



Mercator Research Institute on  
Global Commons and Climate Change



POTSDAM INSTITUTE FOR  
CLIMATE IMPACT RESEARCH

# Scientific policy advice on 1.5°C and climate engineering: Needs, opportunities, and conflicting values

Prof. Dr. Ottmar Edenhofer  
Dr. Martin Kowarsch

Kiel

25 November 2016

# Structure

- 1) The need for scientific assessments
- 2) How to deal with value conflicts?
- 3) New model: the cartography of policy pathways
- 4) Conclusion



# Structure

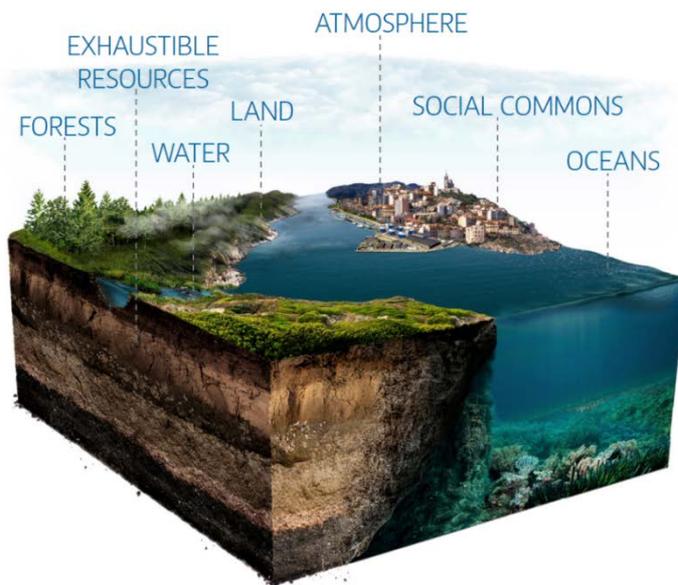
- 1) **The need for scientific assessments**
- 2) How to deal with value conflicts
- 3) New model: the cartography of policy pathways
- 4) Conclusion

# Large-scale collective decision-making requires integrated scientific assessments



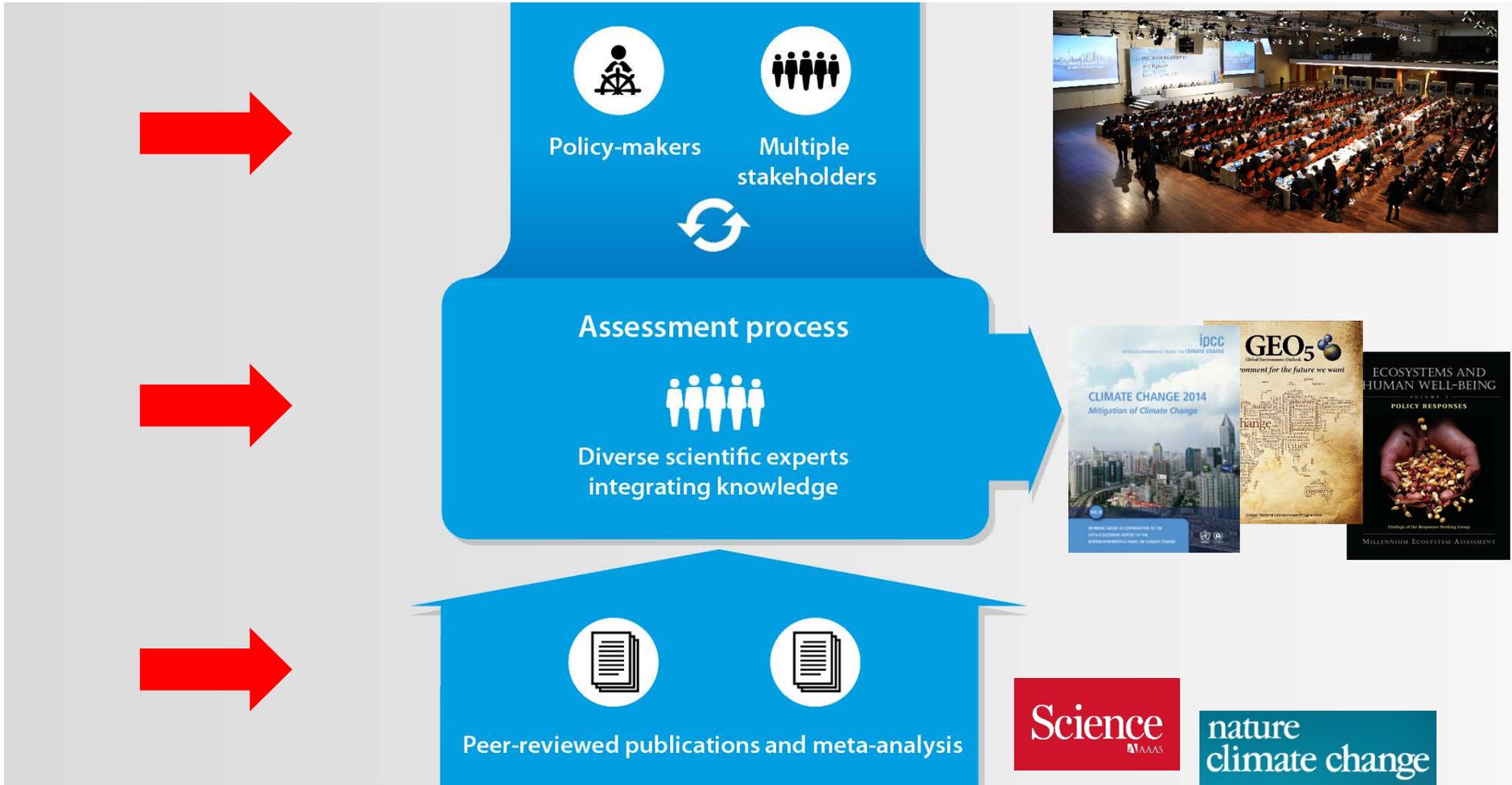
The sciences must help decision-makers understand available policy options. But, climate change as “problem from hell”:

- **disputed normative implications;**
- large-scale, long-term, non-linear risks: new research fields, **high uncertainty;**
- complex **interdependencies** between different policy fields (synergies and tradeoffs), **across disciplines.**



***Standard* disciplinary research & policy advice do not deliver the knowledge needed to assess policy options!**

# Assessments at the science-policy interface



(Kowarsch 2016, *Nature Climate Change*)

# Structure

- 1) The need for scientific assessments
- 2) How to deal with value conflicts?**
- 3) New model: the cartography of policy pathways
- 4) Conclusion

# Key challenge: value judgments and value conflicts

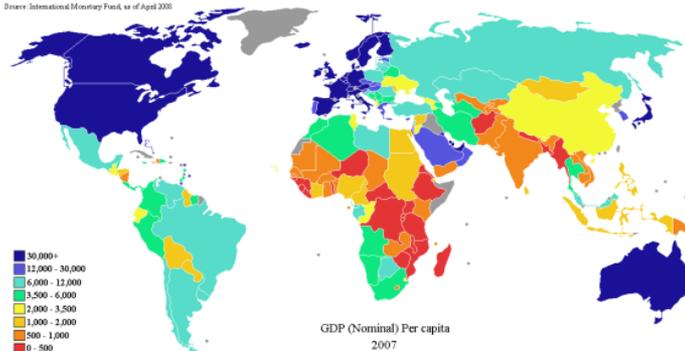
- Assessments need to be:
  - Relevant (salient, well-communicated) to public policy processes
  - Reliable (sound, credible, transparent)
  - Unbiased (i.e., not policy-prescriptive): disputed values/interests

## ➤ An issue of legitimacy – particularly in the solution-oriented policy assessments...

### IPCC Official: “Climate Policy Is Redistributing The World’s Wealth”

Posted on November 18, 2010 by Anthony Watts

Source: International Monetary Fund, as of April 2008



The great socialist plot is revealed! Hold on to your wallet sick)

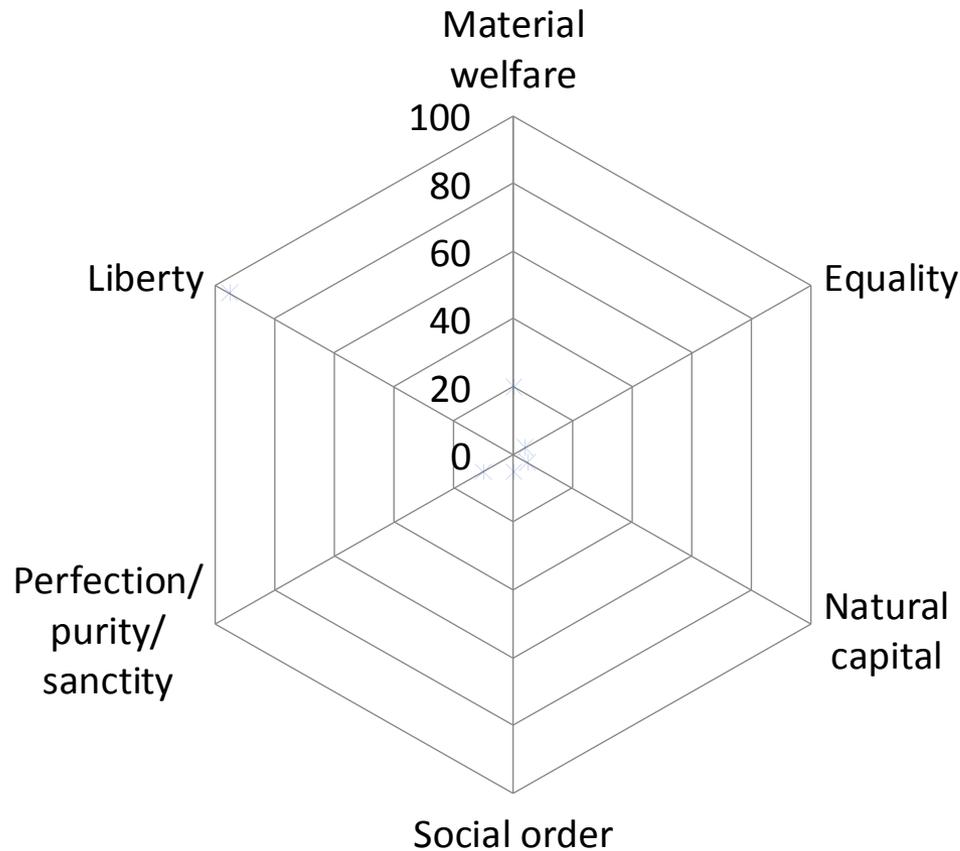
Neue Zürcher Zeitung, 14 November 2010

Climate policy has almost nothing to do anymore with environmental economist and IPCC official Ottmar Edenhofer. The next world economy summit during which the distribution of the world's wealth will be discussed, Ottmar Edenhofer is the co-chair of the summit.

For those who may not know, **Ottmar Edenhofer is the co-chair of the summit.**

# How to deal with different value systems?

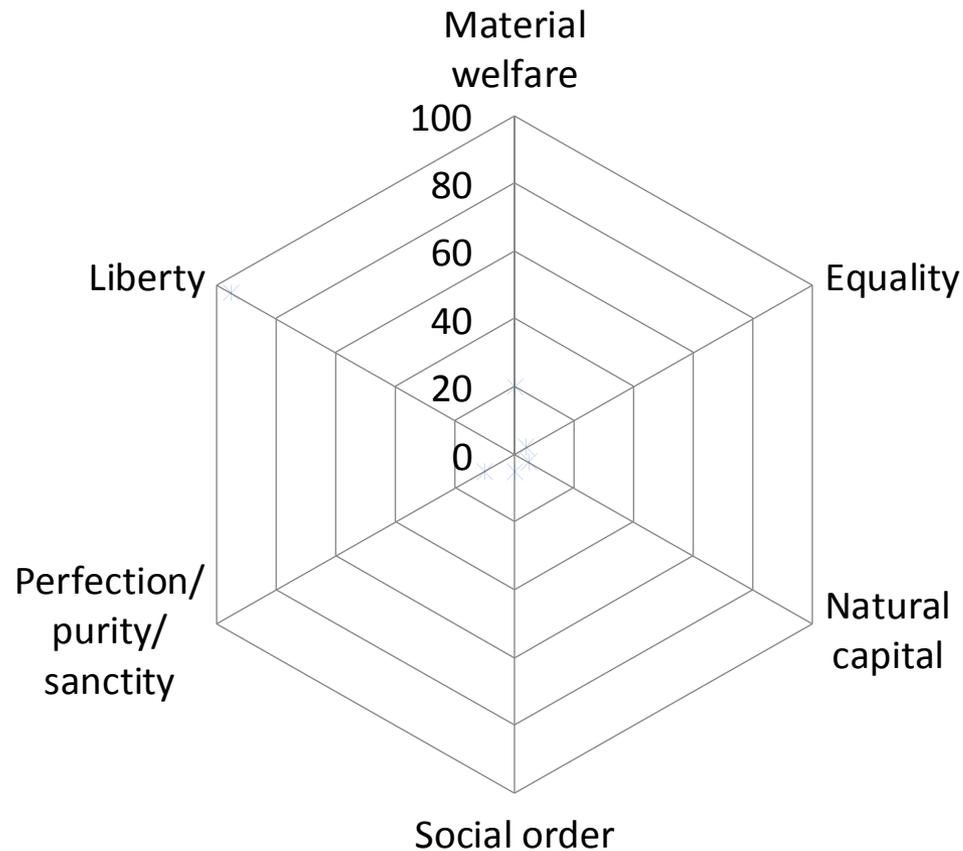
Humans are organized in moral tribes



In addition: different possible time/space extensions for each standpoint!

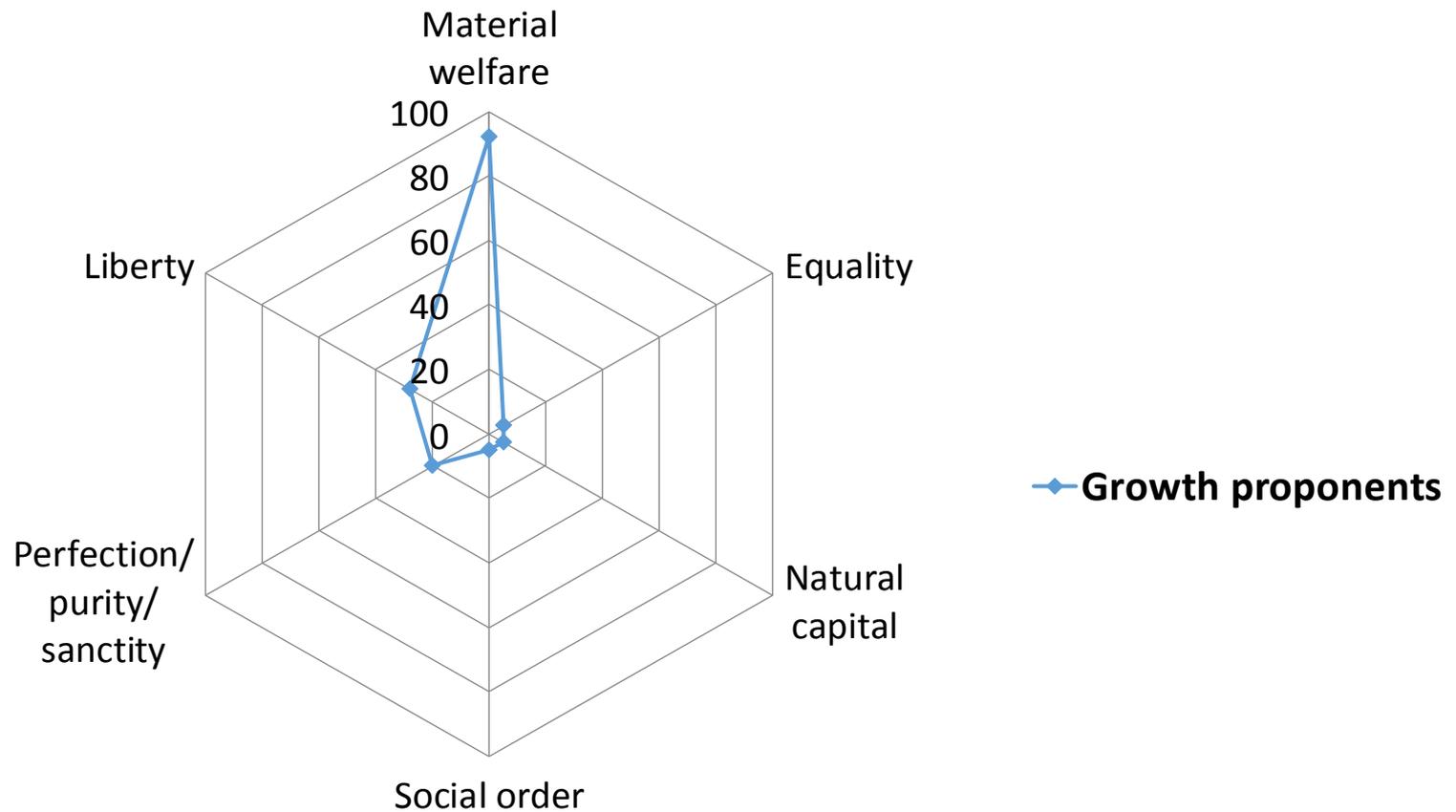
# How to deal with different value systems?

## *Landscape of societal values: hypothesis*



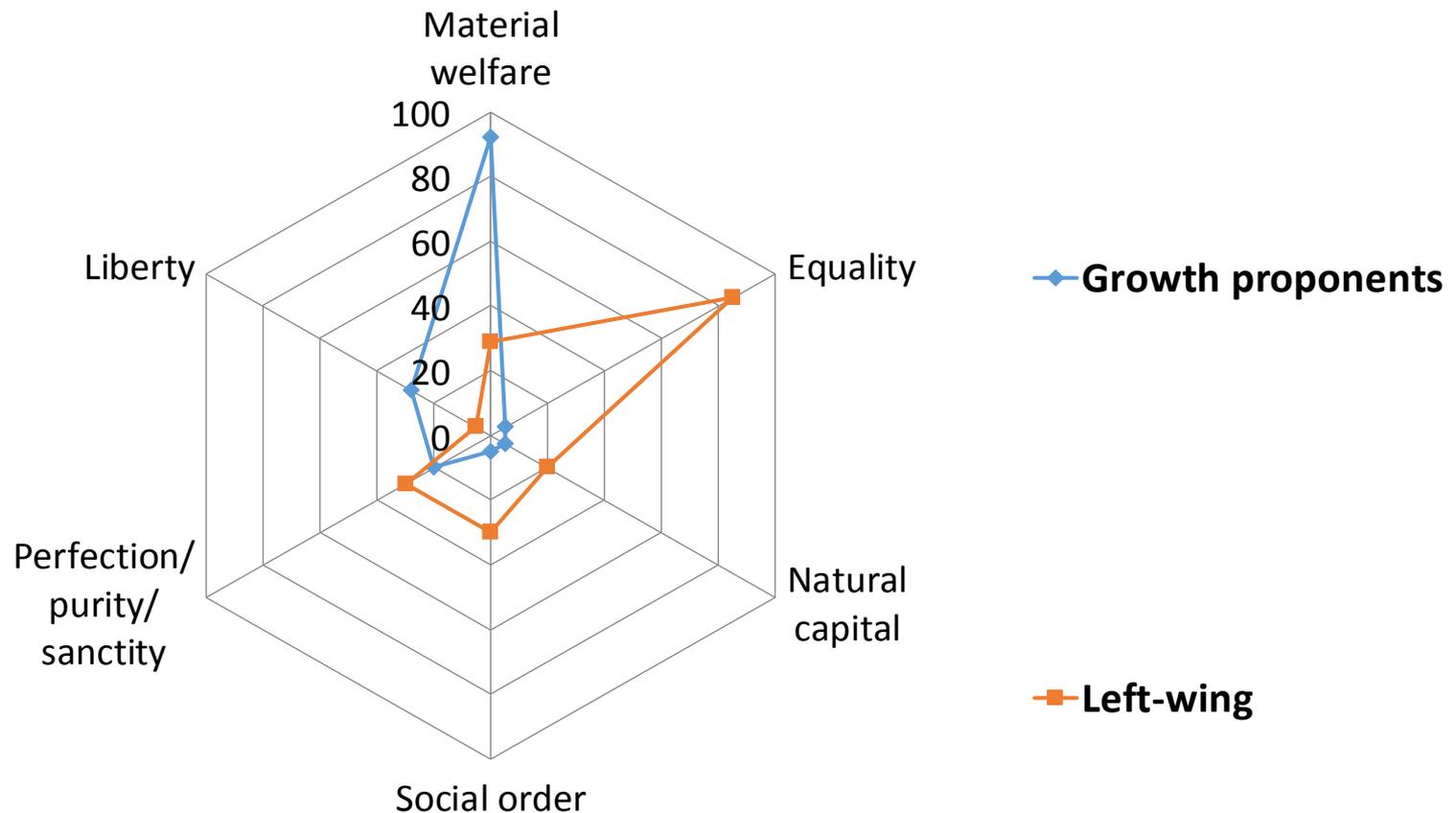
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



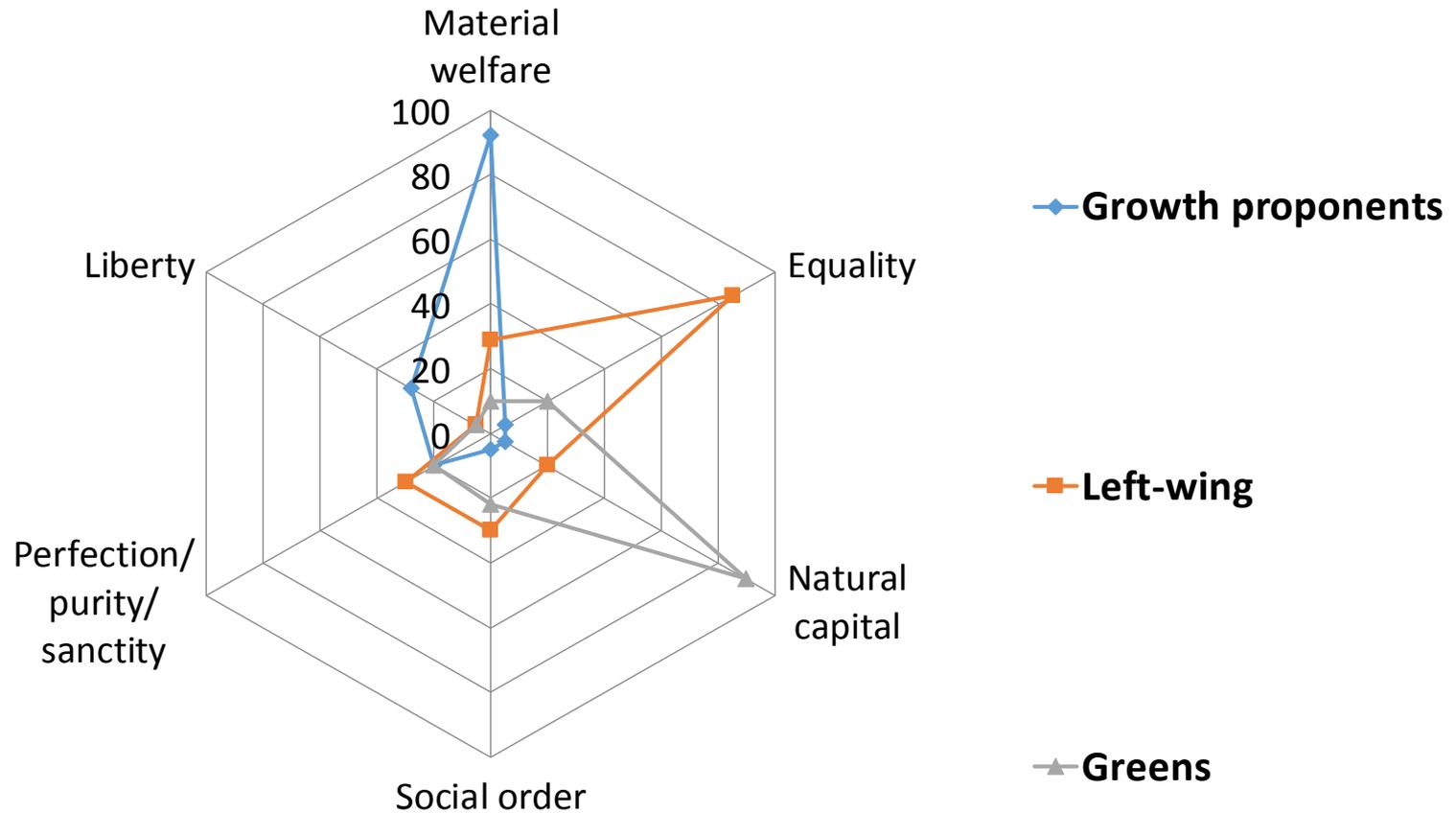
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



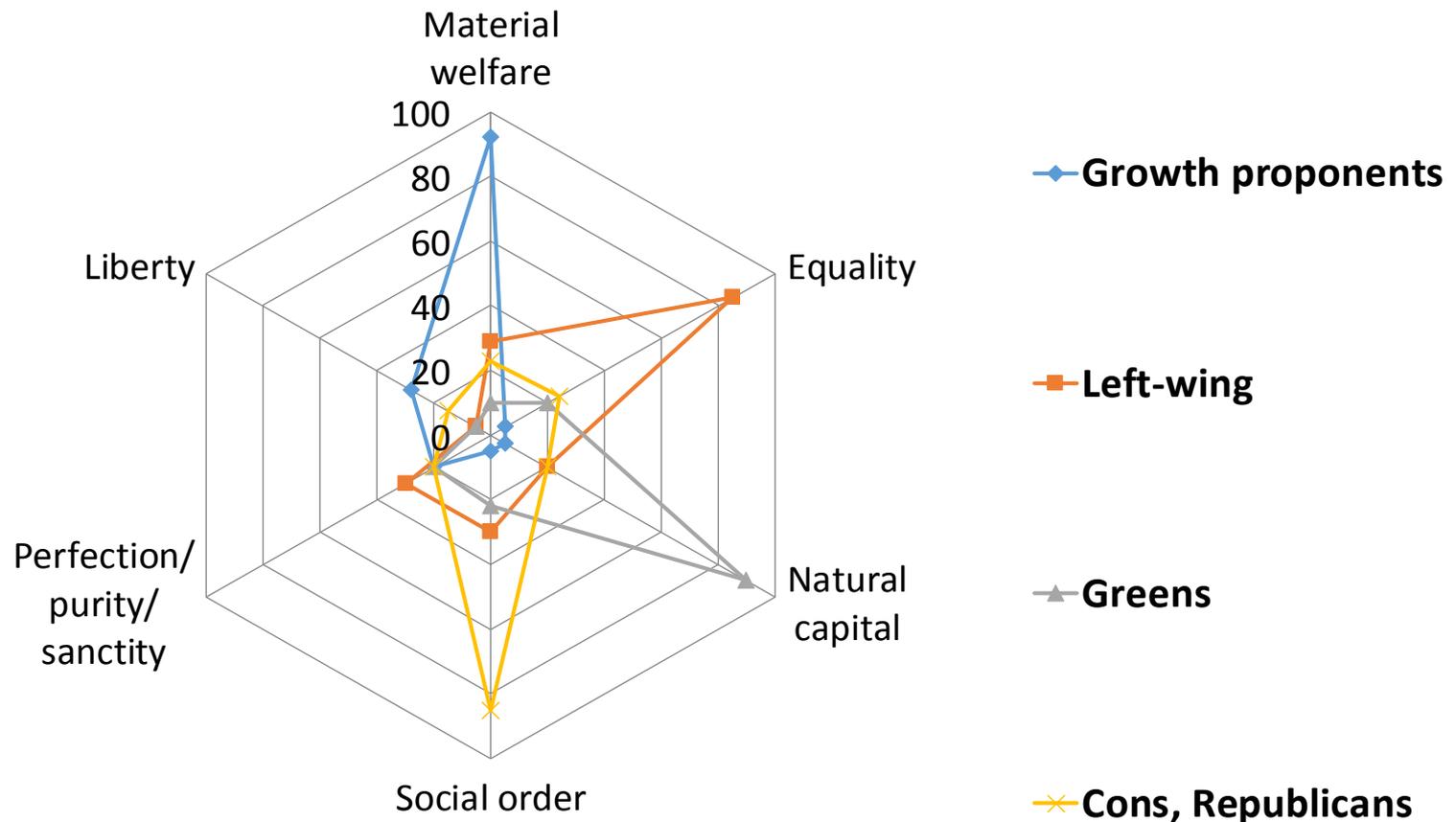
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



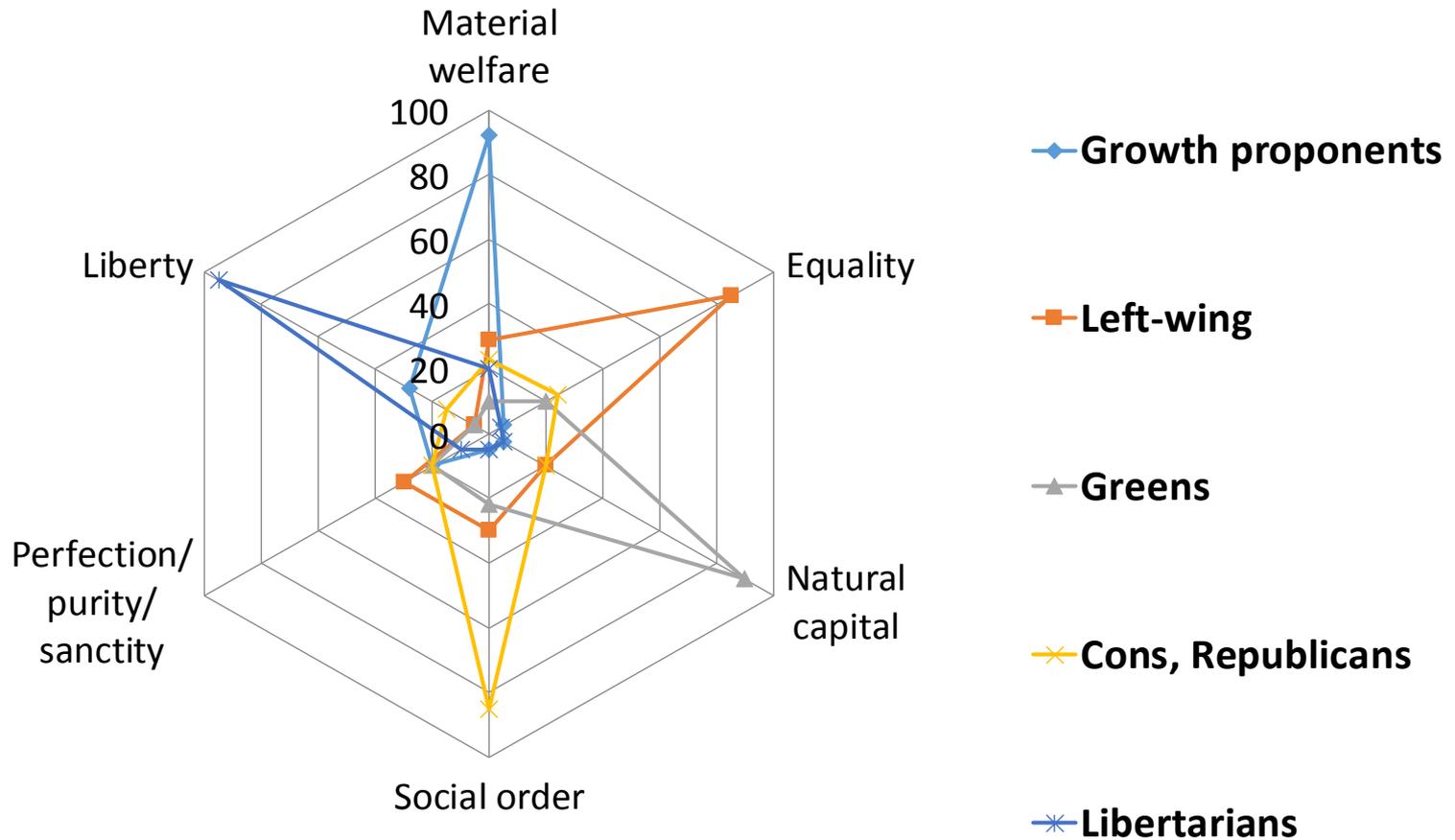
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



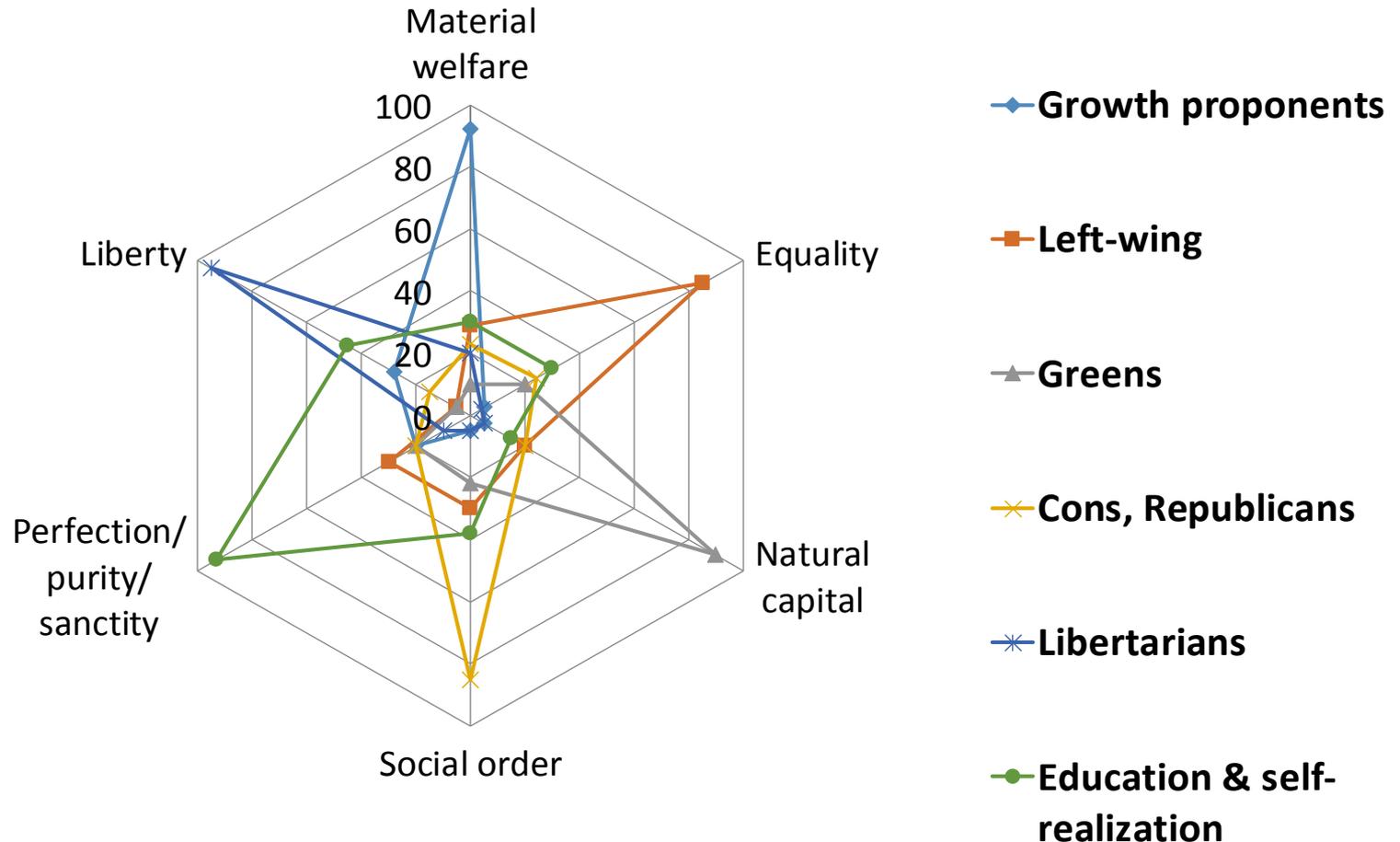
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



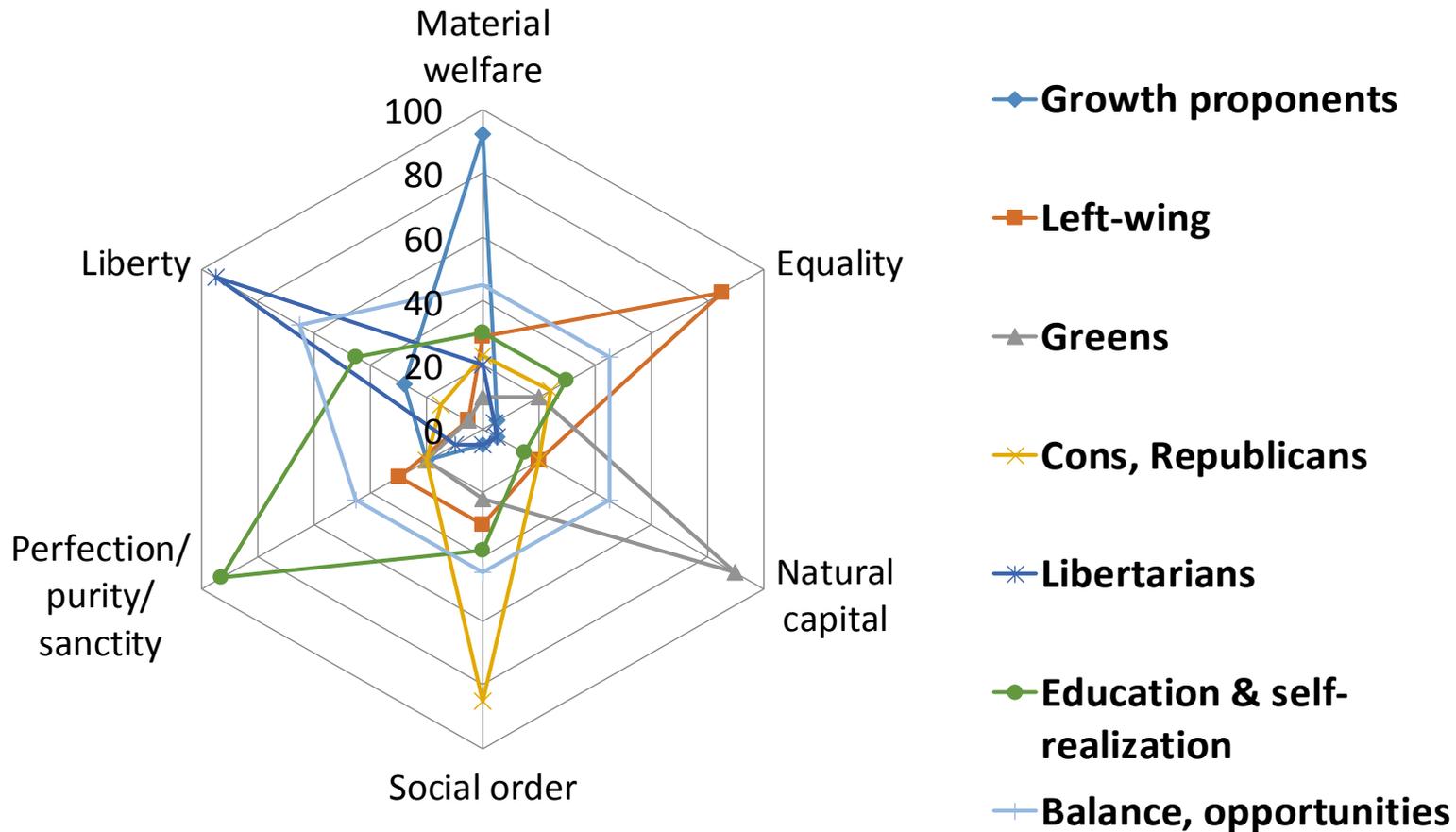
# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



# The search for the “common good”: your favorite group?

*Landscape of societal values: hypothesis*



# Technocratic model: neglecting value conflicts



## DOWNSIDE:

- **Mistakenly presupposes value-free science or value consensus, and a linear transfer of “speaking truth to power”**
  - **Whom to blame for actual consequences after policy implementation?**
- **“Iron cage of bondage” for society (M. Weber’s dystopia) ?**

# The decisionist model is not value-neutral either



## DOWNSIDE:

- No possibility at all of *rationally* discussing disputed objectives
- Unclear how science can appropriately judge policy means, and who is responsible for side effects etc. in the end
- Disputed value judgments even regarding policy *means* !

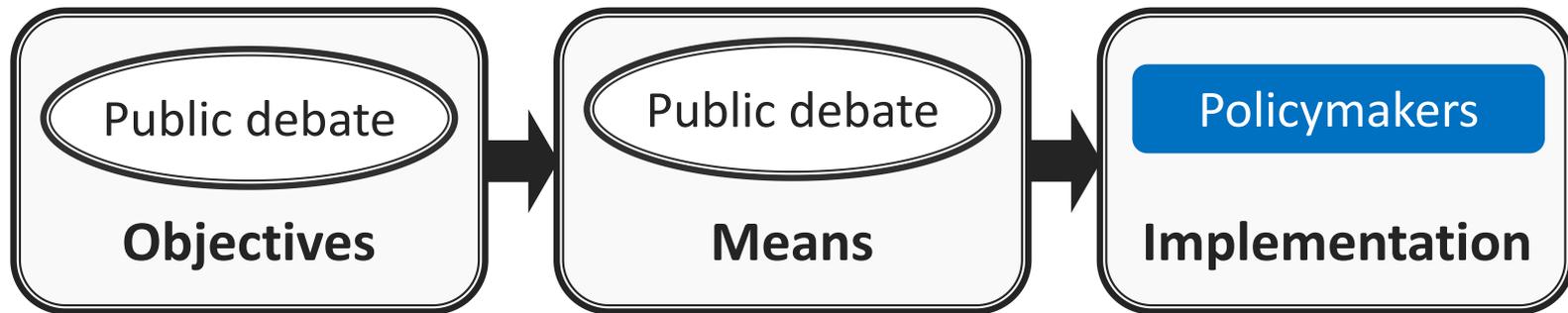
# Normative judgments are inevitable in scientific research

**No facts without values.**

- **Evaluation criteria, risk/welfare concepts, etc.**
- **Epistemic (cognitive) value judgments always implied: Coherence, consistency, simplicity, objectivity; there is no fundamental difference to ethical value judgments**
- **Evaluating consequences of decisions can have considerable societal consequences**
- **‘Thick ethical concepts’ (e.g., development, growth, efficiency, etc.)**

**Modern philosophy of science: facts and values cannot be neatly separated, they are inextricably intertwined**

# Democratic model(s): rarely implemented in practice



## DOWNSIDE:

- Much remains unclear: how can policy objectives and means be determined?
- Again: who is responsible for the actual consequences?
- Sometimes even radical constructivism (epistemological pessimism)

# Structure

- 1) The need for scientific assessments
- 2) How to deal with value conflicts?
- 3) New model: the cartography of policy pathways**
- 4) Conclusion

# Dewey's pragmatist social learning in a nutshell

- **Key idea: evaluating practical implications of hypotheses (as means of achieving a goal)**
  - Science is inherently “applied” and value-laden: hypotheses as tools to overcome a practical problem
- **Interdependency of goals and means via their consequences**
  - Critical comparison with other possible policy means and objectives
- **Objectivity possible (despite value dimension)**
  - We *can* rationally discuss value-laden issues – in terms of direct effects, unintended side effects, and co-benefits.
  - Yet, knowledge is always *fallible*
  - Co-production of knowledge required (deliberative democracy)

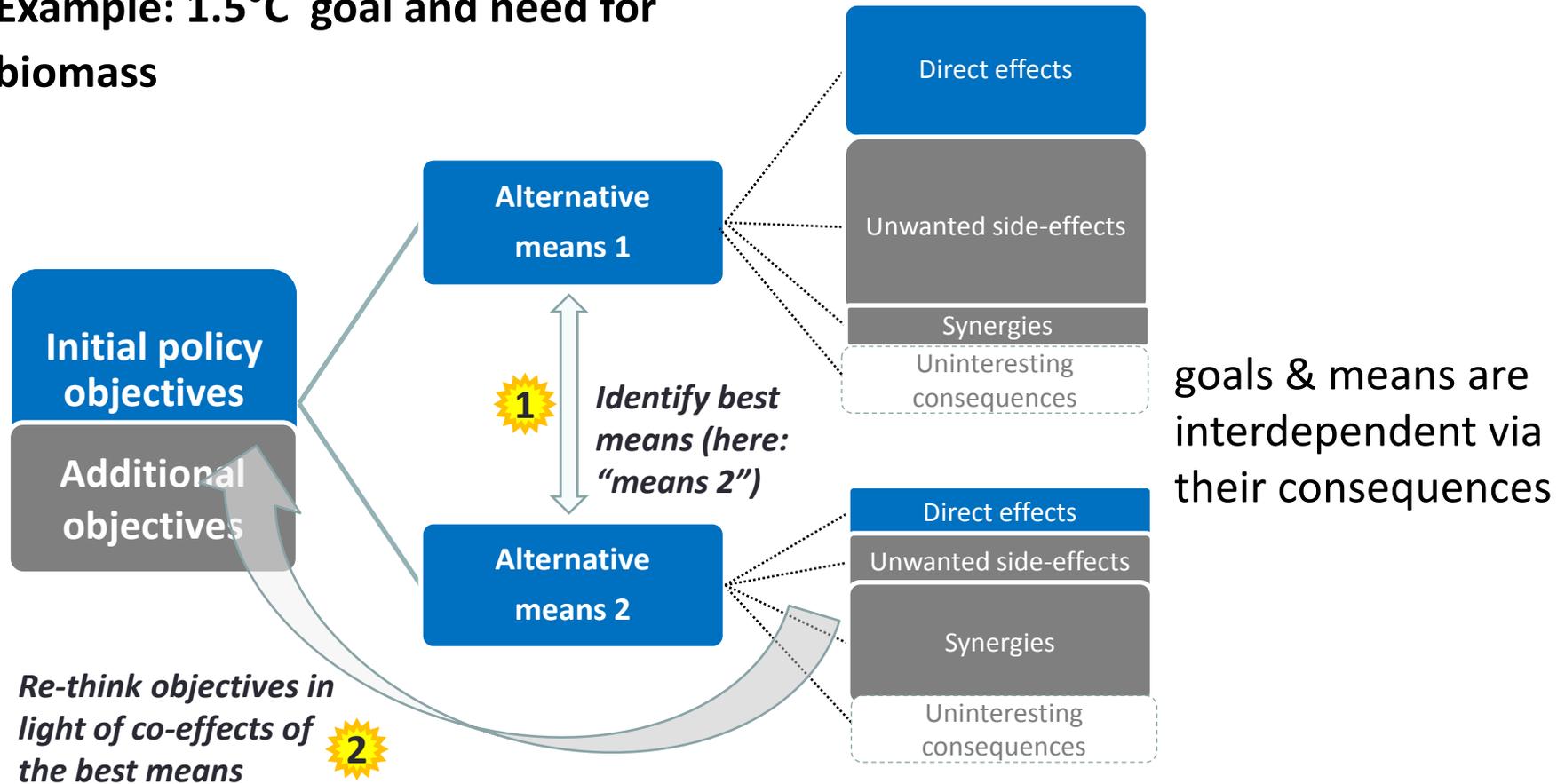


John Dewey  
(1859–1952)

(Kowarsch 2016, Springer)

# Evaluate the diverse (co-)effects!

Example: 1.5°C goal and need for biomass

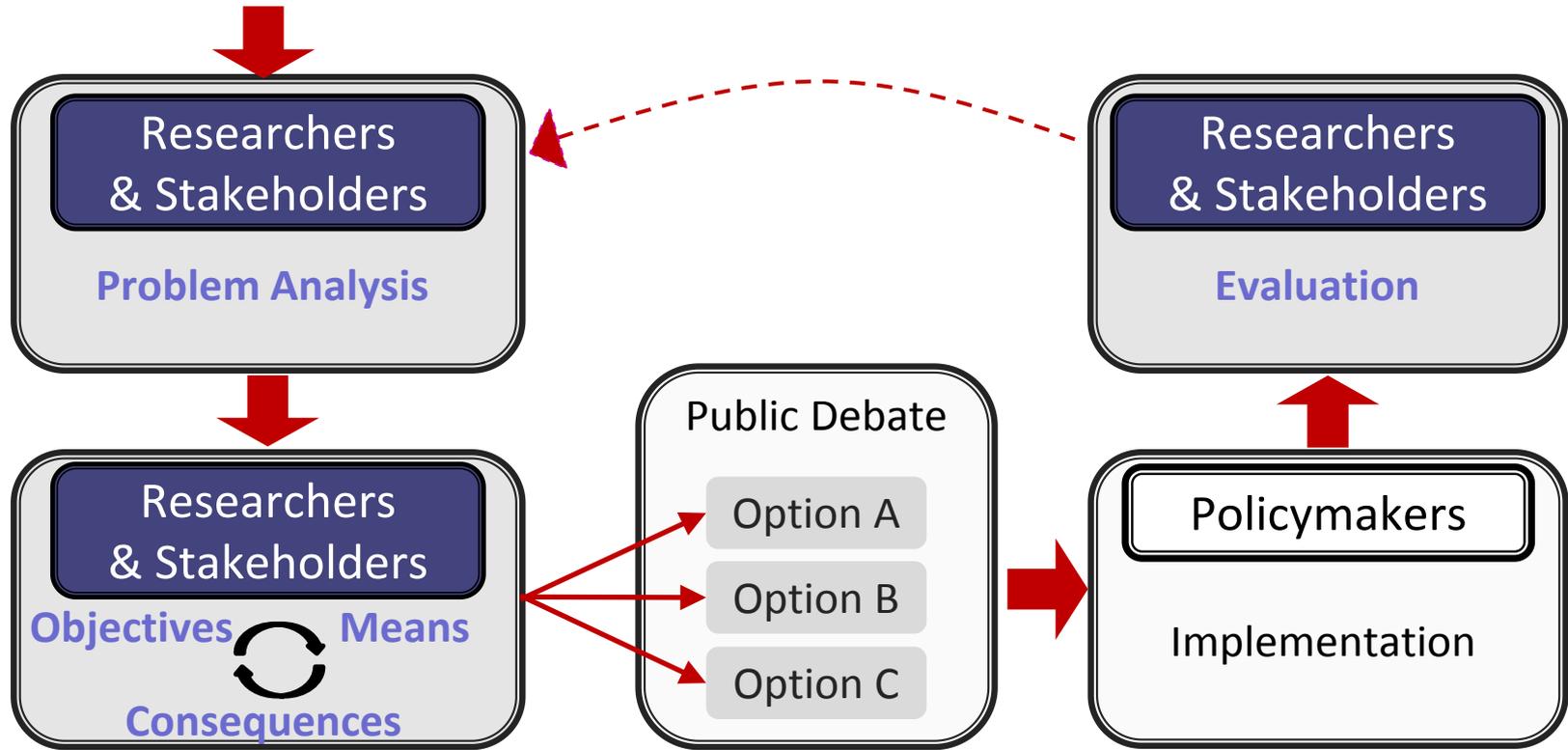


# How to provide sufficient warrant for costs and benefits?

- Reversibility/irreversibility
- Incremental/breakthroughs
- Lock-in effects and path-dependencies
- Possibility of social learning:
  - Costs are also an issue of legitimacy: they can be perceived as prohibitively high when fundamental rights or procedures are violated.
  - To make estimates more evidence-based, policy decisions are to be evaluated *ex post* to facilitate learning.
  - Incremental steps can avoid irreversible lock-in effects.
  - Overlap: policy instruments addressing different values/objectives simultaneously?

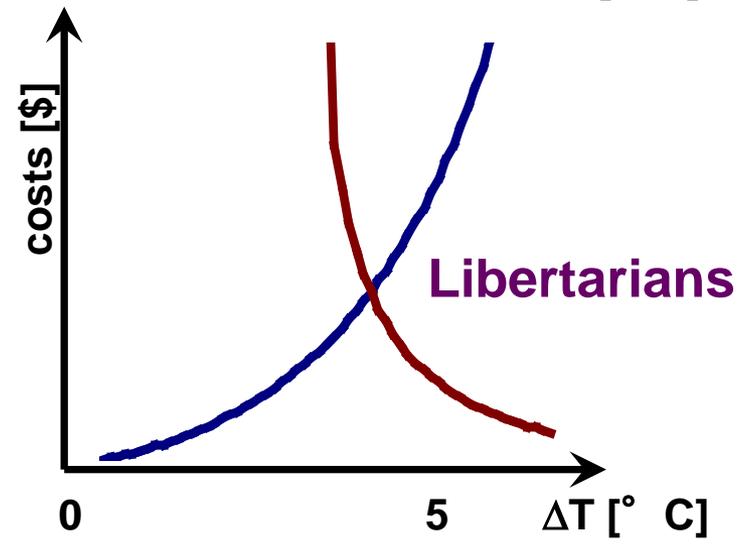
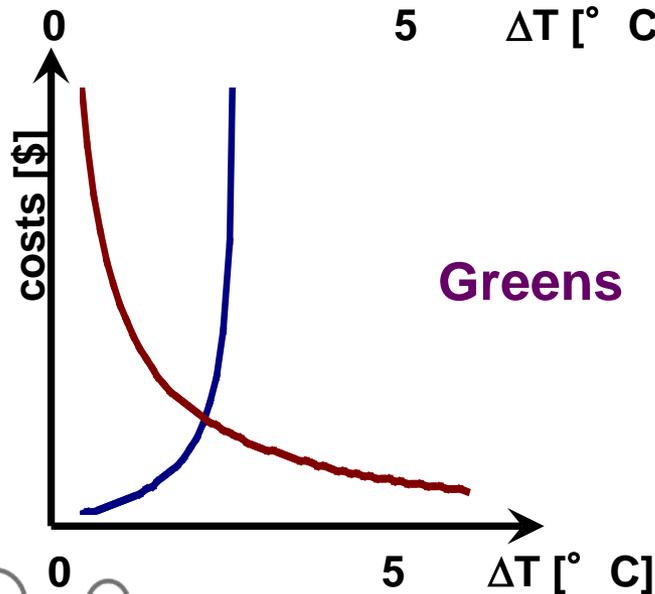
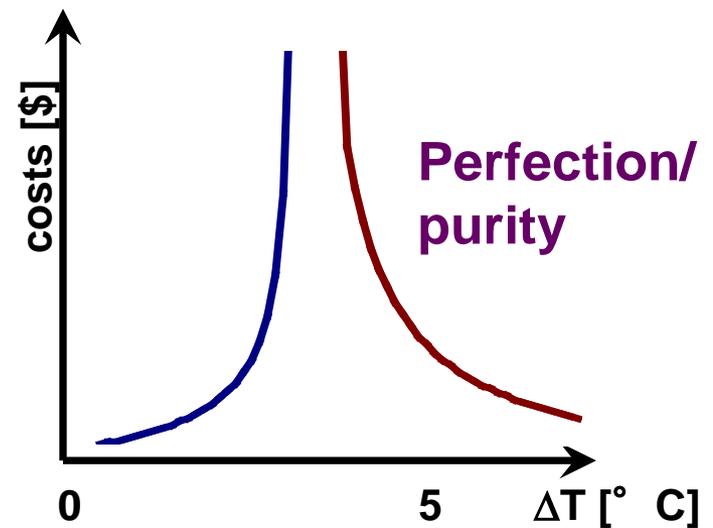
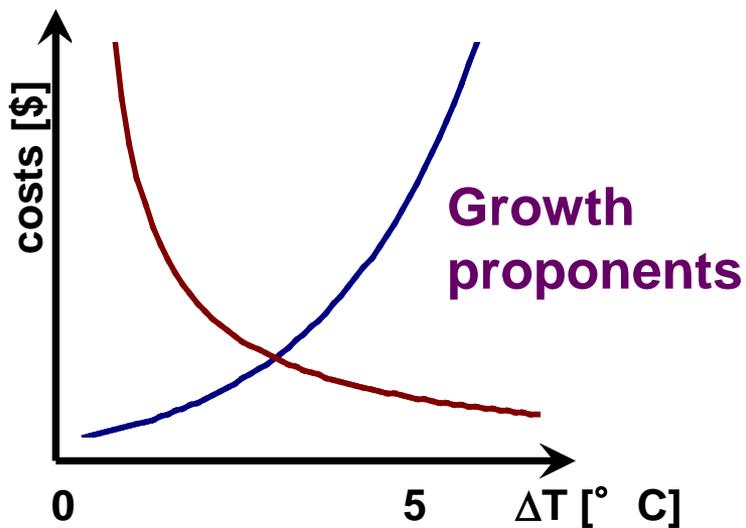
→ Solution-oriented, deliberative policy assessments needed.

# Pragmatic-enlightened model (PEM) of science in policy



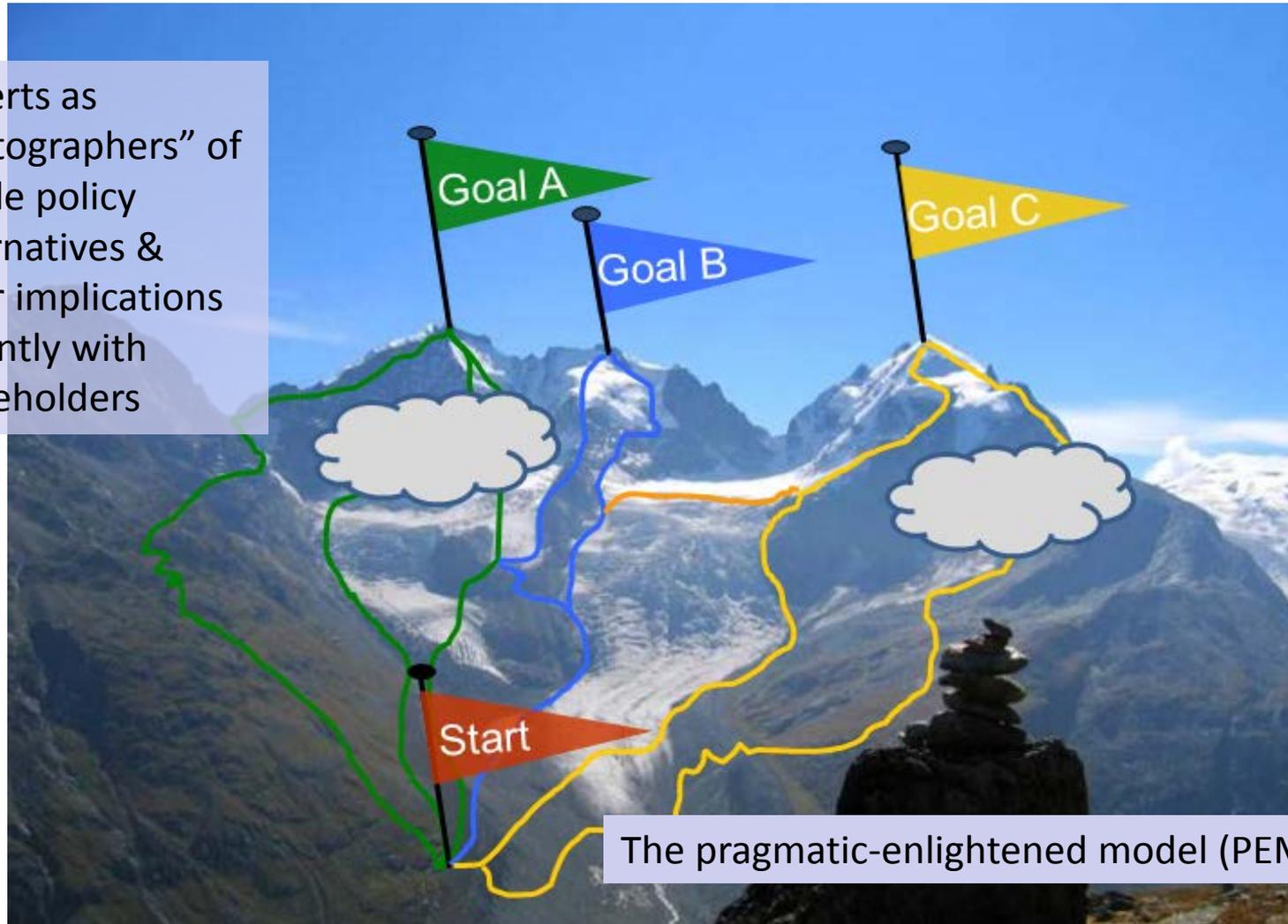
(Edenhofer & Kowarsch 2015, *EnvSci&Pol*)

# Decision theory and deliberation: explore alternative views



# Mapping pathways to allow for iterative learning process

Experts as “cartographers” of viable policy alternatives & their implications – jointly with stakeholders



The pragmatic-enlightened model (PEM)

# Structure

- 1) The need for scientific assessments
- 2) How to deal with value conflicts?
- 3) New model: the cartography of policy pathways
- 4) Conclusion**

# Facilitate an open learning process about policies

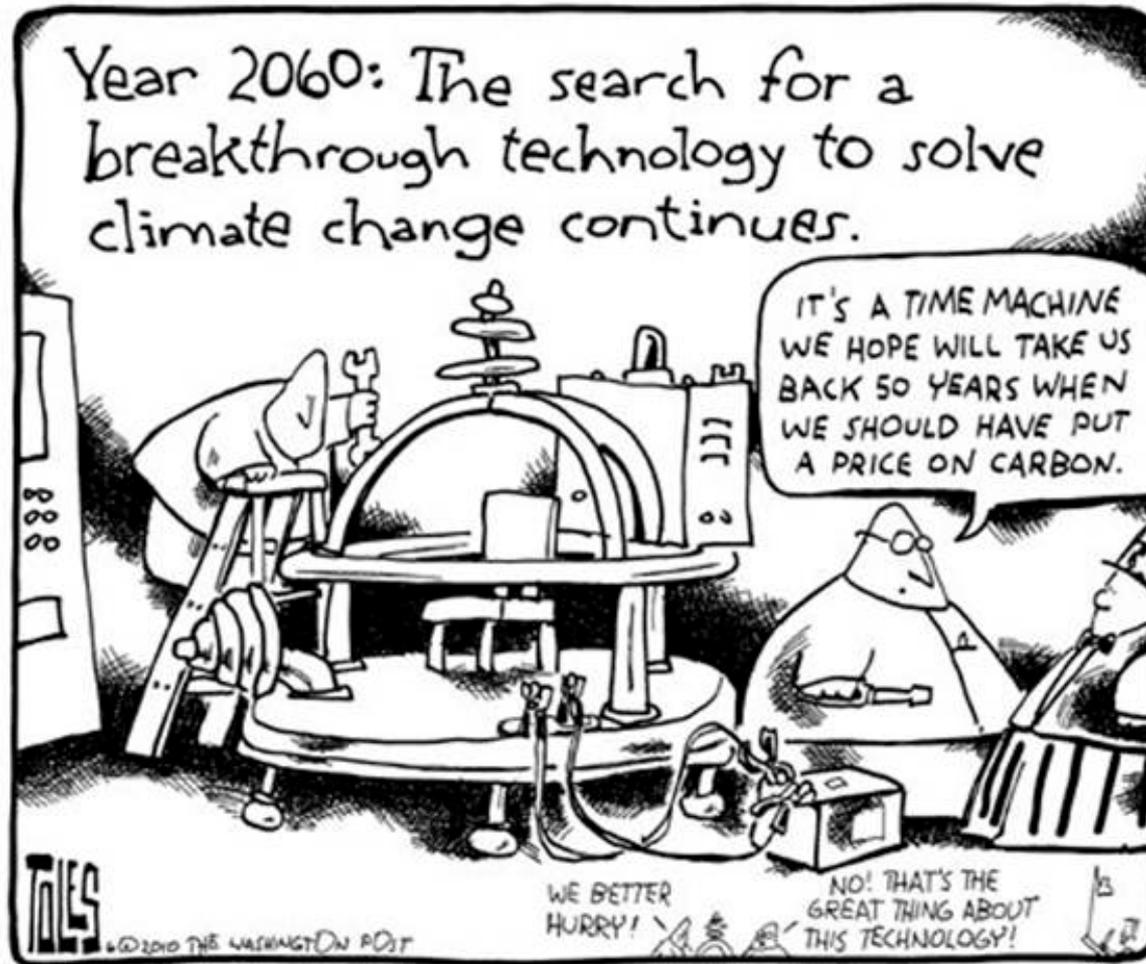
- **Experts and scientists should provide maps instead of unconditional recommendations.**
  - Value conflicts should be made explicit
- **Policy-makers have to learn how to use and appreciate maps of knowledge on policy pathways.**
  - Including the acceptance of painful ex-post policy evaluation and iterative learning processes
  - Should be in their best self-interest...
- **Moreover, increased funding for policy-relevant research and methodology development needed.**
  - Provide incentives for systematic, applied transdisciplinary (ex-post and ex-ante) research, including social science meta-analysis

# Application to CE and 1.5° C

- Value systems determine the framing of the decision problem: exploring multiple framings is essential for a fruitful debate.
- The social learning process helps to understand under what conditions specific means like SRM, CDR are acceptable – subject to the underlying value systems and the evaluation of facts.
- Social learning can lead to convergence of perspectives.
- There is no guarantee for convergence. However, the reasons for divergence can be better understood.



# Can societies learn when confronted with large-scale risks?



(Source: Washington Post)