
International perspectives on selected environmental technology issues

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Biographical notes: Ravi Jain, PhD, PE, Associate Editor, is Dean of the School of Engineering and Computer Science at the University of the Pacific in Stockton, California. Prior to this appointment, he has been an Associate Dean for Research and International Engineering, Executive Director of Interdisciplinary Research Centres, and Director of the Environmental Engineering Management Graduate Program at the University of Cincinnati, College of Engineering. He has held research and faculty appointments at the University of Illinois (Urbana-Champaign) and Massachusetts Institute of Technology. He was a Littauer Fellow at Harvard University and a Fellow of Churchill college, Cambridge University.

Most nations recognise that effective environmental management can assist in achieving economic prosperity while protecting the natural systems of the planet, and providing a higher and sustainable quality of life for its people. Individuals, communities, institutions, and nations are developing and implementing effective environmental management practices and incorporating new technologies for achieving environmental conservation and improvement goals. The quality of the air we now breathe is better than ever before, especially in the industrialised countries. Developing countries are also investing resources and making progress towards environmental protection and enhancement goals.

Using technology in managing and addressing environmental issues can help reduce the economic cost and increase the efficiency and effectiveness of resources utilised. New technology can assist in developing policies and devising innovative strategies to protect human health and the environment. Effective management of environmental technology can also help in focusing attention to reducing risks from persistent, bio-accumulative toxic pollutants in the air, in water, and on land. Environmental technology management can, in addition, help focus on issues of crucial interest such as: effective integration of new technologies, sustainable development, renewable energy sources, and cleaner industrial processes.

The unifying theme of this issue encompasses 'International perspectives on environmental technology management' and discusses programmes and tools that use underlying scientific, engineering and policy knowledge to support environmental technology management.

Stephenson, in his paper on emerging technologies, discusses integration of a new technology with the old proven methods to affect a hybrid process. This way, the net affect is often a cost effective solution to an otherwise difficult implementation problem. He describes successful applications of new micro filtration membranes and configurations within existing operating processes and existing equipment. Steven Krains et al., present the considerable potential for reducing lifecycle energy consumption and pollution associated with commercial and residential buildings in Japan. They propose that when designing a new building to reduce the lifecycle resource consumption and environmental impact, one must consider complex interactions between: the performance of dynamics of the building shell; the structural design; energy supply systems; and other related factors. Marjorie Aelion in her paper on 'Technology development for environmental problems of the Southeastern United States', describes how this region ranks high nationally in air pollutant emissions and how many areas are not in attainment with the new ozone standards. Animal waste from farming have created additional land and water contamination problems in this region. She describes problems that address animal waste, contaminant sediments in water, and coal-fired power plant air emissions.

Renewable and non-renewable energy technologies are of considerable interest nationally and internationally. Khoie offers a simple and usable method of evaluating existing renewable and non-renewable energy technologies. He has suggested a systematic methodology based upon selected factors and criteria. He further provides information on evaluation of existing energy technologies from five points of view in which the importance of economic viability and environmental impacts of the technologies are incorporated. Smith and Bishop evaluate the effects on groundwater by diversion of solid waste from landfills. Their focus is directed at diversion of solid waste resulting from deconstruction and demolition projects. Environmental benefits of this diversion are presented including groundwater contamination issues, diversion methods and techniques.

Funke provides an interesting discussion related to environmental security, a term emphasising a connection between environmental quality and socio-political issues, including traditional national security concerns. Her paper considers current challenges and possibilities for Russia from the perspective of environmental security. She describes how profound environmental problems whose severity and pervasiveness could undermine Russia's attempts to build political and economic stability. Roper in his paper on 'Environmental indicator assessment for smart growth' describes characteristics of the type and magnitude of the growth of a specific region. He discusses how environmental indicators were selected through a stake holder collaborative process and how the whole process was used to assist in the development of environmental land use guidelines. Ortolano and He present issues related to transferring cleaner production technology to industries in China. Discussed are concepts that indicate that relying on cleaner production, companies can simultaneously cut pollution and increase the efficiency of resource use. The paper proposes that a monitoring and management system and a high degree of integration of multiple functions can assist in achieving important environmental technology and management goals. Finally, Roper presents an environmental assessment process for a power plant development project in Argentina. The paper describes various environmental impact considerations and includes a list of comprehensive environmental attributes that were studied. The primary results of these environmental assessments are summarised and compared and contrasted with the US Environmental Process.

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