

THE LIMITS OF ENERGY POLICY MAKING

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Summary

Understanding the relationships between all sectors of human activity is essential to forming a well-organized, productive, intelligent, and pleasant society. Constructing and utilizing a model by which to visualize and understand the interactions between these sectors is a helpful first step towards this goal of understanding. It is then possible to look at the dynamics between these sectors, and subsequently formulate rules and policies based on the model. This article will focus on the sectors of energy, economics, environment, and ethics.

1. Introduction

Energy's crucial role in economic development and human welfare, combined with its strong interactions with the environmental sector, dictate ethical considerations as well as pragmatic. Every person, no matter where on earth, requires some external energy for cooking, warming living spaces, lighting the dark, and (even today in some cases) warding off predators. Yet, vast amounts of energy provide the wealthy few in the world (which includes most people with access to these articles) with luxurious comfort and mobility.

Energy also interacts strongly with the economy. The production of energy has also provided wealth to many. Indeed, it is easy to think of the fortunes made, and too oft squandered by the visible and colorful petroleum wildcatters (picture the mahogany-paneled boardrooms of Houston, New York, London, and Den Hagen). Nevertheless, it is worth noting that the vast majority of shares in publicly traded companies (and thus the wealth accrued) belong, either directly or through mutual funds, to millions of middle income First World-ers.

The significance of the interactions of energy with the economy go far beyond the wealth directly generated. Industry and transportation quite literally run on commercial energy. Without abundant (and inexpensive) energy, industrialized economies falter. In addition to the important role that energy plays in supporting other economic activities, energy production and distribution is, itself, a major sector of the world economy. Three of the ten largest companies in the world are primarily energy producers. Tens of thousands of companies around the world are involved in energy production.

Since huge sums of money are involved in producing and selling energy, and the means to luxury are at stake in consuming energy, the issues of equity and environment can easily be pushed into the back seat. Even when we are serious about striking the balance between economic growth, social equity, the environment, and prudent energy use, we must make our choices by weighing widely disparate sets of values. Herein is a proposal for how to approach the balance between energy, environment, economy, and ethics.

2. The Model: 4-E Diagram

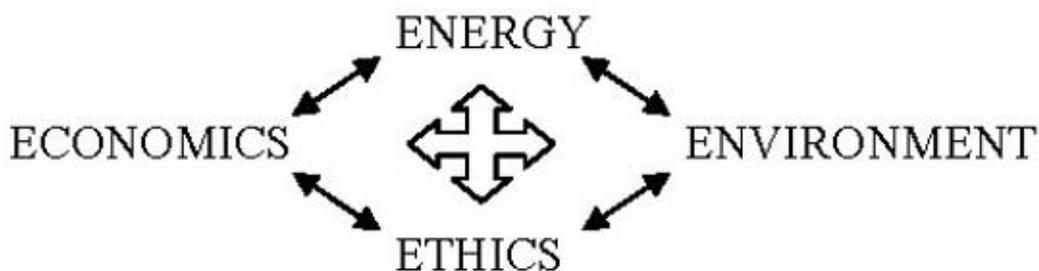


Figure 1: 4-E Diagram

Outside the hallowed halls where the United States Congress conducted its business, in the adjacent packed parking lots, the traffic jams exacerbated by favors from the local constabularies for limousines and extending across lands and oceans. From a desert where a dweller seeks warmth while attending the birth of a camel, to a seaman on an oil-laden supertanker in reverie of the automobile he/she will purchase with seagoing savings, to a metropolitan yuppie shopping at a furniture boutique to decorate the condo with artifacts from nations around the world, the daily activities of all of us are inextricably bound with the four indispensable E's. These four E's can be arranged into a diagram of the diamond persuasion, reminiscent of a baseball field.

That these four E's are intricately and exquisitely connected is indisputable. The subject was Energy at the 75th Anniversary 17th Congress of the World Energy Council in 1998, but the talks, formal and informal were a melange of these four ingredients. This was true for the national (elected and otherwise) government executives, the government (politically appointed and bureaucratic) officials, plus the CEO and COB's who shared their wisdom with us lesser ilk (and the worldwide assembled press).

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Biographical Sketches:

Dr. John Lohrenz, a noted expert in chemical engineering energy and economics, received degrees in Chemical Engineering from the University of Kansas, the University of Oklahoma, and Kansas State University. Areas of specialization include oil and gas project economics, reservoir engineering, optimal decision methods and uncertainties in engineering projects. Some research areas include: the economics of shutting in and abandoning oil and gas production, coupling between two immiscible phases flowing at different velocities in porous media, the theory of optimal development of oil and gas production, option theory applied to the economic assessment of oil and gas, and competitive bidding for assets of uncertain value: simulations. His works have been published in many energy and economics journals, as well as for several technical conferences on these topics. Among his awards his lifetime achievement award from the Society of Petroleum Engineers for his work in engineering economics. HE was a professor of Chemical Engineering at Louisiana Tech University. Dr. Lohrenz passed away before completing this article. It has been finished through work by:

Ellen McCoy is an undergraduate at the University of Rochester, finishing her degree in general engineering. She plans to go on to graduate school for philosophy and physics, with hopes of making contributions to humanity's understanding of the human experience. Ellen has also been assisting in editing the Energy Policy Volume of the Encyclopedia of Life Support Systems.