ENDESA – Massachusetts Institute of Technology (MIT)

Retos Estratégicos en el Sector Energético

Preguntas no Respondidas en el Turno de Preguntas

Madrid, 10 de noviembre de 2008

Prof. Kenneth A. Oye

1. How important, useful or problematic is the production of biofuels from vegetable oil waste after being used in commercial or industrial cooking?

Biofuels from vegetable oil waste is well worth doing and does not require development of advanced technologies. The limit on this biofuel source is availability of waste oil. This is low hanging fruit that we should grab, but there is not enough waste oil to make this a major factor in addressing climate change.

2. When will the issue of storaging renewable energies' output be solved?

This is a critical issue with reference to renewables. Supplies of electricity from renewables vary a lot. Seasonal, diurnal, and weather related variation in solar power and fluctuations in wind velocity are obvious examples. We need to store energy in order to smooth supply. This is why there is so much attention to new battery technologies, photosynthesis and hydrogen production and other unproven storage technologies.

3. What problems and what importance do you preview in relation to biofuels produced from residuals from oil for human consumption production?

In the short term, we have seen fluctuations in food prices as a side effect of US and Brazilian biofuels subsidies. In the long term, this linkage between biofuels and food should grow weaker as new technologies permit the use of a broader range of feedstocks for biolfuels production. For example, as cellulosic sources become practical, we can expect a shift away from US corn kernels nor Brazilian sugar cane.

Prof. Kent Larson

1. Shouldn't use of fuel be measured against GNP instead of "per capita"?

Average real gross domestic product (GDP) per capita is the generally accepted measure for standard of living, but this does not take into account many important qualities. The best measure would be the energy consumed to attain a certain quality of life (leisure time, life expectancy, clean air and water, public health, etc.). Certain countries - Denmark for example - have achieved a high quality of life for a relatively low average energy use.

2. If the resource was emitted CO2 when generating electricity, do you think there is an "external value proposition" strong enough to reduce it?

Yes, this would change the calculation dramatically by privileging renewables over fossil fuels, which would become dramatically more expensive.

3. Efficiency = big brother?

We advocate providing individuals with information at the point of use to allow them to make informed decisions about their energy consumption. Research shows that this can dramatically increase conservation. The data can remain private. Of course, this same data could be used in invasive and improper ways without good public policy and technical safeguards.

4. High impact of psychological aspects. Do you have psychologists in your team?

Yes, we have two staff researchers who have both psychology and computer science backgrounds.

5. How do we balance the measures presented with the need for profits from the key energy players?

Utilities should be compensated for the efforts they make to encourage conservation. Several U.S. utilities, such as Duke Power, are advocating this type of rate structure.

6. Do you think a higher energy price could be the key for the energy behavior change?

Absolutely. When gasoline prices reached $4.00 per gallon in the U.S., miles driven and sales of SUVs plummeted.

7. Achieving energy behavior change seems to require quite an investment. Who should finance it: government, utilities, consumers?

There may be business models that would allow all three to finance energy behavior technology, but I advocate low-cost, consumer electronic, user-pay solutions that leverage technology that people already have: mobile phones, home computers, and internet connections.

8. What about micro-cogeneration in household sector?

This is a promising direction. There are first-generation systems on the market now that integrate a heat pump and generator into a single package to deliver air-conditioning, space heating, electrical power generation & hot water. These will eventually be cost effective, particularly in areas with high energy prices, when increasing centralized generation is difficult, or when expansion of the grid is not possible.

9. How to promote energy efficiency above energy consumption?

Either appeal to the pocketbook (such at factoring in the cost of CO2 in energy prices) or a desire to "save the world" (by motivating a change in personal energy consuming behaviors in the interest of avoiding climate change) - or some combination of both.

Prof. John B. Heywood

1. Companies invest in R & D to save energy; would it be more effective to invest in reducing the current inefficiencies?

We will need to do both: invest in improving the efficiency of today's technologies for electricity generation and utilization, and invest in R & D on promising new technology opportunities. These have different time scales for achieving improvements in mainstream technologies usually showing greater benefits in the nearer term. But R & D investments have long lead times to implementation, so efforts to develop better new technology need to start now.

2. In terms of energy, isn't it more expensive to manufacture an electric car than the expected savings from it?

The initial cost of an electric vehicle with a useful range is much higher than the cost of a conventional vehicle, primarily due to the cost of the battery pack. The cost of the electricity the vehicle uses is less than the cost of petroleum-based fuel. But overall the cost to the purchaser and user of an electric vehicle is currently higher than of a comparable conventional vehicle. In energy terms, usually the overall energy requirements of an EV (or plug-in hybrid) are about the same as that of a charge-sustaining current type of hybrid.

3. Talking about Asia, is efficiency an issue that is going to be considered from the G8?

The current global economic crisis is likely to delay any efforts—either national or global—to deal with and climate change issues. But these issues are sufficiently important that they will have to get back onto our list of high priority issues that must be dealt with.