



**Sargent & Lundy**

# Combustion Turbine Technologies



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# Combustion Turbine Qualifications Summary

Sargent & Lundy has provided design services and owner's engineering, repowering, and related services, for more than 180 combustion turbine projects around the world, primarily combined-cycle and simple-cycle technologies, representing more than 37,000 MW of capacity.

Our experience encompasses combustion turbines, steam turbines, and heat recovery steam generators provided by all the major suppliers/original equipment manufacturers (OEMs) for 50-Hz and 60-Hz grids. From this breadth of conceptual and detailed design experience, we maintain a living database of equipment capital costs applicable to a wide range of plant and equipment configurations.

## Project Locations Worldwide



Algeria	Nigeria
Argentina	Panama
Brazil	Peru
Canada	Philippines
China	Saudi Arabia
Colombia	Singapore
Dominican Republic	South Korea
El Salvador	Russia
Ghana	Thailand
India	Turkey
Indonesia	Turkmenistan
Iraq	United Arab Emirates
Israel	United Kingdom
Jamaica	United States
Mexico	Venezuela

# Combustion Turbine Qualifications Summary

## Experience with all Major Combustion Turbine OEMs and Models

ABB	GT11N2, GT24, GT26
General Electric	Frame 5, LM1800, LM2500, LM6000, LMS100, 6B.03, 6F.03, 7E.03, 7F.03, 7F.04, 7F.05, 7H and 9H (original GE H-Class), 7HA.01, 7HA.02, 9E.03, 9F.03
Mitsubishi	H-100, M501DA, M501F, M501GAC, M501J, M501JAC, M701D, M701F
Pratt & Whitney	FT8, FT4000
Rolls-Royce	RB211, Trent
Siemens	SGT-800, SGT6-3000E (W501D5A), SGT6-5000F (W501F), SGT6-6000G (W501G no longer in production), SGT6-2000E (V84.2), SGT6-4000F (V84.3A), SGT5-4000F (V94.3A), SGT6-8000H

# Combined-Cycle and Cogeneration Projects

## Big Bend Modernization Project

<b>Client</b>	Tampa Electric Company	<p>This project entails converting Unit 1 from firing coal to firing natural gas. The work includes the associated transmission and interconnection facilities, as well as natural gas infrastructure. The existing condenser and circulating water system will be refurbished and reused and water intake systems will be modified for 316b rule compliance. The existing coal-fired Unit 2 will be retired. Sargent &amp; Lundy's project scope spans detailed engineering, design, procurement, project management, and onsite construction management/commissioning oversight. Simple-cycle operation of the new combustion turbines is scheduled for 2021, with combined-cycle operation of the repowered steam turbine slated for 2023.</p>
<b>Location</b>	Apollo Beach, FL	
<b>Plant Type</b>	CC	
<b>Fuel</b>	Natural gas	
<b>Size</b>	1090 MW	
<b>Configuration</b>	2x2x1	
<b>CT</b>	GE 7HA.02	
<b>COD</b>	2023	



## Delta Energy Center (Combined-Cycle and Simple-Cycle)

<b>Client</b>	Lansing Board of Water & Light	<p>We provided owner's engineering/technical advisory services for development of a new natural gas 2x2x1 combined cycle and 1x0 simple cycle (installed indoors in a common building) with combustion turbine bypass stacks, wet cooling tower, and 138-kV switchyard. Our services included site selection; development of general arrangement, piping and instrumentation diagrams (P&amp;IDs), and single-line, and specifications; procurement support for major equipment; detailed design engineering; and construction management contracts. We also supported the client with natural gas and transmission interconnection agreements, environmental permit applications, and review of basic and detailed engineering.</p>
<b>Location</b>	Lansing, MI	
<b>Plant Type</b>	CC and SC	
<b>Fuel</b>	Natural gas	
<b>Size</b>	250 MW	
<b>Configuration</b>	2x2x1 CC / 1x0 SC	
<b>CT</b>	Siemens SGT-800	
<b>COD</b>	2020	



# Combined-Cycle and Cogeneration Projects

## Kings Mountain Energy Center

<b>Client</b>	Gemma Power Systems
<b>Location</b>	Kings Mountain, NC
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	475 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	MHPSA M501GAC
<b>COD</b>	2018

Sargent & Lundy provided complete engineering design in support of Gemma's EPC contract, including balance-of-plant (BOP) and engineered equipment specifications. Design features and systems included auxiliary boiler, condenser, mechanical-draft cooling tower, electrical, instrumentation and control (I&C), distributed control system (DCS), water treatment, wastewater, fire protection, and evaporative cooling. The other major equipment included Vogt heat recovery steam generator and Toshiba steam turbine.



## Mary-3

<b>Client</b>	TechnoVision
<b>Location</b>	Turkmenistan
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	1574 MW
<b>Configuration</b>	(2) 2x2x1
<b>CT</b>	GE 9FA.03
<b>COD</b>	2018

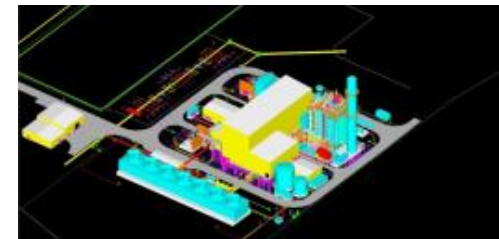
The overall EPC scope included design, supply, and installation of combustion turbines, heat recovery steam generators, steam turbines, and other associated plant equipment, as well as necessary site work. Collaborating with TechnoVision, Sargent & Lundy was responsible for all mechanical, electrical, and I&C equipment detailed design, in close collaboration with TechnoVision and the Turkish EPC.



## Middletown Energy Center

<b>Client</b>	Gemma Power Systems
<b>Location</b>	Middletown, OH
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	475 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	MHPSA M501GAC
<b>COD</b>	2018

Sargent & Lundy provided complete engineering design in support of Gemma's EPC contract, including balance-of-plant (BOP) and engineered equipment specifications. Design features and systems included auxiliary boiler, condenser, mechanical-draft cooling tower, electrical, instrumentation and control (I&C), distributed control system (DCS), water treatment, wastewater, fire protection, and evaporative cooling. The other major equipment included Vogt heat recovery steam generator and Toshiba steam turbine.

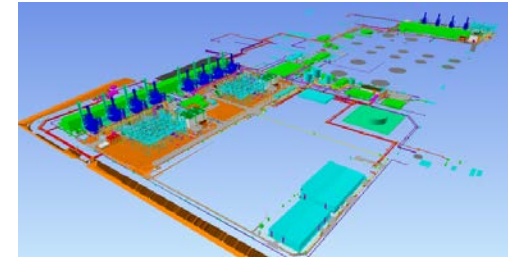




# Combined-Cycle and Cogeneration Projects

## Qassim II, III

<b>Client</b>	National Contracting Co.	As the consulting engineer for the EPC contractor, National Contracting Company, Sargent & Lundy performed detailed engineering design and provided procurement support for expanding the plant capacity through conversion from simple-cycle to combined-cycle operation. The Block C conversion included one new steam turbine and one 25-cell air-cooled condenser. The Block A conversion included two new steam turbines and two 25-cell air-cooled condensers. The project added 440 MW increasing the total output of the site to 1,140 MW.
<b>Location</b>	Saudi Arabia	
<b>Plant Type</b>	CC	
<b>Fuel</b>	Natural gas	
<b>Size</b>	1140 MW total site output	
<b>Configuration</b>	(3) 4x4x1	
<b>CT</b>	GE 7001EA (12)	
<b>COD</b>	2018	



## Umm Al Houl Power (UHP) Independent Water and Power Project (IWPP)

<b>Client</b>	Samsung C&T	The UHP IWPP has a rated output of approximately 2,520 MW net electrical power and produces low-pressure and medium-pressure extraction steam for a total desalination water production of approximately 136.5 million of imperial gallons per day (MIGD). The power plant supplies sufficient LP steam to the adjacent multi-stage flash (MSF) desalination plant to produce approximately 76.5 MIGD of potable water. A reverse osmosis (RO) plant produces the remaining 60 MIGD of potable water. Sargent & Lundy's scope of work included mechanical and I&C engineering of primary plant systems and involved preparing calculations, P&IDs, system descriptions, overall control philosophy, and electrical system studies in support of EPC contractor SC&T.
<b>Location</b>	Doha, Qatar	
<b>Plant Type</b>	CC cogeneration	
<b>Fuel</b>	Natural gas	
<b>Size</b>	2520 MW	
<b>Configuration</b>	(2)3x3x2	
<b>CT</b>	Siemens SGT5-4000F	
<b>COD</b>	2018	



## Wildcat Point Generation Facility

<b>Client</b>	Old Dominion Elec. Coop.	The Wildcat Point EPC project was awarded to White Oak Power Constructors, the JV of Sargent & Lundy and PCL Industrial Construction Company, in June 2014. Sargent & Lundy's portion of the project scope included all detailed design, engineered equipment procurement, commissioning, and JV executive management. Major equipment purchased by the owner and assigned to the JV included two MHI 501GAC combustion turbines, two Alstom heat recovery steam generators, one Alstom steam turbine, and SMIT generator step-up transformers. The facility is on an existing operating site with four combustion turbines.
<b>Location</b>	Rising Sun, MD	
<b>Plant Type</b>	CC	
<b>Fuel</b>	Natural gas	
<b>Size</b>	1000 MW	
<b>Configuration</b>	2x1	
<b>CT</b>	MHI 501GAC (2)	
<b>COD</b>	2018	



# Combined-Cycle and Cogeneration Projects

## Kirikkale

<b>Client</b>	Samsung C&T
<b>Location</b>	Kirikkale, Turkey
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	950 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	Alstom GT26
<b>COD</b>	2017

The project has a rated output of approximately 950 MW net electrical power. Sargent & Lundy services encompassed mechanical and I&C engineering of primary plant systems and involved preparing calculations, P&IDs, system descriptions, logic diagrams, control philosophies, and electrical system studies in support of the EPC contractor SC&T.



## Rabigh 2 IPP DRM

<b>Client</b>	Samsung C&T
<b>Location</b>	Rabigh, KSA
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	2060 MW
<b>Configuration</b>	(3)2x2x1
<b>CT</b>	Siemens SGT6-5000F5(E)
<b>COD</b>	2017

The Rabigh IPP project has a rated output of approximately 2,060 MW net electrical power. Sargent & Lundy's project scope encompassed mechanical and I&C engineering of primary plant systems and involved preparing calculations, P&IDs, system descriptions, logic diagrams, control philosophies, and electrical system studies in support of the EPC contractor SC&T.



## Carty

<b>Client</b>	Abeinsa/Abengoa
<b>Location</b>	Portland, OR
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	440 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	MHI 501GAC
<b>COD</b>	2016

In support of Abeinsa's contract obligations, Sargent & Lundy provided complete engineering and design, including BOP and engineered-equipment specifications. The major components were supplied by Mitsubishi Power Systems Americas, Inc. Key design features included auxiliary boiler, selective catalytic reduction (SCR) and carbon dioxide (CO<sub>2</sub>) control systems, condenser, mechanical-draft cooling tower, electrical and I&C systems, DCS, water supply and treatment system, wastewater system, and fire protection system. Provisions were made for an additional unit of equal size.



# Combined-Cycle and Cogeneration Projects

## Qurayyah IPP 1-6

<b>Client</b>	Samsung C&T
<b>Location</b>	Saudi Arabia
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas/diesel oil
<b>Size</b>	4000 MW
<b>Configuration</b>	6 blocks, 2x2x1
<b>CT</b>	SGT6-PAC 5000F
<b>COD</b>	2015

Sargent & Lundy's project scope entailed the detailed design of the power block and BOP facilities. This included preparing technical specifications for purchase of equipment and commodities, system studies and calculations, P&IDs, flow diagrams, schematics, equipment location general arrangements, 3D model, as-builts, and equipment, valve, and cable lists.



## GMR (S) Energy

<b>Client</b>	Samsung C&T
<b>Location</b>	Singapore
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas/diesel 2
<b>Size</b>	2x400
<b>Configuration</b>	2 blocks, 1x1x1
<b>CT</b>	SGT5-4000F
<b>COD</b>	2014

The 800-MW combined-cycle facility is located on Jurong Island and is Singapore's first privately owned power plant. The facility includes two 1x1x1 power blocks and fires regasified liquefied natural gas (LNG). The owner/developer is Indian infrastructure conglomerate GMR Energy, who awarded the project's EPC contract to the consortium of Samsung C&T and Siemens. Sargent & Lundy supported Samsung C&T by providing mechanical BOP engineering, design, and specifications.



## Ras Al-Khair Power and Desalination Plant (Combined-Cycle and Simple-Cycle)

<b>Client</b>	SEPCOIII
<b>Location</b>	Saudi Arabia
<b>Plant Type</b>	CC/SC and desalination
<b>Fuel</b>	Natural gas
<b>Size</b>	2400 MW
<b>Configuration</b>	5 CC blocks, 2x2x1/ 1 SC block
<b>CT</b>	Siemens SGT6-5000
<b>COD</b>	2014 (CC) / 2013 (SC)

Sargent & Lundy's support to the EPC contractor included BOP engineering and design and procurement specifications; detailed vendor drawing reviews; and coordination for equipment and material delivery and for construction, as requested. We were tasked with meeting the challenges of confirming and finishing detailed engineering that was begun by other parties, as well as integrating previous equipment purchases, including all mechanical and electrical interconnecting. The engineering scope of work was accelerated due to multiple changes in contract participants.





# Combined-Cycle and Cogeneration Projects

## Confidential Combined-Cycle Plant

<b>Client</b>	Confidential
<b>Location</b>	Middle East
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas/diesel no. 2
<b>Size</b>	800 MW
<b>Configuration</b>	2x(6x6x1)
<b>CT</b>	GE LM6000 (12) (SPRINT)
<b>COD</b>	2013

We provided design engineering and procurement services for a new combined-cycle facility, including a gas-insulated substation, located in the Middle East. Both independent blocks (Blocks 1 and 2) consist of six dual-fired GE LM6000 SPRINT combustion turbines, six once-through steam generators (OTSGs), and one steam turbine. The plant was designed to burn natural gas and includes a four-stroke black start diesel generator.



## Edwardsport Integrated Gasification Combined Cycle (IGCC)

<b>Client</b>	Duke Energy
<b>Location</b>	Edwardsport, IN
<b>Plant Type</b>	IGCC
<b>Fuel</b>	Gas
<b>Size</b>	630 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	GE 7FB
<b>COD</b>	2013

The project scope for the Edwardsport IGCC facility involved overall BOP engineering and design. This included raw water collection, treatment, and storage; grey water disposal; coal handling; potable water supply; auxiliary power supply and distribution; various underground piping and electrical infrastructure; fire protection; auxiliary fuel delivery; storm water drainage and collection; oil water collection and separation; DCS interface; and uninterruptible power supply system.



## Deer Creek 1

<b>Client</b>	Basin Electric Power Cooperative
<b>Location</b>	Brookings County, SD
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas
<b>Size</b>	300 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	GE 7FA
<b>COD</b>	2012

Project activities encompassed preliminary engineering, air modeling and permitting support, major equipment and BOP procurement, detailed plant design, and preparation of the construction general work contract specification and project integrated master schedule. The Deer Creek project qualified for Rural Utilities Service (RUS) funding, a division of the USDA. At the time, this was the first combined-cycle plant with the combustion turbine and steam turbine enclosed indoors. At the station dedication ceremony, the client's project manager stated that the project "...was done on time, under budget, and safely."



# Combined-Cycle and Cogeneration Projects

## Dresden

<b>Client</b>	AEP
<b>Location</b>	Muskingum, OH
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas and oil
<b>Size</b>	500 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	GE 7FA
<b>COD</b>	2012

Sargent & Lundy's scope of work for the Dresden project involved the complete engineering and design and included preparing equipment specifications, providing procurement services, and significant input to the project integrated schedule.



## Qurayyah 1-5 (Combined-Cycle) and 1-15 (Simple-Cycle)

<b>Client</b>	Arabian Bemco
<b>Location</b>	Saudi Arabia
<b>Plant Type</b>	CC and SC
<b>Fuel</b>	Gas and oil
<b>Size</b>	1900 MW total
<b>Configuration</b>	(5) 3x3x1
<b>CT</b>	GE7FA (Units 1-15)
<b>COD</b>	2012 (CC)/2007 (SC)

**Phase 1:** Detailed design of power block and BOP simple-cycle facilities. We supported resource planning to purchase necessary equipment, including bills of quantities (BOQs) to purchase bulk commodity materials. Our scope of work also included system studies and calculations; P&IDs, flow diagrams, and schematic diagrams; control logic and system descriptions; equipment location and general arrangement drawings; equipment, valve, and cable lists; construction drawings and installation details; civil and structural works; steam and BOP piping; wiring and cable design; as-built drawings; and O&M manuals.

**Phase 2:** Conversion to combined-cycle operation. The conversion phase, with each block of three combustion turbines in 3x1 arrangement, increased nominal power output to 3,040–3,210 MW. The facility includes emergency/black start diesel generators.



# Combined-Cycle and Cogeneration Projects

## Surgutskaya 1, 2

<b>Client</b>	Gama Power Systems
<b>Location</b>	Surgut City, Russia
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	800 MW total
<b>Configuration</b>	(2) 1x1x1
<b>CT</b>	GE 109FA
<b>COD</b>	2011

The project scope for this new plant in Russia entailed providing detailed engineering and design services. The project included preparation of all equipment specifications, procurement services, and the development of the integrated EPC schedule.



## Shaturskaya

<b>Client</b>	Gama Power Systems
<b>Location</b>	Shatura, Russia
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	400 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	GE 109FA
<b>COD</b>	2010

The project scope for this new plant in Russia entailed providing detailed engineering and design services. The project included preparation of all equipment specifications, procurement services, and the development of the integrated EPC schedule.



# Combined-Cycle and Cogeneration Projects

## J. L. Stall

<b>Client</b>	AEP
<b>Location</b>	Shreveport, LA
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas
<b>Size</b>	540 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	SWPC 501FD2
<b>COD</b>	2010

The JV of Sargent & Lundy and TIC provided detailed design and engineering services on an EPC basis. Our services included specifications and drawings for construction, erection, commissioning, and startup; procurement and expediting of process equipment; and field engineering services. The project was awarded the Associated Builders and Contractors (ABC) South Texas Chapter's top honor in mega-project category in its annual Excellence in Construction competition. The award was based on overcoming obstacles in project completion, use of innovative quality control and scheduling, and effectiveness of site safety record and safety programs.



## Hillabee

<b>Client</b>	Constellation Energy (Exelon)
<b>Location</b>	Tallapoosa County, AL
<b>Plant Type</b>	CC
<b>Fuel</b>	Natural gas
<b>Size</b>	740 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	SWPC 501G
<b>COD</b>	2009

The project scope encompassed detailed engineering and design, including site development, civil design, design criteria, P&IDs, piping physical drawings, natural gas yard, power and control cabling, structural steel and foundations, procurement support, onsite field engineering support during construction, and construction/startup support. Construction was postponed in 2003. In 2008, Constellation, the new owner, authorized Sargent & Lundy to restart the engineering effort.





# Combined-Cycle and Cogeneration Projects

## Riverside Repowering

<b>Client</b>	Xcel Energy
<b>Location</b>	Minneapolis, Minnesota
<b>Plant Type</b>	CC repowering
<b>Fuel</b>	Gas
<b>Size</b>	480 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	GE 7FA
<b>COD</b>	2009

Located where the original Riverside Units 1-5 once stood, this project retired three existing coal-fired boilers and repowered steam turbine 7 with two combustion turbines, designated as Units 9 and 10, each with a heat recovery steam generator. Sargent & Lundy performed detailed engineering and design, developed procurement specifications, and expedited equipment deliveries. We also designed a 10-acre-foot stormwater surge pond within the limits of the existing coal yard. The river water intake structure for the circulating water system was retrofit with installation of underwater screens to meet Clean Water Act Section 316(b) requirements.



## Hopkins Repowering

<b>Client</b>	City of Tallahassee
<b>Location</b>	Tallahassee, FL
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas and oil
<b>Size</b>	300 MW
<b>Configuration</b>	1x1x1
<b>CT</b>	GE 7FA
<b>COD</b>	2008

Sargent & Lundy initially studied repowering from oil to gas firing in order to reduce fuel costs, improve efficiency through reduced heat rate, and reduce emissions. We were then tasked with evaluating if expediting the conversion two years earlier than planned could be implemented. The study determined that the Unit 2 steam turbine could accommodate two combustion turbines and triple-pressure heat recovery steam generators, enabling a two-phased conversion to match load demand. Sargent & Lundy's Phase 1 services included preliminary engineering, BOP procurement/detailed design, and construction/commissioning support (1x1x1). The Phase 2 conversion to 2x1 was delayed due to installation of 11 (9-MW each) reciprocating engines to replace the retired Unit 1.

- 2011 - "Top Gas Plant," *Power Magazine*
- 2009 - Pacesetter Plant Award," *Combined Cycle Journal*



# Combined-Cycle and Cogeneration Projects

## Kaeng Khoi Block II

<b>Client</b>	Mitsui & Co., Ltd. (Mitsui)
<b>Location</b>	Lopburi, Thailand
<b>Plant Type</b>	CC
<b>Fuel</b>	Gas and oil
<b>Size</b>	735 MW
<b>Configuration</b>	2x2x1
<b>CT</b>	Alstom GT 26B
<b>COD</b>	2008

Sargent & Lundy supported Mitsui's EPC efforts by preparing the conceptual engineering, including heat balances, cost estimates, and layout system descriptions. We also reviewed the bids from the major OEMs (GE 9FA, MHI 701F, and Alstom GT 26B).



# Simple-Cycle Projects

## Newman 6

<b>Client</b>	El Paso Electric Company
<b>Location</b>	El Paso, TX
<b>Plant Type</b>	SC
<b>Fuel</b>	Natural gas
<b>Size</b>	226 MW
<b>CT</b>	MHPSA GT5 M501GAC
<b>COD</b>	2023

The overall project scope consists of combustion turbine procurement and basic design (P&IDS, single-line diagrams, planning, permitting, and grid interconnect support); BOP equipment specifications and award support; combustion turbine and BOP vendor drawing reviews; detailed engineering and design; construction specifications and award support; and Installation, testing, and start up.



## Astoria Station

<b>Client</b>	Otter Tail Power Company
<b>Location</b>	Deuel County, SD
<b>Plant Type</b>	SC
<b>Fuel</b>	Natural gas
<b>Size</b>	250 MW
<b>CT</b>	MHPSA M501GAC
<b>COD</b>	2021

This project is a natural gas fired simple-cycle combustion turbine used to provide peaking power. Sargent & Lundy's project scope includes detailed engineering and design for the station, procurement of engineered equipment and construction services, project management, and project controls.



## Black Dog 6

<b>Client</b>	Xcel Energy
<b>Location</b>	Burnsville, MN
<b>Plant Type</b>	SC
<b>Fuel</b>	Natural gas
<b>Size</b>	214.8 MW (net)
<b>CT</b>	GE 7FA.05
<b>COD</b>	2018

Sargent & Lundy's project scope encompassed the detailed BOP design, which included technical equipment procurement specifications; multiple installation specifications; bid evaluations; and specification conformance services. The new combustion turbine was installed on the existing Unit 4 steam turbine pedestal in the existing turbine building, which was modified to support the new combustion turbine. The new combustion turbine exhaust system, including transition duct, expansion joint, and stack with silencer, was installed where the former Unit 4 pulverized coal-fired boiler was demolished. The exhaust system penetrates the boiler building roof and is top-supported from the existing boiler support steel. A new natural gas pipeline was brought to the site to support the new simple-cycle unit and the existing 1x1x1 combined-cycle unit.



# Simple-Cycle Projects

## Charles D. Lamb Energy Center

<b>Client</b>	OMPA	Sargent & Lundy's scope of work included detailed BOP design (civil, structural foundations, mechanical piping, electrical auxiliary power system, I&C), preparation of technical equipment procurement specifications, development of a general work contract installation specification, bid evaluations, and specification conformance. Our services also included providing construction management support at the site. The site was chosen because of its access to a 345-kV electric transmission line and the availability of a natural gas pipeline, as well as for its size, enabling OMPA to expand to a 2x2x1 combined-cycle configuration in the future.
<b>Location</b>	Kay County, OK	
<b>Plant Type</b>	SC	
<b>Fuel</b>	Natural gas	
<b>Size</b>	103 MW	
<b>CT</b>	Siemens SGT6 2000E	
<b>COD</b>	2015	



## Campbell 1

<b>Client</b>	Hawaiian Electric Co., Inc.	Sargent & Lundy provided conceptual, design, permitting support, and detailed design for the simple-cycle addition. Air permits were received in June 2007, after which detailed design commenced. We provided construction management, startup, and testing coordination for the power block and for the design of the plant switchyard, along with a new transmission line to an offsite substation. The facility includes black start capability.
<b>Location</b>	Barbers Point, HI	
<b>Plant Type</b>	SC	
<b>Fuel</b>	No. 2 fuel oil and biodiesel	
<b>Size</b>	125 MW	
<b>CT</b>	Siemens SGT6-3000E	
<b>COD</b>	2009	



## Hopkins Peakers HC3, HC4

<b>Client</b>	City of Tallahassee	Sargent & Lundy provided preliminary engineering, detailed design, and construction support for the installation of two GE LM6000 machines, including a black start diesel generator. Our project scope also included a switchyard upgrade. This peak-load generating facility consists of two GE LM6000 combustion turbines that include SCR and dry inlet chillers, a first in the United States. Major systems (piping, conduits, etc.) were located underground in trenches.
<b>Location</b>	Tallahassee, FL	
<b>Plant Type</b>	SC	
<b>Fuel</b>	Natural gas and oil	
<b>Size</b>	96 MW	
<b>CT</b>	GE LM6000	
<b>COD</b>	2005	

