HOW DOES SCIENCE POLICY GET MADE?

Lisa Dilling

University of Colorado, Boulder

Environmental Studies

WHAT IS SCIENCE AND TECHNOLOGY POLICY?

- Policy = Decision
- S&T policy is aggregate of decision processes that govern both the use of S & T in society, and the production of S & T knowledge- i.e. decisions made about the research enterprise itself

EXAMPLES

- Climate Change Science Program – provides funding (taxpayer $$) for a specific program of research
- National Academy of Sciences– synthesizes information in S & T for public use, e.g. nutritional in public schools, vehicle safety, etc.
- NASA decides to emphasize Mars mission over Earth Science research
- Administration bans use of Federal $$ for stem cell research

"SCIENCE FOR POLICY"

- Research that is done with a specific societal goal in mind, e.g. funding for acid rain research to inform societal decision making
  - Examples….??

"POLICY FOR SCIENCE"

- Governance of the research enterprise
  - What research should we fund? Priorities…$$$
  - Who decides what research is funded?
  - How should the research enterprise be organized?
  - What metrics are used to judge outcomes?
  - Rules of conduct, ethics, etc.

WHO ARE THE ACTORS IN S&T POLICY?

THE NATIONAL ACADEMIES
Advisers to the Nation on Sci... ...neering, and Medicine

NRC, NSB

Congress

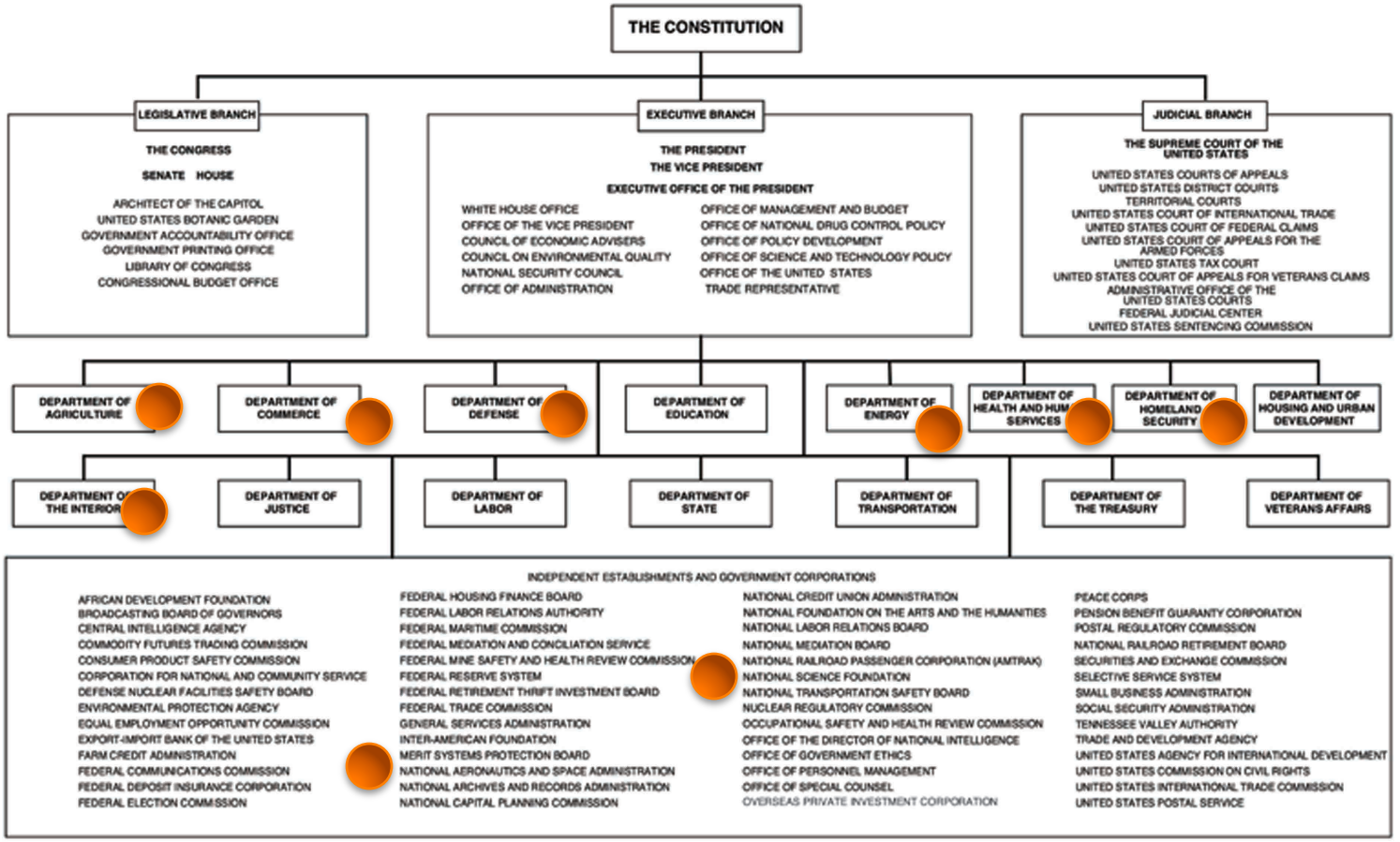
Executive Branch

Organiza-tions

Individuals

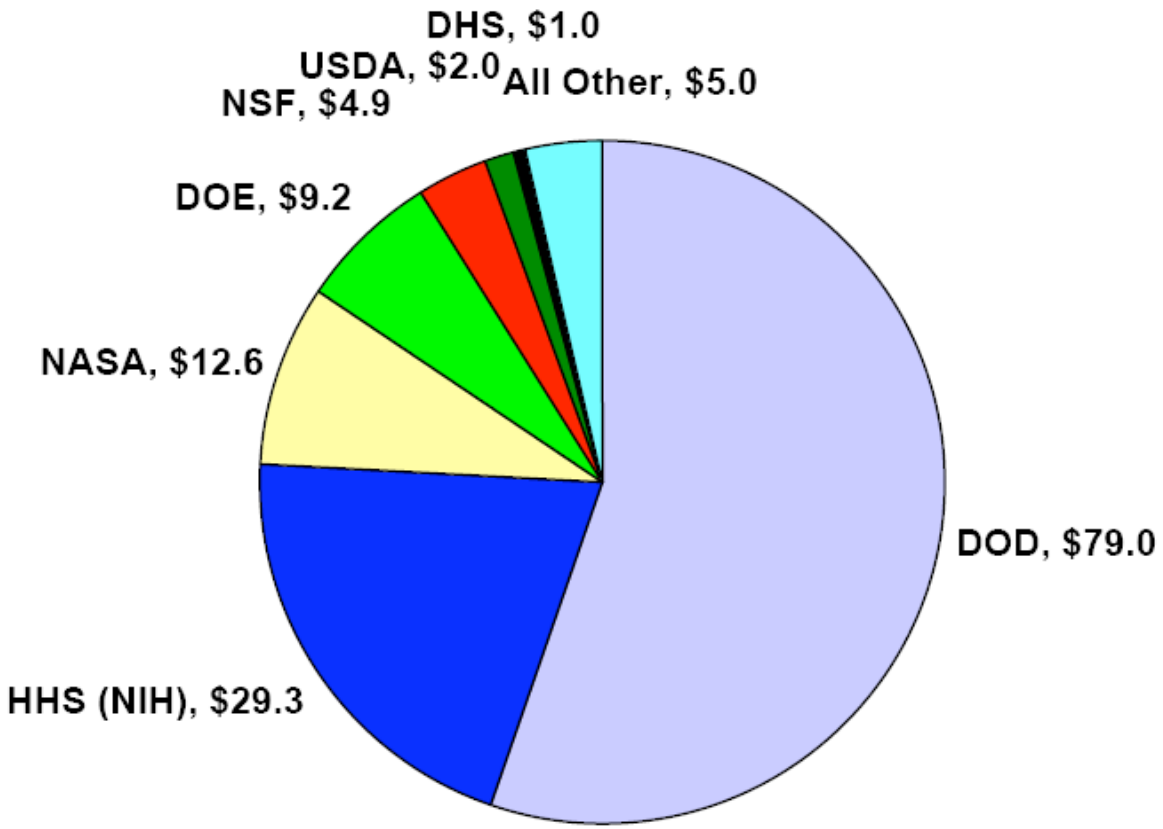
Universities

THE GOVERNMENT OF THE UNITED STATES



Total R&D by Agency: FY 2008 Proposed

Budget Authority in billions of dollars

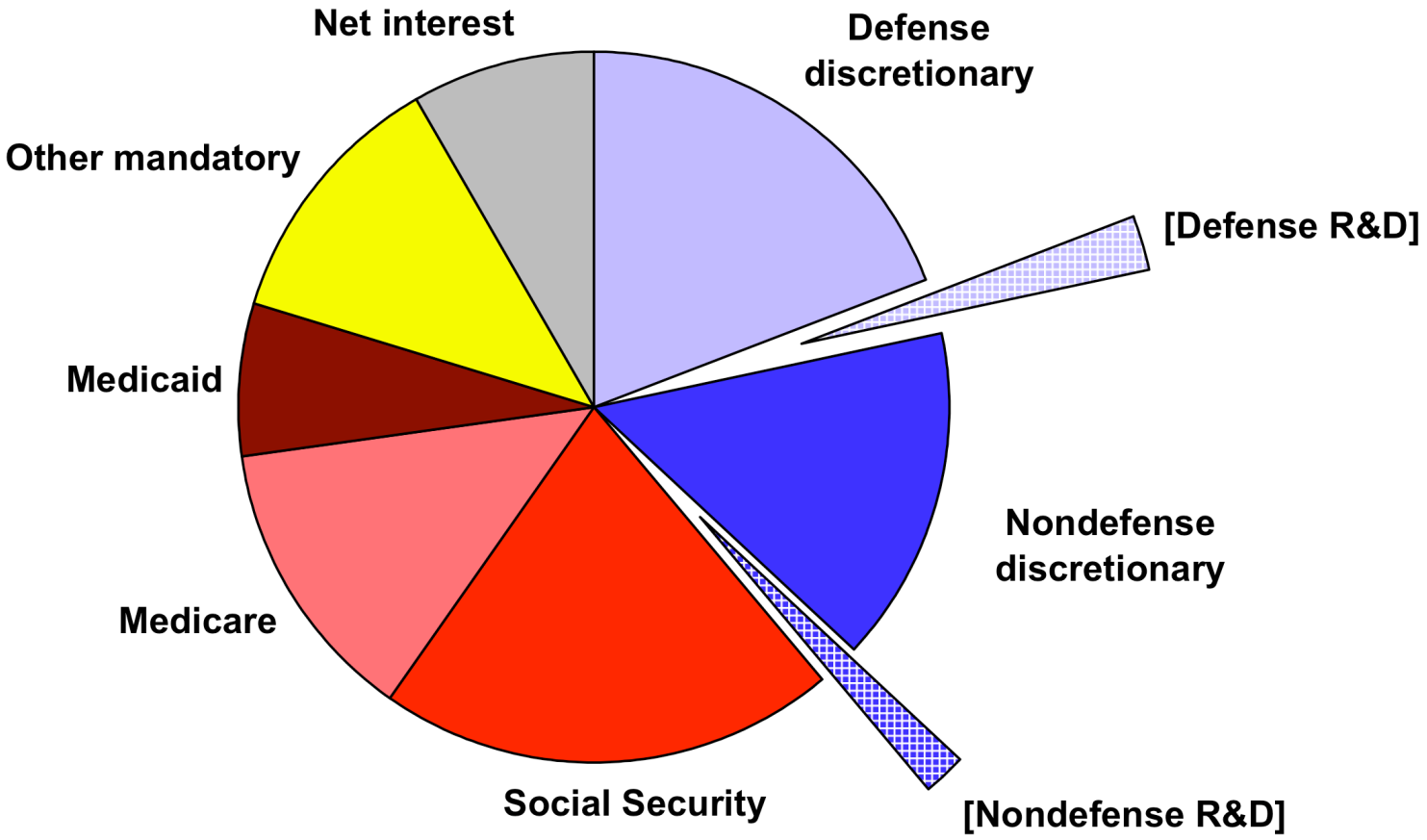


Total R&D = $143.0 billion (revised)

Source: AAAS, based on OMB R&D Budget Data and agency estimates for FY 2008.

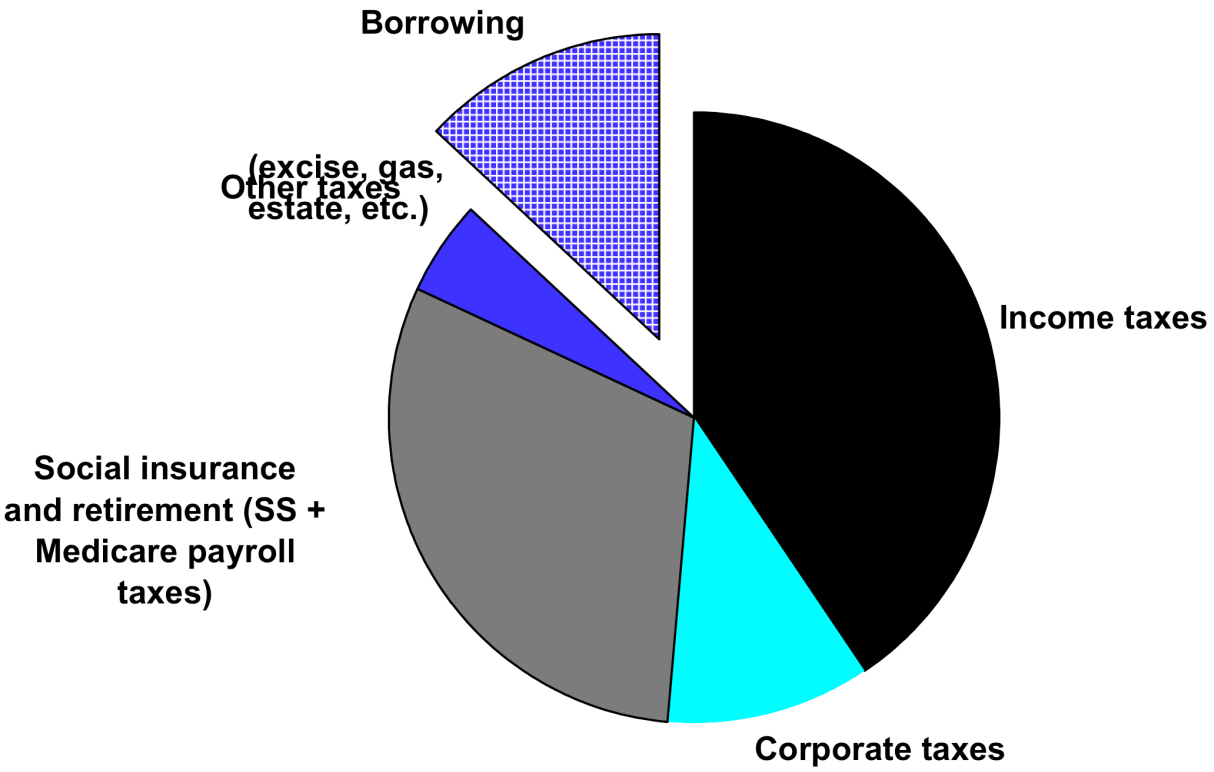
AAAS

Composition of the Proposed FY 2009 Budget
Total Outlays = $3.1 trillion



Note: Projected Unified deficit is $407 billion.
Figures exclude most Iraq and Afghanistan military costs.
Source: AAAS, based on *Budget of the United States Government FY 2009.*

Composition of the Proposed FY 2009 Budget by Source of Funds
Total Outlays = $3.1 trillion



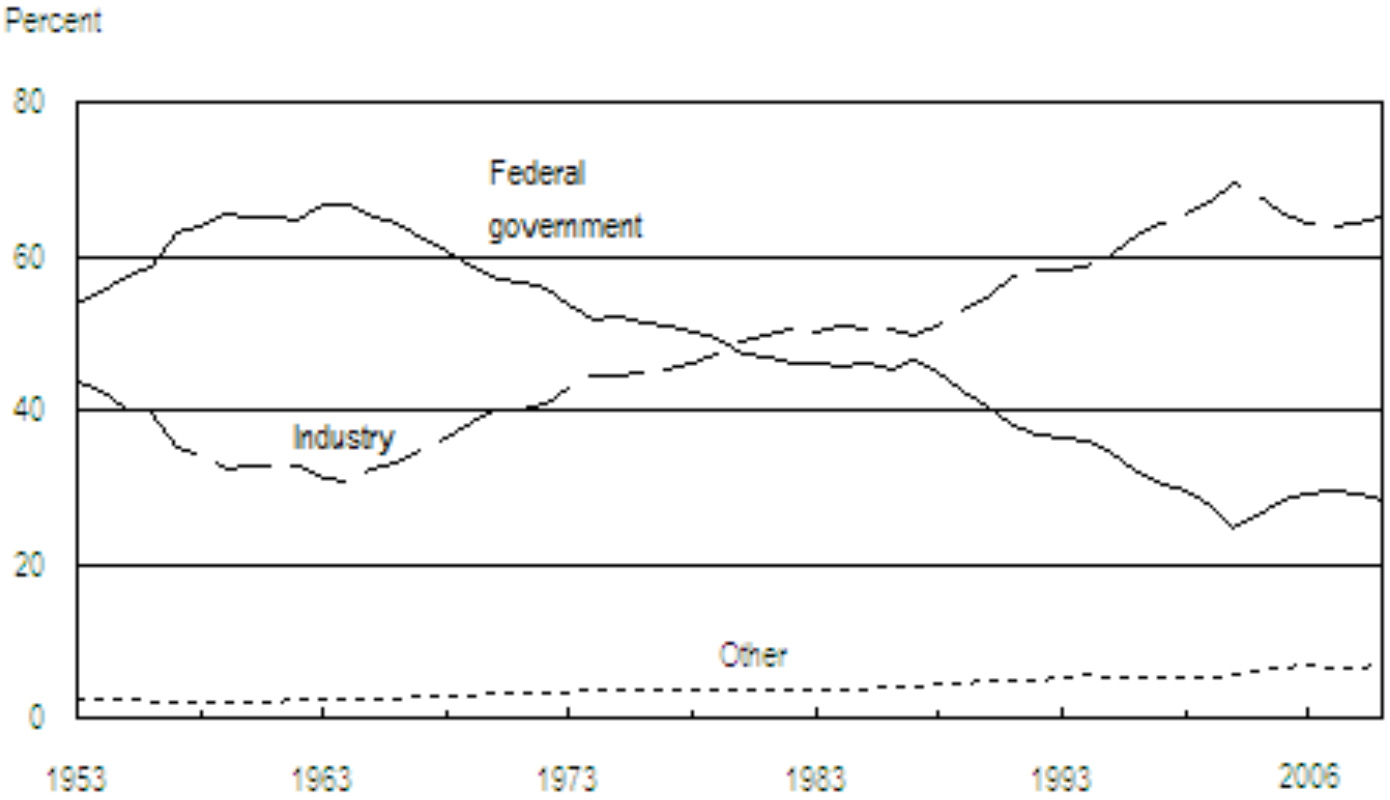
Total Receipts (without borrowing): $2.7 trillion

Source: AAAS, based on *Budget of the United States Government FY 2009.*

ANOTHER IMPORTANT CATEGORY OF S&T DECISION MAKER: INDUSTRY

- Funds more R&D in the US than the Federal Gov't
- Considerations of proprietary data, choices of research topic, marketability of product, profit
- Some state policy influence (through incentives, collocation of facilities, etc.)

FIGURE 1. U.S. R&D expenditures, by source of funds: 1953–2006



NOTE: Data for 2005 and 2006 are projections.

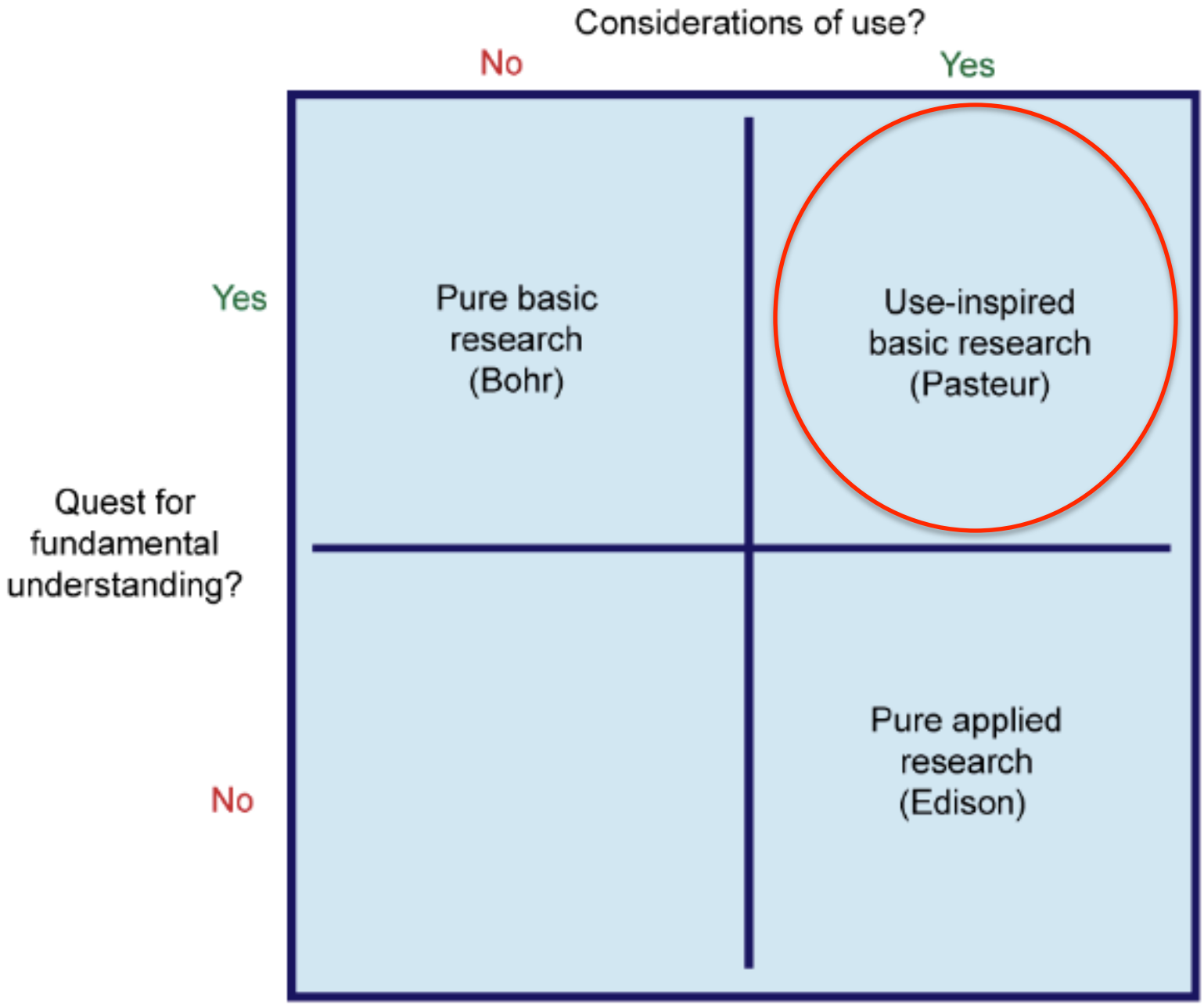
SOURCE: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (annual series).

AN IMPORTANT, CHANGING ELEMENT:

"Social Contract" –
or how the scientific and technical enterprise relates to society as a whole

"USE-INSPIRED" SCIENCE

- Research that is inspired by both
  - the quest for fundamental understanding and
  - considerations of use by society.
- Research intended for use by society must create mechanisms by which user needs are identified and brought into the process.

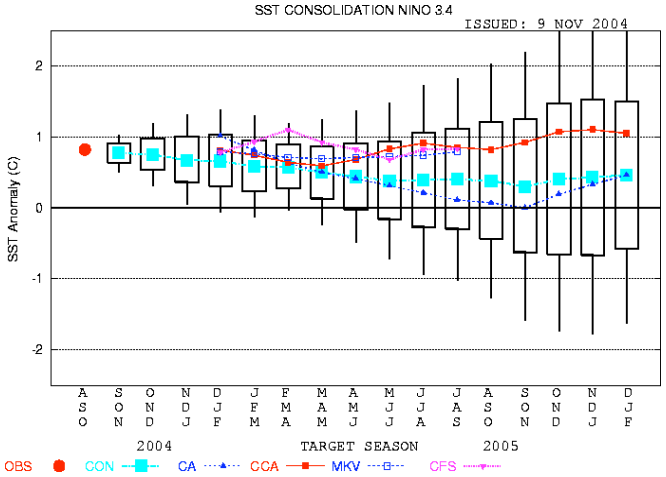


Stokes, D. 1997. Pasteur's Quadrant.

WHAT WE KNOW FROM OTHER FIELDS ON PROVIDING USABLE SCIENCE

- Creating and supplying science that is useful in a particular context is not a "given"
- To be successful at providing useful information to decision-makers requires research and a deliberate approach

PROVIDING "USEFUL" INFORMATION: THE CASE OF CLIMATE FORECASTS



Not as useful as expected to farmers, water managers and so on because of a variety of reasons:

- Information provided often not what was most needed
- Lack of regional specificity, scale mismatch
- Inaccessible presentation, poor communication
- Not presented with accompanying info. more important to decision-maker, such as market and policy information
- Decision-makers incapable of responding to information--institutional constraints
- Lack of trust in information
- Uneven delivery to affected constituents

..... And so on

(Pagano et al. 2002, Eakin and Conley 2002, Pulwarty and Redmond 1997, Letson et al. 2001, Pielke Jr. and Conant 2003, Lemos et al. 2002, etc.)

WHAT DOES IT TAKE FOR SCIENCE TO BE USED IN DECISION MAKING?

- Relevant to a decision context/Makes a difference
- There are viable options
- Compatible with existing values, norms and practices
- Accessible, Credible, Trustworthy
- Reliable/accurate/ appropriate scale and timing

Reviewed in Dilling and Lemos in prep