

CASE STUDY

# Cooperative Energy's Morrow Plant is the Most Efficient Repowered Plant in North America

Cooperative Energy, a generation and transmission cooperative owned by 11 electric cooperative distribution members, provides safe, reliable and affordable power to approximately 437,000 homes and businesses in Mississippi. The cooperative just completed the repowering of R.D. Morrow, Sr. Generating Station from coal-to-natural gas.



## Challenge

Facing an increasingly competitive environment for unit dispatch within the Midcontinent Independent System Operator (MISO) market, Cooperative Energy wanted to shift to a lower-cost natural gas power plant that brings cleaner, more efficient combined-cycle technology. Continuing a 45-year relationship, Cooperative Energy teamed up with Burns & McDonnell for this effort.

During the collaboration, Cooperative Energy wanted to see that all possible options — including the repowering of its coal-fired plants — would be thoroughly evaluated to see what the appropriate choice would be.

The nature of the project at hand needed meticulous planning and attention to detail as there were multiple risks including staying on budget, within the allocated schedule and working through supply chain issues while achieving a high level of power capacity.

**18.1K**

TONS OF DEMOLITION

**7K**

CUBIC YARDS OF  
CONCRETE

**10**

MILES OF PIPE

**130**

MILES OF CABLE

The cooperative also wanted to utilize local labor and retain current staff from the R.D. Morrow, Sr. Generating Station.

## Solution

To start, Burns & McDonnell evaluated the existing equipment inside the plant for its potential reuse. Members of the Cooperative Energy team were included in this phase, and their extensive knowledge of the status of the equipment aided in the design and repower of the plant.

The Burns & McDonnell team then developed work packages for the Cooperative Energy team for the decommissioning of the coal plant and added scopes for various packages through the execution, startup and recommissioning of the repowered plant.

The first steps of the project, including demolition, took 16 months of razing work as the team continued working during the pandemic. Daily temperature checks and staggered schedules to improve social distancing allowed the team to continue working on schedule.

Cooperative Energy elected to pursue a heat recovery repower strategy for its natural gas combined-cycle plant. The heat recovery repower adds a natural gas combustion turbine within the existing infrastructure. The 1x1 combined-cycle unit was equipped with a Siemens 9000HL advanced-class combustion turbine technology paired with the existing steam turbine.

## Result

The advanced gas turbine technology and heat recovery steam generator increased the existing unit's power capacity from 204 MW to 572 MW, which makes it the most efficient repowered unit in North America.

R.D. Morrow, Sr. Generating Station staff played a huge role as their vast knowledge aided the evaluation and design process. Local labor was just as important, and this project was built primarily by crews from the area.

With the team's collaboration and engineering and construction efficiencies, Burns & McDonnell was able to deliver the project under budget, yielding millions in project savings while staying on schedule even during unforeseen challenges. With more than 1.5 million hours of work with zero safety incidents, the plant's resolute reputation for reliability will continue well into the future with natural gas as its new fuel source.

## About Burns & McDonnell



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