

MAINTENANCE OF CAPACITIES TO PRODUCE COMMODITIES

Increased use of goods and services, coupled with population growth, has increased the impact humans have on the economy, the environment, and with each other. Technology has transformed patterns of communications, diet, family life, health, leisure activities, and work. More materials need to be extracted or harvested, processed, manufactured, transported, and recycled or disposed to meet the changing lifestyle and growing population. The increased use of materials transforms the landscape as more factories, warehouses, distribution terminals, and retail outlets are built to supply the increased demand for goods and services.

Given the present trends in the use of nonrenewable resources will the Nation continue to be capable of meeting the needs of current generations and in the future, meet the needs of later generations?

Introduction

The goal of the productive capacity criterion is to provide the information required to assess the Nation's energy and mineral resources and the capability to meet the needs of current and later generations. The indicators within this criterion are displayed in terms of physical units (such as metric tons and acres available) whereas the socio-economic criterion displays many similar indicators in terms of dollar values.

The productive capacity criterion can be viewed as the links in the chain of events required to supply energy and mineral resources to the market. As shown by figure PC-1, when we talk about the productive capacity criterion, this includes finding, extracting, processing, and transporting resources to the marketplace and then when feasible, recycling those resources back into the system. At each individual stage of the life cycle (resources, exploration, production, processing, and manufacturing, and utilization) individual indicators can be identified to help provide the information necessary to allow individuals to judge the Nation's physical ability to meet its energy and mineral requirements. Most, if not all, the indicators are interlinked. None of the indicators identified can be used alone, each provides a piece of the picture of the capability of the United States to meet current and future energy and mineral requirements.

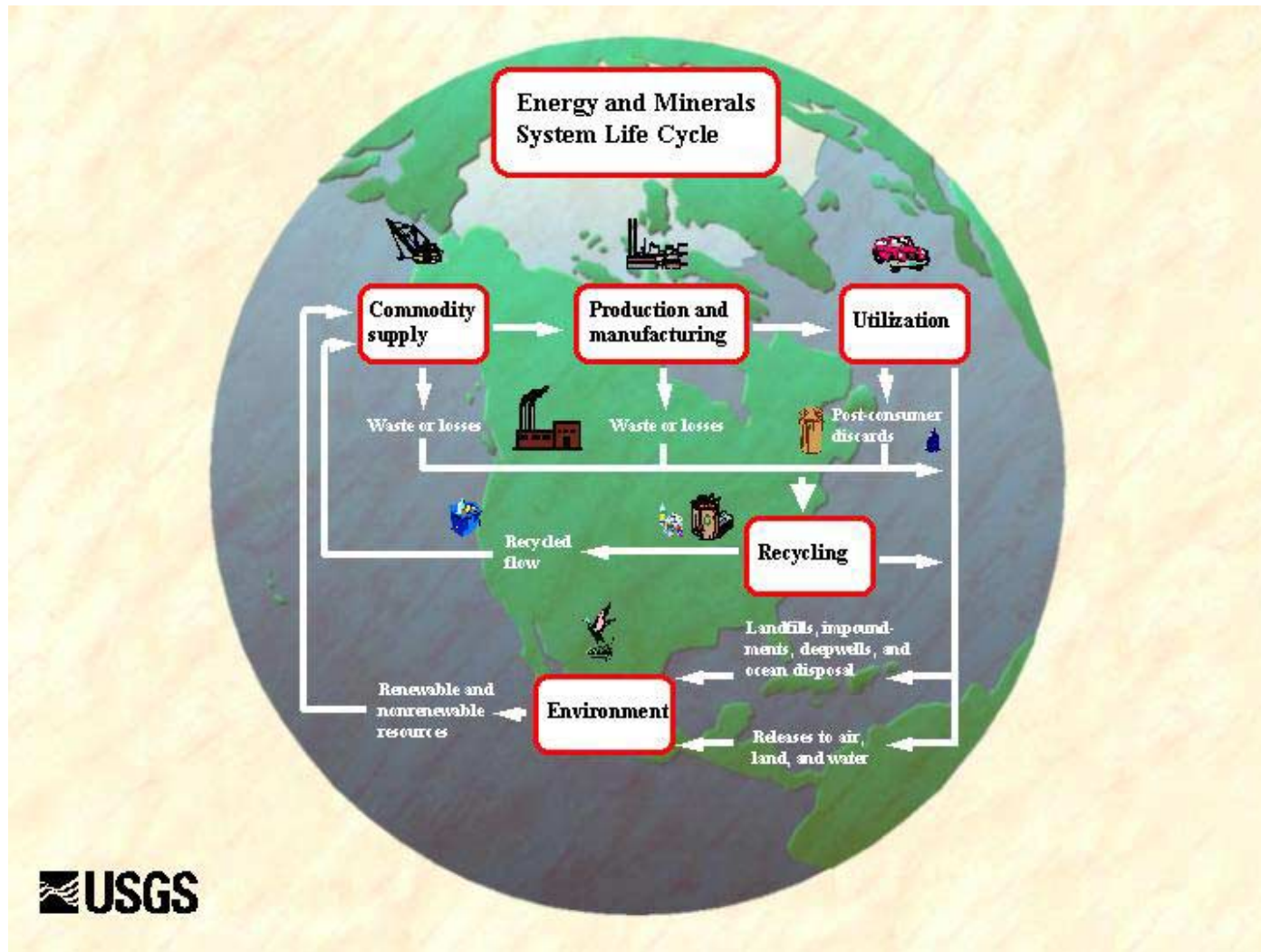


Figure PC-1. Materials flow cycle. The materials flow cycle aids in the analysis of the flow of materials through the economy and environment. The cycle is used to trace the flow of materials through the life cycle from extraction, through production, manufacturing, and utilization to recycling or disposal.

The relevance of the productive capacity indicators to sustainability is that these indicators provide information that shows energy and mineral resources that are present within the country that are potentially available to be extracted and processed to meet market demand, and the past use of imported commodities to help satisfy domestic demand. Societies have to choose where to get their energy and minerals—domestically or through imports. There are tradeoffs associated with either approach and the relative attractiveness of each will depend upon society's beliefs about the relationship between sustainability and domestic resource production.

This criterion is intended to supply the essential information necessary to allow concerned individuals and groups to judge progress in the process of sustainable development as it relates to the Nation's capabilities to meet its current and future requirements for energy and mineral resources. The indicators identified do not define sustainability, but the information they provide through their status and trends are important to any assessment of that goal.

Indicator Categories

The productive capacity criterion has been categorized into five major categories: resources, exploration capacity, production or extractive capacity, processing capacity (such as smelting, refining, and including our ability to transport materials and energy), and the use of energy and minerals.

1. Resources: The resources category is an attempt to provide information to allow for the assessment of the future availability of resources within the boundaries of the United States. This category provides information regarding access, land status, and mineral endowment (resources).
2. Exploration capacity: This indicator category provides information to allow concerned individuals to assess exploration activity and capacity in the United States. This is important for understanding the Nation's ability to supply energy and mineral resources within its borders to meet future needs. Because there is a long lag time between the time a deposit is discovered and the time it reaches production, it is important to look at long-term trends in worldwide and domestic exploration activities to evaluate whether current exploration activities may be sufficient to generate future energy and mineral supply on a timely basis. If not, alternative plans may need to be made.
3. Production (extractive) capacity: The production or extractive capacity category was designed to provide information to measure the Nation's ability to produce or extract raw materials and also to provide the information that measures the current status and trends of how the Nation is meeting its energy and mineral wants and needs. This information is also relevant to the export of the consequences of production that is an issue from a global sustainability perspective.
4. Processing capacity (smelting, refining, and transportation): Information is provided in the processing capacity category to enable the measurement of the Nation's ability to process (smelt and refine) raw materials and energy domestically and deliver supply to meet current and future demand. This also includes information concerning the capability to process imported sources of energy or minerals, not just to process domestically produced commodities.

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5. Use of energy and minerals: The use of energy and minerals criterion provides information from a historical perspective on the changing patterns of consumption. This information can be used to illustrate the long-term trends in use that has important implications for sustainability.