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# Empty Promises of Growth: The Bioeconomy and its Multiple Reality Checks

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## Bioeconomy and economic growth: an intimate, yet ambiguous relationship

- **Contradictory origins of the concept:** „Bioeconomics“ based on the recognition of limitations to a finite planet and the need for degrowth (Georgescu-Roegen, 1971) vs. growth promises of the ‘biotech revolution’ since the 1990s
- **Bioeconomy as promissory discourse:** active ‘future making’ (McCormick and Kautto, 2013), ‘hegemony of optimism’ (Pfau et al., 2014), ‘economics of technological promises’ (Giampietro, 2019)
- **Conflictual relation between** ‘technology-driven’, highly growth-oriented visions based on promises of life science innovations, & ‘socio-ecological’ counter-concepts based on agro-ecology; ‘biomass-based’ or ‘bio-resource-driven’ model located somewhere in between (Hausknost et al., 2017; Priefer et al., 2017; Vivien et al., 2019)
- **Evolution of promises:** EU and German strategies – recent updates less biotech-centered, broader promissory framework focusing sustainability, employment, food sovereignty
- **Moderation of bioeconomy’s growth promises by multiple ,reality checks’**  
Evident in EU updated strategy 2018; German bioeconomy strategy 2020



## The bioeconomy debate: Four strands of research, four reality checks to the growth promise

Departing from Hausknost et al. (2017), we distinguish four relevant strands of research that have mounted 'reality checks' to the promissory bioeconomy

### 1. Processes of representation:

- *Discourse analyses* of bioeconomy programmes, strategies, policy literature
- *Literature reviews* on bioeconomy-related research
- Critical inquiry into practices of *knowledge generation and use* (STS)

### 2. Political-institutional processes:

- Research on actors, networks, interests and strategies – Political science, Political Economy

### 3. Material processes – 'double materiality' (Pichler et al. 2020) of the social in capitalist societies:

- Economic materiality of the bioeconomy** – accounts of bio-based economy as an ensemble of sectors
- Biophysical materiality of the bioeconomy** – accounting of resource and energy flows



## Processes of representation: Analyses of bioeconomy discourses and strategies

- Analysis of the far-flung **'debate on the debate'** on bioeconomy
- **Discourse analyses** show that there is a **large diversity** of goals and aims pursued by governmental bioeconomy policies – not all can be reduced to 'neoliberal growth strategies', framing and priorities are shifting
- **Literature reviews** chart a **contested field of debates** ranging between two poles:
  - Promissory growth- and biotech-centered visions;
  - Opposing socio-ecological visions centered around agro-ecology, sufficiency and post-growth ideas;
  - 'biomass-bioeconomy' as more recent addition: less tech-dominated, but growth-oriented – somewhere in between, but closer to the former
- Critical analyses grounded in STS (Birch, Levidow): How is 'bioeconomic' knowledge generated and circulated?
  - **Reality check:** highlights structural, rather than politically contingent, dominance of the 'sustainable capital' vision as rooted in the **logic and mode of functioning of a financialized neo-liberal economy** itself.
- An indication for this is that **all governmental bioeconomy strategies** assessed by Hausknost et al. (2017) convey visions of the **'Sustainable Capital'** type



## Political-institutional processes: Political economy, actors, interests and strategies

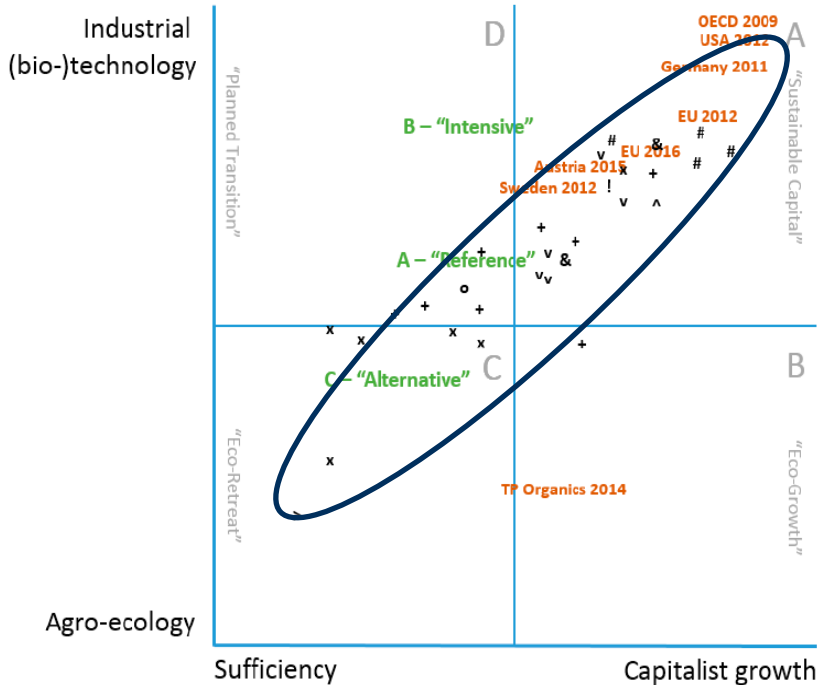
- Work on actors, 'stakeholders' and their roles in BE politics and policy formation
  - Actor mapping, network analysis
  - Surveys among scientists as an important stakeholder group
  - work from Political Economy
- **Findings:** Bioeconomy policies result from tough **strategic battles**, rather than from open and inclusive democratic deliberation or 'neutral' consideration of scientific 'facts'.
- Structural power and strategic resources allow interests of business and government to routinely win out at the expense of socio-ecological concerns.
- **Reality check:** Allows critical scrutiny of why promises are actually made; challenging unrealistic propositions by exposing the interests that their proponents have in making them. Shows how promises of the bioeconomy are often more part of the resistance to, rather than a driving force of, necessary transformations.



## Material Processes of the bioeconomy

- **'Double materiality'** of the bio-based economy:
  - **Economic materiality** as an ensemble of sectors – employment, revenue, industry structure (e.g. Bringezu, 2019; Ronzon et al., 2020)
  - **Biophysical materiality** in terms of material and energy flows, land use, resource and emissions footprints – systematic accounts just starting to emerge (Bringezu et al., 2019).
- **Reality checks:** sobering accounts suggest a more humble view on the **bioeconomy's** asserted **'potentials'**
  - The much-hyped biotech R&D sector remains **quantitatively insignificant**
  - The primary bio-based economy is largely **inert** and in economic terms **stagnant**
  - Patterns of biomass use prevalent in affluent European countries are unsustainable and globally unjust
  - The **scope for potential future expansions** of biomass production and use (e.g. by using waste streams) is very limited.
  - It's unrealistic that the bioeconomy can substitute for all or most of the current uses of fossil resources. Concepts of **cascading use** and **partial circularity** may help such partial substitution in some fields, but will not be able to fully make up for the losses (-> Circular economy no solution either)
  - **Biophysical scenarios** for actually sustainable use of biomass **do not match the visions** that dominate the debate (Hausknost et al., 2017)

# The 'Milky Way' of technology and growth



Socio-economic 'option space' of the bioeconomy (Hausknost et al. (2017))

## Reality Checks summarized:

- Different visions exist, but policies are dominated by a growth- and techno-centered imaginary of 'sustainable capital'
- Actual debates unfold along a single line of tension between that dominant imaginary and an alternative vision of degrowth and agroecology – actors align along that one dimension
- The power balance in the debate is highly skewed
- The actual options for defossilizing the material structure of the bioeconomy don't align with the visions promote in the debate
- How to deal with this is again a question differently answered by the competing imaginaries: **Adapt visions to biophysical reality – or biophysical reality to visions?**

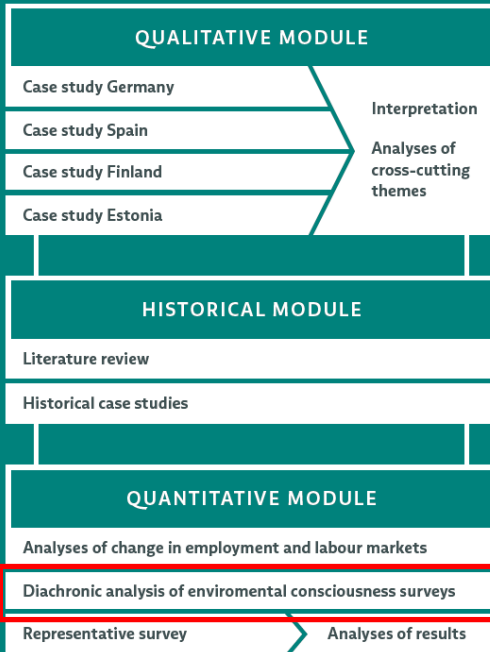


## Bioeconomy as a societal transformation: Mentalities, conflicts, social practices

- The coming transformations that 'bioeconomy' is a part of will require **far-reaching change to the material, institutional and mental infrastructures** that have emerged over the course of the fossil era
  - **'Bioeconomy' cannot be isolated from broader issues** of a *post-fossil* transformation
  - Different models of bioeconomy stand ideal typically for the different trajectories those transformations could take
  - This is contested among powerful actors – as well as in the population
- **How are people enmeshed and invested in the infrastructures of fossil society today, and how does this hinder the transformation?**
  - Who are the forces supporting a post-fossil transformation, who are its opponents?
  - Why do powerful transformative movements not emerge? Or do they?
  - Why do unsustainable, fossilist modes of living persist, how are they perpetuated?



## Structure



## Relational socio-ecological mentality research: How we do this in the *flumen* group

**„Mentalities in flux: Imaginaries in modern circular bio-based societies’**  
BMBF-funded Junior Research Group within the funding programme  
‘Bioeconomy as societal change’

We investigate the mental preconditions and effects of transitions toward bio-based economies in European societies

Combination of mutually complementing qualitative and quantitative methods, contrasting analysis of historical mental transformations

Currently: Focus on qualitative case studies in several European regions

2021: Own representative survey in Germany

Methodical preparation: Analyses of existing survey data to develop relational multivariate methods

GEFÖRDERT VOM



Bundesministerium  
für Bildung  
und Forschung



## Umweltbewusstsein in Deutschland 2018

Ergebnisse einer repräsentativen Bevölkerungsumfrage



# Charting the terrain of tensions and conflicts around post-fossil transformation

- We address these questions using a **relational sociological approach**:
  - Focus on **overall patterns** of attitudes (mentalities) and practices (modes of living) as well as **socio-structural positions** and on the relations among and between them, habits of mutual distinction, structural contradictions...
  - Relations are **charted, not measured** -> multidimensional spatial representation, 'maps' – and the one suggested by Hausknost et al. provides one helpful starting point
- Three interrelated layers of analysis:
  - **Mentalities** – patterns of perceptions and attitudes or **dispositions**
  - **Social Structure** – different social **positions**, or kinds of social, material and spatial situation
  - **Modes of living** – patterns of socio-ecologically relevant practices, or active **position-takings**
- Quantitative modules: relational multivariate methods – factor analyses, cluster analyses, multiple correspondence analyses
- The following analyses are based on the representative survey 'Environmental Consciousness in Germany 2018' (BMU/UBA) – 2000 respondents, broad selection of questions on attitudes, perceptions, practices, sociodemographics
- Using this dataset, can we add a fourth layer to Hausknost et al.'s option space?



# Socio-Ecological Mentalities: 11 ideal types, three 'camps'

## 11 ideal types (3 cluster analyses)

## Three broad 'camps'

- 1. Active Ecosocial Citizenship
- 2. Voluntaristic Individualism
- 3. Ecosocial Contentment



Ecosocial Camp

- 4. [Precarious Openness to Change]

[Not clearly assigned]

- 5. Inert Contentment
- 6. Consumerist Contentment
- 7. Active Anti-transformative Citizenship
- 8. Egocentric Ignorance



Liberal-Escalatory Camp

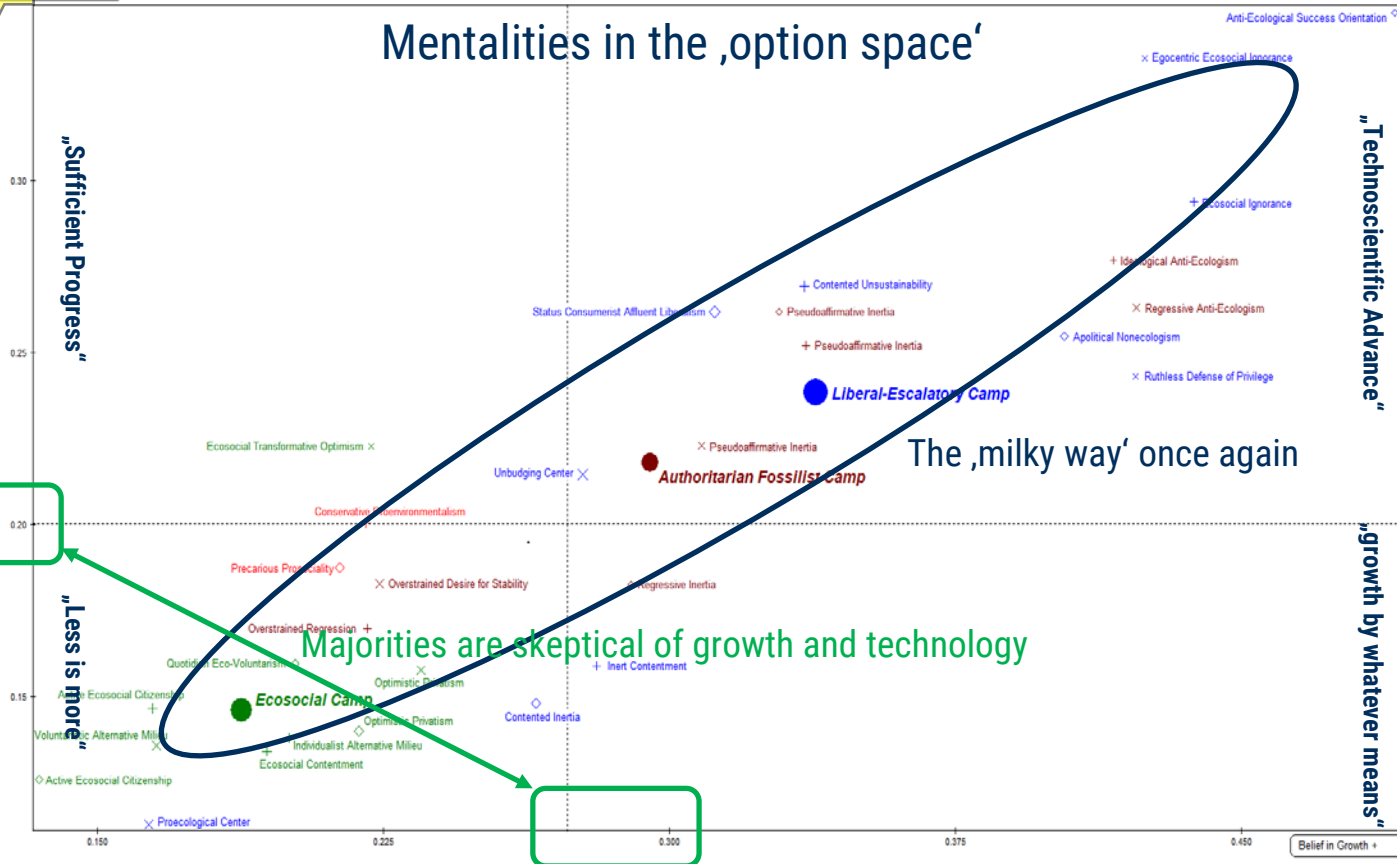
- 9. Precarious Defensiveness
- 10. Pseudoaffirmative Inertia
- 11. Anti-Ecologism



Authoritarian-Fossilist Camp

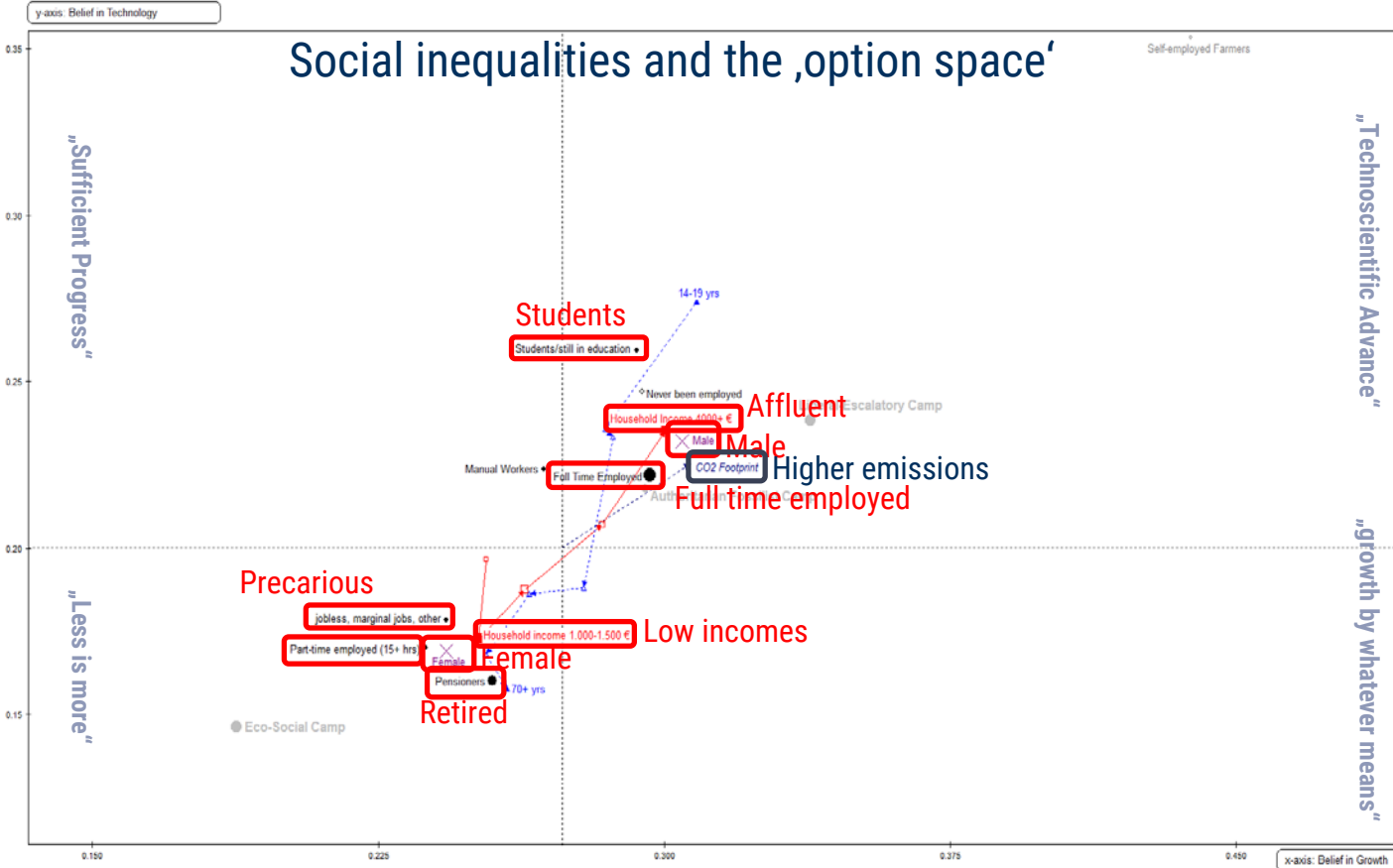
- We then constructed indices from several available items for respondents' respective attitudes concerning technology and economic growth, and juxtaposed these to reproduce Hausknot et al.'s 'option space'...

# Mentalities in the ,option space'

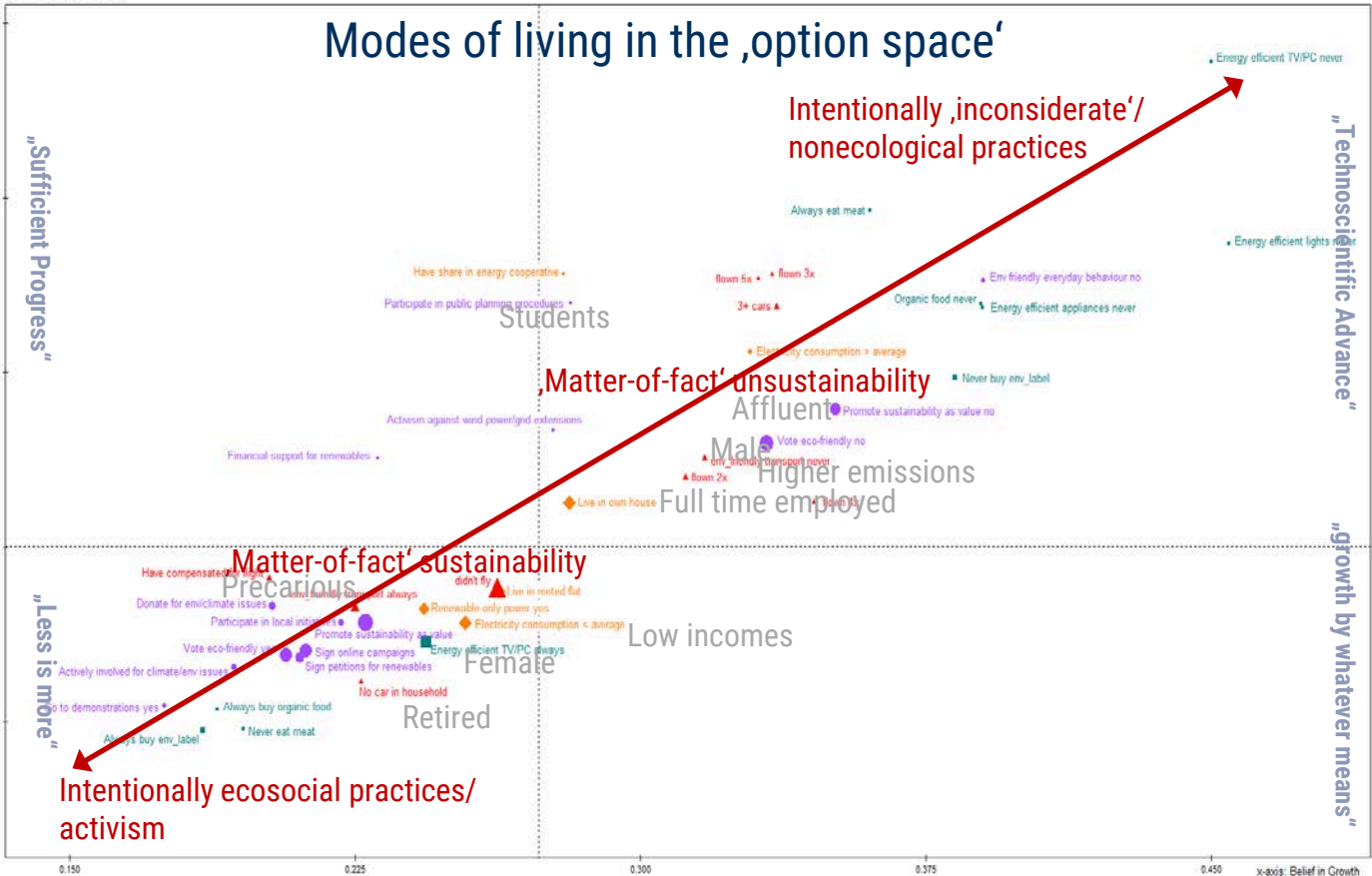


Majorities are skeptical of growth and technology

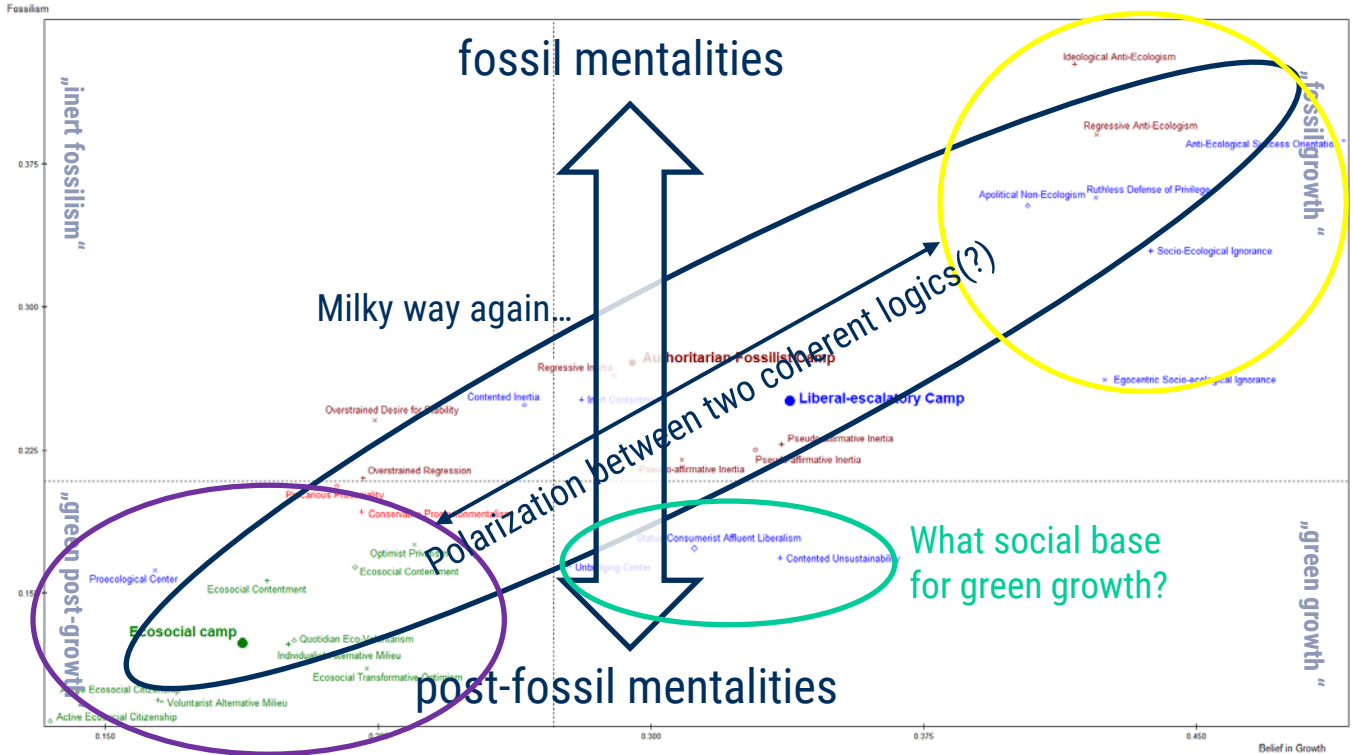
# Social inequalities and the 'option space'



# Modes of living in the 'option space'



# The Third Axis of the Option Space: Fossilism as an 'undead' option...





## Mentalities and socio-political conflicts: Key takeaways

- Notions of **‘acceptance problems’** or **‘lack of information’** **conceal and de-politicize conflicts** about the future of society
- The issue is the **‘what’ of transformation: Adapt modes of living** and collective expectations to biophysical reality **or technically manipulate biophysical reality** to conform to expectations and support business as usual?
- **Majorities intuitively support the former**, while opposing a promissory discourse that has its social base in elites and privileged groups
- Promises of growth and tech are closely entangled with the **fossil promise of access to endless abstract energy** extracted from **‘dead nature’** – green growth is a socially contradictory project
- The promissory complex of growth/technology/abstract fossil power is socially based in a **nexus of masculinity, full-time employment, affluence and intense resource use**
  - The **role of social inequality** in the conflicts around future visions deserves much more attention
  - Sustainable and just societal nature relations will likely require a **changes to the division of labour**





## Conclusions

- **The broader the scope** of research and the more comprehensive the purview of what bioeconomy has to take into account, **the more untenable the promissory discourse** becomes
- Yet, so far the **Moderation of promises** that has occurred remains mostly confined to the level of rhetoric – actual priorities still centered around biotech and hopes for ‚green growth‘
- Understanding why this is so calls for a **further broadening of perspective** to investigate the **power relations, mentalities and patterns of practices** among the population at large that contribute to maintaining the persistence of the growth imperative – or to pushing for apost-fossil, post-growth transformation
- **Relational approach:** Focus on the actively affirmed mutual distinctions, the tensions and conflicts that structure the social
- **Finding:** the ‚**unidimensionality**‘ of the conflict between growth- and technology-focused visions and ecosocial post-growth ideas identified by Hausknost et al. at policy and stakeholder level **reflects a broader latent conflict in society**
  - Majorities (verbally) support the latter, while power rests with the former
- **Additional relevant dimension** at this level: Persistence of **fossilist** mentalities and modes of living. Fossilist, techno-optimist and pro-growth dispositions (and their converses) are all correlated – but some interesting fissures emerge
- **Further research** is needed – and planned...



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Thank you very much for your  
attention.