

*Engineering Implications of Chronic
Materials Scarcity*

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**Engineering Implications of
Chronic Materials Scarcity**

Proceedings of an Engineering Foundation Conference
Organized by the Federation of Materials Societies
for the Office of Technology Assessment
United States Congress and the
National Commission on Supplies and Shortages

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Engineering Implications of Chronic Materials Scarcity

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Preface

National materials policy has emerged into prominence in the United States. It involves both the Federal Government and the private sector. In response, many industrial firms have raised materials planning to the level of corporate policy and established a formal organization, sometimes headed by a vice president. The executive branch of the Federal Government has established a Committee on Materials under the Office of Science and Technology Policy with representatives from Federal agencies having major materials activities; three reports by this Committee, nearing completion, involve an inventory of materials research and development, a study of energy-related materials research and development, and an examination of environmental aspects of the materials cycle.

Interest of the legislative branch in materials policy is evidenced by studies requested of the Library of Congress, the General Accounting Office, and the Office of Technology Assessment.

By another legislative initiative, a new temporary organization, the National Commission on Supplies and Shortages, was established with members from the private sector as well as from both the legislative and executive branches of Government. This Commission is charged with reporting on the possible need for a permanent materials planning institution and with giving special attention to materials information and stockpiling.

The present Conference—the fourth in the series of biennial conferences at Henniker on national materials policy—seeks to examine the interrelationship of engineering and policy implications involved in current national materials policy activities. Two of these activities are explicitly addressed: (1) the work of the materials program of the Office of Technology Assessment and (2) the deliberations of the National Commission on Supplies and Shortages. In addition, attention is focused on conservation of energy in materials processing, the role of materials in defense, and the more effective utilization of renewable resources.

The first Engineering Foundation Conference on National Materials Policy—held at New England College, Henniker, New Hampshire, in 1970—provided a warning of future difficulties. It called attention to the functional relationship of materials, energy, and environment. The following October, the Congress by statute created the National Commission on Materials Policy.

The second Engineering Foundation Conference on materials policy, also at Henniker, was convened in 1972 with active participation by the Chairman and staff of the National Commission on Materials Policy. It explored eight issues that were later to comprise the gist of this Commission's final report. It stressed the need for a cooperative interaction of Government, academia, and industry in the resolution of these issues,

The third Engineering Foundation Conference in this series, in August 1974, was organized by the Federation of Materials Societies for the Office of Technology Assessment. It, too, was held at Henniker and examined options for implementing national materials policy. It stressed the need for reliable and accessible information on all aspects of materials management, the symbiotic relationship of technology -economics-institutions in implementing national policy, and the interdependence of nations with respect to the production, exchange, and the use of materials.

The purpose of this publication is to present the proceedings of the fourth Henniker Conference on National Materials Policy. Like the first three Conferences, it does not recommend or advocate. Its "findings" are exploratory. The Conference searched for options and alternatives. The "findings" contained in the present report are the products of task forces, largely self-selected, of the conferees. No individual responsibility for these reports should be inferred; they stand on their own merits and should be so regarded.

Likewise, as managing agency for the 1976 Conference, neither the Federation of Materials Societies, the OTA, or the NCSS assume responsibility for the substantive product. Its purpose in supporting this activity was to sustain the national interest in materials policy as a subject deserving of close and continuing public attention,

Arrangements for the publication of these proceedings were handled by the Office of Technology Assessment and the National Commission on Supplies and Shortages.

Foreword

These proceedings document the papers delivered, task force deliberations and findings, plenary discussions, and “sense of the meeting” of the fourth Henniker Conference on National Materials Policy.

These conferences, sponsored by the Engineering Foundation, were initiated with four purposes in mind. First, to keep the issue of national materials policy alive, and to remind public interest groups and decisionmakers of its importance. Second, to sustain progress toward the design and development of a national materials policy. Third, to build a consensus as to the essential elements that should comprise a national materials policy. And fourth, to convey to national decisionmakers in the legislative and executive branches of the Federal Government a true perception of this emerging consensus,

There is no good way to measure the effects of these conferences. Certainly, the participants take home with them a lively sense of community in an important enterprise. They share this experience with their associates through trip reports and verbal accounts. The proceedings of previous conferences have literally spread all over the world, are cited widely in the literature of materials policy, are quoted in the halls of Congress, and are summarized or reproduced in official documents.

Another function of these conferences is that of recruitment. Along with the senior participants like N. E. Promisel, J. B. Wachtman, Jr., R. E. Goldhoff, C. E. Ford, and the many who have provided leadership at several past conferences, each time there are new recruits to the materials community, who find at Henniker a crash course in instant expertise.

Above all, the community at Henniker provides entree to people representing the many fields of knowledge encompassed in materials science, technology, and management. No one can pretend to have a firm grasp of all these fields. But meeting for a week to work on important and difficult problems is an ideal introduction,

Moreover, it is not always the experienced senior professional who discovers the way to resolve these knotty issues. Often enough it is the newcomer with a fresh outlook who asks the right question or suggests the novel approach,

As long as these conferences can continue to observe these aims and serve these public purposes, it is likely that ways will be found to continue them. For in the changing world, the design of a materials policy cannot be a fixed decalogue; it must respond to the changing times, and better yet, anticipate them. The present proceedings should be evaluated against that ideal.