OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

Understanding the challenges and opportunities at the Science-Policy Interface: domestic and global perspectives

United Nations Environmental Assembly

Science Policy Forum

Nairobi, Kenya; May 2016

Professor Sir Peter Gluckman

Chief Science Advisor to the Prime Minister of New Zealand

Chair, International Network for Government Science Advice

International Network for Government Science Advice

The challenges and opportunities

- In addressing the SDGs and the 2030 Agenda, the role of both global and domestic policy making will be critical
- The SDGs require an evidence informed approach to policy making at both these levels
- But what is the relationship between scientific evidence and policy at both the global and national levels?

- My core conclusion is that meaningful global responses require effective domestic science advisory mechanisms

Science and diplomacy

- **Science to advance national interests**
  - Economic interests, trade
  - Resource management
  - Soft power, bilateral relations

- **Science to advance global interests**
  - Antarctic and other ungoverned spaces
  - Climate and other global threats (pandemics etc)
  - Transnational challenges – the SDGs

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These perspectives often do not align

Science and diplomacy

- These two perspectives add complexity to policy making and create challenges for effective scientific input

- **Science to advance national interests**
  - Dependent on domestic science advisory systems
  - But the science is often being advanced at the international level by non-scientists (eg diplomats)

- **Science to advance global interests**
  - Often the case is being put by scientists, scientific organisations and NGO advocates who are not engaged with domestic decision makers

Science in international policy making

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- Thus while **science to advance global interests** may be the ambition of many scientists and NGOs, global interests are more likely to be achieved when nations support global or regional goals because of **enlightened self interest**
- **Hence the critical importance of domestic science advisory mechanisms for progress on the international agenda**

- Science, science systems, the policy process, and the science-society interaction are all undergoing very rapid change.

- Inevitably the science-policy nexus is also evolving quickly

- The way science engages with both society and the policy process, and the way these both engage with science will shape our progress as nations and as a global society.

Changing nature of science

- From linear to non-linear
- Accepting complexity
- From reductionist to systems based
  (and the changing place of the scientific hypothesis)
- From certainty to probabilistic
- From normal to post-normal…

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Post-normal science

- The application of science in situations where:
  - The science is complex
  - There is much which is unknown
  - Stakes are high and decision making is urgent
  - There is a high values component and values are in dispute
- Much science applied or needed in the policy space is inevitably ‘post-normal’ (especially with regards the SDGs)
- It is these characteristics and the frequent failure of science to recognize these that can make the public, policy makers and politicians skeptical about the role and utility of science.
- Science advisory systems must be cognizant of these characteristics to be effective

Science and values

- Science is not values-free: scientists make values-based decisions all the time: what to study; what methodology; what is considered sufficient evidence for conclusions…
- But the scientific method is designed to limit (or identify and mitigate) the influence of human values on the collection and analysis of data

- How science is *used* by society is intimately and inherently values-rich
- And policy is inherently values-rich

- Post-normal science engages and confronts values constantly

‘Values’ has distinct dimensions

Integral to science

- Critical thinking
- Skepticism
- Ethics
- Integrity of the processes
- Avoid in bias in collection and analysis of data
- Acknowledging the limits of data
- Evaluating the sufficiency of evidence
- and the inferential gap

Integral to individuals and society

- Cultural, political and religious
- Egoistic, social-altruistic or biospheric
- Hierarchal vs individualistic
- Past experience
- Indigenous and local knowledge
- Cognitive biases

The challenge of science being used as a proxy for values debates

- Values discussions are difficult
- Science has frequently been misused as a proxy for what are primarily values debates:
  - Climate change
  - GMOs
  - Reproductive technologies
  - Stem cells
- Science cannot usually resolve irreconcilable worldviews

Science and policy making

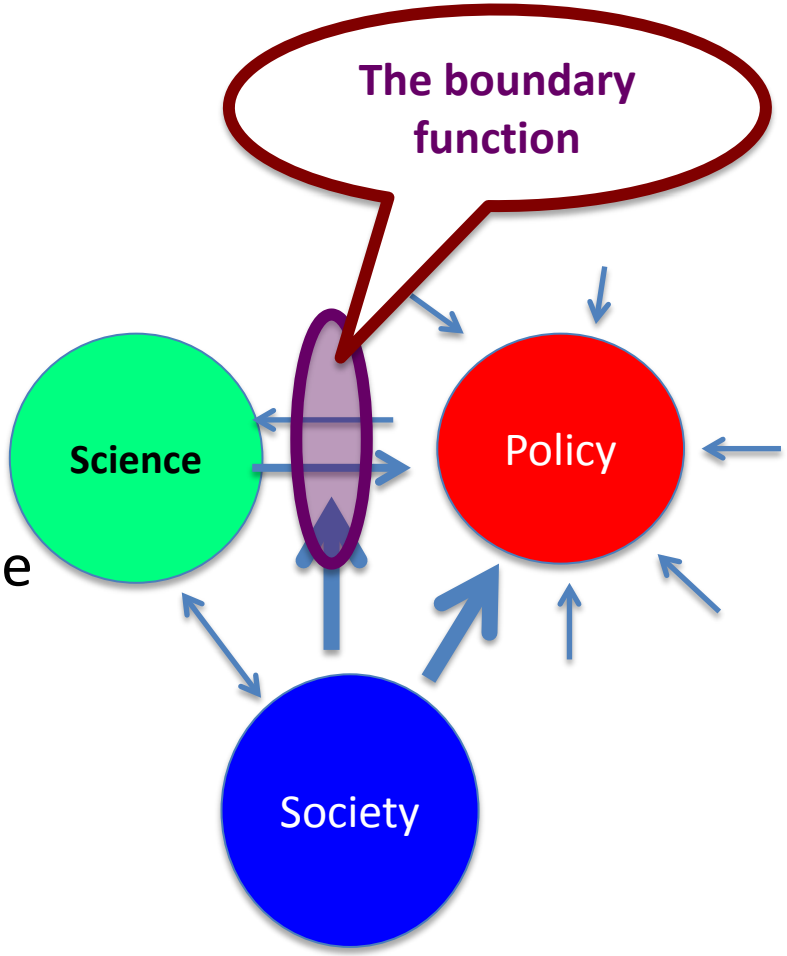
- Policy is rarely *determined* by evidence but policy can be and should be informed by evidence

- Inputs into policy
  - The science

    Evidence of need, possible solutions, impact
  - Public opinion
  - Political ideology
  - Electoral contract
  - Fiscal objectives and obligations
  - Diplomatic issues and any international obligations

Science and policy making

- Science and policy making are very distinct cultures
- The nature of the interaction is influenced by context, culture and history *and by the relationship between science and society*
- There is increasing recognition of the importance of boundary roles and structures to link these cultures
- The nature of boundary entities is variable and evolving: there will not be a one-size-fits-all model



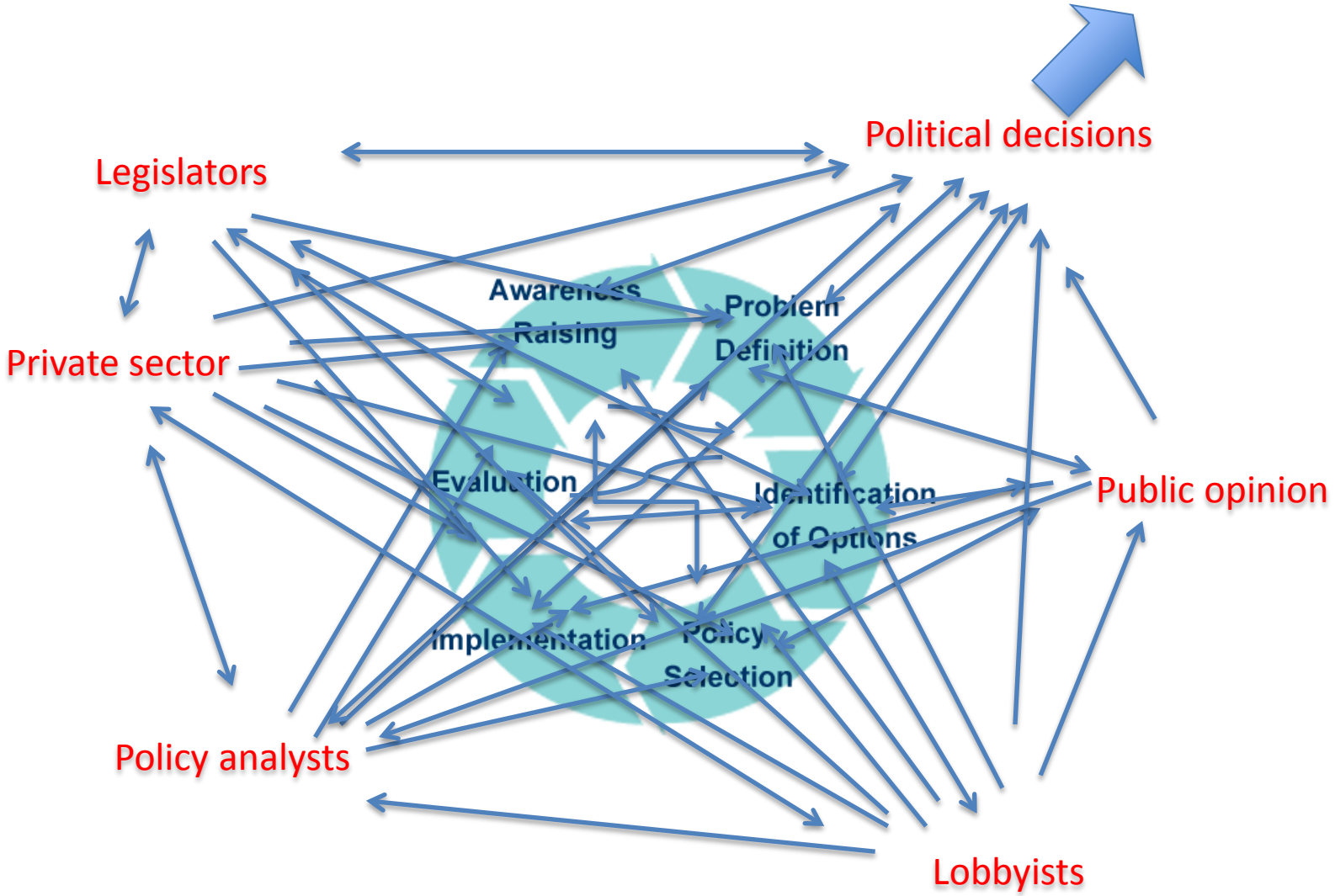
The policy process

- The policy process is not a reality

- The policy cycle is an idealized view of a much more complex and iterative process

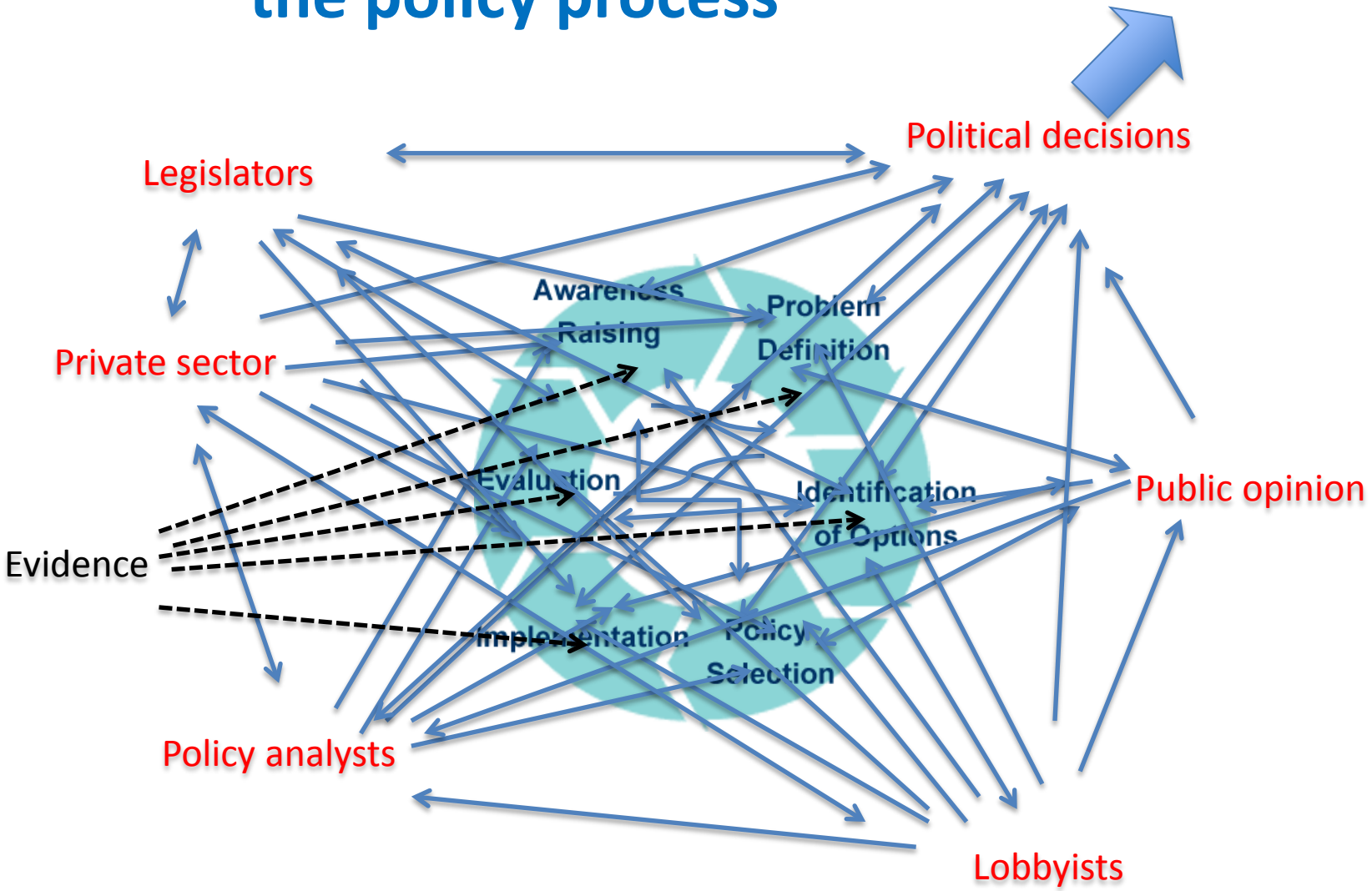
The policy process

POLICY !!!!



Putting evidence into the policy process

POLICY !!!!



The challenges of single point and iterative inputs

Why should science have privilege in the policy process?

- How does it differ from other epistemologies?
- By sticking to its core processes and value
- How science is undertaken and presented will impact on whether it is trusted
- Trust and legitimacy is essential to any claim of privilege.

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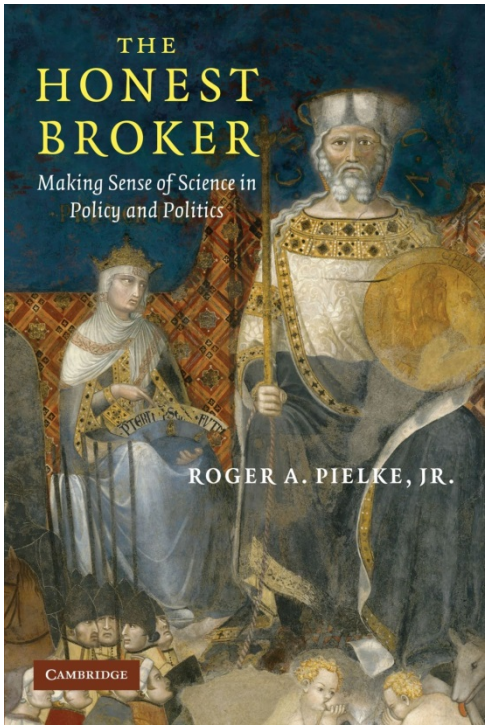
Advocacy versus brokerage

- **The Issue Advocate** is the scientist who collects and presents data with a view to servicing a cause.
- **The Honest Broker** tries to identify and overcome biases the scientific consensus and what are the implications for policy
- Individual scientists often switch between these roles but clarity as to role is important.
- Science advisory systems are most effective when acting as brokers.



Roger Pielke, Jr (2009)
The Honest Broker

The practice of brokerage

- What is known, what is the expert consensus
  (need, impact, alternatives, monitoring etc.)
- What is not known
- Other caveats
- The inferential gap, risk management
- How it relates to other considerations, alertness to social implications
- Options and tradeoffs

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Internal and external science advice

- These are distinct with different accountabilities and roles but must interact
- Internal component - those operating within the government
    - Agency and ministry scientists
    - Expert panels, regulatory agencies
    - Special units (eg JRC, What works units)
    - Parliamentary units
    - Science advisors
- External formal component
    - National academies and academic societies
- Informal roles of academics, scientists in NGOs and industry often acting as advocates rather than brokers

Deliberative mechanisms of scientific advice

- Generally provided by academies or expert panels
- Much depends how the question is framed and by whom
- If academy initiated may not align with policy needs
- Not always sensitive to the needs of policy makers – it is not an academic exercise
- Can only input at a single point in policy
- Hard to be timely or responsive
- Delicate balance: defense of independence can sometimes limit the value and respect for their advice , but that independence is important for public trust and legitimacy

Informal mechanisms of scientific advice

- Particular role of science advisors
- Instant, iterative and responsive
- Brain-storming and critical challenge to the policy maker
- Can impact very early in policy cycle and repeatedly
- Requires a high level of integrity and trust
- Relies on individuals but is not unaccountable
- They can integrate across governmental silos
- They act as conduits to deliberative science advice

Science and policy making - some key points

- The challenge of scientific and policy hubris
- “Evidence informed” rather than “evidence based” policy
- Scientific engagement with the policy process can occur from within and without the policy system
  - Different responsibilities, roles and opportunities
- There are many challenges in ensuring demand for advice at the appropriate stages in policy development
- There are challenges in ensuring the privilege of evidence in the policy process

Core principles of science advising

- Trust
- Avoidance of hubris
- Independence
- Distinguish *science for policy* from *policy for science*
- Understand science informs and does not make policy
- Protect the privilege of science
- Recognize the limits of science
- Brokerage not advocacy
- Engagement with science community
- Engagement with policy community

The art of science advice to government

Peter Gluckman, New Zealand's chief science adviser, offers his ten principles for building trust, influence, engagement and independence.

In 2009, I was appointed as the first science adviser to the Prime Minister of New Zealand. The week I was appointed coincided with the government announcement that the New Zealand food industry would not be required to add folate to flour-based products to help to prevent neural-tube defects in newborns, despite an earlier agreement to do so. As it happens, this is an area of my own scientific expertise and, before my appointment, I had advised the government that folate supplementation should occur. But various groups had stirred considerable public concern on the matter, about health risks and about medicalizing the food supply.

Thus, in my first media interview as science adviser I was asked how I felt about my advice not being heeded. I pointed out that despite strong scientific evidence to support folate supplementation, a democratic government could not easily ignore overwhelming public concern about the food supply. The failure here was not political; rather, it was the lack of sustained and effective public engagement by the medical-science community on the role of folate in the diet. As a result, the intervention did not get the social licence necessary to proceed.

Five years on, I am still in the post. I have come to understand that the primary functions and greatest challenges for a science adviser are providing advice not on straightforward scientific matters, but instead on issues that have the hallmarks of what has been called post-normal science[1]. These issues are urgent and of high public and political concern; the people involved hold strong positions based on their values, and the science is complex, incomplete and uncertain. Diverse meanings and understandings of risks and trade-offs dominate.

Examples include the eradication of exogenous pests in New Zealand's unique ecosystems, offshore oil prospecting, legalization of recreational psychotropic drugs, water quality, family violence, obesity, teenage morbidity and suicide, the ageing ▸

13 MARCH 2014 | VOL 507 | NATURE | 163

Nature, 13 March 2014

From national to international

- Effective international science advice cannot operate without well developed domestic science advisory systems and conditions that promote enlightened self interest.
- These must be well connected to diplomatic and related systems.
- Internationally linked national science advisory networks assist
  - Systems that promote international connectedness of internal science advisory mechanisms networks: Regional groupings of science advisors: eg INGSA, APEC
  - Systems that promote international connectedness of external advisory mechanisms: eg ICSU, IAP
  - Systems that promote international connectedness of both internal and external science advisory systems: INGSA

International Network for Government Science Advice

- INGSA founded in 2014 under the aegis of ICSU
- In partnership with UNESCO
- Concerned with all levels of government (city to global)
- Roles
  - Forum, resources, networking
  - Capacity building workshops
  - Principles of science advice (ICSU, UNESCO, WSF 2017)
- Second international meeting, Brussels 29-30th September 2016
- INGSA Africa
- Membership is free: open to academics, practitioners, policy makers

www.ingsa.org

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The challenges and opportunities for the global agenda

- **Essentially all the SDGs require an evidence informed approach to policy making**
- **Effective global action requires effective domestic science advisory mechanisms supported by transnational mechanisms**
  - **International agency advisory boards**
  - **Liaison between domestic advisory systems**
  - **Scientific input into diplomatic mechanisms**