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After the Oil Runs Out

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If you're wondering about the direction of gasoline prices over the long term, forget for a moment about OPEC quotas and drilling in the Arctic National Wildlife Refuge and consider instead the matter of Hubbert's Peak. That's not a place, it's a concept developed a half-century ago by a geologist named M. King Hubbert, and it explains a lot about what's going on today at the gas pump. Hubbert argued that at a certain point oil production peaks, and thereafter it steadily declines regardless of demand. In 1956 he predicted that U.S. oil production would peak about 1970 and decline thereafter. Skeptics scoffed, but he was right.

It now appears that world oil production, about 80 million barrels a day, will soon peak. In fact, conventional oil production has already peaked and is declining. For every 10 barrels of conventional oil consumed, only four new barrels are discovered. Without the unconventional oil from tar sands, liquefied natural gas and other deposits, world production would have peaked several years ago.

Oil experts agree that hitting Hubbert's Peak is inevitable. The oil laid down by nature is finite, and almost half of it has already been extracted. The only uncertainty is when we hit the peak. Pessimists predict by 2010. Optimists say not for 30 to 40 years. Most experts expect it in 10 to 20 years. Lost in the debate are three much bigger issues: the impact of declining oil production on society, the ways to minimize its effects and when we should act. Unfortunately, politicians and policymakers have ignored Hubbert's Peak and have no plans to deal with it: If it's beyond the next election, forget it.

To appreciate how vital oil is, imagine it suddenly vanished. Virtually all transport -- autos, trucks, airplanes, ships and trains -- would stop. Without the fertilizers and insecticide made from oil, food output would plunge. Manufacturing output would also drop. Millions in colder regions would freeze.

Fortunately, oil production does not suddenly stop at Hubbert's Peak; rather, it declines steadily over time. But because production cannot meet demand, the price of oil will rapidly and continuously escalate, degrading economies and living standards. People complain now about gasoline at $3 per gallon. After Hubbert's Peak, $7 per gallon will seem cheap. Spending $150 to fill up the SUV? Ouch!

How to minimize the impact of declining oil production? Conservation and new finds can help. Higher mileage standards for autos and trucks could cut U.S. oil use by 20 percent

or more. New oil fields continue to be discovered, but they are small. No giant Saudi Arabia-type fields have been found in 30 years. The small fields contribute ever diminishing amounts of oil. But while conservation and new oil can delay Hubbert's Peak and ease its impact, they cannot prevent it. Moreover, even if the United States conserves oil, other countries might not. A practical long-term, non-oil solution to the problem of Hubbert's Peak is needed.

We need new technologies, especially for transportation, which accounts for two-thirds of U.S. oil consumption. Possible options are synthetic fuels from coal, hydrogen fuel from nuclear and renewable power sources, and electrified transport: light rail, rail and maglev. Processes for synthetic gasoline, diesel and jet fuel are well developed but expensive. The environmental problems from coal -- mining, carbon dioxide emissions and other pollutants -- are serious and require more attention. Hydrogen fuel produced by electrolysis from renewable power sources is environmentally clean, but it has serious technical problems. Producing the hydrogen equivalent in energy to the oil now used in U.S. transport would require 10 trillion kilowatt hours of electric energy; we would have to triple our electric generation capacity.

A more practical approach would be the electrification of transport. Switching half the truck and personal auto miles to electrified transport would require an increase in electric generation capacity of only 10 percent. Electrified transport is clean, non-polluting and energy-efficient. Light rail and rail systems are already in wide use. First- generation maglev systems are operating, and lower-cost second-generation systems are being developed.

As oil production declines, the combination of electrified transport and synthetic fuels from coal can meet the challenge. Hydrogen fuel is probably not practical, but research and development on it should continue in the hope of a breakthrough.

Whatever non-oil transport technologies prove best, making the transition from our present systems will take many years. It took decades for the first automobiles and airplanes to evolve into effective systems, and decades to build the interstate highway network. We can't afford to wait until Hubbert's Peak occurs. We should begin now to plan and implement the new, non-oil technologies. If we don't, our economy and living standard will be in serious trouble.

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