

Official Rules

Canadian Engineering Competition

Canadian Federation of Engineering Students
Revised in fall 2007 by the CEC 2008 Organizing Committee

Ce document est aussi disponible en français

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General Rules and Definitions

The term *director* refers to the director responsible for the competition in which the section is founded. The director is appointed or chosen by the organizing committee and is the primary means of contact for competitors, judges and a liaison between the organizing executive.

Eligibility

The Vice President of Competitions determines the eligibility of all competitors, teams, and projects according to the following guidelines set out in this package.

Qualification

1 - The competitors, teams, and projects must have qualified during a regional competition, either the Atlantic Engineering Competition, the Compétition québécoise d'ingénierie, the Ontario Engineering Competition, or the Western Engineering Competition. A team must qualify by placing first or second in their category. If first or second place teams are unable to attend CEC, the third place team from the same region may be invited to attend CEC at the discretion of the VP Competitions.

2 – The teams at any regional competition that are moving on to CEC must be composed of members representing *active* member schools of the Canadian Federation of Engineering Students (CFES) in order to receive an invitation to CEC.

Competitors

3 - All competitors must be enrolled in a Canadian undergraduate engineering program and at least half of the competitors making up any one team must be enrolled in an accredited undergraduate engineering program at the time of the competition except in the following cases:

3a - In the cases of *Innovative Design* and *Engineering Communication*, the competitor must have graduated within a year of the competition from an accredited Canadian undergraduate engineering program and the project entered was completed before graduation. A letter will be required from the supervising professor confirming that no changes have been made to the project since the competitor's graduation. This letter must be dated no more than 30 days prior to the competition.

Project

4 - Only original projects, which are the work of the competitors, may be entered. An original project is one that has not been entered in the Atlantic Engineering Competition, the Compétition québécoise d'ingénierie, the Ontario Engineering Competition, the Western Engineering Competition, or the Canadian Engineering Competition in previous years. The project must not have a common or obvious approach, solution, or application.

5 - Work done during the course of employment related to the engineering degree is also eligible provided that an authorization letter is obtained from the employer allowing the work to be presented at the competition. The work must also meet other eligibility criteria.

Substitutions

6 – The team appearing at the Canadian Engineering Competition must be comprised of the whole original team as it competed at its respective regional competition.

7 - If a competitor is unable to attend the competition due to medical, personal, or other legitimate reasons, the team may compete in his or her absence as a reduced team, or may find a suitable replacement provided that they meet all of the qualifications as outlined in this document. This may only be done in cases of teams with three or more members and at the discretion of the VP Competitions.

8 - If a competition team is unable to send the required teammates to the competition due to medical, personal, or other legitimate reasons (as approved), the next runner-up team from the regional competition shall be eligible to compete.

Regulation Amendments

8 – These general regulations shall be considered the official regulations of the Canadian Engineering Competition, an activity run by the Canadian Federation of Engineering Students. These regulations can only be amended with the approval of the current Canadian Engineering Competition Activity Manager for the CFES (current at the time of vote) and with a two-thirds vote of the Advisory Board of the Canadian Engineering Competition.

1. Consulting Engineering

The purpose of the Consulting Engineering competition is to challenge competitors to design a detailed solution to a large-scale engineering problem. The proposal must be made in a way that promotes the solution to potential customers (in the form of judges). Competitors must demonstrate resourcefulness while acting in good faith with the spirit of the competition.

1.1. Team Composition

The Consulting Engineering team will be comprised of four competitors. At least half of the design team must be representing an accredited engineering program at an active CFES-member school.

1.2. Topic

It is recommended that the topic incorporate more than one engineering discipline. However, while the topic should challenge competitors' technical knowledge and skills, it should also allow room for competitors to evaluate the economic, environmental and social implications of their proposed solutions and address the requirements of the customer. The winning solution will not necessarily be the most technically effective solution, but the solution that has the most real-world applicability and forethought.

Therefore, the topic should be one that could exist in the real world. Topics drawn from reality must be fully documented. All necessary documentation must be provided to the competitors when the problem is presented.

1.3. Resources

1.3.1. Facilities Required

- 1 amphitheater (presentation of problem and team presentations)
- 1 workroom per team (design of solution)
- Simultaneous translation equipment (if judges are not bilingual)

1.3.2. Personnel Required

Judges

A minimum of three (3) judges (and in any excess, an odd number of judges) are required to assess the problem solving abilities, proposed solution, communication skills and team dynamics of the competitors. Judges in this category should come from a variety of backgrounds including communications, sales and technical or consulting engineering experience related to the topic.

Director

The competition director is responsible, along with the VP Competitions, for the design and implementation of the Consulting Engineering competition. The director must present the design problem at the beginning of the competition and answer any questions

raised by competitors. Only the director may answer questions during the design period. The director will also answer any questions the judges may have during the competition.

Official Timekeeper

The Official Timekeeper must be responsible for enforcing time limits during the question period, solution development and presentations, as stated in the rules.

1.3.3. Equipment Provided by CEC

The following equipment will be made available to all competitors during the design phase:

- A design room with at least one table, four chairs and a whiteboard or blackboard
- Paper and pencils/pens for writing
- 1 digital storage device to submit the team presentation
- 1 internet connection
- At least one laptop per team
- Some information relevant to the design problem, at the discretion of the competition director

The following equipment will be available to teams during the presentation phase:

- 1 Digital projector
- 1 Laptop containing the team's presentation file
- Simultaneous translation equipment if judges are not bilingual
- Whiteboard(s) or blackboard(s)

1.3.4. Allowed External Resources

The competitors are allowed to bring the following equipment with them:

- Any background research conducted by team members prior to the competition
- Any electronic material stored on CDs, USB keys, disks or other storage devices – *please check with the organizers to make sure the format of your electronic information will be accessible using the computers provided by CEC*
- Any textbooks, course notes or other reference material

Note: only one laptop will be able to access the internet through the provided internet connection. Any other laptop provided will be used solely to assist the team in preparing the report and presentation.

Important: since the use of the Internet and other external resources is permitted in this competition, all information used by competitors must be referenced very carefully. Competitors are not permitted to submit work completed by anyone other than the members of their team. If there is any evidence that competitors are submitting plagiarized work, the entire team will be eliminated from the competition and their home schools will be notified. Volunteers will monitor each team during the design process to deter teams from cheating, however, competitors are expected to act in good faith with the spirit of the competition.

1.4. Procedure / Timeline

1.4.1. Pre-Competition

At least seven days (168 hours) prior to the competition, the main theme(s) of the competition will be announced to the competitors, judges and public. Exact specifications of equipment available to teams during the competition (laptops, storage devices, available programs, etc.) will also be announced at this time.

1.4.2. Competition

1. Presentation of Problem

The problem must be presented to all competitors and judges at the beginning of the competition. The competition director must provide detailed explanations of what is expected from the competitors, both orally and in writing.

2. Question Period

Competitors then have 15 minutes to ask the competition director any questions. Only the time used to ask the questions (not the answers) should be counted in the 15 minutes. Time used by judges to pose questions will not be counted.

3. Solution Development

Teams will be given 4-6 hours (at the discretion of the organizers) to develop their solutions, produce all required deliverables, and prepare their presentations. All deliverables shall be submitted to the competition director before the end of the allotted time. Competitors may finish before the end of the allotted time.

4. Rest Period

Competitors must be allowed a minimum of one hour to rest before the presentation phase starts.

5. Solution Presentations

Competitors will have a maximum of 20 minutes to present their solutions. All team members must be present and participate in the presentation or be penalized by the judges. Judges then have a maximum of 10 minutes to ask questions. Judges can ask a question at anytime during the presentation. The clock should be stopped during these interruptions.

1.4.3. Timekeeping

The following rules will be adhered to with respect to timekeeping.

1. During the design phase:

- Time is started when all the teams have reached their work areas to develop the solution.
- The remaining time must be announced 3 hours, 1 hour, 30 minutes, and 10 minutes before the end of the allotted time.

2. During the presentation:

- Time is halted when a judge asks a question during the presentation.
- Time is halted when a team member answers a question asked by a judge.

- The remaining time must be indicated to the competitors 10 minutes, 5 minutes and 1 minute before the end of the allotted time for the presentation to the judges.
- A countdown presentation that is visible to both the judges and presenters must be given during the last 30 seconds of the competition.

1.4.4. Presentation Order

- Presentation order shall be determined randomly.
- Presentation order shall be announced one half-hour before the presentations commence. All teams are required to be present at this announcement.
- Teams are not allowed to switch places in the presentation order.

1.4.5. Deliverables

1. For Competitors

Each competitor will receive, electronically, 7 days in advance of the competition, a package outlining the main themes of the competition. This theme will also be posted on the official CEC website. It is the competitors responsibility to ensure that they have received the package.

Each team will receive, in hard copy, a package outlining the problem definition, design and presentation requirements, rules, marking scheme and any other information deemed necessary by the competition director on the day of the competition.

2. From Competitors

Each team is required to submit, electronically, before the end of the design period, a report of 5-10 pages detailing their proposed solution. The report will be made available to the judges before each team's presentation. The report requirements will be outlined in the problem design package.

Each team is required to submit, electronically, before the end of the design period, a presentation about their proposed solution. The requirements of the presentation will be outlined in the problem design package.

1.4.6. Response to Questions

- Only the competition director may answer questions during the problem presentation and design phases. Volunteers and judges may not answer questions regarding rules and procedures at any time.
- During the presentation of the problem, the competition director shall answer orally and write down the answers provided.
- During the design phase, only questions related to deliverable content shall be answered. No answers shall be provided in response to questions about the problem that might lead to the development of a new approach or which might invalidate a solution.
- During the design phase, answers to questions shall be provided in writing to all teams at the same time. A certain amount of time (e.g. 15 minutes) may be allowed to elapse or a significant number of questions accumulated before

responses are provided. A copy of the responses must be provided to the judges prior to the presentations.

1.5. **Assessment and Judging**

- The panel must have an odd number of judges.
- The panel must have three (3) to nine (9) judges.
- The judges should be bilingual or the room equipped for simultaneous translation.
- The presentations shall be carried out without an audience.

1.5.1. **Judging Matrix**

Solution	50%
Addresses problem statement	
Environmental, social, and economic analyses	
Technical feasibility	
Real-world applicability	
Report	20%
Clarity, writing style and professionalism	
Deliverable compliance with expectations	
Presentation	20%
Voice, articulation and timing	
Visual aids	
Innovation	10%
*Insufficient Resource Citations	-50%
Total	100%

2. Engineering Communication

This competition challenges competitors to describe a complicated technical process or issue in terms that the general public can understand.

2.1. *Team Composition*

The Engineering Communication team will be comprised of one (1) or two (2) competitors. The whole team must be representing an accredited engineering program at an active CFES-member school.

Should the presenting team be a subset of the project team, the remaining members of the project team must sign a letter authorizing presentation of the project in order for it to be eligible for the competition.

2.2. *Topic Eligibility*

A topic should adhere to the following criteria:

- The topic must be technical in nature
- The presentation will assess social, environmental and economic ramifications of implementation

2.3. *Resources*

2.3.1. **Facilities Required**

- 1 amphitheatre for presentations
- Simultaneous translation equipment (if judges are not bilingual)

2.3.2. **Personnel Required**

Judges

A minimum of three (3) judges are required to assess the communication skills of the competitors. Judges in this category should have some experience with communications and public speaking. Judges are not required to have any technical engineering experience. If there are more than three (3) judges, they must be odd in number.

Director

The competition director is responsible for the implementation of the Engineering Communication competition. The director must be present at all of the presentations and be available to competitors and judges at any time for questions and requests.

Official Timekeeper

The Official Timekeeper is responsible for enforcing time limits during the presentations. This role can be run jointly with the director.

2.3.3. Equipment Provided by CEC

The following equipment will be available for use by the competitors during their presentations:

- 1 Digital projector
- Microphone(s) for simultaneous translation if judges are not bilingual
- 1 table
- Blackboard(s) or whiteboard(s)

2.3.4. Allowed External Resources

Competitors are required to bring any presentation materials which they will use, including laptops, pictures or diagrams and models or prototypes. A laptop will also be made available should competitors be unable to supply their own.

2.4. Procedure / Timeline

2.4.1. Pre-Competition

At least fourteen (14) days (336 hours) prior to the competition, the team must submit a presentation abstract. The abstract will be reviewed by the Competition Director to assess the suitability of the presentation for inclusion in the Engineering Communication competition. It will be given to the judges for information at least seven (7) days (168 hours) prior to the competition. The abstracts will also be distributed to all CEC competitors upon arrival at the competition.

The abstract must describe the presentation topic in no more than 200 words. It must also state the competitor name(s), school and regional competition attended (OEC, QEC, WEC, AEC).

2.4.2. Competition

1. Presentation Period

Competitors have thirty (30) minutes to present the topic in detail, explained in terms that the public can understand. They must also present the technology's environmental, social, economic and other impacts, and whether these impacts are positive or negative. Lastly, the competitors must give a critical discussion of the technology and associated issues.

2. Question Period

The judges then have a maximum of fifteen (15) minutes to ask questions. If time permits, the audience may also be allowed to ask questions.

2.4.3. Timekeeping

The following rules will be adhered to during the presentation.

- The time must be stopped when a judge asks question during the presentation period.
- The time must be stopped while a team member responds to a question asked by a judge during the presentation period.

- The remaining time must be indicated to the competitor(s): 20 minutes, 10 minutes, 5 minutes, and 1 minute before the end of the presentation.
- A visual countdown must be given during the last 30 seconds of the presentation.
- The timing of the question period after the presentation shall be for information purposes only.

2.4.4. Presentation Order

- The order of the presentations shall be determined randomly.
- Competitors shall be informed of their presentation time at least twelve (12) hours in advance.

2.4.5. Deliverables

1. Presentation Abstract

Prior to the competition, the team must submit a presentation abstract. The purpose of this abstract is for the judges and organizers to be prepared.

The abstract must be a maximum of two hundred 200 words describing the presentation topic. It must also state the competitor name(s), school and regional competition (OEC, QEC, WEC, AEC).

2. Presentation Slides

Competitors must supply a soft copy of their presentation to the Competition Director prior to the day of the competition. These slides will be used to aid the judges in keeping notes and providing feedback when necessary and desired.

2.5. *Assessment and Judging*

- Judges should have experience in communications.
- Judges do not require any technical knowledge on the subjects being presented.
- The panel must have an odd number of judges.
- The panel must have three to nine judges.
- Judges should be bilingual or the room equipped for simultaneous translation.
- The assessment shall be carried out in the audience's presence.
- Feedback forms from the judges shall be provided to each team prior to the closing of the competition.

2.5.1. Judging Matrix

Introduction to topic	25%
Topic clearly presented	
Appropriate level of language	
Interest elicited by topic	
Accuracy of explanation	
Critical analysis	25%
Environmental, social, economic, and other analysis	
Quality of arguments	
Presentation	40%
Voice and articulation	
Visual aids	
Timing	
Written Abstract	10%
<hr/>	
Total	100%

3. Extemporaneous Debate

Competitors must use analytical techniques to present, with minimum preparation, a reasoned point of view of a resolution that has not been disclosed beforehand. The goal is to assess the competitors' abilities to convey ideas and develop arguments. The purpose is not to assess competitor knowledge of parliamentary procedure and formal debating rules. Therefore, the rules normally used in debates have been modified and relaxed to enable students with no formal debate experience to take part.

The debate will be conducted in a parliamentary debate format.

3.1. Team Composition

A debate team must consist of two members. Both team members must be enrolled in an undergraduate engineering program in an active CFES member school.

3.2. Resources

3.2.1. Facilities Required

- 1 amphitheater
- 1 room for judges' deliberation
- 1 room for debater's preparation

3.2.2. Personnel Required

Judges

A minimum of five judges are required to assess the problem solving abilities, proposed solution, communication skills and team dynamics of the competitors. Judges in this category should come from a variety of backgrounds. It is not necessary for judges to have technical experience relating to the topic, but it is suggested that judges have knowledge and/or experience in debating.

Competition Director

The Competition Director and VP Competitions are responsible for the entire implementation of the Debate competition. The Director must work with the Mediator in developing the debate topics, schedule and overall competition procedure. It is recommended that the Director have previous experience in debates, preferably at the Canadian Engineering Competition or a regional competition.

Debate Mediator/Debate Chair

The Debate Mediator, otherwise known as a Debate Chair, is the expert in debate procedure and interpretation. The Mediator acts as an impartial judge and ensures that the judges understand the rules of the debate.

The Chair of the debate ensures the rules of the debate are upheld. He or she grants the right to speak (introduces the debater) and enforces the time limits. Most importantly, the

Chair makes rulings on the “points of procedure” put forward by the debaters. The decisions of the Chair are final.

Timekeeper

The timekeeper is responsible for ensuring that competitors stay within their allotted time limits. The timekeeper will inform speakers of specific time intervals.

The Timekeeper will use hand signals to indicate the number of minutes a speaker has left to conclude their argument. The Timekeeper will also give a fifteen (15) second final countdown. If a question is asked in the first or last minute of the speech, the Timekeeper will indicate this to the Chair so that it can be stopped. If a member of the debater team knocks on the table during the final fifteen (15) seconds, the Timekeeper will permit an extra and final fifteen (15) seconds of grace.

3.2.3. Equipment Provided by CEC

- 1 display board, projector, chalkboard or whiteboard is required to display the debate topic during the debate
- 1-3 stopwatches (a stopwatch for each speaking team is optional but encouraged)
- 2 tables
- 1 podium with microphone
- 1 microphone for each team table and 1 for judging table, to total 3 microphones
- Simultaneous translation equipment

The layout of the amphitheatre should place the tables and podium at the front of the room. The first row of the amphitheatre will be reserved for the judges, moderator and timekeeper. This should be completed to allow for a preparation room for the opposition.

3.2.4. Allowed External Resources

External resources such as stopwatches, writing pads and other tools are allowed at the discretion of the debate mediator and judges. Props used to aid the debate which are not made available to all debaters are not permitted.

3.3. *Debating Rules and Elements*

3.3.1. Teams

The debate is between two teams, each with two members. The proposition will be given the task of presenting an initial set of ideas and arguing their validity. The opposition will then proceed to show how these ideas are undesirable. Before the resolution is revealed, a coin toss is held. The team that wins the toss gets to pick the side that they want to represent. Teams are expected to act responsibly at all times. Inappropriate language or offensiveness towards the other team, the officials, or the audience is not acceptable. Teams are expected to direct all of their speeches towards the audience.

3.3.2. Resolutions

The resolutions will be assigned by the organizing committee and will be validated by the Debate Chairs before the competition begins. They will be related to an issue that the average engineering student should have a defensible opinion on without any preparation. The resolutions will not be truisms. Absolute words such as "all," "everyone," and "always" will also be avoided (eg, "Be it resolved that all engineers are good at math" is not a good resolution, since there are always exceptions). Once both teams are informed of the resolution, they are given ten minutes to prepare for the debate.

3.3.3. Time Allotted to Debaters

The speaking order and times will be as follows:

- First speaker of the proposition: 5 minutes
- First speaker of the opposition: 5 minutes
- Second speaker of the proposition: 5 minutes
- Second speaker of the opposition: 5 minutes
- Rebuttal by the first speaker of the opposition: 2 minutes
- Rebuttal by the first speaker of the proposition: 2 minutes

If a debater is over the time limit, the Chair will allow a fifteen (15) second grace period. Upon the exhaustion of speaking time, loud pounding on tables will be deemed appropriate.

3.3.4. Role of the Proposition

The proposition must narrow down the resolution so that the debate will be about one major topic. The resolutions must not be squirreled or converted into truisms. Squirreling is the act of redefining the resolution so that it has a meaning different than the one intended by the resolution. The proposition must also avoid specific knowledge debates where the average engineer has no familiarity with the topic. The proposition can follow one of two different strategies in the debate:

The Principle Case

In a principle case, the proposition presents a principle and a contention. The principle is a general statement that is debatable based on facts, experience, or morals. Examples include "engineers need to be well rounded" and "Canadians abuse the free health-care system." The contention is the application of the principle to a particular situation relating to the resolution. The contention must be about one major topic and may be a re-statement of the resolution. Example contentions for the above principles would be: "Engineering students should be required to take more complementary studies classes" and "People should be discouraged from going to a doctor unless necessary."

The Plan Case

In a plan case, the proposition still identifies a principle and a contention. Once this is done, they present a plan for implementing the contention and changing the status quo. They must identify the need for change and how the plan will induce this change. Example plans for the above contentions would be: "Students should be required to take two years of general studies before entering an engineering program" and "Individuals should be charged a fee every time they visit a doctor." The plan case is the most

effective when the principle and contention are almost non-debatable. For example, if the resolution is “Be it resolved that waste management should become more stringent,” the contention is almost unquestionable. However, the proposition can intensify the debate by adding, “Thus, we propose that any household that produces more than a certain quota of waste be severely fined.” In a plan case, it is important that the plan does not become too specific since preparation time is limited and the technical knowledge necessary to develop the plan is non-existent.

3.3.5. The First Speaker

The first speaker of the proposition must explain the interpretation of the resolution, clearly state the principle and contention, and clarify any definitions. If a plan case is introduced, the entire plan must be outlined in the first speaker's speech. Finally, the first speaker must initiate the argumentation for the contention and plan.

3.3.6. The Second Speaker

The second speaker of the proposition continues the argumentation of the first speaker and reaffirms concepts that have been attacked by the opposition. New parts of a plan may not be introduced and terms in the resolution may not be defined. New lines of argumentation and new evidence, however, may be introduced.

3.3.7. Role of the Opposition

The opposition's task is to convince the judges that the proposition's views are fallacious. If the case presented by the proposition is a truism or requires specific knowledge to debate, the opposition can appeal to the judges with a "point of procedure" (Section 3.3.11) at the beginning of the first speech from the opposition. If the point is well taken, then the opposition must redefine the resolution in a debatable manner. If the proposition presents a principle case, the opposition is left with little more to do than attack the principle. If the proposition presents a plan case, the opposition can attack the principle, the contention or the arguments for the plan. The opposition can also show how the plan will not work or identify the undesirable side effects that it will create. Finally, the opposition may propose a counter plan that is more effective than the original plan. The first speaker of the opposition must introduce counter plans.

3.3.8. Rebuttals

In the rebuttals, the most prevalent elements of the debate must be summarized in a concise and convincing manner. No new arguments or facts may be presented unless they directly refute what has already been discussed.

3.3.9. Questions

Questions are a secondary means of refuting arguments. They can promptly point out deficiencies in ideas. The debater who currently holds the floor has the authority to take or ignore questions. The opponent who wishes to ask a question indicates their desire by simply standing up. If the debater does not wish to take the question, he or she can so indicate by a wave of the hand or a simple "no, thank you." If this occurs, the inquiring party must sit down. If the current debater wishes to entertain the question, it must be

stated by the opponent in less than 15 seconds. Both team members may take part in answering the question. The time used to ask and answer the question comes out of the current debater's allotted time. Each debater must accept one question during his or her speech, if the opponent is making an honest attempt to ask a question. Three attempts at asking a question constitutes an honest attempt. Questions will not be allowed in the first or last minute of a speech, or during rebuttals.

3.3.10. Heckling

Often, the speaker can contradict himself/herself or make an absurd assumption. Heckling at this time will point out the error and add to the debate. Heckling is acceptable if it is short, to the point and preferably witty. If excess heckling becomes disturbing, the Chair may intervene.

3.3.11. Points of Procedure

If a team believes that one of the rules of the debate have been broken, they must immediately alert the Chair of the violation by standing and saying "Point of Procedure." The Chair will then respond with, "Make your point." The team will then proceed to explain how the debate rules have not been followed. Finally, the Chair will rule on the point by saying, "Point well taken" or "Point not taken." If it is obvious that the Chair is incorrect, the team should not argue with the Chair, but expect the judges to compensate for the Chair's shortcomings. The time it takes to rise and rule on a point is not included in the speaking time of the team currently debating. The following are violations that warrant a point of procedure:

- unprofessional behavior;
- offensive behavior;
- truism*;
- presentation of a specific knowledge case*;
- misquotations;
- speaking to the opposition instead of the audience;
- presenting new arguments in the rebuttal;
- introduction of parts of a plan by the second speaker.

(*If the proposition has presented a truism or specific knowledge case, the opposition must wait until the end of the first debater's speech to point this out.) Moreover, if the officials have failed to follow the rules of debate (incorrect speaking order, too much speaking time allowed, etc.), it may be politely pointed out to them with a Point of Procedure.

3.4. Procedure / Timeline

3.4.1. Pre-Competition

These rules are to be made available to all competitors and judges at least seven (7) days (168 hours) prior to the competition.

A competition briefing will be held before the commencement of the competition and will include the debate moderators/chairs, timekeeper, Competition Director, VP Competitions, judges and competitors. The debate moderators/chairs will run the briefing

and review the rules, tips and expectations for the debates. The purpose of the briefing is not to elude to potential debate topics, but to ensure that all rules and procedures are understood by judges and competitors. There is no timeline for this briefing and questions may be fielded at the discretion of the debate moderators and Competition Director.

3.4.2. Presentation Order

The debate schedule will be prepared at random and presented at the pre-competition briefing (at least thirty (30) minutes prior to the first debate). This schedule will remain visible and updated systematically throughout the Debates competition. The schedule should also illustrate the path which a team will follow depending on wins and losses.

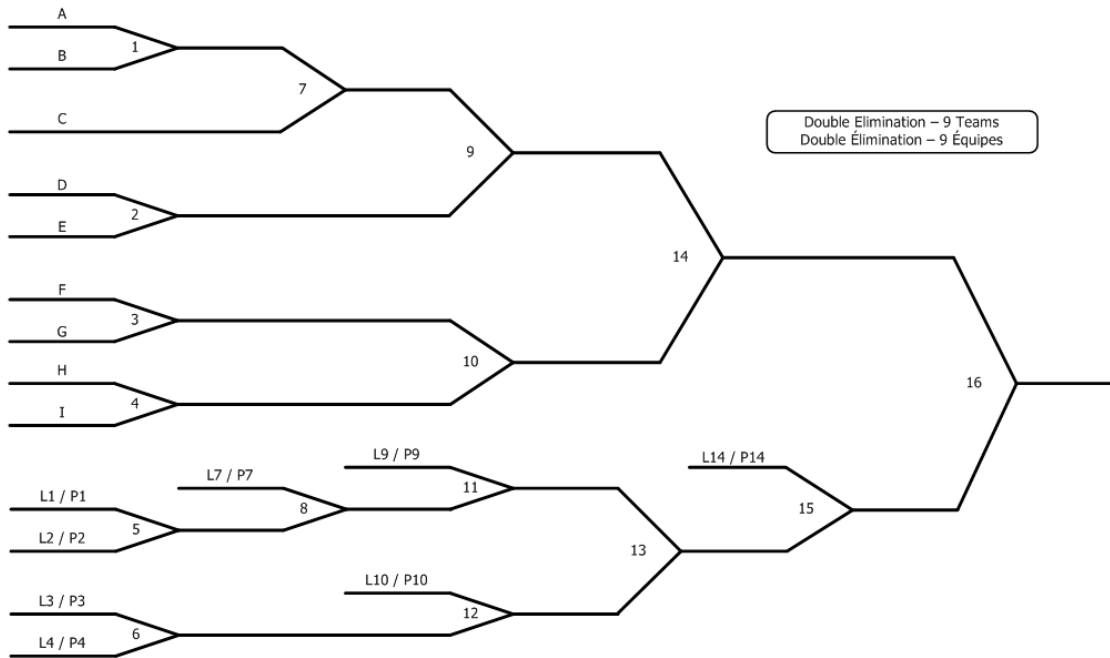
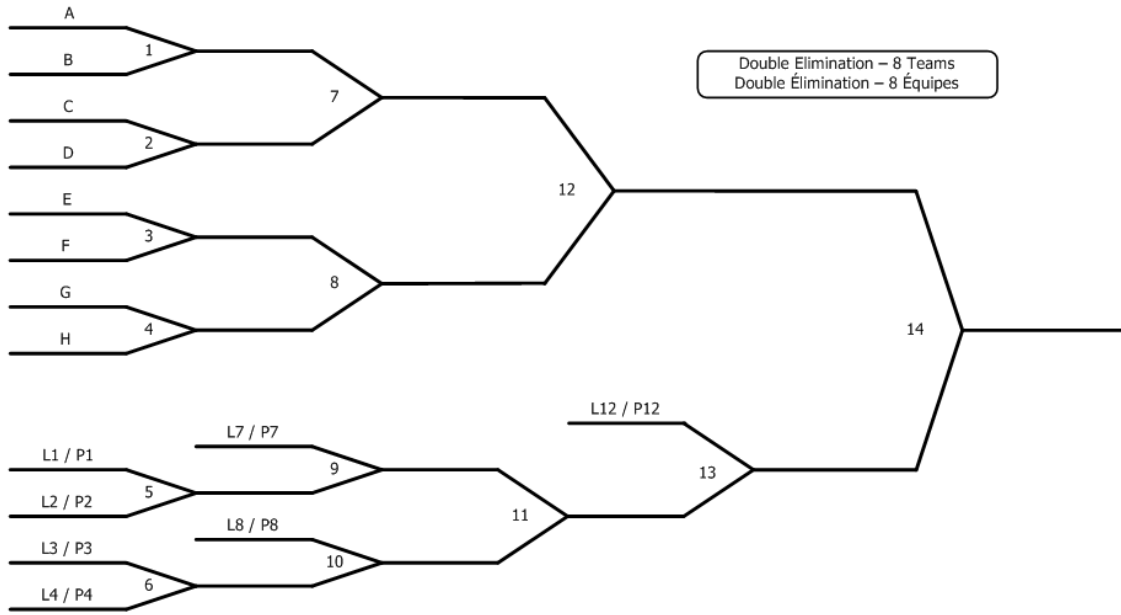
3.4.3. Double Elimination

The debate competition will follow a double elimination format which ensures all teams will get to participate in at least 2 debates. The competition begins with matches between randomly assigned pairs of teams. Once each team has debated once, the losers from the matches will face each other in a second "tree". (Note, in the case of an odd number of teams, all but one team will debate before the second tree commences.) The debates then proceed in the same format with the first tree being those teams that have not lost a match, and the second tree for those that have lost a single match. Once a team has lost 2 matches, they are out of the competition. The final match is between the top teams from each tree, and the third place team is the one with the most wins that didn't make it to the final.

Teams may have to debate two or more times in a row, due to the dynamic nature of the format, however the Debate Director should do their best to ensure teams are given reasonable breaks between debates. Double elimination is used to ensure a minimum level of team participation, therefore if a team proceeds unbeaten until the final round, only to lose to another team, there will not be an additional final debate.

Please see the graphics below for sample breakdowns for 8 and 9 team debate competitions, where the number signifies the match number and Lx denotes the losing team of match number x.

Extemporaneous Debate



3.5. Assessment and Judging

3.5.1. Judging

The debate is judged based upon the most convincing argument. Each judge will decide individually and the debate chair will tally the decisions and announce the winner. The winning team will then move to the next round.

3.5.2. Feedback

After the conclusion of the debate and the announcement of the winning team, judges may elect to provide feedback to the competitors in the form of writing. The Competition Director will provide forms which can be used as a guideline for comments.

4. Innovative Design

The innovative design competition is prepared entirely outside the realm of the Canadian Engineering Competition. Competitors choose their own topic, prepare research and develop a design. The designs must be new and innovative and address a void in society.

4.1. Team Composition

The innovative design team may be comprised of one to four competitors. At least half of the design team must represent an accredited engineering program at an active CFES-member school. The whole team must be in the Engineering Faculty (or equivalent) at a CFES-member school.

Should the presenting team be a subset of the project team, the remaining members of the project team must sign a letter authorizing the presentation of the project in order for it to be eligible for the competition.

4.2. Topic/Project Eligibility

The topic should adhere to the following criteria:

- The project must be technical in nature
- The project must have a design component
- The project must assess social, environmental and economic ramifications of implementation

While the above list provides a guideline to project selection, no projects will be disallowed due to the topic selection. The judging criteria provide a component which analyses the applicability of the project's topic.

4.3. Resources

4.3.1. Facilities Required

An exhibition hall is required to allow competitors to set up displays and perform presentations for the judges. This hall should be in a central location and must be open to the public during the competition.

4.3.2. Personnel Required

Judges

A minimum of five judges are required to assess the skills, abilities, and topics of the competitors.

Director

The competition director is responsible for the logistics and implementation of the Innovative Design competition. The director must be available to competitors and judges at any time for questions and requests.

Official Timekeeper

The Official Timekeeper is typically the Director who enforces the time limits and the rules governing the displays.

4.3.3. Equipment Provided by CEC

The following equipment will be made available to all competitors during the competition time period:

- A single 4' x 8' table
- Electrical power supply for each team
- Internet source (LAN or Wireless)

4.3.4. Allowed External Resources

There is no restriction on the resources which competitors are allowed to bring to the competition. A list of resources must be provided to the Competition Director in accordance with Section 4.4.1.

4.4. Procedure / Timeline

4.4.1. Pre-Competition

14 days (336 hours)	<p>Competition Brief</p> <ul style="list-style-type: none"> • A one page competition brief, detailed in Section 4.4.5 (Deliverables). <p>Announcement of Constraints</p> <ul style="list-style-type: none"> • Space constraints and other logistical constraints must be described to the competitors (maximum display dimensions, maximum display height, use of flammable or dangerous products prohibited, etc.). • Location where all display material, models and equipment will be shipped to and stored must be announced.
7 days (168 hours)	<p>Layout and Specific Needs</p> <p>Competitors must convey the following information to the Competition Director:</p> <ul style="list-style-type: none"> • Any specific needs (layout, electrical, power supply, etc.). • A sketch of the anticipated layout, including placement of the display board and any equipment or models. • The planned shipping modes of displays or equipment including arrival time.
12 hours	<p>Set-up</p> <ul style="list-style-type: none"> • Competitors set up their displays the evening before the display. Compliance with the dimension constraints are checked at the same time.

	<p>Competition Briefing</p> <ul style="list-style-type: none"> • The Director will host a competition briefing, attended by the competitors and judges, where details of the competition timeline and judging structure are discussed. There will be time allowed for questions. • At the briefing, each team will be asked for a copy of their presentation handouts (Section 4.4.5)
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4.4.2. Competition

1. Public Opening

The exhibitions are open for visits from the general public. Competitors must staff their displays for a minimum of 4 hours a day, including 2 hours during judging periods. Judging periods are to be indicated during the competition briefing.

2. Judging

The judges, either individually or in groups of not more than three, will walk among the displays during the judging period. The competitors must give a 20-minute presentation, followed by a 10-minute question period, at their displays. They must use only the resources at their display to illustrate their work. Competitors will be required to give their presentation more than once as each judge must see all displays, but not at the same time.

4.4.3. Timekeeping

The following rules govern timekeeping:

- Time is **not** halted when a judge asks a question during the presentation.
- The remaining time must be indicated to the competitors ten (10) minutes, five (5) minutes, and 1 minute before the end of the allotted time for the presentation.
- A visual countdown must be given during the last 30 seconds of the presentation.
- Time to both ask and answer questions during the question period is counted.

4.4.4. Presentation Order

Presentation order will be chosen and presented at the competition briefing. The order will be selected at random, adhering to the following criteria:

- The judges may view the presentations either individually or in small groups of up to three people.
- Competitors will be required to give their presentation more than once.
- The order should allow all the judges to visit all the displays.
- The order shall prevent the judges from visiting the displays in the same order.

4.4.5. Deliverables

Design Summary

Prior to the competition, the team must submit a design summary. The purpose of this summary is for the judges and organizers to be prepared ahead of time with regard to the topics.

This summary will follow conventional formatting characteristics (12 point font, 1.5 line spacing, 1” paper margins) and is limited to one (1) page. The summary must include, but is not limited to:

- Team Name
- Team Members
- School / Regional Competition (OEC, QEC, WEC, AEC)
- Design topic and description

Presentation Handouts

If a slideshow presentation is to be utilized, a hard copy of all slides must be prepared for each judge. The page layout must include 3 slides per page with space for notes.

4.5. Assessment and Judging

- The judges must be selected in part for having some expertise in the areas studied.
- The panel must have an odd number of judges.
- The panel must comprise a minimum of five judges. There is no maximum number of judges.
- The judges must be bilingual.

4.5.1. Judging Matrix

Project	70%
Design justification	
Environmental and social feasibility	
Economic feasibility	
Technical feasibility	
Innovation	
Presentation	20%
Visual aids	
Voice and articulation	
Timing	
Written Abstract	10%
Total	100%

5. Team Design

This competition challenges junior engineering students to design and build a prototype to address a technical problem. The Team Design category is similar to the Senior Team Design competition, but emphasis is placed on prototype functionality rather than design theory.

5.1. Team Composition

The design teams must be comprised of a maximum of four competitors. At least half of the design team must represent an accredited engineering program at an active CFES-member school. The whole team must be enrolled in a program found in the Faculty of Engineering (or equivalent) at a CFES-member school. The team must be entirely comprised of students in their 1st or 2nd year of an undergraduate, engineering program.

5.2. Resources

5.2.1. Facilities Required

- 1 amphitheater (presentation of problem and team presentations)
- 1 large workroom, subdivided with partitions for each team or 1 separate workroom per team
- 1 centralized competition presentation/testing space (location will depend on the constraints of the design problem)
- Simultaneous translation equipment (pending bilingual judges)

5.2.2. Personnel Required

Judges

A minimum of five judges are required to assess the problem solving abilities, efficacy of solutions and team dynamics of the competitors. Judges in this category are not required to have a technical background, however, an understanding of effective presentation techniques and other engineering ‘soft’ skills are an asset.

Director

The competition director is responsible, along with the VP Competitions, for the entire design and implementation of the Team Design competition. The director must present the design problem at the beginning of the competition and answer any questions. Only the director may answer questions during the design period. The director will also answer any questions the judges may have during the competition.

Official Timekeeper

The Official Timekeeper is responsible for enforcing time limits during the solution development period and the presentations.

5.2.3. Equipment Supplied by CEC

1. The following equipment will be made available to all competitors during the design phase:
 - A design area with at least one table, four chairs and at least one of a whiteboard, chart paper or blackboard
 - Paper and pencils/pens for writing
 - Any materials and/or tools specific to the design problem
 - Power source if powered tools supplied
2. The following equipment will be available to teams during the presentation phase:
 - 1 table
 - Microphone(s) for simultaneous translation if judges are not bilingual
 - Whiteboard(s) or blackboard(s)

5.2.4. Allowed External Resources

No external resources are allowed for the Team Design competition.

5.3. Procedure / Timeline

5.3.1. Pre-Competition

Information about the rules of the competition will be sent to all competitors. A detailed competition timeline will also be provided as well as any background information which may be deemed necessary by the Competition Director.

5.3.2. Competition

1. Presentation of Problem

The problem will be presented to all competitors and judges at the beginning of the competition. The Competition Director will provide detailed explanations of what is expected from the competitors, both orally and in writing.

2. Question Period

Competitors then have fifteen (15) minutes to ask the Competition Director any questions they may have. Only the time used to ask the questions (not the answers) should be counted.

3. Development of the Solution

The teams will have four (4) hours to develop their solution, produce all required deliverables, and prepare their presentation for the judges. All the deliverables must be submitted to the Competition Director before the allotted time expires. Competitors may finish before the end of the allotted time.

4. Rest Period

Competitors must be allowed a minimum of two (2) hours to rest before the presentation and testing phase starts.

5. Presentation and Tests

Competitors have five (5) minutes to present their designs. All team members must be present and participate in the presentation. The original design, its rationale, a description of the design process, and a critique of the prototype are required presentation components. The judges then have a maximum of ten (10) minutes to ask questions.

Each team will then carry out a set number of tests of their design. The number and length of tests must be dictated by Competition Director during the presentation of the problem. The testing may be carried out directly after each team's presentation or after all presentations are complete, at the discretion of the Competition Director.

5.3.3. Timekeeping

- Time is halted when a judge asks or answers a question while the problem is being presented.
- Only the time used to ask questions during the question period is counted, not the time used to answer questions.
- Time for the solution development period is started when all the teams have reached their work areas
- The remaining time for solution development must be announced 2 hours, 1 hour, 30 minutes, and 10 minutes before the end of the allotted time.
- The remaining presentation time must be indicated to the competitors 2 minutes and 1 minute before the end of the allotted time.
- A visual countdown must be given during the last 30 seconds of the presentation to the judges.

5.3.4. Presentation Order

- Presentation order shall be determined randomly.
- Presentation order shall be announced thirty (30) minutes before the presentations to the judges commence. All teams are required to represent themselves at this announcement.
- Teams are not allowed to switch places in the presentation order.

5.3.5. Deliverables

From Competitors

Each team is required to submit a prototype of their design before the end of the design period. This design will be used to test the team's solution to the design problem.

No reports or presentation materials are required in the Team Design competition. Teams may use visual aids in their presentations if they so desire, however, emphasis should be placed on a clear explanation of the design and the functionality of the prototype. This is reflected in the judging criteria.

5.3.6. Response to Questions

- Only the Competition Director may answer questions during the problem presentation and design phases. Volunteers and judges may not answer questions regarding rules or procedures at any time.

- During the presentation of the problem, the Competition Director shall answer orally and write down the answers provided.
- During the design phase, only questions related to deliverable content shall be answered. No answers shall be provided in response to questions about the problem that might lead to the development of a new approach or that might invalidate a solution.
- During the design phase, answers to questions shall be provided in writing to all teams at the same time. A certain amount of time (e.g. 15 minutes) may be allowed to elapse or a significant number of questions accumulated before responses are provided. A copy of the responses must be provided to the judges prior to the presentations.

5.4. Assessment and Judging

- The panel must have an odd number of judges.
- The panel must have five to nine judges.
- The judges should be bilingual or the room equipped for simultaneous translation.
- The assessment shall be carried out in the audience's presence.

5.4.1. Judging Matrix

Presentation	20%
Design process	
Design justification	
Presentation delivery	
Design Quality	50%
Deliverable compliance with expectations	
Technical innovation	
Use of Resources	
Testing	30%
Total	100%

6. Senior Team Design

This competition challenges competitors to design a solution and build a prototype to address a technical problem.

6.1. Team Composition

The Senior Design team will be comprised of a maximum of four competitors. At least half of the design team must be representing an accredited engineering program at an active CFES-member school. The whole team must be enrolled in a program within the Faculty of Engineering at a CFES-member school.

6.2. Resources

6.2.1. Facilities Required

- 1 amphitheater (presentation of problem and team presentations)
- 1 workroom per team (design of solution and prototype construction)
- 1 competition/testing space (location will depend on the constraints of the design problem)
- Simultaneous translation equipment (dependant on bilingual judges)

6.2.2. Personnel Required

Judges

A minimum of five judges are required to assess the problem solving abilities, efficacy of solutions and team dynamics of the competitors. Judges in this category should have some technical engineering experience.

Director

The competition director is responsible, along with the VP Competitions, for the design and implementation of the Senior Team Design competition. The director must present the design problem at the beginning of the competition and answer any questions. Only the director may answer questions during the design period. The director will also answer any questions the judges may have during the competition.

Official Timekeeper

The Official Timekeeper is responsible for enforcing time limits during the solution development period and the presentations.

Volunteers

A minimum of five volunteers (one volunteer for every two teams plus one extra) are recommended to carry out various support tasks during the design period. A minimum of two volunteers are required during the presentation and testing phases.

6.2.3. Equipment Provided by CEC

The following equipment will be made available to all competitors during the design phase:

- A design room with at least one table, four chairs and a whiteboard or blackboard
- Paper and pencils/pens for writing
- At least one laptop per team
- 1 digital storage device to submit the team presentation
- Any materials and/or tools specific to the design problem

The following equipment will be available to teams during the presentation phase:

- 1 Digital projector
- 1 laptop to load presentations
- 1 table
- Simultaneous translation equipment
- Whiteboard(s) or blackboard(s)

6.2.4. Allowed External Resources

The competitors are allowed to bring the following equipment with them:

- Any textbooks, course notes or other reference material.

Note: Internet access will not be provided or permitted during the design phase.

6.3. Procedure / Timeline

6.3.1. Pre-Competition

At least seven (7) days (168 hours) prior to the competition, the main theme(s) dealt with during the competition will be announced to the competitors. Moreover, they will receive a list of all required or optional equipment, software, and/or tools.

6.3.2. Competition

1. Presentation of Problem

The problem must be presented to all competitors and judges at the beginning of the competition. The competition director must provide detailed explanations of what is expected from the competitors, both orally and in writing.

2. Question Period

Competitors have fifteen (15) minutes to ask the competition director any questions they may have. This takes place during the competition briefing, after the presentation of the problem. Only the time used to ask the questions should be counted, not the time used to answer the questions.

3. Development of the Solution

The teams will have eight to ten (8 - 10) hours to develop their solution, produce all required deliverables, and prepare their presentation for the judges. All the deliverables must be submitted to the competition director before the allotted time expires. Competitors may finish before the end of the allotted time.

4. Rest Period

Competitors must be allowed a minimum of six hours to rest before the presentation phase starts.

5. Presentation and Tests

Competitors will be directed to the presentation schedule at least thirty (30) minutes prior to the first presentation. Competitors have fifteen (15) minutes to present their designs. All team members must be present and participate in the presentation or be penalized by the judges. The original design, its rationale, a description of the design process, and a critique of the prototype must be presented. The judges then have a maximum of fifteen (15) minutes to ask questions.

Each team will carry out two tests of their design (or an alternate number of tests specific to the design problem, at the discretion of the competition director). The testing may be carried out directly after each team's presentation or after all presentations are complete, at the discretion of the Competition Director.

6.3.3. Timekeeping

The following rules will be adhered to with respect to timekeeping.

During the problem presentation:

- Time is halted when a judge asks a question during the presentation of the problem.

During the design phase:

- Time is started when all the teams have reached their work areas during development of the solution.
- The remaining time must be announced five (5) hours, one (1) hour, thirty (30) minutes, and ten (10) minutes before the end of the allotted time.

During the presentation and testing phase:

- Time is halted when a judge asks a question during the presentation.
- The remaining time must be indicated to the competitors five (5) minutes and one (1) minute before the end of the allotted time for the presentation to the judges.
- A visual countdown must be given during the last thirty (30) seconds of the presentation to the judges.

6.3.4. Presentation Order

- Presentation order shall be determined randomly.
- Presentation order shall be announced thirty (30) minutes before the presentations to the judges commence. All teams are required to represent themselves at this announcement.
- Teams are not allowed to switch places in the presentation order.

6.3.5. Deliverables

1. For Competitors

Each competitor will receive, electronically, seven (7) days in advance of the competition, a package outlining the main themes of the competition and any materials and/or tools that will be provided to competitors during the competition.

At the competition briefing, each team will receive a package outlining the problem definition, background information, design and presentation requirements, rules, marking scheme and any other information deemed necessary by the competition director.

2. From Competitors

Each team is required to submit, electronically, before the end of the design period, a presentation about their design. The requirements of the presentation will be outlined in the problem design package.

Each team is required to submit a prototype of their design before the end of the design period. This design will be used to test the team's solution to the design problem.

6.3.6. Response to Questions

- Only the competition director may answer questions during the problem presentation and design phases. Volunteers and judges may not answer questions regarding rules, competition interpretation or procedures at any time.
- During the presentation of the problem, the competition director shall answer orally and write down the answers provided.
- During the design phase, only questions related to deliverable content shall be answered. No answers shall be provided in response to questions about the problem that might lead to the development of a new approach or that might invalidate a solution.
- During the design phase, answers to questions shall be provided in writing to all teams at the same time. A certain amount of time (e.g. 15 minutes) may be allowed to elapse or a significant number of questions accumulated before responses are provided. A copy of the responses must be provided to the judges prior to the presentations.

6.4. *Assessment and Judging*

- The panel must have an odd number of judges.
- The panel must have five to nine judges.
- The judges should be bilingual or the room equipped for simultaneous translation.
- The assessment shall be carried out in the audience's presence.

6.4.1. Judging Matrix

Presentation	40%
Design process	
Design justification	
Critique of the design	
Critique of the prototype	
Presentation delivery	
Design Quality	20%
Deliverable compliance with expectations	
Technical innovation	
Consideration of economic, social and environmental impacts of design	
Testing	40%
Total	100%

Revision Record

Date	Revisions Made	Name	Position	Email
22/08/07	Full rules revision and update - CEC08 team	Erin Antcliffe	VPCompetitions, CEC 2008	eantclif@engmail.uwaterloo.ca
06/09/07	Full revision	Stephanie Robinson	Co-Chair, CEC 2008	Stephanie.robinson@cec2008.ca
4/09/07	Formatting and a bit of content update	Brandon Malleck	Co-Chair CEC 2008	Brandon.malleck@cec2008.ca
18/09/07	Add Eligibility Rules	Stephanie Robinson	Co-Chair, CEC 2008	Stephanie.robinson@cec2008.ca
25/10/07	Add Jean's and Patrick's comments	Brandon Malleck	Co-Chair CEC 2008	Brandon.malleck@cec2008.ca
25/10/07	Add Sheena's and Dave's comments	Brandon Malleck	Co-Chair CEC 2008	Brandon.malleck@cec2008.ca
05/10/07	As per conversation with Erin and Steph	Brandon Malleck	Co-Chair CEC 2008	Brandon.malleck@cec2008.ca
10/02/08	Revisions based upon feedback from Regional Competitions, observations, and challenges in implementation	Erin Ancliffe, Brandon Malleck	VP Competitions, CEC 2008 Co-Chair, CEC 2008	erin.ancliff@cec2008.ca brandon.malleck@cec2008.ca