



Short communication

# The Oregon resource interaction model: an application of systems energetics principles to decision-making in Oregon state government—1974

Larry L. Peterson

*School of Architecture, Florida A&M University, Tallahassee, FL 32307, USA*

In addition to Dr. H. T. Odum's specific impacts on theory in many fields related to science, he also had significant influence on the formation of new policies in the areas of land planning and ecosystem management; and, in at least one case, his work greatly influenced the proposal of an energetics-based 'conceptual guidance system' for a state government.

In 1974, I took a leave of absence from the School of Architecture at the University of Florida to work under Oregon's Governor Tom McCall, in his Office of Energy Research and Planning. At that time, Oregon was reeling from the energy crisis and some of its leaders were realizing how they were connected to international markets for sources of energy and raw resources.

Immediately before the McCall administration were the energy shortfalls in fuel oil and gasoline, which were directly affecting the lives of Oregonians on a daily basis. Without legislative authority, the Governor had initiated 'odd-even' gasoline rationing to consumers and asked the business community to turn off their outdoor sign advertising on the weekends to curtail the use of electricity.

A Canadian rail strike which choked the flow of natural gas into the state was directly affecting some of Oregon's important businesses. The strike shut down

plywood and cardboard plants of the timber industry', which both require large amounts of energy for heat and pressure. Suddenly, Governor McCall was under pressure to "go international" for the sake of a large sector of Oregon's economy, a difficult concept for many conservative voters to grasp. The office I worked in was criticized for collecting data on Canadian natural gas and supply lines, since "it had nothing to do with Oregon."

In part to stave off criticism and in part to understand the complexities of energy supply and end use, the Governor requested the Office of Energy Research and Planning to develop a large energetics diagram showing the energy, resource, and economic interactions based on the energetics principles of Dr. Odum (Peterson et al., 1974). We later named the diagram the Oregon resource interaction model (ORIM).

Our effort reflected in large measure, Dr. Odum's views on energy policy and society, succinctly stated in his review of Scientific American's 1971 special issue titled *Energy and Power* (Odum, 1972). His reviews were relatively critical of the special issue because while it was factual and informative about energy and the power needs of society, he felt that it had failed significantly by not also informing society about the limits to technology and energy supplies. In the absence of this critical information he felt they were doing a disservice to society...

*E-mail address:* [llpeterson@townbeacon.com](mailto:llpeterson@townbeacon.com) (L.L. Peterson).

suggesting there were no limits and that technology could solve any constraint in the future. It was not long after publication of his reviews that Odum's warnings would come home to roost. Energy supplies were choked during the Arab Oil Embargo and technology hit on difficult times with major nuclear power plant accidents and bankruptcies of the nuclear industry.

Since the ORIM was quite complex (over 100 flows and storages) for the time, overlays were developed from the master diagram showing the individual flows of water, natural gas, timber, etc. to make understanding easier for state legislators and to make mapping the interventions of the various jurisdictions and statutes of different agencies more clear. Several "cradle to grave" scenarios were developed to show specific energy flows in everyday situations, such as toasting a piece of bread or the timber used in advertising for food stores. These scenarios were mind-benders for many people; reminiscent of my first experience with one of Dr. Odum's seminars.

The office presented the ORIM to both the legislature and key business leaders in Oregon. Governor McCall offered our work to them as a parting gift from his administration, since he was leaving office after two terms and could not run again. The office postulated the ORIM as a framework to be used to organize the state's many databases into a coherent and more useful product. It then proposed analyzing legislation in terms of its overall state-wide net energy consequences, suggesting that many existing pieces of legislation might be counter-productive; and hinted that individual legislators and state agency heads might be held accountable for the overall energetic and resulting economic impacts of their voting records and policy decisions.

Needless to say, the legislature turned our offer down flat and the rumors heard from the business community suggested that they preferred to keep government agencies more ignorant of their affairs than their own strategic planners were prepared to be. The incoming administration, more closely aligned with business interests than with McCall's environmental ones, had no interest in continuing this work and eliminated our office entirely.

Convinced that our approach to forming public policy was fruitful, Governor McCall and some of his office staff formed the Institute for Applied Energetics and secured initial funding to continue their efforts. Unfortunately, lacking a visible platform from which to work and failing health forced McCall to retire from public life altogether before any additional work could be done to significantly affect public policy.

As Governor McCall was ending his final term in Oregon in 1974, Jerry Brown was elected to the office of Governor of California. The staff of the Institute met with Brown and his transition team and presented the ORIM to them with an audience of several hundred in San Francisco. Later in his administration, Governor Brown realized the importance of Odum's energetics principles as a foundation for policy formation and he acknowledged how it could be useful.

As politicians and bureaucrats, not scientists, these two governors and many of their staff realized the validity of Odum's thinking and the utility of energetics diagrams and their ability to enable people to understand the complex interactions of human society, natural systems, and energy flows. And, importantly, they realized how energetics could be used as a rational and factual basis for decision-making and for forming policies to guide the allocation and use of our resources.

Dr. Odum believed that large and complex systems could be understood through analogy and the application of simpler systems. His diagrams were his way of simplifying the complexities of the real world to aid in understanding systems behavior and gaining insights in how they could be managed. It worked in Oregon, to a limited degree, but our timing was late to be truly effectual.

## References

- Odum, H.T. 1972. Unscientific myopia: the illusions of plenty. A review of the "Energy and Power" issue of *Scientific American*. *Landscape Architect* April, 246–248.
- Peterson, L.L. et al., 1974. Oregon Resource Interaction Model. Energetics Diagram and Table of Flows and Storages. Office of Energy Research and Planning, Office of the Governor, State of Oregon (unpublished).