



FLEXENERGY

FlexEnergy

October 25, 2011 –Federal Utility Partnership Working Group

FLEXENERGY INC: COMPANY OVERVIEW

- Over 125 Employees
- Headquartered in Irvine, CA
- Manufacturing Facilities in Portsmouth, NH and Mocksville, NC
- Acquired Ingersoll Rand Energy Systems in 2010
- Small Business
- Products Meet Buy American Act Requirements



The Cleanest Power Platform in the World

- » FlexEnergy Inc's breakthrough technology efficiently converts pollution and waste gases into electricity at a temperature high enough to destroy VOCs and CO, and low enough to not create NOx
- » Integration of mature gas turbine technologies with proprietary thermal oxidizer that can handle low, medium, and high grade fuel streams
 - » Generation of continuous, clean, distributed power, regardless of fuel source, methane content, or application

MEETING FEDERAL MANDATES AND GOALS

- **Energy Efficiency** – The Energy Independence and Security Act (EISA) of 2007 requires 3% annual reduction in energy intensity (30%) by 2015. *Flex systems with Combined Heat and Power (CHP) can help deliver this efficiency.*
- **Renewable Energy** – The Energy Policy Act of 2005 requires agencies, by 2013, to attain 7.5% of electrical consumption through renewable energy and Executive Order (EO) 13423 requires half of that to be from new sources. *Flex systems running on methane will help achieve these requirements. Electrical generation and consumption occurring on Federal land counts twice (FEMP reporting guidance.)*
- **Greenhouse Gas (GHG) reductions** – EO 13514 required Agencies to set target for reducing GHG by:
 - reducing energy intensity in agency buildings. *Flex provides through CHP.*
 - increasing agency use of renewable energy and implementing renewable energy generation projects on agency property. *Flex provides through consumption of methane.*
 - EO 13514 also establishes that beginning in 2020, all facility designs shall meet zero-net energy by 2030. *Flex systems integrated into building and campus designs can help achieve this requirement.*
- **Energy Security** – *Flex systems consuming natural gas provide redundancy to grid supplied power, reliability from 24/7 operations, and resiliency through grid independent operation. Onsite production from methane provide even more security.*

MEETING FEDERAL MANDATES AND GOALS (cont.)

- Additional EISA 2007 requirements:
 - Reduction in the use of fossil fuels in new and renovated building by 55% in 2010 increasing to 100% in 2030; section 433. *Electricity and CHP from methane count.*
 - Large capital investments must be the most energy efficient design that is life cycle cost effective; section 434. *Flex Life cycle costs compare favorably.*
 - Adds cogeneration and heat recovery as “energy savings” for Energy Savings Performance Contracts (ESPC). *Flex systems fit within ESPCs.*
 - Allows sale of excess renewable energy; section 515.
 - EO 13423 requires Agencies to implement renewable energy generation projects on agency property for agency use where practical. *Electricity from methane counts.*

- **FlexEnergy power systems balance efficiency (greater than 60% with CHP), emissions (extremely low), security (grid independent operation capability), and affordability to help meet all of your energy goals!**

FLEX PRODUCTS



FLEX TURBINE™ MT250

- » Grid Parallel and Grid Independent modes
- » Complies with Federal Non-Attainment Zone
- » Integrated Heat Recovery – Cogeneration
- » ~ 100 - MT250s in service (1 Million Operating Hours)

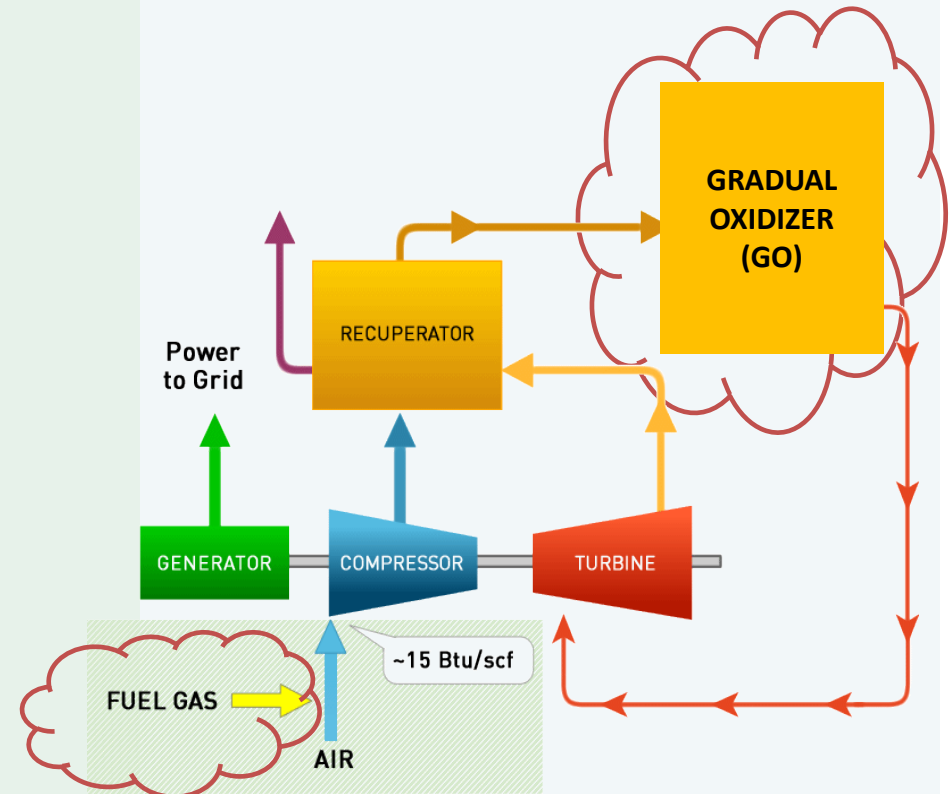
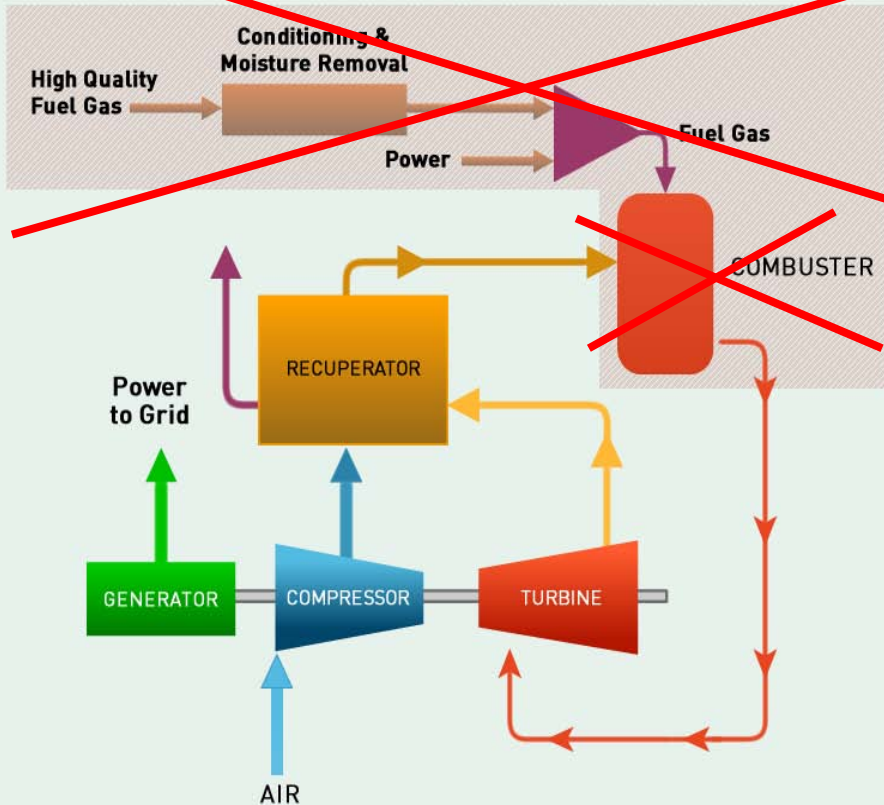
FLEX POWERSTATION™ FP250

- » Same turbine as MT250, plus:
- » Unprecedented Fuel Flexibility
- » Eliminates Fuel Conditioning
- » Grid Parallel and Grid Independent
- » Even Lower Emissions Profile, Meets & Exceeds Environmental Regulations



FLEXENERGY INNOVATION: THE 250 KW FLEX POWER STATION

~~Traditional Powerplant requires fuel conditioning & Compressor~~



- Flexidizer (Thermal Oxidizer) Replaces Combustor & Eliminates Need for Fuel Conditioning
- Fuel Gas Aspiration at System Inlet Eliminates Need for High Pressure

FLEX VALUE PROPOSITION

FlexEnergy has overcome traditional challenges that face power generation technologies in a variety of applications.

Traditional Challenges from Gas Utilization:

- Fuel Flexibility
- Fuel Conditioning
- Emissions Regulations

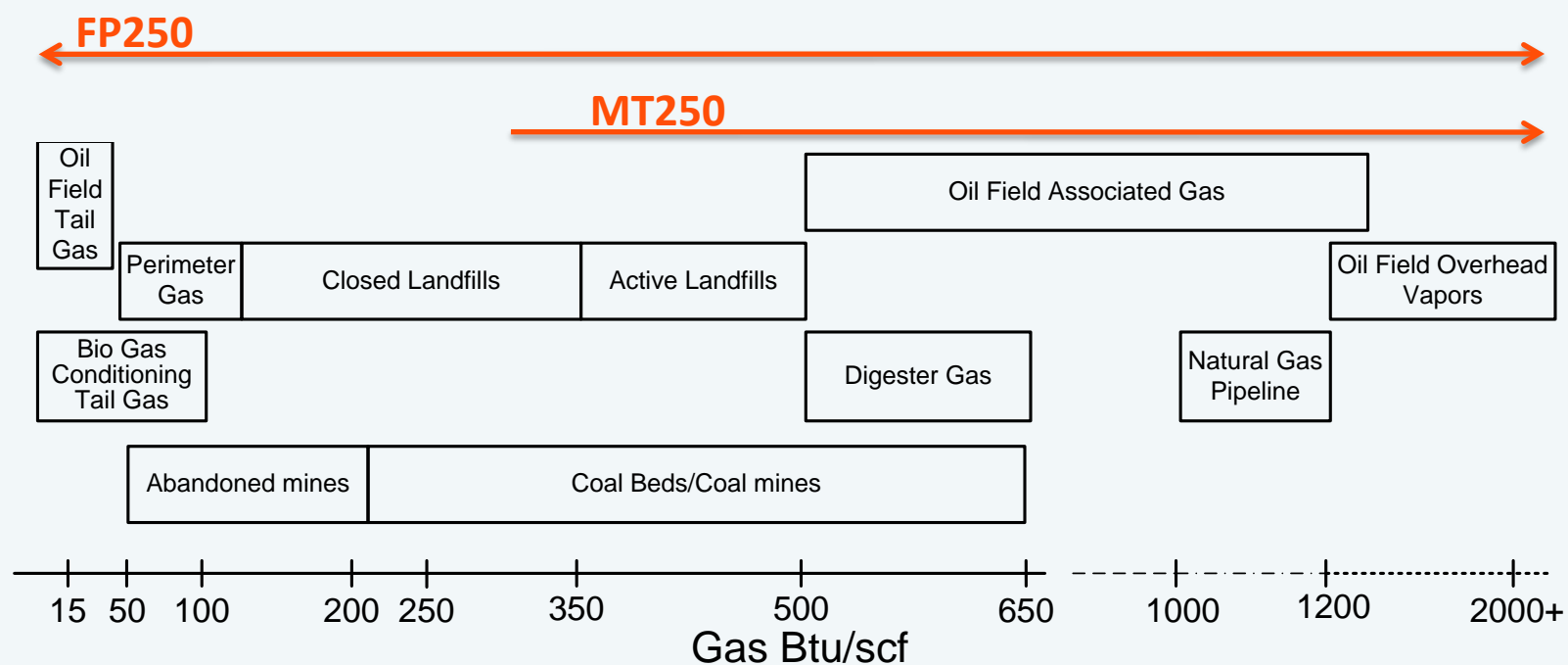


Conventional Fossil Fuel Powered Plants



Reciprocating Engines

FLEX FUEL FLEXIBILITY: WIDEST FUEL OPERATING RANGE



FLEX APPLICATIONS

FlexEnergy's technology has widespread application in various markets:



▪ Digester Gas –
Wastewater Treatment



▪ Associated and Natural Gas –
Oil & Gas Operations



▪ Biogas –
Landfills



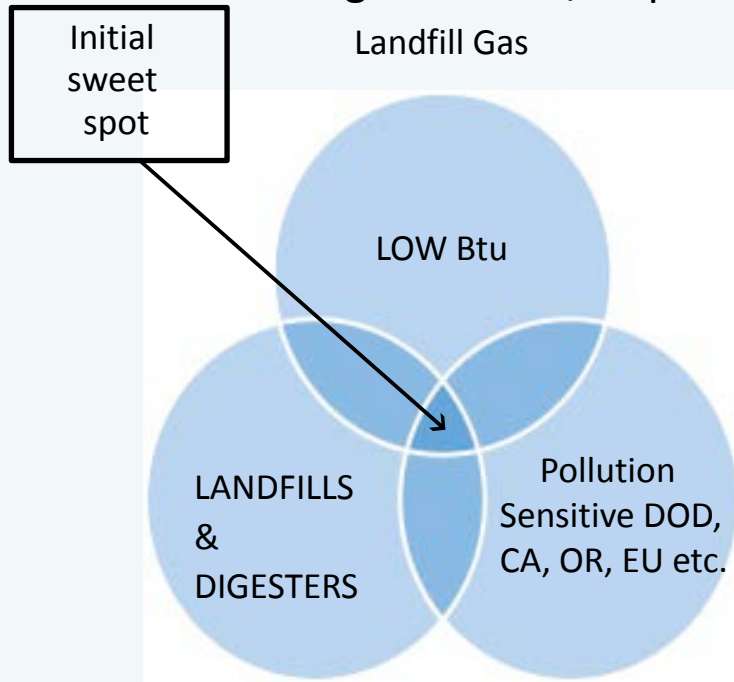
▪ Cogeneration –
Residential, Industrial, Commercial



▪ Tail Gas–
Biogas Conditioning, Biofuel Production

FLEX POWERSTATION 250

- **Contributes to renewable energy, energy efficiency, and Greenhouse Gas (GHG) reduction goals simultaneously.**
- **Best Return on Investment (ROI) - Combinations of low value (Btu) methane gas and non-attainment or other GHG sensitive areas.**
 - Landfill Gas
 - Digester operations
- **High ROI - Energy Security operations**
 - Renewable generation with methane source
 - Reduce reliance on electrical grid with methane or natural gas
 - Designed for 24/7 operation at near full load



- ✓ Federal (DoD) landfills currently flaring or venting methane
- ✓ Waste Water treatment plants (digesters)
- ✓ Mines and oil & gas operations (DoI/BLM)
- ✓ Critical infrastructure with access to methane or natural gas
- ✓ California Self Generation Incentive Program expanding to cover FlexEnergy products.

FP250 Demonstration at Fort Benning, GA

- Funded through the DoD Environmental Security Technology Certification Program (ESTCP) as part of the installation energy test bed initiative.
- Project is a partnership with Southern Research Institute (SRI), which is providing third party verification of the production and emission data.
- System operates on fuel from a closed landfill on base . Methane from the landfill was being collected and flared.
- Electricity generated by the systems is going into the base grid, reducing purchased electricity, contributing to the Army renewable energy and GHG reduction goals.
- System is installed and operational.
- Ribbon cutting Nov 8, 2011.
- Second demonstration site for different operating conditions and/or fuel is being selected.



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TECHNOLOGY & PRODUCTS

- FLEX POWERSTATION -



TURBINES

Flex Turbine™ MT250

Flex Turbine™ FT1800

PRODUCT DESCRIPTION

- » Modular 250 kW system, with upgrades to 333 kW
- » Modular 1800kW system
- » Operates on wide range of fuels down to 270 Btu/scf
- » Efficient Power Production
- » Less Expensive, Small Footprint
- » Lower emissions that meet all regulatory standards
< 10 ppm for NOx, CO, VOC
- » Fully integrated Heat Recovery (CHP)



PROVEN TECHNOLOGY

~ 100 MT250s (1 Million Operating Hours) are currently operating in many markets including:

Oil & Gas Operations, Industrial Processing, Landfills, Digesters,
Combined Heat & Power, & Wastewater Treatment Plants



7 x MT250's: Emeryville, CA



1 x MT250: San Francisco, CA



1 x MT250: Burbank, CA



9 x MT250's: Ventura County, CA

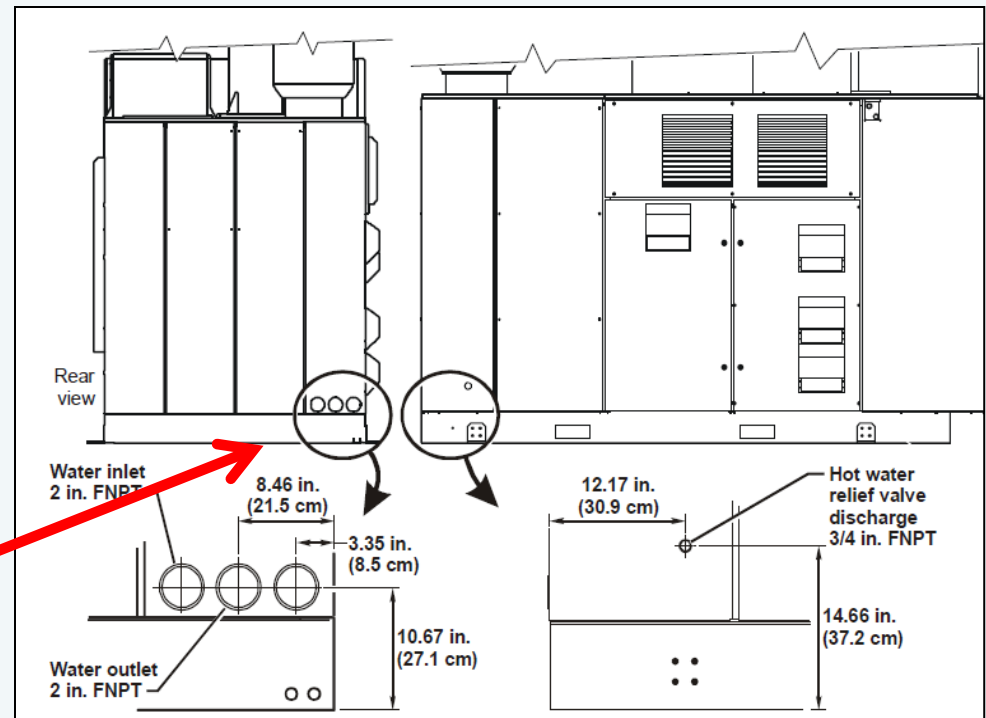
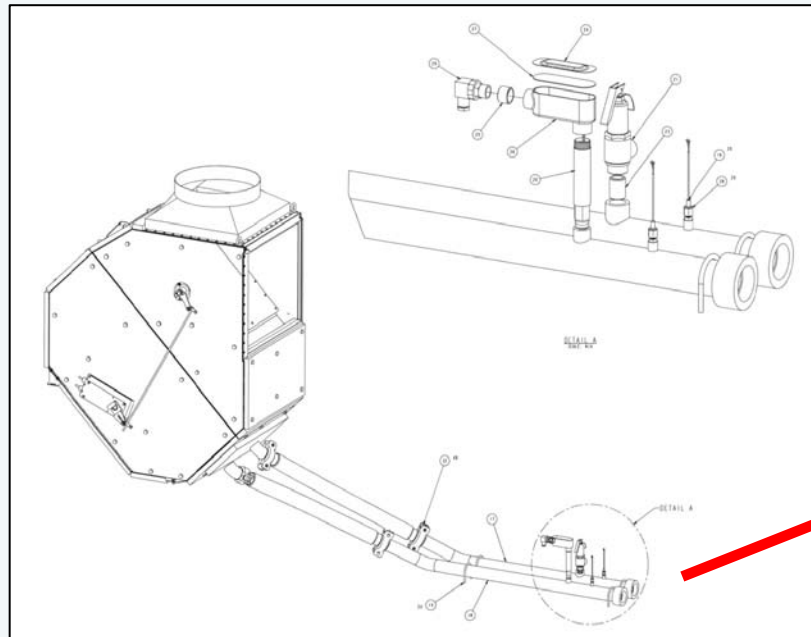


5 x MT250's: (Korea)



4 x MT250: New Jersey

FLEXENERGY INNOVATION: INTEGRATED CHP OPTION



- FlexEnergy offers the INDUSTRY's ONLY integrated hot water CHP module
- Provides renewable onsite heat for digester applications without siting additional 3rd party HEX



VALUE PROPOSITION

FLEX VALUE PROPOSITION

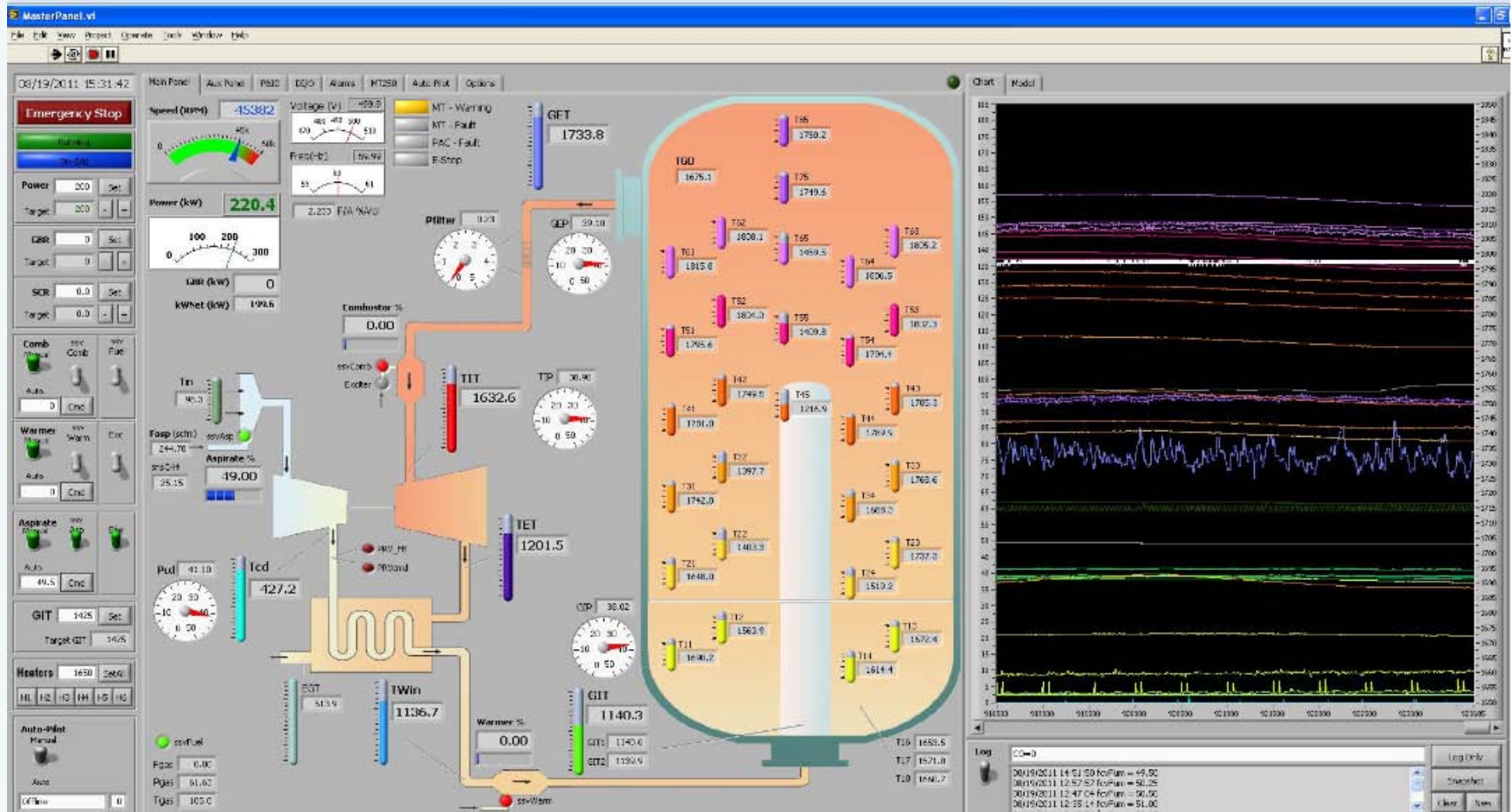
FlexEnergy's Unprecedented Power Generation Solutions

- Ultra low pollution profile (less than 1ppm NOx and CO)
- Efficient use of poorest quality gas (runs on 15 Btu fuel)
all the way to highest quality gas
- On and Off-grid continuous power (Baseload, not Peaking)
- High ROI for customers (with no environmental impact)
- Widespread application in various markets
- Integrated cogeneration
- Reliable, low maintenance system

FLEX EMISSIONS: EXCEEDS ALL CURRENT AND PLANNED REGULATIONS

	Emissions Standards ppmV @ 15% O ₂	NO _x		CO		VOC	
		Current	2012/2013	Current	2012/2013	Current	2012/2013
Regulations	SCAQMD Landfill / Digester IC Engines	36/45	11	2000	250	40 / 250	30
	CARB Distributed Generation Waste Gas Rule	<10	~1	120	<3	60	~1
Solutions	IC Engine (biogas/nat gas)	42-96 / 67-2047	42-96 / 67-2047	345-587 / 217-275	345-587 / 217-275	~150 / ~65	~150 / ~65
	Flex Turbine™ MT250	<9	<9	<10	<10	<9	<9
	Flex Powerstation™	<1	<1	<1	<1	<1	<1

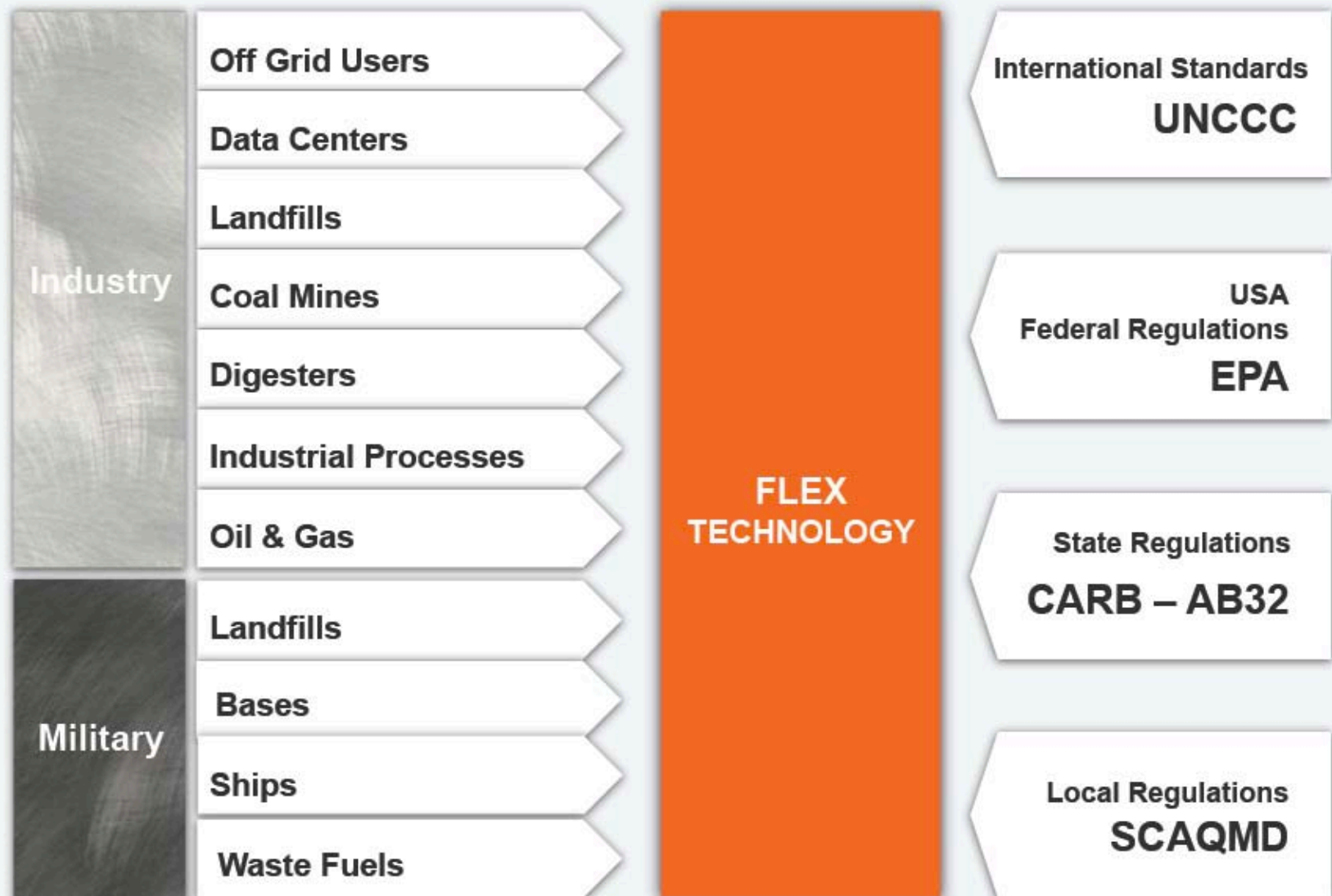
FLEX RELIABILITY: CONTROLS & MONITORING



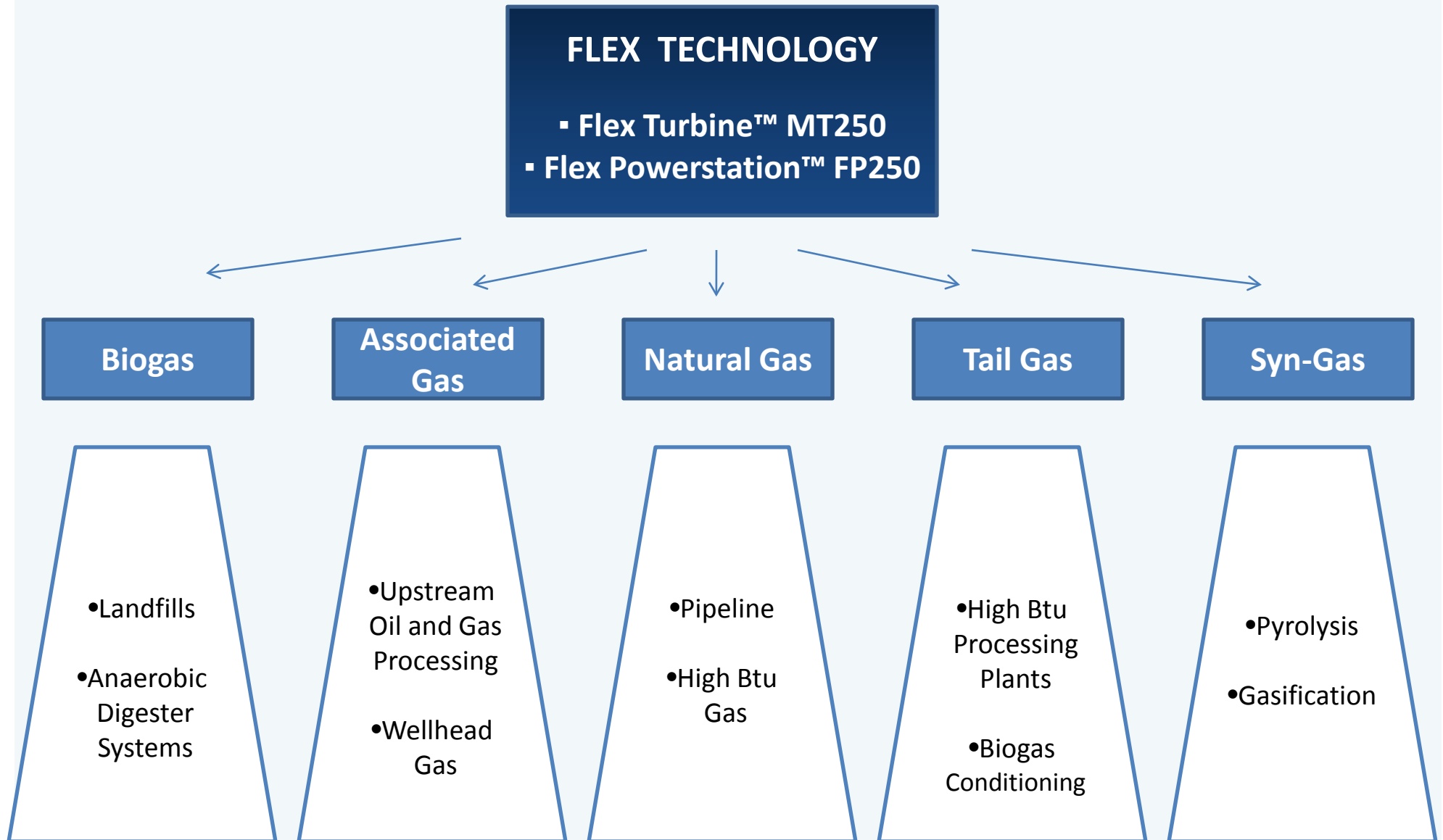
GAS UTILIZATION ALTERNATIVES: FLEX vs. OTHER ALTERNATIVES

	Vent	Flare	IC Engine	Flex MT250	Flex FP250
Fuel Conditioning	NO	YES	YES	YES	NO
Dirty Emissions	YES	YES	YES	NO	NO
Positive Cash Flow	NO	NO	YES	YES	YES
Efficiency	NO	NO	YES	YES	YES
Fuel Flexible	N/A	NO	NO	NO	YES
Low Pressure	N/A	YES	NO	NO	YES
Low Maintenance Cost	YES	MAYBE	NO	MAYBE	YES
Compliant w/ Air Standards	NO	YES For Now	W/ Catalyst	2007	YES


GENERATION MARKETS



FLEX APPLICATIONS



COMBUSTION 101: EVOLUTION OF CLEAN COMBUSTION



	Temp Range	Beneficial Use	Pollution	Residence Time
Open Flame	2700 F +	None	Worst	Very Short (milliseconds)
Lean Combustion	2400 F +	Power Gen	Medium	Very Short (milliseconds)
Flameless Combustion	2000 F + (experimental)	In Development	Low	Very Short (milliseconds)
Flex Oxidation	1650 - 1850 F	Power Gen	Near Zero	Long (~1 sec.)

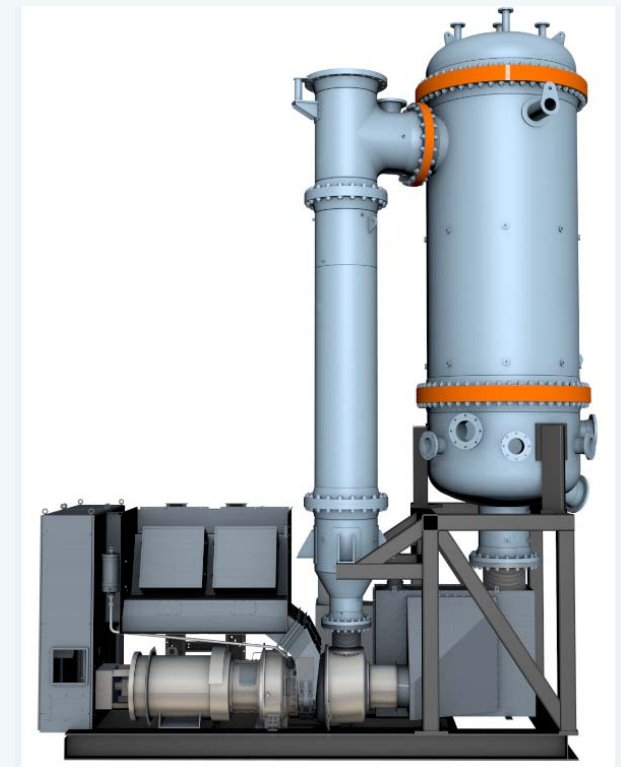


PRODUCT SPECIFICATIONS

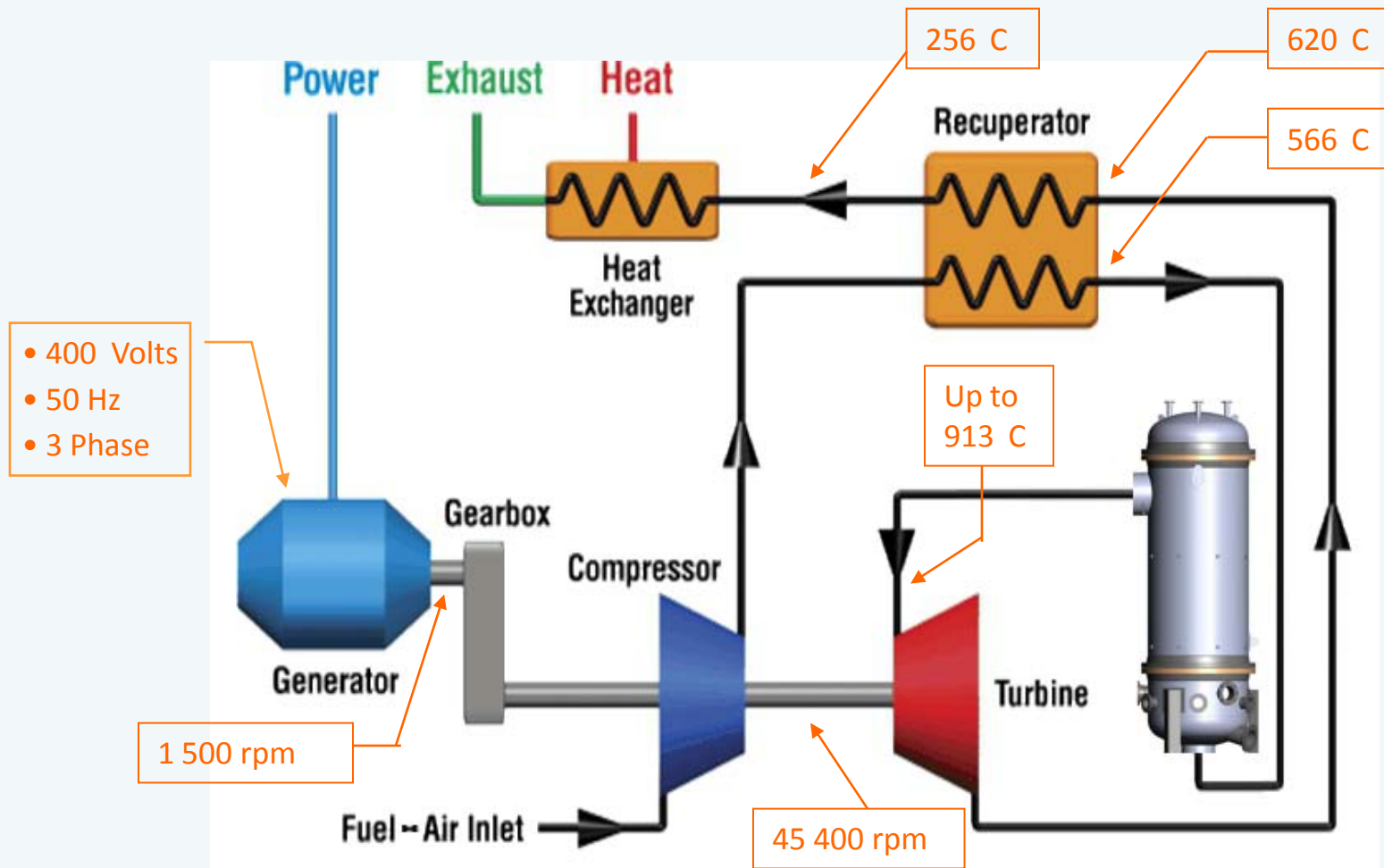
POWERSTATION 250kW: PRODUCT DESCRIPTION

- » Near Zero Emissions
- » Operates on gases down to 50 BTU
- » No Fuel Conditioning
- » Financially Viable
- » Meets all Regulatory Standards
- » Ease of Operation
- » Low Maintenance
- » Hot Clean Exhaust can be recycled
- » Small Footprint

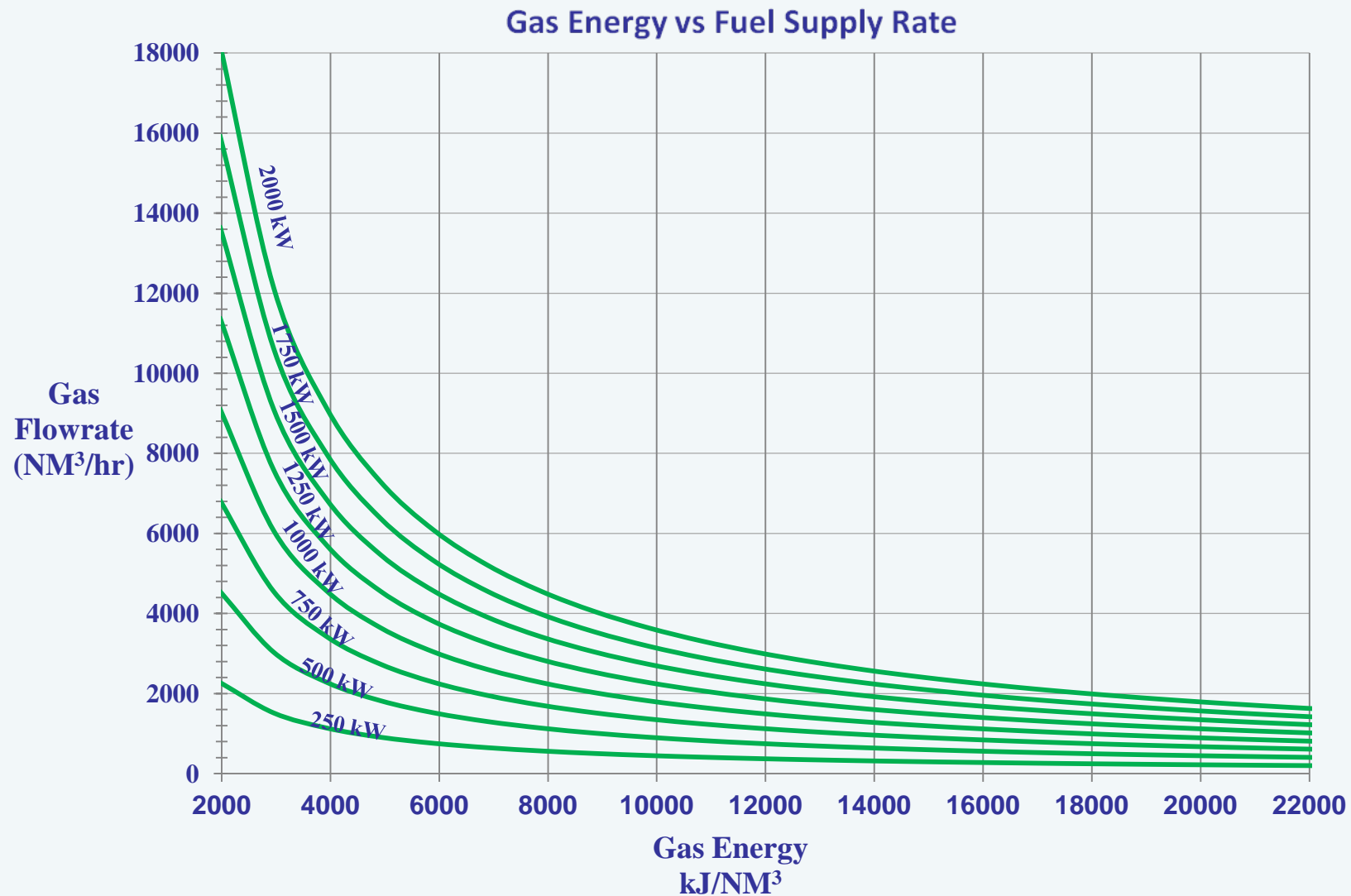
Nominal Electrical Output	250 kW
Minimum Fuel Strength	50 Btu/scf
Minimum Fuel Supply Pressure	2 psig
Nox Concentration in Exhaust Gas	<1 ppm
CO Concentration in Exhaust Gas	<1 ppm
Heat Rate	3,750,000 Btu/hr
Exhaust Gas Temperature	450-500 F
Exhaust Gas Mass Flow	4.7 lb/sec (2.13 kg/sec)
System Weight	54,000 lbs
System Footprint	20 ft x 12 ft



FLEX POWERSTATION™ FP250: CYCLE DIAGRAM



FLEX POWERSTATION™: POWER GENERATION CURVE



Each curved line represents one 250kW Flex Powerstation. To size a power generation system, take into account two variables – the caloric value of the gas (methane content) and flow rate of gas. For instance, gas energy of 4000 kJ/NM³ and flow rate of 1200 NM³/hr would be sized at one (1) 250kW Flex Powerstation

FLEX TURBINE™ MT250: PRODUCT DESCRIPTION

- » Lower Emissions, typical of Microturbine
- » Operates on gases down to 350 BTU
- » Fuel Conditioning
- » Less Expensive
- » Meets all Regulatory Standards
- » Ease of Operation
- » Low Maintenance
- » Hot Clean Exhaust can be recycled
- » Small Footprint

Nominal Electrical Output	250 kW
Minimum Fuel Strength	350 Btu/scf
Minimum Fuel Supply Pressure	100 psig
Nox Concentration in Exhaust Gas	<9 ppm
CO Concentration in Exhaust Gas	<10 ppm
Heat Rate	3,161,000 Btu/hr
Exhaust Gas Temperature	450-500 F
Exhaust Gas Mass Flow	4.7 lb/sec (2.13 kg/sec)
System Weight	12,000 lbs
System Footprint	11 ft x 7 ft





MARKET & COMPETITIVE LANDSCAPE

COMPETITIVE LANDSCAPE: Flex vs. IC Engines vs. Fuel Cells

	FLEXENERGY COMPETITIVE LANDSCAPE				
	All Landfill and Digester Gas	Only High Btu Landfill & Digester Gas (50% of total gas prod.)			Only High Btu Digester Gas
	Flex FP250	Flex MT250	Capstone 200	Jenbacher J208	Fuel Cell Energy DFC300
	oxidizer turbine	microturbine	microturbine	ic engine	fuel cell
Installed Cost (\$/kW)	\$4000 - \$4500	\$3000 - \$3500	\$3000-\$3500	\$2200-\$2500	\$6500-\$7500
Size of the unit kW	250	250	200	330	300
Operating Cost (¢/kWh)	1.5 - 2.0*	3.5*	2.5*	3.5**	4.5*
Operating Gas Range	5% - 100%	30% - 100%	35% - 60%	40% - 50%	45% - 60%
NO _x Emissions (ppm)	<1	<5	<9	40**	<1
	* does not need gas cleanup	*incl. gas cleanup	*incl. gas cleanup	* incl gas cleanup	*incl gas cleanup
				** incl NO _x red. From 80 ppm	

THE HONEST CLEAN ALTERNATIVE: COST COMPARISON

Technology	Total Installed Cost (US \$/kW)	Operating & Maintenance Cost (US \$/kW)
Flex Powerstation™ 250 kW - (Biogas) ^a	\$4,000 ^c	\$0.02
IC Engine - CHP (Biogas) ^b	\$4,822 ^c	\$0.05
Gas Turbine - CHP (Biogas) ^b	\$4,847 ^c	\$0.05
Microturbine - CHP (Biogas) ^b	\$5,793 ^c	\$0.09
Fuel Cell - CHP (Biogas) ^b	\$9,768 ^c	\$0.05
Fuel Cell - Electric Only (Biogas) ^b	\$12,108 ^c	\$0.04

^a source: FlexEnergy

^b source: http://www.cpuc.ca.gov/PUC/energy/DistGen/sgip/proposal_workshop

^c includes cost of gas cleanup system of \$2500/kW as determined by CPUC staff for SGIP recommendations

COST ESTIMATES

Cost Breakdown (US dollars)	Flex Powerstation™ FP250	Flex Turbine™ MT250
Capital Cost	\$800,000	\$400,000
Installation Cost (3 rd Party to provide design, engineering, construction...)	\$150,000 (Up to 4 units)	\$150,000 (Up to 4 units)
Maintenance (10 year total care service package)	\$40,000 (Average/ year)	\$30,000 (Average/ year)

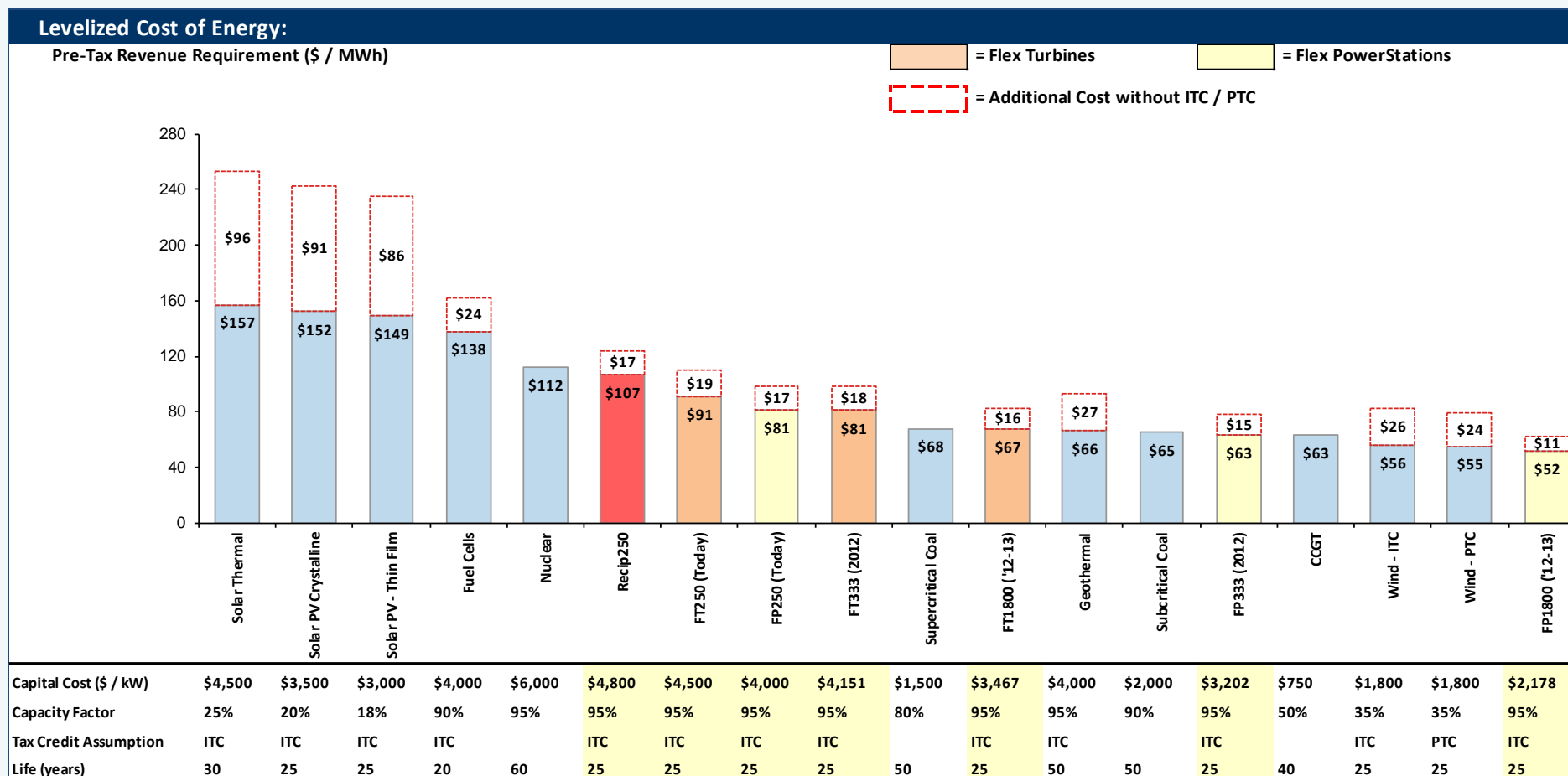
Considerations

- Fuel Input – Cost to purchase fuel into FlexEnergy system (biogas / natural gas) (Cost \$/MMBtu)
- Electric Savings – Cost of electricity that would be offset by self-generation (Cost \$/kWh)
- Natural Gas Savings (for Cogeneration) – Cost of conventional fuel source to produce heat/hot water (Cost \$/ Therm)

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LFG TO GRID POWER

- FlexEnergy's products offer a unique value combination not fulfilled by any other generation - renewable or thermal: (i) baseload power with near-zero fuel costs (ii) competitive capital costs and (iii) low-to-ultra low pollution profile
- The FlexEnergy PowerStation could supplant coal and CCGT as the cheapest form of generation



Notes - Non-Flex related LCOE's (all blue boxes) based on investment banking analysis. Assumes 38% blended tax rate, 8.0% cost of capital.

- Flex products and Recip. Engine assumptions based on internal operating data and CPUC best practices.

LFG TO GRID POWER (cont'd)

- The FT250 and FP250 offer better returns and a far lower pollution profile than the closest competition from reciprocating engines
- At higher quality, open landfills (~50% methane) the FT and FP are both applicable and basically at economic parity with one another (decision thus based on specific landfill traits and need of the customer)
- At a certain breakpoint (low 30's methane %), the FP is THE ONLY VIABLE SOLUTION to costly flaring, while providing one of the best ROI's available across all forms of power generation

Landfill Gas-to-Power: LCOE and Project IRR's		250 kW			333 kW		1800 kW	
	Recip. Engine	FT 250	FP 250		FT 333	FP 333	FT 1800	FP 1800
Standard Landfill Characteristics:								
Targeted Landfill - Methane Quality	Higher	Higher	All Qualities		Higher	All Qualities	Higher	All Qualities
Methane % Assumed	50%	50%	30%		50%	30%	50%	30%
Royalty to Landfill (% of Gross Revenue)	10%	10%	5%		10%	5%	10%	5%
Implied MW Capacity ^{(1), (2)}	2.9	2.9	2.9		3.2	3.2	5.2	5.2
Capital Costs:								
Units Required	12	12	12		10	10	3	3
Total Project Cost (\$MM) ⁽³⁾	14.4	13.5	12.0		13.8	10.7	18.7	11.8
Installed Cost (\$ / kW) ⁽³⁾	4,800	4,500	4,000		4,151	3,202	3,467	2,178
Select Operating Assumptions:								
Capacity Factor	95%	95%	95%		95%	95%	95%	95%
Power Price (\$/KWh, based on PPA's in place)	\$0.105	\$0.105	\$0.105		\$0.105	\$0.105	\$0.105	\$0.105
Avg Annual Opex / KWh	\$0.04	\$0.03	\$0.03		\$0.02	\$0.03	\$0.02	\$0.02
Avg Annual EBITDA (\$MM)	2.3	2.5	2.6		2.9	3.1	5.0	4.9
Pollution Profile:								
Fuel Conditioning Required	Yes	Yes	No		Yes	No	Yes	No
Emissions PPM (Nox, CO, VOC)	> 40, 300,150	< 10 (all 3)	< 1 (all 3)		< 10 (all 3)	< 1 (all 3)	< 10 (all 3)	< 1 (all 3)
Project Returns:								
Levelized Cost of Energy (LCOE)	\$107	\$91	\$81		\$81	\$63	\$67	\$52
Unlevered Project IRR	11%	14%	16%		15%	21%	19%	29%
Years to Payback	7	6	5		6	4	4	2

(1) based on typical scfm flow rates.

(2) Marginal units would be retrofitted accordingly based on kW size needed.

(3) Includes non-equipment installment costs for all products, and Fuel Conditioning at \$2,500/kW for Recip. Engine and all FT's.

Note: Flex products and Recip. Engine assumptions based on internal operating data and CPUC best practices.®

CHP SELF-GENERATION

BOO Project: Commercial CHP \$Th or otherwise Noted				
	Natural Gas		Biogas	
Project summary:	Nat Gas, Delivered		Biogas, Onsite	
Fuel Supply				
Cost of Gas (\$/MMBTU), 10 yr Fwrd Avg	\$6.19		\$1.24	
% of NYMEX			20%	
Power Capacity of Facility (MW):				
Facility Requirement	1.0		1.0	
Onsite Generated Capacity	1.0		1.1	
Add'l Import Required/ (Surplus to Grid)	0.0		0.1	
Heat / Cooling Capacity of Facility (MMBTU / Hr):				
Facility Requirement	3.4		3.4	
Onsite Generated Capacity	3.4		3.6	
Add'l Import Required	0.0		0.0	
System Efficiency:				
Total System Efficiency - Potential	60%		60%	
Total System Efficiency - Usable	60%		58%	
Commodity Prices (10 Yr Forward Avg's):				
Retail Power (\$ / MWh)	\$185.58		\$185.58	
BOO Price Offering (15% Discount to Retail)	\$157.75		\$157.75	
Retail Gas for Heating/Cooling (\$/MMBTU)	\$10.37		\$10.37	
BOO Price Offering (15% Discount to Retail)	\$8.81		\$8.81	
Financial Assumption:	No SGIP	SGIP	No SGIP	SGIP
SGIP Rebate (\$ / kW)	\$0	\$500	\$0	\$2,500
Installed Costs, Net of SGIP (\$/kW)	\$3,000	\$2,500	\$3,000	\$500
Annual Fuel + O&M (10 Yr Avg)	779	779	325	325
All-in Cost (10 Yr Total)	10,786	10,286	7,002	3,877
Annual Savings on Power (10 Yr Avg)	1,313	1,313	1,313	1,313
Annual Savings on Heat/Cooling (10 Yr Avg)	264	264	264	264
Annual Surplus Power Revenue (10 Yr Avg)	-	-	55	55
10 Yr Unlevered IRR	14%	18%	20%	44%
Yrs to Payback	5	5	4	3
With 50% Leverage	No SGIP	SGIP	No SGIP	SGIP
10 Yr Unlevered IRR	22%	30%	32%	105%
Yrs to Payback	4	3	3	1
* Average over a 10 year Life of Project				

FLEX RECENT EVENTS: IN THE NEWS



July 2011: Release of California SGIP Program PD:

\$2.50/watt for renewable biogas with CHP

- 50% up front (\$312,500)
- 50% payable over the first five operating years (\$62,500/year)



Considerable Financial Incentives for Distributed Power Generation

The California Public Utilities Commission (PUC) has just adopted changes to the Self-Generation Incentive Program (SGIP) that enable customers to deploy certain distributed generation technologies at a discounted rate. The intent of the program is to reduce greenhouse gas emissions in the electricity sector, reduce peak demand, ensure deployment of clean energy solutions throughout California, and improve electric system reliability. With this in mind, SGIP can lower the project cost for a distributed power generation system that converts natural gas or biogas into clean energy and heat for on-site use, achieving higher energy efficiency with lower emissions.

Who Qualifies?

Most commercial, industrial, local, state, or federal facilities with a natural gas or methane source and a need for continuous heat and power. This can also include locations such as wastewater treatment plants, dairy farms, food and agricultural operations, and other locations that operate biomass digesters or have usable biogas.

Customers deploying a [Flex Powerstation™ FP250](#) or a [Flex Turbine™ MT250](#) to generate clean, continuous power would qualify for financial incentives up to 60% of the overall project cost or up to \$2,500,000 for a 1MW system.*

With SGIP, Generate Efficient, Low Cost Clean Energy On-Site

* NOTE: Up to \$2,500,000 in incentives could be available for a 1MW system running on biogas. Incentives up to \$4,375,000 could be available for larger biogas systems.

Quick Facts

SGIP Enables

- Clean Energy in CA
- Reduced Greenhouse Gas Emissions
- More Secure Energy Infrastructure



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