How the decarbonisation discourse may lead to a reduced set of policy options for climate policies in Europe in the 2020s

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HIGHLIGHTS

- Research for the coming molecule-centric 'ET2' needs to transcend the experience of Europe's power-centric Energy Transition ('ET1')
- Discourse hysteresis from ET1, and associated emotions and moral discourses, shrink ET2 policy options
- Discourse is not neutral but rather a creation, and hence is part of both problem and solution
- ET research can improve energy policy through P&D complex analysis and reflexivity

ABSTRACT

Centered on molecule-based energy carriers, policy challenges of phase-two Energy Transition ('ET2') differ significantly from the electricity-centric ones (ET1) met by Europe so far. Calls for full electrification and frames shaped by notions of 'renewable', 'green', 'ambition' and 'net-zero decarbonisation' suggest that 'lock-ins' may emerge not only from (by now well-researched) incumbent strategies but also from advocacy discourses inherited from ET1.

With power and knowledge inextricably conjoined, discourses co-construct the policy agenda. To succeed with ET2, Europe must develop a reflexive, multi-level and interdisciplinary strategy that covers the techno-economic-behavioral dimensions and the influence of discourses on policy formulation. By using discourse analysis and discursive institutionalism as an anchor for cognitive neuroscience and for the relevant social science and political science, ET research can consider how science-based and emotion-driven perspectives interbreed in policy and discourse complexes. How shared conceptual spaces are contested can help improve the reflexivity of ET research as well as provide insights on opposition. A keener understanding of two-way interaction between policies and discourses will help free ET2 policies from ET1 lock-ins.

KEYWORDS

1. **INTRODUCTION**

Europe self-congratulates (1) for having achieved the 'triple 20 by 2020'objectives (2) set forth in its 2009 Climate and Energy package (3). Yet, extending this success toward the goal of net-zero decarbonisation by 2050 (4; 5) will be a very different challenge from the one met so far. While policy makers tend to speak of "the" energy transition (ET), the reality is a set of different transitions. "ET1" hereafter refers to the electricity-centric transition of the 2010s, while by "ET2", we mean the still largely embryonic decarbonisation of the wider part of Europe's economy for which electricity is *not* presently the energy carrier.

ET2 is concerned notably with heat, industry and transportation and more generally the 78 percent of Europe's final energy consumed in the form of 'molecules', whether liquid (oil products), gaseous (natural gas) or solid (biomass) (6). ET2 differs from ET1 in terms of how consumers and citizens are impacted and need to be engaged. Unlike electrons, gasoline, diesel, jet fuel, ethanol, methane, propane, wood pellets are usage specific. While hydrogen is now promoted as an alternative to several of these carriers, the production of zero-carbon hydrogen is still in its infancy and will require more complex support schemes than was the case for solar electricity (7; 8). Decarbonizing heat in countries like the UK (9) where it accounts for 46% of final energy demand encounters high uncertainties that make strategic decisions challenging (10, 11). The more so as heat, unlike electricity, remains a "relatively poorly defined" domain (12).

Electricity accounting for about 22 percent of EU final energy use, the 38% share produced from renewable sources in 2020 (13) represents only 8.5 percent of EU final energy. Considering primary-energy emissions, ET1 policies focused on the electricity-sector (including pre-ET hydro) have reduced total energy-related emissions by only about 10 percent. The ET2 goal of full net-decarbonization by 2050 is therefore an order of magnitude greater. This is likely to imply qualitative changes and thus a renewed spectrum of policy options. Whether Europe's ET2 policy formulation displays the necessary adaptability is a question that must be asked. Our inquiry in this Perspective focuses on whether the imbrication of discourses and policies in what we label policy and discourse complexes may be constraining ET2 policy formulation far more than is acknowledged.

2. **ET MODELS AND DISCOURSES LIMITING POLICY-FORMULATION FLEXIBILITY**

Two mutually supportive sources of rigidity in ET2 policy formulation are energy models and, as this Perspective emphasizes, the European ET discourse.

2.1 What Energy and Integrated Assessment models do not model
Integrated Assessment Models (IAMs) such as DICE tend to ignore or downplay differences between ET2 and ET1 as a result of technical, judgmental and representational biases. *Technically*, IAMs ignore technology path-dependency by assuming perfect knowledge of future technologies (14) and/or by making abatement-costs a pure economic variable under constant rate of technological progress (15). Unlike natural-science models that eschew any *judgment*, IAMs "mix descriptive analysis and value judgments" (16). As for *representational* biases, they accrue from computing what is technically feasible and economically advantageous, irrespective of how people may react.

Structured around quantifiable variables, energy models therefore tend to ignore social and governance complexity (17). They assume that agent decisions are informed by what Kahneman and Grubb have called, respectively, rational 'system 2' (18) and 'pillar 2' (19) thinking. Similarly, Mellers observes that as "normative theories became more mathematical", descriptive theories of choices emphasized "cognition over emotion" (20). This overlooks the fact that ET2 calls for significant changes in household practices that generate deeper emotions than interventions focused on power generators. Policy makers may find themselves in positions akin to that of censors of widely held private-life practices such as food habits and mobility (21; 22).

As assessed by a French Parliamentarian Commission and by the IEA, such biases may already have led ET1 policy modeling to neglect that people—not just 'vested interests'-- are concerned with land use, landscape and costs of energy (23; 24). But the bias is higher for ET2 policies: consumers care about how they cook their food, heat their homes, power their cars, run their appliances. As we write, rejections by significant parts of US and European public opinion of measures imposed to fight the COVID-19 pandemic suggest that policies ignore concerns over freedom of choice at their peril.

2.2 The ET2 'ambition' metric at the intersect of scientific, emotion, and moral influences
Also limiting the adaptability of policies within the ET2 P&D complex is a discourse combining science-based analysis, moral considerations, and emotions. The discourse supporting ET2 policies now appeals to emotions such as 'flight-shaming' (25). A full decarbonization goal can be presented as the necessary follow-up on the '20-percent-by 2020' decarbonization achieved in Europe (26; 27; 28) or as only one part of a life-change foregoing "industrial civilization" altogether (29 p.98).

While disregarding climate risks will be held as immoral in many value systems, the invocation of moral sources of policy generates its own discursive logic. This logic may unfold in ways that prioritize, or that exclude policy options differently from what the invoked techno-economic objective of limiting global warming would suggest.

'Ambition', in Haarstad's words, is the nexus around which the scientific, emotional and moral dimensions discursively coalesce (30). For economists, ambition is a matter of degree and trade-offs, for instance toward greener and more inclusive growth (31). But 'ambition' is an ill-defined, versatile concept that may substitute the intensity of one's efforts for their outcomes' effectiveness. Moral ambition indeed tends to reject *trade-offs*; it often aspires to *absolutes* such as eradicating corruption or preventing discrimination. Moral justice in Rawls tradition accepts inequalities only if also of benefit to the worst-off (32; 33). Kant's "categorical imperatives" reflect "absolute necessity" (34 4:389); it must be pursued, as writes climate activist Barrau, even if acting alone hence with no significant impact on climate (29).

Michael Sandel argues that only at its peril can mainstream economic thinking ignore its "origins in moral and political philosophy" (35). Indeed, moral considerations have been present in the global climate debate through notably inter-generational justice considerations. They are now central to the European discourse. Europe's ambition to "lead by example" (5, 4), a *sine qua non* condition of success for present European climate policies, is rooted in a Kantian view of categorical imperatives at odds with the perspectives of other major actors as can be seen in the 2019 Madrid COP negotiations among many others (36).

In the wake of Gustafson (37), Kamminga calls attention to three modes of "moral discourses" that tend to accompany the "policy discourse" (38):

- The *ethical* discourse is the most explicitly framed in terms of moral considerations and also the one fitting most seamlessly with considerations of business ethics, environmental and social responsibility. Putting the future of mankind first is common in Europe – a source of pride yet not an obligatory part of economic utility functions.

- The *narrative* discourse is specific to a community, typically a nation. It can be 'patriotic' as are calls to turn Europe or the UK into a global ET leader (39; 5).

- The *prophetic* discourse can be religious as with Pope Francis (40) or secular, denouncing political and business leaders as do the youth-campaigns led by Greta Thunberg (41; 42) and discretely supported by the European Climate Foundation (43).

As we now develop, the three moral discourses shouldn't be seen as mere marketing instruments for science-based policies. They shape, and not merely communicate ET2 policies, for instance by opposing emission offsets as do Greta Thunberg and Greenpeace (44, 45) irrespective of climate impact and of cost-effectiveness considerations.

2.3 An ET2 Policy & Discourse complex that may straightjacket policies

It is beyond this Perspective's remit to provide a thorough analysis of policy options that tend to be disqualified on 'moral' grounds or to receive less attention than the changes from ET1 to ET2 would call for. Yet examples can illustrate Unruh's point that, anchored in representations, lenses, frames and metaphors, discourses have their own path-dependency (46, p. 817).

Energy being the world's most capital-intensive industry (47), it is worth considering policy options that preserve the use of assets and resources already in existence. Whether existing energy assets such as gas infrastructures should be reused subject to the proper emission constraints should be a techno-economic question. Yet, as shown by J. Stern (48), solutions put forward by the European gas industry (49) to capitalize on complementarity with renewables, face strong discursive headwinds (50 p.16; 51). Dodds et al. observe also that the debate on low-carbon heat in Europe "has become focused on a narrow range of technological options" (52). In Germany, the passing of the Renewable Energy Act fostered substitution of smaller, often municipal companies to the 'Big Four' utilities (53), also shrinking ET2 options (54). This discursive selection of 'winners' is reinforced by influential international reports (55).

Constraining ET2 policy choices through the ET discourse are terms like 'green' and 'renewable'. An example is how hydrogen produced from (green) hydrolysis from (blue) sea water is opposed to (grey) pyrolysis of natural gas as proposed by incumbents (56). Such emotional connotations may generate opposition to ET2 policy options beyond what considerations of their potential would warrant (57). Similarly, although this has begun changing, the "almost complete absence [of negative emissions] from climate policy discussions" despite their "pivotal role" in IPCC scenarios is disturbing" (14). Such option-shrinking is at odds with observations that "all technology options will be needed" to achieve "a green energy revolution and large-scale CO_2 emission reductions" (58).

Voices are being heard (14) that call attention to a broader spectrum of ET2 options for 'netting' than afforestation only. Considering the gap between ambition and actual GHG abatement record, CCS and carbon-removal policy options need more open consideration than is currently the case in, for example, Germany (59).

Altogether, ET research will gain to consider how discourses and policies are being formulated jointly, in two-way interdependence rather than sequentially. To map such interdependence and to enable the reflexivity it calls for, a natural starting point is discourse analysis. Discourse analysis can be the anchor for the development of the broader transdisciplinary approach needed to position ET2 policy recommendations within a properly mapped set of European and non-European policy and discourse complexes. As our next section documents, this transdisciplinary approach should include not only approaches like framing and agenda setting studies that dovetail with discourse analysis but also insights from cognitive neurosciences and from political economy and political science.

3. DISCOURSE ANALYSIS AS AN ANCHOR FOR MOBILIZATION OF SOCIAL SCIENCE IN ET2 RESEARCH

3.1 Discourse analysis as a critical dimension of ET2 research

In the wake of notably Hajer, Unruh, Feindt and Oels, Gee, Geels, and Schmidt, discourse analysis has developed into a fully-fledged, structured research domain (60; 46; 61; 62; 63; 64; 65; 66; 67; 68).

Broadly defined discourse analysis has roots—and may find new impetus-- in, notably, Systemic Functional Linguistics (SFL) and Critical Discourse Analysis (CDA). As pioneered by Halliday and Hasan, SFL differs from the more abstract Chomskyan linguistic by its focus on relations between language and social life (69, 70, 71). Drawing from SFL, CDA explores "the social structuring of language" as part of "the relatively durable structuring and networking of social practices" (72).

This said, notwithstanding such roots and notwithstanding the powerful data analysis tools now at hand, Greckhamer and Cilesiz stress that the process of "empirical discourse analyses remains challenging" (73).

True, 'content analysis' software is available to illuminate aspects of the debate that might otherwise go unrecognized. Content analysis combined with MAXQDA coding of discourses and of storylines has shown, for instance, how ET was de-radicalized by German political parties within a discourse of Ecological Modernization (74). Content analysis similarly identified how a German "energy mix discourse" lost dominance to the renewable-centric discourse (75). It also reveals how Europe's ET discourse emphasizes the national level, political ideology, and conflicts around nuclear and renewable energy (68). Hyperlink network analysis of the German ET Discourse points to how politicians and activists may act as "lone warriors" connected to only their parties or issue groups and to how most scientists are also debating in some electronic ivory tower (76).

Yet the higher levels of meaning nested in discourses are not easily amenable to IT and AI. The top-down design of computers, observes Daniel Dennett in his broader reflections on the mind, creates a "hyper-competent marvel" but one akin to "planned bureaucracies". "[O]rganized around the wrong kind of hierarchies", it suppresses exploration and improvisation at every level" (77, pp. 162-163).

Thus, notwithstanding promising extension of computerized content-analysis to social media (78), the challenge for ET research is that, because it "emphasizes the discursive construction of social realities through texts", discourse analysis is bound to remain "highly interpretive in nature" (73 p. 423). Qualitative interpretive analysis from a broader range of social sciences is therefore in order (79; 80).

3.2 Deepening discourse analysis through framing, agenda setting and 'knowledge regimes'
To address this interpretative dimension of discourse analysis, tools of relevance for ET research include theories of concept development (135) and broader inquiries of issue framing into, in Johannessen's words, "how we construct the stories we tell about the world" (81; 82). Framing, 'priming' and agenda-setting are now recognized as essential aspects of political communication as can be studied by political scientists as well as environmental scientists (83; 84; 85).

The influence of ET1 policies in restricting ET2 policy options comes notably through the frames informing Europe's ET2 debate. By frames, following Schön and Rein, and Goffman, we mean "underlying structures of belief, perception, and appreciation" (86, p. 23; 87). Frames influence agenda-setting (83) and contribute to defining what Lupyan and Bergen label "shared conceptual spaces" (88) in which they cross-fertilize or compete with other proposed frames.

Framing, therefore, is anything but a neutral rendering of a science-based body of knowledge. Analyzing low-carbon energy transitions, Sovacool for instance shows that "what passes for scientific reality or engineering capability" depends on "constructed myths", "visions" or "fantasies" that are "simultaneously rational and allegorical" (89, p. 5). Such is the point made in a different sector in *Foreign Affairs* by Gillian Tett, Chair of the *Financial Times*' editorial Board, when calling for an "anthropological look" at finance and financial crises to unearth "half-hidden cultural patterns… [t]hat make humans tick" (90). Unearthing deeper connotations of the words 'Finance', 'Credit' and 'Bank', she examines "how people use rituals or symbols [in] the meaning of the word they use". Such advice is relevant for ET research also. As Harjanne and Korhonen observe, the term 'renewable', which they dub a thermodynamically incorrect "oxymoron of sorts", lends itself to opportunistic usage with an "ambiguity" that may turn into "a luxury we can no longer afford" (50).

When a discourse can build on accepted frames, it fosters a shift to 'system-1 thinking' (18) that eases the endorsement of its recommendations by policy makers within 'shared conceptual spaces'. As discussed below, it may also reduce the inclination to reflexively assess a given epistemic community's discourses, hence policies. Gaining acceptance for the frames around causalities and recommendations is therefore a key step toward establishing what Hajer studies as discursive hegemony (91), a step that the climate epistemic community has successfully taken in Europe but not in the still highly polarized USA of 2021 nor in key emitting countries like India.

Worth researching is then how the European climate and energy P&D complex fits within a broader ecology of P&D complexes on European integration, 'green growth', China's silk-road… while providing, in Weichselgartner and Kasperson's words, "locally embedded, historically and socially contingent knowledge" (92). Of key relevance therefore is the capacity of politicians to "tell good stories' and carry the way (93). This, in turn, calls for ET research to use discourse analysis in tighter link with political science and political economy than is presently the case.

3.2 Discourse analysis in need of stronger political-science perspectives
Considering the broad gamut of cognitive tools that inform human action, ET research may also relate knowledge and discursive regimes to how discourses construct various interrelated dimensions of reality. This could be done using Gee's seven categories of significance, activities, identities, relationships, politics, connections, and sign systems and knowledge (63).

The contentious relation between language, representation and policies is studied by a growing scholarship of political and environmental scientists who question critically "how knowledge interacts with power and gains political effect in environmental affairs" (94). Some of these concerned scholars help scientists "coproduce actionable climate science knowledge with decision makers" (95). This involves framing questions in a structured dialogue with policy makers around "interactive models of research" (96). Such 'coproduction' of knowledge, however, implies higher transaction costs for research and may falter. At the risk of breaking some taboos, Lövbrand also observes that policy can "influence the funding, making and interpretation of useful European climate policy research" (97). More is at stake than perfecting communication with decision makers. How discourse affects policy cannot be envisioned irrespective of power games (65) and, therefore, politics.

As observed by Meadowcroft in 2011, ET research focuses heavily on policies, and yet "[p]olitics is the constant companion of socio-technical transitions" (98). Among the tools helping to go beyond the linguistic dimensions of discourse analysis are Meadowcroft's three inter-related domains of 'interests', 'institutions' and 'ideas'" (ibid). Also relevant are Unruh's Techno-Institutional Complex (TIC) framework (46) and Geels' multi-level perspective (MLP) on sustainability transitions (99; 100). From Geels also, one may borrow the Triple Embeddedness Framework (TEF) to incorporate corporate strategies into the analysis.

The co-evolution of technology and institutions captured in TIC then needs to be extended to behavioral path-dependency (101; 75). The MLP grid of 'niches', 'regimes' and 'landscapes' can also be specified (102) to cover how discourses that co-evolved with ET1 policies can become embedded in *regimes* (or, in Europe, in the overarching policy *landscape* itself) in ways that may straightjacket ET2 policy formulation.

The notion of 'regime' can help identify how policy and discourse complexes can find some temporary equilibria, which may or may not support optimal policies. The notion of 'regimes' has been extended to knowledge regimes (103) and to discursive regimes (104). Within the MLP framework, it could similarly be extended to what could be called 'ideation and policy-and-discourse regimes'.

In the wake of Keohane and Nye, political economists have also created a useful notion of 'regime' as a set of formal and informal institutions constraining and orienting behaviours (105). The holistic perspective needed to fully capture the institutional dimension of policy formulation can be sought along lines such as North's political economy of resources, institutions, transactions and power structure (106; 46).

At the interface between policies, discourses, power and politics, the approaches reviewed in this Perspective have a common vanishing point, namely, in Kövecses' words, that we experience the world "as the product of some prior categorization and framing by ourselves and others" (107). Discourse analysis is a good starting point, we suggest, in the search for overarching perspectives. Yet, the notion of 'transition' refers to human agency. As Giddens stressed, agency is an inter-disciplinary concept that operates, and can only be fully understood, by mobilizing analytical tools

across academic disciplines. (108). One may therefore also draw from philosophy as needed. Foucault has led the way in analyzing the relation of language to power and the role of language and knowledge in creating, not just describing reality (109).

Indeed, a major branch of discourse-analysis describes itself as Foucauldian. While non-Foucauldian approaches challenge Foucault's 'discursive imperialism' (110), Feindt and Oels find seven features common to both schools, including a skeptical attitude toward claims of single rationality and "objective truth" (61).

Like the role of morals, not just 'ethics', in ET research, this complexification of our relation to truth is bound to be challenging to consider in science-informed and science-invoking ET research. As pursued by notably Feindt and Oels, ET research however already acknowledges that the language of policy relates to the invoked scientific corpus of knowledge in ways that are fragile and contentious (61). Applying the theory of social representation (111, 112), Sherry-Brennan et al. show, for instance, that knowledge on hydrogen as a fuel is interpreted rationally and emotionally through anchoring in pre-existing lay knowledge and through community-interest lenses (113). Cognitive neuroscience may provide increasingly firm grounds from which to mainstream such considerations.

3.3 Cognitive neuroscience shedding light on discourse and policy complexes
With support from social psychology and situated cognition, cognitive neuroscience points at language as key to controlling mental representations (88). Rapid ongoing progress provides powerful ways of pursuing the lines of inquiry through discourse analysis and framing.

Brain and cognitive sciences illuminate increasingly precisely how tensions can arise between truth as pursued in the lab and as informing energy policy. Interestingly, recent findings of cognitive sciences are consistent with economic theories of bounded rationality (114; 115; 18; 19).

Similarly, recent work in situated cognition, a subfield of social psychology and cognitive and social neuroscience (117), suggests that stereotypes that inform mental representations and social judgments are not necessarily stable but depend on actors' goals and contexts (117). ET research may thus investigate for instance which players are considered, and possibly stereotyped as friends or foes, for European ET2 policies.

As observed by Clayton Lewis, the views of causality informing human action do not fit Kant's assumption of universal patterns but exhibit instead a diversity nurtured from the cognitive events to which one has been exposed. Borrowing from metaphysician P.F. Strawson, Lewis captures this diversity in the non-Cartesian language of "collisions, smashings, or collapses" (118). Drawing from Strawson's work on relations between informal language and symbolic logic (119; 120), he shows that, far from adopting science-like views of causality in our daily life, we keep making interpretative choices from "multiple models [and] representations" of how things should fit together. We navigate amongst these multiple models *opportunistically*, treating them "as alternatives" to choose from depending on our contexts and goals. Disturbing as it may be to IAM modelers, the absence of "a single 'true' representation of what is a causal relation" (118) is of relevance to how science and discourse come together in ET policies and to how they inform human agency.

4. THE ET-RESEARCH REFLEXIVITY CHALLENGE

Addressing the UN Convention to Combat Desertification (UNCCD) at its 2019 COP14 meeting in Delhi, the Convention's Executive Secretary spoke for many in the ET community when inviting delegates "to follow Mahatma Gandhi's legacy in […] spreading well-being of peoples" by acknowledging that "science has spelled out what needs to be done. We need to translate this knowledge into policies" (121). Yet, the science-informed discourse of which IPCC reports are the cornerstone is far from having achieved the global "discursive hegemony" that Europe's 'lead by example' discourse assumes.

The hostility in which parts of the public, not just the usual suspects of 'incumbents' and 'vested interests', reacted to science-informed policies to fight the COVID-19 pandemic in the Netherlands and other countries give even higher relevance to Cherp's observation that furthering reflexivity in ET research is a condition for the needed flexibility of policy formulation (122). In the era of the *sovereign* determination of NDCs when China's New Silk-Road initiative promotes hundreds of coal-fired plants, the international context (123) also requires high levels of reflexivity on the part of the climate epistemic community.

Reflexivity is especially in order for Europe ET research when the negotiation of meaning is still to be settled regarding the contrasted manners in which 'justice' can be invoked. The debate pitting 'real-zero' against 'net-zero' offsets is part of the ongoing negotiation of meaning, with major implications for lifestyles and freedom of choice.

As observed by Meadowcroft one decade ago, climate policies and instruments are designed with only scant attention "to the political circumstances that make the adoption of such policies likely" (98). The risk is heightened in an era of network governance (124; 125; 126). Appeals to emotions, moral discourses and high-powered metaphors including through terms like 'green' and 'renewable', as is now standard in the ET discourse to the European public, requires consideration of how ET2 policy formulation may be influenced, possibly straightjacketed, by the deeper cognitive dynamic of the ET policy and discourse complex.

Rationally determined "objective truth" is only one source of what voters and the public consider as truth (108; 61; 18; 118). Hence the conjunction of widely different justifications for ET policies at scientific, moral and emotional levels. This has probably contributed to making Europe's ET1 policies a clear success by world standards. Yet, key terms like "renewable", "green", "incumbents", "decentralized" and "energy-mix discourse" are themselves part of discourses. They summon simultaneously IPCC-validated science, the three 'ethical', 'narrative' and 'prophetic' "moral discourses" (38), and what Lakoff labels the imaginative aspects of reason (127).

The voice of ET research is still dampened, however, by the limited role of social-sciences that led the creation of the ERSS journal and to qualitative lapses in energy social-sciences analysis (128). As observed by Isoaho and Karhunma, discourse-analysis studies can help foster rebalancing (68). As we tried to show, discourse analysis can be a relatively easy and well-trodden entry point toward a broader, reflexive transdisciplinary approach connecting to social sciences, including to political economy and political science.

Three decades ago, in his seminal book *Fire, Women and Dangerous Things*, George Lakoff pitted what he labelled the new 'experimental realism' against traditional 'objectivism'. Challenging that reason is primarily about objectively true or false propositions, he advocated to embrace "the imaginative aspects of reason [such as] metaphor, metonymy, and mental imagery as central to reason" (127). As this Perspective has endeavored to show, Europe's search for absolutes is grounded in morality and emotions. Lakoff's advice thus still resonates, partly unheeded.

5. CONCLUSION AND DIRECTIONS FOR POLICY RESEARCH

This Perspective has highlighted three reasons to use discourse analysis as an anchor for the mobilization of social sciences to better understand how two-way interdependence of policy and discourse may straitjacket ET2 policy formulation through the invocation of 'ambition':

- The transformation of social organization involved in ET2 is an order of magnitude greater than it was for ET1;
- As calls for ecological 'justice' make clear, politics is inseparable from policies, which calls for ET research to draw significantly from political science and political economy;
- European policy makers should beware schizophrenic modes whereby policies are debated among experts as based on science only, and yet are presented to the public around discursive combinations of science, emotion, and (largely Kantian) moral principles.

Discourse analysis is already mobilized for research on opposition to ET policies (75; 129; 101; 46) . Yet ET2 activists, researchers and policy makers also develop discourses to tilt the policy-formulation field without feeling the need for a reflexive perspective. Tooze observes "much of the [ET] conversation in Europe [to be] inward-looking" (130), which removes a key incentive for reflexivity.

Altogether, the incorporation of discourse analysis and of the perspectives from social science and political science as surveyed here still evokes the call by Lang et al. to overcome "dispersed literature" so as to bring the diverse sustainability science closer to society as "a transformational scientific field" (131).

Encouragingly, greater reflexivity is followed by some already (132). Systematic research on climate policy formulation will benefit from building on such examples. Reflexivity is not easy to practice, yet is an essential element of research when policy discourse simultaneously invokes science and claims the moral-high-ground. Cross-disciplinary insights can also be sought, for instance, from how Critical Social Psychology wrestled with the challenge of research reflexivity at the interface between realism, relativism, de-constructivism and normative political advocacy in research (133 p.15).

Acknowledging and researching how discourses, emotions, power and politics shape policy implies a form of what Asara et al. label a "repolitization of sustainability" (134) This may be experienced, at first, as challenging. To paraphrase Meadowcroft (98), science is invoked in ways that tend to hide the ever present 'politics' under the technical veneer of science-informed 'policies'. Focusing on the role of discourses at the interface of power and policy can be a simpler, fruitful starting point in mobilizing the relevant gamut of social sciences to broaden the scope of analysis.

Tensions between Eastern and Western EU member-countries notwithstanding (136dee), Europe has developed its own historically and socially contingent ET policy and discourse complex. By world standards, the latter is remarkably supportive and has worked well during the generation- centric ET1 phase. Yet, in a less than Kantian—at times Hobbesian--global policy context, Europe's ET1 strength may become a drawback if failing to reflexively adapt to the ET2 agenda and its sharper political and emotional implications. From framing analysis to political science, giving discourse analysis a more central role can help bring social sciences to bear in proportion to the actual role of moral principles, perceptions, and emotion in ET2 policy formulation.

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