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Canadian Academy of Engineering
Energy Program Introduction

Canadians enjoy one of the highest qualities of life on the planet[1] thanks in no small part to our energy resources and our knowledge of how to exploit them. In order for these resources to bring more benefit to Canada and in order to pass this rich legacy to our children and grandchildren we need to address the pressing issues of climate change. How to develop energy resources in a manner that is consistent with a sustainable, circular economy that meets the constraints of a global climate change mitigation strategy is one of the great engineering challenges of our time.

As if this were not enough of a challenge, since the end of the first quarter of 2020 we have lived in an unprecedented global economic shutdown due to the CORONA virus. This economic shut down has resulted in a marked reduction in the need for energy particularly in the industrial and transportation sectors. At the time of writing, when and if these sectors will return to their former strength remains unknown. The reduction in demand coupled with a surplus of energy stockpiled in storage and a price war between Russia and Saudi Arabia has raised new questions regarding the path to restart an economically viable energy industry.

The Canadian Academy of Engineering has many Fellows with extensive business and technical experience in many aspects of the energy ecosystem. The Academy has also undertaken numerous studies and participated in several national assessments of the energy sector. From these studies[2] it is clear that a decarbonized future will require a major expansion of emissions-free electricity supply and infrastructure. For Canada's resource sector electrification can provide effective reductions of GHG emissions and this in turn will require innovative technical and economic solutions. The concept of a national electric grid has also been promoted by the Academy[3] as an important nation building project that will be critical to increasing decarbonisation of the energy system.

The energy sector is a sophisticated and technically complex sector that involves many stakeholders and requires high levels of investment to maintain or change operations and involves a range of significant risks that have to be carefully managed.

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[1] https://dailyhive.com/vancouver/canada-ranked-best-country-quality-life-2019

[2] https://www.cae-acg.ca/projects/trottier-energy-futures-project/

[3] https://www.cae-acg.ca/wp-content/uploads/2014/01/2010_Power%20Grid%20Task%20Force%20Vol%201_E.pdf

The debate between “energy economy” and “environmental stewardship” is often presented as a battle between opposing forces. There does not need to be a trade-off between financial and environmental performance. Through innovation and new technologies we can and must achieve both. The reality is that the energy sector will evolve and its evolution will be both facilitated and constrained by what is technically, economically and socially possible, not in the lab or in theory, but in reality, on the ground and at scale. Over the next decades there will undoubtedly be important political, scientific and public debates on how to move forwards. The “engineering perspective” developed by the CAE will provide an important input to these debates and will ultimately help to inform policy and inspire innovations that will contribute to the quality of life for Canadians and, perhaps, provide leadership for other jurisdictions who have similar challenges and fewer resources to address them.

The CAE Energy Program will consist of a number of projects and activities supported by a range of stakeholders. The starting point will be the creating of a CAE Special Interest Group (SIG) on Energy consisting of Fellows of the Academy who are interested in contributing to this topic. Members of the SIG will meet from time to time and present opportunities to contribute to the national and regional dialog on energy policy and strategy

Out of the SIG we will create one or more Task Groups looking into specific aspects of the energy sector. One example that has been discussed is Hydrogen and its role in the energy economy. Another might be on the future or nuclear energy or an assessment of limits to growth of solar and wind energy in Canada. Another topic could be the mix of domestic use and export of our energy resources. The first Task Forces should be formed by September 2020. A task group may develop a roadmap where we could set a vision for how we achieve clean and sustainable sources of energy from our various world class energy sources, identify the gaps, and potential opportunities to close the gap in order to meet the vision.

Task Forces we will produce position papers on their deliberations and conclusions. These may lead to further activities resulting in more comprehensive outputs. It is proposed that a Task Force have a six month mandate in order to maintain momentum and interest.

Knowledge mobilization efforts will ensure that the investment of time, effort and resources achieve tangible outcomes. Knowledge Mobilization may consist of briefings of key decision makers, publication in various media, collaboration with other national academies or other approaches to ensure that the integrated knowledge of the Fellows of the Academy is effectively integrated into the larger energy dialog.

If you have any questions regarding the CAE Energy Program please contact info@cae-acg.ca.

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