



# Industrial Policy: *A Different Perspective on Strategic & Critical Materials at the Department of Defense*

***GUIRR Meeting  
Diminishing Natural Resources  
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# Outline

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- What is Industrial Policy?
- What are the reasons for the recent interest in “strategic materials”?
- Congress and the Department are very concerned about strategic materials!
  - Strategic Materials Protection Board
    - Definitions for “strategic” and “critical” materials
  - Strategic & Critical Materials Working Group
  - Reconfiguration of the Defense National Stockpile



# OD (IP) is Part of OUSD(AT&L)



## Office of the Secretary of Defense

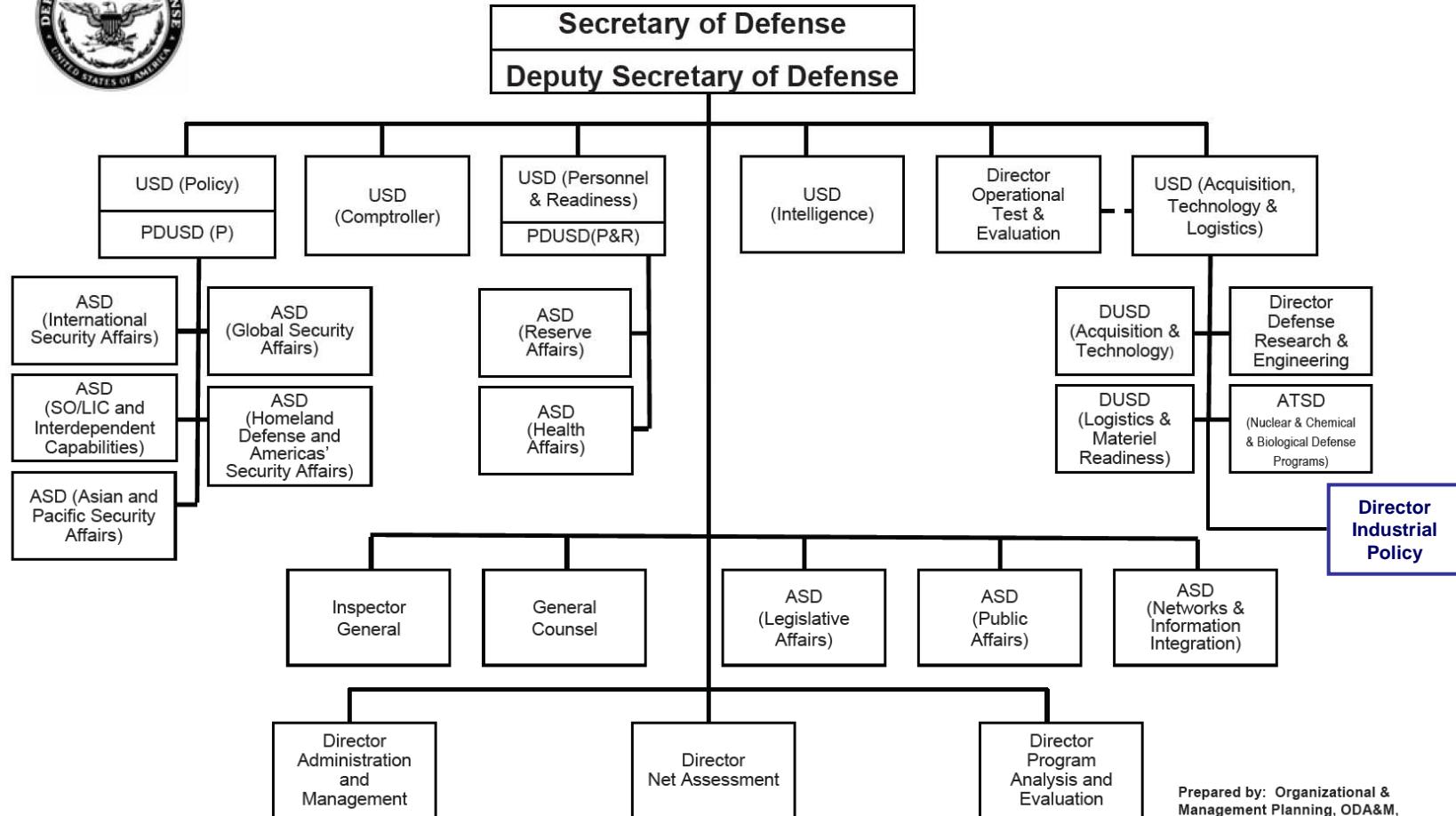


Chart reflects PAS officials and those reporting directly to the Secretary and Deputy Secretary of Defense

Prepared by: Organizational & Management Planning, ODA&M, OSD  
Date: January 2008



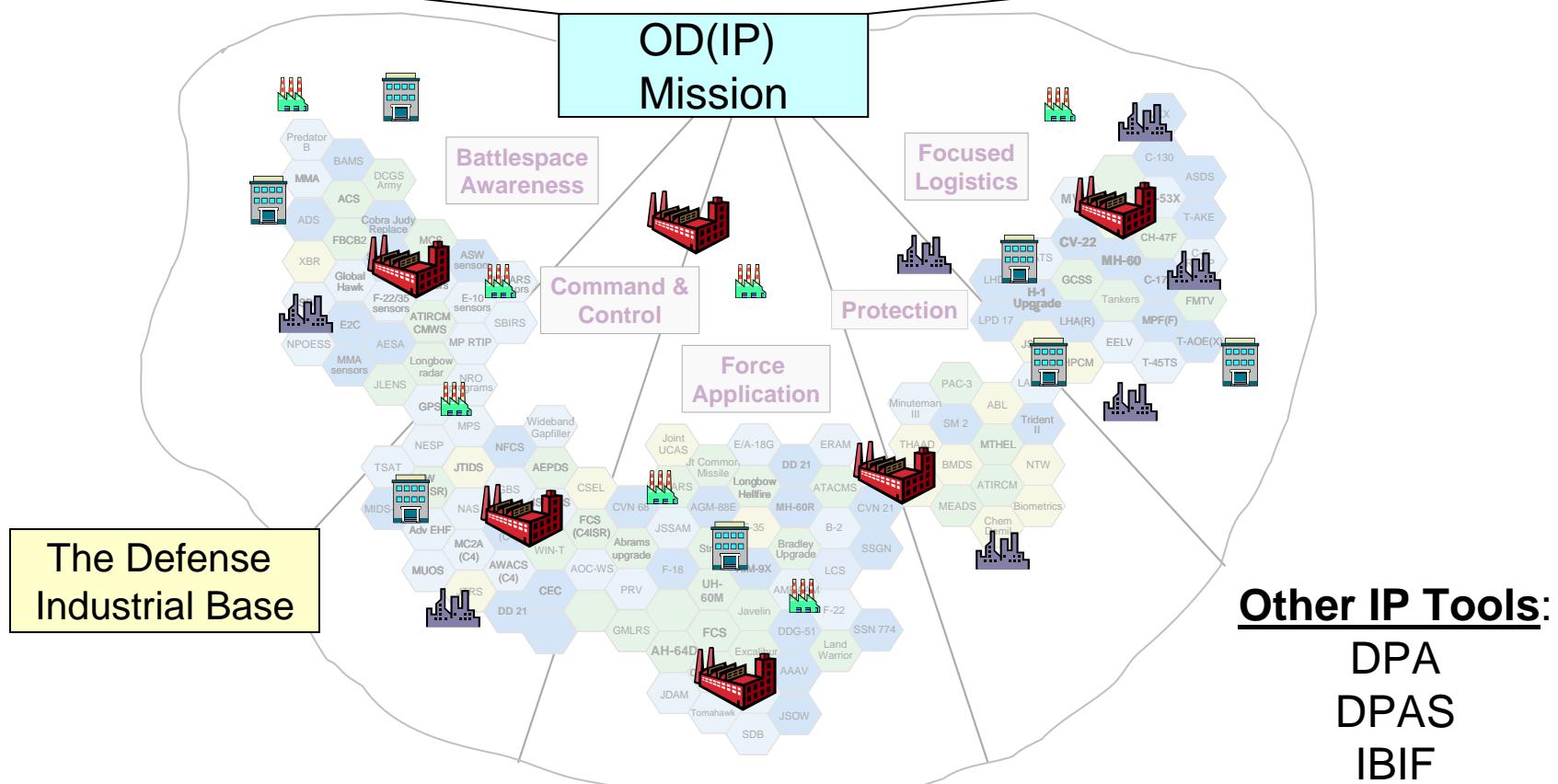
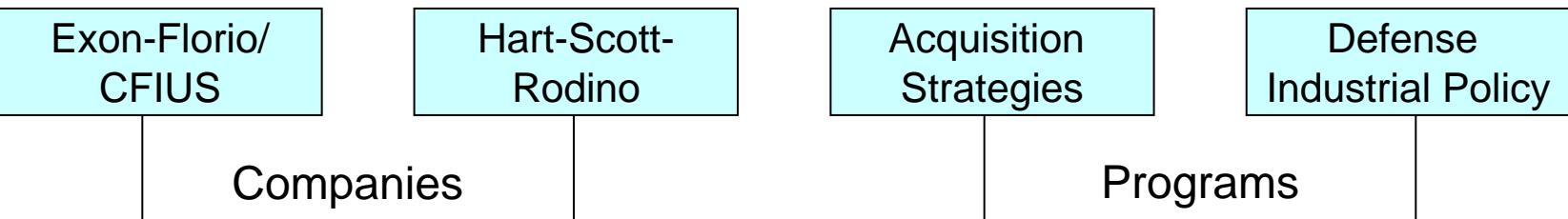
# What is OD(IP)'s Role Within OSD?

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- OD(IP)'s primary role is to advise the USD(AT&L), the DEPSECDEF and SECDEF on matters concerning defense industrial capabilities.
- IP's mission is to make certain the industrial base on which the Department of Defense depends is reliable, cost-effective, and sufficient (i.e. efficient and competitive).



# Industrial Policy's Primary Purpose is to Maintain a Healthy Defense Industrial Base



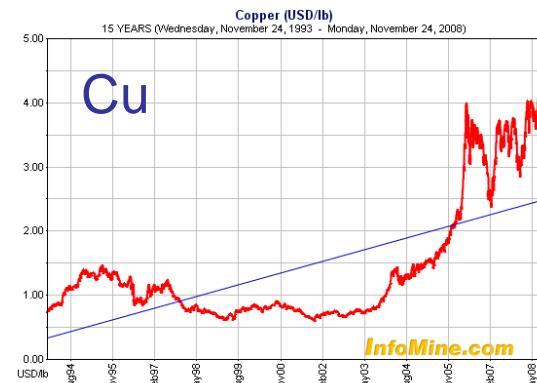
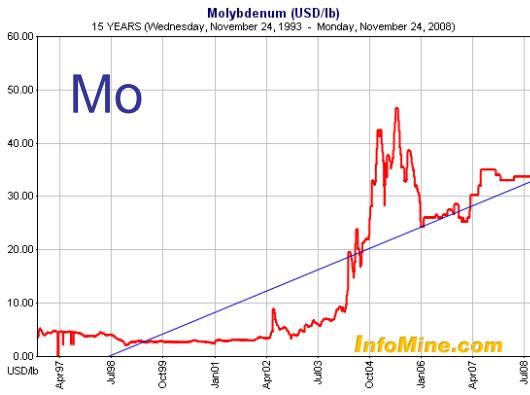


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What are the reasons behind the recent interest in strategic and critical materials?



# Metal Prices Recently Skyrocketed



*The last 5 years or so have been very interesting.  
The next 10 – 15 should be even more exciting.*



# Some Materials Experienced 5 to 10 Fold Increases in Price

Material	Unit	2003 Price	2008 Price	Percent Increase
Chromium	mt	\$54.00	\$325.00	501.85%
Cobalt	lb	\$10.65	\$45.50	327.23%
Niobium	kg	\$34.72	\$54.01	55.56%
Germanium	kg	\$380.00	\$1,537.50	304.61%
Hafnium	kg	\$220.25	\$267.37	21.39%
Indium	kg	\$170.00	\$685.00	302.94%
Manganese	mt	\$950.00	\$4,250.00	347.37%
Molybdenum	lb	\$5.33	\$33.25	523.85%
Nickel	mt	\$8,340.00	\$23,545.00	182.31%
Palladium	troy oz.	\$184.00	\$456.50	148.10%
Platinum	troy oz.	\$671.00	\$2,047.00	205.07%
Rhenium	lb	\$494.42	\$4,650.00	840.49%
Tantalum	lb	\$22.50	\$43.50	93.33%
Titanium	lb	\$4.90	\$15.00	206.12%
Tungsten	lb tungsten content	\$3.44	\$14.34	317.43%

8X

11X

6X

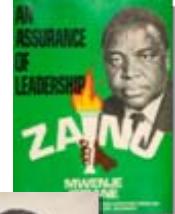


# Major Raw Material Supply Disruptions Have Occurred in the Recent Past

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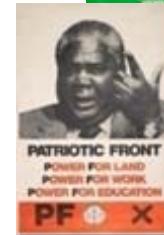
## 1966 through 1971

Embargo of chromium imports from Rhodesia



## 1969

Nickel workers strike in Canada



## 1978

Panic buying of cobalt due to political instability



in Zaire and Zambia

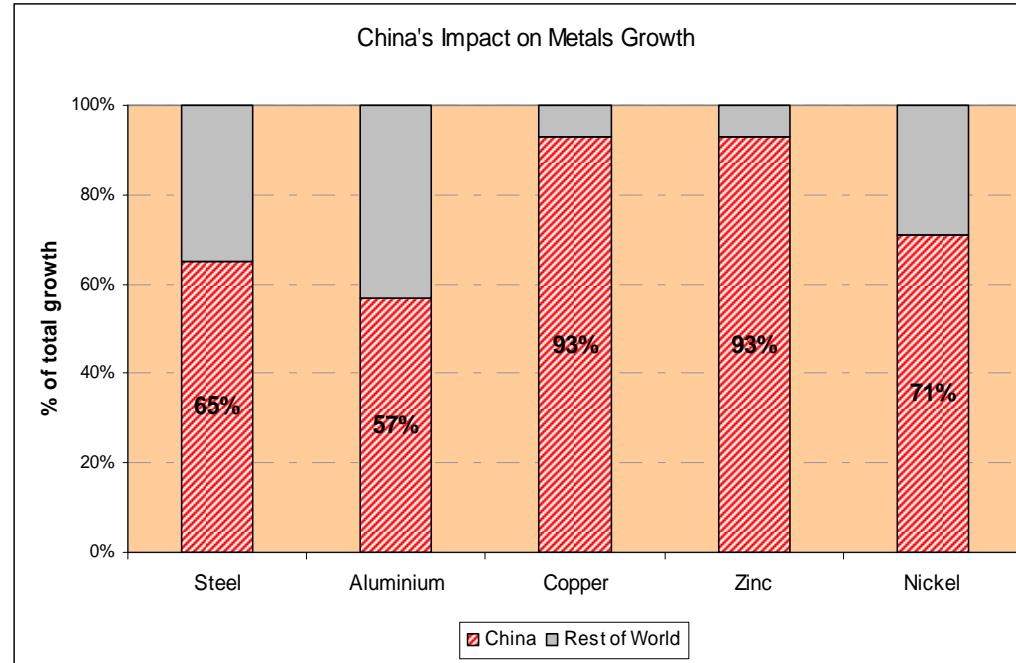


## Present

Unrest in the Congo is causing concern with respect to some metal supplies, especially cobalt ("blood metals")



# The Global Materials Landscape is Changing

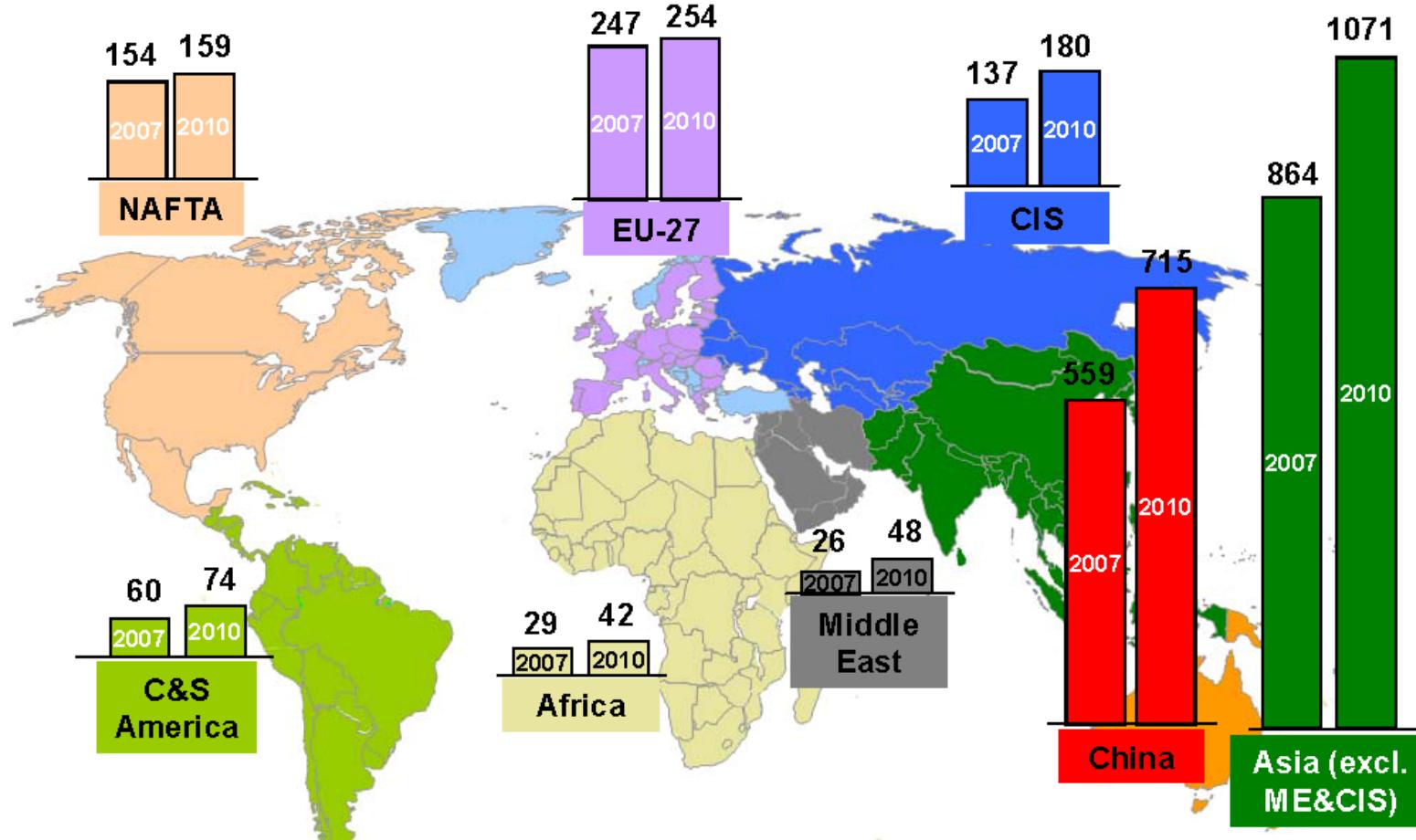


*BRIC theses predict that China and India will become the world's dominant suppliers of manufactured goods and services, respectively, while Brazil and Russia will become similarly dominant as suppliers of raw materials.*



# Steel Production Capacity is Increasing More Rapidly in Developing Countries

## Capacity by Region 2007 vs 2010



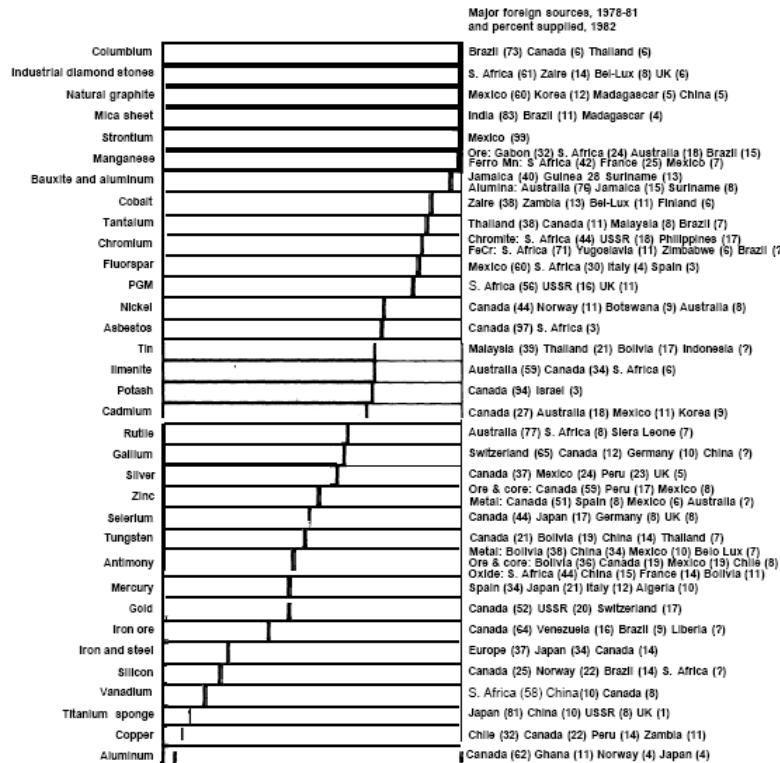
(before economic downturn)



# In the Past, US Import Reliance Was of Little Concern

## 1982 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS

Figure 2-1.—Net import reliance as a percent of consumption, 1982

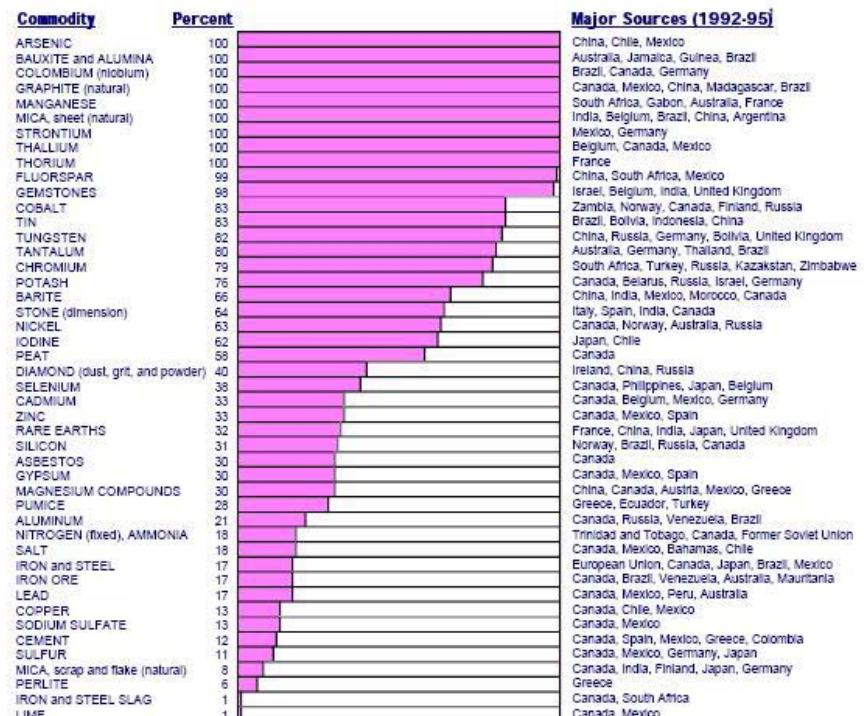


NOTES: Net import reliance is figured as percent of apparent consumption, except for rutile, for which net import reliance is figured as percent of reported consumption.  
Net imports = import exports + adjustments for government and industry stock changes.

Apparent consumption = U.S. primary and secondary production + net imports.

SOURCE: U.S. Department of the Interior, Bureau of Mines.

## 1996 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS

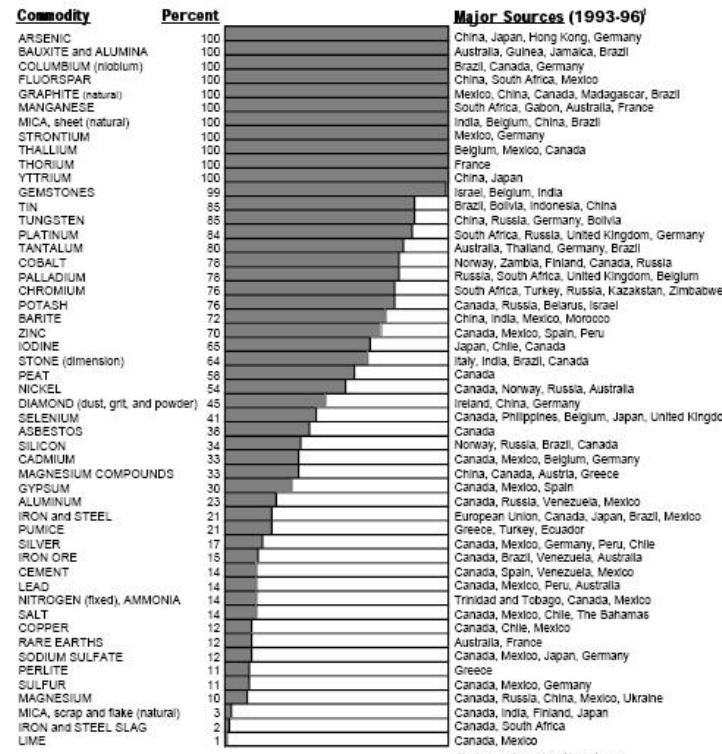


<sup>1</sup> In descending order of importance.



# US Reliance on Imports is Expanding at an Accelerated Rate

## 1997 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS



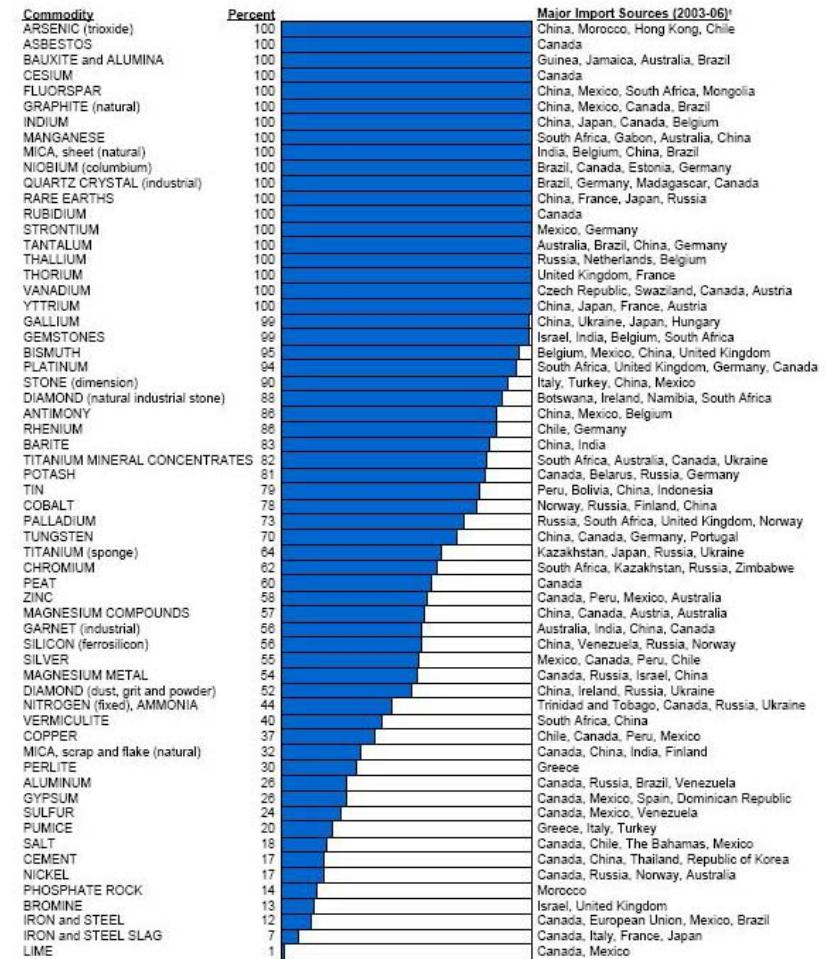
Additional commodities for which there is some import dependency but data are withheld or are insufficient to determine import-reliance levels:

Antimony China, Mexico, Bolivia, South Africa  
Bismuth Mexico, Belgium, China, United Kingdom, Canada  
Boron Prussia, Germany, Hungary  
Germanium Russia, United Kingdom, China, Belgium, Ukraine  
Ilmenite South Africa, Australia, Canada  
Indium Canada, Russia, France, Italy, China  
Kyanite South Africa

Mercury Russia, Canada, Spain, Kyrgyzstan  
Rhenium Chile, Germany, Netherlands, United Kingdom, Russia  
Rutile Australia, Brazil, India, Sri Lanka  
Titanium (sponge) Russia, Japan, China, Kazakhstan  
Vanadium (ferrovanadium) Russia, Canada, Belgium, Austria  
Vermiculite South Africa, China  
Zirconium Australia, South Africa

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## 2007 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS





# Does DoD Buy Magnets for “Smart Bombs” From China?

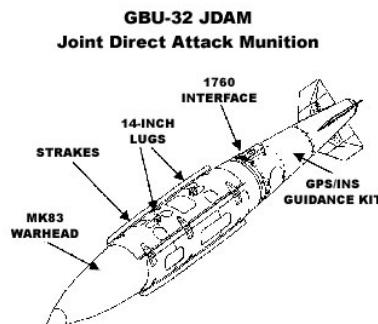
**In April 2008, Senator Hillary Clinton made the following statements concerning the closing of Indiana-based Magnequench:**

*“Right here, over 200 Hoosiers built parts that guided our military's smart bombs to their targets,” the New York senator says.*

*“They were good jobs, but now they're gone to China. And now America's defense relies on Chinese spare parts.*

*“A Chinese company bought the company, called Magnequench, and they wanted to move the jobs to China.*

*“The jobs went to China, but so did the technology. And now the United States military has to buy the magnets we need for the smart bombs we invented from China.”*





# Definitions for “Strategic” and “Critical” as Applied to Materials Are Varied

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- In 1919 the Assistant Secretary of War prepared a list of strategic materials, the **“raw materials essential to the prosecution of war, which cannot be procured in sufficient quantities from domestic sources and for which no domestic substitution has been found.”**
- In the Strategic and Critical Materials Stockpiling Act, (50 U.S.C § 187 98h-3) entitled, “Definitions”:
  - (1) The term **“strategic and critical materials”** means that
    - (A) would be needed to supply the **military, industrial, and essential civilian needs** of the United States during a **national emergency**, and
    - (B) are **not found or produced in the United States in sufficient quantities** to meet such need.



# Definitions Are Dependent Upon the User and/or Application

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- The President in a 1994 executive order defined **strategic materials** as those that are:
  - “(1) needed to supply the **military, industrial, and essential civilian needs** of the United States during **national security emergency**, and
  - (2) are **not found or produced in the United States in sufficient quantities** to meet such need and are vulnerable to the termination or reduction of availability.”
- The Department of Defense’s definition describes strategic materials as those:
  - “required for **essential uses in a war emergency**, the **procurement** of which in adequate quantity, quality, or time **is sufficiently uncertain**, for any reason, to require prior provision of the supply thereof.”  
*(Dictionary of Military and Associated Terms, US Department of Defense 2005)*





# Differentiation Between Strategic Materials and Specialty Metals Can Be Challenging

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- In 1941, the **Berry Act** (10 U.S.C §2533a) was established requiring US Government to buy certain products from domestic sources.
- In 1973, **certain metals** were given **“special consideration”**; titanium and various steel and other metal alloys used by defense contractors must be U.S.-made.
- In FY 2007 Congress moved the **Specialty Metals** out of the Berry Amendment.
- Section 842 of P.L. 109-364, which enacted 10 U.S.C §2533b, *The Specialty Metals Amendment*, lists the following metals as **“strategic materials critical to national security”**:
  - Specialty Steel (primarily Stainless Steel)
  - Co- and Ni-based Super Alloys (and some magnets)
  - Titanium and titanium alloys.
  - Zirconium and zirconium base alloys



# A DoD Strategic Materials Protection Board Was Established

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## Public Law 109–364

John Warner National Defense Authorization Act for Fiscal Year 2007

### **SEC. 843. STRATEGIC MATERIALS PROTECTION BOARD.**

(a) IN GENERAL.—Chapter 7 of Title 10, United States Code, is amended by adding at the end the following new section:

#### **§ 187. Strategic Materials Protection Board**

(a) ESTABLISHMENT.—(1) The **Secretary of Defense** shall establish a Strategic Materials Protection Board.

#### **Purpose of the Board:**

The SMPB is to determine the need to provide a long-term domestic supply of strategic materials designated as critical to national security, and analyze the risk associated with each material and the effect on national defense that non-availability from a domestic source would have.



# Strategic Materials Protection Board Responsibility Was Delegated to IP

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- Congress requires SECDEF to establish a Strategic Materials Protection Board.
- By memorandum dated May 4, 2007, SECDEF delegated responsibility to the USD(AT&L) to chair the Board.
- On May 22, 2007, the USD(AT&L) delegated to the DUSD(IP) responsibility to act as the Board's Executive Secretary.
- DUSD(IP) delegates responsibility to SME's in his Office.



# The SMPB Developed Definitions for Strategic and Critical Materials

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**Strategic Material** is a material -

“technical”

- 1) which is essential for important defense systems, and
- 2) which is unique in the function it performs, and
- 3) for which there are no viable alternatives.

**Material Critical to National Security** (“Critical Material”) is a *strategic material* for which -

“business”

- 1) the Department of Defense dominates the market for the material, and
- 2) the Department’s full and active involvement and support are necessary to sustain and shape the strategic direction of the market, and
- 3) there is significant and unacceptable risk of supply disruption, due to vulnerable U.S. or qualified non-U.S. suppliers.

“security of supply”

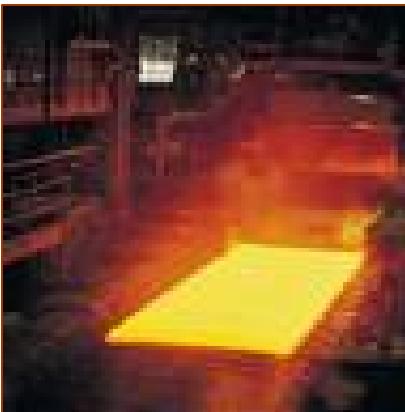
*Critical materials require a reliable domestic source.*



# “Standard” Materials Can Be Strategic Materials

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- Definitions for strategic and critical materials have changed over time.
- The concepts share two common elements: criticality of application (uniqueness/lack of viable substitutes) and vulnerability of supply (domestic sufficiency).
- These factors do not always mesh well with other criteria, e.g. the terms "rare" or "precious".
- Not all strategic materials are rare or precious, and not all precious or rare materials are strategic. In fact, a strategic material may be relatively commonplace in absolute terms.



**For example:** Steel armor plate is a “strategic material” because; it is essential, unique in function, and due to cost and other factors, there are no viable alternatives.





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What is your mental picture of  
the Defense National Stockpile?



# Piles of Rocks?



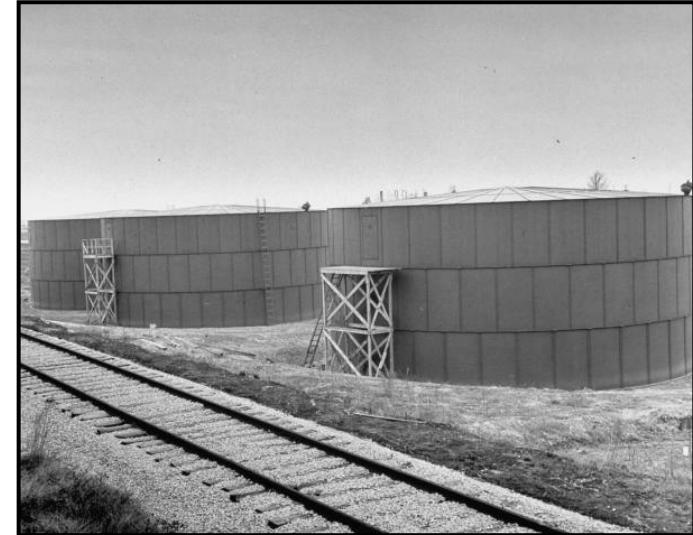


# Stacks of “Raw” Materials?





# Obsolete Materials?





# The Stockpile Has Always Been a Top Priority Within the US Government



THE WHITE HOUSE  
Washington

February 7, 1962

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**NATIONAL SECURITY ACTION MEMORANDUM NO. 124**

**TO:** Honorable Edward McDermott  
Acting Director, Office of Emergency Planning

**(SUBJECT: Review of Principles and Policies Guiding the Stockpiling of Strategic Materials)**

To confirm our earlier discussions, I am designating you to serve as the chairman of a group of department and agency heads to review the principles and policies which should guide our program for the stockpiling of strategic materials. Any stockpiling must obviously be related to our Nation's defense strategy, and must insure that materials necessary to our national defense and security will be available in the event of national emergency.

I believe your committee should also give attention to specific goals as well as to basic principles, to the acquisition and maintenance of the material, and to the disposal of materials now on hand in excess of goals determined to be appropriate. This program is of vital importance to the Nation both in terms of our security and in terms of the Federal investment in these stockpiled goods. In addition, consideration should be given to the problems of our domestic minerals industry and to the international consequences of our programs of acquisition and disposal.

In the past there may have been justification for classifying all or most of the information bearing on this program, but the changes in circumstances from the initiation of the program to the present call for a review of the secret classification. I expect, therefore, that your committee composed of the heads of those departments and agencies whose responsibilities bear heavily on whether classification is warranted promptly review this question and that you will take the steps necessary to de-classify as much information as possible consistent with national security.

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I am hopeful that your review will be completed by an early date and, in any event, no later than March 19.

Those who will serve on the committee with you are the Secretaries of Defense, State, Interior, Commerce and Labor, the Director of the Central Intelligence Agency, and the Administrator of the General Services Administration.

(signed) JOHN F. KENNEDY

cc: The Secretary of State  
The Secretary of Defense  
The Secretary of the Interior  
The Secretary of Commerce  
The Secretary of Labor  
Director, Central Intelligence Agency  
Administrator, General Services Administrator



*Even in the midst of global crisis, strategic materials remained on the President's list of important issues.*



# Congress Recognized the “Value” of the National Defense Stockpile

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- In FY1994, Congress authorized the sale of excess materials from the Stockpile, the proceeds from which could be used for purposes other than Stockpile business. Accumulated sales to date exceed \$5.5 billion.
- In the years between 1994 and 2005, many Congressionally-mandated studies of the NDS were conducted. Most determined Stockpile needed to be changed.
- In FY 2006 Congress directed DoD to “determine whether the National Defense Stockpile should be reconfigured to adapt to current world market conditions to ensure future availability of material required for defense needs.” (House Report 109-89)
- Interim report submitted to Congress in August 2006 recommended a detailed independent study, Congressional tasking not completed.
- National Materials Advisory Board (National Academy of Sciences) completed a review of the stockpile in October 2007 and recommended the NDS should be reconfigured.
- In 2008 NDAA, Congress again tasked DoD to examine NDS (Page 189 of Senate Report 110-155).



# SMPB Was Asked to Complete Certain Congressional Taskings

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- Title XXXIII of House Report 109-89  
**(National Defense Stockpile)**
  - a review of the current policy to dispose of material in the National Defense Stockpile (NDS) and
  - **recommendations regarding reconfiguration of the NDS** to adapt to current world market conditions to ensure future availability of materials required for defense needs.
- Page 189 of Senate Report 110-155  
**(Strategic and Critical Materials)**
  - *"the materials critical to the strategic defense interests of the United States, the domestic suppliers of those materials and their reliance on foreign sources of production, efforts by foreign countries to stockpile critical materials, and the steps that are being taken to ensure that strategic and critical materials not produced domestically will be available to support the defense needs of the United States during a protracted conflict."*



# Strategic & Critical Materials Working Group Was Established in 2008

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*To ensure consistency for the various Department activities and reporting requirements related to strategic materials, the SMPB Executive Secretary formed the Strategic and Critical Materials Working Group.*

- Established/Chaired by OD(IP)
- Administrator of the Defense National Stockpile Center is Executive Secretary
- Members from:
  - OD(IP)
  - DLA/DNSC
  - Army, Navy, Air Force, Marine Corps, J-8
  - USGS, DOC-ITA



# The Working Group Helped Assemble a “DoD List of Strategic Materials”

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- The Working Group developed a repeatable process for compiling the Department's list of strategic materials.
- Weapons systems were “deconstructed” down to basic materials.
- Input was gathered from a variety of sources; the Services, DLA, DCMA, IDA, USGS, DOC, etc.
- Institute for Defense Analysis developed a set of “filters” to determine “vulnerabilities”.
- The results of “filtering” are to be used to examine the risks associated with materials and guide application of mitigation strategies to ensure availability of required materials.





# A Variety of Criteria Were Explored to Create a List of Strategic Materials

MATERIAL	TOP 10 "HAS CAUSED DELAYS"	TOP 10 "WILL CAUSE DELAYS"	TOP 10 "DOD DEMAND"	Riskiest 6	PSD 1 Shortages	MCR	Specialty Metals Studies	DNSC Suspended Sales
Steel: Manganese	•	•	•	•	•	•		•
Aluminum	•	•	•			•		
Titanium	•	•	•	•	•	•		
Nickel	•	•	•	•	•	•		
Copper	•	•	•			•		
Super Alloys: Nickel & Cobalt	•	•	•	•	•	•		
Zinc	•		•			•		•
Germanium	•			•			•	•
Tin	•	•				•		•
Chromium	•	•	•	•	•	•		•
Vanadium						•		
Molybdenum		•	•			•		
Tungsten		•		•	•	•		
Niobium			•			•		

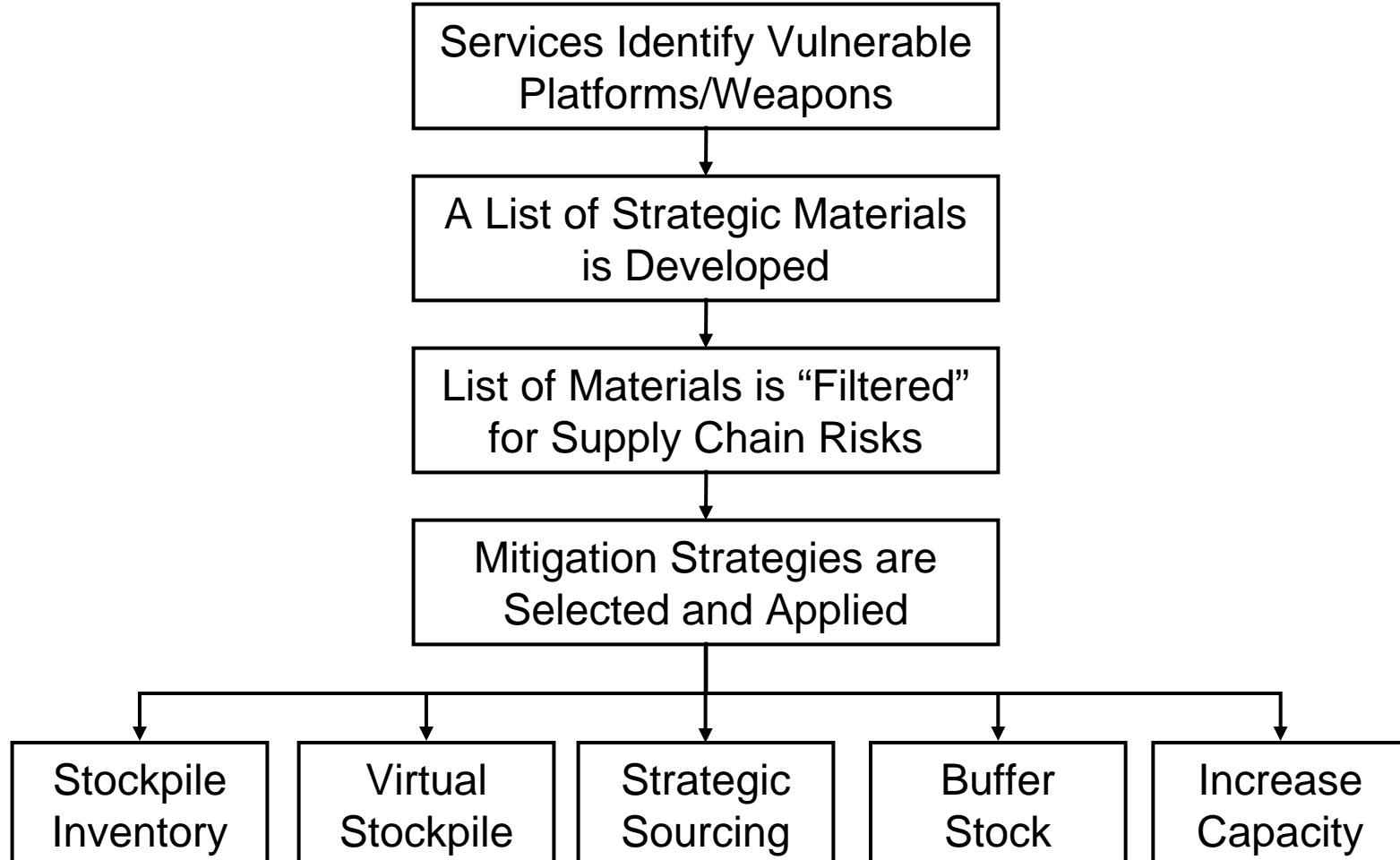
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# A Simplified Repeatable Process for Ensuring the Supply of Strategic Materials Was Developed





# The Process is the Basis for a Strategic Materials Risk Management Program

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*Risk Management Generally Includes Four Fundamental Principles:*

**IDENTIFY**

**STUDY**

**WATCH**

**ACT**



# Reconfiguration of the Stockpile is Being Pursued

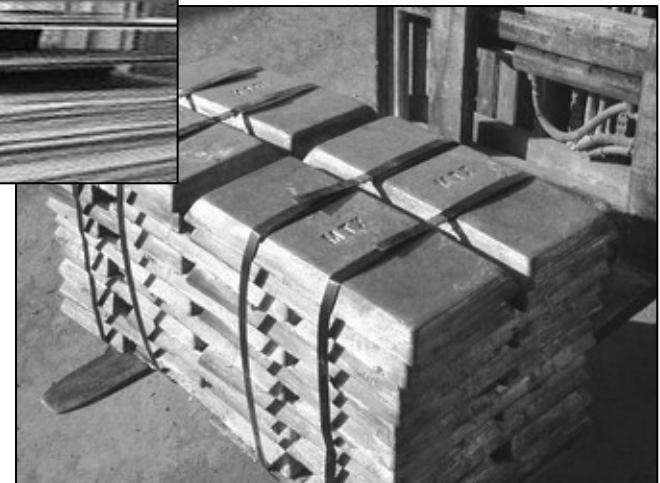
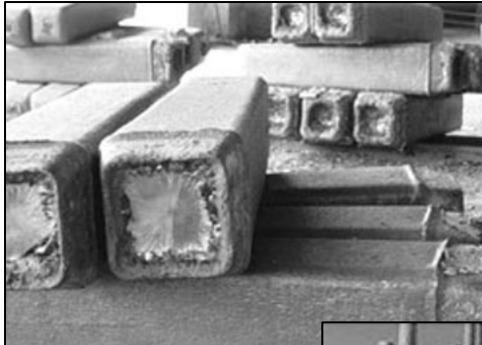
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- Initiatives being considered are:
  - **Reconfigure** the NDS into the **Strategic Materials Security Program**
  - Grant the SMSP broad programmatic **flexibility**
  - Modify the current policy to **dispose of materials** in the NDS
  - Enhance the acquisition authority to employ **risk mitigation** strategies
  - Consider the need to augment the Transaction Fund with an **annual appropriation**

A legislative package is being drafted.



# What is the Vision for the New Stockpile?





# Summary

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- OD (IP) is the keeper/watcher of the Defense industrial base.
- The SMPB and Working Group were established to address DoD's strategic and critical materials issues.
- Definitions rule! The pen is mightier than the sword! (ask me later about acquisition regulations)
- The Department is interested in managing risks with respect to the supply of essential materials.
- A transformed Stockpile could take advantage of many new materials management approaches and thus better ensure the availability of required materials.
- Risk mitigation with respect to strategic materials must be considered at ALL stages of product development!