

ZORLU ENERJİ ENERGY MANAGEMENT

Zorlu Enerji adopts an approach that prioritizes efficiency and sustainability in energy management. The company develops and implements strategies to ensure the effective use of energy resources and reduce environmental impact. Under its Energy Management System framework, the goal is to enhance energy efficiency through the use of high-efficiency equipment, the adoption of energy-saving technologies, and continuous monitoring methods. This approach supports the achievement of both economic and environmental sustainability goals and highlights Zorlu Enerji's commitment and dedication to energy management.

Energy efficiency is a critical priority for Zorlu Enerji, aiming to use existing energy resources more effectively. The company focuses on energy efficiency projects by regularly monitoring energy consumption in its business processes. It aims to improve environmental performance through practices such as the use of high-efficiency equipment, the adoption of energy-saving technologies, and the optimization of energy consumption.

Zorlu Enerji has established Energy Management System policies, which are publicly available on the company's website:

- [Zorlu Doğal Energy Policy](#)
- [Rotor Energy Policy](#)

➤ **Energy audits to identify opportunities for improving energy performance**



Zorlu Enerji has ISO 50001 Energy Management System, which provides a structured framework for managing and improving the energy performance of its Kızıldere and Gökçedağ plants. This system helps organizations establish policies for more efficient energy use, set objectives, and take actions to achieve those objectives. A key component of ISO 50001 is the audit process. Regular audits are conducted to ensure compliance with the system requirements, verify that energy performance improvements are being achieved, and identify areas for further enhancement. These audits play a crucial role in maintaining the effectiveness of the energy management system and ensuring continuous improvement in energy efficiency. This initiative,

launched to meet legal requirements for the two plants, is aimed at being applied to other plants and integrated into business processes.



➤ **Quantified targets to address energy savings**

Zorlu Enerji has assigned Energy Managers to each of its energy teams. The energy team meets once a year to conduct risk and opportunity analysis within the scope of the energy management system. As a result of the identified targets, action plans are created to achieve the targets, and a responsible person is assigned for each target. The target evaluation periods are defined in the target action plan. As an example, the target achieved by Kızıldere GPP and Gökçedağ WPP this year is as follows:

Kızıldere GPP Targets

Target-1: By using 2021 as the baseline year, achieve an annual electricity saving of 95,040 kWh by the end of 2025 through the implementation of the "New Design Fan Blade System for Kızıldere 3 Unit 1 GPP Cooling Tower."

Target-2: By using 2021 as the baseline year, reduce energy costs and carbon emissions by the end of 2026 through the implementation of the "Automatic Inhibitor Filling System."

Target-3: Provide Competency and Awareness training on Energy Efficiency to 10 people every year.

Target-4: Obtain ISO 50001 Energy Management Standard certification by the beginning of 2024.

Target-5: Prepare a "Measurement Plan" for the calibration and verification of measurement devices by the end of 2024.

Gökçedağ WPP Targets

Target-1: Implement maintenance periods for wind turbines averaging 100-120 person-hours.

Target-2: Provide Competency and Awareness training on Energy Efficiency every year.

Target-3: Obtain ISO 50001 Energy Management Standard certification by the beginning of 2024.

Target-4: Prepare a "Measurement Plan" for the calibration and verification of measurement devices.

➤ Actions to reduce the amount of energy use

Duyarlı ol! Project



The "Duyarlı Ol Project" is an integrated environmental management initiative aimed at conserving resources and raising awareness by focusing on governance, sustainable procurement, energy, water, and waste management. This project, which emphasizes individual-level measures and eco-friendly choices for employees, has been implemented by Zorlu Enerji Osmangazi Elektrik Perakende (OEPSAŞ) in collaboration with SKD Turkey across its offices in Afyonkarahisar, Bilecik, Eskişehir, Kütahya, and Uşak. As part of its

“Smart Life 2030” vision, OEPSAŞ has earned a gold certification under this project. By promoting the use of renewable energy, digitizing business processes through Digital Subscription Services, and achieving savings in paper, water, and fuel, the company has made significant strides in combating the climate crisis. It has also aimed to standardize the use of renewable energy in electricity production and consumption by certifying all its offices with the Renewable Energy Source Guarantee System.

In this context:

- Monthly electricity consumption amounts are measured, and per capita consumption figures are tracked and recorded.
- Grounding measurements are conducted in buildings to check for energy loss or leakage.
- Energy-efficient equipment is preferred in offices.
- Sensor-equipped (LED) lights are used in common areas for energy efficiency.
- Mileage and fuel consumption of company vehicles are monitored, and effective driving is tracked via the vehicle tracking system. Relevant personnel are informed about fuel savings.

At the OEPSAŞ Eskişehir office, energy efficiency-focused initiatives have led to energy savings. In 2023, the office achieved energy savings of 459,095.59 kWh (43,516.17 m³), representing an approximately 45% increase compared to 2022.



ESP (Electric Submersible Pumps) Project

One of the projects developed within Zorlu Enerji with a focus on energy efficiency is the ESP project. In geothermal power plants, as water is drawn from wells, water pressure may decrease over time, and it may be necessary to increase the power of the pumps. Using more powerful pump models is considered a significant step in enhancing energy efficiency.

In the first phase, the hot well ESP application was initiated at the Kızildere geothermal field, and in 2023, operations for transitioning to ESP at the designated hot wells continued. ESP systems have been installed at 12 wells in the Kızildere geothermal field and 5 wells in the Alaşehir geothermal field. Since 2020, ESP investments have resulted in:

- **Kızildere II Power Plant:** An average additional flow of 155 tons/hour from 16 wells, contributing 2.06 MWe to net electricity production.
- **Kızildere III Power Plant:** An average additional flow of 165 tons/hour from 11 wells, contributing 2.4 MWe to net electricity production.
- **Alaşehir Power Plant:** An average additional flow of 105 tons/hour from 6 wells, contributing 1 MWe to net electricity production.

At well KD-62A, an electric submersible pump reaching a depth of 1,700 meters and operating at a flow temperature of 235°C has been recorded as an example reaching the deepest point at the highest temperatures worldwide. This pump provides significant contributions to the Kızildere III Geothermal Power Plant and, consequently, to the country's electricity production.



Additionally, energy efficiency measures have included the renewal of lighting systems at the Kızildere plant. At Kızildere I, the exterior lighting systems have been renewed, and lighting fixtures have been replaced with more efficient LED fixtures. This project has resulted in an annual energy saving of 10,500 kWh.

➤ **Evaluation of progress in reducing energy consumption**

Zorlu Enerji continuously monitors and evaluates its progress in reducing energy consumption and enhancing energy efficiency. The company's efforts in this area are supported by various projects and improvement initiatives.

Zorlu Enerji continuously improves its energy efficiency efforts with the goal of reducing direct energy consumption by 10% compared to the previous year. The achievements in this process contribute to both lowering costs and reducing environmental impacts.

➤ **Use of clean or green energy**

Zorlu Enerji plays a significant role in reducing environmental impacts and supporting sustainability by increasing the use of renewable energy sources in electricity generation. Geothermal, wind, and hydroelectric energy are central to Zorlu Enerji's energy portfolio, and the strategic investments in these sources reflect the company's commitment to renewable energy. The company aims to increase the share of renewable energy in its production portfolio and enhance resource diversity, particularly in the areas of geothermal and solar energy. This approach contributes to combating climate change by reducing carbon emissions. Additionally, Zorlu Enerji prioritizes environmentally friendly practices across all energy production and consumption processes to enhance energy efficiency and minimize environmental impacts.



Zorlu Enerji's headquarters, the Levent 199 General Management Building, holds a LEED Gold Certification. The building is designed in accordance with environmental sustainability principles and incorporates energy efficiency, environmental management, and green building practices. Key features of the design include rainwater harvesting, touchless faucets, natural daylight usage, low-emission materials, high-performance glass facades, solar shading, efficient HVAC systems, 100% renewable energy use, LED

lighting, and energy monitoring/automation. These features contribute to water and energy conservation, enhancing sustainability in building operations.



**THE INTERNATIONAL
REC STANDARD**

Zorlu Enerji plans to enhance the use of renewable energy sources and environmental

sustainability by adopting the I-REC (International Renewable Energy Certificate) system. I-REC is an international certification system that documents renewable energy production and ensures the traceability of this energy. Through I-REC certificates, the use of renewable energy will be certified. Additionally, the use of I-REC will promote sustainable practices in energy production and provide a competitive advantage in the global energy market.

Zorlu Enerji is also working on transforming the Kızıldere Geothermal Power Plant into a hybrid facility. As part of this project, it is planned to meet the electricity needs of Kızıldere III GEPP (Geothermal Power Plant) with a solar energy plant to be installed on its site and roof. Furthermore, it is planned to add a 20.6832 MW solar energy plant to the roof of the existing 165 MW Kızıldere II GEPP and to the plant area in the Sarayköy district of Denizli province, converting it into a Combined Renewable Energy Production Facility.

➤ **Investments in innovation or R&D to decrease energy consumption**



Zorlu Energy places great importance on innovative R&D projects in energy management, focusing on sustainability and efficiency.

The company undertakes various research and development activities to ensure the effective and efficient use of energy resources, reduce environmental impacts, and optimize energy costs. These projects encompass both the improvement of

existing energy systems and the integration of new technologies, aiming to reinforce Zorlu Energy's leadership in the energy sector and its environmental responsibility.

nGEL Project : The primary goal of the nGEL project is to develop flexible tri-generation geothermal energy plants by integrating heating, cooling, and additional power production systems. This integration aims to enhance the overall efficiency of the plants. To address fluctuations in power grids resulting from the widespread adoption of renewable energy systems, nGEL geothermal energy plants are designed to operate effectively in reserve markets. This approach seeks to maximize energy production efficiency while providing solutions to the volatility issues faced by power grids.



SEHRENE Project : The SEHRENE project is an initiative aimed at energy efficiency and a climate-neutral future in Europe. Scheduled to

commence in 2024, the project focuses on improving energy use by developing renewable energy

and thermal storage concepts. It will utilize innovative electrothermal energy storage systems and digital twin technologies to optimize energy management and storage.



FLEXIGRID Project : The FLEXIGRID project aims to improve the efficiency and flexibility of electrical grids in Europe and enhance the integration of renewable energy sources. Launched in 2019 with EU funding, this project supports the transition to an energy system using digital technologies, smart grid solutions,

IoT, and blockchain. The project encompasses a broad scope beyond energy storage, specifically targeting optimization between PV, storage, V2G, and V1G vehicles and the grid through smart charging management platforms. Officially concluded in August 2023, the project tested V2G-compatible vehicles and charging stations for the first time in Turkey at OEDAŞ Tepebaşı Living Village in Eskişehir, and a 336 kWh battery storage system was put into operation. Additionally, the ZES-Roof PV and EV-integrated Energy Management System was tested in collaboration with Inovat.

➤ **Energy efficiency training provided to employees to raise awareness of energy consumption reduction**

The energy managers in the fields have certifications and are officially appointed as Energy Managers. In addition to the training received by the energy team, 30 field personnel received Energy Management System internal audit training in 2023.



Furthermore, Energy Management System awareness training has been completed by all field employees through the Zorlu training platform, Zorlu Academy.