More than 50% of the energy sources becomes “waste” energy generally dissipated to the atmosphere in the form of heat. Thermoelectric effect is a conversion of temperature difference to electric voltage and can be used to convert the wasted heat to useful work. Nanomaterials have great potentials in the field of thermoelectric effect since they have properties that can allow higher efficiency in converting this wasted heat to electricity as compared to bulk materials. The purpose of this project is to develop a method to synthesize bismuth telluride (Bi$_2$Te$_3$) nanowires on a large scale and incorporate nanoinclusions on the produced nanowires. The method used to synthesis of nanomaterials in the lab will hopefully lead to their actual production on an industrial scale for thermoelectric application. Firstly, nanowires are produced using a large reactor. Afterwards, silver nanoparticles are going to be synthesized and mixed with the produced Bi$_2$Te$_3$ nanowires. Each mixture will then be hot pressed into a small disc before we test it for the ZT value (figure of merit to assess the degree of thermoelectric effect). The experiments performed in a 1-liter batch type of reactor were successful in synthesizing Bi$_2$Te$_3$ nanowires in a larger scale as compared to a research lab scale. Furthermore, the research indicates that there is an improvement in ZT. These findings will eventually help in the design for mass production of nanomaterials and further fuel more investigations on the effect of nanoinclusion in nanotechnology to be one step closer to reducing the energy crisis.