Case: The Citizen's Energy Footprint

Earth Day, April 22nd, 2011

Michael is twelve years old and attends middle school[1]. Today his school celebrated Earth Day with a lot of activities ranging from lectures about sustainability, conservation, clean energy, etc. He particularly enjoyed the part when a chef from a nearby restaurant came to demonstrate how to cook tasty food harvested from an experimental vegetable garden that his class started earlier in the school year. The class had hoped that it would turn into a sustainable supply of healthy snacks for the school. The chef's demonstration was a boost in the class's enthusiasm in the project.

Michael attended a lecture during his civics class where the guest speaker Mr. Tom Spence talked about energy conservation and sustainable energy sources. The speaker showed a YouTube[2] video which Michael and his friends enjoyed very much. Mr. Spence engaged the students in a discussion of energy conservation. The video was a great visual motivator for their discussion and there was a lot of debate among the students about how much energy they use each day.

Valerie, one of the bright students in the class, brought up the subject of carbon footprint and how it was used globally as a way of measuring and trading in fossil fuel use. Some students said that the carbon footprint was too high level a concept and that regular citizens like themselves were not in anyway engaged in it realistically. One student suggested that the carbon footprint concept was devised by big companies and advanced economies as a purchased excuse to continue to pollute at the expense of emerging economies. Other students opined that he was just too cynical and that the carbon footprint concept did provide incentives for large entities to conserve energy. Mr. Spence was happy to see that the students were so engaged in such non-trivial discussions.

The civics class teacher, Mrs. Thomson, quieted down the class and continued the discussion by polling the students as to how much energy they used each day. None of the students could come up with an answer. The discussion turned to the YouTube video about individual energy use. When Mr. Spence flashed the comic below on the screen, the whole class broke into laughter.

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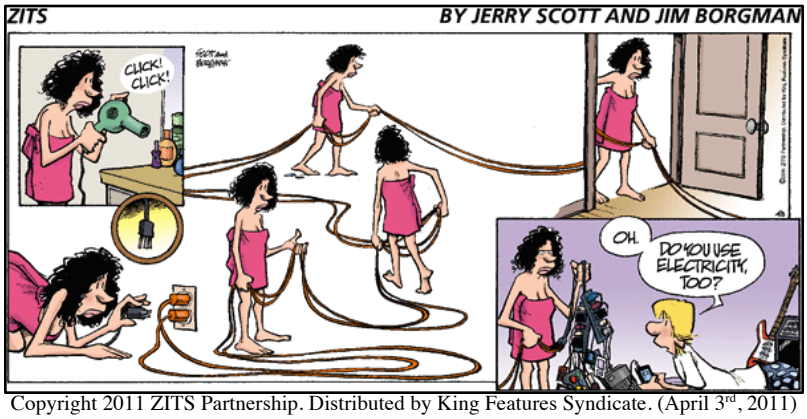
[1] In the US, middle school ages range from 10-14, high school ages range from 14-18 and college ages range from 18-21+.

[2] http://www.youtube.com/watch?v=rG3VDIxM2hU&NR=1



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Some of the students scrambled to try to hide their smart phones, tablets, laptops, mp3 players, and other electronic devices. When Mrs. Thompson pushed them a bit harder to talk about daily energy use, some students voiced that the utilities company had installed "smart meters" in their houses and they could check on that. Some others said that they lived in apartments and did not have such meters installed in each unit. The discussion then turned to the use of energy in transportation and in public places in their daily life. Some students teased those that arrive at school in cars while others biked or took public transportation to school. Michel raised his hand and Mrs. Thomson called on him to speak.

Michael, "It is so complicated and I do not think we can measure accurately how much energy each of us use on a daily basis. Anyway what is the purpose of measuring our energy use while those big companies are wasting energy and polluting the earth?"

Mr. Spence, "Does it mean that if it is too complicated we should not measure our energy use? What we do not measure we cannot manage and conserve. Consider that we have over 300 million people in the US[3] and there are almost nine billion people in the world, how much energy can we conserve together if only we could measure how much energy we use daily and find ways to conserve?"

Michael, "Great. What if we could do that and other people in the rest of the US and other countries still do not take conservation seriously and continue to waste?"

Mr. Spence, "Conservation starts with you, and you, and you… [he pointed to the students and some looked down as if embarrassed]…. You are the young generation. You and the next generations are going to be living on this earth for a long time to come. It will be up to you to decide on what to do and influence others of your generation to do the same."

Mrs. Thomson, "I agree with Michael that you will not have much influence on those big companies *at this time*…. [some giggles]…. But you can all influence each other and

[3] http://www.census.gov/main/www/popclock.html

there is nothing wrong with bringing this conservation effort up from the citizen's level. Together you are more powerful than any of the big companies."

Valerie, "I have a cousin living in Europe and I will text her to ask her what she thinks about this and see what the young people are doing over there. I can ask her what is her 'Energy Footprint'."

Michael, "Do they use the same measure of energy over there? They are on the metric system and we are not. What about Asia and Africa? I don't even know whether we can compare our energy use with folks living in the next county, let alone someone living far away. Are there any standard ways of measuring and comparing energy use?"

From: http://lowellpta.com

Case Analysis

The Case is about motivating the developing a methodology to let citizens measure and calculate their Energy Footprint. Energy Footprint is defined as the average amount of energy a person uses in his/her daily life. This is for citizen use and is in contrast to the concept of carbon footprint used by public and private enterprises. The purpose of this methodology is to encourage citizens to measure, manage, and conserve energy use in their daily life. It should also be noted that there is a need for Standards in developing the methodology so that citizens from different regions and countries could compare their Energy Footprint. With this, citizens from around the world could develop a community to foster sustainability by encouraging each other to reduce their Energy Footprint. The intended audience of this methodology should be young people like Michael and his peers who want to help the environment.

The Case Analysis Questions to be considered:

1. What is the citizen's role in sustainability of the planet, especially on energy use?
2. Is energy use an important sustainability issue in your region? If so, what are the concerns? Are there any Standards in use for instrumentation and calculation of energy use?

3. What are the effective ways to answer the question "What is your Energy Footprint?"
4. Recommend Standards for measuring Energy Footprint and ways of making instrumentation implementing such Standards available to citizens in your country/region.
5. Is this extendable to private and public enterprises and beyond?

The Competition

Each Team will be scheduled to make a Webex presentation[4] in front of a panel of Judges (see below) in English. The time period will be up to 25 minutes for presentation and about 10 minutes for questions and answers. Each Team will submit their presentation file[5] to the Head Judge for dissemination 12 hours before the scheduled presentation so that the judges could preview it and prepare questions. The Head Judge will schedule a pre-meeting ahead of the scheduled presentation so that each Team could test out the Webex features.

The Judges will each be allotted 100 points to be awarded as indicated in [ ] below. The judges will be looking for:

- Demonstration of understanding the problem and evidence of research (online, academic, and other sources are acceptable; must be properly cited). [20]
- A coherent problem solving approach that takes into consideration the user's needs and perspectives, the problem environment, prior solutions, diversity of solution approaches, decision making approach to come up with a recommendation, etc. [20]
- The creativeness of the recommendation, viability considerations of the recommendation, [20]
- Extent to which the Team considered the considerations raised in the Case Analysis paragraph above and answered the provided Case Study Questions. [30]

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[4] Cisco Webex. See Appendix A for hardware, software, and telecommunication requirements.

[5] Microsoft PowerPoint or a PDF file formatted for screen-based presentations.

- Clear, precise, and compelling in the presentation as well as in answering questions from the Judges. [10]

Panel of Judges

- Professor Bruce Harding, Engineering, Purdue University; Chair, ANSI Committee on Education; Standards Teacher, and Researcher.
- Professor Nitin Aggarwal, Business, San José State University; Standards Researcher.
- Yitin Trivedi, Synopsys; IEEE Committee on Education, Standards Expert.
- Kathryn Hautanen, Synopsys; Sustainability Expert.

Organizer and Head Judge (non-voting)

- Professor Stephen K. Kwan, Business, San José State University; ANSI Committee on Education. Contact: stephen.kwan@sjsu.edu

Appendix A – Webex Requirements

The Webex teleconference will be conducted with the VoIP features of the system. Only a single computer is needed for the presenter. It is encouraged that more than one member of the team is given the chance to present and answer questions. A video camera is needed. External microphone and speakers will be very helpful. Please review the following:

1. Check out: http://support.webex.com/support/system-requirements.html
2. To check whether you have the appropriate players installed for UCF (Universal Communications Format) rich media files, go to: https://cobsjsu.webex.com/cobsjsu/systemdiagnosis.php
3. Please perform a Join Meeting Test ahead of time: http://www.webex.com/lp/jointest/