Colleagues:

This response is provided on behalf of the Ames Laboratory. We find that the Framing Document is cogent, compelling and cohesive, and that it proses several important questions. We are providing responses on a few of those, where we feel that we have significant input to offer.

1. Mission statement for DOE energy research.

We find this to be very suitable, and particularly commend its avoidance of any mention of particular means of meeting the stated goals.

3. Principles for allocating resources.

It is important, within all of the categories of this question, to avoid positions that discourage appropriate risk-taking. DOE should be prepared to pursue lines of research - even in applied areas - that are riskier than would be acceptable in a corporation that has to be responsible to its shareholders.

4b. Technology user facility design principles

There is a fundamental difference between the proposed technology user facilities and the typical Office of Science user facilities. At major facilities such as light sources, the typical use involves bringing a specimen, collecting some data, and then leaving. Perhaps slightly different cases apply where a company essentially "owns" a beamline, but still, the mode of operation is essentially such that a user can have minimal contact with other users, and leave no trace of his or her activities. It is easy to maintain a high degree of confidentiality, even when using a shared facility. A "technology user facility," in contrast, is likely to involve longer-term development activities, rather than just instrument use, and thus there is likely to be much greater interaction between users of the facility. Furthermore, it is possible or even likely that the facility will be changed by the uses to which it is put, thus leaving potentially valuable commercial information in place. For industrial users, this can pose a challenge to IP protection unless a corporation can have exclusive use of the facility for an extended period of time. Such a mode of operation, in turn, poses the possibility of a company strategically "locking out" its competition. The appropriate modes of operation for such a facility need to be considered very carefully if it is to avoid these problems.

4c. Gathering technology market information

This is an issue that is addressed in the APS/MRS report on Energy Critical Elements, where the gathering of market information is identified as a key element in a strategy for anticipating research needs before they develop into crises. It is essential for corporations to be assured and fully confident that information that they provide will be held in the utmost confidentiality, or they will inevitably avoid participating in any data-gathering. It would be helpful if the data were gathered by an agency with Principal Statistical Agency status.

7. The six strategies

While it is agreed that these are, indeed, the correct strategies, the bridges between the Supply and Demand sides represent quite specific choices, and presenting such specific choices conflicts with the philosophy of identifying technological alternatives and letting the marketplace decide among them. Take the case of progressively electrifying the vehicle fleet, for example: this is only one alternative and, even though it might be overwhelmingly evident that it is the right one, it should still compete in the marketplace with other alternatives such as high-efficiency IC engines, biofuels, etc.

Other comments:

However the energy future unfolds, it is almost beyond question that it will involve increasing electrification, and that electrical energy will gradually supplant other modes of delivery to the consumer. The consequence of this is a need for radically increased grid capacity, and the development of grid-scale storage and smart grid technology are essential. Much less attention has been given, so far, to the issue of providing enough material for the grid infrastructure - transformers, towers and cables. There is a large need to develop and field new technologies for these purposes, allowing greater currents to be carried in fewer cables, extending the distance between towers, etc, and allowing existing rights-of-way to be used at higher capacity, as a partial alternative to the more challenging task of opening new ones. Ultimately, the cost of the physical infrastructure, and the need to acquire the raw material for it, is going to be a bigger challenge than the technology involved in making the grid smart.

-Alex King

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