ENERGY INPUT-OUTPUT RELATIONSHIPS IN SHALE OIL PRODUCTION

Comments by Panel Chairman

Albert G. Melcher

As our technological society moves from a period of cheap energy into a period in which energy will become more costly to deliver for end use, we are asking a number of questions which we did not ask 10 and 20 years ago. Some of these relate to resource depletion, some relate to international politics and economics, some relate to the ways in which we use our energy, and some relate to the technologies and economics of new sources of energy.

This latter subject—bringing major quantities of a new fuel to the American public—is the concern of this entire symposium. This panel, which will commence the entire session, melds that concern with the question of how we use our energy. One of the uses of energy is for making more energy. Another aspect of *"use"* is *"wise use"*: do we waste energy, do we use it frivolously, do we use it with the welfare of future generations in mind? How and where can we use our energy, which is becoming more limited as resources are depleted, and more costly, in more effective ways?

These are major social concerns, and within the past year nearly everyone has recognized the need to conserve energy. Some talk of a 1985 reduction from trend consumption of 125 Q to 108 Q, others talk of 95 Q, but there is little basic disagreement on energy conservation. Nor is there significant disagreement on the need to develop new sources and new technologies.

So, in our oil shale programs, we now have the issue before us: "How much energy does it take to produce how much energy?" A number of people have addressed the matter, and some have quantified their assessment. We are fortunate in having three of them on the program today. Further, there has been a tremendous amount of heat without much light generated by some people, and a tremendous amount of misinformation. Should I say that we are fortunate that the protagonists of misinformation are not on the program?

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Bear in mind that the speakers today are talking only about oil shale, not about all fossil fuels or all energy systems. Also, they will be talking about a *portion* of the total system which commences with geologic exploration and terminates with the end use, or final demand, for energy.

At the Colorado Energy Research Institute, we are conducting a study on "Net Energy Balances in Fossil Fuels." Our study will be published late this year; hence, we do not have any definitive findings on data, study methodology or policy-related issues and "energy accounting systems" at this time. I will say, however, that there are a number of ways of defining the boundaries of the systems to be studied and of accounting methods for displaying the results of the balance or energy input-output calculations. Some of these will be discussed today. Also, there are a number of ways in which energy balance studies may be useful, and there are a number of reasons why they are of limited use and why other decision-making tools are more important. I am delighted to join with you in what should be a fascinating learning experience for all of us.