



Equating Economics, Energy, and Growth

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Topic: [Economics/Finance](#)

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This is a short essay by John Howe, talking about the **connection between economics, energy, and growth**. John is a semi-retired mechanical engineer, who is known for his invention of the [solar tractor](#), pictured on his web site [solarcarandtractor.com](#). He is also the author of the book [The End of Fossil Energy](#).



John Howe with Solar Golf Cart that he invented

A. Nothing of Substance Moves or Grows without Energy

This includes a body, a bird's nest, population, a building, a road, or a civilization. Energy is arguably the most important word in the dictionary.

Oil is presently the world's primary source of energy, providing 40% of all energy and over 90% of transportation fuel. (Fuel is another term for energy.)

Energy is necessary for and can be represented by warmth or heat resulting in a higher temperature over ambient surroundings.

Energy can be accessed from past surplus as food, firewood, a loaf of bread, a charged battery, fossil fuels, fissionable elements, or mass moved to a higher level like a reservoir of water.

Most of the world's energy came from or is coming via radiation from the sun's fusion, albeit dilute and sporadic as it reaches the earth. Exceptions are nuclear fission, geothermal, and tidal.

Energy **cannot be borrowed** from the future. Next week's food won't assuage today's hunger.

B. World Production of Pre-stored Oil has Peaked

This oil represents millions of years of conveniently stored solar energy and photosynthesis.

Conventional (light and easily accessible) oil reached a maximum of over 75 million barrels per day in May of 2005. All liquid fuels including tar sand oil, heavy oil, deep off shore oil, polar oil, natural gas liquids, and bio fuels peaked at about 85million barrels per day in the third quarter of 2008.

These numbers are historic facts as presented by the International Energy Agency and our own Department of Energy. (www.eia.doe.gov)

USA production peaked in 1970 as predicted in the 1950's by M.K. Hubbert. This fact resulted in the “energy crisis” of the seventies and a sharp increase in the price of oil as well as a temporary reduction of world oil production. This setback was quickly resolved and superseded by vast sources of new world oil from our arctic, the North Sea, Russia, Mexico, South America, Africa, and the Mid-east.

There is no evidence that equivalent new resources are available to solve our problems now. There was no great ramping up of oil production, as oil prices rose in the 2002 to 2008 period.

C. We Live in an Economic System Entirely Dependent on Growth

Our prosperity needs the promise of a future return of principal **PLUS** interest to justify the investment of present principal. This worked well for the last one-hundred years as long as there was always an excess of cheap pre-stored fossil energy available to “fuel” the growth. (For this premise, we will ignore the clouding issue of inflation and speak in terms of real growth.)

D. The Crux: Now that Pre-stored Energy, Represented by Oil, has Peaked and is in Terminal Decline, Growth and our Economic System Cannot Continue

Prosperity, food to feed a growing population, an oil-based transportation system, and new building are all forms of energy dependence, which must now go into terminal decline.

This is a geophysical constraint, not choice or something that can be avoided by changing the laws of physics, political action, increasing demand, or wishful thinking.

Civilization and our cheap-energy lifestyle are on the verge of collapse. The longer we deny the situation and try to perpetuate the past party, the more severe will be the crash and fewer will be our options.

E. One Source of Confusion is the Hidden Price of Oil

If oil is becoming scarce, why is oil less expensive? This is where things become less clear but further thought will shed light.

The price of oil only reflects the delicate balance of multiple transactions between consumers and oil producers. If consumers have declining wealth to offer from past, stored wealth then there is

less real value to support ever-increasing costs to produce remaining more-expensive oil.

As more of the world is producing less of everything (especially energy-dependent food) because of energy-curtailed growth, only the decreasing sources of cheap oil are competitive. Out-of-work consumers cannot justify new oil exploration and the remaining expensive, non-conventional sources, which were supposed to save us.

As soon as the economy begins to revive a little bit, the increased demand can be expected to drive the price of oil up until the declining, remaining wealth cannot support the more-marginal, more-expensive sources. Fewer, poorer customers result in fewer, more-desperate suppliers; the only ones who can still produce relatively cheap oil.

The end result is the beginning of the second half of the 200 year oil age. The first half (hardly more than one lifetime) was typified by growth, prosperity, and increased population. The second half can only be the opposite unless we recognize the enormity of our dilemma and quickly initiate emergency damage control and drastic measures such as are summarized in the acronym: [LEARN](#).

- Localization,
- Education,
- Adaptation of solar power (in its several varied forms),
- Rationing (of remaining fossil energy starting with gasoline), and
- Negative population growth (on our terms rather than waiting for more abhorrent catastrophes).

Nowhere in this essay have the terms “global warming”; “climate change”, or “environmentalism” been mentioned. These are obviously related to energy, the hyper-consumptive fossil fuel age, and are of dire concern. It is this writer’s opinion, however, that these issues tend to divert focus from the imminent energy-economic crisis, which is not well understood and conspicuously absent or avoided in the media.



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