Roles and Responsibilities of Scientists in Response to Fukushima: A U.S. Perspective

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THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine

Questions Posed by Organizers

- How to make a “unified voice” of scientists
- How to establish the relationship between the scientific community and the government
- How to build the relationship between the scientific community and general public
- How to promote international cooperation among scientific communities
- Advice to Japan

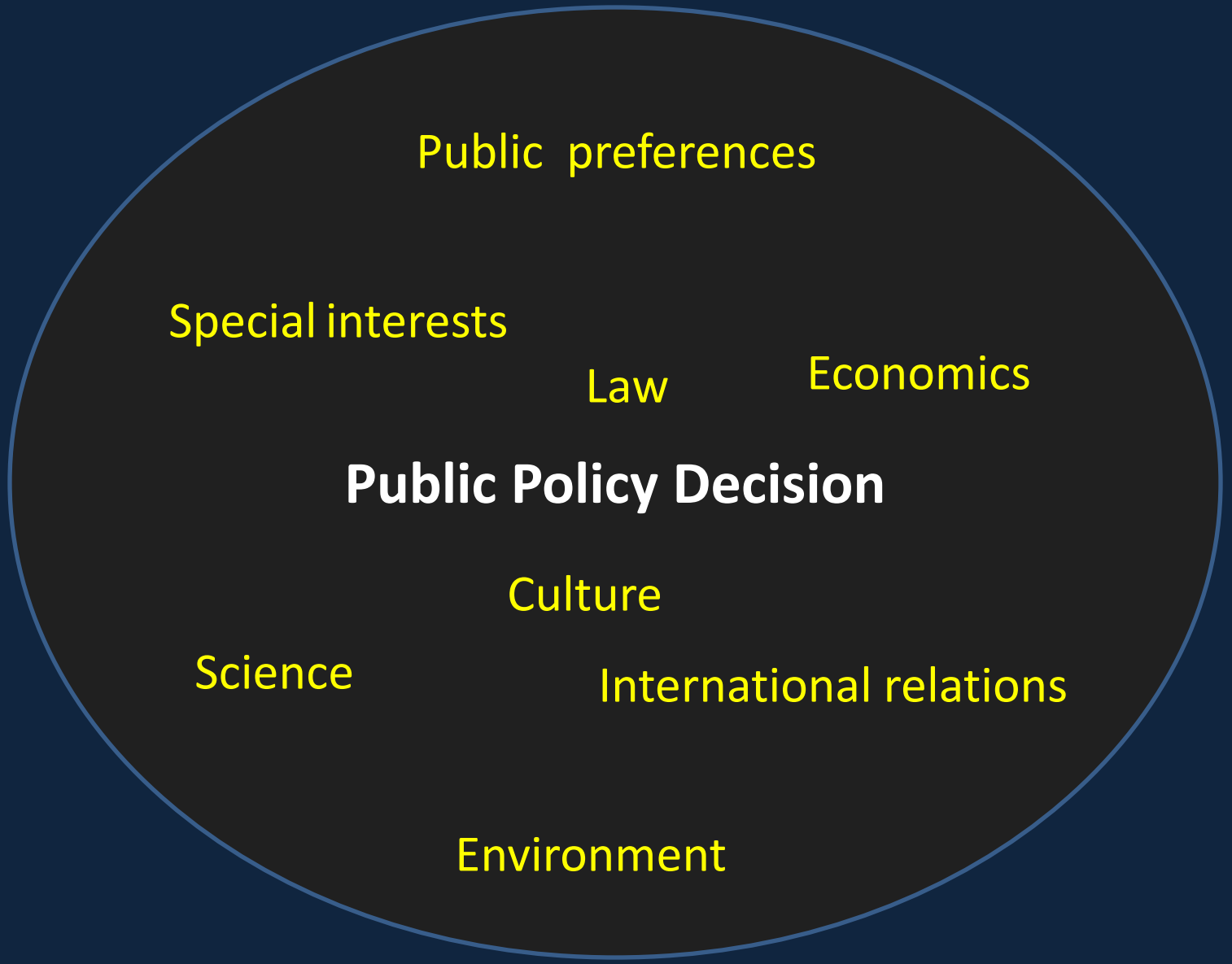
Opinions expressed in this presentation are mine alone

Not the National Academy of Sciences

Not the U.S. Government

Responsibility of Scientists

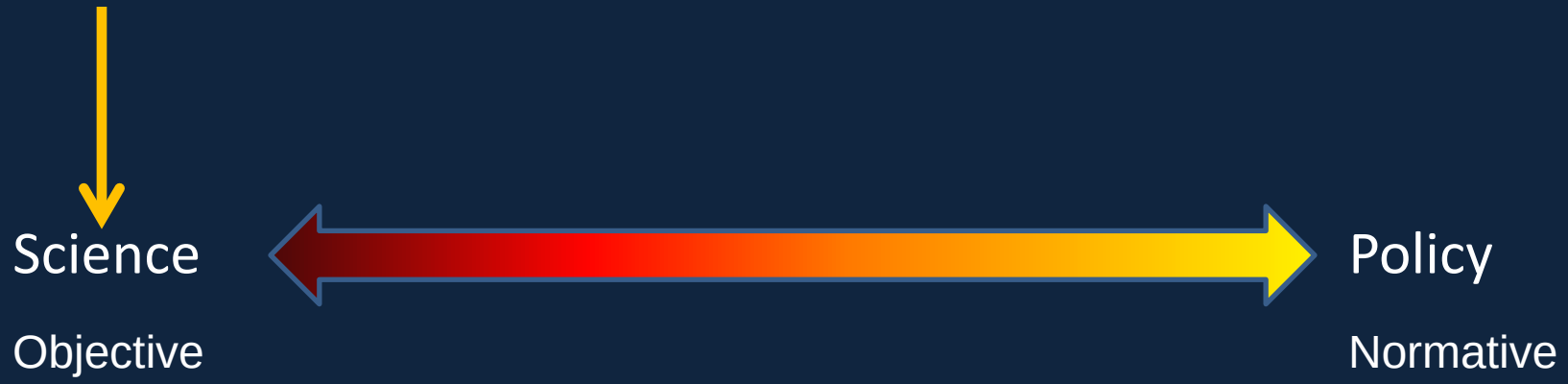
- Science informs important public policy decisions and individual choices
- Scientists are responsible for communicating science to government and public
- Scientists are not qualified to make public policy
- Scientists lose credibility when they become advocates for particular policies or choices


Public preferences
Special interests
Law
Economics
Public Policy Decision
Culture
Science
International relations
Environment

Science-Policy Continuum (1)

Health risks from Fukushima releases?

Radionuclide releases
Environmental transport
Human uptake
Radiation effects



Science-Policy Continuum (2)

Size/locations of evacuation zones around Fukushima?

How much radiation was released and where did it go?

What are the health risks?

What level of health risk is acceptable?

Science-Policy Continuum (3)

Future of nuclear power in Japan?

What alternative energy sources are available?
What are their risks?

How quickly can alternative sources be developed?

Are risks and costs acceptable?

Unified Scientific Voice

- **Scientists:** Most credible source of information about science
- **Scientific organizations:** Best able to speak with "unified voice"
- **Broad-based scientific organizations:** Best able to speak with unified voice on societally important scientific issues

Many Scientific Voices in U.S.

- **Inside U.S. Government**
  - Scientific staff
  - Federal Advisory Committees
- **Outside U.S. Government**
  - Individual scientists
  - Scientific organizations

Different roles and perceived credibility

U.S. Government Advisory Bodies

Established & tasked by U.S. Government

Comprised of non-government experts

Advise on government programs and priorities

- President's Council of Advisors on Science and Technology
- Advisory Committee on Reactor Safeguards
- Nuclear Energy Advisory Committee
- Nuclear Waste Technical Review Board

Scientific Organizations

Independent of government

Perceived as more credible on science issues

- **Science Academies**

  National Academy of Sciences

- **Scientific Societies**

  American Nuclear Society

  American Physical Society

- **Other Private Organizations**

  RAND

Unified Voice for Science in U.S.

U.S. National Academies

- National Academy of Sciences (NAS)
- National Academy of Engineering (NAE)
- Institute of Medicine (IOM)
- National Research Council

Congressionally chartered (1863)

Private & nonprofit

"Advisors to the Nation on Science, Engineering, and Medicine"

NAS Advisory Activities

200-300 study reports each year on science, engineering, and medicine

- Consensus studies
- Workshops and symposia

Involving > 6,000 scientists, engineers, medical professionals

Study sponsors

- Primarily U.S. government
- Also states, private foundations, others

Relevant NAS Studies

- **Health Risks from Exposure to Low Levels of Ionizing Radiation (BEIR VII)** (2006)
- **Safety and Security of Commercial Spent Nuclear Fuel Storage** (2006)
- **Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States** (2006)
- **Analysis of Cancer Risks in Populations Living Near Nuclear Facilities** (in progress)
- **Lessons-learned from Fukushima** (possible study)

NAS Study Process

Independent: No government control

Non-partisan: No involvement in political process or issues

Objective: Scientific consensus through collection and weighing of evidence

Credible: Careful selection of technical experts; peer review of study reports

Transparent: Open study process

Possible Approach for Japan

Real or virtual scientific organization to advise government

- Independent of government
- Non-partisan
- Able to marshal Japanese science, technical, and medical communities
- Credible and transparent processes for formulating and transmitting scientific advice

Building Relationships with International Community

Institutions already in place in many countries

Bilateral: National Academies of Science

- NAS (US)
- Royal Society (UK)
- Académie des sciences (France)
- Russian Academy of Sciences

Multilateral: InterAcademy Council

- Organization of national science academies
- Global scientific, technological, and health issues

Building Relationships with Public (1)

Process is important!

- Process transparency
- Opportunities for public input
- Open information-gathering activities
- Public access to study information
- Public access to products of studies

Building Relationships with Public (2)

Communication is important!

Scientific Term	Public Meaning
Theory	Hunch, speculation
Uncertainty	Ignorance
Error	Mistake, wrong incorrect
Bias	Distortion, political motive
Values	Ethics, monetary values
Manipulate	Illicit tampering

Somerville and Hassol, Physics Today 64(10), 2011

Closing Thoughts

Perspectives based on U.S. approaches and experiences

U.S. approaches may not transfer directly to Japan

- Different social norms
- Different political systems

Japan must identify best approach

Thank you!