# CHENG | POWER SYSTEMS

**Cheng Cycle® is patented steam injection technology designed to:**

- Increase power output of gas turbine 50-90%
- Improve efficiency by up to 40%
- Reduce NOx to <10 PPM
- Reduce CO to <10 PPM
- Low Cost/kW & High Reliability
- Better Heat Rate & Low O&M Cost
- High Part Load Eff. With Lower Emissions
- No Derating for Temp.

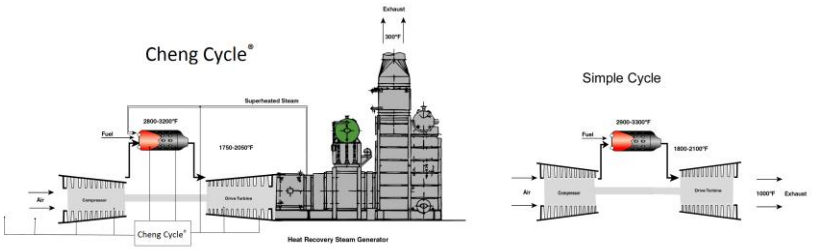
Cheng Cycle® is a patented technology for converting new and existing simple-cycle gas turbines to highly efficient and clean power generators that are especially beneficial for the peaking and intermediate load electrical power markets.

The Cheng Cycle® incorporates full heat recovery massive steam injection and uses an energy-storage heat-recovery steam generator (HRSG) design with automatic control of thermodynamic feedback for stable operation at maximum efficiency.

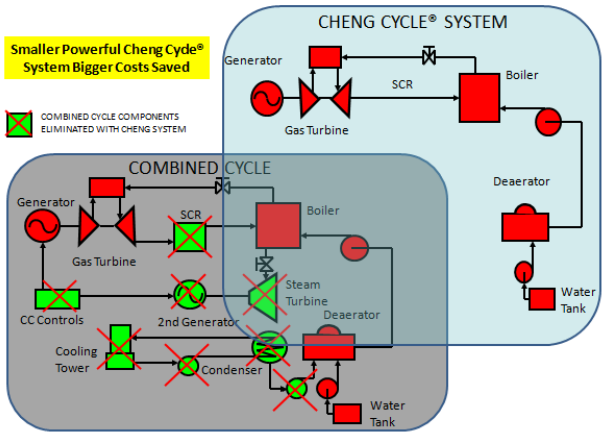
The Cheng Cycle® is recognized worldwide as a heat recovery steam injected gas turbine cycle and has 26 years of operating history

Cheng Cycle® has been applied to Kawasaki M100-13 2.5 MW, RR Allison 501 6 – 8 MW, GE Frame 6B 42 MW, GE LM 2500 27.5 MW systems

Completed engineering for the retrofit of GE 7EA, 7FA, LM6000 PC, Westinghouse W501 D5A and 501F systems



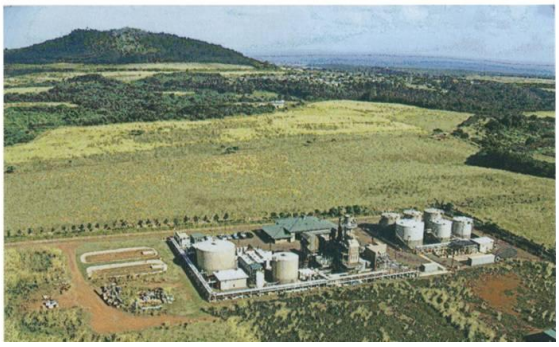

The Cheng Cycle® offers efficiencies equaling and capacities exceeding those of the combined-cycle plant for the underlying simple-cycle engine type without the steam turbine, steam turbine generator and associated cooling loop, control systems and auxiliaries of the combined-cycle plant.




Since 1983, about 100 variants of the original Cheng cycle engines have been installed at more than 60 sites around the world. The original unit, an Allison 501KH plant, has accumulated more than 150,000 skid hours, and has demonstrated reliability such that the maintenance interval for steam-injected Allison engines has been increased from 24,000 hours to 34,000 hours between major overhauls.

The latest Cheng Cycle® plant, the GE 7LM2500 Cheng Cycle® operated by the Kaua'i Island Utility Cooperative at the Kapaia Power Station in Hawaii has logged more than 120 starts and about 14,000 operating hours as of June 1, 2004. The plant has exceeded all expectations and performance guarantees, and is making an average of 27 MW with a heat rate of less than 7,900 BTU per kWh (LHV) burning naphtha. Using only steam injection, the plant can comply with its air permit, achieving NOx emissions rates of 12.5 ppmvd, corrected. The plant is also considerably under-running planned maintenance costs. At the first hot-section inspection interval, 12,500 hours, no overhaul or replacement was required.

**2. Big power, little package.** Kapaia Power Station, commissioned in September 2002, supplies over 50% of the power required by the island of Kauai. *Courtesy: Cheng Power Systems/KPS*



**Cheng Power Systems, Inc. • 480 San Antonio Road, Suite 120 • Mountain View, CA 94040 • www.chengpower.com**