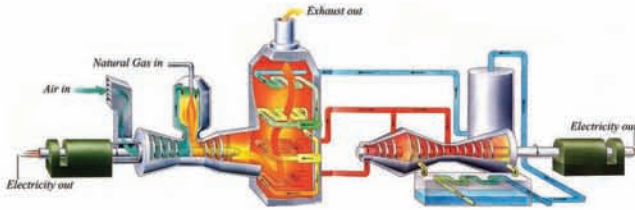


# Environmental Benefits of Valley Energy Center Technology

## Combined-Cycle Technology is Environmentally Superior

The CPV Valley Energy Center will be a combined-cycle generation (CCG) facility that produces electricity from both natural gas combustion and the subsequent capture of normally wasted heat energy. Utilizing both methods of electricity generation increases efficiency, uses less fuel, and thus produces lower emissions of pollutants such as particulate matter and nitrogen oxides.



## How the Combined-Cycle Process Produces Electricity More Efficiently

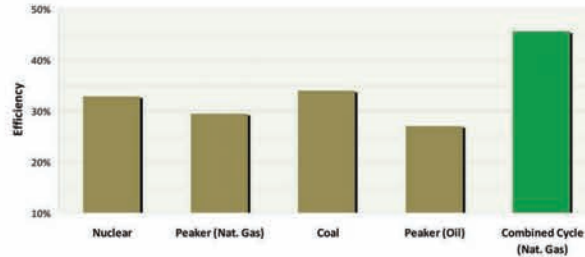
The CPV Valley Energy Center will generate electricity in 2 cycles, as outlined in the following steps:

1. In the first cycle, filtered air is mixed with natural gas and ignited to turn the blades and shaft of the combustion turbine.
2. The rotating turbine shaft turns an electromagnet within the electrical generator that creates an electrical current.
3. The electrical current created travels to a step-up transformer to boost the voltage before being sent through transmission lines to power our homes, schools, and businesses.
4. In the second cycle, the hot exhaust gases produced in the first cycle pass through a heat recovery steam generator (boiler). The hot gases pass over a series of water-filled coils causing the water to boil and turn into steam.
5. This steam is routed to a steam-powered turbine which rotates a shaft in another electrical generator, creating electricity the same way as described in steps 2 and 3. In this way the second stage creates additional electricity from waste heat.
6. Once the steam leaves the steam turbine it will pass through a condenser, turning back into water. The condensed steam then returns to the heat recovery steam generator as water.

## High Efficiency Technology Yields Fewer Emissions

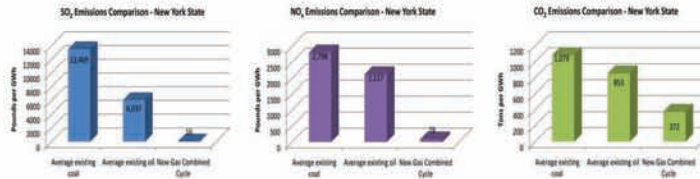
Natural gas combined-cycle generation units can be up to 45 to 50 percent energy efficient, whereas coal and oil generation units are typically only 25 to 35 percent efficient. The increased efficiency means that less fuel is used and therefore fewer emissions are produced per BTU of raw energy consumed.

### Electric Generation Technology Efficiencies



Source: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report" (<http://www.eia.doe.gov/cneaf/epa/spat6.html>)

## Existing Conventional Power Plants Compared with New Combined-Cycle Natural Gas in New York



Combined-cycle natural gas energy facilities, like the Valley Energy Center, are some of the cleanest forms of fuel-based electricity generation in the world.

- CO<sub>2</sub> emissions from CPV on a lb/kw-hr basis would be about 35 percent of those from an existing coal-fired power plant in NY and about 44 percent of those from an existing oil-fired power plant in NY.
- NO<sub>x</sub> emissions from CPV would be about 1/36 of those from a coal plant and about 1/27 of those from an oil plant.
- SO<sub>2</sub> emissions from CPV would be about 1/842 those from a coal plant and about 1/377 those from an oil plant.
- Mercury emissions from combined-cycle natural gas are virtually zero.

# Environment

VALLEY ENERGY CENTER

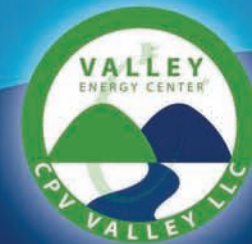
## Relative Exposure Comparisons

An entire year of exposure to particulate matter (PM<sub>2.5</sub>) from the Valley Energy Center would be equivalent to:

- 1 day inside a house with a traditional wood burning stove, or;
- 2.5 hours mowing the lawn with a gas-powered lawn mower

An entire year of exposure to nitrogen oxides (NO<sub>x</sub>) from the Valley Energy Center would be equivalent to:

- Spending 1 day in New York City, or;
- Cleaning the oven for 1 hour



Competitive Power Ventures, Inc.