

# **WATERLOO** **ENGINEERING**

## **Consulting Engineering Design Problem**

Fall 2012  
Waterloo Engineering Competition  
November 2-3

## General Rules & Guidelines

1. All communication devices must be turned off.
2. Competitors will be allowed to use:
  - a. Computers, USB keys, CDs, pre-existing files etc.
  - b. Internet
  - c. Reference books
 All other tools must be cleared with the competition coordinator before use. Cell phones, online communication (e.g. MSN, GoogleChat, Skype) or other communication devices are prohibited.
 

**Violation of these rules may result in disqualification.**
3. Visitors are not allowed throughout the development and build stage.
4. Keep work stations clean. Tidy up at the end.

## Schedule

The schedule for Consulting Engineering is as follows:

Friday, Nov. 2 <sup>nd</sup>	5:30 p.m. – 6:00 p.m.	Check-In	RCH 3 <sup>rd</sup> Floor
	6:00 p.m. – 6:30 p.m.	Welcome/Briefing/Question period	RCH 301
	6:30 p.m. – 11:30 a.m.	Design	RCH 3 <sup>rd</sup> Floor Rooms
	11:30 a.m. – 12:00 a.m.	Submissions/Debriefing	RCH 301
Saturday, Nov. 3 <sup>rd</sup>	7:30 a.m. – 8:00 a.m.	Competitor Check-In	E5 Main Floor
	8:00 a.m. – 2:00 p.m.	Presentation/Demonstration	E5 5106
	2:00 p.m. – 2:30 p.m.*	Prizes and Winner Announcements	E5 5106

\*Times are approximate and will be confirmed come competition day

Volunteers will bring food and drinks around to teams between 9:00 and 9:30 p.m. Each competitor will be given one (1) can of drink. Competitors are encouraged to bring water bottles as bottled water will not be provided. There will be water fountains nearby for refills. Please remind the competition coordinators and volunteers of your dietary restrictions and/or allergies

There will be a question period after the problem is presented during the briefing session. No questions will be answered during the development and build stage to ensure fairness in the competition.

**Background Information:**

Canada, for a great amount of time, has been considered to be an agricultural superpower. However, this “fact” is not as true as it seems. Canada is actually not the superpower that many Canadians believe it to be, the truth is that Canada’s agriculture industry is falling behind globally [1].

Trends have shown the significance of this problem. Over the past 15 years, there has been a 15% decrease in Canada’s share of the global wheat market, while government subsidies to farmers have increased to over 8 billion dollars annually [1].

Setting aside the Canadian issue for one second, and looking at the food crisis on a global scale, it is clear that significant changes need to occur if Canada is to help feed the world population. Stats have shown that from the 7 billion people living on this planet, there are nearly 1 billion people worldwide who are in a malnourished state [2]. That is one-seventh of the population, and with current UN projections stating that the population will reach 9 billion by 2050 [3], the potential of the global poverty rate increasing is tremendous.

The Canadian Federation of Agriculture over the past few years have been tackling problems addressing the policies, but technical advancement and planning still has a strong influence on the overall outcome.

**Problem Statement**

Your group has been hired by the Government of Canada to improve its agricultural industry in a holistic manner to regain its global significance while, boosting food security, and minimizing worldwide crisis and famine. You are free to consider both policy and technical solutions.

Any recommendations that are not revenue-neutral should be justified with the understanding that taxpayer dollars are limited and the government has a mandate to ensure businesses and consumers are satisfied, even in the recession.

Ideally, your solution will promote the agriculture industry’s global presence while maintaining sufficient supplies to accommodate the consumption within Canada itself.

Assume any current policy can be changed, upcoming projects can be cancelled or modified, and past projects can be continued or revived.

**Advice**

Go here: [http://wec.uwaterloo.ca/consulting\\_engineering.html](http://wec.uwaterloo.ca/consulting_engineering.html) to see how you will be judged (“Marking Scheme”) and what you’re supposed to be doing (“Deliverables”).

It is highly recommended (as the marking scheme shows) to use a structured engineering design method to form the outline of the report and presentation.

Some questions that can get you started (but that do not necessarily have to be answered word-for-word; they are just meant to help you address the problem statement):

- What different strategies are there to address agricultural demand at the national and international level?
- What are some possible metrics one can use to measure improvement in the industry?
- Is it best to diversify or specialize the export products?
- What effect can advanced technologies have in improving production?
- What effect can farmers play in reducing productivity?
- How would commercialization impact this industry

**Deliverables:**

- 1) A technical report detailing your analysis and suggested solution (body no more than 15 pages long)
- 2) A PowerPoint Presentation, 15-20 minutes in length

**Additional Resources**

Encyclopedia of the Nations.

<http://www.nationsencyclopedia.com/economies/Americas/Canada-AGRICULTURE.html>

Canadian Federation of Agriculture. <http://www.cfa-fca.ca/>

Global Research. <http://www.globalresearch.ca/global-famine>

For Competition Details and Marking Scheme; Deliverables; Permissible Tools please refer to [http://wec.uwaterloo.ca/consulting\\_engineering.html](http://wec.uwaterloo.ca/consulting_engineering.html)

You are expected to find your own data and statistics to support your analysis and solution

**References**

[1] The growing problem: Canada slips from agricultural superpower status. *The Global and Mail*, News, <http://www.theglobeandmail.com/news/national/time-to-lead/the-growing-problem-canada-slips-from-agricultural-superpower-status/article1316188/>

[2] Hunger Notes,

<http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm>

[3] United Nations, Department of Economics and Social Affairs.

[http://esa.un.org/wpp/Analytical-Figures/htm/fig\\_1.htm](http://esa.un.org/wpp/Analytical-Figures/htm/fig_1.htm)