovation and Societal Transitions, 43, 80–98. https://doi.org/10.1016/j.eist.2022.03.003
- **27.** TKİ (2024). Status of Coal Resources and Reserves: Türkiye and the World Ankara: Turkish Coal Operations Authority (TKİ)
- 28. World Bank. (2022). Just Transition for All: Guidance Note. Washington, DC.



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