



TurnKey to Power®

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GKE Energy is a global solution provider specialized in power generation projects

About GKE

GKE, formerly known as BGM, has been established in 1998 in Turkey with the purpose of delivering customized engineering and automation solutions for power plants to enable its customers to fulfill the complex requirements of the industry.

GKE has been one of the most trusted partners in the industry paving the road for the company to successfully evolve into a reliable full scale Engineering-Procurement-Construction Contractor specialized in gas and coal fired power plants within a decade.

Today with its vast experience and profound know-how on power generation and gas compression technologies, GKE is serving Power and Oil & Gas industries and provides its clients with competitive, on-time, high quality, comprehensive and concerted engineering procurement and construction services. GKE allows its customers to optimize their efforts by dealing with an accountable single source of "responsibility" during the transformation of their imagined projects into real assets.

Today's power market's realities, expectations and forecasts will transform current power supply structure. GKE is now extending its services from turnkey to tailor made basis in a way to cover not only centralized generation with the use of fossil fuels but also distributed generation with the use of both fossil fuels and renewable resources.

GKE Energy offers the following wide variety of services for green field and brown field projects; individually, in a fully integrated manner or in any combination and creates solutions specifically tailored according to its customer's needs.

Engineering (E)

- Engineering Management (EM)
- Procurement (P)
- Procurement Management (PM)

Construction (C)

- Civil Construction
- Mechanical Erection Installation
- Electrical Erection/Installation
- Instrumentation and Control
- Commissioning
- Start-up
- Testing

Construction Management (CM)

Those services are offered for following technologies:

- Simple Cycle Power Plants
- Co-Generation Power Plants
- Combined Heat and Power Plants
- Combined Cycle Power Plants
- Coal Fired Power Plants
- Environmental Air Quality Systems
- Relocation of existing power plants
- Modernization, refurbishment and rehabilitation of existing power plants.
- Renewable energy

OUR MISSION

Creating sustainable value for our customers, business partners, employees and shareholders, by offering high added value and innovative engineering solutions in sectors, especially in energy, where we can use our competitive competences.

OUR VISION

Being the preferred contractor company by our stakeholders in targeted markets.



History

- 1998** Established as BGM Engineering. Supplied Engineering and Automation Services in Energy business.
- 2007** BGM Industrial was established. Supplied Turnkey EPC Contracting Services in Energy and Industrial Plant businesses.
- 2012** Garanti Koza Group acquired majority shares of BGM.
- 2014** BGM Industrial's name was changed to Garanti Koza Energy.
- 2018** Garanti Koza Energy became part of the group GK Global BV. Garanti Koza Energy established its R&D Center.
- 2019** Garanti Koza Energy rebranded as GKE Energy.



Fully integrated services

EPC Turnkey

The provision of EPC services on turnkey basis constitute of providing engineering, procurement and construction services in a fully integrated manner and is the most efficient way for the implementation of a project. By its nature, this method requires the least possible customer's involvement therefore minimizes the risks onto which customer is normally exposed under other models.

Single Point of Responsibility

GKE Energy undertakes overall project responsibility starting from the commencement date until the end of warranty period. Customer is not exposed to risks inherent in considerable number of contracts that have to be entered between GKE Energy and suppliers and subcontractors. The sole interface point for the customer regarding engineering, procurement, construction, commissioning, start up, testing, hand over and warranty activities is GKE Energy project management team.

Performance, Completion and Budget

All performance and completion related guarantees and warranties are provided by GKE Energy. Customer is compensated for performance deficiencies and delays in project completion by means of liquidated damages. Additionally GKE Energy assumes full responsibility for overall project cost.

Interface Management

The single point of control over the total plant design and project management provided by GKE Energy greatly favours the homogeneity of the plant concept as well as compatibility of equipment and materials and therefore minimizes number of interfaces and makes interface management much more effective.

Engineering Excellence

Engineering and design have been GKE Energy's core competencies. GKE Energy engineering and design solutions ensure higher constructability, reliability, quality, performance and ease of operation and maintenance on every project.

Our experience and excellence in engineering and design are combined with technical integrity to achieve tailor made and optimum solutions based on each project's unique needs.

Engineering teams work in fully automated environment by means of state of the art software and tools such as 3D design softwares, PDMS, ETAP, CAESAR, STAAD, TANK, and MS Project & Primavera. The use of 3D design tools increases speed, fault free design, and working efficiency.

An Alternative Approach: Partial EPC

In Partial EPC approach customer has the option to directly procure any of the equipment packages and/or construction services in case customer is ready to assume some further controlled risks. Risk sharing will automatically bring considerable cost savings to customer. In this model GKE Energy will still carry the overall management responsibility and provide engineering, documentation and advisory services for all activities undertaken by the customer.





Gas & Oil Fired Power Plants

From green-field projects to modernization, rehabilitation and refurbishment of existing power plants, GKE Energy offers broad range of alternative configurations by using state of the art technologies and equipment to meet customer's expectations.

Simple Cycle Power Plants

Power plants with simple cycle configuration seem to be the best configuration option to meet urgent power needs either on base load or peak load basis. Depending on the site location, fuel availability and schedule requirements of our customers, GKE Energy can offer wide range of technologies such as truck-mounted gas turbines, stationary gas turbines and reciprocating engines.

Co-Generation and CHP Plants

GKE Energy identifies the optimum Co-Generation technology to meet it's customers requirements either for industrial steam or district heating purposes. Municipal utilities can use the steam for district heating, and industrial users benefit from using it in production processes such as heating or drying. Alternatively steam can be used in absorption chillers to cool industrial processes or warehousing facilities.

GKE Energy offers co-generation and CHP plants based either on gas turbines or reciprocating engines and can guarantee a thermal efficiency up to 95%.

Combined Cycle Power Plants

GKE Energy engineers, procures and constructs combined cycle power plants based on reciprocating engines, aeroderivative gas turbines and heavy duty gas turbines by committing:

- High efficiency and availability
- Reliable and eco-friendly generation
- Flexible operation with fastest start up and shut down times available in the market



Coal Fired Power Plants

Coal continues to be one of the primary sources in power generation in today's markets. GKE Energy is able to offer a wide range of coal fired power plants based on different boiler technologies including;

- Pulverised Coal Boilers
 - ▶ Subcritical,
 - ▶ Supercritical,
 - ▶ Ultra-Supercritical
- Circulating Fluidized Bed Boilers.

Environmental Air Quality Systems

To reduce environmental footprint of its customers' power plants and ensure the compliance with increasingly more stringent air quality control regulations, GKE Energy offers proven, cost-effective solutions to control emissions.

GKE Energy provides EPC turnkey delivery of all major air quality technology types available, either by upgrading existing systems or by installing new technology;

- Flue Gas Desulfurization (FGD)
 - ▶ Wet
 - ▶ Seawater
 - ▶ Dry
- Selective Catalytic Reduction (DeNO_x)
- Particulate Emission Control

Modernization, Refurbishment, Rehabilitation of Existing Power Plants

Performance improvements are necessary to save fuel, to stay competitive in the market and especially to comply with stringent regulatory requirements.

GKE Energy helps its customers to reduce the cost of electricity and to comply with regulatory requirements through;

- Inspection and Assessment for power plants
- Efficiency Improvement
- Subsystem Retrofits
- Emission Reduction
- Capacity Factor increase (renewable)
- Automated Generation Control (AGC) (Primary Frequency Control, and Secondary Frequency control Systems)
- Mechanical and controls Rehabilitation and retrofit of old steam turbines and turbine auxiliary systems
- Boiler rehabilitation, upgrade and retubing,
- Control system and field instrumentation upgrade
- Burner upgrade and combustion efficiency increase
- Online efficiency monitoring and efficient generation dispatch systems



Renewable Energy

As an inclusive EPC provider, GKE Energy retains its position as a single point of contact for all renewable energy needs. GKE Energy provides bankable, innovative and reliable renewable energy solutions for its Customers around the world.

Hydro Power

- Competitive EPC turnkey solutions for hydropower plants
- Customized design and installation
- Modernization of existing plants
- Integration of turbines from various manufacturers
- Highest degree of operational safety

Biomass Power

EPC turnkey services for biomass fuels such as wood chips/ bark, sawmill residue, bagasse (residue from sugar cane), rice and cotton husks, EFB (residue from Oil Palm industry), chilly stalks, sunflower oil cake, soybean oil cake, coconut husks, olive pits:

- Biomass treatment and storage system
- Boiler
- Steam system
- Cooling system
- Power generation system
- Water treatment system
- Electrical and control systems

Geothermal

GKE Energy offers wide range of equipment and services as well as complete turnkey solutions that provide optimal plant configuration using flash, dry steam power plants, binary and flash/binary combined power plant technologies.

- Geothermal water & steam analysis for power plant design
- Project planning and advisory services for the power plant construction
- Turbine selection and design
- Steam receiving and gathering system
- Condensing, gas ejection and cooling system
- Power plant distributed control system (DCS)
- Piping, valves and power island balance of plant (BOP)
- Electrical cabling and high-voltage power export
- Civil engineering
- Plant construction management



Solar Power

GKE Energy delivers complete EPC services for commercial and utility-scale PV, CPV, and CSP solar projects

- Grid Integration
- Plant Design & Engineering
- Project Development
- Project Finance
- Balance of Systems Technologies
- Mounting Systems
- Procurement & Construction Management

Wind Power

- Wind turbine selection,
- Layout optimisation, contracting,
- Turnkey construction, site management, installation, commissioning and project management
- Project financing and investor relationship management
- Logistics and insurance concept
- Service and maintenance concept
- Handling of the Clean Development Mechanism/ CDM (CO₂ certificates)



Borçka - İyidere
380 kV
Transmission
Line



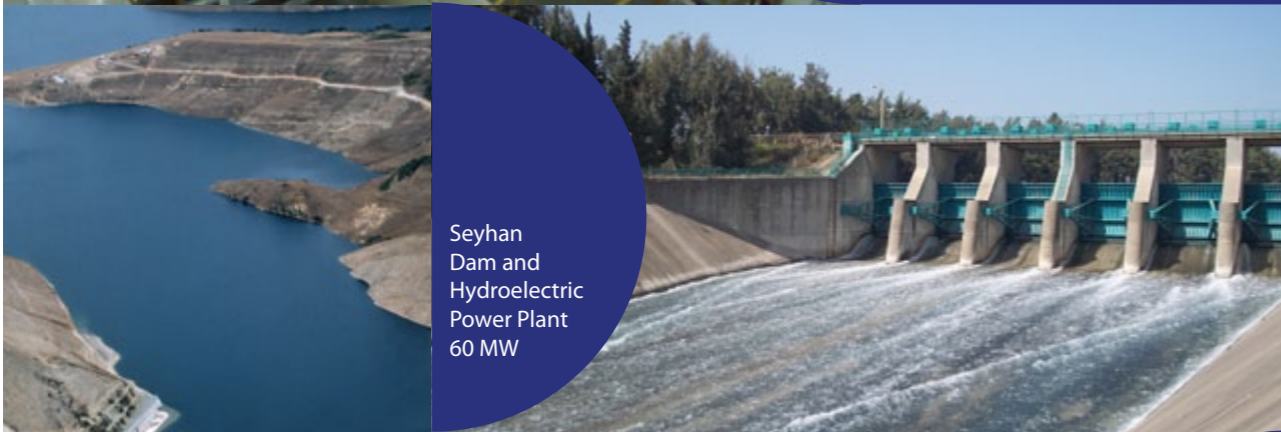
Zorlu
Lüleburgaz
65 MW
Combined
Cycle Power
Plant



Uğur Enerji, Çerkezköy 60 MW
Combined Cycle Power Plant



Seyhan
Dam and
Hydroelectric
Power Plant
60 MW



Kuzgun Dam and Hydroelectric
Power Plant 21 MW

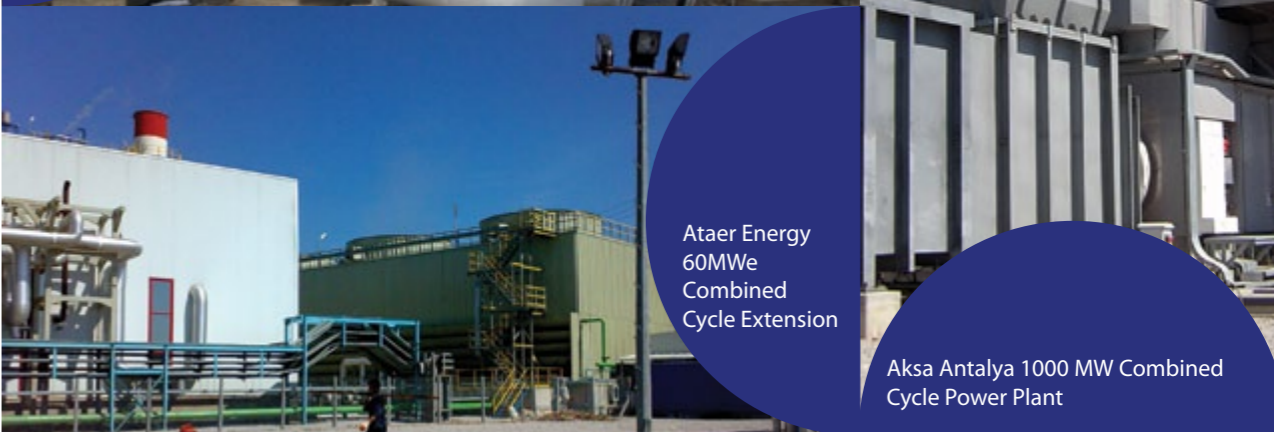


Habaş, Aliğa
230 MW
Combined
Cycle Power
Plant

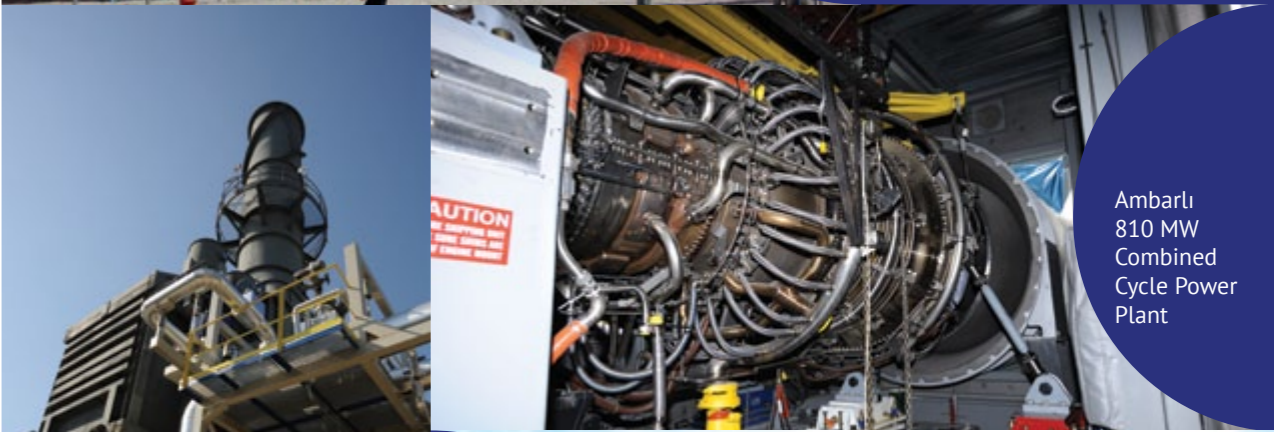
Botaş Çorum
Natural Gas
Compressor
Station 46 MW



Ataer Energy
60MWe
Combined
Cycle Extension



Aksa Antalya 1000 MW Combined
Cycle Power Plant



Ambarlı
810 MW
Combined
Cycle Power
Plant



AES Entek İzmit 60 MW
Co-Generation Plant

Azerenergy
Janub 750 MW
Combined
Cycle Power
Plant

Selected References

EPC

Project	Scope	Completion Year
Ambarli Repowering Project, 810 MW Combined Cycle Power Plant	EPC Turnkey supply for Electrical BOP, Steam Turbine Island Modernization (Partial EPC for the Plant), Plant Automation	2012
Topcam Dam and Hydroelectric Power Plant 60 MW	EPC Turnkey Construction	2011
Ataer Energy 60MWe Combined Cycle Extension	EPC Turnkey Delivery	2010
AES Entek Izmit 60 MW Co-Generation Plant	EPC Turnkey Delivery	2009
Cerkezoy 48 MW Co-Generation Power Plant	EPC Turnkey Delivery	2006
Borcka — Iyidere 380 kV Transmission Line	EPC Turnkey Delivery of 130 km Single Circuit, Triple Bundled, 1272 MCM	2006
Power House for Sugar Plant (150Ton/hr Steam and 15MW electricity)	EPC Turnkey Delivery	2006
Kuzgun Dam and Hydroelectric Power Plant 21 MW	EPC Turnkey Construction	1998
Afsin-Elbistan Coal Power Plant	Civil and Structural Construction Works	1984
Doganci (Selahattin Saygi) Dam	EPC Turnkey Construction	1983
Tercan Dam and Hydroelectric Power Plant 15 MW	EPC Turnkey Construction	1974
Seyhan Dam and Hydroelectric Power Plant 60 MW	EPC Turnkey Construction	1956

Engineering

Project	Scope	Completion Year
Ambarli 810 MW Combined Cycle Power Plant	Basic and Detailed Engineering for Repowering Project	2012
Aksa Antalya 1000 MW Combined Cycle Power Plant	Basic and Detailed Engineering	2011
Ugur Energy 65 MW Combined Cycle Power Plant	Basic and Detailed Engineering	2010
Zorlu Tereshkova 2x 170 MW Combined Heat and Power Plant	Engineering Management	2007
Botas Corum Natural Gas Compressor Station 46 MW	Basic and Detailed Engineering	2007
Bosen 63 MW Combined Cycle Power Plant	Basic and Detailed Engineering	2006
Atlas Energy 600 MW Coal Fired Power Plant	Lender's Engineering	2014
Zorlu Luleburgaz 65 MW Combined Cycle Power Plant	Basic and Detailed Engineering	2012
Sadelmi SPA, Entek Power Plant Relocation	Basic and Detailed Engineering for Relocation of Gas Turbine and HRSG	2007

Commissioning and O&M

Project	Scope	Completion Year
OMW Samsun 890 MW Combined Cycle Power Plant	O&M for Plant Control and Instrumentation, Auxilliary Boilers, Heat Exchangers	2016
Azerenergy Janub 750 MW Combined Cycle Power Plant	Erection Supervision, Commissioning and Start up	2015
Ambarli 810 MW Combined Cycle Power Plant	Commissioning of EBOP	2013
Unit Rudeshur 750 MW Simple Cycle Power Plant	Commissioning of Instrumentation and Control Systems	2005
Akenerji Power Plants LTSA	Long Term Service Agreement Instrumentation and Control Systems	1998-2008

Automation

Project	Scope	Completion Year
Ambarli 810 MW Combined Cycle Power Plant	Plant Control System - DCS and Unit Control System for Steam Turbine	2013
Istanbul Manucipality Odayeri Waste to Heat Plant	Control and Boiler Burner Management System and BOP	2010
Akenerji Ulubat 100 MW Hydroelectric Power Plant	Wireless Data Communication and Control	2010
Habas, Aliaga 230 MW Combined Cycle Power Plant	Plant Control System - DCS	2006
SCA Selkasan Power Plant	Design and Supply of Automation for Steam Boiler, Burner Management System, HRSG, and BOP	2010
9 x Akenerji Co-Generation PP Automation	Plant Control System - DCS	2004
Ugur Enerji, Cerkezoy 60 MW Combined Cycle Power Plant	Plant Control System - DCS	2010

Rehabilitation And Efficiency Improvement

Project	Scope	Completion Year
Kemerköy & Yeniköy Coal Fired Power Plant (5x210 MW) Rehabilitation & Power Upgrade Project	Rehabilitation of Boiler and firing system, Flue Gas Treatment Upgrade, EPC Turnkey rehabilitation and supply for Electrical BOP & Modernization of Plant Automation (DCS)	Ongoing
Akenerji Bozoyuk 133 MW Combined Cycle Power Plant	Fuel Gas Performance Heater System Turnkey Delivery	2012
Akenerji Kemalpaşa 127 MW Combined Cycle Power Plant	Fuel Gas Performance Heater System Turnkey Delivery	2012
EUAS Sivas Kangal 457 MW Coal Fired Power Plant	Replacement of Old Burners with Low NO _x High Efficient Burners	2015
Baymina GDF Suez 770 MW Combined Cycle Power	Engineering for GT Inlet Air Cooling System	2012
Ataer Energy 60 MW Combined Cycle Power Plant	HRSG, ACC and HP-LP Pressure Let down EPC Turnkey Delivery	2010-2012
Soda Sanayi A.S. Burner Upgrade Project	Replacement of Single Liquid Fuel Burners with Low NO _x High Efficient Liquid and Gas Fuel Burners	2005
Doga Enerji 180 MW Co-Generation Power Plant	Fuel Gas Performance Heater System Turnkey Delivery	2008



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