

SUSTAINABLE ENERGY AND ENVIRONMENTAL REMEDIATION IN CANADA: CHALLENGES AND FUTURE RESEARCH DIRECTIONS

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FACULTY OF ENGINEERING AND APPLIED SCIENCE
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Abstract: Production of various types of energy (renewable and non-renewable) faces different challenges in terms of technical, environmental, and economic prospects. For instance, high concentration of greenhouse gases, particularly carbon dioxide, in the atmosphere leads to adverse environmental impacts such as high temperature, precipitation, and risks of forest fires. Thus, it is important to explore proper and efficient technologies for energy production and utilization that maintain a sustainable environment. The research studies conducted by our team try to find solutions for some of current theoretical and practical challenges in chemical and energy processes. The recent research activities of the team mainly have focused on carbon management, water and wastewater treatment, bioenergy production, flow assurance, and process systems engineering. Our researchers in the team employ hybrid modeling and experimental tools including analytical and numerical modeling, connectionist/smart techniques, molecular dynamics simulation, Lattice Boltzmann method, optimization strategies, and experimentation at various scales to efficiently design, operate, and optimize different processes in energy and environment sectors. An overview of conventional as well as emerging and leading strategies in energy and environment management and sustainability is given in this presentation. The key theoretical and practical challenges to develop (and produce) a variety of energy sources are then described. Referring to green alternative technologies, the speaker will explain how his research works, tools, and outcomes can address the challenges and contribute to the energy and environment field and corresponding industries across the world, particularly Canada. At the end, the speaker will provide a brief on future prospects of development and discovery in the area of sustainable energy and environmental remediation in Canada by focusing on his current and future research strategies/plan where the need of multidisciplinary research and engineering activities is highlighted to attain a high process performance with the minimum negative impact on the environment.



Dr. Sohrab Zendehboudi is an associate Professor in the Department of Process Engineering at Memorial University, NL, Canada. His research interests include Energy & Environment, Transport Phenomena, and Process Systems Engineering. For more than 15 years, Sohrab has worked as a process engineer, researcher, instructor, supervisor, and professor at various companies/universities in Iran, Kuwait, USA, and Canada. Sohrab is currently an associate editor for a number of journals including Canadian Journal of Chemical Engineering, Energies, Journal of Porous Media, Special Topics & Reviews in Porous Media: An International Journal, Journal of Geofluids, and AIMS Energy. Sohrab holds a PhD in Chemical Engineering (specializing in Transport Phenomena) from the University of Waterloo, Canada.

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