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HAMBURG CLIMATE FUTURES OUTLOOK

Assessing the plausibility of
deep decarbonization by 2050



Diverse ways of knowing in a changing climate (1/2)

Knowledge and knowledge production affect the way people perceive and engage with the world. *Diverse ways of knowing* refers to diverse scientific or everyday practices and technologies for accessing the world, including different approaches within the same epistemic system, such as observations and models, and different epistemic systems, such as local, traditional, or indigenous knowledge systems (Crate et al., 2019; Schnegg, 2019; Singer, 2020). There is robust evidence that diverse ways of knowing matter for climate change mitigation (Brugnach et al., 2014), adaptation (Petzold et al., 2020), and sustainable development in general (Sterling et al., 2020).

With respect to assessing plausible climate futures, engaging with diverse ways of knowing is important in various ways. It is important, for example, to help explain social and behavioral change or inertia due to diverse interpretations of global warming (O'Reilly et al., 2020), to help identify trade-offs with sustainable development that are expressed through the contestation of global norms on local sites (Wiener, 2018b), and to help advance knowledge co-production approaches in support of climate observation, climate projections, and resilience and adaptation strategies at the local and regional scale (Forbes, 2011; Balbo et al., 2016; Savo et al., 2016). This inclusive approach facilitates a better understanding of different types and stages of knowledge production and their impact on policy decisions (see Section 8.10). The following examples demonstrate how CLICCS researchers engage with diverse ways of knowing and how they matter for assessing and interpreting plausible climate futures.

Through cross-cultural comparison of “different ways of explaining climate change”, Schnegg et al. (2021) demonstrate that people often combine different epistemologies. For example, scientists and laypeople often agree that humans are the cause of global warming. But the scientific and local understandings of how local practices and climate change interact can also diverge (Brüggemann and Rödder, 2020). Furthermore, some indigenous communities blame themselves for climate change, since in their ontologies, the weather is perceived as a local phenomenon, which rewards and punishes people for their right and wrong actions (Rudiak-Gould, 2014; Schnegg et al., 2021). These findings urge us to rethink how different understandings of the environment and climatic changes influence people's behavior, and how this relates to our expectations of plausible social dynamics, for example, regarding consumption patterns (Section 8.8) or social movements and climate protests (Section 8.4).

Climate justice is a key contested norm of global climate governance, which includes diverse approaches from the Global South (Sovacool et al., 2017). Climate justice has diverse “meanings-in-use” contingent upon how it is enacted (Wiener, 2009) by societal agents across spatial and temporal contexts. Wilkens and Datchoua-Tirvaudey (2020) explore these meanings by zooming in on sites of contestation in the Arctic and the Mediterranean, and studying affected stakeholders' justice claims. They argue that a decolonial approach is particularly helpful to account for multiple diversities (i.e., justice claims, scale, and ways of knowing). The researchers identify distinct expectations ►

Diverse ways of knowing in a changing climate (2/2)

of societal agents toward climate change policies, and identify practices of contention that allow further research to assess whether or not support exists for goals that are set by global climate regimes. The study also accounts for diverse epistemologies and ontologies of nature and climate. This becomes visible in many climate governance issues such as the discussions around trade-offs between climate action and sustainable development (see Box 2).

Diverse ways of knowing also help understand how likely changes in the natural system might be. One example for such a diverse approach relates to new ways to integrate insights from both observations and models to project plausible futures of our climate system. For example, Notz and Stroeve (2018) combine

insights from observations, conceptual modeling and large-scale numerical models to obtain a more robust understanding of future changes in Arctic sea-ice area than would be possible by just one of these approaches.

In conclusion, integrative assessments such as the *Hamburg Climate Futures Outlook* benefit from the engagement with diverse ways of knowing by incorporating fundamental aspects of social-ecological dynamics that affect climate futures. In this edition, the social drivers knowledge production (Section 8.10) and climate litigation (Section 8.5) show that engaging with diverse ways of knowing is relevant for assessing the plausibility of deep decarbonization by 2050.