

Energy and War: Be Efficient, Not Bellicose

In Europe the belief is widespread that the main drive for the US planned Iraq war is the control over the oil resources in Iraq and in the wider Middle East. Oil and energy are fuelling our economies and societies, but are they worth the war? Will the US stay the leading nation in the world when they military control the world of oil and serve themselves with cheap supplies? Or is it better to devote the intellectual and economic capacities of this great nation to get rid of the present energy addiction? This article shows the US forego huge opportunities of energy efficiency without any negative impact on the final energy bills. As M. Porter argues this neglect will undermine US competitive power in economic markets. The message therefore is that the US better should become energy efficient instead of bellicose.

Energy is vital to a luxurious and cultural life. In particular industrialized nations need a lot of energy for the production, transport, consumption processes of a wealthy population. But how much energy is needed? To find this out, the formula $E = P \cdot A \cdot I$ is useful. "Energy Need = Population x Affluence x Energy Intensity" or total amount of energy needed is the product of the number of inhabitants, times the material wealth per person, times the quantity of energy per unit produced of material wealth. To answer the question about the height of our real energy needs, one should investigate the three factors.

1. Population is a given factor for a nation. Policy in all civilized nations aims to extend life expectancy. This has reduced the outflow significantly. At the inflow policy can try to influence population growth, but this arises ethical disputes and final choice should be left over to the individuals and families. So, energy needs cannot really be changed by population policies.
2. Wealth is less well defined as population is. When we are struck in traffic jams, when waste parallels our consumption, when resources are spent on weaponry, this all raises the gauge of our national welfare but not that much our personal well-being. But for a good life in an industrialized society we need a lot of things: a comfortable dwelling, a reliable car, diversified food, flights to visit distant relatives and other cultures, etc. This all needs energy but also conservation is possible. Waste has no meaningful purpose. Reducing our commuting time and expenses by a better urban planning makes sense. But living in the dark and cold is conservation without outcome. Therefore energy conservation is Janus-faced: some is positive, some is negative. Positive conservation can save massive amounts of energy while improving quality of life. But the distinction on what is positive and negative conservation is blurred and depends on people's beliefs, preferences, education, experiences, etc.
3. Energy Intensity is the amount of energy a nation needs to produce one unit of wealth or gross domestic product. Efficiency is the reverse of intensity. The lower the intensity or the higher the efficiency the better. No one is served by wasting energy in generating wealth. Unlike about the two previous factors – population and conservation – public debate here is meaningless. Forces in society that favor inefficiency are evil and follow hidden agendas of big money and big power.

Common wisdom has been spread that industrialized nations must have access to massive flows of cheap energy to fulfil the needs. When energy would be expensive bills would be high and households would loose income and companies would loose competitive power. This looks rather evident but is it also true?

I analyzed the electricity consumption and intensity (efficiency) data of the OECD nations for the latest year where (nearly) complete data on quantities and prices were available. Why electricity and not oil is analyzed is only due to the availability of data, but fortunately electricity is a leading indicator of energy use in industrialized nations. The regression of electricity intensity on electricity prices for the OECD nations is shown in the figure.

The figure shows a clear inverse relationship between the electricity price and the electric intensity of wealth, or the common wisdom that high prices trigger high efficiency (low intensity) is confirmed. The figure shows how different wealthy industrialized nations perform in efficiency. Denmark and Japan are on top, only preceded by Switzerland that owns an atypical industrial structure. Germany, the Netherlands, France follow nearby. At the bottom one finds former communist nations where energy was cheap or free and inefficiency tremendous. But where are the US? Fortunately not all at the end, but somewhere anonymous under the median of the ranking. The distance with Japan is however significant: the US electricity intensity is 2.3 times higher than the Japanese one or its efficiency is 2.3 times lower. When the US would use electricity as efficient as Japan in generating wealth, the nation can scrap more than half of its power plants and facilities.

But this is not the main lesson one should derive from the figure. The most striking message is that the nations that have adopted a policy of higher end-use prices pay no higher bills than the nations of cheap energy. In scientific terms the price elasticity of electricity intensity is larger than one. In common words: the gain in efficiency runs faster than the height of the price, making the product of both – this is the bill – lower than when prices are kept low.

So, a policy of higher prices of energy will not harm the real economy but will make the US smart and efficient, and prepare for the global competition of the future. The US domestic economic and social rewards will be high. The environmental payback is tremendously large, and so is the political return. The US can again become the leading country in world summits on the environment and sustainable development. It will then be a beloved leader of the world, and not one that is hated in so many nations and where the allies are alienated from. The choice is a political one and is all in the hands of the most mighty nation in the world and in history: be efficient or be bellicose.