Capstone Microturbines

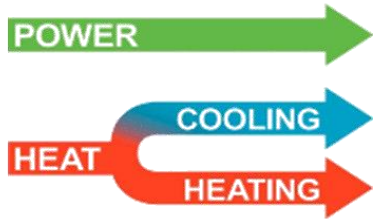
Design, operation, features and benefits

optimal
optimised energy solutions

Capstone®
Turbine Corporation
AUTHORIZED DISTRIBUTOR

© 2012 Optimal Group Australia

What is a Microturbine?



- Electrical Generator
- Compact, clean & quiet
- Produces useful clean heat
- Operates on Natural gas and many other fuels

© 2012 Optimal Group Australia
optimal
optimised energy solutions

Capstone Turbine Corporation

- World leader in Microturbines – with over 85% of market share
- Publicly listed US company
- Over 9,000 units shipped worldwide
- Proven technology over 20 years – Designed & built in California
- www.capstoneturbine.com

© 2015 Optimal Group Australia

Product Sizes:
Power Only or Combined Heat & Power (CHP)

Unit	Power(1)	Heat (2)	Chill (3)
C30	30 kW	55 kW	
C65	65 kW	120 kW	122 kW

Unit	Power(1)	Heat (2)	Chill (3)
C200	200 kW	297 kW	262 kW

Unit	Power(1)	Heat (2)	Chill (3)
C600	600 kW	891 kW	807 kW
C800	800 kW	1,118 kW	1,069 kW
C1000	1,000 kW	1,485 kW	1,351 kW

Notes:
(1) Max power at ISO conditions
(2) Hot water at ISO conditions, 60°C at 10°C ΔT
(3) Chilled Water at ISO, assumes exhaust fired chiller

optimal
optimised energy solutions

Scalable Solutions – 30 kW to 10 MW

optimal
optimised energy solutions

Power from Propane

Capstone's class leading turndown and load response is delivered with lower cost and cleaner LPG/Propane

Fast Install

Lower Fuel Costs

Class Leading Load Respons e

Lowest O&M

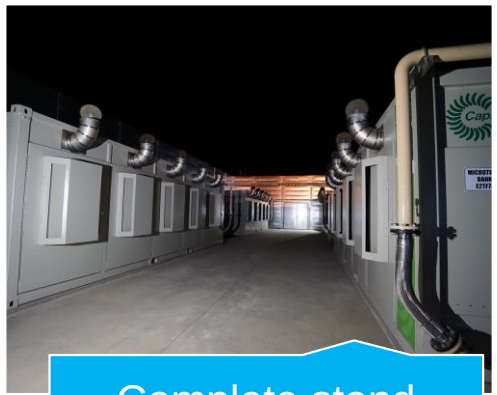
Lowest Emission s

Ultimate Flexibility

1. Improve existing generation's efficiency with Capstone part load performance
2. Parallel with utility for better power security and savings
3. Stand alone power system for complete redundancy and flexibility

Parallel with existing onsite generation

Parallel with utility



Complete stand alone power system

Turbine Corporation

Southern California Edison Co.

California, United States

optimal

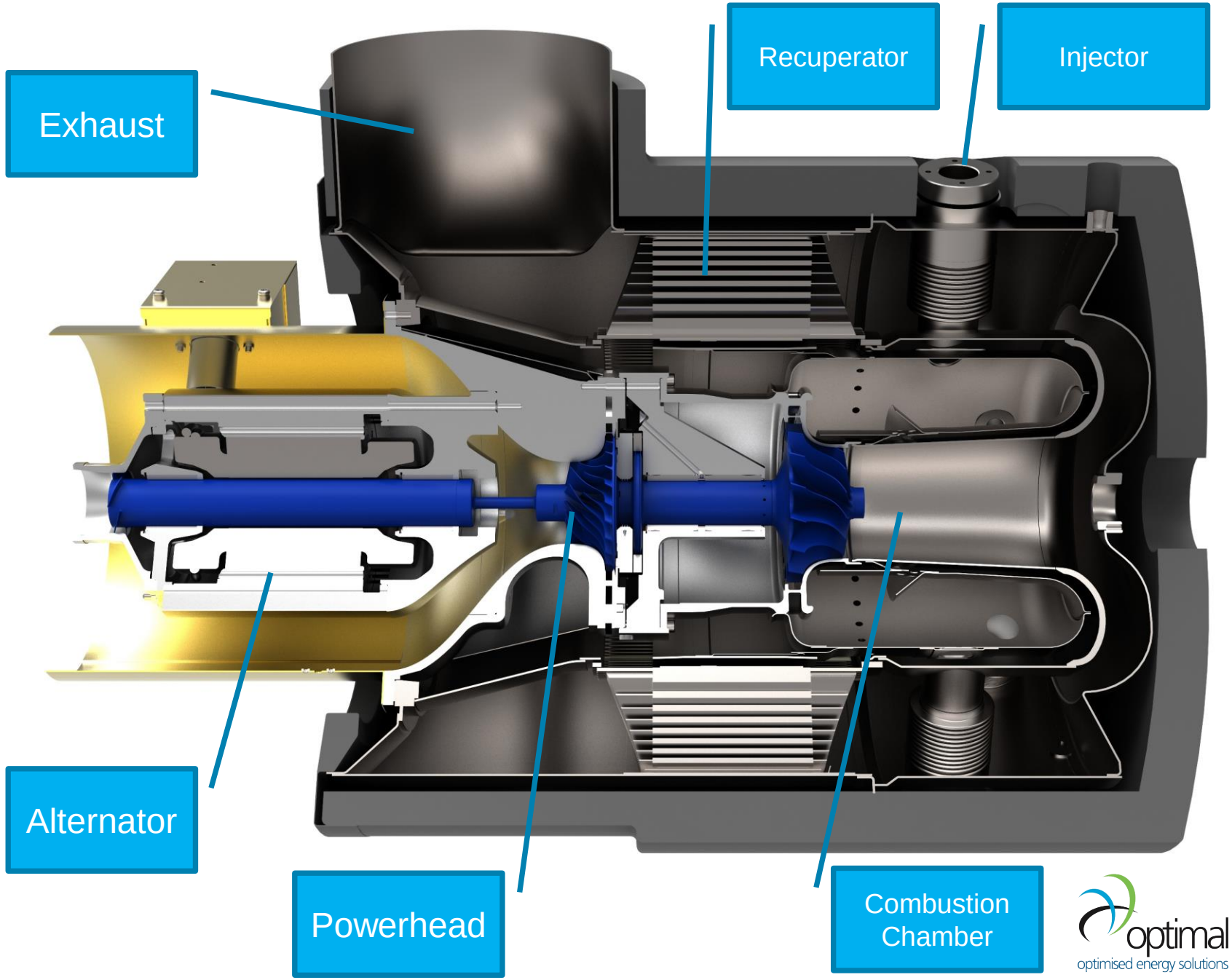
optimised energy solutions

Turbine Design

Low maintenance

Excellent Turndown

No gearbox



optimal
optimised energy solutions

One Moving Part – cont..

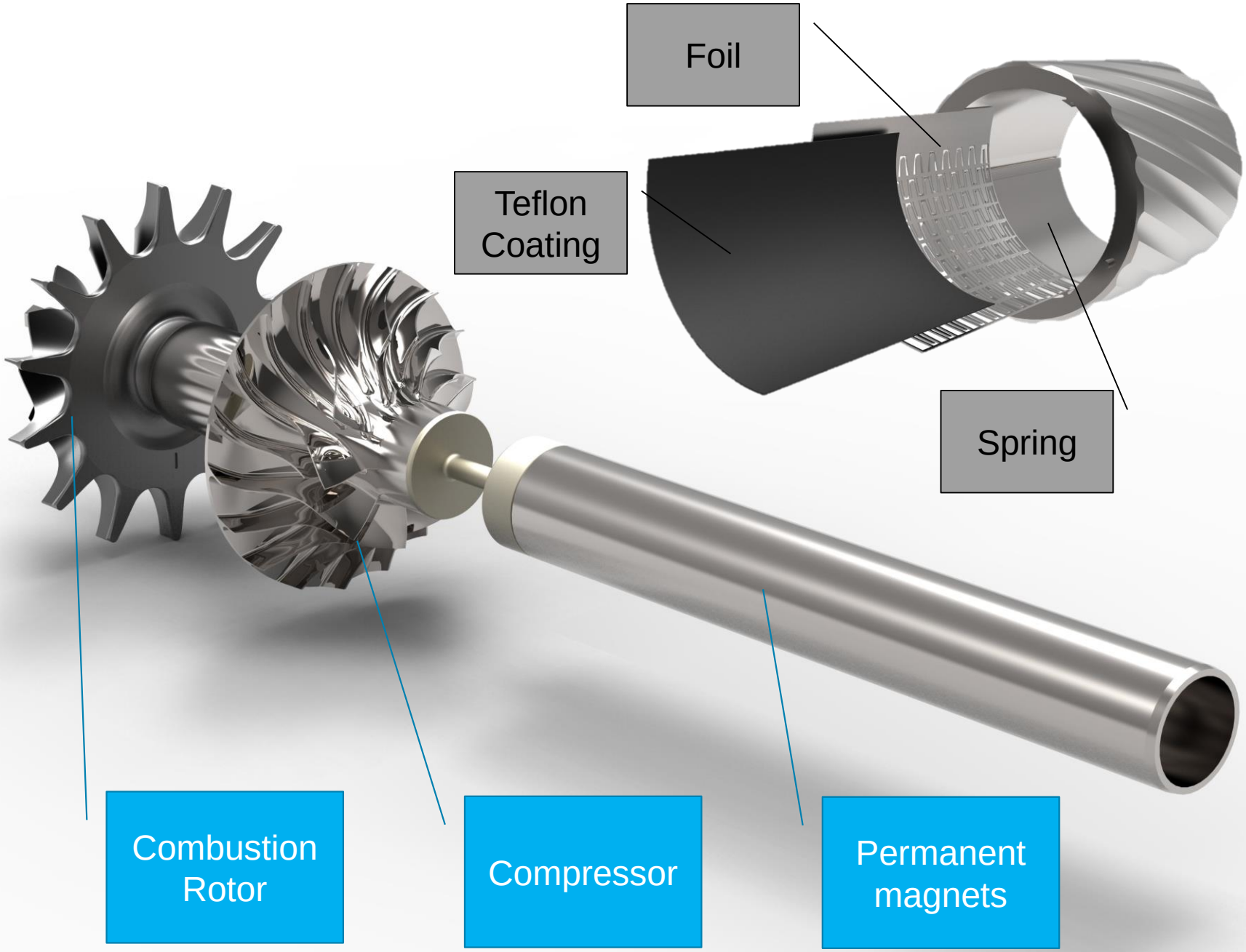
Air Bearings – Friction Free

Oil & Coolant Free

Load Range 10% to 100%

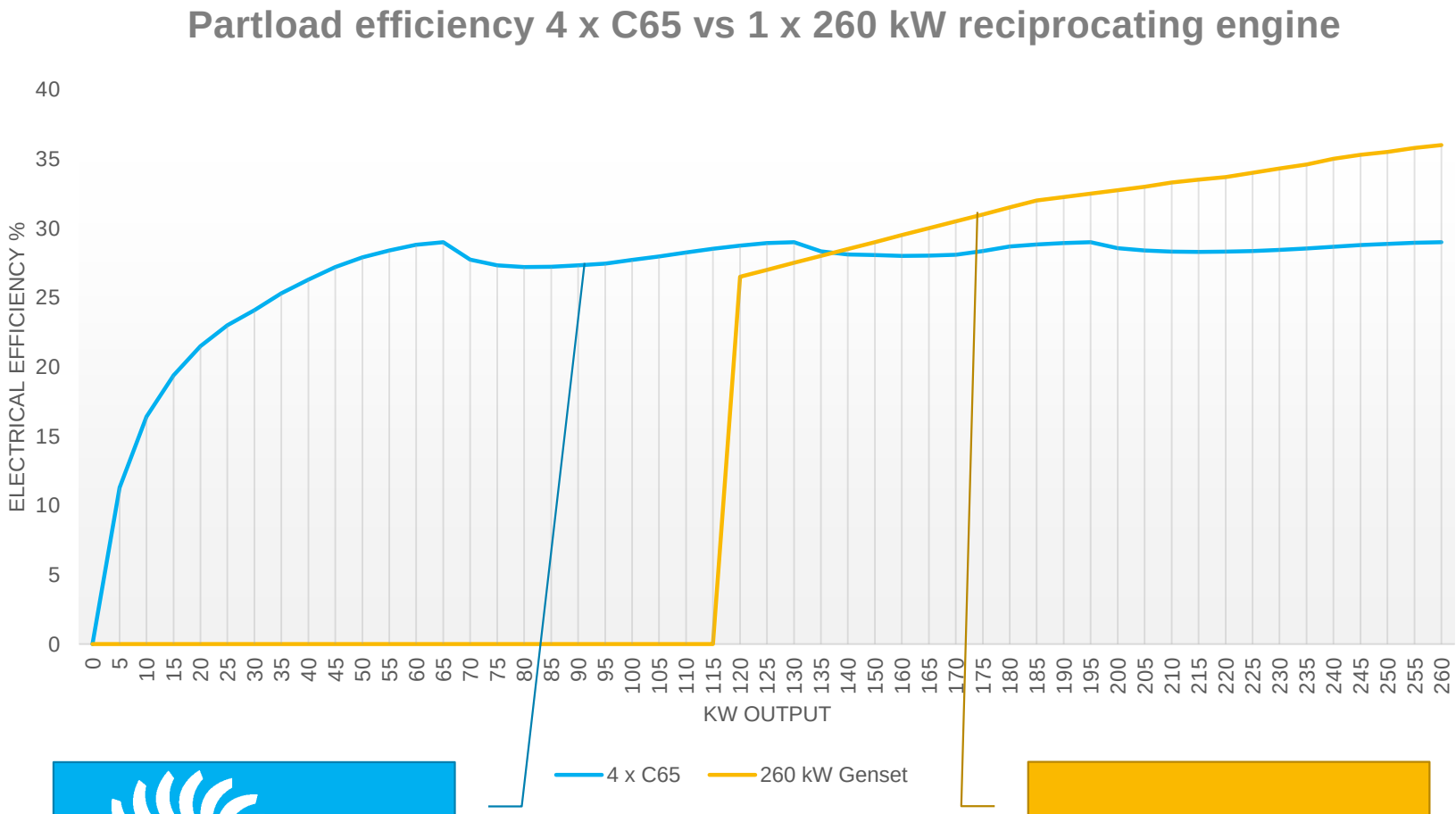
High Reliability

Low Maintenance



Part load electrical efficiency advantage:

Multi-packed Capstone vs. single engine

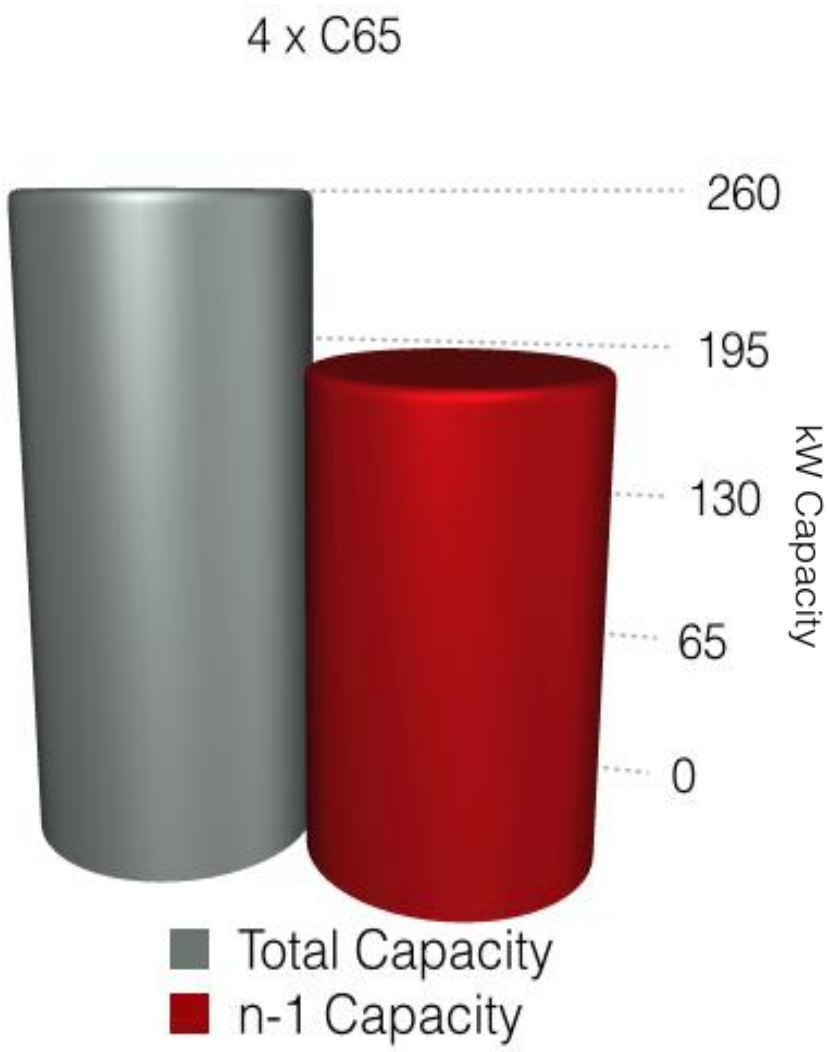


Capstone®

Engine

optimal
optimised energy solutions

Multipack: significant redundancy and flexibility

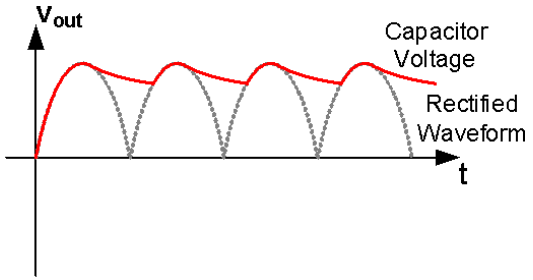


optimal
optimised energy solutions

Inverter power & integrated protective relays

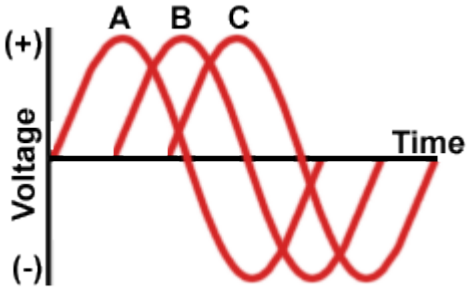
Rectifier

DC power



Inverter

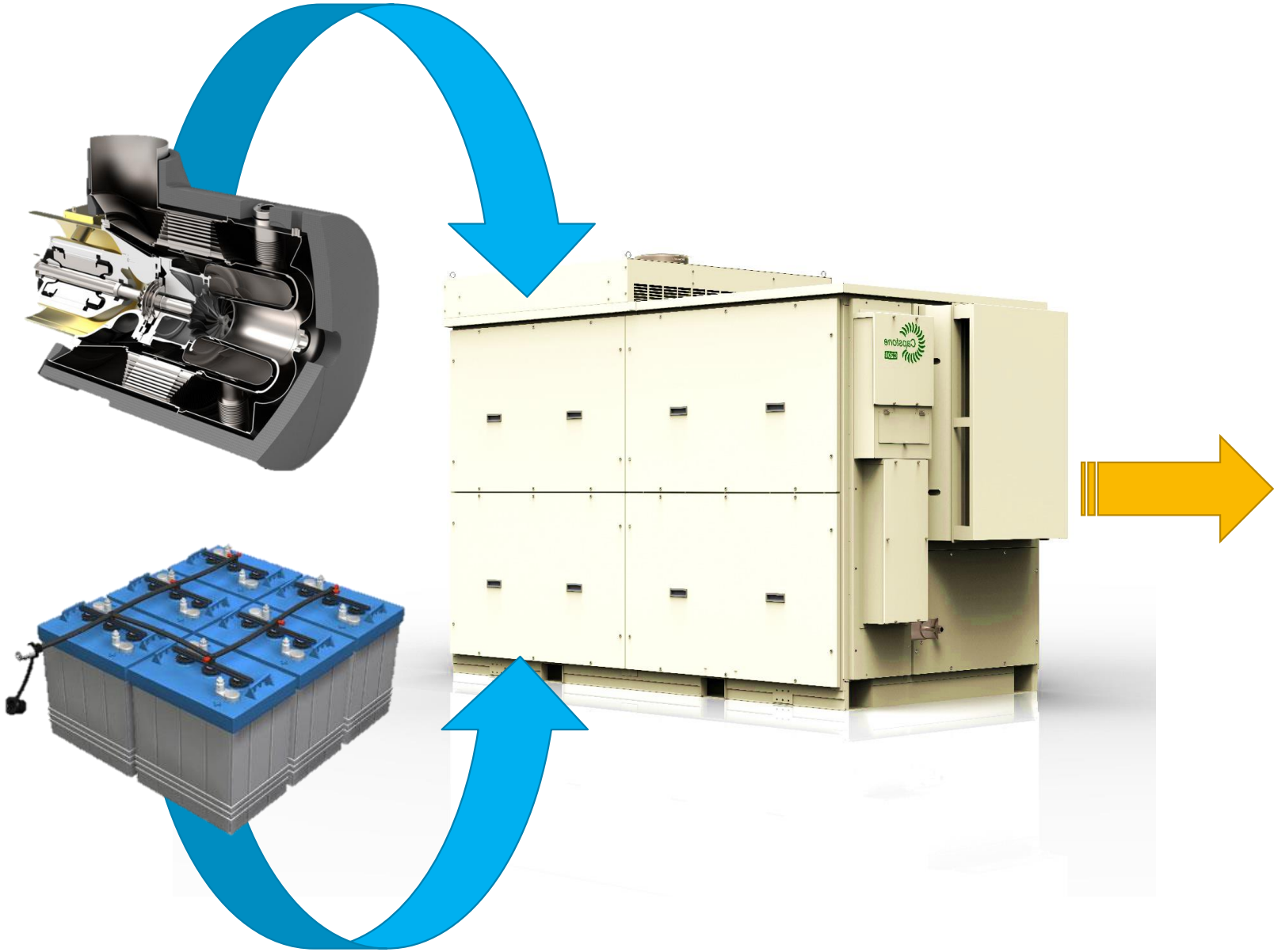
Pure AC power



No fault current
No synchronisation
No gearbox
Pure ‘UPS’ quality power

Dual Mode Microturbine: onboard DC battery bank

- Black start
- Instant load response
- Batteries store energy when load falls off

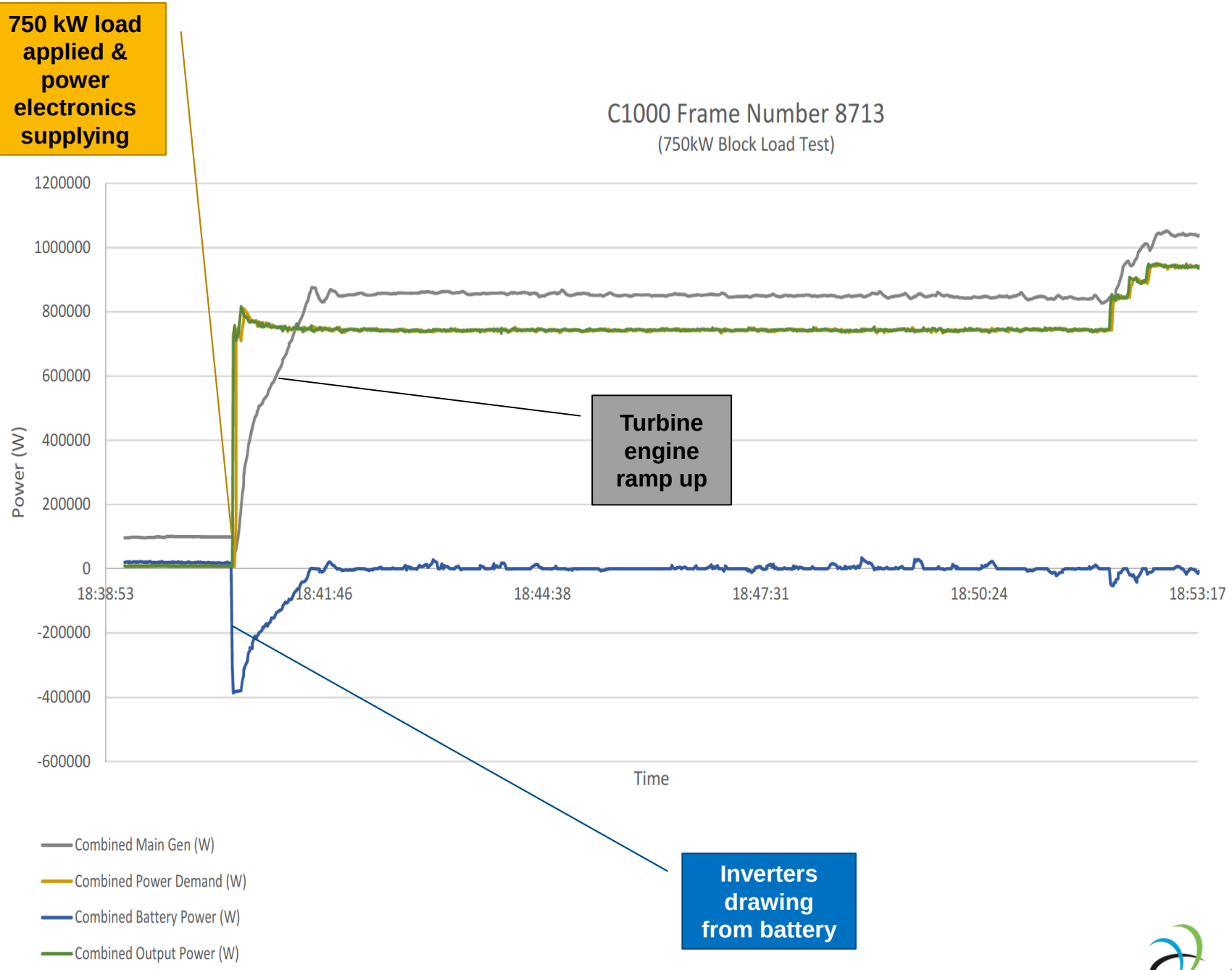


optimal
optimised energy solutions

Demand Response

75% load available from start (75% step load)

750 kW load shown from C1000



optimal
optimised energy solutions

Maintenance

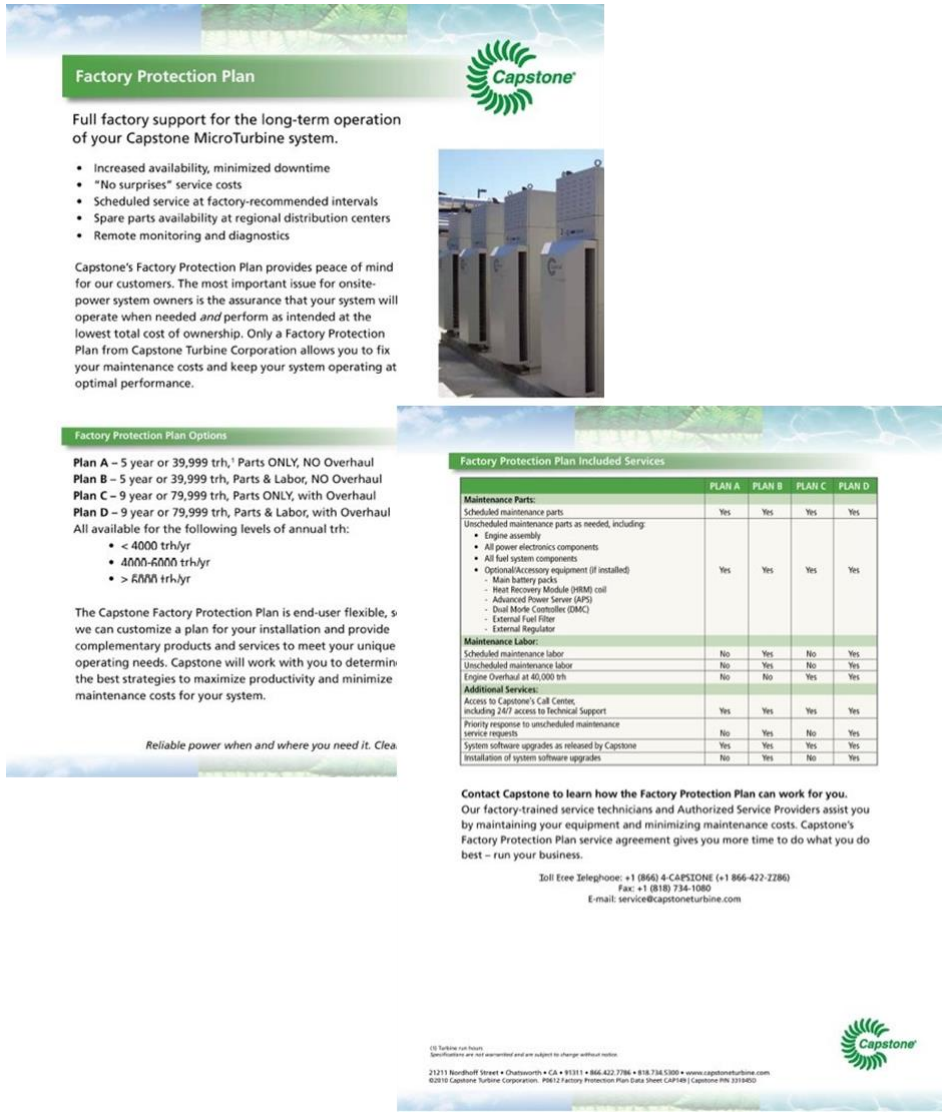
8000 hour service intervals due to oil & coolant free design

National Service Capability & Training Centre

“Plug and Play” design for minimal service times

Major Overhauls (40,000 hours) completed within a day

Factory Protection Plan : FPP



Factory Protection Plan

Capstone

Full factory support for the long-term operation of your Capstone MicroTurbine system.

- Increased availability, minimized downtime
- "No surprises" service costs
- Scheduled service at factory-recommended intervals
- Spare parts availability at regional distribution centers
- Remote monitoring and diagnostics

Capstone's Factory Protection Plan provides peace of mind for our customers. The most important issue for onsite-power system owners is the assurance that your system will operate when needed *and* perform as intended at the lowest total cost of ownership. Only a Factory Protection Plan from Capstone Turbine Corporation allows you to fix your maintenance costs and keep your system operating at optimal performance.

Factory Protection Plan Options

Plan A – 5 year or 39,999 trh,[1] Parts ONLY, NO Overhaul
Plan B – 5 year or 39,999 trh, Parts & Labor, NO Overhaul
Plan C – 9 year or 79,999 trh, Parts ONLY, with Overhaul
Plan D – 9 year or 79,999 trh, Parts & Labor, with Overhaul
All available for the following levels of annual trh:

- < 4000 trh/yr
- 4000-6000 trh/yr
- > 6000 trh/yr

The Capstone Factory Protection Plan is end-user flexible, s
we can customize a plan for your installation and provide
complementary products and services to meet your unique
operating needs. Capstone will work with you to determin
the best strategies to maximize productivity and minimize
maintenance costs for your system.

Reliable power when and where you need it. Clea

Factory Protection Plan Included Services

	PLAN A	PLAN B	PLAN C	PLAN D
Maintenance Parts:				
Scheduled maintenance parts	Yes	Yes	Yes	Yes
Unscheduled maintenance parts as needed, including: • Engine assembly • All power electronics components • All fuel system components • Optional/Accessory equipment (if installed) - Main battery packs - Heat Recovery Module (HRM) coil - Advanced Power Server (APS) - Dual Mode Controller (DMC) - External Fuel Filter - External Regulator	Yes	Yes	Yes	Yes
Maintenance Labor:				
Scheduled maintenance labor	No	Yes	No	Yes
Unscheduled maintenance labor	No	Yes	No	Yes
Engine Overhaul at 40,000 trh	No	No	Yes	Yes
Additional Services:				
Access to Capstone's Call Center, including 24/7 access to Technical Support	Yes	Yes	Yes	Yes
Priority response to unscheduled maintenance service requests	No	Yes	No	Yes
System software upgrades as released by Capstone	Yes	Yes	Yes	Yes
Installation of system software upgrades	No	Yes	No	Yes

Contact Capstone to learn how the Factory Protection Plan can work for you.
Our factory-trained service technicians and Authorized Service Providers assist you by maintaining your equipment and minimizing maintenance costs. Capstone's Factory Protection Plan service agreement gives you more time to do what you do best – run your business.

Toll Free Telephone: +1 (866) 4-CAPSTONE (+1 866-422-7786)
Fax: +1 (818) 734-1080
E-mail: service@capstoneturbine.com

(1) Turbine run hours
Specifications are not warranteed and are subject to change without notice.

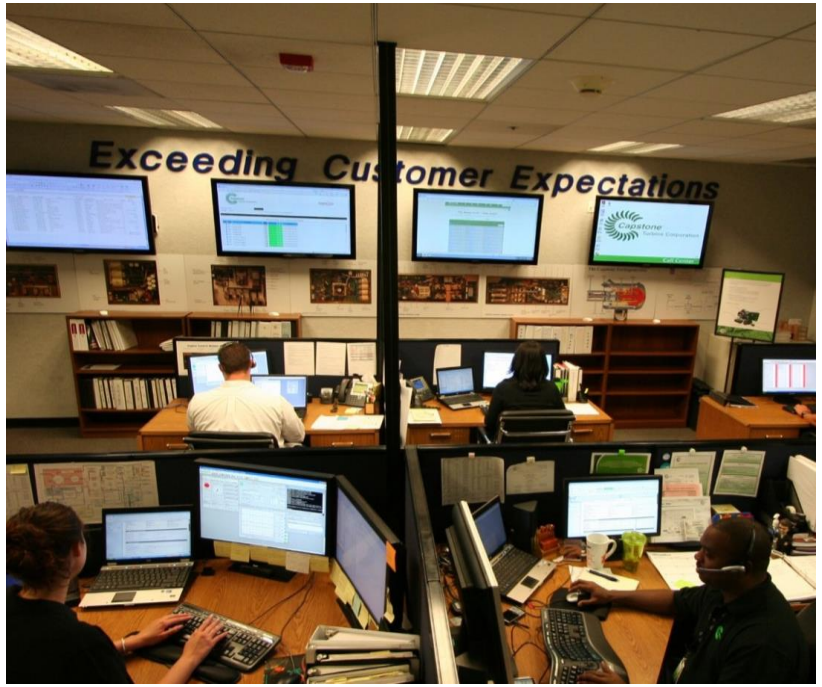
Capstone

21211 Nordhoff Street • Chatsworth • CA • 91311 • 866.422.7786 • 818.734.5300 • www.capstoneturbine.com
©2010 Capstone Turbine Corporation. P5012 Factory Protection Plan Data Sheet CAP14B | Capstone P/N 1019450

- 40,000 & 80,000 hour plans
- 5,9,10 & custom year options
- Parts only *or*
- Truly comprehensive plans
  - *all parts*
  - *all labour*
  - *scheduled and unscheduled*
- Refurbish at end of life and continue under FPP

Monitoring & management

Remote monitoring



Support and Optimisation

- *1300 368 476* – 24/7 national service call centre
- Optimisation & management plan
- Factory trained techs – each capital city
- Locally warehoused parts
- Singapore Capstone factory distribution and service support

optimal

optimised energy solutions

Capstone® Turbine Corporation
AUTHORIZED DISTRIBUTOR

Optimal Group Australia

Onsite Power
Combined Heat & Power
Combined Cooling, Heat & Power

9 Bastow Place, Mulgrave, Victoria, Australia
✆ 1300 678 476
sales@optimalgroup.com.au
optimalgroup.com.au