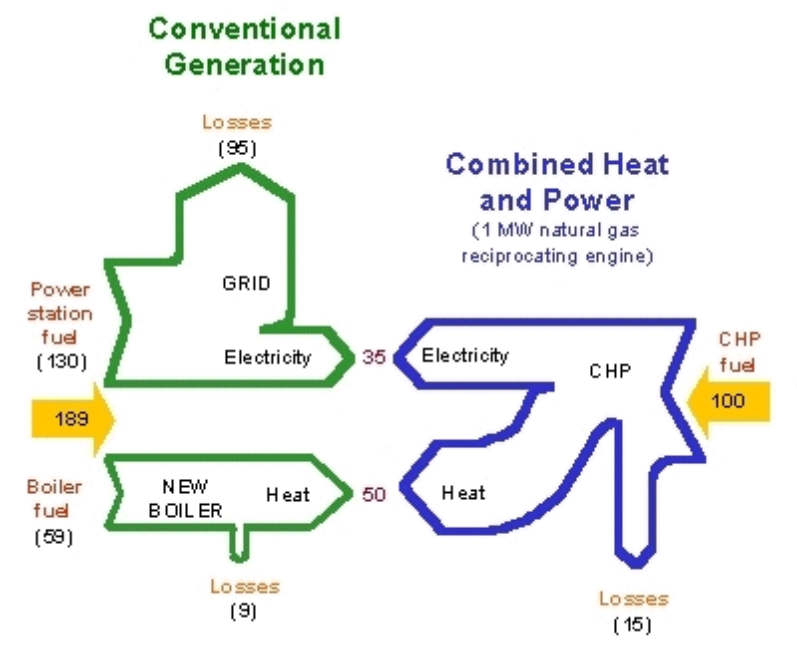
CHP BASICS

Combined heat and power (CHP) technologies produce both electricity and steam from a single fuel at a facility located near the consumer. These efficient systems recover heat that normally would be wasted in an electricity generator, and save the fuel that would otherwise be used to produce heat or steam in a separate unit.

CHP offers dramatic advantages in efficiency and much lower air pollution than conventional technologies. A wide variety of CHP technologies generate electricity and meet thermal energy needs (direct heat, hot water, steam, process heating and/or cooling) simultaneously, at the point of use. By contrast, conventional generation of electric power throws away much of the heat generated in production, and conventional thermal energy generation often misses an easy opportunity to generate power.

Due to their capture of useful energy both as electricity and thermal output (heating, cooling, steam, hot water, dehumidification, etc.), CHP systems should always be able to exceed the total fuel efficiency of even the best central power plants, dividing the energy content of the fuel inputs into the delivered energy content of the total useful output, and taking average transmission and distribution line losses into account. A state-of-the-art central plant (a combined cycle combustion turbine using natural gas) offers a maximum system fuel efficiency for delivered power in the range of 55-60%. At this efficiency level, CHP systems will effectively double the central electric system's average delivered fuel-use efficiency of about 30%. However, under common circumstances, CHP systems will achieve efficiencies regularly exceeding 60%, and where conditions of thermal load and site permit, may achieve efficiencies exceeding 80%. Some systems have been shown to reach efficiency levels in excess of 90%.

For these reasons, while USCHPA seeks policies to recognize and provide incentive for any CHP systems that can reduce energy waste compared to the current central system power production, USCHPA is willing to accept a requirement that CHP systems qualify for incentives only when they can demonstrate efficiency exceeding the best of the central-station power plants on a delivered power basis; i.e., achieve a useful energy output representing at least 60% of the gross energy input into the CHP system's prime mover.



This diagram compares the typical fuel input needed to produce 35 units of electricity and 50 units of heat using conventional separate heat and power. For typical electric and thermal efficiencies, CHP is nearly twice as efficient.