

Fall 2009  
Waterloo Engineering Competition  
November 6-7

**Consulting Engineering  
Design Problem**



### General Rules & Guidelines

1. All communication devices must be turned off.
2. Visitors are not allowed throughout the development and build stage.
3. Keep work stations clean. Clean up at the end.

### Schedule

The schedule of the Junior Team Design competition is as follows:

Saturday, November 7	8:00 a.m. - 8:30 a.m.	Welcome and briefing	WEEF Lab
	8:30 a.m. - 12:30 p.m.	Design	WEEF Lab
	12:30 p.m. – 1:00 p.m.	Lunch	
	1:00 p.m. - 4:00 p.m.	Presentations	WEEF Lab

Drinks will be available throughout the development and build stage of the competition. Volunteers will bring pizzas around to teams between 9:00 and 10:00 p.m. 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. No questions will be answered during the development and build stage to ensure fairness in the competition.

## Background

"There is concern that Canada's landfills are reaching capacity and it is becoming increasingly difficult to find sites for new ones. Landfills also produce approximately 25% of Canada's methane emissions (methane is a powerful greenhouse gas). Recycling can help reduce the amount of waste entering landfills and help conserve natural resources.

Access to recycling programs has improved since the mid-1990s and Canadian households are recycling larger quantities than ever before. Income and education have little impact on recycling behaviour; households with access to recycling programs tend to use them equally.

However, differences in levels of access are apparent depending on dwelling type. Canadians who live in single detached homes are more likely to have access to recycling services than Canadians living in mobile homes or apartments. "

That is a quote from an article written in 2007 made available by Statistics Canada (source: <http://www.statcan.gc.ca/pub/16-002-x/2007001/article/10174-eng.htm>).

## Motivation

The purpose of this competition is to assist your client, Waste Diversion Ontario, which is still looking for more ways to reduce, reuse and recycle!

Some base questions:

- What are the issues?
- What are the root causes?
- Who do they impact?
- How much waste is generated in Ontario? Residential? Industrial?
- How much waste is recycled or diverted?
- Are the current waste diversion methods sufficient?
- What is e-waste? Is it a growing concern?

These are, however, merely motivation to your group to assist in solving a pressing question that has been given to you...

## Problem Statement

Waste Diversion Ontario has retained your group (feel free to give yourself a company name) to: *Evaluate Ontario's current waste diversion system, find weaknesses and propose solutions to how these weaknesses can be improved. Each recommendation should contain some background information and weigh the pros and cons of implementation.*

## Some Guidance

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. One good source to review is the Waterloo Cases in Design Engineering's "[Engineering Design Method](#)".

An **important** aspect of this report is the **proposal** outlining a next step or new idea that could be used to improve the system. This is a fairly open ended issue and therefore **creativity** is beneficial.

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):

- Why is it important for Ontario to have a system like this in place?
- What are the problems that are still being faced?
- What are the next steps?
- What regulations have already been imposed to help this cause? What regulations could be imposed to further the cause?
- An example is the regulation "recently" imposed to make grocery stores charge 5 cents for a plastic bag

## References

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).