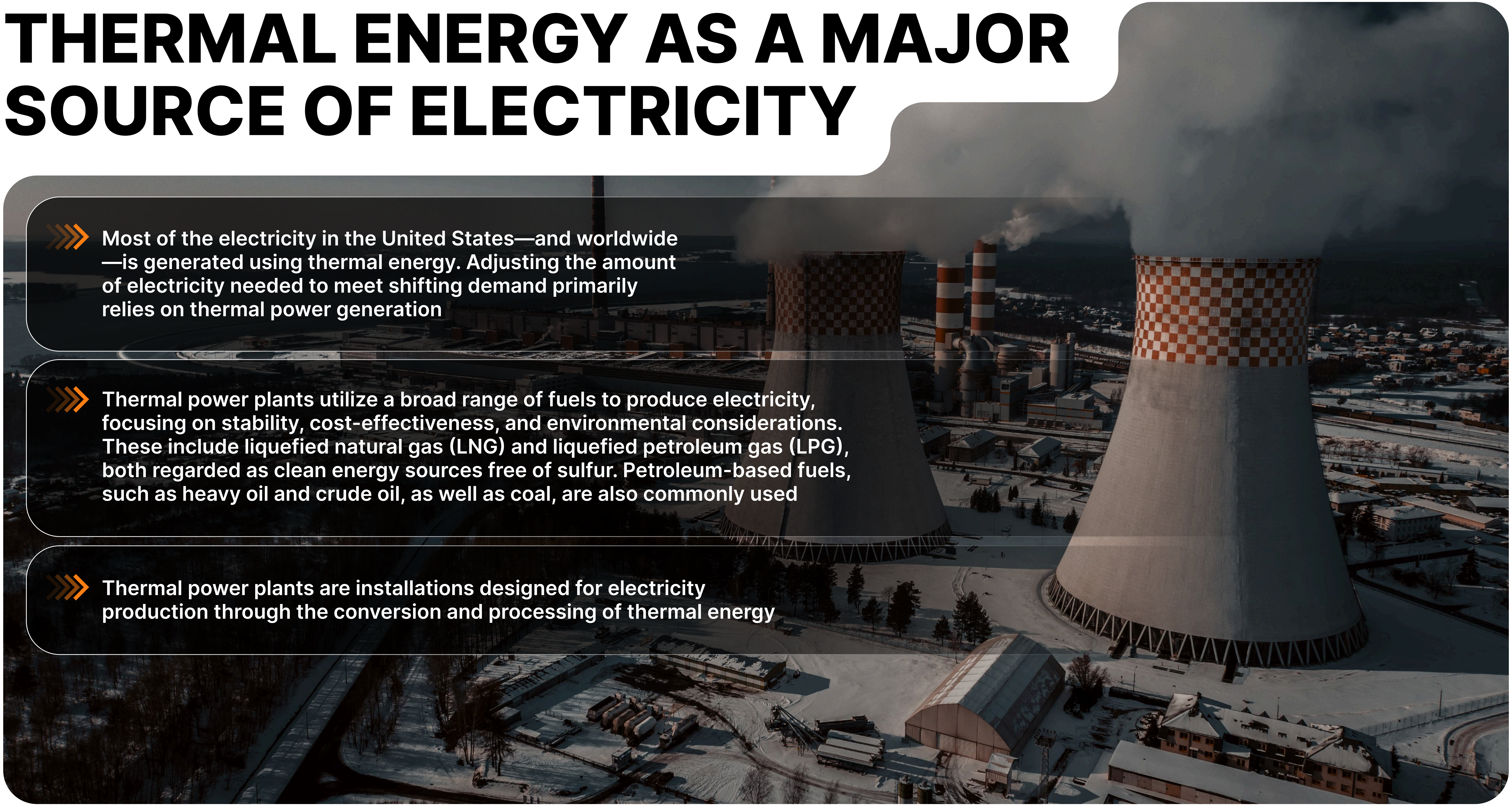
DESIGN AND CONSTRUCTION OF THERMAL POWER PLANTS

DIRECTION: Energy Sector

THERMAL ENERGY AS A MAJOR SOURCE OF ELECTRICITY

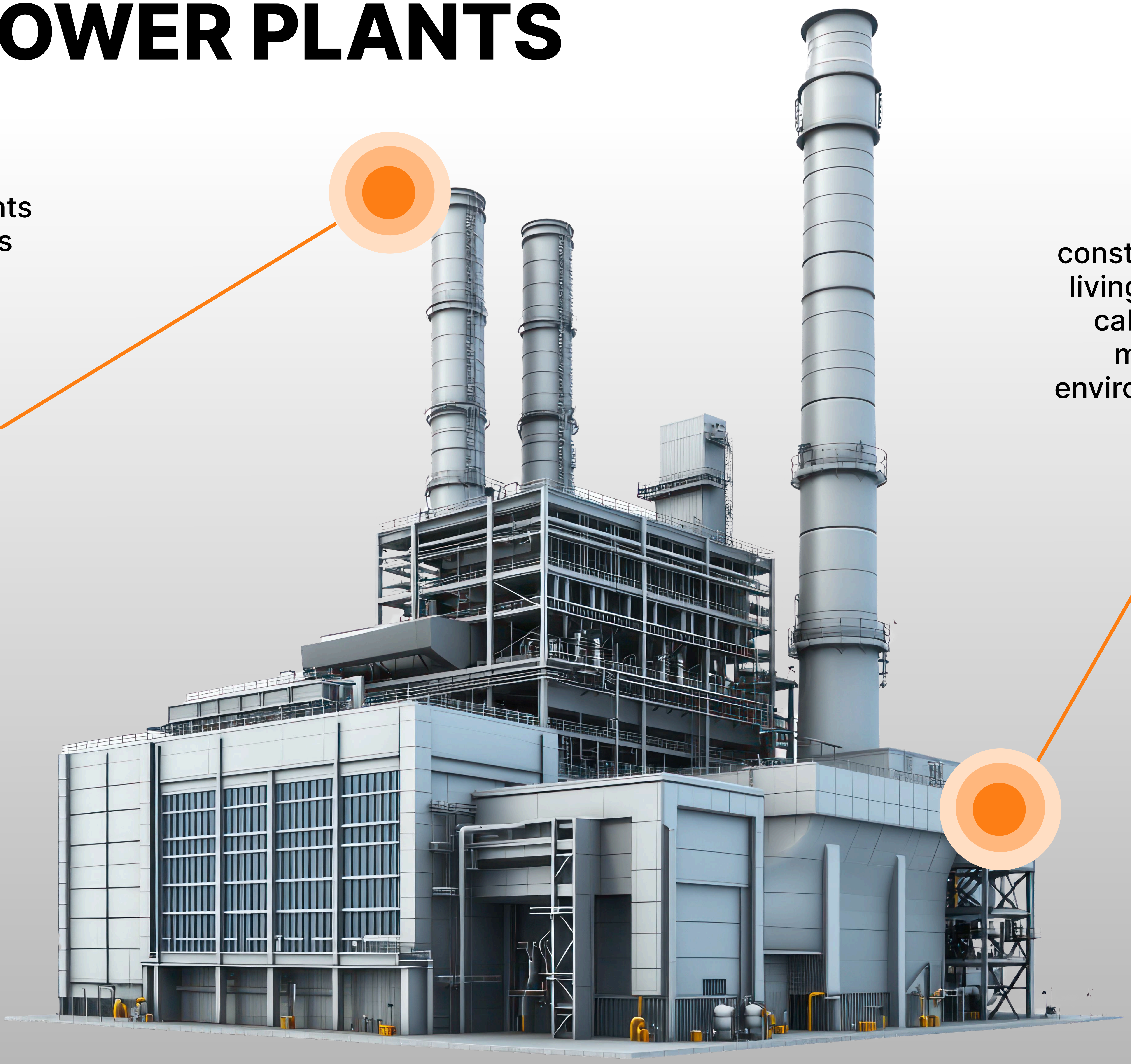


- Most of the electricity in the United States—and worldwide—is generated using thermal energy. Adjusting the amount of electricity needed to meet shifting demand primarily relies on thermal power generation
- Thermal power plants utilize a broad range of fuels to produce electricity, focusing on stability, cost-effectiveness, and environmental considerations. These include liquefied natural gas (LNG) and liquefied petroleum gas (LPG), both regarded as clean energy sources free of sulfur. Petroleum-based fuels, such as heavy oil and crude oil, as well as coal, are also commonly used
- Thermal power plants are installations designed for electricity production through the conversion and processing of thermal energy

APPLICATIONS OF LOW-CAPACITY THERMAL POWER PLANTS

Low-capacity thermal power plants are widely used in various sectors due to their compact size, cost-efficiency, and ability to provide autonomous power supply

They are utilized for heating and electricity in smaller facilities such as schools, daycare centers, pools, clinics, and sports complexes. This is especially relevant in remote or hard-to-reach areas where centralized heating and power networks are absent or not economically viable



Moreover, low-capacity plants are commonly employed at temporary construction sites. They ensure necessary living and working conditions for portable cabins, temporary structures, and other mobile facilities, providing stable work environments under all weather conditions

These plants are also used in agriculture—on farms and in greenhouses—where continuous heating and electricity are essential for normal operations

SIGNIFICANCE OF LARGE THERMAL POWER PLANTS

Large thermal power plants, in turn, play a crucial role in sustaining entire communities and major industrial facilities. They provide centralized heating for residential buildings, offices, and factories—especially in colder regions. With their high capacity, these plants can support large-scale facilities such as metallurgical complexes, chemical factories, and other enterprises requiring substantial heat and electricity

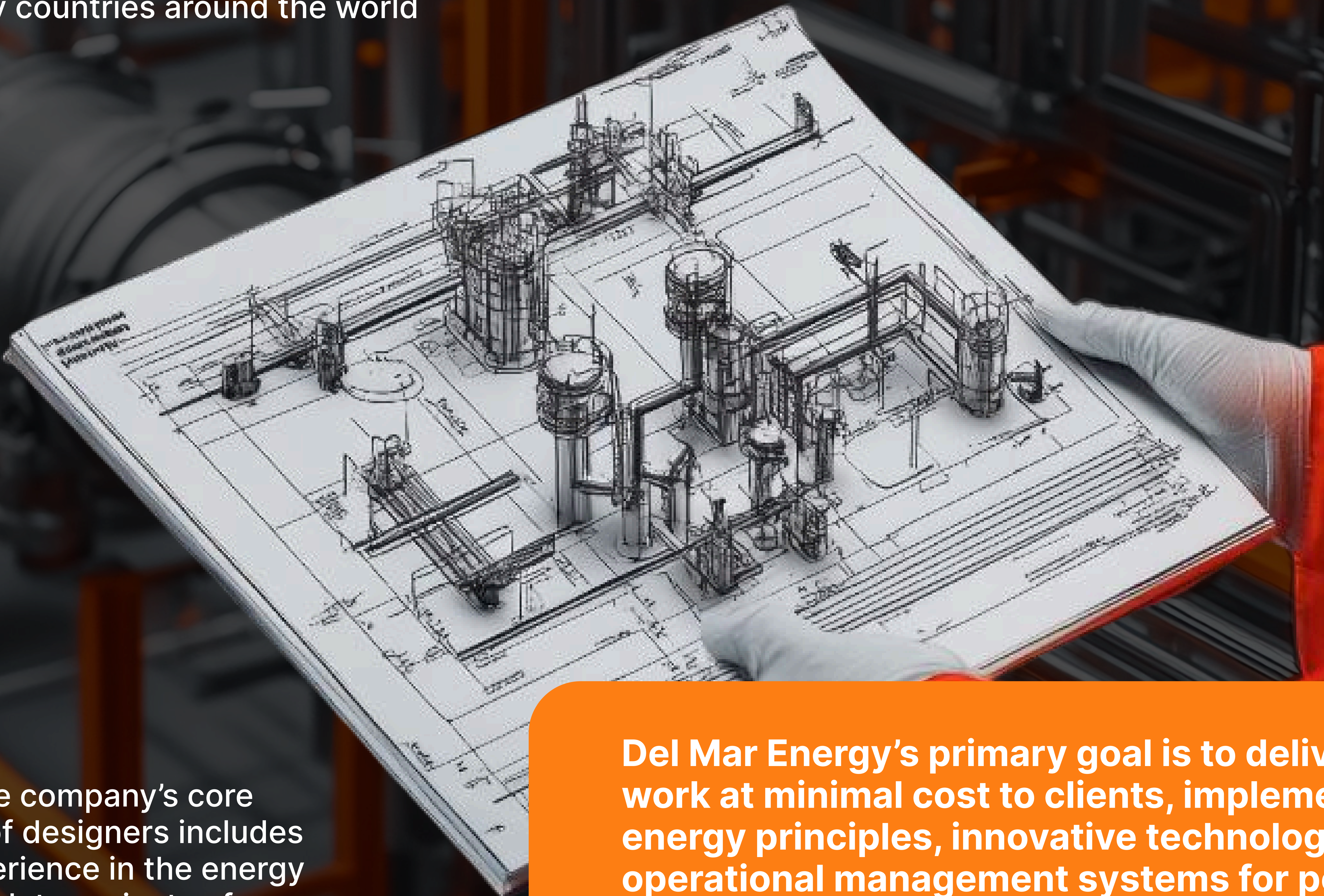
Thus, both low-capacity and large thermal power plants are indispensable to the energy system, powering various economic sectors and enhancing people’s quality of life

COMPREHENSIVE DESIGN AND CONSTRUCTION BY DEL MAR ENERGY

Del Mar Energy's Engineering and Design Center specializes in the full-spectrum design of thermal power plants and electrical infrastructure. Our engineering experts operate not only in the U.S. but also across many countries around the world

SINCE 2000

Del Mar Energy has focused on designing and building power plants. Acting as the general contractor, the company has constructed more than 95 power plants to date. We bring extensive experience, skilled personnel, and continuously evolving resources to every project



Thermal power plant design is one of the company's core business areas. Del Mar Energy's team of designers includes professionals with over 30 years of experience in the energy sector, enabling us to successfully complete projects of any complexity

Del Mar Energy's primary goal is to deliver high-quality work at minimal cost to clients, implementing green energy principles, innovative technologies, and modern operational management systems for power plants

There are thousands of TPP worldwide, with the greatest concentration found in countries with high energy demands, such as China, the United States, and India. Most power plants run on coal, natural gas, and oil, although there is growing interest in alternative fuels like biomass

Coal-fired TPP remain among the most widespread, producing up to 40% of the world's electricity. However, gas-fired plants, which generate about 23% of energy due to their environmental and operational advantages, are gaining popularity. Oil-fired plants are less common and are typically found in regions with accessible oil resources. Modern TPPs can range in capacity from 50 to 1,000 MW or more, and construction can take anywhere from 2 to 5 years, depending on the project's scope and type

THERMAL POWER PLANTS (TPP)

Thermal power plants (TPP) play a pivotal role in global energy, supplying much of the electricity used by both residential and industrial consumers

CONSTRUCTION TRENDS AND MODERNIZATION IN THERMAL POWER

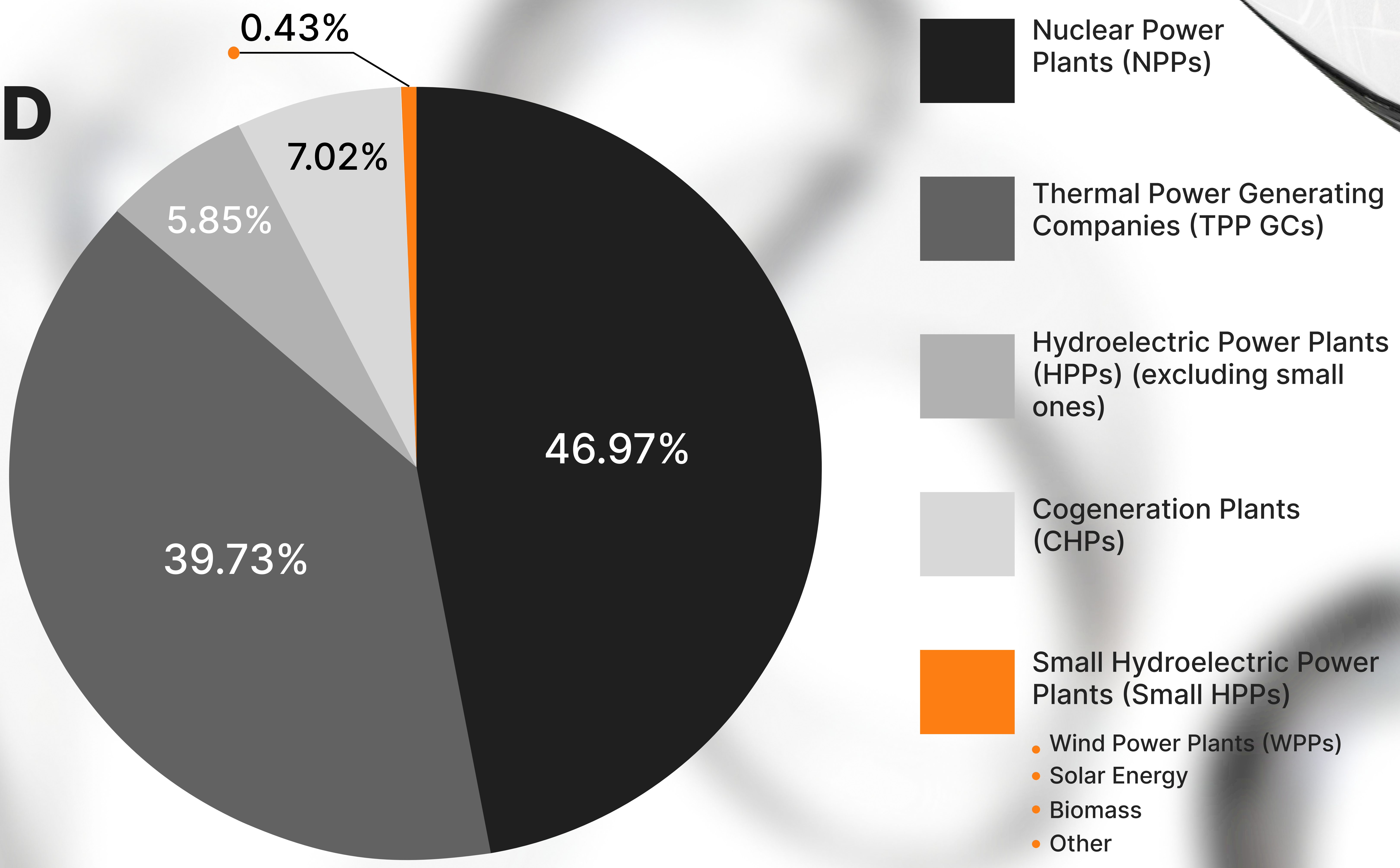
Construction of TPP is accelerating most rapidly in developing countries like India and Vietnam, where electricity demand continues to grow. In developed nations such as Germany and the U.S., the focus is on modernizing existing plants and implementing eco-friendly technologies, including carbon capture systems. The total installed capacity of TPP globally exceeds 5 TW, with hundreds of billions of dollars allocated annually for their construction and upgrades

Key advantages of TPP include stable power output, the ability to meet peak demand, and fuel flexibility. However, they also face challenges such as high greenhouse gas emissions, dependence on fossil fuels, and the urgent need for greener solutions. Many countries, including those in the European Union and the U.S., are gradually shutting down coal-fired TPPs in favor of more modern gas plants or renewable energy sources

Thus, TPP remain a vital part of the global energy system, though their future increasingly hinges on the adoption of innovative technologies to reduce environmental impact and a shift toward cleaner energy sources

PROSPECTIVE DEVELOPMENT OF CENTRALIZED HEATING SYSTEMS

- Advances in centralized heating, along with improvements in traditional methods of producing, distributing, and consuming thermal energy, call for the active use of alternative and renewable energy sources. Emphasis is placed on enhancing energy, environmental, and economic efficiency. In the future, such systems should be integrated into a unified “meta-system” that enables a holistic approach to resource management



ADVANTAGES OF THERMAL POWER PLANTS (TPP)

COST-EFFECTIVE FUEL

Fuel used at TPP is generally cheaper than comparable resources used at nuclear power plants

LOWER CONSTRUCTION COSTS

The construction and preparation of TPP typically require smaller investments compared to other types of power generation

FLEXIBLE SITING

TPP can be built virtually anywhere, as they do not depend on proximity to natural resources. Fuel can be transported by road or rail from anywhere in the world

COMPACT FOOTPRINT

TPP occupy relatively little space, making them suitable even for countries with limited land where real estate is highly valued

CHEAPER FUEL

Fuel for TPP is generally less expensive than fuel for diesel-powered installations

INDEPENDENCE FROM SEASONAL FACTORS

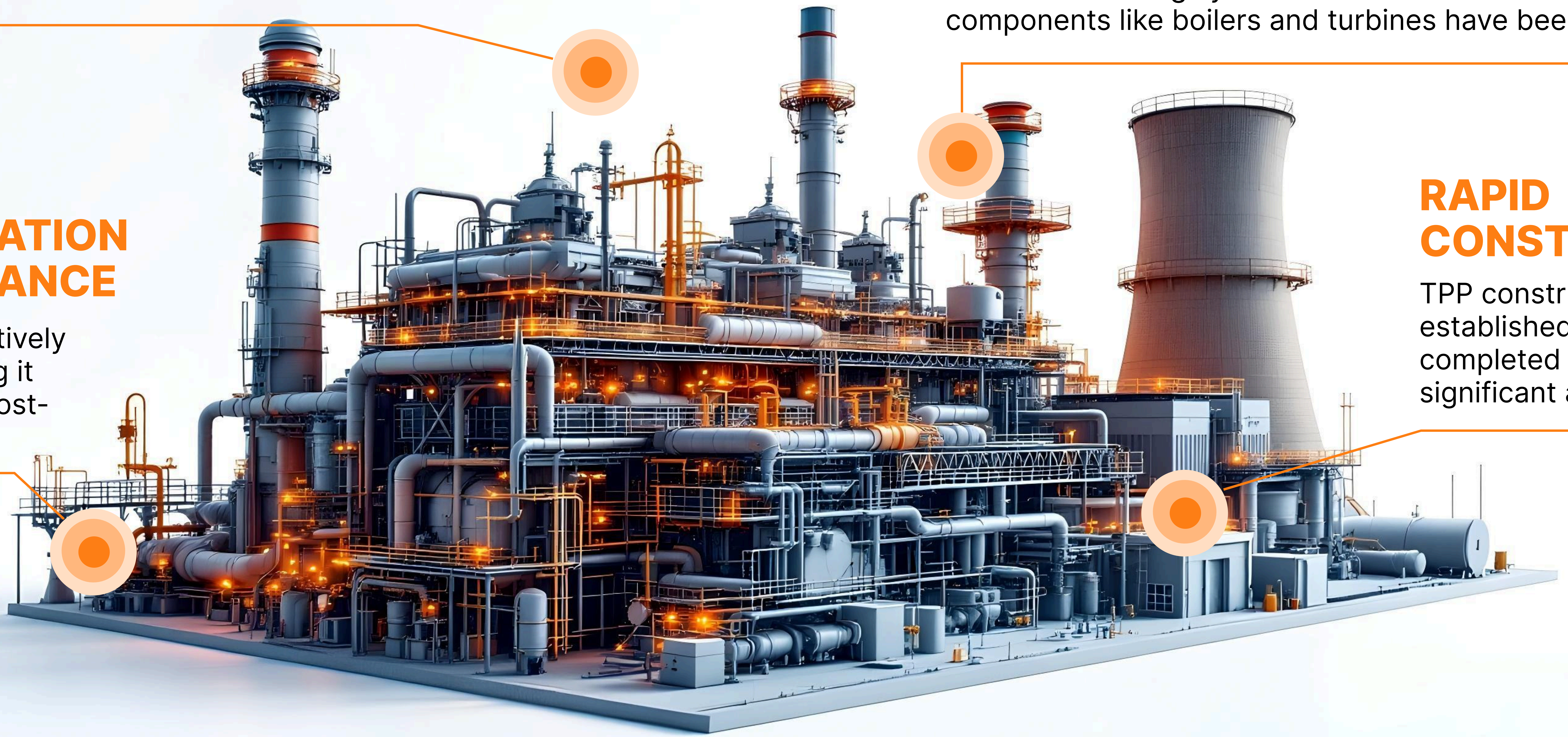
Power generation at thermal power plants (TPPs) is not dependent on seasonal fluctuations, which gives them an advantage over hydroelectric power stations

EASE OF DECOMMISSIONING

At the end of a TPP's service life, dismantling and disposal are relatively simple. Moreover, infrastructure elements—such as water and heating systems—remain functional even after key components like boilers and turbines have been replaced

EASE OF OPERATION AND MAINTENANCE

Operating a TPP is relatively straightforward, making it more convenient and cost-effective to maintain



RAPID CONSTRUCTION

TPP construction is well-established and can be completed quickly, saving a significant amount of time

DURABLE INFRASTRUCTURE

Supporting infrastructure for water and heat supply retains its operational characteristics for a long period and can continue functioning after the main equipment is upgraded

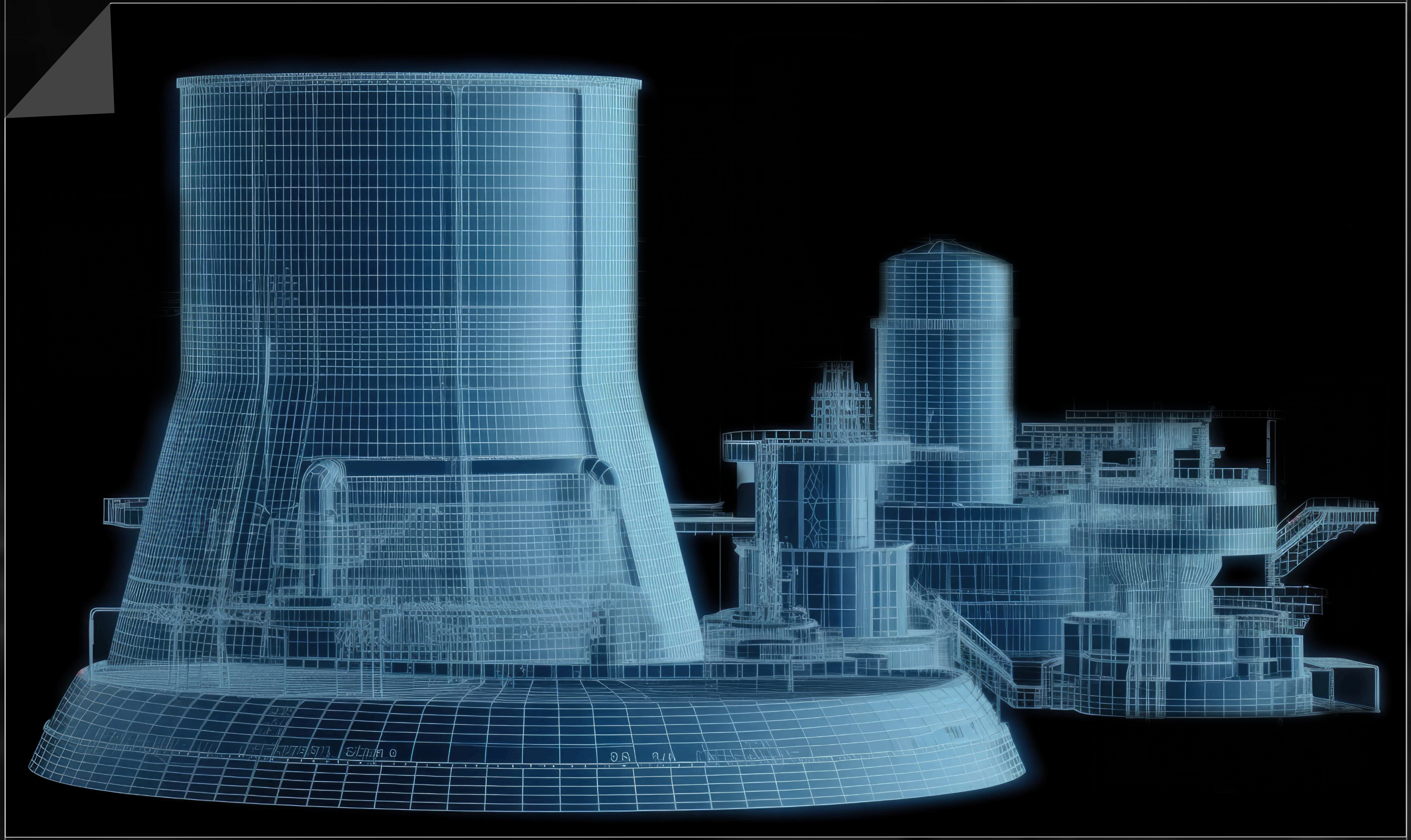
These advantages make TPPs an important and in-demand part of the energy system, especially when there's a need for quick, cost-effective power solutions

- While thermal power plants operate, they produce water and steam that can be used for heating systems or various industrial processes. TPPs are key energy producers, generating around 80% of the country’s electricity
- Combining power generation with heat supply, plus a long service life, makes TPPs economically advantageous systems. Thanks to extensive experience, accountability, and highly skilled specialists, Del Mar Energy leads not only domestically but also on the international stage

OUR HIGHLY QUALIFIED SPECIALISTS EXPERTLY DESIGN THERMAL POWER PLANTS IN THE FOLLOWING AREAS:

- **Development of TPPs** based on steam turbine generators ranging from 1 MW, using boilers fueled by various resources (gas, liquid, or solid)
- **Design of TPPs** using gas piston power plants with capacities starting at 100 kW
- **Full-cycle TPP construction and design** on a turnkey basis

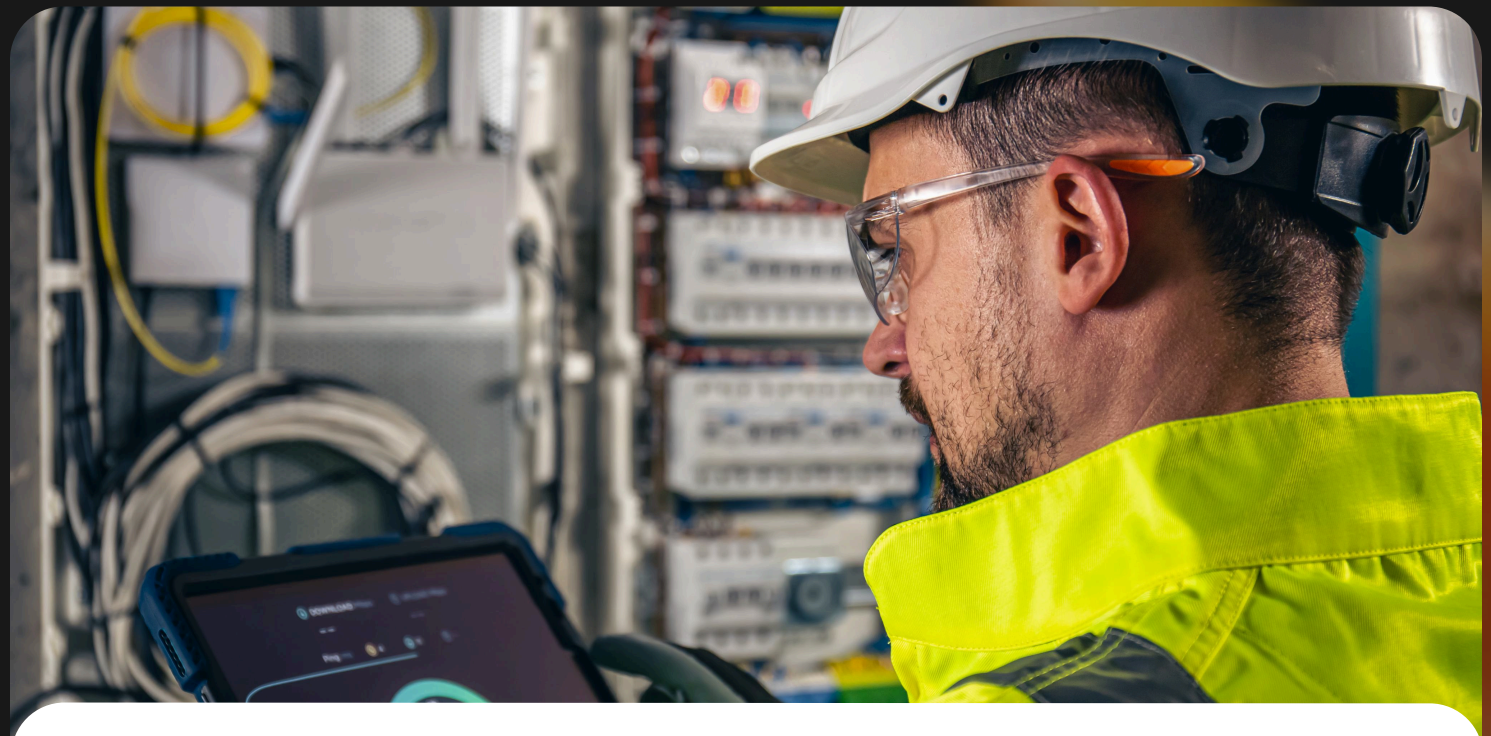
When designing combined heat and power plants (CHPs), we use equipment and technology from leading global manufacturers such as MWM, MTU, JCB, Cummins, Wilson, Parsons, G-Team, Ekol, and others



Modern technologies in thermal energy focus on increasing efficiency, reducing environmental impact, and optimizing economic performance. A key innovation is the use of highly efficient boilers and turbines. Supercritical and ultra-supercritical pressure technologies improve plant efficiency, reduce fuel consumption, and cut greenhouse gas emissions. Additionally, combined-cycle systems that integrate gas and steam turbines further maximize energy output

Carbon Capture, Utilization, and Storage (CCUS) systems have become an essential element of TPP modernization. They allow carbon dioxide to be extracted from emissions and safely stored, significantly lowering a plant's carbon footprint. Moreover, many facilities are transitioning to alternative and renewable fuels, such as biomass, and incorporating solar or wind installations for supplementary power generation

DIGITIZATION, AUTOMATION, AND HYBRID APPROACHES FOR MODERN THERMAL POWER PLANTS



Digitalization and automation play a pivotal role in enhancing TPP operations. Smart sensors, monitoring systems, and artificial intelligence enable real-time tracking of equipment health, predicting potential failures, and optimizing operational processes. This increases station reliability, lowers maintenance costs, and reduces energy losses

Additionally, the industry is seeing rapid growth in modular and hybrid power plants. Due to their compact size and scalability, modular TPPs can be constructed quickly. Hybrid solutions that combine traditional TPPs with renewable sources provide stable and eco-friendly power supplies

Cogeneration and trigeneration are also becoming standard at modern TPPs. These technologies produce electricity, heat, and cooling simultaneously, making the plants more versatile and cost-effective. Along with the use of innovative materials and the adoption of distributed generation systems, these advancements solidify TPPs’ role as a critical component of the global energy infrastructure

MAXIMIZING PROFITABILITY IN THE THERMAL POWER INDUSTRY

A comprehensive approach is applied to increase margins in thermal power plant (TPP) operations, focusing on cost optimization, innovative technologies, and diversification of revenue streams

One key strategy involves reducing fuel expenses by transitioning to more affordable and efficient fuel sources, such as natural gas or biomass, which can substantially lower costs. Long-term contracts with suppliers lock in stable prices, and optimizing the fuel-energy balance cuts energy losses during combustion, boosting resource efficiency

Energy-saving technologies also play a crucial role. Implementing supercritical and ultra-supercritical pressure methods, upgrading turbines and boilers, and introducing cogeneration and trigeneration allows simultaneous production of electricity, heat, and cooling—thus increasing plant profitability

Automation and digitalization, including automated control systems, big data analytics, and remote monitoring, further reduce operating costs, enhance equipment accuracy, and minimize human error

STRATEGIES FOR COST REDUCTION AND REVENUE DIVERSIFICATION

Operating expenses can be lowered through efficient maintenance management, streamlined fuel logistics, and the use of durable materials that cut equipment replacement costs. Revenue diversification, such as providing industrial customers with heat, integrating renewable energy sources, selling captured CO_2, and participating in capacity markets, opens additional financial opportunities

Investments in innovations—like carbon capture, utilization, and storage (CCUS) systems, modular and hybrid TPPs, and energy storage solutions—boost companies' competitiveness. Enhanced staff training and automating routine tasks also reduce personnel costs and enable more efficient oversight of complex equipment

Selling surplus power during peak demand hours at higher prices on capacity markets further increases profits. In combination, these strategies help thermal power companies strengthen their positions, trim costs, and increase profitability while ensuring sustainable business growth amid rising competition and environmental standards

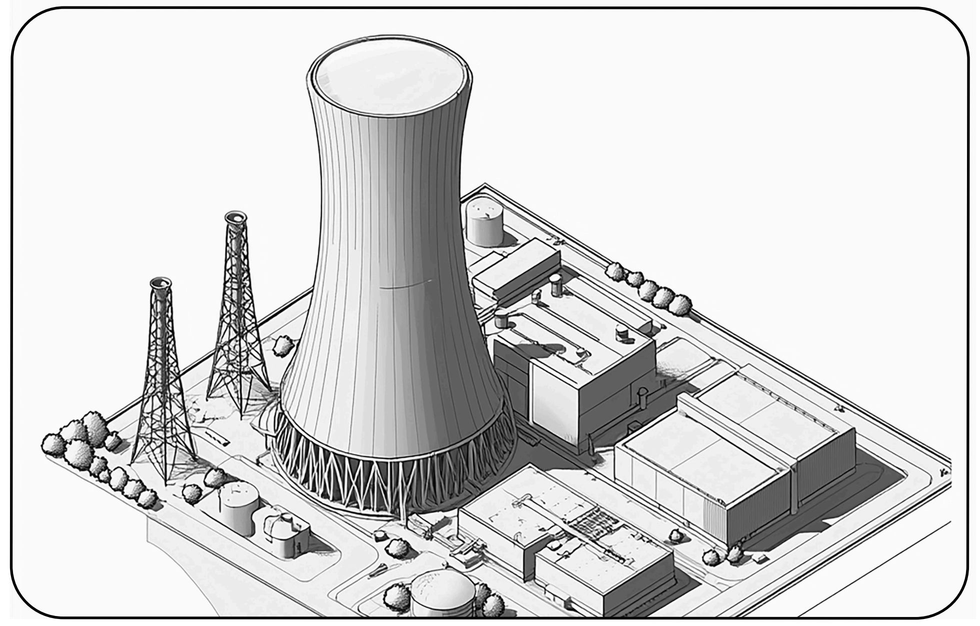
COST FACTORS IN BUILDING A THERMAL POWER PLANT

The expenses for constructing a thermal power plant (TPP) depend on numerous factors, including plant type, capacity, technology, fuel choice, location, and automation level. On average, building a 500 MW TPP ranges from $500 million to $1 billion, but actual costs can vary significantly →

One major cost component is the design and preparatory phase, which involves engineering solutions, environmental impact assessments, and construction planning. These preliminary efforts typically account for about 5–10% of the budget

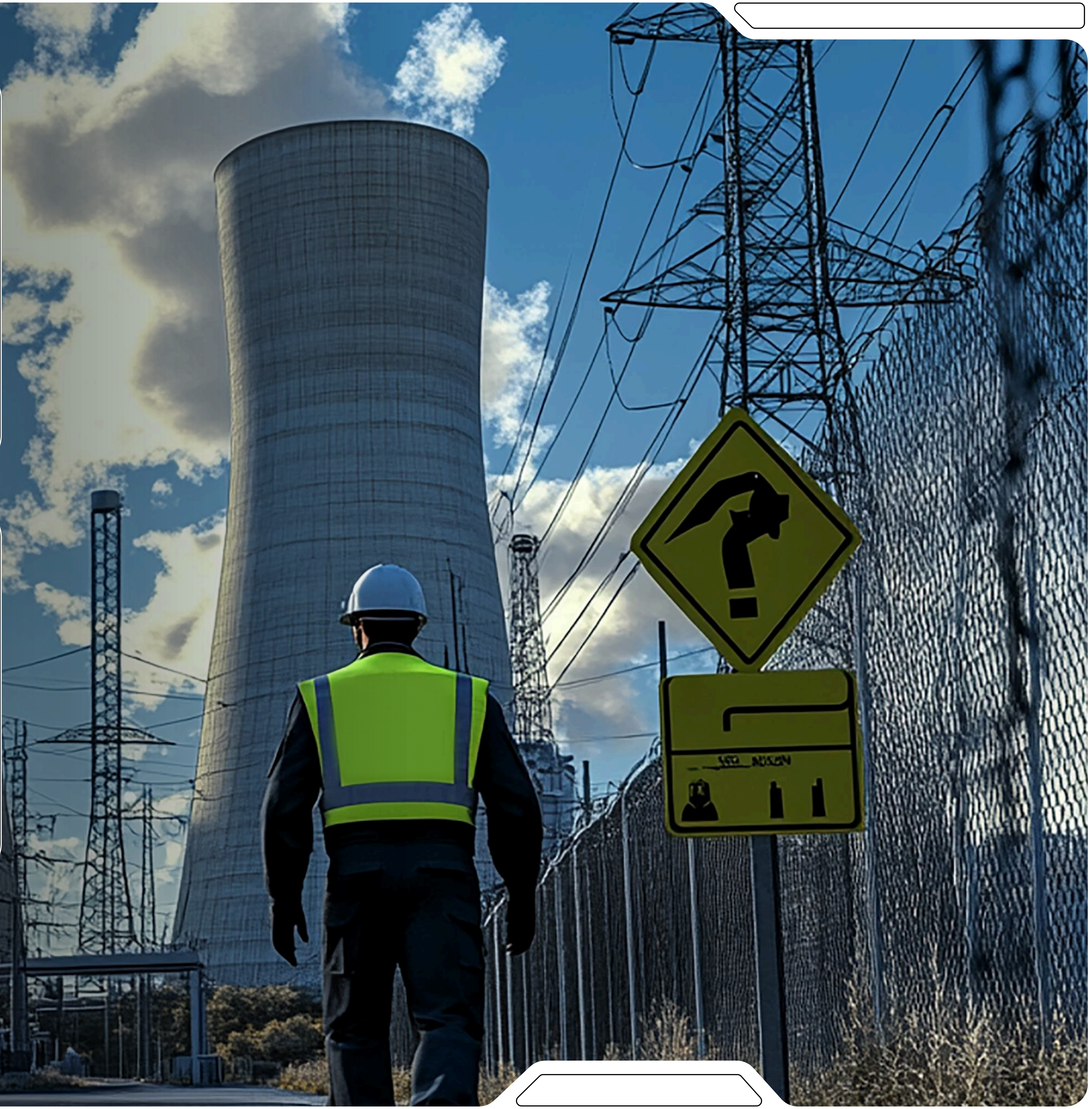
The largest share of expenses comes from turbines, generators, and boilers. Turbine systems can consume up to 40% of the budget, while boilers account for another 15–25%

Their costs hinge on chosen technologies, such as supercritical or ultra-supercritical pressure. Modern power plants also require advanced digital control systems, adding an additional 5–10% to overall expenditures



- Infrastructure systems such as fuel supply, water provision, and cooling play a pivotal role. The cost of transporting and storing fuel—particularly for coal or gas—accounts for about 10–15% of the budget. Cooling and water intake systems add another 10–20%, depending on plant requirements and local conditions. Construction and installation work, including building structures, equipment installation, and pipeline laying, takes up 15–25% of the total cost

- Connecting the plant to power grids requires additional investment, especially if substations or transmission lines must be built. These expenditures typically run about 5–10% of the budget. Environmental requirements, including carbon capture systems and emission filters, can add another 5–15% —particularly in countries with stringent environmental regulations



FINANCIAL AND ADMINISTRATIVE EXPENSES IN TPP CONSTRUCTION

Thus, building a TPP is a multifaceted process involving significant expenses for equipment, infrastructure, design, and compliance with environmental standards. With proper planning and modern technologies, these costs can be optimized while maintaining high plant efficiency and reliability

Financial and administrative costs—such as licensing, insurance, taxes, and project management—make up **5–10%** of the total

Gas-fired thermal power plants generally cost less to construct, ranging from **$500 million to $800 million for 500 MW** capacity, whereas coal-fired plants are pricier **(from $800 million to $1.2 billion)** due to more complex fuel-supply systems and additional environmental measures. Compact modular TPPs are typically less expensive at around **$300–$500 million** but offer lower capacity

RISK FACTORS IN TPP CONSTRUCTION

Constructing thermal power plants (TPPs) involves various risks that can affect timelines, budgets, safety, and efficiency. One major category is technical risks. During design, construction, and equipment installation, unforeseen ground or geological conditions may arise, requiring additional reinforcement or project adjustments

Delivery delays or specification mismatches of high-tech components—such as turbines and boilers—can complicate installation and calibration, extending the time needed to bring the plant online

Financial risks also play a significant role in TPP construction, given its capital-intensive nature. Increases in the cost of building materials and equipment—due to global market changes or currency fluctuations—can substantially inflate the overall budget

A lack of funding, delays in financing, or withdrawal of investor support may lead to project suspension or revised construction timelines

ENVIRONMENTAL AND SOCIAL RISKS

Environmental risks concern the impact of a TPP on its surrounding ecosystem. Non-compliance with current regulations—like capture and purification of emissions—can result in fines, lawsuits, or even halting the project altogether

Negative effects on the local environment, such as disrupting water balance or improper waste management, may spark protests from local communities or environmental groups, adding reputational and financial burdens

Social risks include potential public discontent, especially if constructing the plant raises health concerns or worsens local environmental conditions. Protests or legal actions can slow down the project or necessitate additional spending on communication and conflict resolution. In some instances, residents may need to be relocated, increasing costs and creating social tensions

COMPREHENSIVE RISK MANAGEMENT IN TPP PROJECTS

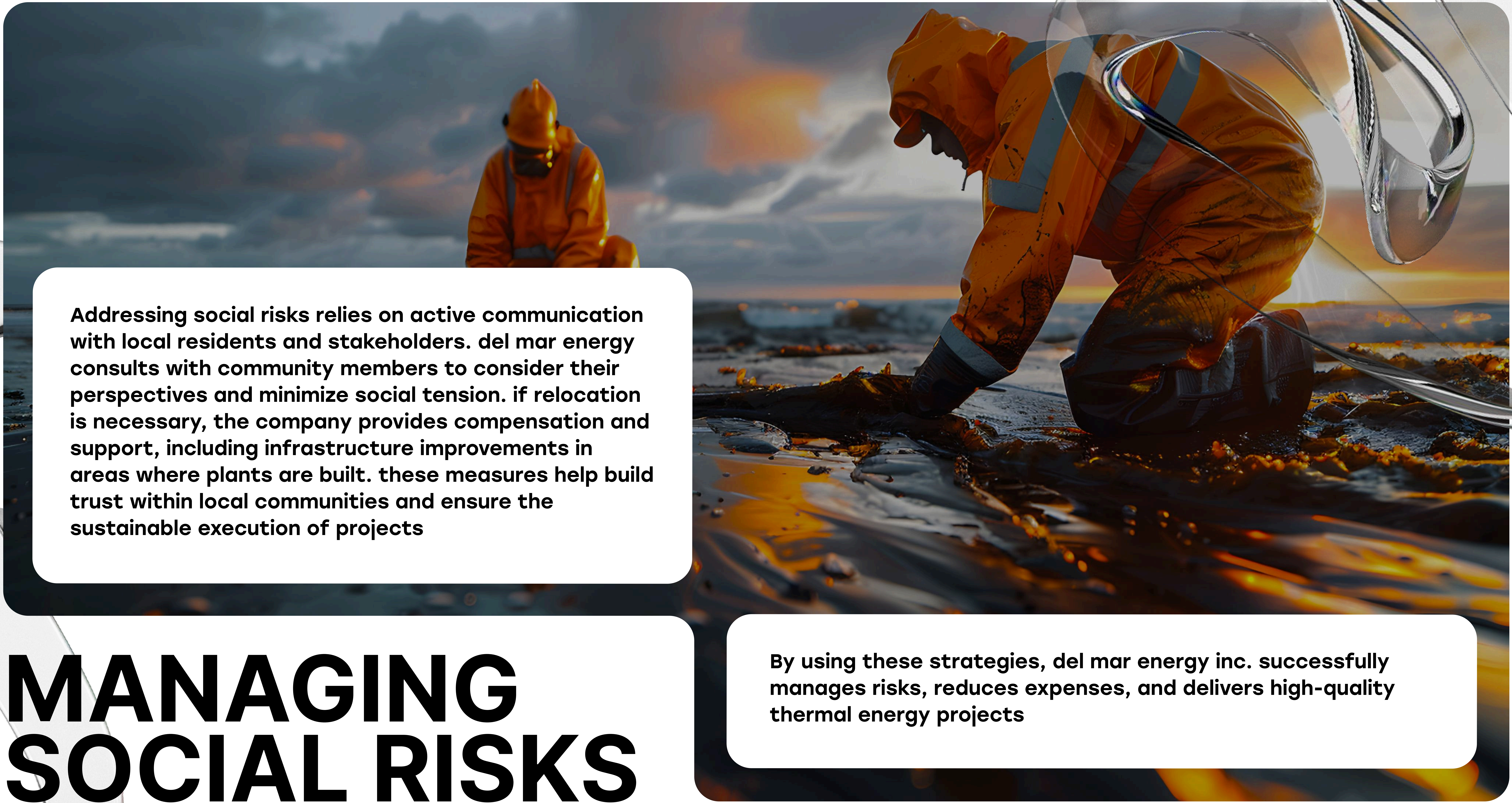
- Del Mar Energy Inc. employs a comprehensive approach to managing the risks associated with designing and constructing thermal power plants (TPPs). The company leverages modern technologies, advanced planning methods, and highly qualified personnel to minimize technical, financial, environmental, and social risks

- Technical risk management begins with thorough preparation during the design stage. The company conducts detailed geological and engineering surveys to avoid potential ground issues and accommodate any necessary project adjustments. To prevent equipment delivery delays, Del Mar Energy partners with reliable international suppliers, securing long-term contracts that ensure quality and on-time shipment

- Equipment installation and calibration are carried out by experienced specialists under strict oversight. Furthermore, the use of digital technologies and monitoring systems enables quick detection and resolution of potential malfunctions

FINANCIAL AND ENVIRONMENTAL RISK MITIGATION

- Financial risk reduction is achieved through careful financial planning and budget optimization. Del Mar Energy signs long-term contracts for materials and equipment to minimize the impact of market fluctuations on project costs
- To guard against currency risks, the company uses financial instruments like hedging. Additionally, it actively seeks investments and collaborates with international financial institutions, ensuring stable funding even amid unforeseen changes
- Addressing environmental risks is one of Del Mar Energy’s top priorities. The company implements advanced emission control systems, carbon capture, utilization, and storage (CCUS), and waste management practices
- Environmental assessments conducted during the design phase help minimize ecological impacts. Del Mar Energy also actively integrates renewable energy sources, such as biomass, alongside traditional fuels, reducing each plant’s carbon footprint



MANAGING SOCIAL RISKS

Addressing social risks relies on active communication with local residents and stakeholders. del mar energy consults with community members to consider their perspectives and minimize social tension. if relocation is necessary, the company provides compensation and support, including infrastructure improvements in areas where plants are built. these measures help build trust within local communities and ensure the sustainable execution of projects

By using these strategies, del mar energy inc. successfully manages risks, reduces expenses, and delivers high-quality thermal energy projects

EXAMPLE INVESTMENT OPPORTUNITY

By opening a deposit of **$75,000**, in 230 days, your balance will be →

$222,180

Deposit Term:

230 DAYS

ROI:

296.24%

MANAGING SOCIAL RISKS

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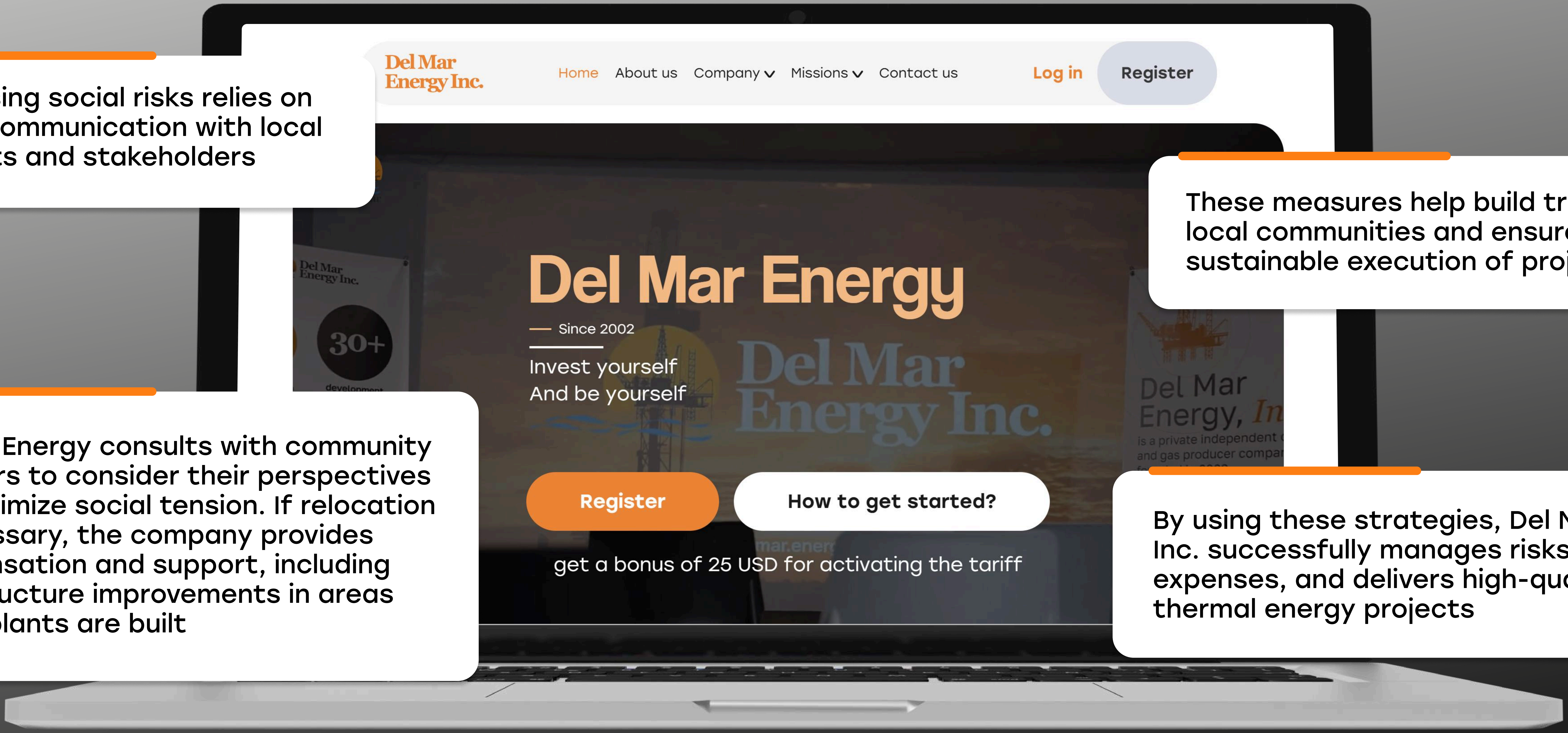

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LEADERSHIP TEAM

MICHAEL LATHAM

Founder/CEO

Michael Latham is the founder and CEO of Del Mar Energy. He established the holding company in 2002 in Texas, successfully building and growing industrial sectors

NICK KAUFMAN

COO (Chief Operating Officer)

Nick has served as COO since 2018. A Texas native and graduate of the University of Massachusetts, Nick initially worked in law. He first encountered Del Mar Energy in 2013 and officially became a partner in 2018. Nick introduced many of the modernized technologies now used in production

STEFAN RUSSO

CIO (Chief Information Officer)

Stefan started his internship at Del Mar Energy in 2016. In less than five years, he advanced from intern to company director

THOMAS LIEBERMAN

CMO (Chief Marketing Officer)

Born in 1984 in Nevada, Thomas studied at a local university before moving to New York in 2006 to work in marketing and public relations. He began collaborating with Del Mar Energy in 2011. Prior to joining the company, Thomas worked on promoting brands such as P&G, Gillette, and General Motors