ASHRAE Technical Group established on

Exergy Analysis for Sustainable Buildings

Exergy Analysis for Sustainable Buildings is concerned with all exergy aspects of energy and power utilization of systems and equipment for comfort and service, assessment of their impact on the environment, and development of analysis techniques, methodologies and solutions for environmentally safer, sustainable low-exergy buildings.

Existing HVAC systems and equipment have already achieved high thermal efficiencies as defined by the first law of thermodynamics. According to the second law of thermodynamics however, there is a need to increase currently low exergy efficiencies primarily due to the fact that existing systems and buildings demand and designed generally for high-exergy sources. In this respect, IEA Annex 37 recognized exergy-efficient buildings and development of low-exergy systems and equipment to be the most important need for sustainable development and environment. Currently, ASHRAE TCs/TGs/TRGs are not involved in exergy aspects of buildings and there is a lack of information about the importance and relevance of the subject matter, in particular for green buildings and for sustainable development. Existing ASHRAE publications and Handbooks do not provide any relevant information. This TG will raise the exergy awareness among ASHRAE members and provide the fundamental information and tools to all ASHRAE TCs/TGs/TRGs for the implementation of exergy-efficient designs and development of consistent exergy related methodologies. This TG will establish a robust road map for a comprehensive set of scientific and technical steps for an environmentally safer building technology and HVAC systems and facilitate the new ASHRAE theme of Engineering for Sustainability.

Two seminars will be held in the frame of the ASHRAE Annual Meeting in Quebec, Canada, 24-28 June 2006.

Exergy Analysis and Sustainability, Part I: Fundamentals
(Chair: Eric Ratts)
International Energy Agency Annex 37 recognizes that exergy-efficient buildings with low-exergy systems and equipment will be the most important step for the next-generation of sustainable development and environment. Currently, there is a lack of practical information about the importance and relevance of the subject matter, in particular for green buildings and for sustainable development. First part of the seminar will focus on the exergy-based relationship of buildings with the environment, raise the exergy awareness among engineers, and provide the fundamental information and basic tools for the implementation of exergy-efficient designs.

Exergy Analysis and Sustainability, Part II: Comfort Applications
(Chair: Birol Kilkis)
At the midst of the energy, environment, humankind, and economy quadrilemma for sustainable development, the second part of the Seminar deals with practical aspects of green building design with main emphasis to low-exergy building concept and next-generation of exergy conscious equipment. This seminar also covers other exergy analysis applications for human comfort.