

Notes for Peter Balash at ACEEE workshop 11/16/2006 (Disclaimer: nothing below is necessarily the views of NETL or DOE).

Importance of Energy Efficiency

Almost 60% of primary energy consumed in the US is wasted. Dick Munson's history showed us that original power plants often operated as central heating plants as well.

Efficiency improvements take a long time to become apparent, but then are very powerful. "end-use" efficiency in particular is at the tail of a long chain of distribution. Improvements here take long due to the slow turnover of the capital stock.

Modeling

Modeling is difficult. Will electricity intensity improvements continue (kWh/GDP), as they have since a peak in the 1990s, or is the drop off in that ratio only temporary? 1950-2005 looks like a polynomial of degree 2; 19905-2005 looks like a negatively sloped line; what happens if plug-in hybrids penetrate successfully – could kWh/GDP flatten out or increase?

Substitution of sources (eg electricity for petroleum) may slow rate of energy consumption, but unlikely to reverse its growth, given population increases

Complex interactions

At least four relationships are of importance at a national scale

- 1) Energy security and economic growth
- 2) Economic growth and climate change
- 3) Energy security and climate change
- 4) Energy efficiency and economic growth

There are other permutations. Modeling that addresses only a subset of these relationships (perhaps necessarily) will leave out important considerations

Finally, Dick Munson wrote of the opportunities in competitive markets for efficiency improvements and innovation in general, something not usual under regulated monopoly. This is a crucial point, as the debate over whether the provision of energy services is in fact a natural monopoly (and thus best regulated), appears to have gained new life (ironic, given the passing of Milton Friedman (Skip – that's an after the fact addition, but Milty argued regulation a cure worse than the disease!)), as reflected by a plaintive plea for help by William Hogan, who at the September 2006 Energy Economic Conference stated that markets are under attack and help is needed.