

The Cost of Sustainability

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## Abstract

Eco-friendly houses combine a multitude of simple additions to a normal house without needing to custom design a new house. By simply adding solar panels, a geothermal heating/cooling system and water saving appliances, the carbon footprint and environmental impact of your house can be greatly reduced. However these additions are not cheap, with solar panels and geothermal heating/cooling system costing upwards of \$20,000 and the water saving appliances adding up to over \$10,000. The purpose of this research paper was to determine when the initial cost of the eco-friendly house will even out with the initial cost of conventional house after the savings on utility bills have been applied. The house the research was based off of was compiled using the average household data from the 2010 United States Census. Solar panels will produce electricity for the house and reduces the electricity bill but costs \$21025.21 after federal and local incentives. Selling the extra energy produced and with the cost of electricity saved, it takes about 18-19 years to begin saving money. The geothermal heating and cooling system saves electricity on heating and cooling by using the earth's heat as an energy source. The system cost about \$20,650 compared to the cost of a conventional heating, ventilation and cooling system (HVAC) of \$5000. The geothermal heating and cooling system takes around \$767 annually to run as opposed to \$2313 annual cost of running the HVAC system. With the \$1545 annual savings, the homeowner would start saving money within 9 years. Waterless toilets and eco friendly water appliances cost about \$6019.97 total with an annual water bill of \$233.97. Compared to conventional water appliances, the homeowner would begin to save money in 17 years. After the data was compiled, it would take 13.598 years to begin saving money on the eco-friendly house. This is why green energy is considered a long term investment.