

# **ANEXO I: PRECIO BASICO DE POTENCIA**

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**I3: PUBLICACIONES DE LA REVISTA  
GTWH**

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# Simple Cycle Plant Prices

## Budget estimate prices for 2010

### Standard production model

Equipment-only budget prices for packaged turbine gensets and simple cycle power plants are FOB the factory in year 2010 U.S. dollars for a single-unit purchase.

We are talking standard power plant packages equipped with basic systems and controls required of an operational installation without bells and whistles, options or customized changes.

Akin to a standard automobile equipped with wheels, brakes and steering but without cruise control, self-parking, navigation system or moon roof.

### Scope of supply

Basic scope of supply for an operational simple cycle power plant typically includes the gas turbine, electric generator, dry low NOx combustion (standard for new generation designs), and balance-of-plant systems:

□ **Gas turbine.** Skid-mounted single-fuel gas turbine assembly, starting and lube oil systems,

fuel forwarding system and gas turbine controls.

□ **Generator.** Usually air cooled for gas turbines rated below 150MW and hydrogen cooled at the higher ratings. However, for many large units, air cooling is available as a lower priced alternative.

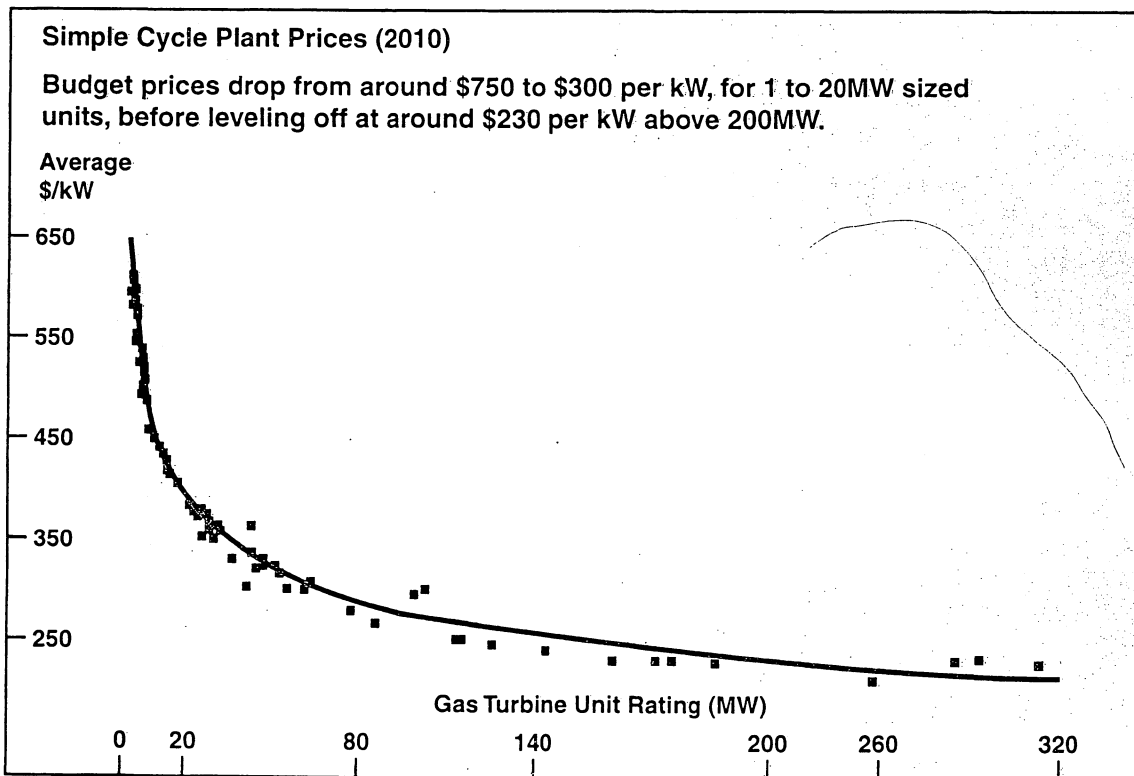
□ **DLN combustion.** Increasingly, advanced gas turbine models include dry low NOx combustion in the basic scope of supply.

□ **Balance of plant.** Standard air intake filter and silencer, exhaust stack with silencer, vibration monitoring and plant control system. Packaged gensets include acoustic enclosures with ventilation and fire protection systems for outdoors installation.

### Power ratings

Industry practice is to reference plant pricing to ISO base load output rating on natural gas fuel at 15°C ambient temperature, sea level and 60% relative humidity site conditions.

Units are rated without inlet or exhaust duct



## Simple Cycle Prices

losses, and without water or steam injection for NOx reduction or power augmentation, unless otherwise specified.

Nominally quoted prices are for design rating with power output measured across the electric generator terminals in order to include electrical and any reduction gearing losses.

Specific project bid prices on the other hand are usually quoted in the form of gas turbine OEM guarantees on power, heat rate and firing temperature at site specific conditions.

That is why guaranteed site specific performance ratings will differ from the design ratings published in this GTW Handbook.

### Bid quotes

Conservative gas turbine OEMs tend to bid slightly higher heat rate and lower power output to allow for normal variations in manufacturing tolerances.

Typically, for performance guarantees, there is a safety margin of 0.5 to 1% points on efficiency and power ratings that end up with operators realizing better performance in actual service.

Several factors enter into a project price quote, including number of units ordered, scope of equipment supply, site specifics, duty cycle, geographic location and market share position.

Changes in currency valuations also play a role depending on where gas turbine engineering, design, manufacture and test take place.

Gas turbine gensets specially designed for onshore oil and gas pipeline operation typically are priced around 10% higher than industrial or utility power plants due to the increased cost of packaging and safety requirements.

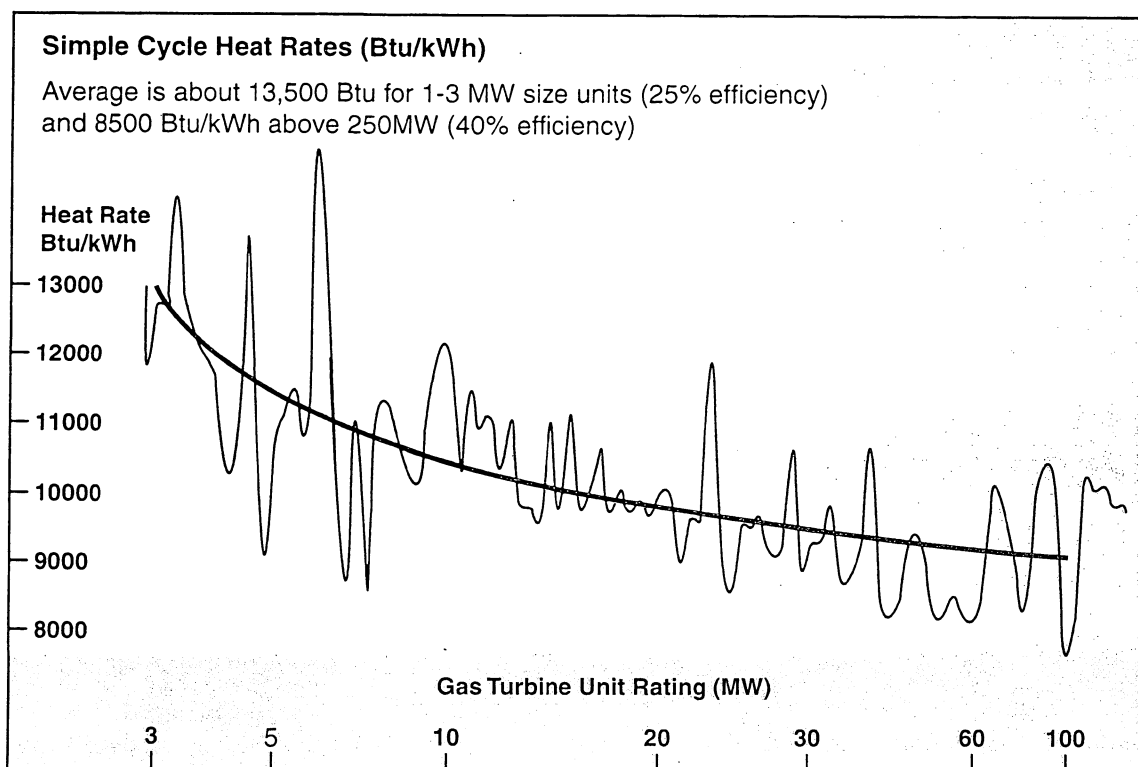
Offshore platform packages cost even more. They require specialized mounts and housing, marine-resistant coatings and materials, and ultra efficient salt air and water intake filter systems.

### Scoping studies

The GTW Handbook prices are handy for preliminary assessment and evaluation of equipment costs. Keep in mind, for budget planning, that engineering and construction services for installation can add 60 to 100% to the cost of equipment.

In general, prices are considerably higher for small gas turbines in the "under 20 MW size range" than for larger units.

Over 20MW, up to around 150MW, the \$/kW falls off considerably as economies of scale allow OEMs to reduce the manufacturing costs of large machines. Beyond that, the \$/kW curve more or less remains flat regardless of size. ■



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# Simple Cycle Plant Prices

Equipment-only budget prices for basic power plant FOB the factory in fixed 2010 US dollars

Model	ISO Base Load	Heat Rate Btu/kWh	Efficiency	Budget Plant Price	\$ per kW
VPS1	504 kW	16,378 Btu	20.8%	\$409,200	\$812
ST6L-813	848 kW	13,099 Btu	26.0%	\$685,600	\$808
Saturn 20	1,210 kW	14,025 Btu	24.3%	\$888,000	\$734
M1A-13D	1,485 kW	14,238 Btu	24.0%	\$1,033,000	\$696
KG2-3E	1,895 kW	21,543 Btu	15.8%	\$1,131,400	\$597
ST18A	1,961 kW	11,237 Btu	30.4%	\$1,318,400	\$672
OGT2500	2,670 kW	12,780 Btu	26.7%	\$1,632,100	\$611
UGT 2500	2,670 kW	12,780 Btu	26.7%	\$1,623,500	\$608
M1T-13D	2,930 kW	14,444 Btu	23.6%	\$1,711,900	\$584
VPS3	3,152 kW	12,560 Btu	27.2%	\$1,886,100	\$598
Centaur 40	3,515 kW	12,240 Btu	27.9%	\$2,057,100	\$585
VPS4	3,522 kW	11,906 Btu	28.7%	\$2,068,700	\$587
501-KB5	3,897 kW	11,747 Btu	29.0%	\$2,238,100	\$574
ST40	4,039 kW	10,310 Btu	33.1%	\$2,344,800	\$581
GTES-4	4,100 kW	14,132 Btu	24.1%	\$2,248,900	\$549
Mercury 50	4,600 kW	8863 Btu	38.5%	\$2,639,000	\$574
Centaur 50	4,600 kW	11,630 Btu	29.3%	\$2,539,800	\$552
501-KB7S	5,245 kW	10,848 Btu	31.5%	\$2,834,200	\$540
SGT-100	5,250 kW	11,203 Btu	30.5%	\$2,822,100	\$538
M7A-01	5,512 kW	11,530 Btu	29.6%	\$2,913,900	\$529
Taurus 60	5,670 kW	10,830 Btu	31.5%	\$3,007,400	\$530
THM1203A	5,760 kW	15,184 Btu	22.5%	\$2,847,000	\$494
UGT 6000	6,200 kW	11,120 Btu	30.7%	\$3,203,800	\$517
GT6000	6,200 kW	11,299 Btu	30.2%	\$3,194,900	\$515
GTES-6	6,200 kW	12,782 Btu	26.7%	\$3,122,200	\$504
Taurus 65	6,300 kW	10,375 Btu	32.9%	\$3,277,700	\$520
CX501 KH5	6,344 kW	8551 Btu	39.9%	\$3,383,600	\$533
501-KH5	6,447 kW	8509 Btu	40.1%	\$3,429,300	\$532
M7A-02D	6,721 kW	11,264 Btu	30.3%	\$3,394,200	\$505
SGT-200	6,750 kW	10,824 Btu	31.5%	\$3,428,100	\$508
M7A-03D	7,439 kW	10,290 Btu	33.2%	\$3,719,200	\$500
Taurus 70	7,520 kW	10,100 Btu	33.8%	\$3,761,000	\$500
SGT-300	7,900 kW	11,158 Btu	30.6%	\$3,837,600	\$486

Model	ISO Base Load	Heat Rate Btu/kWh	Efficiency	Budget Plant Price	\$ per kW
THM1304-10	9,320 kW	12,170 Btu	28.0%	\$4,269,400	\$458
THM1304-11	10,760 kW	11,459 Btu	29.8%	\$4,809,400	\$447
GE10-1	11,250 kW	10,892 Btu	31.3%	\$5,020,500	\$446
Mars 100	11,430 kW	10,320 Btu	33.1%	\$5,127,900	\$449
THM1304-12	11,620 kW	11,165 Btu	30.6%	\$5,118,700	\$441
GTES-12	12,000 kW	10,242 Btu	33.3%	\$5,330,100	\$444
THM1304-14	12,680 kW	11,000 Btu	31.0%	\$5,479,800	\$432
SGT-400	12,900 kW	9817 Btu	34.8%	\$5,668,300	\$439
PGT16	13,720 kW	9760 Btu	35.0%	\$5,941,800	\$433
LM1600PA	13,820 kW	9577 Btu	35.6%	\$5,994,000	\$434
MF-111	14,570 kW	11,020 Btu	31.0%	\$6,072,200	\$417
Titan 130	15,000 kW	9695 Btu	35.2%	\$6,360,400	\$424
UGT 16000	15,520 kW	11,150 Btu	30.6%	\$6,360,900	\$410
GTES-16	16,000 kW	9787 Btu	34.9%	\$6,666,400	\$417
UGT 15000	16,500 kW	9980 Btu	34.2%	\$6,806,400	\$413
SGT-500	17,180 kW	10,597 Btu	32.2%	\$6,922,100	\$403
PGT20	17,464 kW	9706 Btu	35.2%	\$7,130,200	\$408
LM2000PJ	17,657 kW	9707 Btu	35.1%	\$7,168,800	\$406
LM2000PS	18,412 kW	9874 Btu	34.6%	\$7,394,700	\$402
L20A	18,522 kW	9948 Btu	34.3%	\$7,410,900	\$400
LM2500PJ	21,846 kW	9644 Btu	35.4%	\$8,405,000	\$385
LM2500PE	23,091 kW	10,027 Btu	34.0%	\$8,705,000	\$377
SGT-600	24,770 kW	9985 Btu	34.2%	\$9,200,100	\$371
FT8 PowerPac	25,490 kW	8950 Btu	38.1%	\$9,602,500	\$377
GT25000	25,600 kW	9612 Btu	35.5%	\$9,501,100	\$371
UGT 25000	25,680 kW	9590 Btu	35.6%	\$9,524,900	\$371
PG5371PA	26,300 kW	11,990 Btu	28.5%	\$9,205,600	\$350
RB211-G62 DLE	27,520 kW	9415 Btu	36.2%	\$10,071,000	\$366
LM2500 PH STIG	27,630 kW	8450 Btu	40.4%	\$10,308,600	\$373
SGT-700	29,060 kW	9480 Btu	36.0%	\$10,474,700	\$360
LM2500PK	29,316 kW	9629 Btu	35.4%	\$10,469,100	\$357
RB211-GT62 DLE	29,500 kW	9055 Btu	37.7%	\$10,689,600	\$362
LM2500PR	29,962 kW	9182 Btu	37.2%	\$10,824,700	\$361
MF-221	30,000 kW	10,670 Btu	32.0%	\$10,444,900	\$348
LM2500PR	30,464 kW	8854 Btu	38.5%	\$11,046,500	\$363
FT8-3 PowerPac	30,850 kW	9260 Btu	36.8%	\$11,005,300	\$357
LM2500PK	30,982 kW	9287 Btu	36.7%	\$10,889,400	\$351
H-25	31,000 kW	9806 Btu	34.8%	\$10,912,100	\$352
RB211-GT61 DLE	32,120 kW	8680 Btu	39.3%	\$11,485,000	\$358
LM2500+ RD	33,165 kW	8774 Btu	38.9%	\$11,775,100	\$355
LM2500+ RC	36,333 kW	9184 Btu	37.2%	\$11,875,600	\$327
PG6581(B)	42,100 kW	10,642 Btu	32.1%	\$12,631,100	\$300

Model	ISO Base Load	Heat Rate Btu/kWh	Efficiency	Budget Plant Price	\$ per kW
LM6000PF	42,732 kW	8222 Btu	41.5%	\$15,451,100	\$362
LM6000PD	43,068 kW	8173 Btu	41.7%	\$14,494,300	\$337
LM6000PC	43,843 kW	8519 Btu	40.1%	\$14,627,300	\$334
PG6591C	45,400 kW	9315 Btu	36.6%	\$14,643,400	\$323
SGT-800	47,000 kW	9096 Btu	37.5%	\$15,111,400	\$322
LM6000PD Sprint	47,505 kW	8198 Btu	41.6%	\$15,598,200	\$328
LM6000PF Sprint	48,092 kW	8151 Btu	41.9%	\$15,780,800	\$328
LM6000PC Sprint	50,836 kW	8478 Btu	40.2%	\$16,201,800	\$319
LM6000PH	51,000 kW	8135 Btu	41.9%	\$16,448,700	\$323
Trent 60 DLE	51,685 kW	8138 Btu	41.9%	\$16,607,400	\$321
LM6000PG	53,500 kW	8582 Btu	39.8%	\$16,905,400	\$316
GT8C2	56,300 kW	10,080 Btu	33.8%	\$16,842,700	\$299
FT8-3 TwinPac	62,006 kW	9215 Btu	37.0%	\$18,500,000	\$298
Trent 60 WLE ISI	64,000 kW	8224 Btu	41.5%	\$19,531,800	\$305
PG6111FA	77,100 kW	9760 Btu	35.0%	\$21,394,200	\$277
PG7121EA	85,100 kW	10,430 Btu	32.7%	\$22,667,300	\$266
MS7001EA	85,400 kW	10,419 Btu	32.7%	\$22,748,000	\$266
LMS100PB	99,044 kW	7665 Btu	44.5%	\$29,272,000	\$296
LMS100PA	103,045 kW	7890 Btu	43.2%	\$30,945,800	\$300
GT11N2	113,600 kW	10,247 Btu	33.3%	\$28,516,600	\$251
GT11N2	115,400 kW	10,065 Btu	33.9%	\$29,024,500	\$252
PG9171E	126,100 kW	10,100 Btu	33.8%	\$30,927,800	\$245
M701DA	144,090 kW	9810 Btu	34.8%	\$34,464,800	\$239
SGT5-2000E	168,000 kW	9825 Btu	34.7%	\$38,625,100	\$230
GT13E2	182,200 kW	9123 Btu	37.4%	\$42,102,300	\$231
PG7241FA	183,000 kW	8999 Btu	37.9%	\$42,406,900	\$232
GT24	188,782 kW	8967 Btu	38.1%	\$43,443,800	\$230
SGT6-5000F	202,000 kW	8955 Btu	38.1%	\$45,750,100	\$226
PG9351FA	256,156 kW	9221 Btu	37.0%	\$54,284,600	\$212
PG9371FB	284,209 kW	9016 Btu	37.8%	\$65,247,000	\$230
SGT5-4000F	292,000 kW	8567 Btu	39.8%	\$67,470,300	\$231
GT26	292,800 kW	8617 Btu	39.6%	\$67,508,100	\$231
M701F4	312,100 kW	8683 Btu	39.3%	\$70,755,000	\$227
M701G2	334,000 kW	8630 Btu	39.5%	\$74,696,600	\$224
SGT6-5000H	375,000 kW	8531 Btu	40.0%	\$84,628,900	\$226

# Simple Cycle Prices

Turnkey equipment-only budget prices quoted FOB the factory in 2009 US dollars.

Model	Cycle	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budget Price	Price per kW
VPS1	50/60 HZ	500 kW	16,467 Btu	20.7%	\$488,600	\$977
ST6L-813	50/60 HZ	848 kW	13,099 Btu	26.1%	\$738,000	\$870
Saturn 20	50/60 HZ	1,210 kW	14,025 Btu	24.3%	\$966,500	\$799
M1A-13D	50/60 HZ	1,485 kW	14,238 Btu	24.0%	\$1,135,400	\$765
KG2-3E	50/60 HZ	1,895 kW	21,543 Btu	16.7%	\$1,324,600	\$699
ST18A	50/60 HZ	1,961 kW	11,237 Btu	30.4%	\$1,423,400	\$726
OGT2500	50/60 HZ	2,670 kW	12,780 Btu	26.7%	\$1,796,100	\$673
UGT 2500	50/60 HZ	2,850 kW	11,975 Btu	28.5%	\$2,110,700	\$741
M1T-13D	50/60 HZ	2,930 kW	14,444 Btu	23.6%	\$1,906,600	\$651
VPS3	50/60 HZ	3,148 kW	12,553 Btu	28.3%	\$2,048,800	\$651
Centaur 40	50/60 HZ	3,515 kW	12,240 Btu	27.9%	\$2,207,500	\$628
VPS4	50/60 HZ	3,519 kW	11,907 Btu	30.4%	\$2,228,400	\$633
501-KB5	50/60 HZ	3,897 kW	11,747 Btu	29.0%	\$2,390,900	\$614
ST40	50/60 HZ	4,039 kW	10,310 Btu	33.1%	\$2,477,000	\$613
GT4000SI	50/60 HZ	4,050 kW	10,065 Btu	33.9%	\$2,478,400	\$612
GTES-4	50/60 HZ	4,100 kW	14,132 Btu	24.2%	\$2,446,900	\$597
Centaur 50	50/60 HZ	4,600 kW	11,630 Btu	29.3%	\$2,716,100	\$590
Mercury 50	50/60 HZ	4,600 kW	8863 Btu	39.0%	\$2,770,000	\$602
501-KB7S	50/60 HZ	5,245 kW	10,848 Btu	31.5%	\$3,030,300	\$578
SGT-100	50/60 HZ	5,250 kW	11,203 Btu	30.5%	\$3,018,500	\$575
M7A-01	50/60 HZ	5,512 kW	11,530 Btu	29.6%	\$3,116,400	\$565
Taurus 60	50/60 HZ	5,670 kW	10,830 Btu	31.5%	\$3,196,500	\$564
THM1203A	50/60 HZ	5,760 kW	15,184 Btu	22.5%	\$3,146,800	\$546
GTES-6	50/60 HZ	6,200 kW	12,782 Btu	26.7%	\$3,374,000	\$544
Taurus 65	50/60 HZ	6,300 kW	10,375 Btu	32.9%	\$3,483,500	\$553
CX501 KH5	50/60 HZ	6,344 kW	8551 Btu	39.9%	\$3,581,800	\$565
UGT 6000	50/60 HZ	6,360 kW	10,835 Btu	31.5%	\$3,481,500	\$547
501-KH5	50/60 HZ	6,447 kW	8509 Btu	40.1%	\$3,591,800	\$557
GT6000	50/60 HZ	6,500 kW	11,187 Btu	30.5%	\$3,553,300	\$547
M7A-02D	50/60 HZ	6,721 kW	11,264 Btu	30.2%	\$3,650,700	\$543
SGT-200	50/60 HZ	6,750 kW	10,824 Btu	31.5%	\$3,676,000	\$545
M7A-03D	50/60 HZ	7,439 kW	10,290 Btu	33.1%	\$3,974,800	\$534
Taurus 70	50/60 HZ	7,520 kW	10,100 Btu	33.8%	\$4,009,500	\$533
SGT-300	50/60 HZ	7,900 kW	10,937 Btu	31.2%	\$4,139,700	\$524
UGT 8000	50/60 HZ	9,000 kW	10,150 Btu	33.6%	\$4,512,600	\$501
THM1304-10	50/60 HZ	9,320 kW	12,170 Btu	28.0%	\$4,658,600	\$500

Model	Cycle	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budget Price	Price per kW
Mars 100	50/60 HZ	10,695 kW	10,515 Btu	32.5%	\$5,274,200	\$493
THM1304-11	50/60 HZ	10,760 kW	11,459 Btu	29.8%	\$5,239,300	\$487
GE10-1	50/60 HZ	11,250 kW	10,892 Btu	31.4%	\$5,463,900	\$486
THM1304-12	50/60 HZ	11,620 kW	11,165 Btu	30.6%	\$5,589,000	\$481
GTES-12	50/60 HZ	12,000 kW	10,242 Btu	33.3%	\$5,760,800	\$480
THM1304-14	50/60 HZ	12,680 kW	11,000 Btu	31.0%	\$5,973,500	\$471
SGT-400	50/60 HZ	12,900 kW	9817 Btu	34.8%	\$6,141,300	\$476
PGT16	50/60 HZ	13,720 kW	9760 Btu	35.0%	\$6,459,600	\$471
LM1600-PA	50/60 HZ	13,820 kW	9577 Btu	35.6%	\$6,502,400	\$471
MF-111	50/60 HZ	14,570 kW	11,020 Btu	31.0%	\$6,701,200	\$460
Titan 130	50/60 HZ	15,000 kW	9695 Btu	35.2%	\$6,930,800	\$462
UGT 16000	50/60 HZ	15,900 kW	10,870 Btu	31.4%	\$6,933,700	\$436
GTES-16	50/60 HZ	16,000 kW	9787 Btu	34.9%	\$7,231,700	\$452
UGT 15000	50/60 HZ	16,900 kW	9750 Btu	35.0%	\$7,373,000	\$436
SGT-500	50/60 HZ	17,180 kW	10,597 Btu	32.2%	\$7,586,400	\$442
PGT20	50/60 HZ	17,464 kW	9706 Btu	35.2%	\$7,722,500	\$442
L20A	50/60 HZ	17,640 kW	9948 Btu	34.3%	\$7,780,500	\$441
LM2000PJ	60 HZ	17,657 kW	9707 Btu	35.2%	\$8,201,800	\$465
LM2000PS	60 HZ	18,412 kW	9874 Btu	34.6%	\$8,015,900	\$435
LM2500PJ	50 HZ	21,846 kW	9644 Btu	35.4%	\$9,928,800	\$454
LM2500PE	50 HZ	23,091 kW	10,027 Btu	34.0%	\$10,010,900	\$434
SGT-600	50/60 HZ	24,770 kW	9985 Btu	34.2%	\$10,164,300	\$410
FT8 PowerPac	50/60 HZ	25,490 kW	8950 Btu	38.1%	\$10,522,300	\$413
GT25000	50/60 HZ	25,500 kW	9639 Btu	35.4%	\$10,443,100	\$410
UGT 25000	50/60 HZ	26,200 kW	9400 Btu	36.3%	\$10,786,100	\$412
PG5371(PA)	50/60 HZ	26,300 kW	11,990 Btu	28.5%	\$10,476,200	\$398
RB211-G62 DLE	50/60 HZ	27,520 kW	9415 Btu	36.2%	\$11,086,100	\$403
LM2500 PH STIG	60 HZ	27,630 kW	8450 Btu	40.4%	\$11,241,800	\$407
FT8-3 PowerPac	50/60 HZ	27,970 kW	8900 Btu	38.3%	\$11,260,900	\$403
SGT-700	50/60 HZ	29,060 kW	9480 Btu	36.0%	\$11,537,900	\$397
LM2500PK	50 HZ	29,316 kW	9629 Btu	35.4%	\$9,932,800	\$339
RB211-GT62 DLE	50/60 HZ	29,500 kW	9055 Btu	37.7%	\$11,726,600	\$398
LM2500PR	50 HZ	29,962 kW	9182 Btu	37.2%	\$11,024,900	\$368
MF-221	50/60 HZ	30,000 kW	10,670 Btu	32.0%	\$11,716,800	\$391
LM2500PR	60 HZ	30,464 kW	8854 Btu	38.5%	\$11,015,400	\$362
FT8-3 PowerPac	50/60 HZ	30,850 kW	9260 Btu	36.8%	\$12,102,300	\$392
LM2500PK	60 HZ	30,982 kW	9287 Btu	36.7%	\$9,932,900	\$321
H-25	50 HZ	31,000 kW	9806 Btu	34.8%	\$12,096,900	\$390
RB211-GT61 DLE	50/60 HZ	32,120 kW	8680 Btu	39.3%	\$12,588,700	\$392
LM2500+ RD	60 HZ	33,165 kW	8774 Btu	38.9%	\$12,143,700	\$366
LM2500+ RC	60 HZ	36,333 kW	9184 Btu	37.2%	\$11,131,000	\$306
PG6581(B)	60 HZ	42,100 kW	10,642 Btu	32.1%	\$15,129,300	\$359

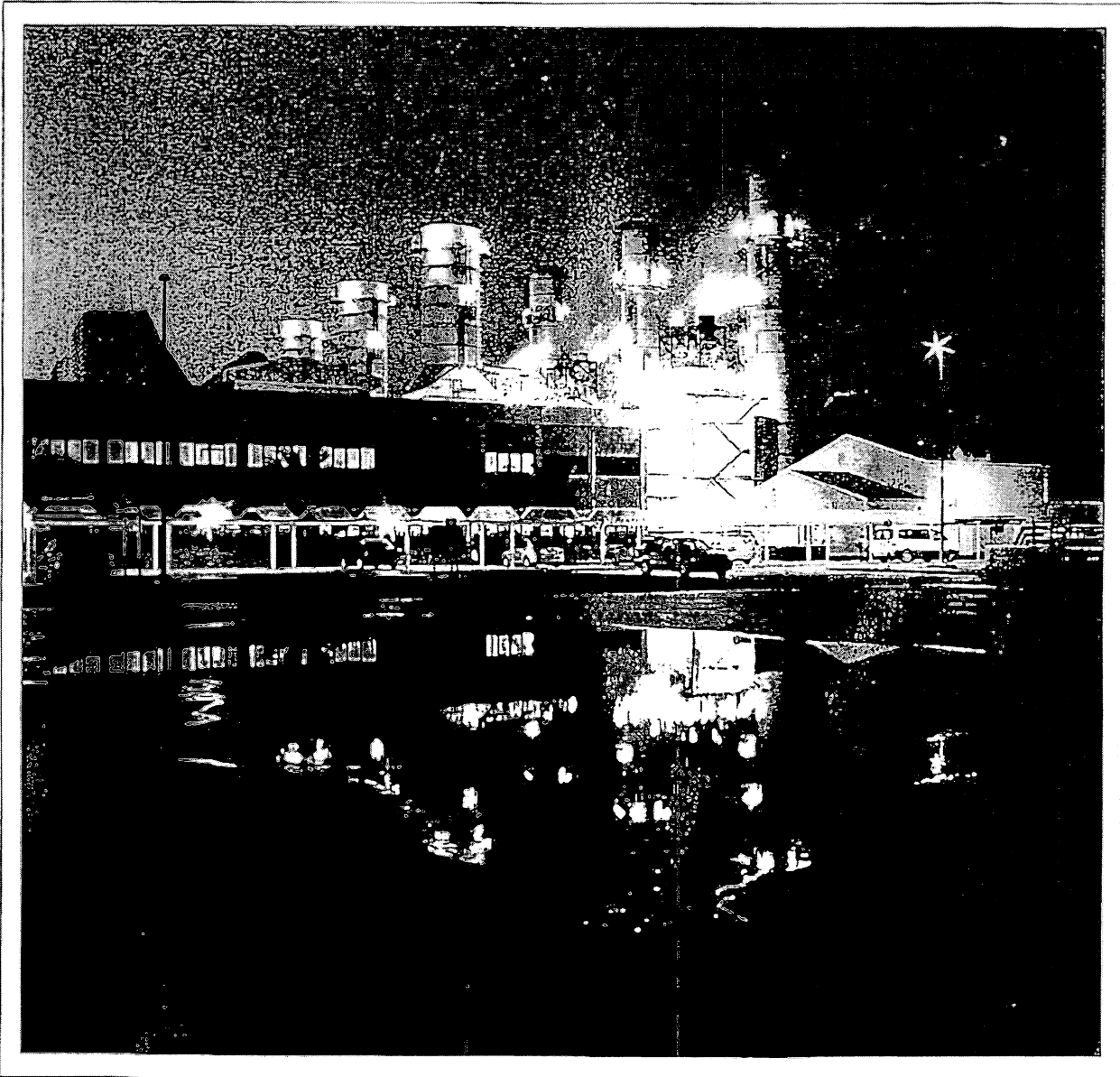
Model	Cycle	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budget Price	Price per kW
LM6000PF	50 HZ	42,732 kW	8222 Btu	41.5%	\$16,472,300	\$385
LM6000PD	50 HZ	43,068 kW	8173 Btu	41.7%	\$15,373,600	\$357
LM6000PC	50/60 HZ	43,843 kW	8519 Btu	40.1%	\$14,319,100	\$327
PG6591C (50Hz)	50/60 HZ	45,400 kW	9315 Btu	36.5%	\$16,412,200	\$362
SGT-800	50/60 HZ	47,000 kW	9096 Btu	37.5%	\$16,765,500	\$357
LM6000PD Sprint	50 HZ	47,505 kW	8198 Btu	41.6%	\$16,389,200	\$345
LM6000PF Sprint	60 HZ	48,092 kW	8151 Btu	41.9%	\$16,105,000	\$335
LM6000PC Sprint	50 HZ	50,836 kW	8478 Btu	40.2%	\$15,387,000	\$303
LM6000PH	50 HZ	51,000 kW	N/A	N/A	\$17,829,600	\$350
Trent 60 DLE	60 HZ	51,685 kW	8138 Btu	41.9%	\$18,165,700	\$351
LM6000PG	50 HZ	53,500 kW	8582 Btu	39.8%	\$17,473,100	\$327
GT8C2	50 HZ	56,300 kW	10,080 Btu	33.9%	\$19,082,200	\$339
FT8-3 TwinPac	50/60 HZ	56,340 kW	8840 Btu	38.6%	\$19,306,100	\$343
FT8-3 TwinPac	50/60 HZ	62,006 kW	9215 Btu	37.0%	\$20,739,700	\$334
Trent 60 WLE IS!	60 HZ	64,000 kW	8224 Btu	41.5%	\$19,374,800	\$303
PG6111(FA) (50Hz)	60 HZ	77,100 kW	9760 Btu	35.5%	\$24,341,800	\$316
PG7121(EA)	50 HZ	85,100 kW	10,430 Btu	32.7%	\$25,954,400	\$305
MS7001EA	60 HZ	85,400 kW	10,419 Btu	32.7%	\$25,709,100	\$301
LMS100PB	50 HZ	99,044 kW	7665 Btu	44.5%	\$35,445,900	\$358
LMS100PA	50 HZ	103,045 kW	7890 Btu	43.9%	\$34,033,700	\$330
GT11N2	50 HZ	113,600 kW	10,247 Btu	33.3%	\$30,160,700	\$265
GT11N2	50 HZ	115,400 kW	10,086 Btu	33.9%	\$30,610,900	\$265
PG9171(E)	50 HZ	126,100 kW	10,100 Btu	33.8%	\$32,732,500	\$260
M701DA	60 HZ	144,090 kW	9810 Btu	34.8%	\$36,386,000	\$253
SGT5-2000E	50 HZ	168,000 kW	9825 Btu	34.7%	\$40,853,000	\$243
PG7241(FA)	60 HZ	171,700 kW	9360 Btu	36.5%	\$41,790,400	\$243
GT13E2	50 HZ	179,900 kW	9249 Btu	36.9%	\$43,376,600	\$241
PG7251(FB)*	60 HZ	184,400 kW	9215 Btu	37.0%	\$45,365,500	\$246
GT24	60 HZ	188,782 kW	8968 Btu	38.1%	\$46,363,200	\$246
SGT6-5000F	60 HZ	202,000 kW	8955 Btu	38.1%	\$46,560,900	\$230
PG9351(FA)	50 HZ	255,600 kW	9250 Btu	36.9%	\$58,375,200	\$228
PG9371(FB)*	50 HZ	279,200 kW	9016 Btu	37.9%	\$66,417,400	\$238
GT26	50 HZ	289,139 kW	8716 Btu	39.1%	\$72,420,600	\$250
SGT5-4000F	50 HZ	292,000 kW	8567 Btu	39.8%	\$73,373,600	\$251
M701F4	60 HZ	312,100 kW	8683 Btu	39.3%	\$77,003,600	\$247
M701G2	60 HZ	334,000 kW	8630 Btu	39.5%	\$81,365,400	\$244

# Gas Turbine World

## 2007-08 GTW Handbook

A Pequot Publication

Volume 26



For Project Planning, Engineering, Construction and Operation

**Section 2**

Scope and Trends .....28  
Simple Cycle .....30  
Combined Cycle .....40  
Mechanical Drive .....51

**Prices up  
15% on  
average  
for 12-16  
months  
delivery wait**

The 'equipment-only' budget prices in the *GTW Handbook* for packaged gensets and simple cycle power generation projects are FOB the factory in year 2008 U.S. dollars for a single-unit purchase.

We are talking standard power plant packages equipped with basic systems and controls required of an operational installation, without bells and whistles or extensive accessories.

#### Scope of supply

Basic scope of supply for a standard simple cycle power generating plant includes:

- **Gas turbine plant.** Consists of skid-mounted single-fuel gas turbine, starting and lube oil systems, fuel forwarding system, gas turbine controls.

- **Electric generator.** Primarily air-cooled designs below 150 MW output and hydrogen-cooled above 150 MW. Even for the larger units, however, air-cooling is often supplied as a lower priced alternative.

- **Balance of plant.** Includes standard air intake filter and silencer, exhaust stack with silencer, vibration monitoring, plant control system.

Packaged gensets include acoustic enclosures with ventilation and fire protection systems for outdoors installation.

- **NOx control.** Usually not included in standard scope of supply. However, many advanced gas turbine models do include dry low NOx combustion systems as standard.

#### \$ per kW

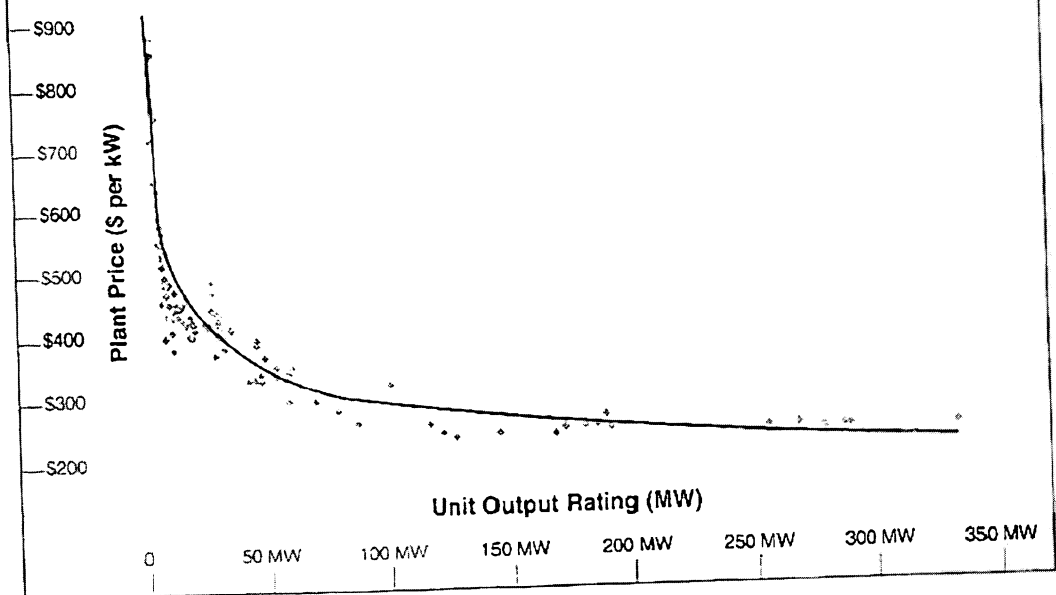
Industry practice is to reference plant prices to base load design output rating on natural gas fuel at 15°C ambient temperature, sea level and 60% relative humidity ISO site conditions.

Units are rated without inlet or exhaust duct losses, and without water or steam injection for NOx reduction and power augmentation, unless otherwise specified.

Quoted prices are for nominal ISO output ratings measured across the electric generator terminals to allow for electric generator and any reduction gearing losses.

Eventually, towards the end of sales negotiations with OEMs, you should be dealing with guaranteed performance ratings at either project specified or ISO conditions.

**Simple Cycle Plant Prices 2007.** The decrease in \$/kW prices size reflects economy of scale in the manufacturing costs of larger units and ability of advanced designs to produce more kW per pound of air flow.

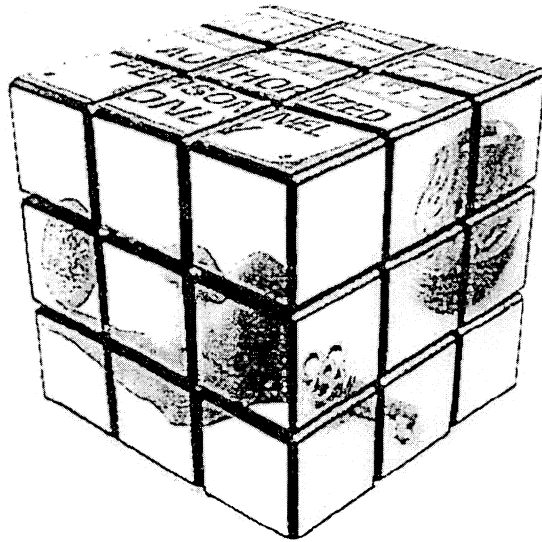


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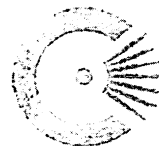


Complete Coverage

## We have the right combination.

Our mission is to be a world leader in gas turbine maintenance, repair, and overhaul by focusing on our customers, and our employees who serve them.

At TCT we have the right combination of a global reach, our complete coverage of service support, and we are an authorized overhaul facility for both Rolls-Royce and General Electric aeroderivative gas turbines.



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North America Toll Free: 1-877-219-5800 - International Toll Free: 001-800-514-5800 - E-mail any questions to: [info@tcturbines.com](mailto:info@tcturbines.com)

In either case, guaranteed ratings will differ from the design ratings listed in the gas turbine specifications reference section of the *GTW Handbook*.

#### Performance and price variables

Most OEMs guarantee a slightly higher heat rate and slightly lower power output than ISO design ratings to allow for normal inconsistencies in manufacturing tolerances.

Normally they build in a safety margin of 0.5-1.0 lower efficiency and power than rated or delivered in actual service.

The number of units ordered, scope of equipment supply, site-specific requirements, geographic location, and competitive market conditions all factor into an actual price quote.

Changes in currency valuations also come into play, sometimes significantly since competitive suppliers must take into account the impact of currency exchange rates on profit margin.

Gas turbine gensets specially designed for onshore oil and gas pipeline operation typically are priced around 10% higher than industrial or utility gensets due to the enhanced scope of equipment and safety requirements.

Offshore packages cost even more. They require specialized mounts and housing, marine-resistant coatings and materials, ultra efficient

salt air and water intake filter systems.

#### Scoping studies

Budget prices listed here are intended for preliminary project assessment and evaluation of simple cycle electric power generating equipment.

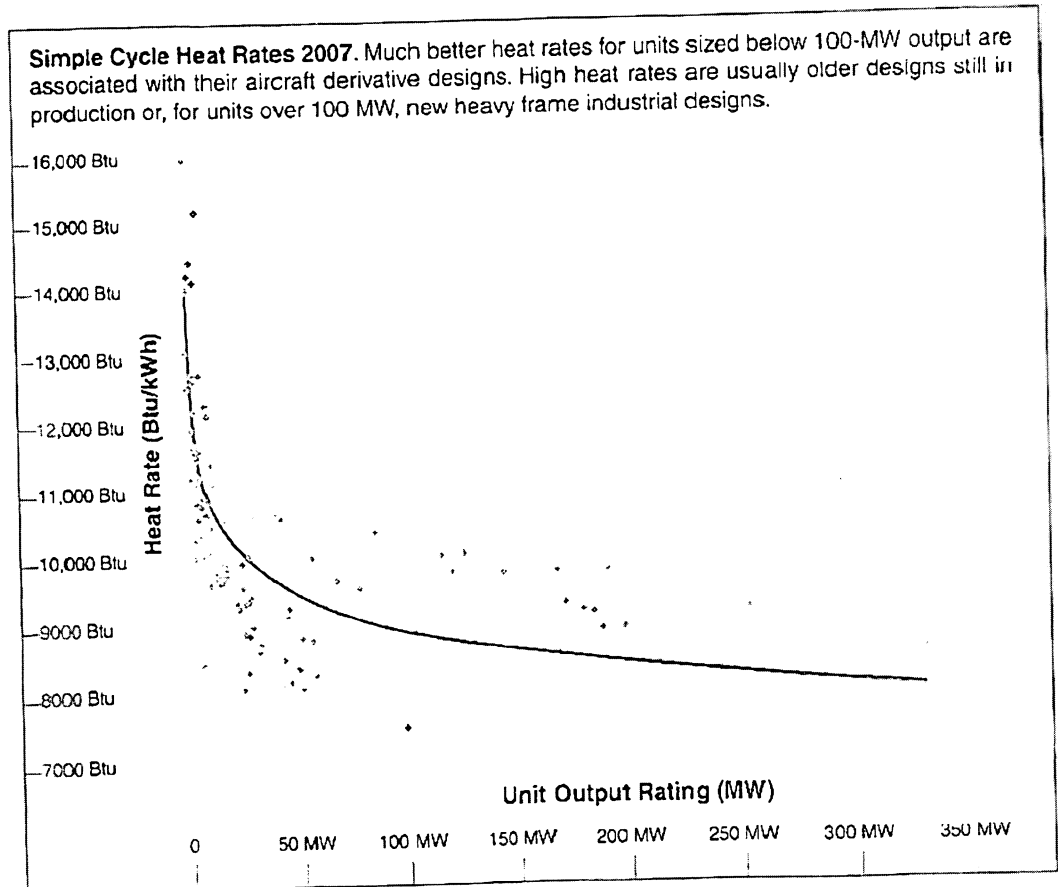
Project managers conservatively estimate that installation and complete turnkey plant costs can easily add anywhere from 60 to 100% on top of equipment-only prices for simple cycle plants.

Actual prices will depend on the changing situations in which competitive suppliers find themselves, geographic area of business interest, marketing strategies, and manufacturing capacity.

All of these factors enter into the bid and evaluation process when shopping for new gas turbine generation.

As shown in the plot of simple cycle plants the \$/kW prices for small gas turbines below 20 MW unit size are much higher than \$/kW for the much larger units which benefit from economies of scale.

Characteristically, in the below 50 MW range, aeroderivative gas turbine designs are also more efficient and have lower heat rates than industrial units.



*These are equipment-only budget prices quoted FOB the factory in 2008 US dollars for simple cycle electric power plants.*

Model	Frequency	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budgetary Price	Price per kW
VPS1	50/60 Hz	514 kW	15,981 Btu	21.4%	\$547,000	\$1,064
ST6L-813	50/60 Hz	848 kW	13,099 Btu	26.1%	\$871,000	\$1,027
Makila TI	50/60 Hz	1050 kW	12,580 Btu	27.1%	\$1,136,000	\$1,082
Saturn 20	50/60 Hz	1200 kW	14,025 Btu	24.3%	\$1,056,000	\$880
M1A-13D	50/60 Hz	1475 kW	14,229 Btu	24.0%	\$1,315,000	\$892
KG2-3C	50/60 Hz	1499 kW	22,367 Btu	15.3%	\$1,092,000	\$728
KG2-3E	50/60 Hz	1895 kW	21,543 Btu	15.8%	\$1,241,000	\$655
ST18A	50/60 Hz	1961 kW	11,237 Btu	30.4%	\$1,677,000	\$855
OGT2500	50/60 Hz	2670 kW	12,780 Btu	26.7%	\$2,051,000	\$768
UGT-2500	50/60 Hz	2850 kW	11,970 Btu	28.5%	\$2,146,000	\$753
M1T-13D	50/60 Hz	2907 kW	14,439 Btu	23.6%	\$1,899,000	\$653
VPS3	50/60 Hz	3106 kW	12,675 Btu	26.9%	\$1,979,000	\$637
Centaur 40	50/60 Hz	3515 kW	12,240 Btu	27.9%	\$2,085,000	\$593
VPS4	50/60 Hz	3568 kW	11,714 Btu	29.1%	\$1,975,000	\$554
501-KB5S	50/60 Hz	3897 kW	11,747 Btu	29.1%	\$2,147,000	\$551
ST40	50/60 Hz	4039 kW	10,310 Btu	33.1%	\$2,339,000	\$579
OGT4000 SI	50/60 Hz	4050 kW	10,065 Btu	33.9%	\$2,203,000	\$544
GTES-4	50/60 Hz	4100 kW	14,132 Btu	24.2%	\$1,823,000	\$445
Centaur 50S	50/60 Hz	4600 kW	11,630 Btu	29.3%	\$2,347,000	\$510
Mercury 50	50/60 Hz	4600 kW	8865 Btu	38.5%	\$2,923,000	\$635
501-KB7S	50/60 Hz	5245 kW	10,848 Btu	31.5%	\$2,919,000	\$557
SGT-100	50/60 Hz	5250 kW	11,203 Btu	30.5%	\$2,700,000	\$514
CX501-KB7	50/60 Hz	5344 kW	10,640 Btu	32.1%	\$2,806,000	\$525
M7A-01D	50/60 Hz	5381 kW	11,648 Btu	29.3%	\$2,565,000	\$477
M7A-01	50/60 Hz	5512 kW	11,530 Btu	29.6%	\$2,473,000	\$449
GE5	50/60 Hz	5520 kW	11,130 Btu	30.7%	\$2,520,000	\$457
Taurus 60	50/60 Hz	5670 kW	11,225 Btu	30.4%	\$2,575,000	\$454
THM1203A	50/60 Hz	5760 kW	15,184 Btu	22.5%	\$1,870,000	\$325
GTES-6	50/60 Hz	6200 kW	12,782 Btu	26.7%	\$2,197,000	\$354
Taurus 65	50/60 Hz	6300 kW	10,375 Btu	32.9%	\$2,985,000	\$474
UGT-6000	50/60 Hz	6360 kW	10,835 Btu	31.5%	\$2,956,000	\$465
501-KH5	50/60 Hz	6447 kW	8509 Btu	40.1%	\$3,456,000	\$536
OGT6000	50/60 Hz	6500 kW	11,187 Btu	30.5%	\$2,972,000	\$457
M7A-02D	50/60 Hz	6721 kW	11,264 Btu	30.3%	\$3,173,000	\$472
SGT-200	50/60 Hz	6750 kW	10,824 Btu	31.5%	\$3,330,000	\$493
Taurus 70	50/60 Hz	7520 kW	10,100 Btu	33.8%	\$3,619,000	\$481

Model	Frequency	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budgetary Price	Price per kW
SGT-300	50/60 Hz	7900 kW	10,937 Btu	31.2%	\$3,505,000	\$444
THM1304-9	50/60 Hz	8640 kW	12,341 Btu	27.7%	\$3,489,000	\$404
UGT-8000	50/60 Hz	9000 kW	10,150 Btu	33.6%	\$3,842,000	\$427
THM1304-10	50/60 Hz	9320 kW	12,170 Btu	28.0%	\$3,503,000	\$376
Mars 90	50/60 Hz	9450 kW	10,710 Btu	31.9%	\$4,298,000	\$455
UGT-10000	50/60 Hz	10,300 kW	9670 Btu	35.3%	\$4,888,000	\$475
Mars 100	50/60 Hz	10,690 kW	10,520 Btu	32.4%	\$5,093,000	\$476
THM1304-11	50/60 Hz	10,760 kW	11,459 Btu	29.8%	\$4,277,000	\$398
GE 10-1	50/60 Hz	11,250 kW	10,892 Btu	31.3%	\$5,040,000	\$448
THM1304-12	50/60 Hz	11,520 kW	11,165 Btu	30.6%	\$4,978,000	\$432
GTES-12	50/60 Hz	12,000 kW	10,242 Btu	33.3%	\$5,278,000	\$440
THM1304-14	50/60 Hz	12,680 kW	11,000 Btu	31.0%	\$5,119,000	\$404
SGT-400	50/60 Hz	12,900 kW	9817 Btu	34.8%	\$6,412,000	\$497
PGT16	50/60 Hz	13,720 kW	9760 Btu	35.0%	\$7,094,000	\$517
LM1600PE	50 Hz	13,748 kW	9749 Btu	35.0%	\$7,111,000	\$517
MF-111B	50/60 Hz	14,570 kW	11,020 Btu	31.0%	\$6,860,000	\$471
TITAN 130	50/60 Hz	15,000 kW	9695 Btu	35.2%	\$7,752,000	\$517
GTES-16	50/60 Hz	16,000 kW	9787 Btu	34.9%	\$6,963,000	\$435
UGT-15000	50/60 Hz	16,900 kW	9750 Btu	35.0%	\$7,243,000	\$429
SGT-500	50/60 Hz	17,000 kW	10,600 Btu	32.2%	\$6,740,000	\$397
L20A	50/60 Hz	17,640 kW	9948 Btu	34.3%	\$7,213,000	\$409
LM2000PS	50 Hz	17,674 kW	9779 Btu	34.9%	\$7,639,000	\$432
LM2000PJ	50 Hz	17,855 kW	9888 Btu	34.5%	\$7,499,000	\$420
PGT25	50/60 Hz	22,417 kW	9404 Btu	36.3%	\$9,765,000	\$436
LM2500PE	60 Hz	23,292 kW	9315 Btu	36.6%	\$10,871,000	\$467
SGT-600	50/60 Hz	24,770 kW	9985 Btu	34.2%	\$10,460,000	\$422
UGT-15000 STIG	50/60 Hz	25,000 kW	8130 Btu	42.0%	\$12,731,000	\$509
FT8 PowerPac	50/60 Hz	25,490 kW	8950 Btu	38.1%	\$12,299,000	\$483
OGT25000	50/60 Hz	25,500 kW	9639 Btu	35.4%	\$11,336,000	\$445
UGT-25000	50/60 Hz	26,200 kW	9400 Btu	36.3%	\$11,870,000	\$453
PG5371(PA)	50/60 Hz	26,300 kW	11,990 Btu	28.5%	\$ 9,786,000	\$372
H-25	50/60 Hz	27,500 kW	10,097 Btu	33.8%	\$11,228,000	\$408
RB211-6562 DLE	50/60 Hz	27,520 kW	9415 Btu	36.3%	\$11,886,000	\$432
LM2500 PH STIG	60 Hz	27,630 kW	8391 Btu	40.7%	\$13,327,000	\$482
FT8-3	50/60 Hz	27,970 kW	8900 Btu	38.3%	\$12,081,000	\$432
SGT-700	50/60 Hz	29,060 kW	9480 Btu	36.0%	\$11,906,000	\$410
RB211-6762 DLE	50/60 Hz	29,500 kW	9055 Btu	37.7%	\$12,624,000	\$428
MF-221	50/60 Hz	30,000 kW	10,670 Btu	32.0%	\$11,561,000	\$385
RB211-6761 DLE	50/60 Hz	32,120 kW	8680 Btu	39.3%	\$14,307,000	\$445
LM2500 RD	60 Hz	33,165 kW	8774 Btu	38.9%	\$14,314,000	\$432
PG6561(B)	50/60 Hz	39,620 kW	10,710 Btu	31.9%	\$12,083,000	\$305
PG6581(B)	50/60 Hz	42,100 kW	10,642 Btu	32.1%	\$12,855,000	\$305

Model	Frequency	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budgetary Price	Price per kW
LM6000PD SGT-800 PG6591(C)	60 Hz	43,068 kW	8173 Btu	41.8%	\$15,907,000	\$369
	50/60 Hz	45,000 kW	9215 Btu	37.0%	\$15,426,000	\$343
	50/60 Hz	45,400 kW	9315 Btu	36.6%	\$15,330,000	\$338
LM6000PD Sprint LM6000PC FT8 TwinPac	60 Hz	46,824 kW	8235 Btu	41.4%	\$17,548,000	\$375
	60 Hz	50,080 kW	8434 Btu	40.5%	\$17,863,000	\$357
	50/60 Hz	51,350 kW	8890 Btu	38.4%	\$17,571,000	\$342
Trent 60 DLE GT8C2 FT8-3TwinPac	50/60 Hz	51,685 kW	8138 Btu	41.9%	\$18,457,000	\$357
	50 Hz	56,300 kW	10,065 Btu	33.9%	\$17,890,000	\$318
	50/60 Hz	56,340 kW	8840 Btu	38.6%	\$19,156,000	\$340
Trent 60 WLE SGT-1000F PG6111(FA)	50/60 Hz	58,000 kW	8336 Btu	40.9%	\$20,551,000	\$354
	50 Hz	67,700 kW	9730 Btu	35.1%	\$21,156,000	\$313
	50/60 Hz	77,060 kW	9620 Btu	35.5%	\$22,002,000	\$286
PG7121(EA) LMS100PA GT11N2	60 Hz	85,100 kW	10,430 Btu	32.7%	\$19,514,000	\$229
	60 Hz	98,816 kW	7569 Btu	45.1%	\$32,453,000	\$328
	50 Hz	113,600 kW	10,247 Btu	33.3%	\$25,988,000	\$229
GT11N2 SGT6-3000E PG9171(E)	60 Hz	115,400 kW	10,065 Btu	33.9%	\$27,365,000	\$237
	60 Hz	120,500 kW	9840 Btu	34.7%	\$29,167,000	\$242
	50 Hz	126,100 kW	10,100 Btu	33.8%	\$29,172,000	\$231
M701DA SGT5-2000E PG7241FA	50 Hz	144,090 kW	9810 Btu	34.8%	\$34,033,000	\$236
	50 Hz	168,000 kW	9825 Btu	34.7%	\$37,800,000	\$225
	60 Hz	171,700 kW	9360 Btu	36.5%	\$40,176,000	\$234
GT13E2 PG7251FB GT24	50 Hz	179,900 kW	9247 Btu	36.9%	\$42,433,000	\$236
	60 Hz	184,400 kW	9215 Btu	37.0%	\$44,004,000	\$239
	60 Hz	188,782 kW	8956 Btu	38.1%	\$46,421,000	\$246
SGT5-3000E SGT6-5000F PG9351(FA)	50 Hz	191,000 kW	9825 Btu	34.7%	\$42,093,000	\$220
	60 Hz	198,300 kW	8985 Btu	38.0%	\$46,982,000	\$237
	50 Hz	255,600 kW	9250 Btu	36.9%	\$57,123,000	\$224
SGT6-6000G M701F PG9371(FB)	60 Hz	267,500 kW	8715 Btu	39.2%	\$64,065,000	\$240
	50 Hz	278,300 kW	8810 Btu	38.7%	\$66,020,000	\$237
	50 Hz	279,200 kW	9016 Btu	37.9%	\$64,044,000	\$229
SGT5-4000F GT26 M701G	50 Hz	286,600 kW	8638 Btu	39.5%	\$70,023,000	\$244
	50 Hz	289,139 kW	8716 Btu	39.2%	\$69,347,000	\$240
	50 Hz	334,000 kW	8630 Btu	39.5%	\$80,824,000	\$242

**Prices up 20% on average for 18-24 months delivery wait**

The 'equipment-only' budget prices for turnkey combined cycle projects are FOB the factory in year 2008 U.S. dollars referenced to a standardized OEM reference plant design.

This year's plot of total plant equipment costs versus power output shows the classic slope of decreasing price with increasing size -- but the change in price is more gradual than for simple cycle units.

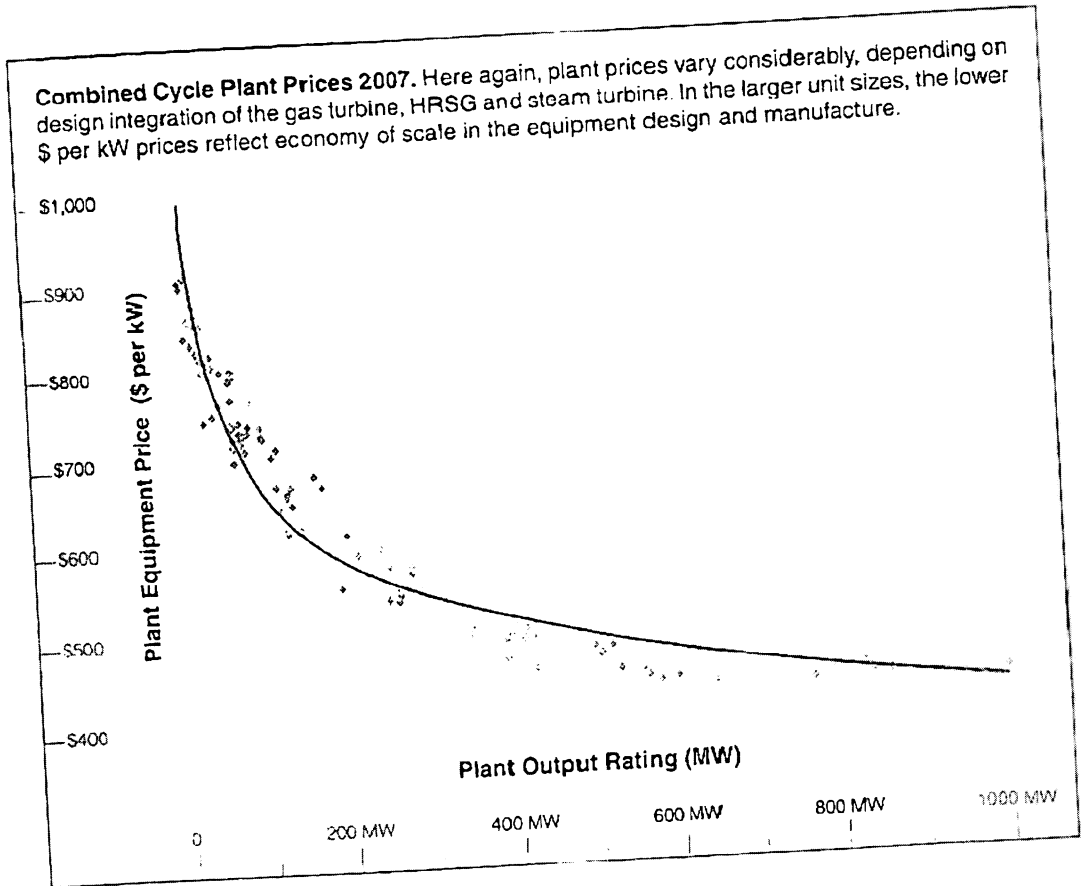
This is attributed to the increased engineering development and manufacturing costs for advanced technology gas turbine designs (F+, G and H models) specially developed for combined cycle power generation and associated increase in the cost of more advanced steam turbine cycle equipment.

On the gas turbine side, new materials and coatings developed for the buckets and nozzles (to withstand high temperature) are more expensive and the process required to manufacture them is more costly.

**Scope of supply**

Basic equipment for an operational combined cycle package includes gas turbines, heat recovery steam generators, steam turbine, electric generators and associated balance-of-plant systems:

- *Gas turbine.* Skid mounted single fuel design with acoustically treated enclosure for outdoors installation and with standard starting and control systems. No inlet air heating or chilling.
- *Steam turbine.* Condensing subcritical designs, with single or dual-pressure levels for small plants, triple-pressure levels with reheat for large plants. Axial or radial exhaust and water-cooled heat rejection.
- *Unfired HRSG.* Outdoors mounted heat recovery steam generator, with ductwork but no bypass damper, short exhaust stack. Dual-pressure level design or triple pressure units with reheat. Catalytic sections are optional add-on (expensive).



*These are equipment-only budget prices quoted FOB the factory in 2008 US dollars for combined cycle reference plant modules.*

Plant Model	Net Plant Output	Freq.	LHV Efficiency	No. Gas Turbines	Steam Turbine	Equipment Only	Price per kW
STAC 60	7.3 MW	50 Hz	39.6%	1xTAURUS 60	1.8 MW	\$6,913,000	\$947
STAC 70	9.5 MW	50 Hz	41.7%	1xTAURUS 70	2.0 MW	\$9,040,000	\$954
UGT 10CC1	13.5 MW	50 Hz	45.8%	1xUGT 10000	3.5 MW	\$13,029,000	\$965
STAC 100	13.8 MW	50 Hz	40.7%	1xMARS 100	3.1 MW	\$12,194,000	\$886
STAC 130	17.7 MW	50 Hz	42.7%	1xTITAN 130	3.7 MW	\$16,015,000	\$904
UGT 15CC1	21.2 MW	50 Hz	44.4%	1xUGT15000	5.2 MW	\$18,879,000	\$891
LM2000PJ	23.9 MW	60 Hz	47.6%	1xLM2000PJ	6.8 MW	\$22,152,000	\$926
LM2000PS	24.0 MW	60 Hz	45.0%	1xLM2000PS	6.1 MW	\$21,450,000	\$895
L20A-1	25.0 MW	50 Hz	48.6%	1xL20A	8.3 MW	\$23,082,000	\$923
UGT 10CC2	26.5 MW	50 Hz	46.7%	2xUGT10000	7.5 MW	\$23,415,000	\$884
LM2500PJ	31.1 MW	60 Hz	50.0%	1xLM2500PJ	9.1 MW	\$27,276,000	\$876
FT8 PowerPac	32.9 MW	50/60 Hz	49.7%	1xFT8	8.8 MW	\$29,274,000	\$890
THM 1304-11	32.9 MW	50/60 Hz	45.5%	1xTHMx1304-11	11.4 MW	\$28,397,000	\$863
UGT 25CC1	33.0 MW	50 Hz	46.2%	1xUGT25000	8.0 MW	\$28,487,000	\$863
SCC-600	36.1 MW	50/60 Hz	50.1%	1xGT10B	12.6 MW	\$31,346,000	\$868
FT8-3 PowerPac	36.6 MW	50/60 Hz	50.6%	1xFT8-3	10.0 MW	\$31,742,000	\$868
RB211-GT62	39.8 MW	50/60 Hz	51.4%	1xRB211-GT62	12.2 MW	\$34,619,000	\$871
SCC-700	41.3 MW	50/60 Hz	51.1%	1xGT10C	12.9 MW	\$35,837,000	\$868
UGT 15CC2	42.8 MW	50 Hz	44.8%	2xUGT15000	10.8 MW	\$34,224,000	\$800
LM2500+RD	44.3 MW	60 Hz	52.0%	1xLM2500+RD	12.1 MW	\$38,700,000	\$873
L20A-2	51.0 MW	50 Hz	49.1%	2xL20A	16.9 MW	\$42,236,000	\$828
LM6000PD	54.2 MW	60 Hz	52.5%	1xLM6000PD	12.2 MW	\$46,712,000	\$862
S106B	64.3 MW	50 Hz	49.0%	1xMS6001B	23.8 MW	\$51,968,000	\$808
Trent 60 DLE	64.6 MW	60 Hz	52.5%	1xTrent 60 DLE	15.2 MW	\$53,691,000	\$831
SCC-800	66.5 MW	50/60 Hz	53.7%	1xGTX100	21.4 MW	\$56,407,000	\$848
FT8 TwinPac	66.7 MW	50/60 Hz	50.4%	2xFT8	18.0 MW	\$53,659,000	\$804
HK-37	66.8 MW	50/60 Hz	47.1%	1xHK-37	19.6 MW	\$51,107,000	\$765
S106C	67.2 MW	50 Hz	54.3%	1xMS6001C	23.1 MW	\$56,880,000	\$846
UGT 25CC2	67.2 MW	50 Hz	47.0%	2xUGT25000	17.2 MW	\$51,305,000	\$764
Trent 60 WLE	72.7 MW	50 Hz	50.3%	1xTrent 60 WLE	15.9 MW	\$58,552,000	\$806
SCC-600	73.2 MW	50/60 Hz	50.7%	2xGT10B	26.0 MW	\$58,681,000	\$802
FT8-3 TwinPac	74.2 MW	50/60 Hz	51.3%	2xFT8-3	20.6 MW	\$59,174,000	\$798
2xRB211-G62	75.5 MW	50/60 Hz	50.2%	2xRB211-G62	24.1 MW	\$59,111,000	\$783
2xRB211-GT62	79.5 MW	50/60 Hz	51.4%	2xRB211-GT62	24.4 MW	\$63,178,000	\$794
2025	81.4 MW	50/60 Hz	50.1%	2xH-25	27.5 MW	\$63,012,000	\$775
SCC-700	83.6 MW	50/60 Hz	51.8%	2xGT10C	26.8 MW	\$66,617,000	\$797

Plant Model	Net Plant Output	Freq.	LHV Efficiency	No. Gas Turbines	Steam Turbine	Equipment Only	Price per kW
SCC-1000F	100.8 MW	50 Hz	52.6%	1xV64.3A	33.1 MW	\$81,117,000	\$805
LMS100PB	112.8 MW	60 Hz	51.7%	1xLMS100PB	16.2 MW	\$86,572,000	\$767
S106FA	117.7 MW	50 Hz	55.1%	1xMS6001FA	43.9 MW	\$93,243,000	\$792
LMS100PA	117.9 MW	60 Hz	50.2%	1xLMS100PA	16.7 MW	\$87,396,000	\$741
3025	122.2 MW	50/60 Hz	50.1%	3xH-25	41.4 MW	\$86,690,000	\$710
2xTrent 60 DLE	129.9 MW	60 Hz	52.8%	2xTrent 60 DLE	31.1 MW	\$95,584,000	\$736
S107EA	130.2 MW	60 Hz	50.2%	1xMS7001EA	48.7 MW	\$89,745,000	\$689
S206B	130.7 MW	50 Hz	49.8%	2xMS6001B	49.4 MW	\$90,354,000	\$691
SCC-800	135.0 MW	50/60 Hz	54.4%	2xGTX100	44.4 MW	\$96,255,000	\$713
S206C	136.1 MW	50 Hz	55.0%	2xMS6001C	48.1 MW	\$99,741,000	\$733
2xTrent 60 WLE	146.4 MW	60 Hz	50.8%	2xTrent 60 WLE	32.9 MW	\$96,934,000	\$662
KA8C2-2	163.5 MW	60 Hz	49.7%	2xGT8C2	51.1 MW	\$122,580,000	\$750
SCC6-3000E	173.0 MW	60 Hz	50.5%	1xW501D5A	58.5 MW	\$101,200,000	\$584
S109E	193.2 MW	50 Hz	51.9%	1xMS9001E	71.8 MW	\$121,835,000	\$631
SCC-1000F	201.2 MW	50 Hz	52.5%	2xV64.3A	74.0 MW	\$125,789,000	\$625
MPCP1(M701)	212.5 MW	50 Hz	51.4%	1xM701D	70.4 MW	\$128,736,000	\$606
S206FA	239.4 MW	60 Hz	55.7%	2xMS6001FA	89.7 MW	\$148,010,000	\$618
SCC5-2000E	251.0 MW	50 Hz	52.2%	1xV94.2	91.1 MW	\$145,832,000	\$581
KA13E2-1	252.8 MW	50 Hz	52.8%	1xGT13E2	72.9 MW	\$147,357,000	\$583
S406B	261.3 MW	50 Hz	49.8%	4xMS6001B	99.0 MW	\$140,815,000	\$539
S107FA	262.6 MW	60 Hz	56.0%	1xMS7001FA	95.6 MW	\$157,709,000	\$601
S207EA	263.6 MW	60 Hz	50.9%	2xMS7001EA	100.7 MW	\$139,706,000	\$530
KA24-1	278.9 MW	60 Hz	57.1%	1xGT24	90.7 MW	\$165,540,000	\$594
S107FB	280.3 MW	60 Hz	57.4%	1xMS7001FB	101.0 MW	\$165,744,000	\$591
MPCP1(M501F)	285.1 MW	60 Hz	57.1%	1xM501F	55.3 MW	\$150,810,000	\$529
SCC5-3000E	290.0 MW	50 Hz	56.5%	1xV94.2A	69.5 MW	\$168,594,000	\$581
SCC6-5000F	295.7 MW	60 Hz	57.0%	1xW501F	105.3 MW	\$171,006,000	\$578
KA11N2-2	344.8 MW	50 Hz	51.3%	2xGT11N2	117.6 MW	\$174,396,000	\$506
SCC6-3000E	346.9 MW	60 Hz	50.6%	2xW501D5A	118.0 MW	\$163,995,000	\$473
KA11N2-2	348.5 MW	60 Hz	51.9%	2xGT11N2	117.7 MW	\$166,343,000	\$477
209E	359.5 MW	50 Hz	49.4%	2xMS9001E	121.5 MW	\$168,719,000	\$469
S109FA	390.8 MW	50 Hz	56.7%	1xMS9001FA	141.8 MW	\$197,937,000	\$507
S209E	391.4 MW	50 Hz	52.7%	2xMS9001E	148.5 MW	\$185,213,000	\$473
SCC6-6000G	397.1 MW	60 Hz	58.8%	1xW501G	129.6 MW	\$207,303,000	\$522
MPCP1(M501G)	398.9 MW	60 Hz	58.4%	1xM501G	134.5 MW	\$208,428,000	\$523
S107H	400.0 MW	60 Hz	60.0%	1xMS7001H	****	\$215,022,000	\$538
MPCP1(M501H)	403.0 MW	60 Hz	60.0%	1xM501H	****	\$216,049,000	\$536
S109FB	412.9 MW	50 Hz	58.0%	1xMS9001FB	151.7 MW	\$214,836,000	\$520
SCC5-4000F	416.0 MW	50 Hz	58.3%	1xV94.3A	129.4 MW	\$216,890,000	\$521
MPCP1(M701F)	416.4 MW	50 Hz	59.0%	1xM701F	142.6 MW	\$220,441,000	\$529
KA26-1	424.0 MW	50 Hz	58.3%	1xGT26	135.7 MW	\$220,676,000	\$521
MPCP2(M701)	426.6 MW	50 Hz	51.6%	2xM701D	142.4 MW	\$191,692,000	\$449

Plant Model	Net Plant Output	Freq.	LHV Efficiency	No. Gas Turbines	Steam Turbine	Equipment Only	Price per kW
MPCP1(M701G2)	498.0 MW	50 Hz	59.3%	1xM701G2	172.3 MW	\$251,597,000	\$505
SCC5-2000E	505.0 MW	50 Hz	52.5%	2xV94.2	184.9 MW	\$223,204,000	\$442
KA13E2-2	507.4 MW	50 Hz	53.0%	2xGT13E2	147.6 MW	\$225,920,000	\$445
S109H	520.0 MW	50 Hz	60.0%	1xMS9001H	****	\$269,185,000	\$518
S207FA	529.9 MW	60 Hz	56.5%	2xMS7001FA	195.8 MW	\$243,121,000	\$459
KA24-2	560.0 MW	60 Hz	57.3%	2xGT24	183.6 MW	\$256,506,000	\$458
S207FB	562.5 MW	60 Hz	57.5%	2xMS7001FB	204.0 MW	\$258,027,000	\$459
SCC5-3000E	576.0 MW	50 Hz	56.4%	2xV94.2A	215.3 MW	\$262,932,000	\$457
SCC6-5000F	598.0 MW	60 Hz	57.4%	2xW501F	217.4 MW	\$270,350,000	\$452
MPCP3(M701)	645.0 MW	50 Hz	51.8%	3xM701D	218.7 MW	\$250,877,000	\$389
KA13E2-3	763.2 MW	50 Hz	53.2%	3xGT13E3	223.5 MW	\$329,634,000	\$432
S209FA	786.9 MW	50 Hz	57.1%	2xMS9001FA	289.2 MW	\$373,261,000	\$474
SCC6-6000G	794.3 MW	60 Hz	58.8%	2xW501G	281.2 MW	\$360,835,000	\$454
S209FB	825.4 MW	50 Hz	58.0%	2xMS9001FB	303.7 MW	\$366,923,000	\$445
SCC5-4000F	832.0 MW	50 Hz	58.2%	2xV94.3A	288.7 MW	\$366,576,000	\$441
MPCP2(M701F)	835.6 MW	50 Hz	59.2%	2xM701F	288.0 MW	\$380,465,000	\$455
KA26-2 ICS	857.7 MW	50 Hz	59.0%	2xGT26	281.1 MW	\$389,225,000	\$454
MPCP2(M701G2)	999.4 MW	50 Hz	59.5%	2xM701G2	348.0 MW	\$453,299,000	\$454

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*Prices up  
10% on  
average for  
12-16  
months  
delivery wait*

The 'equipment-only' budget prices in the GTW Handbook for mechanical drives are FOB the factory, in year 2008 U.S. dollars for a single or two-unit purchase.

They are for a bare bones mechanical drive with basic systems and controls required of an operational installation, without bells and whistles or site specific auxiliaries and accessories.

#### **Scope of supply**

Basic scope of supply for a standard mechanical drive gas turbine includes:

- **Engine package.** Skid-mounted single fuel gas turbine, output shaft coupling to connect with driven equipment, start and lube oil cooling systems.
- **Output gearbox.** Parallel-shaft gearbox usually standard; epicyclic gearbox design is more compact and efficient but adds to the price.
- **Inlet and exhaust.** Ducting and inlet silencer, inlet air filter, exhaust silencer. Options such as multi-stage inlet air filtration, anti-icing, air inlet cooling, water injection.
- **Auxiliaries.** Vibration, speed and temperature instrumentation, turbine control, fire protection systems.

#### **Price and delivery driven by demand**

The price level of mechanical drive gas turbines has increased by about 10 percent over 2006 prices, and is expected to continue rising in 2008.

Typical gas turbine shipment schedules of 12 to 14 months a year ago are currently running 18 to 20 months from date of order. Pipeline compressor packages can add more than 6 months to this cycle.

Major pipeline projects across Eastern Europe and China bolstered by increasing offshore activity in Southeast Asia and West Africa have combined to create strong demand.

Floating production, storage, and offloading (FPSO) vessels are also a growing market for gas turbine drivers. Higher than average scope of supply for these offshore vessel installations (and platforms) is reflected in higher price levels, particularly for the smaller-size units.

This is a function of additional equipment such as corrosion resistant materials and special mounting required to stand up to severe operating environments.

#### **Efficiency is also a price factor**

The rapidly expanding liquefied natural gas (LNG) market has also created a growing market for very large, heavy frame single-shaft drivers to power refrigerant compressor trains requiring many thousand hp per train.

Since mechanical drive gas turbines mainly operate continuously at base load output there is a price premium paid for high efficiency and high availability performance.

With natural gas fuel selling for \$7-8 per million Btu in the U.S., efficiency is a much more important economic factor today (even for gas pipeline compressor station installations) than it was a few years ago with gas selling for \$3-4 per million Btu.

#### **Drives can cost more than gensets**

The cost of manufacturing, assembling and packaging mechanical drives can easily exceed the cost of packaging that same gas turbine as a genset.

On the surface one might expect that the added cost of an electric generator alone would rule out such an imbalance, but comparative industry price tags say otherwise.

Actually, a mechanical drive might range from \$900,000 to \$1.25 million compared to a \$1 million equipment price for a complete genset.

The primary reason is that mechanical drive gas turbine packages for oil & gas or petrochemical applications must be designed to insure safe operation in hazardous, explosive and flammable environments.

That is in addition to meeting strict standards such as spelled out by API, ISO 9001 (v. 2000) and PED (European directive on pressurized equipment) specifications.

The net result is that a mechanical drive for oil & gas can be more expensive than an electric generating plant powered by the same gas turbine model driving an electric generator.

*These are equipment-only budget prices quoted FOB the factory in 2008 US dollars for mechanical drive gas turbines.*

Model	Base Load Rating	Heat Rate Btu/shp-hr	LHV Efficiency	Budget Price	Price per kW
VPS1	705 hp	11,665 Btu	21.8%	\$549,900	\$780
ST6L-795	909 hp	10,301 Btu	24.7%	\$843,700	\$928
ST6L-813	1137 hp	9786 Btu	26.0%	\$1,109,000	\$975
TV3-137	1475 hp	9664 Btu	26.3%	\$1,246,000	\$845
IM150	1580 hp	9190 Btu	27.7%	\$1,320,000	\$835
Saturn 20	1590 hp	10,370 Btu	24.5%	\$1,265,000	\$796
M1A-13X	2010 hp	10,193 Btu	25.0%	\$1,333,000	\$663
M1A-13D	2083 hp	10,078 Btu	25.3%	\$1,349,000	\$647
ST18A	2630 hp	8425 Btu	30.2%	\$1,658,000	\$631
M1T-13D	4104 hp	10,229 Btu	24.9%	\$2,134,000	\$520
VPS3	4410 hp	8958 Btu	28.4%	\$2,064,000	\$468
UGT 3000	4500 hp	8100 Btu	31.4%	\$2,106,000	\$468
Centaur 40	4700 hp	9125 Btu	27.9%	\$2,077,000	\$442
VPS4	4931 hp	8497 Btu	30.0%	\$2,372,000	\$481
ST40	5416 hp	7687 Btu	33.1%	\$2,394,000	\$442
501-KC5	5500 hp	8495 Btu	30.0%	\$2,717,000	\$494
Centaur 50	6130 hp	8500 Btu	29.9%	\$2,709,000	\$442
SGT-100	6600 hp	7955 Btu	32.0%	\$3,175,000	\$481
501-KC7	7400 hp	7902 Btu	32.2%	\$2,982,000	\$403
M7A-01D	7425 hp	8450 Btu	30.1%	\$2,992,000	\$403
M7A-01	7607 hp	8342 Btu	30.5%	\$3,066,000	\$403
Taurus 60	7700 hp	7965 Btu	32.0%	\$3,103,000	\$403
THM1203A	8046 hp	10,870 Btu	23.4%	\$3,243,000	\$403
D-336-1	8445 hp	8105 Btu	31.4%	\$3,403,000	\$403
NK-12ST	8450 hp	9748 Btu	26.1%	\$3,405,000	\$403
UGT 6000	8840 hp	7970 Btu	31.9%	\$3,552,000	\$402
M7A-01S	8956 hp	7481 Btu	34.0%	\$3,667,000	\$410
GT6000	9100 hp	8080 Btu	31.5%	\$3,656,000	\$402
M7A-02D	9276 hp	8162 Btu	31.2%	\$3,654,000	\$394
M7A-03D	10,179 hp	7520 Btu	33.8%	\$3,441,000	\$338
SGT-200	10,300 hp	7595 Btu	33.5%	\$3,565,000	\$346
Taurus 70	10,310 hp	7310 Btu	34.8%	\$3,605,000	\$350
AI-336-2-8	10,724 hp	7901 Btu	32.2%	\$3,764,000	\$351
NK-14ST	10,730 hp	7951 Btu	32.0%	\$3,766,000	\$351
UGT 8000	11,300 hp	7560 Btu	33.7%	\$3,937,000	\$348
THM1304-10	13,008 hp	8715 Btu	29.2%	\$4,397,000	\$338

Model	Base Load Rating	Heat Rate Btu/shp-hr	LHV Efficiency	Budget Price	Price per kW	
Mars 90	13,220 hp	7655 Btu	33.2%	\$4,554,000	\$345	M
AI-336-1-10	13,405 hp	7283 Btu	34.9%	\$4,618,000	\$345	L
NK-40ST	13,410 hp	7483 Btu	34.0%	\$4,620,000	\$345	L
GTU-10P	13,812 hp	7689 Btu	33.1%	\$4,668,000	\$338	L
UGT 10000	14,280 hp	6970 Btu	36.5%	\$4,827,000	\$338	M
Mars 100	15,000 hp	7490 Btu	34.0%	\$5,031,000	\$335	L
THM1304-12	16,092 hp	8001 Btu	31.8%	\$5,230,000	\$325	L
GTU-12P	16,588 hp	7356 Btu	34.6%	\$5,391,000	\$325	L
SB60-2	17,530 hp	8215 Btu	31.0%	\$6,039,000	\$345	L
THM1304-14	17,701 hp	7881 Btu	32.3%	\$6,098,000	\$345	L
SGT-400	18,000 hp	7030 Btu	36.2%	\$6,201,000	\$345	L
LM1600-PA	19,200 hp	6892 Btu	36.9%	\$6,739,000	\$351	L
Titan 130	20,500 hp	7025 Btu	36.2%	\$6,796,000	\$332	L
NK-38ST	21,460 hp	6695 Btu	38.0%	\$6,975,000	\$325	L
UGT 10000 STIG	21,760 hp	5840 Btu	43.6%	\$7,069,000	\$325	L
Avon 2648	21,923 hp	8323 Btu	30.6%	\$7,122,000	\$325	L
GTU-16P	22,086 hp	6879 Btu	37.0%	\$7,141,000	\$323	L
UGT 15000	22,700 hp	7170 Btu	35.5%	\$7,152,000	\$315	L
UGT 16000	22,700 hp	7840 Btu	32.5%	\$7,224,000	\$318	L
Avon 2656	22,807 hp	8022 Btu	31.7%	\$7,264,000	\$319	L
SGT-500	23,290 hp	7760 Btu	32.8%	\$7,266,000	\$312	L
GT15001	23,800 hp	7271 Btu	35.0%	\$7,426,000	\$312	L
L20A	24,138 hp	7270 Btu	35.0%	\$7,531,000	\$312	L
LM2000PS	25,236 hp	7205 Btu	35.3%	\$7,874,000	\$312	L
PGT25	31,200 hp	6750 Btu	37.7%	\$9,937,000	\$319	L
LM2500PE	32,013 hp	6777 Btu	37.6%	\$10,196,000	\$319	L
NK-36ST	33,530 hp	6990 Btu	36.4%	\$11,551,000	\$345	L
SGT-600	34,100 hp	7250 Btu	35.1%	\$11,526,000	\$338	L
GTU-25P	34,330 hp	6365 Btu	40.0%	\$10,934,000	\$319	L
FT8	34,690 hp	6615 Btu	38.5%	\$11,725,000	\$338	L
RB211 G56	34,900 hp	7100 Btu	35.8%	\$11,796,000	\$338	L
UGT 25000	36,300 hp	6910 Btu	36.8%	\$11,798,000	\$325	L
GT25000	36,400 hp	6880 Btu	37.0%	\$11,830,000	\$325	L
FT8-3	37,940 hp	6580 Btu	38.7%	\$11,837,000	\$312	L
MS5002(C)	38,005 hp	8814 Btu	28.9%	\$11,858,000	\$312	L
RB211 G62	39,600 hp	6705 Btu	38.0%	\$12,812,000	\$324	L
SGT-700	40,390 hp	6820 Btu	37.3%	\$11,833,000	\$293	L
RB211 GT62	40,750 hp	6565 Btu	38.8%	\$12,255,000	\$301	L
PGT25+	42,070 hp	6187 Btu	41.1%	\$12,831,000	\$305	L
MS5002(E)	42,912 hp	7070 Btu	36.0%	\$13,389,000	\$312	L
MS5002(D)	43,690 hp	8650 Btu	29.4%	\$13,631,000	\$312	L
RB211 GT61	44,500 hp	6290 Btu	40.5%	\$14,162,000	\$318	L

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Model	Base Load Rating	Heat Rate Btu/shp-hr	LHV Efficiency	Budget Price	Price per kW
LM2500RD	45,439 hp	6404 Btu	39.7%	\$13,586,000	\$299
PGT25+G4	45,590 hp	6175 Btu	41.2%	\$14,698,000	\$322
LM2500RC	49,754 hp	7119 Btu	35.7%	\$14,876,000	\$299
LM6000PC	57,796 hp	6024 Btu	42.2%	\$16,154,000	\$280
MS6001(B)	58,380 hp	7650 Btu	33.3%	\$16,317,000	\$280
LM6000PD	58,809 hp	5985 Btu	42.5%	\$16,437,000	\$280
LM6000PF	58,810 hp	5985 Btu	42.5%	\$16,437,000	\$280
LM6000PD	58,852 hp	6080 Btu	41.9%	\$16,449,000	\$280
LM6000PC	59,530 hp	6240 Btu	40.8%	\$16,639,000	\$280
LM6000PC	59,762 hp	5963 Btu	42.7%	\$16,703,000	\$280
Trent 60	70,418 hp	5939 Btu	42.9%	\$17,834,000	\$253
MS7001(EA)	115,630 hp	7720 Btu	33.0%	\$21,646,000	\$187
M9001(E)	174,520 hp	7350 Btu	34.6%	\$29,267,000	\$168

Model	Frequency	Base Load Rating	Heat Rate Btu/kwh	LHV Efficiency	Budgetary Price	Price per kW
Trent 60 WLE	(60 Hz)	58,000 kW	8336	40.9%	\$15,490,000	\$267
SGT-1000F	(50,60 Hz)	67,700 kW	9730	35.1%	\$19,230,000	\$284
PG6101(FA)	(50,60 Hz)	70,140 kW	9980	34.2%	\$20,060,000	\$285
PG6111(FA)	(50,60 Hz)	75,900 kW	9760	35.0%	\$19,730,000	\$260
PG7121(EA)	(60 Hz)	85,100 kW	10,430	32.7%	\$19,230,000	\$226
GT11NM	(60 Hz)	87,900 kW	10,594	32.2%	\$19,780,000	\$225
LMS100PA	(50/60 Hz)	102,479 kW	7279	46.9%	\$25,930,000	\$253
M501	(60 Hz)	113,950 kW	9780	34.9%	\$22,790,000	\$200
GT11N2	(60 Hz)	115,400 kW	10,150	33.6%	\$23,310,000	\$202
SGT6-3000E	(60 Hz)	120,500 kW	9840	34.7%	\$22,770,000	\$189
PG9171(E)	(50 Hz)	123,400 kW	10,100	33.8%	\$22,610,000	\$183
PG9171(E)	(50 Hz)	126,100 kW	10,100	33.8%	\$23,760,000	\$188
M701DA	(50 Hz)	144,090 kW	9810	34.8%	\$26,840,000	\$186
SGT5-2000E	(50 Hz)	157,000 kW	9920	34.4%	\$28,430,000	\$181
SGT5-2000E	(50 Hz)	163,300 kW	9905	34.5%	\$29,400,000	\$180
PG7241FA	(60 Hz)	171,700 kW	9360	36.5%	\$30,910,000	\$180
GT13E2	(50 Hz)	172,200 kW	9376	36.4%	\$32,070,000	\$186
GT24	(60 Hz)	179,000 kW	9098	37.5%	\$33,690,000	\$188
M501F	(60 Hz)	185,400 kW	9230	37.0%	\$32,630,000	\$176
GT24B	(60 Hz)	187,700 kW	9251	36.9%	\$34,210,000	\$182
SGT5-3000E	(50 Hz)	188,200 kW	9360	36.5%	\$32,410,000	\$172
SGT6-5000F	(60 Hz)	198,300 kW	8985	38.0%	\$35,340,000	\$178
PG9331(FA)	(50 Hz)	245,000 kW	9360	36.5%	\$43,060,000	\$177
M501G	(60 Hz)	253,000 kW	8760	39.0%	\$44,830,000	\$177
PG9351(FA)	(50 Hz)	255,600 kW	9250	36.9%	\$45,300,000	\$177
GT26	(50 Hz)	262,000 kW	8930	38.2%	\$47,490,000	\$181
SGT6-6000G	(60 Hz)	266,300 kW	8685	39.3%	\$47,720,000	\$179
M501G	(60 Hz)	267,500 kW	8730	39.1%	\$46,600,000	\$174
PG9371(FB)	(50 Hz)	268,800 kW	9040	37.8%	\$47,630,000	\$177
SGT5-4000F	(50 Hz)	272,000 kW	8960	38.5%	\$49,570,000	\$182
M701F	(50 Hz)	278,300 kW	8810	38.7%	\$50,160,000	\$180
GT26B	(50 Hz)	281,000 kW	8910	38.3%	\$50,650,000	\$180
M701G	(50 Hz)	334,000 kW	8630	39.5%	\$62,220,000	\$186

Model	Base Load Rating	Heat Rate Btu/kWh	LHV Efficiency	Budget Plant Price	Price per kW
M701DA	144,100 kW	9810 Btu	34.8%	\$22,300,000	\$155
V94.2	163,300 kW	9905 Btu	34.4%	\$24,500,000	\$150
PG9231EC	169,200 kW	9770 Btu	34.9%	\$26,700,000	\$158
PG7241FA	171,700 kW	9360 Btu	36.5%	\$28,500,000	\$166
GT13E2	172,200 kW	9375 Btu	36.4%	\$26,700,000	\$155
V84.3A	180,000 kW	8980 Btu	38.0%	\$30,700,000	\$170
PG7251FB	184,400 kW	9215 Btu	37.0%	\$29,400,000	\$160
M501F	185,400 kW	9230 Btu	37.0%	\$27,950,000	\$151
GT24	187,700 kW	9250 Btu	36.9%	\$34,700,000	\$184
V94.2A	188,200 kW	9360 Btu	36.5%	\$28,400,000	\$151
W501FD2	198,300 kW	8985 Btu	38.0%	\$28,900,000	\$146
PG9331FA	243,000 kW	9360 Btu	36.4%	\$35,960,000	\$148
PG9351FA	255,600 kW	9250 Btu	36.9%	\$38,900,000	\$152
PG7001H..	260,000 kW	8640 Btu	39.5%	\$41,000,000	\$158
M501G	264,000 kW	8730 Btu	38.5%	\$37,900,000	\$143
W501G.	266,300 kW	8685 Btu	39.3%	\$37,300,000	\$140
PG9371FB	268,800 kW	9040 Btu	37.7%	\$39,900,000	\$148
M701F	270,300 kW	8930 Btu	38.2%	\$43,200,000	\$160
M701G	271,000 kW	8820 Btu	38.7%	\$44,715,000	\$165
V94.3A	272,400 kW	8745 Btu	39.0%	\$40,000,000	\$147
GT26	280,900 kW	8910 Btu	38.3%	\$41,700,000	\$148
M701G2	334,000 kW	8630 Btu	39.5%	\$51,500,000	\$154

Genset	Base Load Rating	Heat Rate Btu/kWh	Efficiency	Plant Price	Per kW
PG6111FA	.75,900 kW	9760 Btu	35.0%	\$ 18,600,000	\$ 245
PG7121EA	.85,400 kW	10,420 Btu	32.8%	\$ 16,600,000	\$ 194
GT11N2	.116,500 kW	10,050 Btu	33.9%	\$ 19,700,000	\$ 169
W501D5A	.120,500 kW	9840 Btu	34.7%	\$ 19,900,000	\$ 165
PG9171E	.123,400 kW	10,100 Btu	33.8%	\$ 20,400,000	\$ 165
M701DA	.144,100 kW	9810 Btu	34.8%	\$ 22,400,000	\$ 155
V94.2	.159,400 kW	9950 Btu	34.4%	\$ 24,700,000	\$ 155
GT13E2	.165,100 kW	9560 Btu	35.7%	\$ 27,400,000	\$ 166
PG9231EC	.169,200 kW	9770 Btu	34.9%	\$ 27,100,000	\$ 160
PG7241FA	.171,700 kW	9420 Btu	36.2%	\$ 31,250,000	\$ 182
GT24	.179,000 kW	9098 Btu	37.5%	\$ 27,700,000	\$ 154
V84.3A	.180,000 kW	8980 Btu	38.0%	\$ 30,700,000	\$ 170
PG7251FB	.184,400 kW	9215 Btu	37.0%	\$ 33,900,000	\$ 184
M501F	.185,400 kW	9230 Btu	37.0%	\$ 29,250,000	\$ 158
W501F	.186,500 kW	9190 Btu	37.1%	\$ 31,150,000	\$ 167
W501FD	.189,500 kW	9190 Btu	37.1%	\$ 31,650,000	\$ 167
V94.2A	.190,700 kW	9660 Btu	35.3%	\$ 30,200,000	\$ 158
PG9311FA	.243,000 kW	9360 Btu	36.4%	\$ 38,880,000	\$ 160
W501G	.253,000 kW	8760 Btu	38.5%	\$ 40,300,000	\$ 159
PG9351FA	.255,600 kW	9250 Btu	36.9%	\$ 40,900,000	\$ 160
GT26	.262,000 kW	8930 Btu	38.2%	\$ 38,800,000	\$ 148
M501G	.264,000 kW	8730 Btu	38.5%	\$ 41,450,000	\$ 157
V94.3A	.265,900 kW	8840 Btu	38.6%	\$ 42,300,000	\$ 159
PG9371FB	.268,800 kW	9040 Btu	37.7%	\$ 45,700,000	\$ 170
M701F	.270,300 kW	8930 Btu	38.2%	\$ 43,200,000	\$ 160
M701G	.271,000 kW	8820 Btu	38.7%	\$ 44,720,000	\$ 165
M701G2	.334,000 kW	8630 Btu	39.5%	\$ 55,700,000	\$ 167

Plant Model	Base Load Output	Heat Rate Btu/kWh	# Efficiency	Budget Price	\$ per kW
Trent	58,000 kW	8528 Btu	40.0%	\$17,350,000	\$299
V64.3	63,000 kW	9640 Btu	35.4%	\$17,700,000	\$281
V64.3A	67,100 kW	9810 Btu	34.8%	\$20,600,000	\$308
PG6101FA	70,140 kW	9980 Btu	34.2%	\$22,200,000	\$317
PG7121EA	85,400 kW	10,420 Btu	32.8%	\$21,200,000	\$248
UGT-110000	114,500 kW	9480 Btu	35.0%	\$14,000,000	\$122
GT11N2	116,500 kW	10,050 Btu	33.9%	\$24,100,000	\$207
W501D5A	120,500 kW	9840 Btu	34.7%	\$25,800,000	\$214
PG9171E	123,400 kW	10,100 Btu	33.8%	\$25,900,000	\$210
M701DA	144,100 kW	9810 Btu	34.8%	\$29,400,000	\$204
V94.2	157,000 kW	9920 Btu	34.4%	\$30,500,000	\$194
GT13E2	165,100 kW	9560 Btu	35.7%	\$35,200,000	\$213
PG9231EC	169,200 kW	9770 Btu	34.9%	\$35,200,000	\$208
PG7241FA	171,700 kW	9420 Btu	36.2%	\$40,500,000	\$236
GT24	179,000 kW	9098 Btu	37.5%	\$39,300,000	\$219
V84.3A	180,000 kW	8980 Btu	38.0%	\$39,700,000	\$220
W501F	186,500 kW	9130 Btu	37.4%	\$40,400,000	\$217
V94.2A	190,700 kW	9660 Btu	35.3%	\$37,500,000	\$197
PG9311FA	243,000 kW	9360 Btu	36.4%	\$47,100,000	\$194
W501G	253,000 kW	8760 Btu	38.5%	\$49,700,000	\$196
PG9351FA	255,600 kW	9250 Btu	36.9%	\$51,000,000	\$199
GT26	262,000 kW	8930 Btu	38.2%	\$51,900,000	\$198
V94.3A	265,900 kW	8840 Btu	38.6%	\$50,400,000	\$190
M701F	270,300 kW	8930 Btu	38.2%	\$51,000,000	\$189
M701G	334,000 kW	8630 Btu	39.5%	\$60,700,000	\$182

# 000299

### Simple Cycle Price Levels (continued)

000300

Budgetary average equipment-only price levels for new basic gas turbine electric power generating package including single-fuel gas turbine, air-cooled electric generator (some H<sub>2</sub> cooled on larger units), skid and enclosure, inlet and exhaust ducts and exhaust silencer, standard control and starting systems, conventional combustion system (unless noted otherwise as dry low emissions), F.O.B. the factory in year 2000 U.S. dollars. Prices can vary significantly depending on the scope of plant equipment, geographical area, special site requirements and competitive market conditions.

Gas Turbine	ISO Base Load	Heat Rate Btu/kW-hr	LHV Efficiency	Budget Price	\$ per kW
PG6101FA	70,140 kW	9980 Btu	34.2%	\$22,000,000	\$314
PG7121EA	85,400 kW	10,420 Btu	32.8%	\$21,000,000	\$246
UGT-110000	114,500 kW	9480 Btu	35.0%	\$14,000,000	\$122
GT11N2	116,500 kW	10,050 Btu	33.9%	\$23,900,000	\$205
W501D5A	120,500 kW	9840 Btu	34.7%	\$25,500,000	\$212
PG9171E	123,400 kW	10,100 Btu	33.8%	\$25,600,000	\$207
M701DA	144,100 kW	9810 Btu	34.8%	\$29,100,000	\$202
V94.2	157,000 kW	9920 Btu	34.4%	\$29,890,000	\$190
GT13E2	165,100 kW	9560 Btu	35.7%	\$34,500,000	\$209
PG9231EC	169,200 kW	9770 Btu	34.9%	\$34,550,000	\$204
PG7241FA	171,700 kW	9420 Btu	36.2%	\$41,000,000	\$239
GT24	179,000 kW	9098 Btu	37.5%	\$38,500,000	\$215
V84.3A	180,000 kW	8980 Btu	38.0%	\$38,900,000	\$216
W501F	186,500 kW	9130 Btu	37.4%	\$40,000,000	\$199
V94.2A	190,000 kW	9375 Btu	36.4%	\$36,100,000	\$190
PG9311FA	243,000 kW	9360 Btu	36.4%	\$45,300,000	\$186
W501G	253,000 kW	8760 Btu	38.5%	\$47,800,000	\$189
PG9351FA	255,600 kW	9250 Btu	36.9%	\$49,500,000	\$194
GT26	262,000 kW	8930 Btu	38.2%	\$51,350,000	\$196
V94.3A	265,000 kW	8860 Btu	38.5%	\$51,400,000	\$194
M701F	270,300 kW	8930 Btu	38.2%	\$50,500,000	\$187
M701G	334,000 kW	8630 Btu	39.5%	\$60,120,000	\$180