

Conservation alone is not enough

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Since the Oil Embargo of 1973 and the subsequent tripling of energy prices, public concern has been translated into Energy Conservation action. Conservation does appear to be the most promising response to the 'Energy Crisis'. However, what is commonly overlooked is that the direct use of high-grade energy is not the only areas where we have had scant regard for the true value and scarcity of our non-renewable energy resources. Capital stock in the form of buildings, transport networks, and machinery also involve a substantial indirect energy input as well as the more obvious direct operational energy costs.

All capital stock uses energy during one or more life-cycles. Energy is used in creating and establishing capital stock, in maintaining it and, depending upon the nature of the capital stock, energy is used in operating it. In our industrial society there is a great network chain of machines which, in turn, produce other machines. Each chain can be traced back to the use of the first prehistoric tool and each step back up the chain has required an input of energy — indirect energy which we are not always aware of.

The design and organisation of our settlements largely determine the level of operational energy costs such as those of heating and transport. Energy savings through conservation measures alone are ultimately limited by the nature of our capital stock. Continued unsound investment in our capital stock now will result in surfacing problems in the future which will confound the best of our intentions and efforts as we face not only continued rising energy prices, but also the inability of supply to match demand.

Over the life-time of a building an average ratio of direct and indirect energy costs is as follows: Maintenance: Initial Capital: Operational Energy Costs = 1 : 2 : 10. Suppose a greater proportion of the total life-cycle energy costs were concentrated at the design stage which resulted in a building with double the initial capital costs (including design), double the maintenance costs, and half the operating costs. Then the life cycle energy costs of the building would be 11 energy units instead of 13 energy units as above. The example given exaggerates the additional capital and maintenance energy costs required to effect the reduction in operating energy costs. And yet existing taxation legislation does not encourage developers to increase the capital costs of buildings in order to reduce operating costs, thus creating the anomaly where it pays to waste energy.

Likewise, Town Planning legislation does not allow for more homogeneous zoning so that small scale industry can be set up or transferred to residential areas. Sympathetic design of small scale work places can avoid 'polluting' residential areas. Home to work travel distances can be reduced without costly transport networks being essential. Present day zoning laws encourage inner city land values to rise as demand increases for those properties where home to work transport costs and time are less. In the meantime the less affluent continue to live in the outer city areas and commute longer distances to centralised work places.