There are many factors that contribute to defining the current state of the art cogeneration plant. These deciding elements include political stability, social growth, and economic development. Political stability of a country can affect the current technologies by implementing different regulatory policies. Interpretation of these policies can in turn determine how manufacturers and corporations carry out certain projects. Industries will be forced to follow rules pertaining to many areas, including those for manufacturing and building costs, energy regulations, and environmental laws. The increasing of advancement of society’s can also have a major influence on the designs and definitions of the current state of the art. As more knowledge about different trends in cogeneration is attained, many companies will begin to formulate new ways to implement projects that will utilize the advantages of these concepts, creating technologies that will influence and change the current state of the art. The economic conditions of a society also have a significant influence in what the state of the art of cogeneration plants are decided to be. The economic development at a certain time can determine the costs of certain materials by either increasing or decreasing their prices. This factor will influence the purchase of these materials that could be used to manufacture the different components of the plant (Limaye, 1987).

A cogeneration plant that has been decided as the current state of the art is one that employs the combined cycle. The simple arrangement of a combined cycle is comprised of gas turbines and steam turbines that recover heat to produce steam for a steam turbine generator. The typical cycle obtains output heat from an open gas circuit and inputs that energy into a heat recovery steam generator. Multiple pressure boilers, extraction steam turbines, and condensers can be used to better the performance. A combined cycle can obtain up to 80% utilization of fuel input and an efficiency that varies between 50 to 58% compared to the other cycles that have less than 50% efficiency. Other advantages of the combined cycle are low gas emissions, low capital costs, small space requirements, and fast initialization of machinery.

The combined cycle can be applied to many applications, which include those for heating and electricity. In plants that employ the current state of the art to provide heating to inhabited areas, maximum steam outputs are necessary for the fuel inputs that are used. This consideration results in plants having additional boilers. Efficiency of the plant can be increased by inserting extra units. Usually the efficiency required for this heating application requires high energy efficiency and provides the highest economic value (Hu, 1982). For electricity production, condensers are inserted to provide flexibility in the electrical output. The configuration of these types of plants is similar to that of the heating applications but is smaller in size and limited by the consumer demand and rate costs. Thus, the combined cycle will be used to maximize the heat the fuel ration to meet the demands.

As of now, the implementation of this current state of the art has provided more benefits than other cycles that have been discovered. Although these benefits are useful for the current societal needs, there are still flaws in efficiency and output production. As knowledge of cogeneration grows and new technologies are created, the current state of the art will be replaced to help overcome these problems.