

Ten reasons why it's different this time



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During a recent workshop on biofuels, I was asked the question: 'Why is it different this time; why is there any reason to believe that the current interest in biofuels won't just disappear as it has before?' It is an excellent question and deserves a better answer than I was able to give then on the spur of the moment. Here are 10 reasons, some overlapping, why it's different this time.

1. For over five years now the cost of energy in oil has been greater than the cost of energy embedded in at least some forms of biomass. This is especially true for cellulosic biomass where biomass at \$70 per ton (a reasonable delivered cost for biomass) has an energy content roughly equal to the energy content of oil at about \$20 per barrel. Therefore it is at least technically possible to produce liquid fuels that cost less than petroleum fuels on an equal energy basis. That has not been even technically possible before. Brazil in particular is successfully producing ethanol at an energy equivalent cost less than that of gasoline.
2. More and more countries, both developed and developing, are simply realizing that they can no longer afford the economic costs and security costs of continued exclusive dependence on petroleum. It is no longer just the USA and Europe that are interested in biofuels. The interest is literally worldwide.
3. The peak oil issue, and the potential for truly drastic societal disruption accompanying the peak oil transition, is much more widely appreciated. Even if oil were cheap and had no national security drawbacks, people and governments now better understand the need to prepare for a future in which we cannot have all the oil we want, regardless of the price.
4. For the first time, some large fuel users are leading the charge for biofuels. GM was out front early in this effort with its campaign to 'Live Green, Go Yellow' and their investments in second-generation biofuel companies. GM

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is now being joined by many other large fuel users (notably the aviation industry and the military) who are simply unwilling to accept the *status quo* of continued oil dependence.

5. Brazil is a large, growing economy that has achieved energy security and is now exporting ethanol and, even more important, its ethanol production technology. Developing tropical nations will really benefit from Brazilian leadership and technology. Decades of intelligent, consistently applied policies have achieved this enviable position. Brazil thereby serves as an example of what can be done with persistence and intelligence. Goal for Team Brazil!
6. The oil companies fought biofuels tooth and nail in the past. While they could and should do much more to diversify transportation fuels, given the essential nature of the product they market, just about every independent oil company now has some investment and activity in biofuels. Among the majors, BP's \$500 million investment in biofuels and Shell's early leadership stand out. Hats off to them. Even Exxon-Mobil, the last big hold out, has entered the biofuel arena with a big bet on algal biofuels.
7. Emerging renewable portfolio standards for electricity generation mean that some power companies and utilities are in the market for huge amounts of sustainable biomass. A few of my friends in the biofuel industry dread this competition for feedstock. I think they should welcome it. Biopower demand will help catalyze the formation of biomass supply chains and the associated logistics. This will drive down the cost of delivered biomass while increasing the amount and reliability of supply.
8. At least \$5 billion in public and private funds has been invested or committed over the past few years to develop the conversion technology for cellulosic biofuel production. This is about 100 times more than the previous annual investment rate. As a consequence, the conversion technology is developing faster than almost anyone thought possible. Venture capitalist Vinod Khosla deserves special recognition for his leadership role, as does the US Department of Energy. We need a similar effort on biomass supply chain and logistics. Who will lead that?
9. Increasing concern about rising greenhouse gas levels has highlighted the need for fundamental changes in the way we use fossil carbon. It is not widely appreciated yet, but biofuels can capture and sequester carbon (in roots, soil organic matter, etc.) as part of biofuel production. Biofuels are the thus only way to have carbon negative fuels. The more you drive, the more carbon is sequestered. As my kids would say, 'Way cool!'
10. Finally, my conversations with colleagues in developing nations tell me that more and more of them are thinking along the following lines:
 - a. The USA and other countries got rich in part because of cheap oil and the supremely useful liquid fuels it provides.
 - b. Oil isn't cheap anymore and depending on it for future growth is a dangerous gamble.
 - c. Some biofuels are, or will soon be, cost competitive with oil and can thereby fill the role for us that petroleum did for the USA and the North.

- d. We can strengthen our own economy, particularly our underdeveloped agricultural sectors, by producing our own biofuels.
- e. Therefore, of course we must develop biofuels.

I am sure biofuels will continue to hit bumps in the road...we have already encountered some really big ones. But we are still moving forward around the world. Thus I am confident it really is different this time. We will have biofuels because we can have them and because we must have them.

Optimistically and relentlessly yours,

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Editor in Chief

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