



POWER FOSSIL

Capitalizing on US
Feedstock Advantages
in a Tight Global
Market

ZACHRY

CURRENT OPPORTUNITIES AND CHALLENGES IN FOSSIL POWER

1

GROWTH

- Capacity planning challenges from flattening electricity demand and significant change in the energy source mix
- Management of complex retirement and refurbishment schedules

2

EFFICIENCY

- Optimal load balancing across the fleet
- Investor and PUC demand for ever increasing efficiency, facility availability and price predictability

3

COSTS

- “War for talent” in securing the best workforce for operating and upgrading existing facilities
- Rising costs of complying with stringent environmental and safety standards

4

UNCERTAINTIES

- Future direction of regulatory and environmental demands
- Impact of increased capacity for distributed energy generation on transition grid’s economics
- Evolution of tax policy toward renewable energy sources

“Today, oil, natural gas and coal provide 82% of world energy. Twenty years from now, their share will be only slightly lower: 75% to 80%. There will, however, be a big shift in the mix among those conventional fuels... Natural gas will gain market share around the world.”

Daniel Yergin
Vice Chairman
IHS

ZACHRY ADDS VALUE ACROSS THE LIFECYCLE OF FOSSIL POWER FACILITIES



PLAN

We plan with the end in mind – engineering a facility that makes the optimal use of its site, and is designed for maximum efficiency, ease of maintenance and upgradability. We plan this way because we understand the priorities across the full lifecycle of fossil power generation facilities.



BUILD

The construction phase is where the majority of the project risk in power generation resides. That is why Zachry has a self-perform model that allows us to manage project risk more effectively, and to respond to changing customer requirements more swiftly.



RENEW

We work on the assumption that fossil power facilities can operate for 80 years or more - that with strategic maintenance and thoughtful capital investments, our customers should be able to extend the productive lives of these facilities for generations.

DISTINGUISHED SERVICE ON NUMEROUS FOSSIL POWER PROJECTS

THE SCALE

- ✓ Our fossil power portfolio spans more than five decades and includes over 100 facilities designed and constructed to produce a total of more than 60,000 megawatts.
- ✓ We have built some of the nation's largest gas-fired power plants in recent years, serving both the independent power production market as well as regulated utilities.
- ✓ Experience gained in power plant design and construction allows us to deliver outstanding turnkey operations and maintenance services, including executing more than 100 outages each year.

THE SKILLS

- ✓ We have adapted to changing environmental regulations in developing new coal-fired facilities and modifying existing coal plants in order to help sustain the country's baseload energy needs, while simultaneously advancing coal gasification and other innovative technologies.
- ✓ High voltage and substation services, as well as fleet maintenance, are also included in the comprehensive offerings we provide in supporting the lifecycle of power facilities.

THE SAFETY

- ✓ Our extensive experience in air quality control systems implementation is supported by more than 16 million cumulative employee hours dedicated to these efforts.

CREATING AND SUSTAINING AMERICA'S FOSSIL POWER CAPACITY



EXPERIENCED WITH THE WORLD'S LEADING ORIGINAL EQUIPMENT MANUFACTURERS



Zachry has earned a reputation for our advanced-class combustion turbine EPC expertise.

OUR VALUE ADDED IN THE PLAN STAGE OF FOSSIL POWER FACILITIES

Our capabilities in the '**PLAN**' phase of fossil power project execution include:

- ✓ Project development and consulting
- ✓ Studies and analysis
- ✓ Full service design engineering
- ✓ EPC execution planning
- ✓ Project and construction management
- ✓ Professional staffing services
- ✓ Plant start-up and commissioning
- ✓ Plant reliability and maintainability program development



COLLABORATION IS THE KEY TO ADDRESSING PROJECT CHALLENGES



THE CUSTOMER'S CHALLENGE

Topaz Power Group's Nueces Bay and Barney Davis power plants had multiple challenges when the company commissioned Zachry to repower these facilities. The aging infrastructure at Nueces Bay included units built in the 1940s on dirt reclaimed from the Bay in the 1920s. The plant had since been decommissioned. Environmental sensitivities were paramount in this location surrounded by water on three sides. The site was so limited in size that it also mandated highly coordinated scheduling due to its lack of laydown space. The Barney Davis facility, 25 miles away, was built in the 1970s and would require Zachry to maintain Unit 1 operation while repowering Unit 2 and constructing two additional units.



COLLABORATION IS THE KEY TO ADDRESSING PROJECT CHALLENGES



THE ZACHRY APPROACH

Zachry treated the Topaz projects as an integrated effort and used a joint engineering team as well as a shared procurement group. Engineering began with an intensive review of existing equipment on both sites to ensure the new equipment would function appropriately with the portions being re-used. Project leaders would later credit the quality of this review as key to the overall success of the project. Zachry's Construction Group refurbished and retrofitted the portions of the plants identified for re-use. The team then repowered existing steam turbines and replaced the natural gas-fired thermal boilers with new high efficiency combustion turbines and heat recovery steam generators.

THE BUSINESS OUTCOMES

The Nueces Bay project was completed and turned over to Topaz 26 days ahead of schedule with zero cost change orders. The Barney Davis completion followed shortly thereafter. Together, the two facilities produce nearly 1,400 megawatts of electricity – enough to power 600,000 homes. The combined projects were named Best Industrial Project by ENR Texas & Louisiana in the year that they were completed.

“This project is proof of Zachry’s ability to bring the whole package to the client by integrating engineering and procurement into the mix of its construction capabilities. To overcome the challenges this project presented, we needed a cohesive approach.”

Project Procurement Manager
Zachry Group

OUR VALUE ADDED DURING THE BUILD PHASE OF FOSSIL POWER FACILITIES

Our capabilities in the '**BUILD**' phase of fossil power project execution include:

- ✓ Integrated, turnkey EPC project delivery
- ✓ Direct hire construction
- ✓ Project management
- ✓ Safety and QA/QC
- ✓ Commissioning and plant/unit startup
- ✓ Small and midsize project experience
- ✓ Large and mega-project experience
- ✓ Firm price, date-certain delivery



SUCCESS BREEDS REPEAT BUSINESS FROM FLORIDA POWER PROVIDER



THE CUSTOMER'S CHALLENGE

As part of its strategy to become the leader of clean energy in the US, Florida Power and Light (FPL) developed a plan to transform its three oldest plants into high efficiency, 3-on-1 combined cycle power plants. The utility recognized that, by converting the Cape Canaveral, Riviera Beach and Port Everglades facilities to new natural gas-fired technology from older systems burning fuel oil, it could significantly increase the amount of power produced while also greatly reducing emissions. Existing facilities were demolished in 2010, 2011 and 2013, respectively. In each case, Zachry was selected to replace the former units with new state-of-the-art 1250 MW plants that FPL would christen as Next Generation Energy Centers.



SUCCESS BREEDS REPEAT BUSINESS FROM FLORIDA POWER PROVIDER



THE ZACHRY APPROACH

Zachry's turnkey engineering, procurement and construction (EPC services) for the three Florida power facilities takes advantage of the latest technology in combustion turbines to ensure high efficiency and high output. Equally important has been the company's ability to draw upon extensive experience in power plant construction and attract and retain a skilled and experienced workforce. This resulted in the Cape Canaveral and Riviera Beach projects being delivered ahead of schedule and FPL awarding the Port Everglades project to Zachry in 2013 for a targeted completion in 2016. During a national shortage in skilled craft labor, most Zachry employees on the Port Everglades facility have worked on all three FPL projects.

THE BUSINESS OUTCOMES

The Florida Next Generation Energy Centers run on considerably less fuel than their predecessors, saving hundreds of millions of dollars and translating to lower costs for FPL customers. FPL reports that its residential bills are lower than the national average and lowest among the state's 55 electric utilities. Since 2001, the switch to gas has enabled FPL to reduced its use of foreign oil by 98 percent. The plant design at the facilities is sensitive to the impact on nearby aquatic life. Water intake structures use a system of traveling screens, buckets and returns to allow marine life to avoid harm. Manatee heaters are placed in the discharge canals to ensure the safety of these endangered creatures during colder months.

“This important investment will benefit our customers for decades to come with significant improvements in efficiency, environmental performance and reliability.”

President and CEO
Florida Power & Light

TEAMING ARRANGEMENT GENERATES POWER AND GOODWILL



THE CUSTOMER'S CHALLENGE

The Florida Municipal Power Agency (FMPA) of Orlando provides power to approximately two million Florida residents. Demand for power in the region is expected to increase substantially over the next two decades. FMPA and the Kissimmee Utility Authority (KUA) of Kissimmee jointly own the Cane Island Power Park. FMPA and KUA selected Zachry to provide EPC services to add a fourth power-generating unit at the facility to produce an additional 300 megawatts to complement three existing smaller units totaling 475 megawatts. Extremely poor soil conditions in the area proposed for the expansion added to the challenge.



TEAMING ARRANGEMENT GENERATES POWER AND GOODWILL



THE ZACHRY APPROACH

Zachry's Engineering Group first tackled the soil issues where porous limestone required the volume and duration of grout injection to increase far beyond the original scope. Detailed planning mitigated the setback, reducing downtime by shifting people and equipment to other work outside the power block while the soil conditions were addressed. Zachry's team then proceeded with construction of a combined-cycle, natural gas-fired unit that uses treated wastewater for cooling to preserve groundwater resources. A heat-recovery steam generator collects waste heat from the turbine and converts it to electricity.

THE BUSINESS OUTCOMES

The FMPA and KUA added the desired generating capacity to their system and found an ally in their community outreach efforts in the process. Zachry's project team for Cane Island Unit 4 received the Heart of Florida United Way's Live United Spirit Award, placing among the top 25 contributors of the 450 businesses in the workplace giving campaign. While completing the Cane Island expansion, Zachry's team also led a joint effort to help the Central Florida Community Bread Basket, a non-profit food bank, upgrade its Intercession City-based food distribution facility.

“It’s refreshing to work with a company that not only talks about working as a team with the owner, but actually shows it. Thanks again for making this an enjoyable effort by doing all that you promised and more.”

VP of Power Supply
Kissimmee Utility Authority

Manager of Power Production
Kissimmee Utility Authority

OUR VALUE ADDED DURING THE RENEW PHASE OF FOSSIL POWER FACILITIES

Our capabilities in the '**RENEW**' phase of fossil power project execution include:

- ✓ Continuous presence plant operations and maintenance services
- ✓ Reliability engineering, assessments & improvement programs and technologies
- ✓ Maintenance skill development
- ✓ Specialty services
- ✓ Turnarounds/outages
- ✓ In-plant capital projects and upgrades



INDUSTRIAL SERVICES KEEPS GEORGIA PLANTS HUMMING



THE CUSTOMER'S CHALLENGE

Georgia Power Company, a unit of Southern Company, selected Zachry for core maintenance at Plant Wansley and Plant Yates near Atlanta, and Plant Scherer near Macon, Georgia. Maintenance work began in September 2011 on the three plants, which have a combined generation capacity of 6,550 megawatts. Functioning as a supplemental maintenance service provider requires close collaboration with the owner's programs and processes. The integration and coordination of Zachry work processes with those of Georgia Power would be critical to long-term success. Outage services require the planning/scheduling and costing of significant work in a window lasting from several days to months. Outages also require the recruiting and retention of qualified and highly productive supervision and craft personnel.



INDUSTRIAL SERVICES KEEPS GEORGIA PLANTS HUMMING



THE ZACHRY APPROACH

Zachry provides continuous presence maintenance at the three Georgia Power plants. Services can range from landscape maintenance to boiler work and precision millwright capabilities. Outage services include balance of plant work through major boiler turbine maintenance. The work is managed by Zachry's Industrial Services Group (ISG), whose maintenance services are in place at more than 90 sites nationwide. The highly competitive environment for supervisory and craft personnel requires focused coordination of Zachry's human resources and project management functions to identify needs, recruit in advance of the outage and retain critical skill sets for successful outage completion.

THE BUSINESS OUTCOMES

As the owner's prime maintenance contractor, Zachry helps Georgia Power consolidate the number of on-site contractors to lower indirect overheads, improve productivity and reduce cost of ownership. As the owner's prime outage contractor, Zachry delivers early front-end planning/scheduling and costing to ensure both parties are prepared to execute and complete the work on plan, within schedule and budget. Successful performance allows the owner to control the work in a dynamic environment, optimizing maintenance and capital spending to improve availability. Recruiting qualified supervision and craft personnel is critical. Zachry's HR processes are designed to meet this challenge by delivering resources with the skills and experience to successfully complete the work.

OUR ABILITY TO ADD VALUE TO YOUR PROJECT IS THE PRODUCT OF OUR DISTINCTIVE APPROACH

Zachry's approach to business is based on four key principles

Focus on Distinctive Value

We're always looking for ways to deliver distinctive value to our customers – through performance on immediate work and through using the freedom that our structure allows to focus on value beyond today's bottom line.

Priority on Customer Success

We recognize customer success is the basis for our success. We work to understand your goals so we can collaborate effectively and identify opportunities to enhance your business outcomes.

Right Team in the Right Place

We've assembled an extraordinary professional workforce. We continue to invest in training and development to keep their skills on the leading edge.

Adaptive Excellence in Execution

We believe every project is unique. Our self-perform model, integrated capabilities, loyal workforce and stable project teams allow us to deliver outstanding execution safely under any conditions.

WHAT WE WANT YOU TO KNOW

The Zachry Group's approach to doing business is purpose-built to help you take advantage of your biggest opportunities and tackle the challenges that you will face along the way.

Like you, we are completely focused on accountability for results. Our entire operating model is designed to deliver that accountability – from our lifecycle mindset to our self-perform execution capabilities.

We recognize that the projects we do represents some of the biggest commitments that our customers make – not just for them, but for the customers, communities and employees that depend on them.

LET'S CONTINUE THE CONVERSATION IN PERSON

We would welcome the chance to learn more about your needs.



SCOTT DUFFY

Senior Vice President
Business Development
Zachry Group
527 Logwood
San Antonio, TX 78221-1738
210.588.5149
duffys@zachrygroup.com