

Energy use in healthcare services: Radiography procedures

Mohammad Amin Esmaeili *, Ashkan Jahromi , Fernando Dominquez , Nicholas Thomas , Ashlee Mcadam and Janet Twomey , Michael Overcash , Dr. Bayram Yildirim , Don Malzahn

Industrial and Manufacturing Engineering Department, Wichita State University

In 2010 the U.S. healthcare sector rose to comprise 18% of the nation's GDP. During that year \$8.8 billion was on energy to meet patient needs. As the percent of GDP spent on healthcare rises over the next several years, there will be an associated rise in energy consumed by healthcare services. The majority of information on energy consumption and improvements in healthcare are at the macro level. Instead, this research explores energy use based upon the principles of life cycle analysis at the healthcare service level. The goal is to achieve a substantial increase in knowledge of healthcare services with the aim of improved sustainability. In this presentation the energy consumption during the delivery of x-ray and CT services are reported. The setting for data collection is the Veteran's Administration (VA) Hospital in Wichita, Kansas. The results reveal that a large portion of the energy consumption is due to the idle time which can be reduced operationally. Thus, it is shown that improvements of energy use in health care should not be restricted to heating, ventilating, air conditioning and lighting since these are largely fixed after installation. The importance of idle energy leads to possible improvements by hospitals in patient scheduling or by manufacturers to lower standby power demands. Energy savings in the radiology department through the application of operations research tools are discussed.

Keywords: Energy, Healthcare, Hospital, Radiography, Radiology, Environment.