

GE Energy

GE Gas Turbines for Power Generation and Mechanical Drive



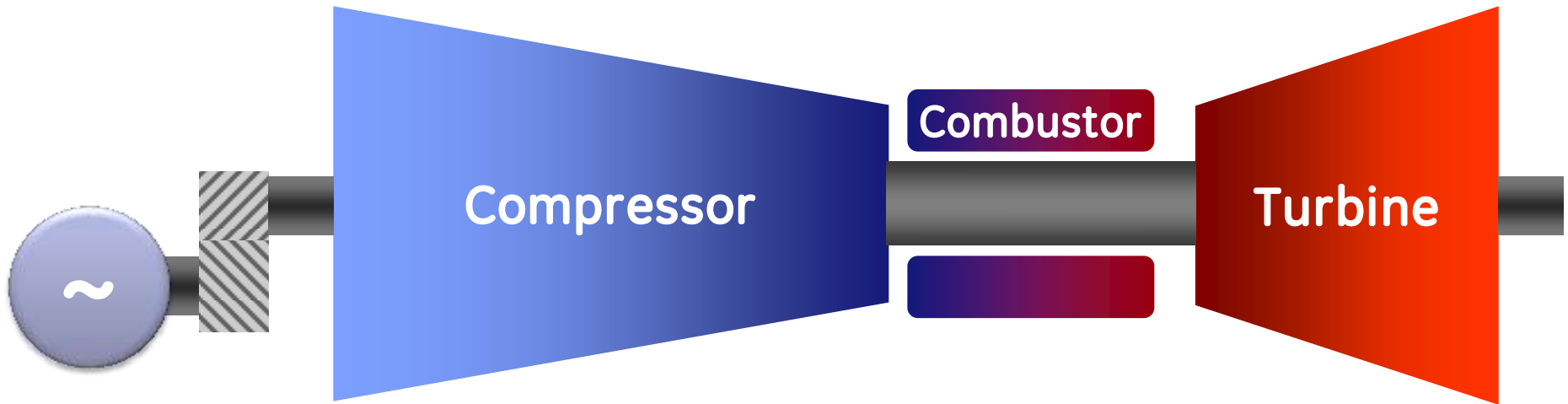
imagination at work

Where are Gas Turbines used?



Gas turbine configurations

Single shaft configuration

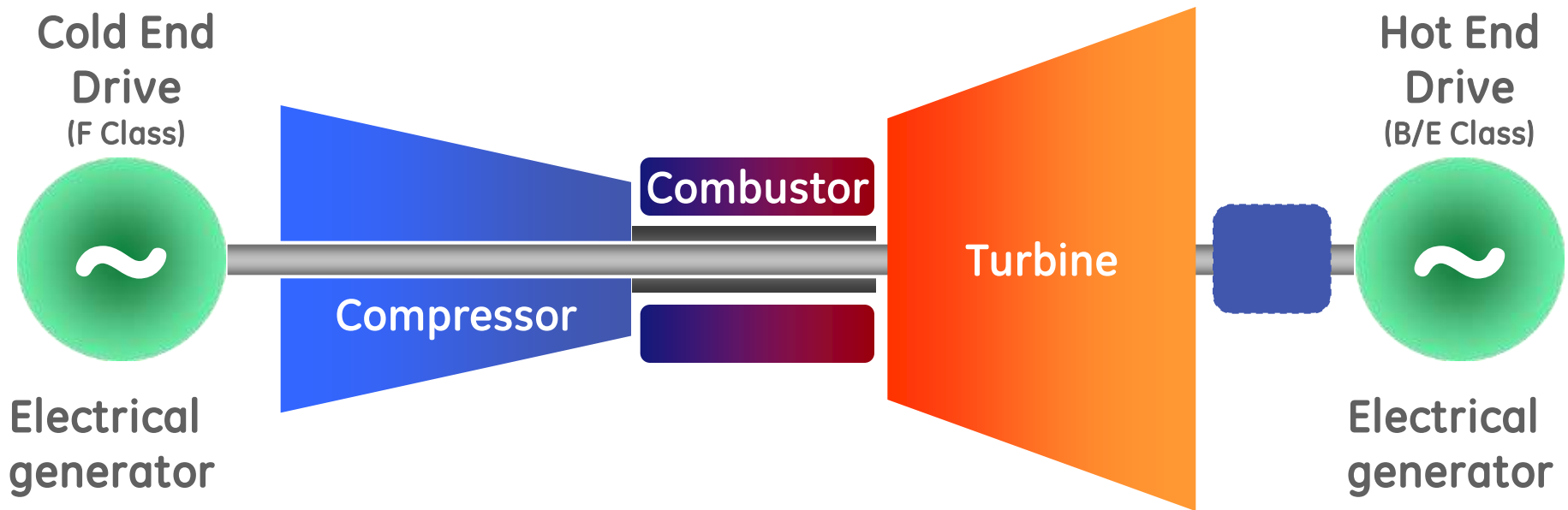


Frame 5 & 6 Gas Turbines
Output Shaft Speed > 5000rpm
Some require reduction gearbox
Some are **COLD** and some are **HOT** end drive
Frame 7 Output Shaft Speed = 3600rpm
Frame 9 Output Shaft Speed = 3000rpm
Do Not Require Gearbox for 60/50HZ apps

Turbine Drives
Compressor +
External Load

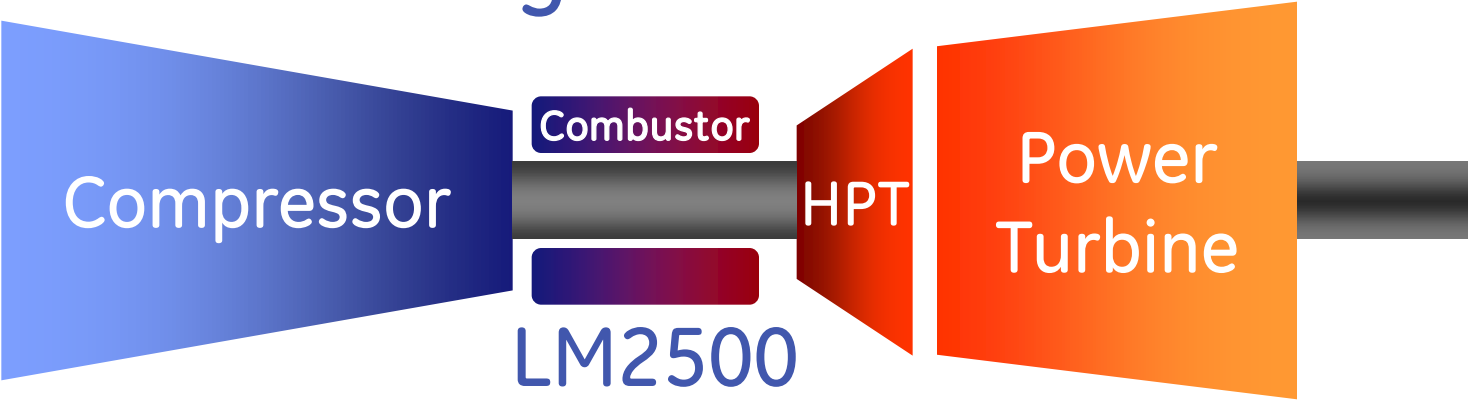
Gas Turbine components

Most HDGT's for power gen are single spool, compressor and turbine are on the same shaft at the same speed



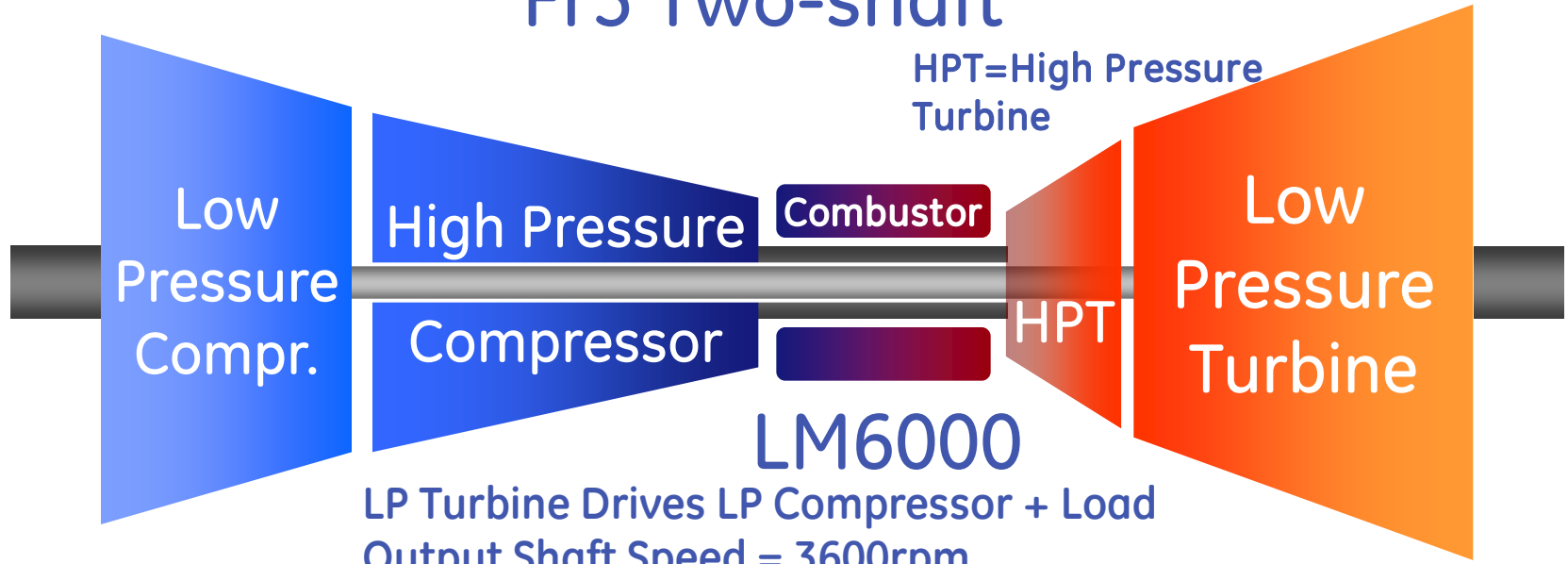
Model	Comp	Comb	Turb	MW	Gear	# Shafts	Drive end
MS6001B	17	10	3	42	Yes	1	Hot
MS7001EA	17	10	3	85	No	1	Hot
MS6001FA	18	6	3	77	Yes	1	Cold

Gas turbine configurations



Fr5 Two-shaft

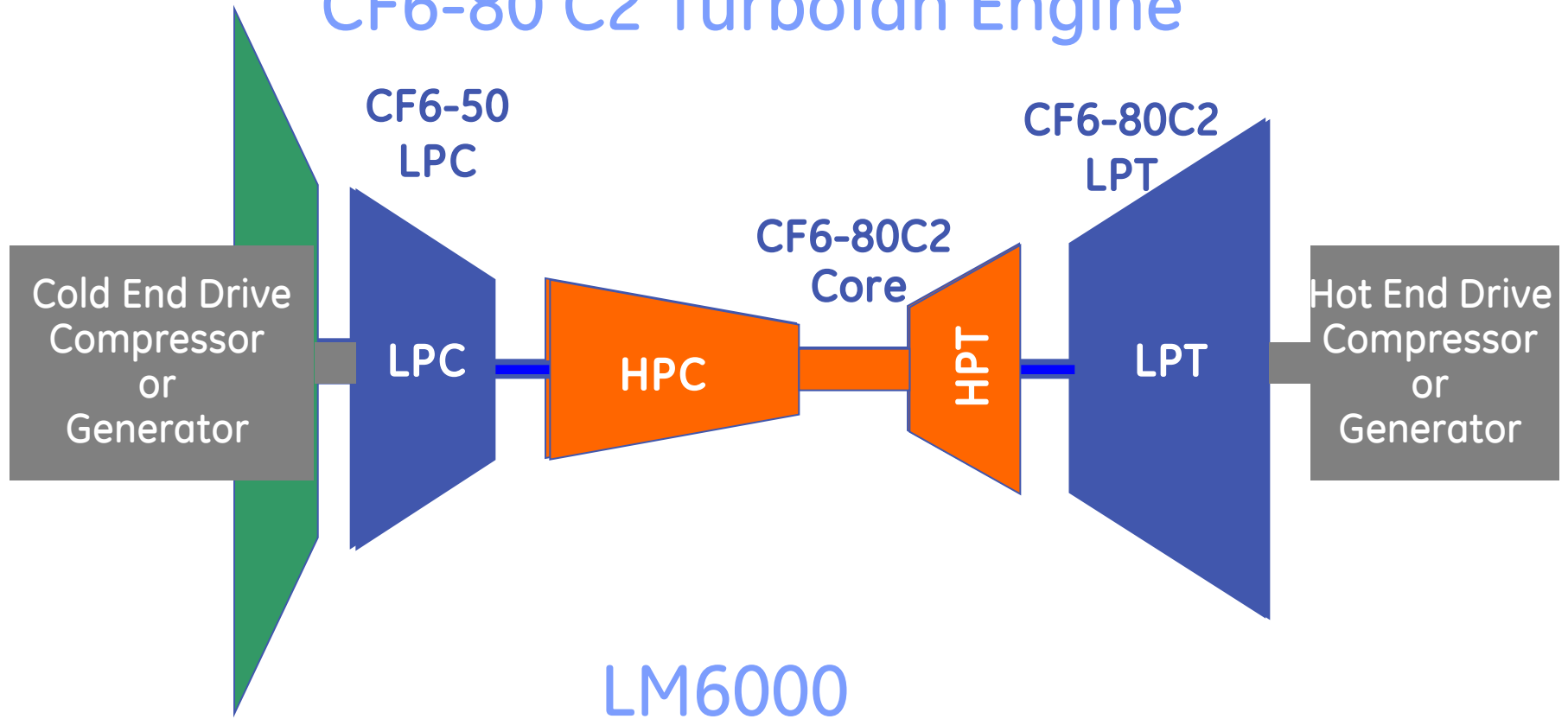
HPT=High Pressure Turbine



LP Turbine Drives LP Compressor + Load
Output Shaft Speed = 3600rpm
LP Rotor and Electric Generator - 1 Shaft
Gearbox is required for 50 Hz applications

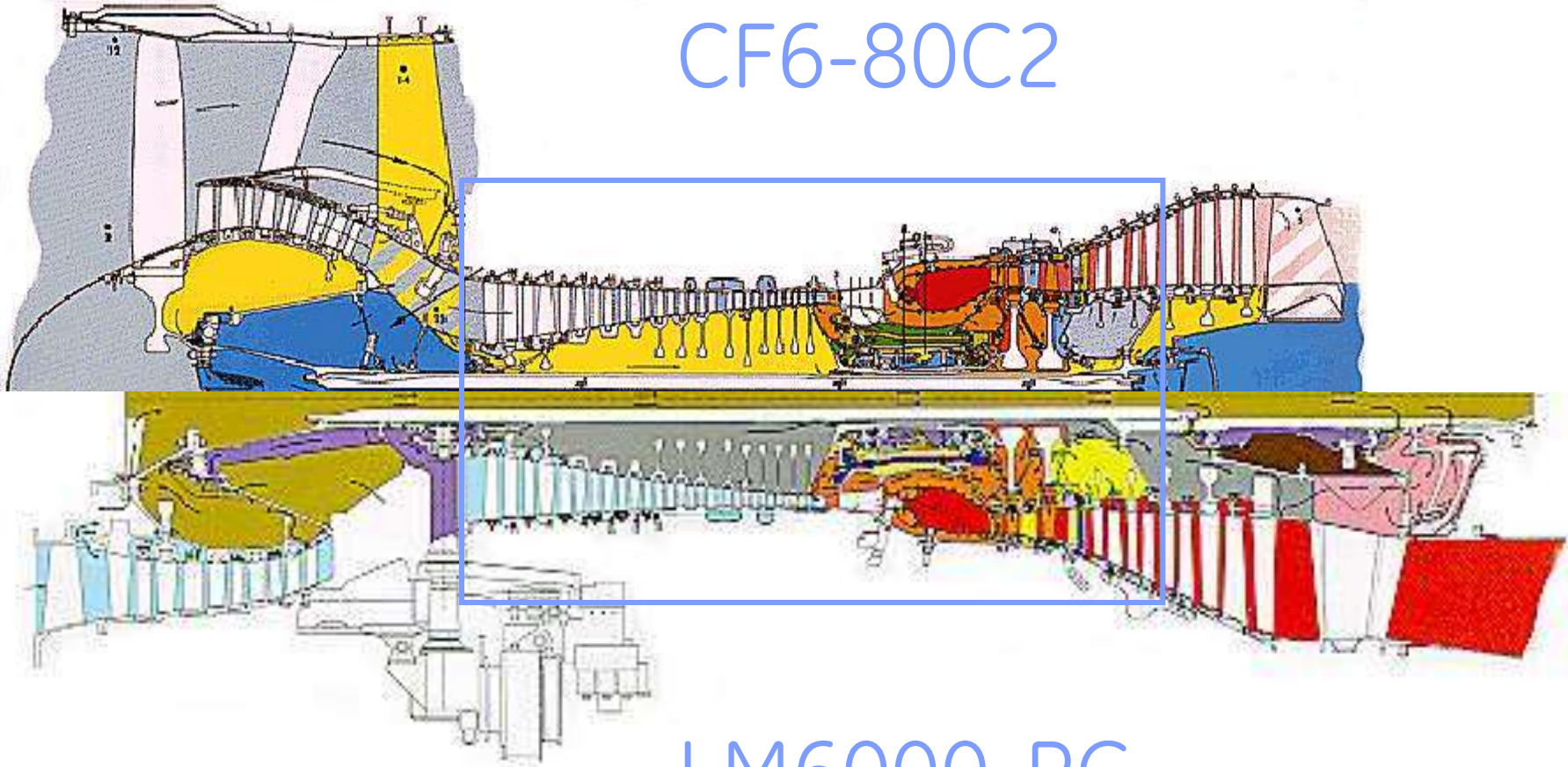
The LM6000 Concept

CF6-80 C2 Turbofan Engine



High Commonality of Parts

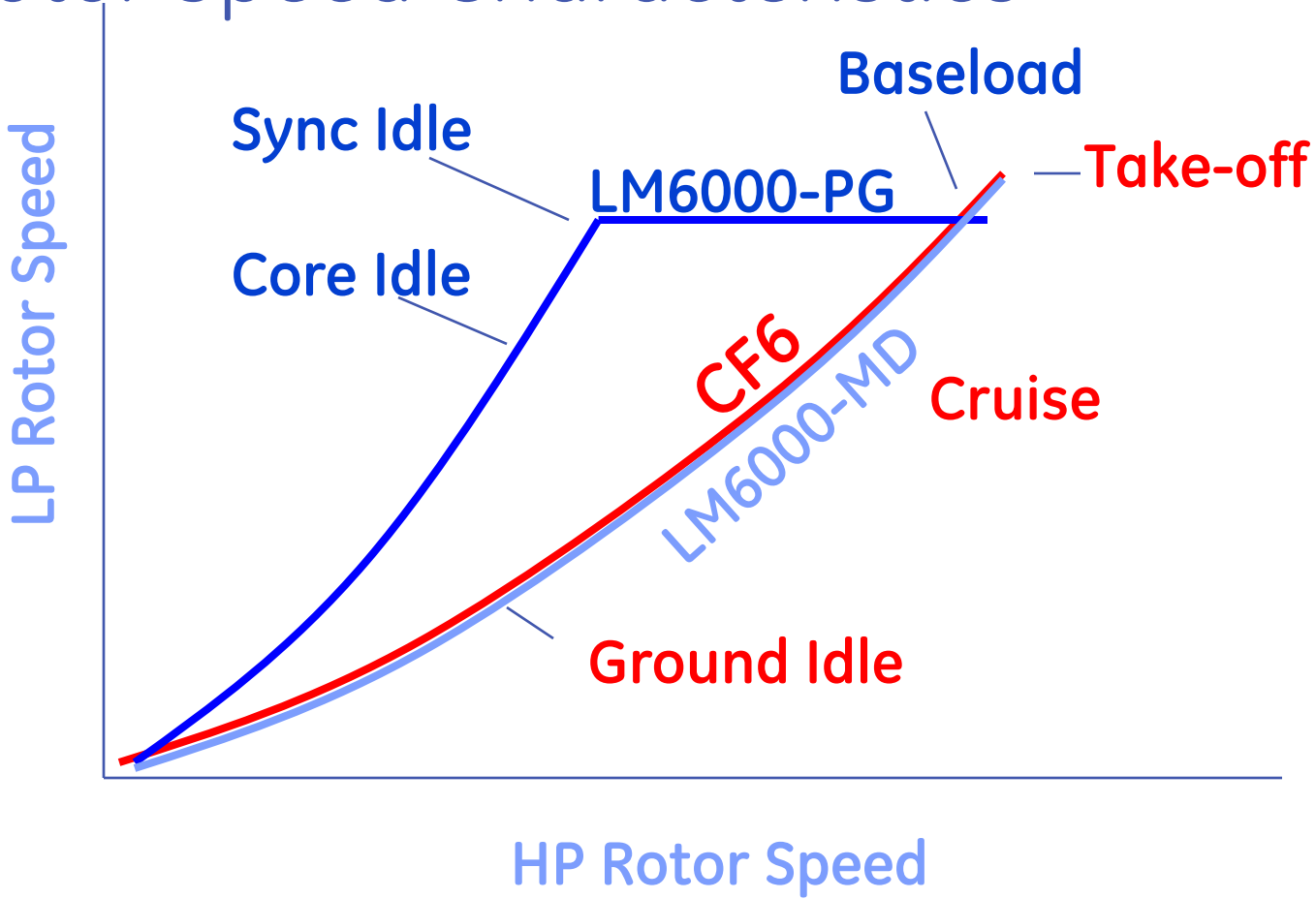
CF6-80C2



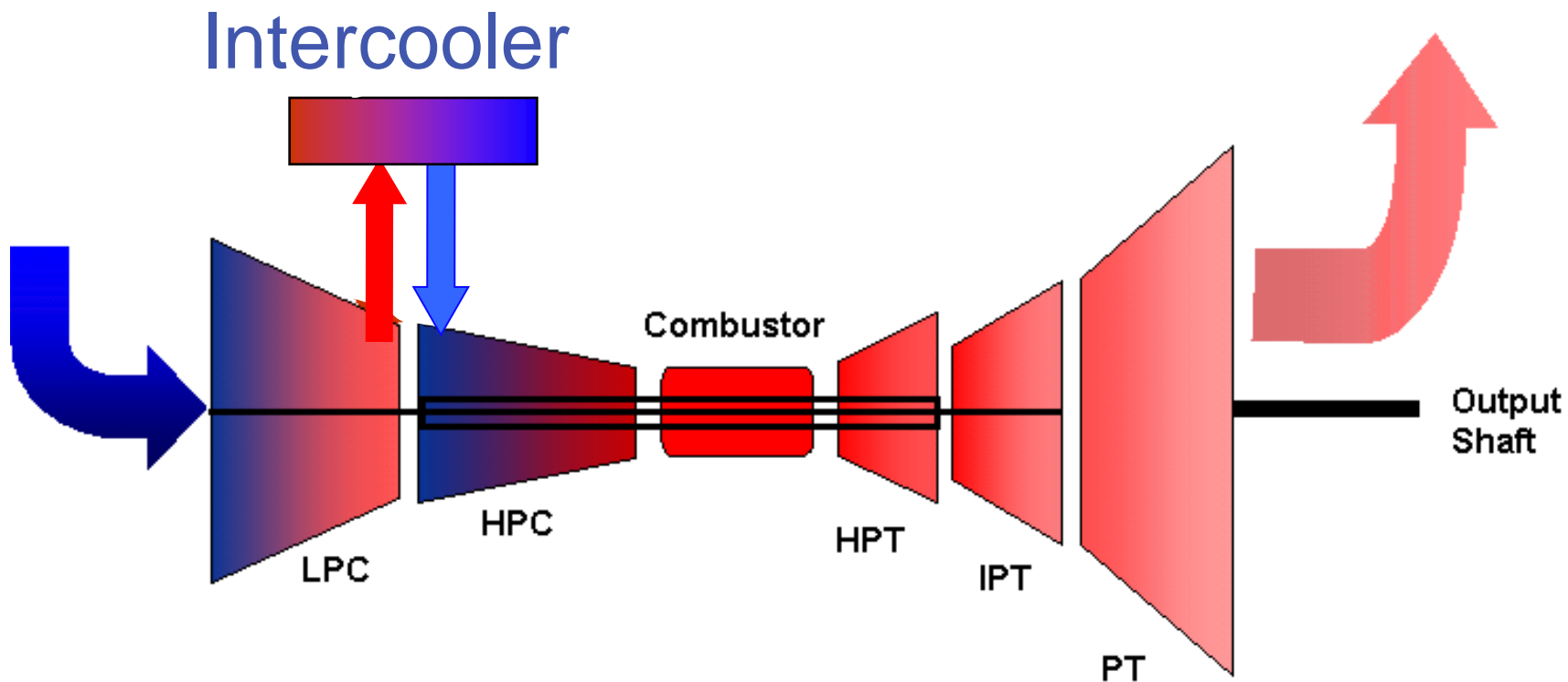
LM6000-PC

LP Speed vs HP Speed

Designed for Variable Rotor to Rotor Speed Characteristics



LMS100 Configuration



Some customers like them both!!

1xFr7EA

6xLM6000



Where do LMs come from?

Power Output
MW/SHP
Thermal Efficiency

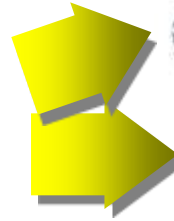


B747
B767, MD-11, A310/330

A300



CF6-80C2



LMS100

100
46%



LM6000

42-50/60,150
43%

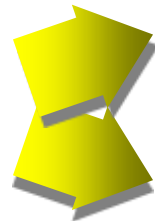


C-5

DC-10



TF39/CF6-6



LM2500+

34.0/45,600
39-41%



LM2500

23.3/31,200
38%

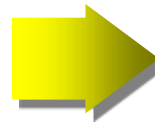


F/A-18

F-117



F404



LM1600

14.3/19,200
37%

LM2500/PGT25

LM2500



LM2500+

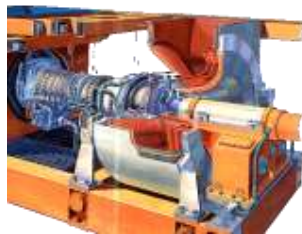


LM2500+G4



PGT is the Low Pressure Turbine specifically designed by GE for oil & gas applications:

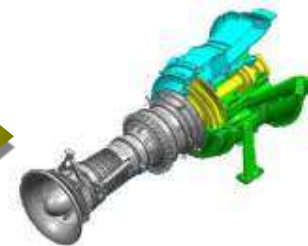
- Higher rotational speed for direct coupling
- Higher efficiency
- Hydrodynamic bearings



PGT25



PGT25+



PGT25+G4

Gas Turbine Offerings

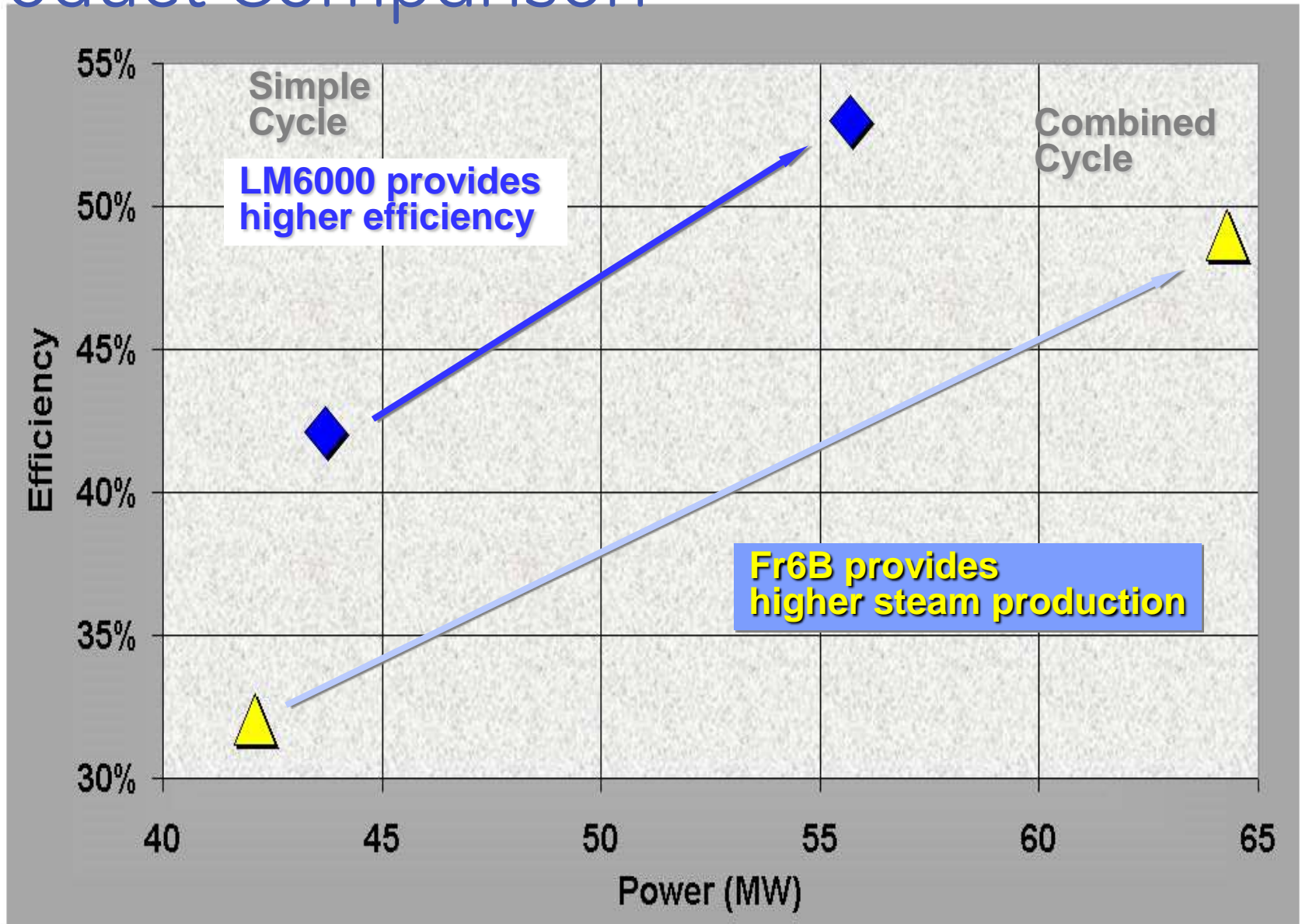


LM6000

Frame 6

Output - SC/CC (MW)	43.7/55.7	42.1/64.3
Efficiency – SC/CC (%)	42.1/53.0	32.1/49.0
Shaft Speed (rpm)	3600	5163
Pressure Ratio	29.0	12.2
Exhaust Gas Temperature (°C)	444	548
Exhaust Flow (kg/s)	127.3	141.0
Reliability/Availability (%)	99.0/97.6	99.2/96.2

Product Comparison



Fuel Flexibility

Frame 6B is able to operate

- > with very low calorific value fuels down to ...
Btu/scf
- > With ash-bearing liquids fuels

LM6000

- > with calorific value fuels down to 400 Btu/scf
- > DLE is capable of operating with fuels with
varying properties