

7-1-2007

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Recommended Citation

Eckhart, Michael (2007) "Climate. Renewables: Old Problem, New Answers," *New England Journal of Public Policy*. Vol. 21: Iss. 2, Article 7.

Available at: <https://scholarworks.umb.edu/nejpp/vol21/iss2/7>

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Renewables: Old Problem, New Answers

This article by Michael Eckhart is taken from the proceedings of the EPIIC Symposium at Tufts University in February 2005.

My job is to insure that the forecasts of conventional wisdom don't come true. We're in the business of making renewable energy come true instead.

I believe there are two major drivers in the future of energy. Number one is the fundamental economics of energy. And number two is human effort to change those economics.

The American Council on Renewable Energy is a four-year-old nonprofit based in Washington. Our job is to collect all of the actors needed to be successful in our country. It's not a trade association, it's a nonprofit.

The first technical driver for renewables is the climate change. I don't know why there is any debate about whether it's true. As a person with children, the trends actually terrify me. And I say, at what point do we fully accept the environmental consequences of our lifestyle, our way of life. What are we waiting for? For children to accept responsibility? Why not us?

Second, on the matter of oil supply, there is an alarming gap between the domestic oil supply and domestic demand or consumption. That gap is net import. Oil demand will increase from last year, 82 million barrels per day, to 121 million barrels per day in 2030. That's a 50 percent increase in oil demand.

I recall a very compelling article in *Scientific American* in 1998, which convinced me that oil production in the world is going to peak in this decade, sometime between 2005 and 2015, and then begin declining. I wonder, how is it that we are going to have a 50 percent increase in oil demand when we are going to have a decline in oil production? That doesn't add up. And what it tells me is that we are going to see not a calm future. We are going to see supply disruptions and pricing behaviors that we have never experienced before. The past is not an indicator of the future. When supply,

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literally, does not meet demand, we are going to see war. We are going to see conflict.

In my own scenario, China will take care of itself. China has been acquiring oil fields in Africa and all around the world. But we have a system in America that I think China will some day notice. Think about the possible hostile takeover of ExxonMobil by China. A little humor in a terrible world. Our oil future really looks like trouble. And electricity looks the same. And we have to do something about this problem. I say that what we do about it is turn to renewable energy. I don't care how hard this is. This is not a uniformly available resource: solar, wind, geothermal, and biomass. All are spread unevenly everywhere.

This is my view (this is the old 1996 Shell scenario): Economic growth in the world continues unabated, driving total energy demands. But the brown, conventional energy sources face physical limitations, economic limitations, and environmental constraints, resulting in their topping out, creating the gap. That gap has to be filled by something, and what's available are the renewables. This is my view of the future. This is why I'm working on this. And I ask you to share this view.

Quickly, here is where we are: wind power is taking off. Thirty years ago there were little wind machines in people's backyards and now this is big boy technology. This is energy collection. This is harvesting the energy from nature on a massive scale using the best of human ingenuity and engineering skills. And I think it's got a huge future.

Where is it in the United States? Well, in the old days, in the previous wave of wind power, from 1980 to 1995, it was mostly in California, based on tax incentives. But now, in the past ten years, it is all throughout our country, and in particular, it is down the middle of the country, where the wind blows all day and all night. And it is rural-based electricity, if we can build a transmission system to get that energy to market. This is a strong market. And it is going to get stronger.

In solar TV we've got a worldwide market that's taking off, which is very strong in Germany and in Japan. Where I want to draw your attention, though, is not where we can use it for environmental purposes in our country, but what you can do around the world. This technology transforms lives. The path from poverty begins with the first kilowatt hour, and solar TV can deliver that first kilowatt hour. Maybe it can't power home heating and refrigeration and air conditioning, but it can get that first kilowatt hour and that will lift somebody initially out of poverty. It's a very exciting thing to participate in.

Consider biofuels such as corn-based ethanol, cellulosic ethanol, and then, biodiesel, which the Europeans are driving. I drive a Prius. I get fifty miles to the gallon, and when I convert that to E85, which is 85 percent ethanol, I will be getting three hundred miles per gallon of gasoline.

Now, the fleet average is twenty-seven and I am getting 300 miles to the gallon of gasoline, that's a ten to one improvement using today's technology

and today's available fuel — a revolution on our doorstep. In my view, in 2020 we will be stunned by the success of the combination. And remember, this estimate is not based on changing technology. It is the intersection of existing technologies to create revolution: Hybrid technology and biofuel are setting in at the same time. I think we are on the verge of a revolution. You should invest in it. You should buy the car and you should participate in it.

Phase one was the last thirty years of R and D in these technologies in renewables. Now we need a second phase, a new look at where the nation is going with renewables. Let's put them into use.

Water
