

COMPARING CALCULATORS: A Teachable Moment

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How can online calculators that are designed to measure an individual, family or community's numerous carbon, energy and/or ecological footprint best be used as an educational tool?

In theory, these tools should have potential to help students understand the role of energy in our lives and the impact energy consumption and carbon emissions have on climate and the environment. In practice, however, calculators are problematic. Several studies have examined a wide range of calculators¹ and found that most are "black boxes" that don't show how the calculations are made. Few offer any degree of transparency in terms of what the variables are and what the source of the calculation is. Moreover, using the same input in different calculators can lead to significantly different output.

Rather than pointing students to one particular calculator and input their personal information or perhaps data from their school or community, a more in-depth activity would have students comparing different calculators and then present their findings on which calculators they consider to be superior.

Here are a few guiding questions and suggestions on comparing calculators:

-To what degree are the calculators transparent? In other words, is it possible to see how different factors are actually calculated and why, or is the equation hidden? If it is hidden, is it possible to determine what the calculation is?

-Is the calculator from an authoritative and trusted source? If the calculations used to weigh different factors are accessible to are user, are they from reputable sources such as the National Renewable Energy Laboratory?

-Is there a particular bias evident in the way questions are asked or conclusions are reached?

-In comparing the output of calculators, it is important to use as much as possible the same input. How do various calculators compare in terms of the required input?

-What are the strengths and weaknesses of various calculators, and which are superior?

¹See: Padgett, J. P. et al (2007). A comparison of carbon calculators. [Environmental Impact Assessment Review](#). [Volume 28, Issues 2-3](#), February-April 2008, Pages 106-115.

Also see: Bottrill, C. (2007). Internet-based tools for behaviour change. Paper presented at European Council for Energy Efficient Economies (ECEEE) Summer Study 2007 Dynamics of Consumption Session 9, paper 211. <http://www.eci.ox.ac.uk/research/energy/downloads/eceee07/bottrill.pdf>