

# Electrification of the HVAC Infrastructure

*John D. Manning, PE, President, Earth Sensitive Solutions, LLC*

## ABSTRACT

When considering strategies to reduce carbon emissions the obvious target of opportunity is to displace the use of fossil fuels to heat our buildings. Improving thermal envelopes and system efficiency is not aggressive enough to meet the urgent challenge. Due to the fact that only 5% of the market is “in play” in any given year and a 20% reduction in every one of the “in play” opportunities will only result in a 1% annual reduction and simply result in missed opportunities being put back into the 20 year cycle. The electrification of the heating market is the only strategy that can displace fossil fuels with significant market penetration and reliability. Electrification means using heat pumps to provide heating. Heat pumps will also provide air conditioning, domestic water heating, pool heating and many other low temperature (< 140 F) heating applications. Combining heat pumps with renewably generated electricity, either onsite or offsite will create a 100% reduction in carbon emissions, creating a potential of 5% annual reduction in the emissions associated with heating our buildings. Even without dedicated renewable generation to operate the heat pump there is a 50-70% reduction in emissions and as the grid becomes “cleaner” every heat pump installed will benefit.

The operating characteristics of the various heat pump choices will also have a growing impact to the electrical grid. Overall kwh requirements as well as peak KW demand will be discussed to help a designer understand the implications of various choices in heat pumps.

## BIOGRAPHY

Mr. Manning has been working with heat pumps since being awarded a National Science Foundation Grant to study Solar-Assisted Heat Pumps in 1975 at Syracuse University. He has been involved in the industry in virtually every capacity, heat pump designer, product marketing manager, IGSHPA Trainer, installing contractor, utility consultant, system design engineer and since 2003 as Founder and President of Earth Sensitive Solutions, LLC. Mr. Manning was trained in the science of Climate Change by Al Gore and is a member of The Climate Reality Leadership Corp and is also a board member of NY-GEO.