



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

POWER SUPPLY USING A NATIONAL GRID

*Ken Holum, Consultant
Ken Holum and Associates*

In 1973, with all readily available sources of energy in short supply, we must use our remaining resources as efficiently as possible. We must find improved techniques for meeting our growing energy needs, and we are determined to meet those needs without avoidable environmental degradation.

You have asked me to discuss electric power supply and power pooling. As we consider future action with respect to electric power supply, it is essential to understand that a relationship does exist between "electric power needs" and the alternative sources of energy that are, or may be, available.

We can and must learn to conserve energy. Nonetheless, the American economy will continue to require substantial energy inputs. Unless those requirements are met, our productivity will certainly be reduced and our comfort and convenience diminished.

During the winter months we will need to heat homes, offices, and factories. We can plan and insulate our homes better, but they will still require heat. There is no easy way to meet the electric power needs of a healthy economy and a comfortable people within the requirements of good environmental practices and sound conservation.

Let me identify readily available management techniques which the electric power industry should employ to improve the efficiency of the industry. Application of these techniques will reduce the environmental damage associated with electric energy supply, and its transmission and distribution, while improving substantially the efficiency with which we use resources.

Power supply facilities, generating plants, and transmission lines should be planned, built, and managed to serve regional and national needs while we maintain and protect the pluralistic, free choice local electric systems. The regional power supply systems created to achieve this objective should all be interconnected by an extra high voltage transmission network, which we have appropriately named "The National Grid."

Regional power supply systems designed and managed to meet the bulk power supply requirements of all utilities would obviously

have facilities that take full advantage of the economies of scale. These facilities would also be located where fuel costs are lowest and environmental damage can be kept to a minimum.

Transmission systems designed to meet the needs of all utilities would obviously reduce the environmental damage imposed by duplicating delivery systems. Extra high voltage transmission lines built to meet regional and national requirements multiply the carrying capacity of each facility and substantially reduce the unit cost. An electric power system designed and managed to meet the needs of all utilities in a given region provides unique opportunities for utilizing both resources and capital investments at substantially higher levels of efficiency than we are presently achieving.

A publicly owned National Grid and publicly owned regional bulk power supply systems would become a reality if legislation that is currently pending in both houses of the Congress is enacted. In the Senate, the National Grid bill is sponsored by Senators Mansfield, Metcalf, Humphrey, McGovern, Abourezk, and Hathaway. The House bill is sponsored by Congressman Tiernan of Rhode Island.

The sponsors of the National Grid legislation are convinced that public involvement in bulk power supply is the best, if not the only, way to attain the construction of an extra high voltage, nation-wide electric power system and comprehensive planning of the electric power supply facilities needed in each region. They expect the National Grid to achieve better use of resources, while reducing environmental damage. Certainly, an interconnected, nation-wide transmission system would significantly improve service reliability while reducing the investment and the facilities committed to reserves and standby.

The electric utilities have acknowledged the potential benefits inherent in region-wide power planning and management by creating "voluntary power pools." Properly organized and managed, voluntary power pools could achieve most of the public interest benefits available to a publicly owned National Grid.

Unfortunately, the voluntary power pools created under the leadership of the investor-owned utilities generally fall far short of meeting the public interest need for region-wide coordinated power supply planning, building, and management. In fact, to the extent that these imperfect power pools mislead the public into thinking that real power pooling has been accomplished, they are more likely to adversely affect the public interest.

Region-wide planning for bulk power supply should be done

in a way that permits all distribution systems to participate as if they were a unit of a region-wide bulk power supply system. All electric utilities, regardless of type or ownership, should have an assured right to participate as joint owners in generating stations planned to meet region-wide needs, and each utility should be completely free to utilize its own sources of capital to do so. Together all utilities should plan, build, and operate a region-wide transmission network interconnecting all systems in the region, and all utilities should be able to use the transmission network under predetermined reasonable and equitable terms.

Public interest, region-wide power pools could make certain the best possible use of existing facilities, conserving both capital and resources. More important, region-wide power planning, with all systems participating, could assure the construction of the best possible alternative when generating stations need to be built and avoid waste and duplication in transmission line construction.

Finally, the regional power supply systems must be interconnected by an extra high voltage transmission network so that bulk power can be moved across the country freely as the sun rises and sets and from north to south to take advantage of seasonal diversities. With four time zones, it just does not make sense to replicate the dinner hour capacity four times, and it is ridiculous that the winter peak requirements of the northern plains is not utilized to offset summer air conditioning peaks in New Orleans, Las Vegas, and Montgomery, Alabama.

More important, perhaps, a National Grid will permit locating more coal-fired power plants where they should be built—close to fuel rather than close to markets. Low sulphur subbituminous coal from Wyoming and Montana is being marketed to utilities from the Rockies to the Alleghenies, and in many cases the rail haul charges are three and four times the cost of the coal at the mines. Does it make sense to burn fuel oil hauling Wyoming coal to Detroit and Chicago when the energy could move by wire if it were first converted to electric power?

A Department of Interior analysis called Study 190, completed by the Department in 1968, indicated that interconnecting the West electrically would achieve a benefit-cost ratio of 1.8 to 1 utilizing the criteria applied to federal projects at that time. No effort has been made to update these studies, but costs associated with inflation have almost certainly offset the arbitrary, stricter standards now in use.

A recent engineering and economic evaluation conducted by

consumer-owned electric utilities in the Missouri River Basin area indicates that a mill per kilowatt hour can be saved by substituting electric transmission for a 100 mile rail haul. The study has been conducted to help identify the most economic location for a 1,200 megawatt base load station composed of either two 600 kilowatt machines or three 400 kilowatt units, to be built and owned jointly by rural electric cooperatives, municipal electric systems, and public power districts.

For economic, environmental, and conservation purposes we need a National Grid. We need it now as the most readily available and logical technique for increasing the available supply of electric power, maintaining service reliability, and reducing future environmental damage.

Unfortunately, until this time electric utility leaders have been unwilling or unable to do the job. Until they demonstrate an active and aggressive interest in real power pooling, I support National Grid legislation. I am convinced that the National Grid concept represents a readily available means to meet important energy requirements within the framework of sound environmental practice, good conservation, and wise use of capital. We will not realize its potential benefits if we wait to see those benefits realized by voluntary power pools.