

CORNHUSKER ECONOMICS

Looming Changes in the Energy Economy

Over the next decade or two, the energy sector on which the world economy is based will undergo significant transformations. The fossil fuels on which the industrial revolution was built are on their way out. Nebraskans will face higher energy prices, but they will also produce more energy.

What's the problem with the energy economy?

There are a number of them:

1. For one, supplies of petroleum and gas (and even coal) are finite. Many energy experts are convinced that "peak oil," the historical maximum rate of oil production, has arrived – production rates will decline from here on. If that time is not upon us, it soon will be. That will put upward pressure on oil prices – a direct incentive for energy consumers to find another way.
2. To add to this, we have the climate change problem. While not everyone is yet convinced, climate change is potentially catastrophic for our children, and is directly attributable to world-wide use of fossil fuels. Many see limiting the use of coal as a primary means of reducing carbon emissions to the atmosphere.
3. Even more evident is the high and growing cost to the United States of protecting a secure supply of foreign oil. In 1980, President Carter proclaimed that the U.S. would use military force if necessary to defend its national interests in the Persian Gulf region. We have done so. Military expenditures were ramped up to implement this policy, first in the form of naval and military installations in the area, and then in the form of war – Iraq I, Iraq II, and perhaps Afghanistan should also be included. Though it is true there are other motives for these military adventures in the Middle East, such as

Market Report	Yr Ago	4 Wks Ago	10/9/09
<u>Livestock and Products,</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.....	\$91.57	\$83.81	\$80.30
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	108.11	107.41	102.57
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	103.48	102.80	94.53
Choice Boxed Beef, 600-750 lb. Carcass.	152.27	142.12	134.46
Western Corn Belt Base Hog Price Carcass, Negotiated.	61.98	49.76	48.36
Feeder Pigs, National Direct 50 lbs, FOB.....	44.76	40.00	*
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean.....	69.60	54.51	52.93
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct.....	94.50	91.87	92.00
National Carcass Lamb Cutout, FOB.	271.37	246.97	245.24
<u>Crops,</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Imperial, bu.	5.27	3.51	3.69
Corn, No. 2, Yellow Omaha, bu.	4.01	3.10	3.39
Soybeans, No. 1, Yellow Omaha, bu.	8.78	9.68	9.42
Grain Sorghum, No. 2, Yellow Dorchester, cwt.....	5.48	4.88	5.39
Oats, No. 2, Heavy Minneapolis, MN, bu.	*	1.95	2.39
<u>Feed</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	190.00	*	*
Alfalfa, Large Rounds, Good Platte Valley, ton.....	77.50	82.50	82.50
Grass Hay, Large Rounds, Premium Nebraska, ton.	85.00	*	*
Dried Distillers Grains, 10% Moisture, Nebraska Average.	147.50	81.00	105.00
Wet Distillers Grains, 65-70% Moisture, Nebraska Average.	57.00	33.00	37.00
*No Market			

protecting the U.S. from terrorists and a desire for more democracy in the region, there can be no doubt that concern for energy security was high on the list.

4. Finally, the instability of international oil prices adds to the instability of the U.S. economy. The costs of additional macroeconomic instability are significant and are borne by most all of our citizens, as is evident from the recession the U.S. is now experiencing.

Will the problems cited above provide sufficient incentive for a revolution in the energy economy?

No. Rising prices due to peak oil will do their part, but military expenditures and the costs of climate change and petroleum insecurity do not directly affect the price we pay for energy. These costs are not borne directly by energy buyers – they are passed on as "external" costs for others to bear.

But we should expect of our legislators that they recognize these external costs of petroleum usage, and find a way to "internalize" them – to include these costs in the price of fossil fuels. The increased price would provide a strong incentive for energy consumers to conserve on petroleum use, and for energy innovators to discover new substitutes and new energy systems.

It is a lot to expect that governments could internalize these costs perfectly, but the current U.S. cap and trade bills, and next month's United Nations climate change discussions in Copenhagen represent efforts to begin to internalize at least the climate impacts of energy use.

The approach being considered in both the U.S. and in Copenhagen is "cap and trade" rather than a carbon tax. A carbon tax would be added on to the price of fossil fuels such as petroleum, at a level that would approximate the value of the external costs mentioned above – carbon pollution, military expenditures, economic volatility.

But public reaction against taxes is strong, even in the pursuit of laudable objectives, so the policy of choice is to cap the level of carbon emissions rather than tax them. As the cap is reduced through time, the purchase price of carbon fuel rises, and the combination of mandatory reductions and higher prices provides strong incentives for dramatic change in the energy economy.

If not fossil fuels, then how about biofuels?

Nebraskans will naturally think of two alternatives to fossil fuels: wind and biofuels. There are basic energy sources, including nuclear (Nebraska has two nuclear plants already, and is considering a third),

geothermal and solar. And there are non-fuel substitutes that could result in dramatic conservation of fossil fuels, such as insulation, lower speed limits, time-of-day electrical pricing, etc.

Biofuels have a special bridging role to play in the energy transition to new energy sources. Because they are liquid, biofuels can be used to replace petroleum in the transportation industry, which is going to use liquid fuels unless and until the entire fleet is transformed to electricity.

Nebraska has a head start in producing corn ethanol and soybean biodiesel, and our agricultural sector has the capacity to increase these further without jeopardizing food supplies. Second-generation biofuels from cellulose or algae are not yet in commercial production, but when and if they are, Nebraska has a substantial capacity to produce both. Furthermore, new technologies may soon make it feasible for Nebraska industries to burn agricultural byproducts for heat and electricity, thus reducing our imports of coal or natural gas.

Currently, biofuels are not competitive with fossil fuels without public subsidies. These subsidies serve the same purpose as carbon taxes – to stimulate substitution of biofuels for fossil fuels. Carbon taxes and/or cap and trade are more sensible policies to achieve this objective, but subsidies serve a public purpose until these are in place.

Richard Perrin, (402) 472-9818

Roberts Professor

Department of Agricultural Economics

University of Nebraska-Lincoln

rperrin@unl.edu

Adam Liska, (402) 472-8744

Assistant Professor

Department of Biological Systems Engineering

University of Nebraska-Lincoln

aliska2@unl.edu