



# Energy Conversions Inc.

6411 Pacific Highway E.  
Tacoma, Washington, 98424  
Phone: 253-922-6670 Fax: 253-922-2258

**Date:** 9/28/00 page 1 of 3  
**Today's Date** \_\_\_\_\_

**Subject:** Information affecting Engine Conversion Cost estimates

**To: Attention**

The following information ECI uses to more completely understand the application so we may accurately provide a price quotation for conversion kit /s. Please check the correct space or fill in the information. Fill this page out, then print it and fax to ECI.

Project name or title \_\_\_\_\_

Location where engines will be converted \_\_\_\_\_

Location where engines will be operated \_\_\_\_\_

Expected Time frame \_\_\_\_\_ New application or existing  
\_\_\_\_\_

Approximate Altitude \_\_\_\_\_ Normal high Ambient temp. \_\_\_\_\_

Number of units to convert \_\_\_\_\_ (at a given site or location)

Engine Model /s (cylinder number & type) \_\_\_\_\_

Engine application ("Standby or continuous", "Propulsion, generation or other", "variable speed or synchronous" will this be a USCG inspected or ABS classed application)

\_\_\_\_\_

Engine power rating (KW or HP) \_\_\_\_\_ Engine RPM \_\_\_\_\_

Duty cycle % at full power \_\_\_\_\_

Type of governor used \_\_\_\_\_ Control side of engine \_\_\_\_\_

Voltage available for powering controls

: \_\_\_\_\_  
(current options: 24VDC, 74VDC, 120VDC, 120VAC, 240VAC ) (Approx 600 watts needed)

Voltage and Hz available for powering heaters and pumps

: \_\_\_\_\_

Gas supply:

Nominal mole % Methane \_\_\_\_\_ Ethane \_\_\_\_\_ Propane \_\_\_\_\_ Butane \_\_\_\_\_ Nitrogen \_\_\_\_\_  
CO2 \_\_\_\_\_

Pipeline supply \_\_\_\_\_

Well head gas \_\_\_\_\_

Stored fuel: Compressed \_\_\_\_\_ or Liquefied \_\_\_\_\_

**EMD Kit options:**

Priced w/bare cylinder heads \_\_\_\_\_ or complete with valves, springs & keepers \_\_\_\_\_

Price to include complete power assemblies \_\_\_\_\_ or just pistons and heads \_\_\_\_\_

**General Kit options:**

Active Engine preheating is required, 15-30kw Supply as part of the kit ?

\_\_\_\_\_ Y or N

Gas leak detection system and control interface. Supply as part of the kit?

\_\_\_\_\_ Y or N

(if yes specific detail of system will need to be defined)

**Turbocharged engines options:**

Achieving diesel rated power is dependent on the temperature of air in the engine and gas quality. Poor quality gas can be used but the output power must be reduced. Further reducing air temperatures at the engines after coolers also extends the power available. Cool non jacket water is typically supplied to the custom after coolers. The source of this cool water is site specific. It may be from a Radiator, Heat exchanger or cooling tower for example. The size of the radiator would be site specific depending on mean ambient temperatures. The piping layout must also be planned based on the site and weather or not the unit is existing or a new application. Energy Conversions can do the design, planning and engineering. Optionally the installing contractor/distributor may do this if they wish to. ECI desires to evaluate the design for acceptable operating results.

Heat exchanging with river water or raw water is preferable. If an additional radiator is planned, locating it adjacent to/ between the existing radiator/s and fan may work well or applying a two circuit radiator core may be cost beneficial by utilizing the air flow from one radiator fan. This is recommended if at all possible however potential losses to the main radiator must be considered and designed for.

Have ECI supply the hardware for the after cooling cold water source? \_\_\_\_\_ Y or N if yes  
After cooling cold water source (Radiator, Heat exchanger, tower, other)

On Turbocharged EMD systems, higher diesel replacement is available with non standard diesel injectors. These injectors are limited in there fuel output and would reduce the available diesel output power by approx. 13%. If reduced rated power in the diesel mode is acceptable, the pilot fuel can be reduced to 4-8% instead of the 8-10% with standard injectors. Is reduced power and reduced pilot fuel acceptable and desirable? \_\_\_\_\_ Y or N

**General system requirements:** (Equipment not normally supplied by ECI)

Circuit breakers for motors and control system

Motor starter for cooling water pump and if used radiator fan.

Compressed air supply for controls >80 PSI.

Gas supply of 120 to 150 PSI. Smooth Even pressure. Pressure surges or pulsation are not acceptable.

Technical support: Systems are sold including limited technical support labor to perform guiding of the start of hardware installation and start up testing and commissioning. Additional technical support is available. Labor rate of \$840 per day plus expenses of travel, food and lodging. Typical first time installation would require two trips. First trip after product arrives to direct the installation process, answer questions relating to the hardware and possible interface of signals. A second trip to do final installation details, final inspection, start up and testing is expected.