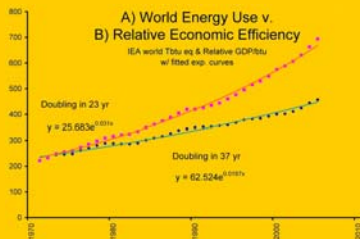


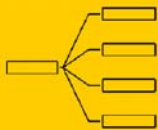
Retargeting Sustainability for Full Effect

Our
Efficiency Learning Rate is
Slower Than Our Energy
Consumption Rate

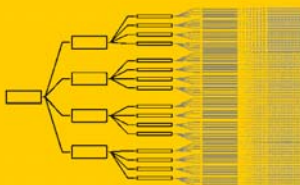


& Will Get Harder to Improve
and Have Diminishing Returns
in the Future

Is Only Aimed at
our Traceable Impacts



and Leaving 10 Times What
We Can See Uncounted



So,... Paint a Truer Picture for
Others & Create a Longer
Vision for Ourselves.

...and Maybe Just Not Push
the limits.

We need to retarget sustainability because our expectations and methods are missing the target. Efficiency gains are too slow now and naturally have diminishing returns. The energy uses we target miss the energy we directly consume distributed throughout the economy, so neglect the great majority.

- 1) After 30 years of effort economic efficiency is improving at 2% and energy use increasing at 3%.¹ Common experience and the principle of entropy say perfecting things gets harder and less profitable over time. First you take the easy steps, and later improvements are harder. Services also still require a minimum resource use that efficiency can not eliminate.
- 2) Our way of targeting our energy & carbon impacts does not include the distributed part from delivering goods and services (total embodied energy). Consequently our individual responsibility appears to be for only about 10% or less of the energy use impacts we directly cause.²

There are also other reasons why after 30 years of effort our energy consumption trends continue to increase at the same accelerating rates.

- 3) A lot of things have not worked. It turns out that nature has more layers of 'infrastructure' than the sustainability designers expect. It directly interferes with hopeful models for steering or complex life-support system.
- 4) Incentives for driving change in competitive businesses often don't work. They normally don't **a)** apply the same pressures to everyone, and **b)** provide an easily communicated path for complex system re-learning of old ingrained habits. Both requirements are hard to satisfy, and direct government control likely to be even worse.
- 5) Agricultural biofuels, for example, **a)** use a lot of fossil fuels, **b)** need continually growing amounts of land, **c)** and so cause forest burning for food production. It makes those biofuels more, not less, carbon intensive than gasoline. The real flaw is our normal 'just take it now' business plan. It hides the 'what then' requirement for sustainability, complicated now by how remote footprint conflicts multiply when approaching resource limits.

The basic choice is to **speed up our rate of learning** or **slow down the growing complexity of the task**, or both.

- 6) When you learn how to count the total energy used for delivering goods and services it becomes apparent that all spending uses energy at about the same rate per dollar. This is the main reason energy use is growing. Indeed, most efforts for sustainability throughout history have been aimed at sustaining economic growth. Now we need to switch to sustaining the earth, a different purpose rather than a different degree of effort.
- 7) It appears we do not yet know how to either slow down growth without harm, or how to continue growth without harm.
- 8) What we can do is **Paint a Truer Picture**, and try to both learn faster and slow down the growing complexity of the problem.

1) OECD IEA 2007 World Data 2) [DollarShadow](#) Embodied Energy Method