FEASIBILITY VERSUS VIABILITY

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There is a difference between what is feasible and what is viable. A feasible process is possible and can be undertaken immediately when provided with the resources to do so, whereas a viable process can work successfully at large scale over a long period into the future. It is critically important to distinguish between what is feasible and what is viable within the context of sustainability because a feasible process is not necessarily a viable process. A viable renewable energy source is truly sustainable only if it can repeatedly maintain and replace itself without the use of fossil fuels as a backup. Replacing the use of fossil fuels with renewable energy sources and infrastructure will initially require the use of fossil fuels, but once in place those renewable energy sources and infrastructure need to be truly sustainable without further use of fossil fuels.

Assuming a process is viable just because it is feasible runs the risk of pursuing dead end pathways in a transition from fossil fuels to renewable energy. One way to examine and determine the viability of an energy process is to undertake a life cycle energy analysis of that process. Even then, the process might not be viable in the longer term, say beyond 200 years, when it is reliant on the mining of scarce minerals which will require greater levels of energy over time. The peaking of fossil fuels also applies to the peaking of mineral extraction.

A peer reviewed publication by Mario Giampietro, Kozo Mayumi, and Jesus Ramos-Martin (2006) states

> "Many claim that biofuels represent a viable and desirable alternative to fossil energy fuels. This paper (the first of a series of two) provides a critical appraisal of the claim that a large scale move to biofuels is either feasible or desirable for powering the economy of a developed country.
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> … In relation to the future use of biomass for energy purposes it is crucial to eliminate the dangerous stereotypes currently proposed by the mass media and by those proposing the idea of farming for fuels. Biofuel is not a silver bullet solution to the actual energy crisis. The dream that everything in developed societies can remain the same by just replacing oil with ethanol from crops or plantations is very easy to sell in TV commercials but it is not feasible. It is only generating a dangerous myth in the perception of the general public."

The above publication cites several publications which had also examined the viability of biofuels prior to 2006. The above publication and subsequent publications by the same authors resulted in the book *The Biofuel Delusion: The Fallacy of Large-Scale Agro-biofuel Production* by Mario Giampietro and Kozo Mayumi published in 2009.

An example of misplacing what is feasible as opposed to what is viable is provided by Bill McKibben's 2016 response to the *Planet of the Humans* documentary which had interviewed him on his stance on biomass. Bill McKibben conceded that he initially supported the use of biofuels and in his defence, he wrote:

> “Like the film-maker, I previously personally supported burning bio-mass as an alternative to fossil fuels—in my case, when the rural college where I teach replaced its oil furnaces with a wood-chip burner more than a decade ago, I saluted it. But as more scientists studied the consequences of large-scale biomass burning, the math began to show that it would put large amounts of carbon into the atmosphere at precisely the wrong moment: if we break the back of the climate system now, it won’t matter if forests suck it up fifty years hence. And as soon as that became clear I began writing and campaigning on those issues.”

Prior to 2016, Bill McKibben had been at minimum 10 years behind the ball park in his tracking of peer reviewed publications on the viability of biofuels and 7 years behind a publicly available book which addressed the same issue. Bill McKibben deserves flak for helping to promote biofuels before 2016 when it was known since 2006 by the better-informed research community and since 2009 by members of the public that biofuels are not viable.

We can all be mistaken. Bill McKibben's contribution to misinformation prior to 2016 is an example of why it is so important to base forward planning of a transition from fossil fuels to renewable energy on proven viable energy processes. We do need to innovate and discover new energy processes, but at the same time we must bear in mind that a feasible process is not necessarily a viable process. Just because an energy process is possible does not necessarily mean we should adopt that energy process on a large scale.

References

Giampietro M., K. Mayumi, and J. Ramos-Martin. (2006) *Can biofuels replace fossil energy fuels? A multi-scale integrated analysis based on the concept of societal and ecosystem metabolism: Part 1*. International Journal of Transdisciplinary Research Bol 1, No. 1, 51-87

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