



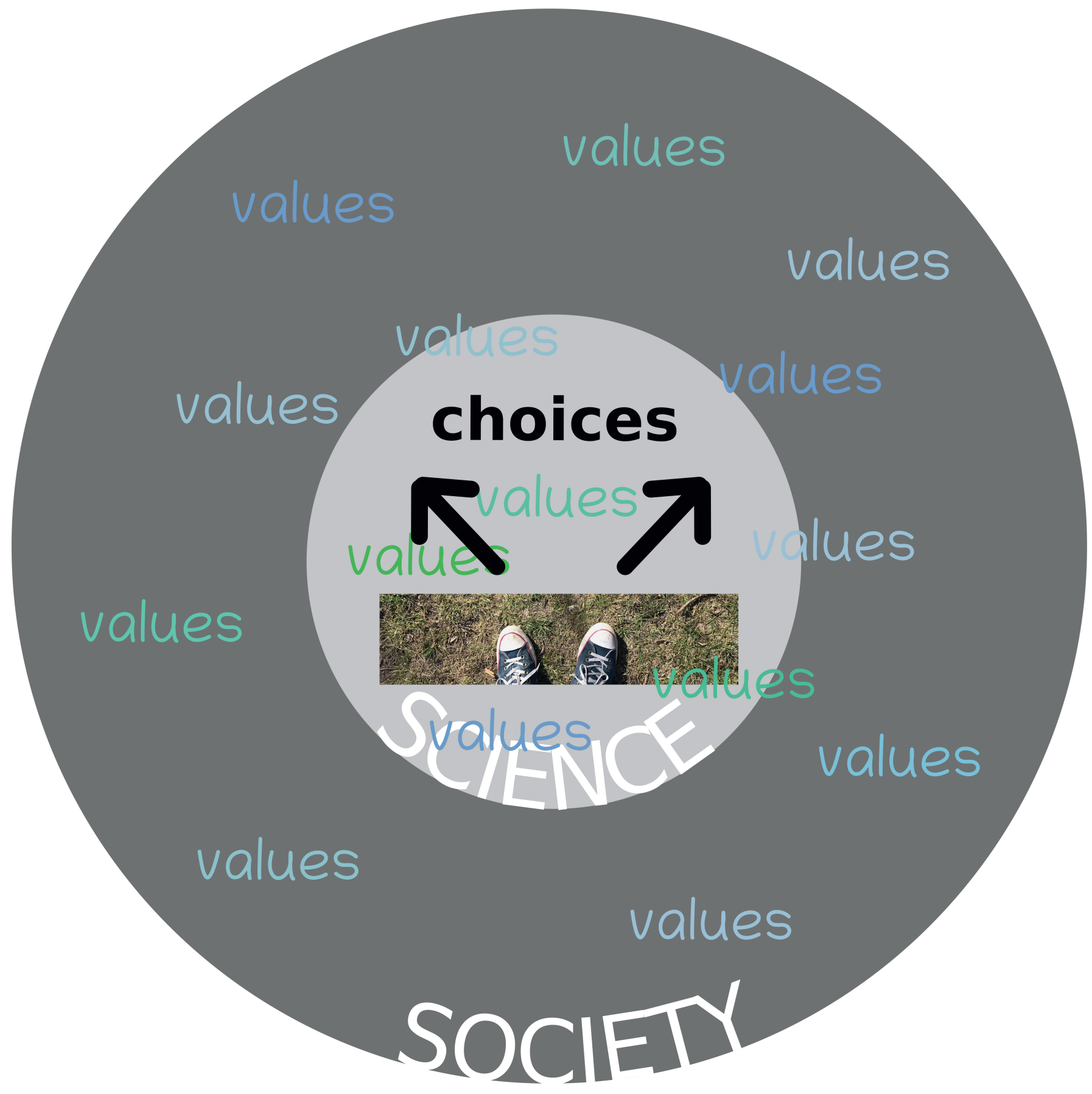
Values in (climate) science: What model-based assessments of climate sensitivity teach us about value-judgements & demands on norms thereon

Why look at Equilibrium Climate Sensitivity (ECS)?

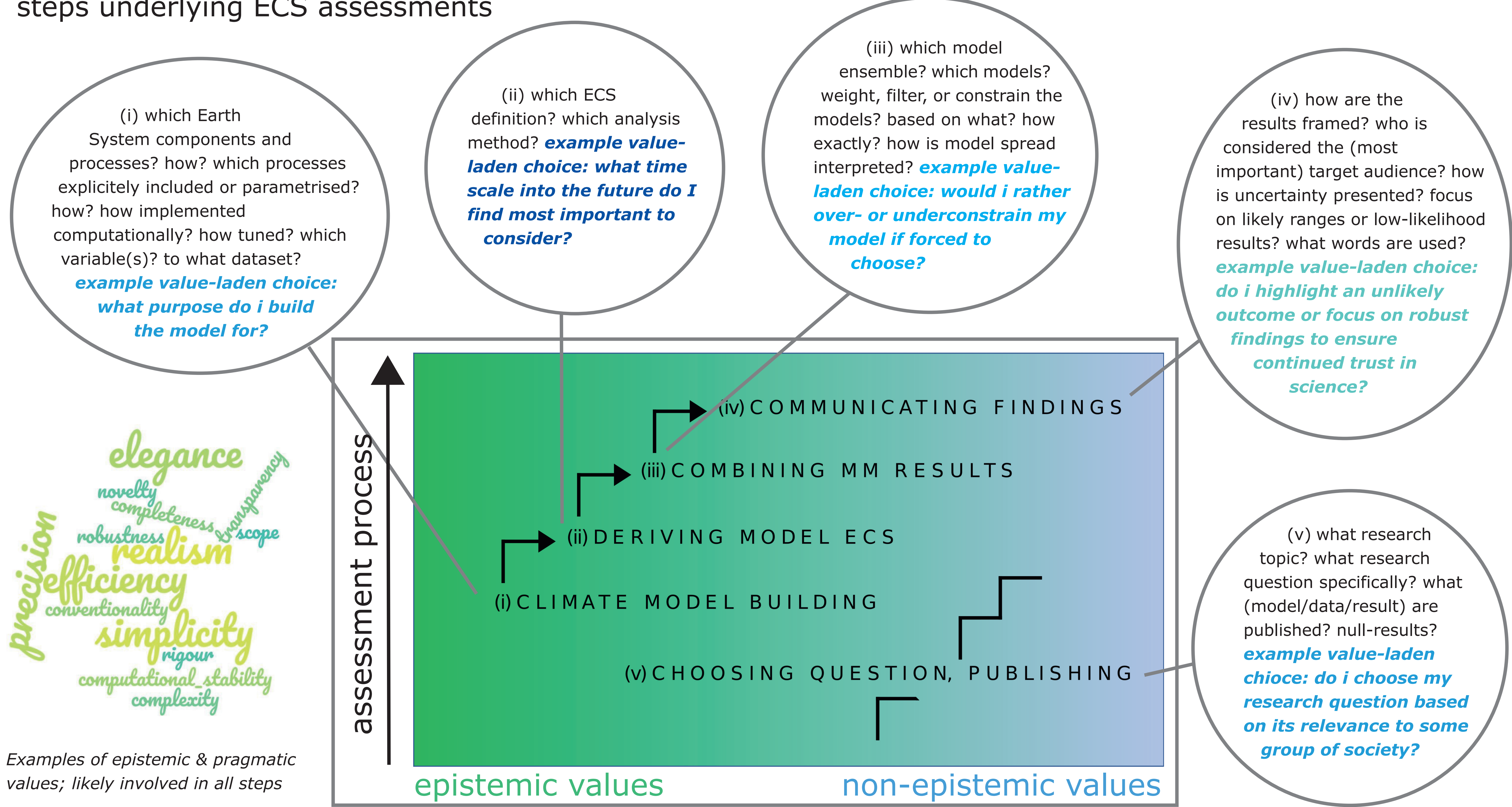
- Equilibrium climate sensitivity (ECS) is a key property of the climate system, indicative of the magnitude of future climate change.
- ECS has for the last 40 years been an important part of climate change assessments e.g. by the IPCC, providing a much-considered time evolution of scientific (un)certainty¹⁻³.
- Global climate models (GCMs) have provided important evidence for ECS assessments, and ECS is important to characterise and evaluate GCMs.
- GCM-based assessments of ECS are methodologically representative examples of large areas of climate science.

What are values in science and why should we care?

- Science is full of choices, and evidence and logic often leave several decisions similarly supported. Scientists' decision-making in these cases might then be guided, consciously or unconsciously, by *values*.
- Much philosophical literature is concerned with these value-judgements in science, showing that values can guide science both in positive and negative ways, and that they can not, and arguably should not, be eliminated.
- Where scientific results inform policy-making, as the case for much of climate science, value-judgements can hence not be completely outsourced to the decision-makers, calling for strategies to manage values *in* science.



Case study: Typical choices and possible value-judgements involved at the different steps underlying ECS assessments



Existing proposals for value-management

- ... have suggested that the influence of values is legitimate
- if the aims of research are legitimate by some measure⁴
 - as long as it's not acting in place of evidence⁵
 - if the values are democratically endorsed or based on stakeholder input⁶⁻⁸
 - as long as it's transparent⁹

What challenges to the proposals become clear from the case study?

- agency is distributed across generations of researchers, numerous institutes, countries, and disciplines
- many consequences of a choice can not be known at the time of choosing
- many choices are so technical that stakeholder are unlikely to be able to have an opinion
- climate models are multi-purpose tools and assessments various aims and a diverse audience
- the value-judgements potentially involved include types other than those related to risk preferences
- further agency outside the individual scientist lies in institutions, funding bodies, journals

Conclusions

- Numerous choices underlie (climate-)scientific assessments, and value-judgements are likely involved in addressing them.
- Existing proposals to help navigate these choices and decide on legitimate and illegitimate value-influence are difficult to apply, showing the need for new framings.

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