Notice of Intent for New Degree/Diploma Programs

The Notice of Intent (NOI) is completed after Program Discussion once it is determined that a New Program is appropriate. The NOI provides additional details regarding the nature and aspirations of a proposed program. Please submit the completed NOI to ciqe@ontariotechu.ca. The NOI will be presented to the Academic Resource Committee for evaluation and recommendation to the Provost.

Applicant Information

Faculty: Faculty of Engineering and Applied Science
Faculty Lead: Dr. Daniel Hoornweg and Dr. Amirkianoosh Kiani
Program Level: ☑ Graduate ☐ Undergraduate
Program Name and Degree Designation: Graduate Diploma (G.Dip) in Energy Systems Engineering

Is this program in collaboration with another faculty? No
If yes, which Faculty? N/A
Modality: ☐ Online ☑ Hybrid
Will this program have an experiential learning component? ☑ Yes ☐ No

If yes, please provide details of experiential learning, including potential partners and any anticipated impact on existing resources or placements in other programs.

The Energy Systems Engineering Graduate Diploma integrates experiential learning through project-based coursework focused on clean energy including generation through renewables, nuclear, geothermal and hydrogen, as well as storage, transmission, conservation, and development of integrated systems.

Assignments and projects are embedded within existing graduate courses and do not require additional facilities beyond those already available in the Faculty of Engineering and Applied Science. This approach builds both technical and professional competencies that align with Ontario Tech's emphasis on applied, technology-driven learning.

Overview of Proposed Program

Please briefly describe the proposed program.

The Energy Systems Engineering Graduate Diploma is designed to prepare energy professionals to understand and lead innovations in energy systems. The program provides an overview of energy systems, focuses on integrating energy components, approaches, conservation, and digital technologies such as automation, robotics, data analytics, and smart design to enhance productivity, sustainability, and competitiveness in energy systems.

The program offers one or two courses that assess energy applications across systems. This broader platform is supported through two or three courses more specific to energy applications such as energy storage, HVAC and nuclear facility decommissioning. With graduation of the new Energy Engineering Program scheduled to have its first graduates in May 2027 this G.Dip. will support potential continued graduate studies for these students, as well as a broad and pragmatic graduate route for professionals working on the quickening energy transition. Several new courses, such as Small Modular Reactors, Railway and Transit systems, and electrifying mobility, are expected to be added to the suite of available courses over the next few years. All courses listed below are now available in the Graduate Calendar.

Students complete four (4) graduate-level courses (12 credits total) from the list below, providing both theoretical understanding of overall energy systems and practical training in specific energy applications:

One or two courses from

- ENGR 5014G - Pollution Prevention and Sustainable Engineering
- ENGR 5410G - Project Management for Engineers or NUCL 5010G - Project Management for Nuclear Engineers
- ENGR 5415G - Foundations of Engineering Management
- ENGR 5100G - Advanced Energy Systems
- NUCL 6140G - Life Cycle Assessment in Nuclear Applications
- NUCL 5510G - Nuclear Safety Design and Regulation

Two or three courses from

- ENGR 5101G - Thermal Energy Storage
- ENGR 5102G - Fuel Cells and Hydrogen Systems
- ENGR 5161G - HVAC and Refrigeration Systems Design and Analysis
- ENGR 5925G - Control and Operation of AC Drives
- ENGR 5930G - Adaptive Control
- ENGR 5940G - Intelligent Control Systems
- ENGR 5945G - Mobile Robotic Systems
- NUCL 5300G - Advanced Topics in Radioactive Waste Management
- NUCL 5330G - Principles of Nuclear Facility Decommissioning
- NUCL 5100G - Nuclear Plant Systems and Operation
- NUCL 5600G - Future Role of Nuclear Energy
- ENGR 5511G - Introduction to Railway Systems
- ENGR 5544G - Railway Systems Operation and Maintenance
- ENGR5775G Knowledge Discovery & Data Mining
- ENGR5965G Digital Devices and Techniques for Smart Grid Automation and Protection

In addition to the courses above several courses are under development and would be added to the menu as they are included in the Graduate Calendar. Many have already been offered as Special Topics courses. These include:

- Smart Energy Systems;
- Waste-to-Energy Systems;
- Nuclear-Renewable Hybrid Systems;
- Micro Energy Grids;
- Cyber Security for Energy Systems;
- Measuring and Modelling Sustainability;
- Integrated Mobility;
- Advanced Community Energy Systems;
- Small Modular Reactors;
- Nuclear Energy in Society;
- Life Cycle Assessment in Energy Applications.

The diploma can be completed on a part-time or full-time basis and is fully stackable into the MASc or MEng programs. It provides a flexible pathway for professionals seeking to upskill in energy systems or transition into leadership roles in the energy sector.

Describe how the principles of Equity, Diversity, Inclusion, and Decolonization have been considered.

The Energy Systems Engineering Graduate Diploma integrates equity, diversity, inclusion, and decolonization principles by promoting equitable access through hybrid delivery and flexible scheduling. The program encourages participation from women, Indigenous peoples, and other underrepresented groups in engineering through targeted outreach and mentorship opportunities. Its curriculum highlights global perspectives in manufacturing and design, emphasizing inclusive innovation and workforce transformation. Course projects and case studies reinforce responsible engineering practices and the social dimensions of automation and digitalization, ensuring students appreciate the human and ethical aspects of technological change. The G.Dip. fully supports and contributes to the energy sector's 'Equal by 30' aspirational goal to increase female representation in the energy sector (some 45 Canadian companies and agencies are signatories).

If this program contains any indigenous content, please provide information regarding consultation with the Indigenous Education Advisory Circle (IEAC).

The program currently does not include specific Indigenous content. However, future iterations may incorporate case studies on inclusive manufacturing, sustainable industrial design, and technology development in partnership with Indigenous communities. Any inclusion of Indigenous content will be preceded by consultation with the Indigenous Education Advisory Circle (IEAC) to ensure cultural accuracy and alignment with Ontario Tech's protocols.

For more information on how Indigenous content is defined at Ontario Tech University and how to consult with the Indigenous Education Advisory Circle (IEAC), please refer to the Protocol for Consultation with the Indigenous Education Advisory Circle.

Evidence of Need

List all other Ontario universities that offer similar programs.

Comparable programs at Ontario institutions:
While no exact graduate diploma in Energy Systems Engineering exists in Ontario, there are related credentials and programs that signal demand in this field:

University	Program
Toronto Metropolitan University	Professional Master's Diploma in Energy and Innovation
University of Waterloo	Green Energy Graduate Diploma
McMaster University	Power and Energy Engineering Technology diploma

What is the intended applicant pool for this program and the projected enrollment?

The program is intended for engineers and technical professionals in the energy sector who require up-skilling in energy system integration and application of specific evolving technologies. The program can be pursued individually by professionals as well as supported by energy sector employers. For example, the program can be tailored for potential partners such as electricity utilities, energy providers, and advisory consultancies. The program can be laddered into the Meng, MASc or PhD in Mechanical and Energy Engineering. The anticipated Year 1 intake is approximately 15–25 students, with a steady-state enrolment of around 30 students per year (mix of part-time professionals and full-time students).

What are the trends indicating societal need for graduates in this area. Please visit *Ontario Job Futures*, *the Government of Canada Labour Market Trends website, and the Durham Workforce Authority* and Include projections for jobs in this area over the next 5 to 10 years. You may also include data from other sources, if relevant.

Across Ontario and Canada, the energy sector is undergoing a significant transformation driven by the energy transition (decarbonization, and a growing Canadian and global demand for electricity). Several

industry partners, such as OPG, Bruce Power, Enbridge, Atkins-Realis, AECOM and CNSC, have been consulted in the preparation of this program. The recent success of the Continuous Learning Nuclear Career Accelerator program at Ontario Tech provides a powerful example of growing demand in the sector (the program had some 750 applications for 150 spots and is now being replicated).

Resources

What human and physical resources will be required to launch and sustain the program?
How will existing programs be impacted?
What is the marketing pitch for this program and what outlets should be used?

The Energy Systems Engineering Graduate Diploma will be delivered by existing staff in the Faculty of Engineering and Applied Science with expertise in energy systems. No new hires or additional resources are required. The program will use existing classrooms, laboratories, and computational facilities already supporting graduate teaching and research.

The impact on existing programs will be minimal, as the courses are part of the current graduate curriculum. The diploma consolidates these offerings into a focused, stackable credential that strengthens Ontario Tech's leadership in advanced and smart manufacturing education. Marketing will target engineers and professionals through the university website, professional networks, and industry partnerships.

Consultation

Provide details regarding consultations with other programs and/or Faculties at Ontario Tech University, external agencies/partners, and supporting departments (e.g. the Office of the Registrar, School of Graduate and Post-Doctoral Studies), and include information about potential collaboration or possible duplication. Include an explanation of the consultation process and a summary of the feedback provided.
Consultations were held within the Faculty of Engineering and Applied Science, including discussions with the Graduate Program Directors, department faculty, and the Dean's Office. Input from the School of Graduate and Postdoctoral Studies (SGPS) will ensure alignment with Ontario Tech's graduate credential framework and stackable program structure.

Feedback confirmed that the proposed diploma complements existing MASc and MEng offerings without duplication and supports the university's strategic focus on digitalization, advanced manufacturing, and applied research. The program also aligns with ongoing collaborations and industry engagement in automation, robotics, railway engineering, and energy engineering.

Discussions have also been held with industry representatives. Companies such as OPG, Bruce Power, Westinghouse, Atkins-Realis, Alstom, Siemens, and AECOM, as well as agencies such as NWMO, AECL, CNSC, Ministry of Energy, Natural Resources Canada have all expressed interest in supporting current staff to join the program.

Has this NOI been approved by the Faculty Dean(s)? ☑Yes ☐ No
Date Approved: December 1, 2025