LETTERS

Cogeneration in West Germany

Amory B. Lovins, in his letter to *Science* (24 June, p. 1384), states that ". . . President Carter's speechwriters may have taken the incorrect cogeneration figure for West Germany from the same source I did," referring to his article in the October 1976 issue of *Foreign Affairs*. Lovins then identifies the "incorrect" source as our report (*1*). On page 6 of our report we said:

> In West Germany, a much larger proportion of the electrical energy is generated by self-producers (principally industrial establishments), rather than utilities, as indicated in the following tabulation.
>
> | | United States | West Germany |
> |---|---|---|
> | Utilities | 94.3% | 71.5% |
> | Self-producers | 5.7 | 28.5 |
>
> Of the West German industrial (excluding railroads) net production, 59 percent goes for their own use. The generation (and sale) of this much surplus electricity suggests a wider practice of the energy-conserving techniques of combining the generation of electricity and process heat in West German industry.

We did not identify how much of the 28.5 percent of electricity generated by self-producers represented cogeneration, and did not mean to imply that all of it did. Since then, R. H. Williams has determined that 12 percent of electricity generation in West Germany represents cogeneration, which corroborates our suggestion that the practice is more widespread in West Germany than in the United States.

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References and Notes

1. R. L. Goen and R. K. White, *Comparison of Energy Consumption Between West Germany and the United States* (Stanford Research Institute, Menlo Park, Calif., June 1975).

"Lovins' Fever"?

As usual, Allen L. Hammond and William D. Metz have done a fine job in summarizing the vagaries of the federal program in solar energy R & D (Research News, 15 July, p. 241). Unfortunately, and not surprisingly, this critique shows evidence that they, like so many others, have caught "Lovins' fever"—for which there is no known antidote.

Without any great hope that further analysis can really change minds, I think it may be worth reminding the readers of *Science* of several unresolved difficulties before they begin to bang on ERDA's (the Energy Research and Development Administration's) door.

1) To assert that solar energy is fundamentally different from other energy sources because it is "democratic" is, indeed, a beautiful thought. But examinations of decentralized solar systems which would provide temperature conditioning and electricity to communities indicate they will be more "democratic" for the well-to-do located in the suburbs than for the lower-income groups in urban centers.

2) Assessments of on-site solar systems to the contrary, no one has articulated in any detail—let alone determined—the energy system-wide effects of meeting a substantial fraction of total final energy demands at a regional level through the use of such distributed energy technologies. These effects may include added costs to consumers still relying on utilities, a decrease in overall community energy efficiencies as a result of the displacement of commercial and industrial activities to remote locations, and increased state and local government responsibilities in case of disruption of the local systems.

3) For the next 40 to 50 years, and probably much longer, a major fraction of the nation's energy system of production and distribution will rely on centralized energy facilities. Dialogs which focus on solar energy's role in a hybridized complex of centralized and distributed subsystems are, therefore, much more productive than those which cast the situation in an either-or context.

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Archeoastronomy at Pueblo Bonito

Jonathan E. Reyman's article "Astronomy, architecture, and adaptation at Pueblo Bonito" (10 Sept. 1976, p. 957) raises an interesting question about the intended functions of buildings that were purposely astronomically aligned. In 1975, Fisher, O'Flynn, and I reported (*1*) on the same window alignments in Pueblo Bonito to which Reyman refers. His measurements confirm our findings that the two windows open to the winter solstice sunrise. However, we feel that his hypothesis of "adaptive strategy" for the windows is far from settled. That the alignment is real there is no doubt. However, if it is intentional, it is certainly not clear that the alignment ever served to set a calendar. To begin with, because of the angular width of the windows, it is impossible to determine the date of the