SAPEA

Science Advice for Policy by European Academies

Making Sense of Science for Policy under conditions of complexity and uncertainty

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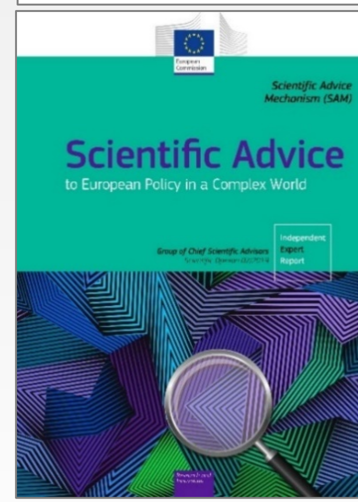
Background

- Evidence review
- Overarching question:

> How to provide good science advice to European Commission policymakers, based on available evidence, under conditions of scientific complexity and uncertainty?

- launched July 2019
- Informed GCSA's Scientific Opinion
- GCSA's Scientific Opinion *Scientific Advice to European Policy in a Complex World* was launched in September 2019
- The Scientific Opinion is primarily addressed to policymakers across the European Commission



Timeline of *Making Sense of Science for Policy*

Feb 2018
Scoping Paper

Jul 2019
Launch of the SAPEA Evidence Review Report

Sep 2019
Launch of the GCSA Scientific Opinion

Sep 2019
Handover to the European Commission

Sep 2019 onwards
Outreach

First *Making Sense of Science for policy* Working Group meeting, Brandenburg Academy, Berlin, September 2018

SAPEA Working Group

- 16 working group members
- from 12 different countries
- 37.5% of female representation
- 1 working group member nominated by a Young Academy

Structure of report

- Ch.2: **Key terms**
- Ch.3: **Prospects, limitations and constraints** of science advice for policymaking
- Ch.4: Policymakers' **needs for science advice**
- Ch.5: **Potential for enhancing the interface** between science advice and policymaking
- Ch.6: Summary of the **main findings**

Challenges in science for policy

- Policy maker wants **relevant** knowledge. But: not easy to define what the relevant knowledge is.
- There is a need to **reduce the complexity**, to confine the problem into a selection of various policy options.
- You have to find solutions within a certain **time frame**. Often this is part of a conflict between policy making and science.
- There is a need to **explore possibilities**, to balance pro's and con's, and instruments are needed to do so.
- There is a need to **legitimize the decisions** within an arena of competing different interest groups.
- There is a need for **robustness and consensus** in the assessments
- Assessors have to negotiate **credibility** with scientific peer groups, policy makers and other actors involved.

Discussions focussed on

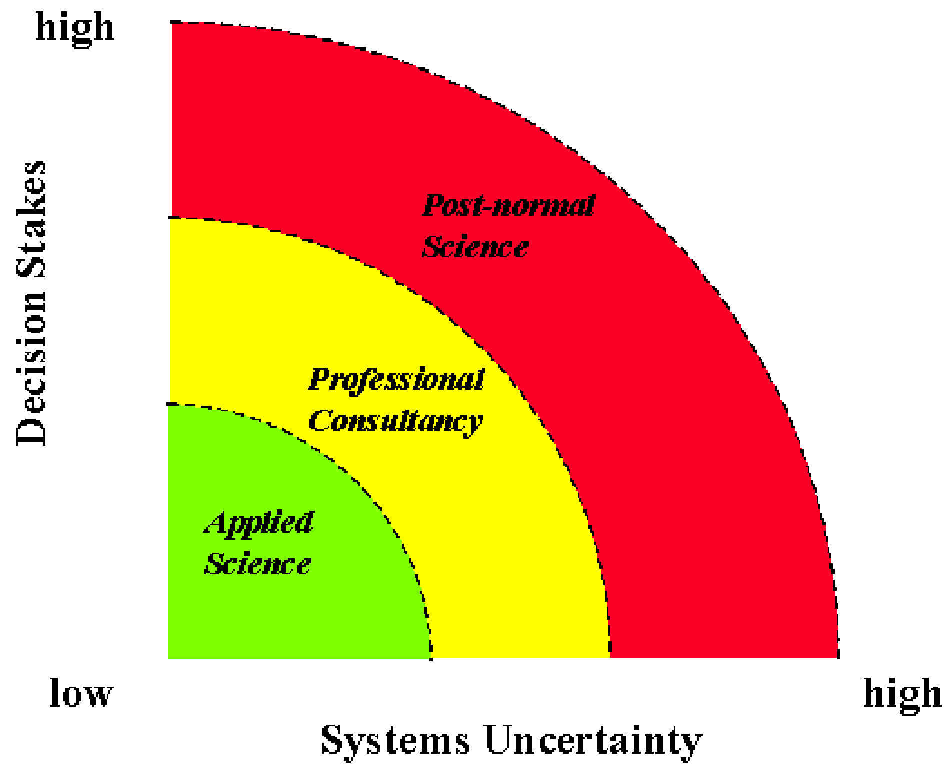
- **How useful** is scientific knowledge for public decision-making?
- What **other forms of knowledge** and understanding are required within democratic policy processes?
- Should scientific understanding be regarded as universal, or is that **scientific understanding dependent on context** and situational conditions?
- **What status** should be given to scientific knowledge within sometimes polarised and controversial issues?

- Diverse group, we did not always agree on the answers
- Agreement on **broad definition** of science (vitenskap)
- Concepts such as **transformative, transdisciplinary or co-creative research and extended peer communities** elucidate the direction in which the debate about the nexus between science & society is moving

Complex - *uncertain* - risks

Typical characteristics:

- Decisions urgent
- Stakes high
- Values in dispute
- Irreducible & unquantifiable uncertainty



- Assessment: models, scenarios, assumptions, extrapolations
- (hidden) value loadings in problem frames, indicators chosen, assumptions made

- **Knowledge Quality Assessment!**

(Funtowicz & Ravetz, 1993)
http://www.uu.nl/wetfilos/wetfil10/sprekers/Funtowicz_Ravetz_Futures_1993.pdf

Elements of Post-Normal Science

- Appropriate management of **uncertainty, quality and value-ladenness**
- **Plurality** of commitments and perspectives
- **Internal extension of peer community** *(involvement of other disciplines)*
- **External extension of peer community** *(involvement of wide range of actors in problem framing, environmental assessment & quality control)*

Plurality of styles of scientific reasoning

- **Styles of reasoning** characterise the way by which academic disciplines & practices arrive at scientific propositions
- Determine what counts as rational or irrational, scientific or quasi-scientific, valid or invalid evidence, true or false.

- Examples of styles:
  - Postulation (mathematics)
  - Experimental exploration
  - Hypothetical construction of analogical models
    (Feynman: "*What I cannot create, I do not understand*")
  - Ordering of variety by comparison and typology
  - Statistical analysis of regularities of populations / probabilities.

(Crombie 1992, 1994, Hacking 1982, 1985, 1992, Kusch 2010)

Unrealistic assumptions about scientific evidence

- **Illusion of certainty**: making policymakers more confident about knowing the future than is justified
- **Illusion of transferability**: making policymakers overconfident that certainty in one aspect of the problem applies to all other aspects as well;
- **Illusion of 'absolute' truth**: making policymakers overconfident with respect to the truthfulness of evidence;
- **Illusion of ubiquitous applicability**: making policymakers overconfident in generalising results from one context to another context;
- **Illusion of a linear relationship between evidence and problem-solving**: making policymakers believe that science will offer right solutions to complex problems.

Functions of scientific knowledge in policy advice

- **Enlightenment**: being informed about the state-of-the-art of factual issues (descriptions) and causal/functional relationships that form reliable knowledge
- **Orientation**: making oneself familiar with and gaining a more in-depth understanding of a challenge or a problematic situation, including visions and plans for future actions
- **Strategic planning**: providing strategies for reaching a predefined goal or objective that meet the purpose and make the side-effects of each strategy transparent to the decision-maker, including uncertainties and ambiguities (trade-offs)
- **Integration**: bringing various forms of knowledge into a coherent framework and a common understanding
- **Co-creation of knowledge**: engaging representatives of science, civil society, politics, private sector and/or the affected public(s) in designing new insights or options that facilitate the creation of innovative solutions to a given problem or challenge

Integration of different types of knowledge in the policy process

- Distinguish what is known, what is uncertain and what is unknown
- Impact on different aspects of human life must be made clear
- precautionary principle must be taken in account
- Clarify the values involved
- Involve expertise outside academia (local knowledge, know-how, citizen science etc.)

Main findings: Basic insights on science advice

- Anticipation of human interventions in the Anthropocene era
- Critical review of the evidence and its implications for policymaking
- Not prescribe but inform policies
- Functionality of science advice depends on issue and context
- Form must meet function when designing science-policy interfaces
- Plurality of legitimate perspectives, styles of reasoning and insights
- Effects of heuristics, biases and frames
- Affected by values, conventions and preferences
- Right composition of advisers and quality of dialogue
- Trust between advisers and policymakers
- Analytic rigour and deliberative argumentation
- Involvement of stakeholders and citizens
- Communication with stakeholders and society

Main findings: Science advice at European level

Organisation of science advice

- Multidisciplinary composition of advisory bodies
- Analytic-deliberative approach
- Capacity building
- High ethical standards
- Operational rules and rights

Science-policy-society interface at European level

- Need for ‘knowledge brokers’
- Building long-term relationships
- Open and robust information flows
- Dealing with dissent
- Trust in advisory processes
- Incorporation of citizens into the process

Take home insight

- **“Science advice is always affected by values, conventions and preferences.**
  …
  Rather than highlighting the role of the ‘objective’ knowledge provider, the **science-policy nexus is better served when both sides are transparent about what values and goals they apply and how knowledge claims are selected, processed and interpreted.** This creates more trust and confidence in institutions and in the processes for science advice.”

Conclusions

The world's most pressing problems are also incredibly complex
Scientific knowledge around these areas can often be uncertain or contested

- **Science is one of many sources of knowledge that inform policy**. Its unique strength is that it is based on rigorous enquiry, continuous analysis and debate, providing a set of evidence that can be respected as valid, relevant and reliable.
- **Science advice** supports effective policymaking by providing the best available knowledge, which **can then be used to understand a specific problem, generate and evaluate policy options and monitor results of policy implementation**.
- Science provides meaning to the discussion around critical topics within society.
- Works best when guided by **co-creation of knowledge and policy options.**
- **Relationship between science advisers and policymakers relies on building mutual trust**, where both scientists and policymakers are honest about their values and goals.
- **Scientific knowledge should always inform societal debate and decision-making**. Citizens often have their own experiences of the policy issue under consideration and should be included in the ongoing process of deliberation between scientists, policymakers and the public

https://www.sapea.info/topics/making-sense-of-science/

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