
Sustainable Minerals Roundtable

Introduction

Sustainable development is an evolving concept that works to improve the economy, the environment, and society for the benefit of current and future generations. Its main premise is that actions we take today must provide for our own needs without diminishing the assets, resources, and capabilities available to our descendants.

Commitment to sustainable development principles necessitates integration of environmental policies and development strategies so as to satisfy current and future human needs, improve the quality of life, and protect resources. It involves managing resources in a way that is conducive to long-term wealth creation and the maintenance of capital (physical¹, economic, human, natural, and social). This perspective extends naturally to mineral/material² and energy resources that are a form of natural capital and are an important source of wealth creation. How does the concept of sustainable development apply when mineral/material and energy resources are nonrenewable?

First, the goal of sustainability as applied to mineral/material and energy resources is not to sustain a given deposit, but to sustain the flow of services provided by mineral/material and energy resources and to do so in a manner such

¹ Physical (built or produced) assets that are assigned monetary value and traded in markets.

² In this document, mineral/material refers to mineral(s) and mineral-based material(s).

that, over a commodity's life cycle, the net contribution to society is positive. The natural capital embodied in mineral/material and energy resources should be transformed into physical, economic or social capital of equal or greater value.

Second, these resources are integral components of economic systems, providing essential inputs to virtually every economic sector. Sustainability requires ongoing investment in technological development to ensure that the services now provided by specific resources will continue to be provided, whether through substitution, recycling, or other means.



Recycling is an important aspect of minerals in sustainability. In 2000, 95 percent of all automobiles that had reached the end of their useful life were recycled (Steel Recycling Institute, 2001; Photo source: Brøderbund Software, Inc., 1997).

Third, mineral/material and energy revenues are the driving force for some local, regional and national economies. Sustainable development for the nonrenewable resource sector means ensuring that those economies will be sustained, even if the resources may be depleted. At the

local level, this means diversifying the economic base of resource-dependent communities so that they will survive the eventual closure of the facilities that sustain them, or market-driven downturns in production. At the national level, it means investing the proceeds of resource activities in additional areas, so that if revenues decline, the country will have other sources of income.

Fourth, resource extraction, processing, use, and disposal may have serious environmental consequences that have the potential to threaten environmental security and degrade present and future quality of life. Sustainable development for mineral/material and energy systems means ensuring that there is no enduring environmental harm from extraction, processing, use, and disposal, even if short-run disturbance of the environment is unavoidable.



Natural environments are at risk of negative impacts as a result of our mineral/materials and energy production, consumption, and disposal (Source: Brøderbund Software, Inc., 1997).

Fifth, resource development can result in social impacts. Sustainable mineral/materials and energy development means that the communities are engaged in an open, honest, and effective process of consultation and communication from exploration through production to closure and post-closure.

Sustainable development can provide the foundation for a policy framework that ensures that mineral/material and energy resources are produced, used, re-used, recycled, disposed of, or stored in landfills for future use in a manner that respects the economic, social, and environmental needs of the local, national, and global communities. Within this framework, the benefits provided by mineral/material and energy resources are acknowledged, as is the reality that geology dictates the location of deposits. Moreover, sustainable development makes good business sense because improving the efficiency of extracting and processing resources, while enhancing environmental and community systems, can create both economic and environmental rewards.

Formation of the Sustainable Minerals Roundtable

Nonrenewable resources could both contribute to and hinder our ability to achieve a sustainable future, depending upon how the related activities are conducted. The management of nonrenewable resources is subject to great controversy, with some stakeholders focused on the threat to the economy if extraction does not occur, while others focus on threats to the environment if it does. In response to this kind of conflict, stakeholders representing government, the mineral/material and energy industries, and the environmental community expressed interest in finding ways to include mineral/material and energy systems in the discussion of sustainable resource management. The Sustainable Minerals Roundtable (SMR) was a response to this interest.

The SMR was formed to develop measures (indicators) of sustainable development for mineral/material and energy systems that would be broadly applicable, be acceptable to a wide

SMR Mission

The Mission of the Roundtable is to support the Nation's commitment to sustainable development. The Roundtable will develop indicators of sustainability, based on social, economic, and environmental factors, to provide a means for assessing the status and trends

range of stakeholders, and meet the needs of the public, policy makers, and private firms in their respective roles. The SMR is co-chaired by the U.S. Forest Service and U.S. Geological Survey, with meetings convened by the University of Nevada's Mining Life Cycle Center in Reno.

The SMR is open to all interested parties. Fifteen meetings have been held around the country since the fall of 1999, in order to facilitate broad participation and involve diverse viewpoints. Participants have included individuals associated with agencies of the Federal government interested in mining, minerals, and energy, private firms engaged in nonrenewable resource extraction, local governments, tribal organizations, and nongovernmental organizations.

The main challenge in actually pursuing sustainability is in learning how to integrate our various goals, aspirations, and competing demands in ways that improve the economy, the environment, and society over the long term. (U.S. Interagency Working Group on Sustainable Development Indicators, 1998)

Sustainable Development

The term *sustainable development* was introduced in 1980 by the International Union for the Conservation of Nature. It was popularized in Our Common Future, the report of the World Commission on Environment and Development (1987), chaired by Dr. Gro Harlem Brundtland, then Prime Minister of Norway. This report defined sustainable development as "development that meets the needs of the present

generation without compromising the ability of future generations to meet their own needs."

Since the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil in 1992, sustainable development has become accepted as a foundation for public policy. The heads of state and governments participating in the 2002 World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa, reaffirmed their commitment to the principles of sustainable development, and the importance of its three pillars: environmental protection, economic development, and social equity. Moreover, the WSSD Plan of Implementation specifically addresses the minerals sector, calling on nations to take a life-cycle approach to the environmental, economic, health, and social impacts and benefits of mining activity, and to foster sustainable mining practices through support to developing countries.



Will adequate resources be available for future generations? (Source: Cheryl Bloomquist, Duluth, MN).

The United States used the concept of sustainable development in several major initiatives in the past decade. In its initial 1996 report, Sustainable America, the U.S. President's Council on Sustainable Development recommended that the Federal government develop national indicators of progress toward sustainable development in collaboration with the private sector and nongovernmental

SMR Vision

We envision a future in which the capacities of mineral/material and energy systems meet the demands of current and later generations, while maintaining or enhancing the environmental, social, and economic systems in the United States and the world.

organizations, and regularly report on these indicators to the public. The United States also participated in a special working group that developed seven criteria and 67 indicators to assess sustainable management of temperate and boreal forests. In 1995, the United States formally endorsed these criteria and indicators for forests. They have since provided the groundwork for the development of several parallel resource indicator systems, including that of the SMR.

Benefits of Criteria and Indicators for Mineral/Material and Energy Systems

Information about current and long-term conditions and about the processes that affect those conditions is essential to evaluating our progress in pursuit of sustainable development. Indicators are useful as analytical, explanatory, communication, planning, and performance assessment tools. Effective indicators turn vast amounts of analyzed data into meaningful and relevant information and, in so doing, reduce complexity and bring clarity.

The primary purposes of this set of indicators are to:

- encourage a national dialogue about how mineral/material and energy systems can best contribute to a sustainable America;
- identify the types of information that will be needed for an informed public dialogue;
- highlight strategic trends and priorities related to mineral/material and energy systems; and
- support an interim assessment of the Nation's progress toward its sustainability goals.

The set of indicators developed through the SMR is a first look at some of the key economic, environmental, and social factors that may be important to mineral/material and energy systems. The SMR sustainability indicators

describe a broad range of attributes of these systems, including the positive as well as negative ones. They are not being developed with any specific regulatory or policy application in mind; although it is possible that they will contribute to future developments in these areas. For example, while present environmental regulations focus on end-of-pipe issues, there is much interest in considering a systems approach to regulation in the future. Broader scale indicators may provide insight into how to develop such an approach.



Growing populations and urban development require mineral/material and energy resources (Source: Brøderbund Software, Inc., 1997).

It is expected that the SMR indicators will form a starting point for a more complete set of indicators for mineral/material and energy systems. Eventually, after extensive public review, discussion, and revision, the final set of indicators will become part of a larger national interdisciplinary measurement framework along with the indicators for forests, rangelands, and water resources.

National level indicators for mineral systems are also being developed in Canada following the same broad timeline. The SMR has ongoing contact with the developers of the Canadian indicators. It is expected that there will be some overlap between these sets of indicators and that there will also be differences reflecting climatic, cultural, and political differences between Canada and the United States.

For additional information, please visit www.unr.edu/mines/smr/

Future SMR Plans and Milestones

The SMR has committed to publish a first report by 2003 on the indicators. This report will be a milestone in our ability to report upon the state of the nation's mineral/material and energy systems. Material from this document is expected to contribute significantly to the 2005 Update of the 2000 Resource Planning Act Assessment (USDA Forest Service, 2000), a report mandated by the Forest and Rangeland Renewable Resources Planning Act (1974).

Other Roundtables

Three other roundtables are creating sustainable development indicators related to forestry, rangelands, and water. Information about these roundtables can be found at:

Forestry: <http://sustainableforests.net/>

Rangelands:

<http://www.cnr.colostate.edu/RES/srr/>

Water: <http://water.usgs.gov/wicp/acwi/swrr/>

Upcoming SMR Meetings and Workshops

Sep. 19, 2002	SMR Informational Briefing – Washington, DC
Nov. 19-20, 2002	SMR General Meeting – Chicago, IL
Dec. 3, 2002	SMR Workshop at the Northwest Mining Association Annual Meeting and Exposition – Spokane, WA
Feb. 25, 2003	SMR papers as part of an all-day session on Mining and Sustainable Development at the 2003 Society for Mining, Metallurgy, and Exploration Annual Meeting – Cincinnati, OH
Apr. 10, 2003	SMR Session at the Mineral Economics and Management Society Annual Meeting – Golden, CO

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U.S. Interagency Working Group on Sustainable Development Indicators, 1998, Sustainable development in the United States—An experimental set of indicators: U.S. Interagency Working Group on Sustainable Development Indicators, 136 p.

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The production of minerals plays a vital role in local, regional, and national economies, while sometimes radically changing the landscape, either temporarily or permanently (Source: Brøderbund Software, Inc., 1997).