



APPROACHES TO A RETURN TO THE MOON

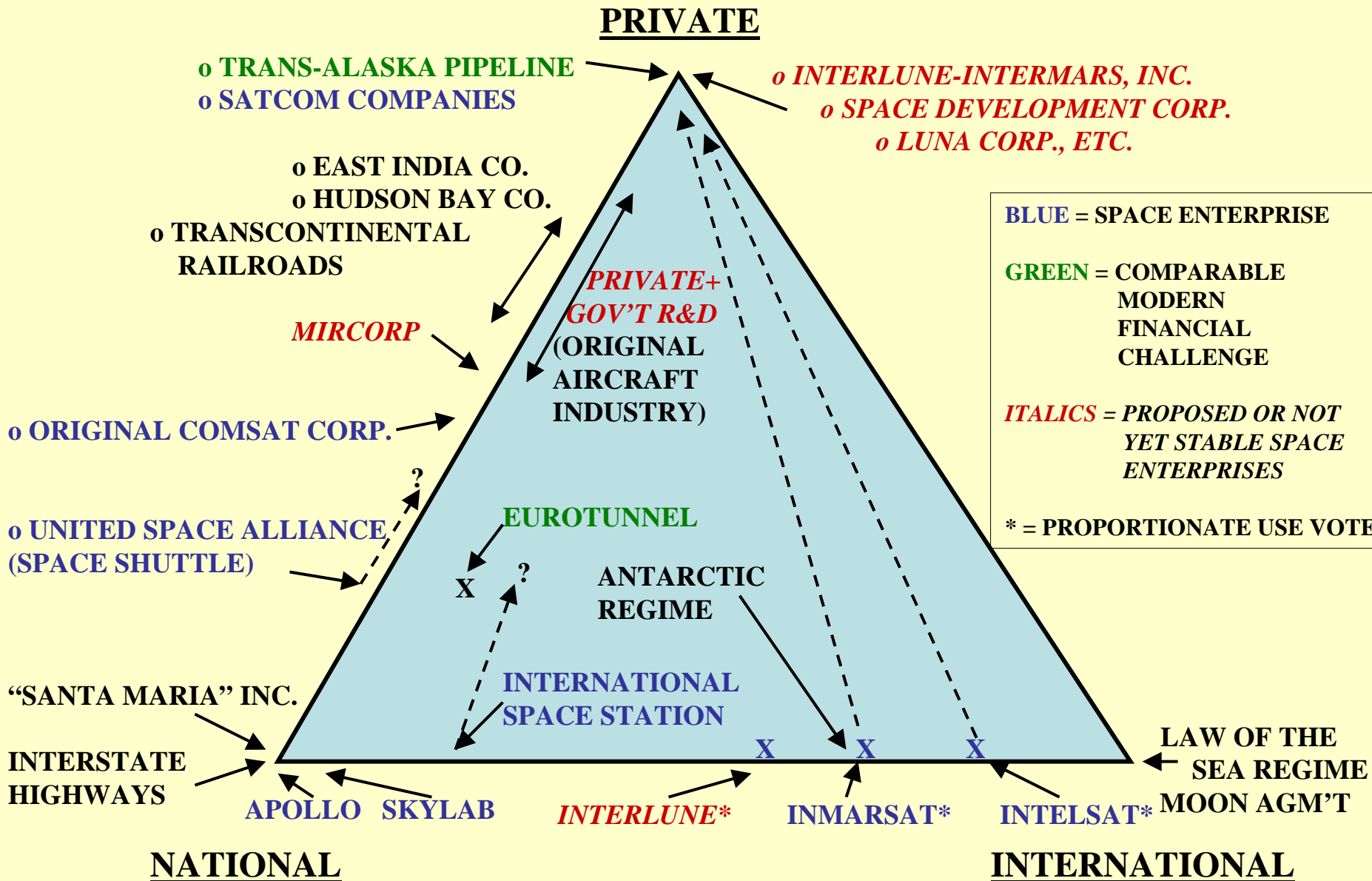
NEEP 533 LECTURE 35

Harrison H. Schmitt

LEGAL IMPLICATIONS: ACCESSING SPACE RESOURCES

- **NATIONAL**
 - **FEDERAL LAW**
 - **STATE LAW**
 - **REGULATIONS**
- **INTERNATIONAL**
 - **CUSTOMARY LAW**
 - **TREATY LAW**
 - **SPACE LAW**
- **WEIGHT OF LEGAL IMPLICATIONS**
 - **DEPENDS ON MANAGEMENT CONTROL SYSTEM CHOSEN**

‘PURE’ MANAGEMENT CONTROL COMPONENTS: LARGE ENTERPRISES



MANAGEMENT CONTROL APPROACHES

APPROACH

- **ALL U.S. GOVERNMENT**
- **INTERNATIONAL, ONE NATION / ONE VOTE**
- **MULTILATERAL CONSENSUS MODEL**
- **MULTILATERAL PROPORTIONATE USE VOTING**
- **PRIVATE / GOVERNMENT PARTNERSHIP**
- **PRIVATE + GOVERNMENT R&D**
- **ALL PRIVATE**

EXAMPLE

- **APOLLO / PANAMA CANAL / MANHATTAN PROJECT**
- **UN AGENCIES / LAW OF THE SEA REGIME**
- **INTERNATIONAL SPACE STATION / ANTARCTIC REGIME**
- **INTELSAT / INMARSAT**
- **MODERN AIRLINE INDUSTRY / U.S. AGRICULTURE**
- **PRE-1958 AIRCRAFT INDUSTRY**
- **TRANS-ALASKA PIPELINE**

MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 1

- **ALL GOVERNMENT OR GOVERNMENT /
PRIVATE PARTNERSHIP**
 - **U.S. POLITICAL ENVIRONMENT**
 - **SPACE LAW ENVIRONMENT**
 - **MANAGERIAL CONTROL ENVIRONMENT**
 - **FINANCIAL AND TECHNICAL FEASIBILITY**
 - **BUDGETARY COMMITMENT**
 - **TECHNICAL MATURITY**
 - **REGULATORY ENVIRONMENT**

MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 2

- **INTERNATIONAL**
 - **SPACE LAW ENVIRONMENT**
 - **MANAGERIAL CONTROL ENVIRONMENT**
 - **CONTRACT DISPERSION**
 - **U.S. POLITICAL ENVIRONMENT**
 - **BUDGETARY COMMITMENT**
 - **TECHNICAL FEASIBILITY**
 - **FINANCIAL FEASIBILITY**

MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 3

- **MULTILATERAL (INTELSAT)**
 - **PROPORTIONATE USE VOTING SYSTEM**
 - SPACE LAW ENVIRONMENT
 - MANAGERIAL FREEDOM
 - FINANCIAL AND TECHNICAL FEASIBILITY
 - RETURN ON INVESTMENT ?
 - TECHNICAL MATURITY
 - U.S. POLITICAL ENVIRONMENT
 - BUDGETARY COMMITMENT

MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 4

- **ALL PRIVATE**
 - **FINANCIAL AND TECHNICAL FEASIBILITY**
 - **RETURN ON INVESTMENT**
 - **TECHNICAL MATURITY**
 - **MANAGERIAL FREEDOM**
 - **U.S. POLITICAL ENVIRONMENT**
 - **REGULATORY ENVIRONMENT**
 - **SPACE LAW ENVIRONMENT**

RELATIVE PRIORITIES COMPARISON

•ALL GOVERNMENT OR GOVERNMENT / PRIVATE PARTNERSHIP

- U.S. POLITICAL ENVIRONMENT
- SPACE LAW ENVIRONMENT
- MANAGERIAL CONTROL
- FINANCIAL AND TECHNICAL FEASIBILITY
 - BUDGETARY COMMITMENT
 - TECHNICAL FEASIBILITY
- REGULATORY ENVIRONMENT

•MULTILATERAL (INTELSAT)

- PROPORTIONATE USE VOTING SYSTEM
 - SPACE LAW ENVIRONMENT
 - MANAGERIAL CONTROL
- FINANCIAL AND TECHNICAL FEASIBILITY
 - RETURN ON INVESTMENT ?
 - TECHNICAL FEASIBILITY
- U.S. POLITICAL ENVIRONMENT
 - BUDGETARY COMMITMENT

•INTERNATIONAL

- SPACE LAW ENVIRONMENT
 - MANAGERIAL CONTROL
 - CONTRACT DISPERSION
- U.S. POLITICAL ENVIRONMENT
 - BUDGETARY COMMITMENT
- TECHNICAL FEASIBILITY
- FINANCIAL FEASIBILITY

•ALL PRIVATE

- FINANCIAL AND TECHNICAL FEASIBILITY
 - RETURN ON INVESTMENT
- MANAGERIAL FREEDOM
- U.S. POLITICAL ENVIRONMENT
- REGULATORY ENVIRONMENT
- SPACE LAW ENVIRONMENT

SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: FINANCING ISSUES

- **MINIMUM TOTAL START-UP CAPITAL REQUIRED**
 - **FIRST HE-3 DELIVERY TO FIRST ON-LINE FUSION POWER PLANT**
- **MINIMUM TAX REVENUES REQUIRED**
- **MINIMUM PRIVATE CAPITAL REQUIRED**
- **#MINIMUM COST OF CAPITAL / INTEREST ON NATIONAL DEBT**
- ***MAXIMUM FINANCING FEASIBILITY**
- **LEAST REGULATORY COSTS**
- ***MINIMUM OPERATING COSTS**
- ***MAXIMUM RETURN ON INVESTMENT**
 - **FOR GOVERNMENT: SPINOFFS, LOWER POWER COSTS, REDUCED IMPORTS, ENVIRONMENTAL BENEFITS**
- ***MAXIMUM STAYING POWER**

WEIGHTING FACTOR OF 2

* WEIGHTING FACTOR OF 3

SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: MANAGERIAL ISSUES

- **MINIMUM COMPLEXITY OF MANAGEMENT**
- **#MINIMUM COMPLEXITY OF OPERATIONS**
- **ACCESS TO LARGEST TECHNICAL BASE**
- **#QUALITY IN PLANNING**
- **#QUALITY IN RDT&E**
- **#QUALITY IN PRODUCTION**
- **#QUALITY IN OPERATIONS**
- **QUALITY IN MARKETING AND SALES**
- **QUALITY IN PRODUCT DISTRIBUTION**
- ***MAXIMUM SALES MARGINS**
- **#QUALITY IN FINANCIAL CONTROLS**
- **#QUALITY OF WORK FORCE**
- ***MOTIVATION OF WORK FORCE**

WEIGHTING FACTOR OF 2

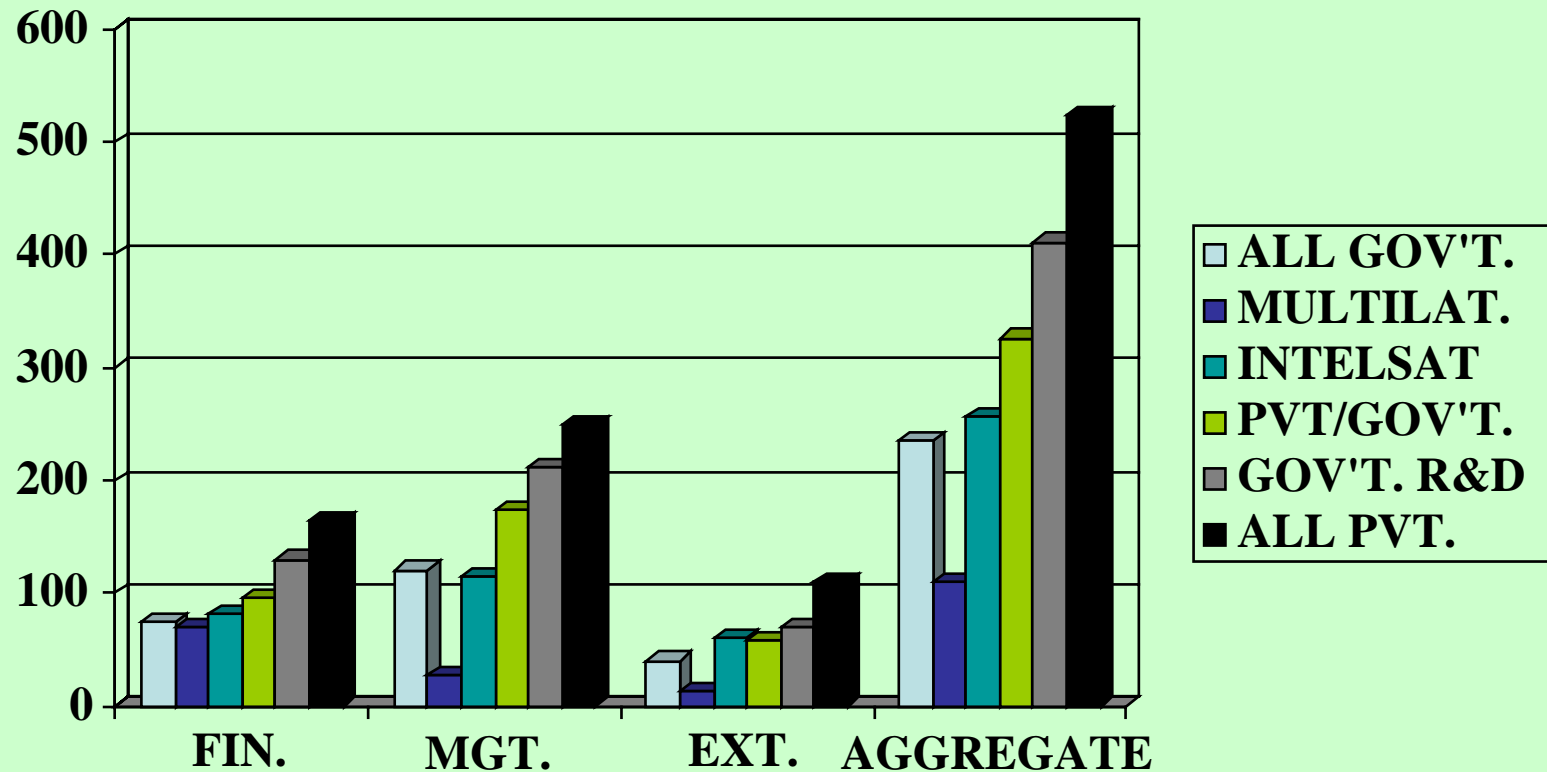
*** WEIGHTING FACTOR OF 3**

SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: EXTERNAL ISSUES

- ***MAXIMUM ENVIRONMENTAL PROTECTION**
- **MAXIMUM POTENTIAL FOR TECHNOLOGY SPIN-OFF**
- **#MAXIMUM BENEFIT TO OVERALL U.S. ECONOMY**
- ***MAXIMUM BENEFIT TO PEOPLE IN DEVELOPING NATIONS**
- **#MAXIMUM POTENTIAL FOR SPACE SETTLEMENT**

WEIGHTING FACTOR OF 2
*** WEIGHTING FACTOR OF 3**

SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES



INTERNATIONAL LAW: GENERAL - 1

- **WHAT COUNTS AS INTERNATIONAL LAW?**
 - **LAW OF PRESENT INTERNATIONAL POLITICAL SYSTEM "GOVERNING" THE COEXISTENCE OF NATIONS**
 - **BODY OF PRINCIPLES**
 - **RULES**
 - **INSTITUTIONS**
 - **PROCEDURES AND PRECEDENTS**
 - **BENEFITS**
- **WHAT ARE ITS POTENTIAL ADVANTAGES?**
 - **REGULATION OF RELATIONS**
 - **PREDICTABILITY OF INTERACTIONS**
 - **RESOLUTION OF DISPUTES**



INTERNATIONAL LAW: GENERAL - 2

- **DOES INTERNATIONAL LAW WORK?**
 - **MOST STATES COMPLY WITH MOST OF THE TIME.**
- **SOURCES**
 - **TREATIES OR FORMAL AGREEMENTS**
 - **INTERNATIONAL CUSTOMARY LAW**
 - **GENERAL PRINCIPLES OF LAW RECOGNIZED BY MOST MAJOR NATIONAL LEGAL SYSTEMS**
- **TREATIES AND AGREEMENTS**
 - **MOST IMPORTANT COMPONENT OF INTERNATIONAL LAW**
 - **LEGALLY BINDING ONLY ON THOSE WHO RATIFY**
 - **INTERNATIONAL PRESSURES CAN BE APPLIED**
 - **MAY REQUIRE MINIMUM NUMBER TO "ENTER INTO FORCE"**
 - **"RESERVATIONS" RELATED TO PARTICULAR PROVISIONS MAY BE TAKEN BY INDIVIDUAL STATES**



INTERNATIONAL LAW: GENERAL - 3

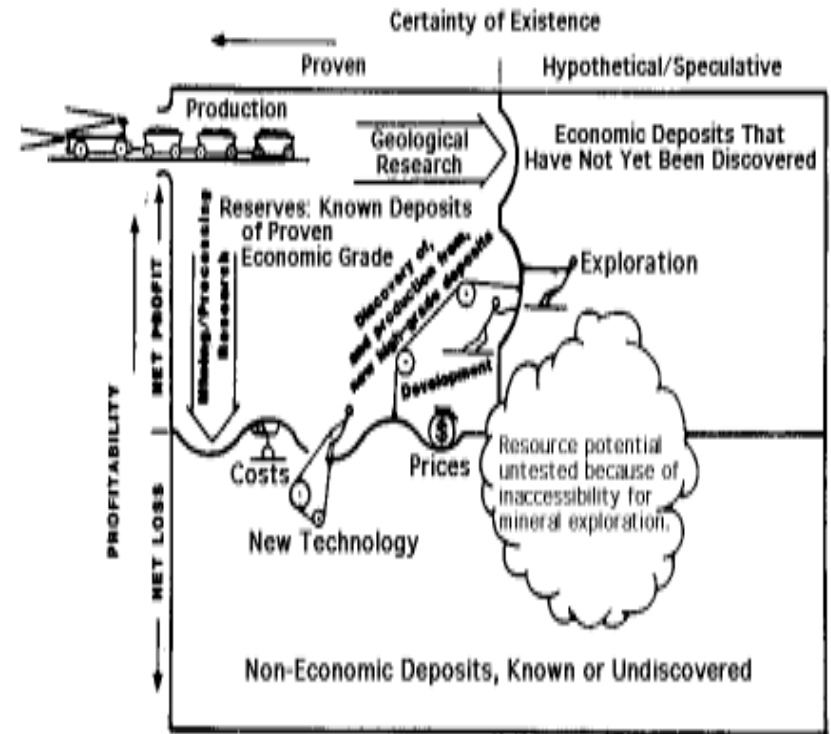
- **CUSTOMARY LAW**

- **WIDESPREAD PRACTICE OR COMMON TO MOST LEGAL SYSTEMS**
- **"RULE" FOLLOWED AS BINDING OVER TIME RATHER THAN CONVENIENT**



TERRESTRIAL MINING LAW: GENERAL -1

- NATIONAL SYSTEMS PREDOMINATE
- ALL "INTERNATIONAL" MINING LAW DERIVES FROM NATIONAL LAW.
- ALTERNATIVE SITUATIONS FOR A PROSPECTIVE MINER:
 - OWNS LAND AND MINERAL RIGHTS
 - OWNS ONLY THE MINERAL RIGHTS
 - LEASES MINERAL RIGHTS FROM OWNER
 - EMPLOYED BY "STATE" OWNER
- PUBLIC OWNERSHIP OF MINERAL BEARING LANDS
 - ROOTS IN "SOVEREIGN" RIGHTS, I.E., THE RIGHTS OF THE CROWN.



TERRESTRIAL MINING LAW:

GENERAL -2

- **ACCESS TO PUBLIC MINERAL RIGHTS:**
 - **MINING CLAIMS SYSTEM (MINER HAS TITLE TO EXTRACTED MINERALS)**
 - **CURRENT SPACE LAW**
 - **CONCESSION OR LEASING SYSTEM (STATE HAS TITLE TO MINERALS)**
 - **STATE PRODUCTION**
 - **STATE-PRIVATE PARTNERSHIPS**
 - **STATE MANAGED CONTRACTS WITH PRIVATE ENTITIES**
- **REGULATORY CONTROL MAY BE (AND USUALLY IS) EXERTED BY THE STATE**
 - **LAUNCH LICENSES**
 - **COMMUNICATION LICENSES**
 - **RETURN PAYLOAD LICENSES**
 - **ENVIRONMENTAL IMPACT STATEMENT**

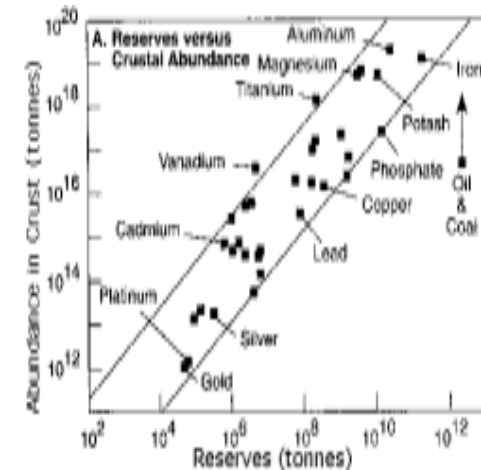


Figure 13-1 A, Mineral Resources, Economics and the Environment, S.E. Kesler, Macmillan

TERRESTRIAL MINING LAW:

UNITED STATES*

HISTORY - 1

– PRIVATE ENTERPRISE UNDER REGULATORY FRAMEWORK

• GENERAL MINING LAW OF 1872 LARGELY MODIFIED BY MODERN ENVIRONMENTAL REGULATIONS

– CLAIMS SYSTEM (METALLIC AND NON-METALLIC MINERALS)

– BIDDING / LEASING SYSTEM (FOSSIL FUELS)

• NO EFFECTIVE NATIONAL MINERALS POLICY EXCEPT DURING WAR-TIME (WW II AND KOREA)

• STRATEGIC MATERIALS "POLICY" DRIVEN BY THE INTERNATIONAL MARKETPLACE AND DOMESTIC POLITICS

• STRATEGIC STOCKPILE NO LONGER A PRIORITY ISSUE
• (EVEN THOUGH, AS A MARITIME NATION, IT PROBABLY SHOULD BE)



TERRESTRIAL MINING LAW: HISTORY - 2

- **SOVIET UNION / RUSSIA**

- **ORIGINAL OBJECTIVES OF STATE PRODUCTION**

- **SELF-SUFFICIENCY**
- **ECONOMIC BASE FOR SETTLEMENT OF SIBERIA**
- **FOREIGN EXCHANGE**

- **CURRENT OBJECTIVES OF STATE-PRIVATE PARTNERSHIPS**

- **FOREIGN EXCHANGE**
- **CRIMINAL AND / OR POLITICAL CONTROL**
- **RE-EMERGENCE OF NATIONALISM**



TERRESTRIAL MINING LAW: HISTORY - 3

- **CHINA**

- STATE PRODUCTION THROUGH MILITARY SUBDIVISIONS
 - WARLORD TRADITION
- STATE EMPHASIS ON INDUSTRIAL AND ENERGY SUPPLY GROWTH
- SOME TRANSITION TO CONCESSION SYSTEM?

- **JAPAN**

- "PRIVATE" ENTERPRISE WITH CLOSE STATE COOPERATION / INFLUENCE
- DEPENDENT ON IMPORTS FROM FOREIGN PRODUCERS OR FROM CONCESSIONS IN FOREIGN LANDS

TERRESTRIAL MINING LAW: HISTORY - 4

- **WESTERN EUROPE**
 - **SPECTRUM OF APPROACHES**
 - **UNITED KINGDOM: MIX BETWEEN U.S. AND JAPAN**
 - **FRANCE: SIMILAR TO JAPAN**
 - **NORWAY: PRIVATE INTERNALLY / CONCESSIONS IN THE OFF-SHORE**
 - **SWEDEN: STATE-PRIVATE PARTNERSHIPS**
- **THIRD / FOURTH WORLD NATIONS**
 - **LARGELY CONCESSIONS TO PRIVATE OR FOREIGN STATE-RUN ENTITIES**

TERRESTRIAL MINING LAW: IMPLICATIONS IN AN INTERNATIONAL REGIME

- **A FUTURE NEGOTIATED SYSTEM MAY NOT HAVE A ROLE FOR PRIVATE ENTERPRISE**
 - **ALL RESOURCE ACTIVITY MAY BE UNDERTAKEN BY THE INTERNATIONAL ENTITY**
- **IF PRIVATE ENTERPRISE HAS A ROLE, IT MAY BE WITH A:**
 - **COMPETITIVELY BID CONCESSION, WITH PAYMENT OF RENT AND/OR ROYALTIES,**
 - **NON-COMPETITIVE CONCESSION, OR**
 - **CONTRACT TO WORK FOR THE INTERNATIONAL ENTITY.**

CHRONOLOGY OF INTERNATIONAL AGREEMENTS RELEVANT TO SPACE

EARTH

SPACE

ANTARCTIC TREATY

1959

1964

INTELSAT AGREEMENT

1967

OUTER SPACE TREATY

1968

RESCUE/RETURN OF ASTRONAUTS, ETC.

1972

LIABILITY FOR DAMAGE IN SPACE

1975

REGISTRATION OF OBJECTS LAUNCHED

1976

IMMARSAT AGREEMENT

*LAW OF THE SEA
CONVENTION*

1982

1979

MOON AGREEMENT

ANTARCTIC MINERAL
RESOURCES CONVENTION

1988

1988

SPACE STATION AGREEMENT

ANTARCTIC ENVIRONMENT
PROTOCOL

1991

ITALICS - NOT RADIFIED BY U.S.

RIO ENVIRONMENTAL
AGREEMENTS

1992

**RED - ONLY SPACE TREATY
DIRECTLY RELEVANT TO
RESOURCES**

*LAW OF THE SEA RE-NEGOTIATED
"AGREEMENT"*

1994

KYOTO AGREEMENT

1997

1997

COMMERCIAL SPACE ACT OF 1997

2004

2003

COMMERCIAL SPACE ACT OF 1998

COMMERCIAL SPACE ACT OF 2003

SENATE RATIFICATION "LAW OF THE SEA" ?

