Efficiency is a fundamental part of power generation. If you can convert 100% of the individual forms of energy from a source to electrical power, that source would be a perfect power generating method. Current nuclear power is the closest resource we have to a perfect power source. At a 92.2% efficiency it is greater to most fossil fuels by almost 40%.

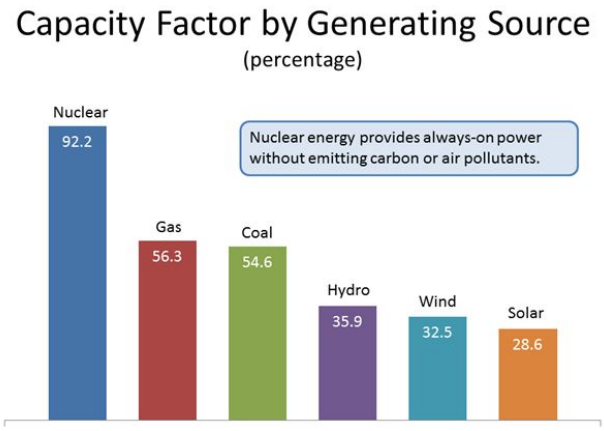

Fig. 1 - Efficiencies of popular power generation methods

Not only is the efficiency rating of Nuclear power greater than that of any other fossil fuel but the power capacity per kg of most nuclear sources are far greater than that of any fossil fuel counterpart. According to the European Nuclear Society, 1kg of coal will produce approximately 8kWh of power where as uranium-235 can produce 24 million kWh. This substantial difference in power generation density is what makes nuclear power such an efficient resource.

Nuclear power is also vastly more reliable power source due to its resilience to environmental conditions and always on capabilities. Nuclear power plants maintain around an 80 to 90 percent capacity over long periods of time. Nuclear power plants are designed to run for extended periods of time without requiring breaks except to refuel which occurs once every 18-24 months. Due to nuclear power's ability to operate in extreme conditions such as low and high temperatures, it stands to be the most reliable power supply method currently used today. One example of nuclear power's environmental resilience is that of the "polar vortex" of 2014 when natural gas supplies were greatly impacted by the extreme cold temperature. Natural gas production capacity dropped greatly below its normal capacity however Nuclear power maintained its 95 to 98 percent power generation capacity.

Due to nuclear power's high capacity and reliability, it can be said that when compared to coal power generation, nuclear power is the superior generation method for sustained power generation. On top of nuclear power's reliability due to always on capability, nuclear power also maintains no carbon emissions while producing power.