



ONTARIO ENGINEERING COMPETITION 2015

# Consulting Engineering

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## Rulebook

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*Consulting Engineering Competition Commissioners*  
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University of Ontario Institute of Technology	ENG-LG 21( 9:00 AM: 9:30 AM)
University of Ottawa I	ENG-LG 21 ( 9:30 AM: 10:00 AM)
University of Toronto	ENG-LG 21( 10:00 AM: 10:30 AM)
Carleton University	ENG-LG 21( 10:30 AM: 11:00 AM)
Queen's University	ENG-LG 21( 11:00 AM: 11:30 AM)
Ryerson University	ENG-LG 21 (11:30 AM: 12:00 AM)
<b>Lunch</b>	<b>ENG (12:00 PM: 1:00 PM)</b>
University of Waterloo A	ENG-LG 21 (1:00PM - 1:30 PM)
University of Guelph	ENG-LG 21 (1:30PM - 2:00 PM)
Western University	ENG-LG 21 (2:00PM - 2:30 PM)
University of Waterloo B	ENG-LG 21 (2:30PM - 3:00 PM)
University of Ottawa II	ENG-LG 21 (3:00PM - 3:30 PM)
McMaster University	ENG-LG 21 (3:30PM - 4:00 PM)

## Consulting Engineering

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## 1 Category Description & Objective

The objective of the Consulting Engineering category is to bring undergraduate engineering students together to think innovatively and efficiently for an optimal solution. The problem provided may be tackled using the multi-disciplined engineering fields and simply making engineering a business. Engineers often perform consulting services for wide range of problems as system implementation, company restructuring, production optimization and general design. The participants are encouraged to follow the Scoring provided and incorporate the OEC 2015 theme into their design. Winning entries will combine originality, technical and economic feasibility, business, environmental and ethical implementations, justifiable design choices, and a high quality presentation.

## 2 Category Logistics

### 2.1 Awards

First Place: \$2000

Second Place: \$1500

Third Place: \$750

### 2.2 Eligibility

- Maximum of sixteen (16) team of four (4) individuals are eligible to compete in this category.
- Multidisciplinary teams are recommended, but not mandatory.
- All team must meet all general entry requirements of OEC 2015.

### 2.3 Facilities Provided by the Organizing Committee

- Access to one (1) room per group during competition with adequate facilities
- Access to the Internet for all participating teams
- A hardcopy of the Problem Statement and Rubric will be provided
- Printing facilities as required but during selected times

### 2.4 Facilities Provided by the Competitors

Competitors are required to provide the following:

- The proposal document and presentation document must be submitted in “.PDF” and “.ppt” respectively.
- Both (presentation and proposal document) must be submitted in one email to [consulting@oec2015.ca](mailto:consulting@oec2015.ca) and CC'd to [competition@oec2015.ca](mailto:competition@oec2015.ca) by the deadline announced during the briefing session.
  - For convenience, please have your subject line as: University-Category-Title (for example: Ryerson-Consulting-Proposal.doc)
- **Note:** If due to any circumstance your team was not able to submit it via email, a USB must include the files and submitted prior to the submission deadline. Additionally, please have the files under a folder subjected as the requested email subject line.
- Include reference materials relevant to the problem within the email (Optional but recommended)
- APA Citation is required in the proposal document as well as during the presentation.

- A response to the submission email will be sent as confirmation within 2 hours of submitting. If

## 2.5 Competition Personnel

- Three (3) Category Official (Contact: [consulting@oec2015.ca](mailto:consulting@oec2015.ca))
  - Names: **Asad Mohani, Ankit Sharma, Kumail Khalfan**
- One (1) or more timekeepers
- Associate judges to complete the panel(s), with either three (3) or preferably five (5) judges in total on each panel
- One (1) Head Judge
- Volunteers to carry out various support tasks

## 2.6 Collection and Distribution of Materials

Although this may not be applicable, if there is a need to purchase items relating to the competition material(s), you will be informed about the store location and further details during Phase 1.

## 2.7 Notes Regarding Opening the Final Presentations to Public Viewing

The OEC Advisory Board strongly advocates for both the principles of the integrity of the competition and showcasing engineering talent. In the case of Consulting Engineering, this presents a known conflict of principles since all competitors are presenting a solution to a common problem. Hence, the OEC Advisory Board gives the OEC Organizing Committees the right to make the final presentations open or closed at their discretion.

## 3 Topic Inquiry

The topic posed to competing teams will be challenging and complex and will require reasonable thought process for a feasible solution. The scenario will be realistic and will give teams the opportunity to offer a credible technical solution, use novel ideas, and allow analysis of the problem from multiple angles. A proper solution should address issue that will be mentioned on the Problem Statement and abiding by the Scoring is a plus.

## 4 Competitor Deliverables

Team within the Consulting Category will be required to submit the following:

- One (1) Proposal Report, using the format provided (see 2.4) by the OEC Organizing Committee. The report must be a comprehensive document of the proposed design/solution.
- One (1) Final Presentation, using format as defined (see 2.4) by the OEC Organizing Committee.
- Any additional requirements will be announced during Phase 1 of the process. The OEC Organizing Committee is responsible for providing the necessary materials for any additional deliverables.

## 5 Judging

The OEC Organizing Committee have selected well experienced professionals including consultants as part of the Judging process. Evaluations will be highly based on the Scoring provided as well as how well the solution meets the requirements, originality, and persuasiveness of the presenters.

An odd number of judges must be used, preferably five (5), although three (3) is a minimum in any given panel. Multiple panels of judges may be used when required.

Judges' deliberation will be conducted privately and the results will not be released until the final banquet. A summary of feedback from the judges will be compiled for each team.

## 6 Scoring

<b>Proposal Report .....</b>	<b>/55</b>
Originality Justification .....	/20
- Is the proposed idea <b>unique</b> and <b>justifiable</b> ? And how realistic is its implementation?	
- How <b>sustainable</b> and how well is this solution for the amount of years required?	
- Is the <b>energy and power</b> of the city <b>self-sufficient</b> ?	
Aspects Considered.....	/15
- <b>Economic</b> feasibility	
- <b>Environmentally</b> friendly and impacts	
- <b>Safety</b> and Execution process within location	
- Additional concerns include <b>infrastructure, distribution, geography, imports, carbon footprint, public opinion</b>	
Usage of Data.....	/15
- Does it meet the forecasted demands shown on <b>Table1</b> ?	
- Was the Gross Energy Demand in <b>Figure 1</b> incorporated in the data?	
- Was the <b>location considered</b> and researched about?	
- Were the assumptions on <b>data and analysis</b> sensible?	
- Any additional research depth with accuracy will be considered	
Report displayed professionally with APA citation.....	/5
<b>Final Presentation .....</b>	<b>/35</b>
Communication.....	/15
- Were they <b>Clear, Concise, Concrete and Coherent</b> ?	
- Did they deliberate on their stance – <b>Self Sufficiency in Energy and Power</b> ?	
- Did they provide sufficient eye contact with the judges and were they engaging?	
Organization .....	/5
- Did all team member appear and contribute to the proposal process?	
- Communication <b>between the team</b> members	
- Was there a flow in presenting including an introduction and conclusion?	
Quality of material and persuasiveness .....	/15
- Were the judge's questions responded to sensibly?	

- Was their approach to the issue justified?

<b>Penalties .....</b>	
Misuse of Under-time .....	-5/min
Misuse of Over-time .....	-10/min

## 7 Competition Procedures

### 7.1 Releasing the Statement of Theme

- The Statement of Theme will be discharged to fellow competitors and judges as well as the public at least seven (7) days prior to the competition date.
- Competitors will also receive a list of suggested material if required during this time.

### 7.2 Judges' Briefing

- Judges' will be briefed with the Scope of Work before it being disclosed to competitors.
- Category Officials will present the Scope of Work to all consulting competitors and answer all questions. Note: Amendments to the problem may be required by consensus of judges and will be informed to competitors accordingly.
- Logistics, criteria and other related judging information will be covered during this time.

### 7.3 Phase 1: Releasing the Scope of Work

- All Competitors, Category Officials, Timekeeper(s) and Judges MUST be present during this phase.
- The Problem Statement which outlines full details of the problem and judging criteria will be presented to all competitors and judges at this time .
- Category Official will present the Scope of Work orally having competitors and judges receive hard copies of the competition.
- The order of presentation will also be announced at this time
- Note: All questions may be posed only during the Question Period (See Phase 2 for details).

### 7.4 Phase 2: Question Period

- There will be a Question Period following Phase 1 with duration of 20 minutes.
- Eligible questions that may be asked include clarification of Scope of Work, rules and related logistics.
- Only Category Officials may answer questions.
- Questions and answers will be recorded and distributed to the competitors and judges.

### 7.5 Phase 3: Development of the Solution and Preparation of Deliverables

- Each team will have six (6) hours to develop their solution, produce all required deliverables, and prepare their presentation for the judges. All the deliverables must be submitted to the Official before the allotted time expires. Competitors may finish before the end of the allotted time without penalty.
- Should the OEC Organizing Committee provide additional time due to significant travel time between locations, all competitors will be informed accordingly.

- Teams must present their own work. Proper citation in APA format is required for previously published works. Violations will be ruled on by the Category Official and may be grounds for disqualification.
- Question and Inquiry Issues:
  - Only questions related to the format of the deliverables will be answered during Phase 3. Answers will not be given to any question that might lead to the development of a new approach or that might invalidate a potential solution.
  - Questions must be emailed to [consulting@oec2015.ca](mailto:consulting@oec2015.ca)
    - Responses to all inquiries will be sent to all teams at the same time. Note: Email replies will be done in a timely fashion and not to expect replies right away.
    - Questions will not be accepted during the final 30 minutes of Phase 3.
    - Questions and responses from Phase 3 will be provided to the judges prior to the presentations and report reviews.
- Announcements of the remaining time will be made at 1 hour, 30 minutes, and 10 minutes before the end of the allotted time for Phase 3.
- Your report and final presentation must be submitted electronically via email: [consulting@oec2015.ca](mailto:consulting@oec2015.ca) (Subject your email as: Final) or via USB (to a category official) before the deadline of the six (6) hours provided.
- Submissions after the deadline will not be considered. Additional resources/materials cannot be brought to the presentation if it was not submitted.

## 7.6 Phase 4: Rest Period

- Competitors will have an allotted six (6) hours rest period between the end of Phase 3 and the Final Presentations which commence on Saturday.

## 7.7 Phase 5: Report Review

- The competition organizers will distribute copies of all the reports to all of the judges.
- Format (i.e. hard or soft copy) is at the discretion of the organizing committee, but the judges must be able to review the reports during the presentation regardless of format
- The competition organizers must allow sufficient time for the judges to review the reports prior their respective presentations. For example, there may be a review period before each presentation, or there may be a review period for the first half of the reports prior to the first half of presentations, then a second review period for the second half of the reports prior to the second half of presentations.
- It is not required that all judges review all reports, but it is recommended that at least two (2) judges review each report for marking.

## 7.8 Phase 6: Final Presentations

- The order of presentation will be determined randomly.
- Teams will be given five (5) minutes to set up the presentation and ten (10) minutes to present their solution and deliverables.
- Note: Presenters must persuade judges with their works based on the Scoring scheme provided.

- Presenters may expect brief question by judges for clarification during their presentation, however detailed questions will be presented after the presentation within the question period. Note: Time will be halted while a judge asks a question and while the team responds.
- The remaining time must be indicated at 10 minutes, 5 minutes and 1 minute before the end of the allotted time. A visual countdown must be given during the last 30 seconds of allotted time.
- A five (5) minute question period will follow each presentation during which judges may ask detailed questions of the presenters.

### **7.9 Multi-Stream Judging – Determination of Final Winners**

- Multi stream judging will be implemented having each judge provide their top four (4) finalists to the other judges. A collective decision will be made from all judges.
- Note: The numeric scores will form the main basis for comparison. In the event of a tie, the team scoring higher on will be given the higher ranking.

## Ontario Engineering Competition 2015

### Consulting Engineering

The Government of Ontario has requested your consulting firm to submit a preliminary proposal to address a newly proposed power generation project in Springfield, ON. In order to make it the province's symbol of green energy, after 2020, the city **must** be self-sufficient with regards to energy and power. You must develop an engineering solution that addresses the forecasted energy demands as provided in Table 1. The coordinates and map for the currently proposed location of the city have been provided in Figure 1. You have been informed that any land within the marked area can be obtained for the purpose.

Upcoming laws make it a requirement for all new energy policies and projects to consider the environment as the top priority. Ensure that your solution includes details for economic feasibility, environmental impacts, execution and safety at the very least. You may also wish to address issues such as location, infrastructure, distribution, geography, imports, carbon footprint, public opinion etc. In order to ensure your proposal is selected, you must convince a panel that it's original and feasible. You may credible sources of information in order to obtain other data, however failure to reference these using APA style will result in immediate disqualification.

Year	Gross Energy Demand (MWh)					Total
	Commercial	Residential	Industrial	Agricultural	Electrification of Transportation	
<b>2020</b>	354600	277200	234600	12000	1800	<b>880200</b>
<b>2021</b>	354000	272400	237000	12000	3000	<b>878400</b>
<b>2022</b>	358800	274800	241200	12000	4800	<b>891600</b>
<b>2023</b>	365400	279000	247800	12000	6600	<b>910800</b>
<b>2024</b>	369000	282000	250800	12600	7800	<b>922200</b>
<b>2025</b>	376800	286800	253800	12600	8400	<b>938400</b>
<b>2026</b>	381600	288600	254400	12600	9600	<b>946800</b>
<b>2027</b>	385200	290400	256200	12600	10200	<b>954600</b>
<b>2028</b>	390000	293400	259200	12600	10800	<b>966000</b>
<b>2029</b>	395400	357600	262200	12600	12000	<b>1039800</b>
<b>2030</b>	400800	301200	264600	12600	13200	<b>992400</b>
<b>2031</b>	408600	307200	266400	12600	14400	<b>1009200</b>
<b>2032</b>	415200	312600	267600	12600	15600	<b>1023600</b>
<b>2033</b>	422400	318600	268800	12600	16800	<b>1039200</b>
<b>2034</b>	429600	324600	270600	12600	18600	<b>1056000</b>

Table 1: Forecasted Gross Energy Demand up to 2034



## 1.1 Requirements:

- **Proposal** – A document outlining your unique solution and the sources, data, analysis and assumptions used to come up with the same
- **Presentation** – A PowerPoint presentation containing select details of your solution to be presented to the Energy Board of Ontario.

## 1.2 Submission

All submissions must be sent by email to [consulting@oec2015.ca](mailto:consulting@oec2015.ca) by no later than the specified submission time. The proposal document must be submitted in “.PDF format”. The presentation must be submitted in “.ppt” format.