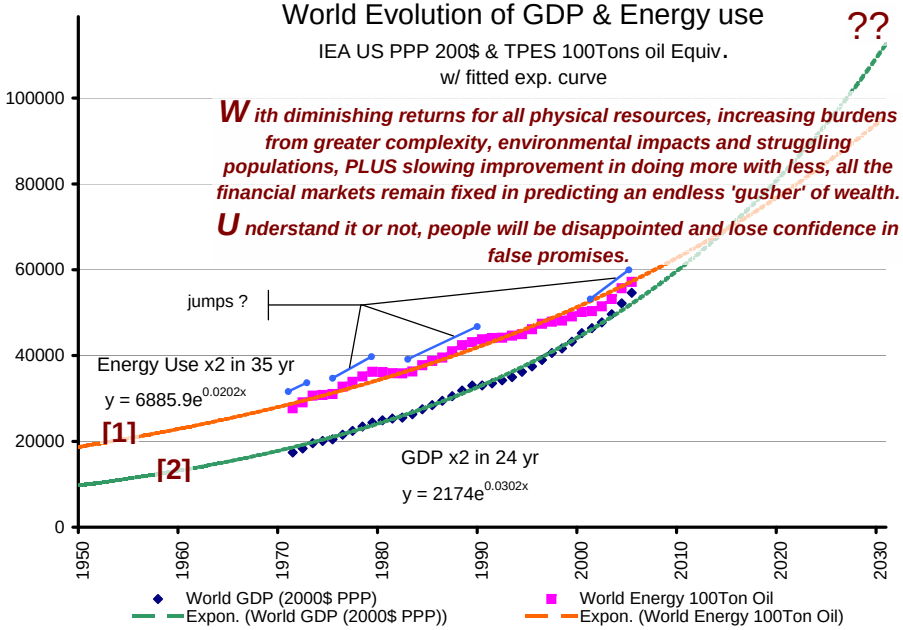
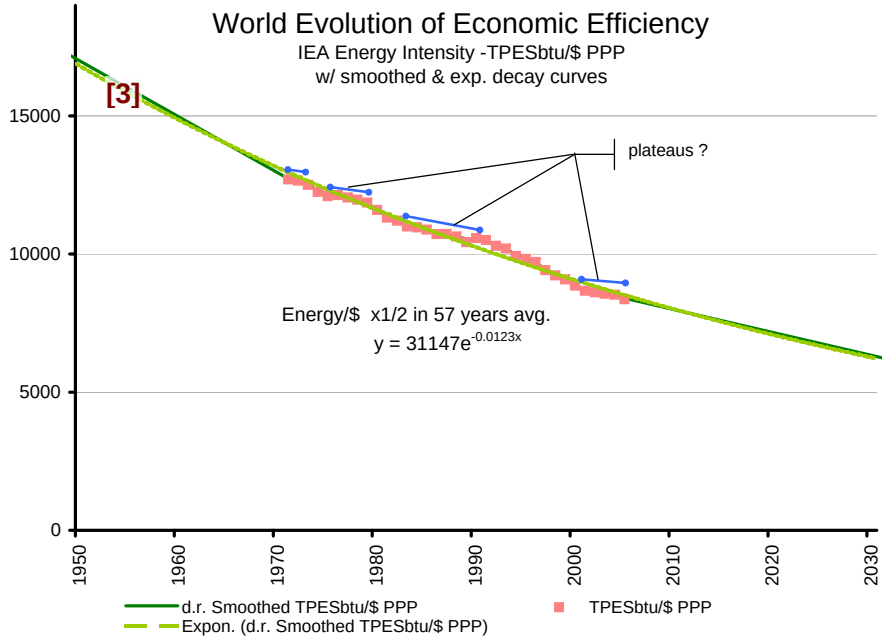
Old Expectations



And a New Reality



it's that the earth is leveling off „.´¯

The upper curve [1] is world energy use (MTons/100 Oil), drawn on the same graph as [2], the world GDP in Billions of $'s, both from OECD/IEA data. Putting them on the same graph allows comparing their shapes. What look like 'jumps' in energy use seem to match periods of more rapid GDP growth, but also in curve [3] coincide with 'plateaus' of relatively slower efficiency improvement. Slower efficiency improvement corresponds with faster growth... A more detailed look is available at http://www.synapse9.com/issues/World-eff_grow.pdf.

One possible reading is that periods of most rapid efficiency improvement are periods when implementing new methods of efficiency cause a kind of system-wide 'retooling' and slower growth. An alternate reading is that periods of rapid growth seem to coincide with times when reducing energy use seems less important. Those are consistent with practice in any field of work, where 'retooling' in some sense slows you down and growth is easier when not responding to limits.

Decreasing our *total* impacts on the earth is another matter. With efficiency improving at just 1.2%, only if growth declines below 1.2% and efficiency gains continue, would impacts begin to slowly decline. Presently investment is allocated only to maximize investment growth, however, and efficiency gains are just a much smaller side effect of competition.

There's an interesting open question about where the ultimate maximum efficiency plateau of the economies will be, since zero energy use is only possible with zero use. Economies just repackage physical resources, and growth without content won't create 'value' anyone would buy. Thermodynamics also requires some minimum degree of waste for any physical process.

At present, though, careful study of the shape of the efficiency improvement data reveals no more likely permanent plateau *other than* zero. That indicates that whatever the ultimate minimum btu/$ physical cost of wealth is, we have not hit it yet. It may be close at hand or far away. If it were possible to cut waste in half over and over, it still seems likely to take about the same ~57 year historic natural evolution rate of efficiency to do it. That's been the natural rate at which competition has stimulated the economies to retool, driven by economies steadily doubling not reducing their total energy use & impacts... That won't stabelize our burdens on the ecosystems or the climate, and competion only pursues the path of greatest returns.

Because the measure of investment value at present is only its own rate of multiplication and improved efficiency in producing wealth is a secondary effect, what the earth needs to is to reverse that, to make accumulation of investment contingent on demonstrated reduction of physical impacts.

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So multiplying more efficiently won't work!