

Canadian Grand Engineering Challenges Exercise

Table 1 Canadian Grand Engineering Challenges

Grand Challenge	Description
Resilient Infrastructure	• Infrastructure in Canada is most at risk due to climate change. • Infrastructure and buildings are designed to withstand certain stresses and increasingly those stresses are changing due to climate change.
Access to affordable, reliable and sustainable energy	• Canada is the largest per capita energy consumer in the world and consumes about 5 times more energy than the world average • Canada's high energy consumption per capital is because of our very large energy sector relative to our population not due to personal emissions
Access to safe water in all communities	• Canadian freshwater systems are under significant strain due to climate change, aging infrastructure, and contamination. • The quality of drinking water supplies in rural and Indigenous communities has become severely degraded, leaving communities to boil water, arrange for water delivery via truck, or haul it from a water filling station
Inclusive, safe, and sustainable cities,	• Cities are home to over 80% of Canadians • Cities have complex environmental stresses, including climate change and global biodiversity loss
Inclusive and sustainable industrialization	• Manufacturers export more than \$354 billion each year, representing 68% of all of Canada's merchandise exports • Canada needs to position itself as a leader in sustainable industrialization or eco-production and eco-manufacturing
Access to affordable and inclusive STEM education.	• Engineering education in Canada has grown substantially over the past 165 years in the number of programs offered and the number of students who study engineering but there continues to be a lack of diversity in the student and faculty bodies. • Today, female enrolment in engineering programs across Canada persists at 20 percent and only 18% of licensed professional engineers are women

Adapted from:

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Answer the following Questions within your group:

Discussion Questions

1. Discuss and debate which goal in Table 1 do you believe is crucial to accomplish in Canada within the next 10 years?
2. What are some of the challenges of accomplishing this challenge?
3. Discuss the importance for the engineering profession to shift towards a stronger societal focus within this challenge?

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