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Sustainable Engineering: A Central Driver for Sustainability

Sustainability is a critically important goal for human activity and development. Sustainability in the area of engineering, in particular, is of great importance to any plans and efforts for overall sustainability. This is due to many factors, including 1) the pervasiveness of engineering activities in societies, 2) their importance in economic development and living standards, and 3) the significant impacts that engineering processes and systems have had, and continue to have, on the environment. But sustainable engineering is extremely complex and challenging. Many factors that need to be considered and appropriately addressed in moving towards engineering sustainability are examined in this presentation. These include appropriate selection of resources bearing in mind sustainability criteria; the use of sustainable engineering processes, enhancement of the efficiency of engineering processes and resource use, and a holistic adoption of environmental stewardship in engineering activities. In addition, other key sustainability measures are addressed, such as economics, equity, land use, lifestyle, sociopolitical factors and population. Conclusions are provided related both to pathways for engineering sustainability and to the broader ultimate objective of sustainability.

Keywords: Sustainability, Sustainable Engineering, environment

Biography:

Marc A. Rosen is a Professor at the University of Ontario Institute of Technology in Oshawa, Canada, where he served as founding Dean of the Faculty of Engineering and Applied Science. Dr. Rosen was President of the Engineering Institute of Canada. He is a registered Professional Engineer in Ontario, and serves as Editor-in-Chief of several journals and Director of Oshawa Power and Utilities Corporation. With over 60 research grants and contracts and 600 publications, Dr. Rosen is an active teacher and researcher in sustainable energy, environmental impact, and energy technology (including renewable energy and efficiency improvement). Much of his research has been carried out for industry, and he has written numerous books. Dr. Rosen has worked for such organizations as Imatra Power Company in Finland, Argonne National Laboratory near Chicago, and the Institute for Hydrogen Systems near Toronto. Dr. Rosen has received numerous awards and honors.