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The 'climate dialectic' in energy policy: Germany and India compared

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Abstract

Climate change expresses the global development crisis as a crisis for all societies. Governments in both over-developed and under-developed countries are forced to square the circle between climate crisis and energy policy. Across these contexts the policy imperative to reduce greenhouse gas emissions cascades into energy policy, and into wider fields of social and political life. The article investigates this process, advancing the concept of a 'climate dialectic' in policy change. From this perspective, the article develops a critique of climate policies as they have emerged in Germany and India. This positions Germany, a high-income post-industrial society, with India, a low-income industrialising country. Key climate and energy initiatives from each country are compared and discussed in terms of a common effort at expanded development opportunities. In this respect, with the key objective of maintaining 'growth as usual', the persistence of coal-fired power and coal extraction becomes highly politicised. Energy policies are found to be increasingly embedded in the wider 'climate dialectic', forcing new, more transformative possibilities onto the agenda.

1) Introduction

With climate science the underlying conflicts between economic growth and a stable climate have become clearly manifest. The conflict is played-out most clearly in the policy dynamics of liberal democratic states. Here, the state remains caught in its double bind, between acting as an instrument of dominant interests and acting in the interests of society in general. Acting in the general interest requires extensive emissions reductions, yet governments find it difficult to deliver on this imperative given the implications for vested interests and for economic growth. Failure to act on emissions creates the prospect of deeper climate change: the longer that national states continue to variously deny, manage or displace the crisis, the more the crisis deepens. In this respect climate crisis contrasts with economic crises, which are cyclical and enable a

'correction' within the economic system. Climate change is driven by the appropriation of sequestered emissions embedded in the ecosystem, as fossil fuels: about three-quarters of anthropogenic greenhouse gas emissions are produced by the burning fossil fuels, with the recent coal boom having 'reversed the long-standing trend of gradual decarbonization' (IPCC 2015: 5). Appropriation is offset by re-sequestering, for instance up to eighty per cent of Co2 is dissolved in the oceans, though this can take centuries and falls with rising carbon saturation, and some greenhouse gasses have a short-lived effect, twelve years in the case of Methane (Houghton et al; 2001). Over time, though, net excess emissions accumulate in the atmosphere. Since 1750 emissions concentrations have risen faster than at any time in the last twenty thousand years, reaching levels not seen for over eight hundred thousand years (IPCC 2014: 4). . This cumulative nature of climate crisis explains its persistent character and how it is both produced by and challenges social and political structures.

The article assesses how climate change produces an unfolding process of policy change, caused by increased enmeshment in what the article characterises as a growing 'climate dialectic'. In policy terms, a series of tensions and contradictions open up under climate change, focused especially on energy policy and the question of how to transform energy supply systems. The article posits the 'climate dialectic' as a process of 'socialising' climate crisis from the ecosystem into fields of state policy. As the dialectic intensifies, so the socialisation process deepens. The article examines official energy policy debates in India and Germany, demonstrating both radical differences and surprising similarities in the logic of the debate. Here we find states trying to force the proverbial square peg into a round hole, seeking to construct consistency, especially through ideologies of development. The resulting politicisation of energy policy bears-out the suggested logic of the 'climate dialectic'. The article concludes with recommendations for policy in terms of measures to deepen understanding of the process of climate 'socialisation'.

2) Methods: modeling 'climate dialectic'

Conceptualising climate change dialectically is important for overcoming false dualities between 'climate' and 'society'. Society is now remaking climate; climate action to address this is no-less of a remaking process, grounded in the capacity to measure and establish causalities, through climate science. The concept of a climate dialectic rests on this concept of co-production between ecology and society: the two are integrated, producing each other (Moore 2015: 82).

Climate change, as an ecological transformation 'produced' by society, itself literally starts to transform society (Smith 1984). This reflects the 'metabolic rift' between society and the ecological relations on which it depends, in this case a rift between emissions dependency and climate stability (Foster 2009). Importantly the rift is socially-produced, and binds ecology and society into a common dialectical movement. This is not a two-

world model, of nature and society at odds; rather, given we exist both ecologically and socially, it posits a one world socio-ecology riven with deep conflicts between forces of appropriation and sustainable existence. From this perspective, as Moore puts it, we can interpret 'the ways in which Social limits make Natural limits, and vice versa' (Moore 2015: 79-80).

The dialectical understanding of climate change, as a social and political dynamic, is critical for climate strategy. For effective strategy it is important to capture the mutually-constitutive logic of social change: failure to act on climate change may itself be highly effective in creating a backlash and forcing meaningful policy initiatives; the success in managing concerns about climate change, with opinion-sensitive, perhaps populist initiatives, may by contrast fail to offer an adequate response. More fundamentally, understanding the social process of climate change as a dialectic allows analysis to appreciate the generative nature of the crisis: climate change may not be the 'grave-digger' of, for example, capitalist society, but it certainly forces new vulnerabilities and imperatives onto the agenda (see Rosewarne, Goodman and Pearse 2014). A model of climate policy change is needed that can tap the strategic potential for transforming society that is embedded in present-day forms of appropriation. A critical priority in this context is to distinguish how climate agency differs from social agency, and the extent to which we can characterise a specifically climate dialectic for policy.

The climate dialectic, in the sense of a consciousness of social agency in climate change, only emerges with the popularisation of climate science, perhaps with the IPCC in 1988, itself a creation of the WMO and UNEP, and the related creation of the NGO-led 'Climate Action Network' and corporate-led 'Global Climate Coalition'. Both were policy coalitions explicitly established to influence the emerging climate agendas. With this we can date climate agency from 1988 and can crack the unfolding climate dialectic. Climate change itself can of course be dated centuries if not millennia before 1988, and climate science has its origins well before the Twentieth Century. But only once this was popularised and translated into a normative agenda for policy, and for political contestation, did it gain coherence as a form of agency.

The first and clearest distinguishing feature of climate agency is its cumulative biophysical character. The biophysical attributes of fossil fuels give them an autonomy to act back on society. These 'limits' created by climate change are indissolubly bio-physical, but they are also socially generated: as detailed by the IPCC, contemporary global warming is 'extremely likely' to have been caused by the accumulation of 'anthropogenic greenhouse gas emissions', mainly from the burning fossil fuels (IPCC 2014: 4). In this, climate change poses the profound question of how to exercise climate agency, a question that increasingly impinges-on and displaces 'business as usual'. Cooptation and management strategies are clearly inadequate in the face of growing emissions, and produce a legitimacy crisis that politicises ecological appropriation in new ways. In this

context the second key aspect of climate agency comes into play, namely its historical scope as a form of political subjectivity, across globally uneven causes and effects. Engagement with the 'long' history of climate science brings into play new forms of temporal closure, adding to the urgency of action. The policy struggle cannot continue indefinitely and is radically delimited: here, with climate change, new fixed horizons emerge for social agency.

Overall, a political dynamic is set in train and climate concerns increasingly impinge on policy, forcing what James O'Connor characterises as a 'socialisation' process (O'Connor 1998). Essentially this involves increasing engagement with climate concerns on the part of public authorities, in policy fields, along with involvement amongst growing public constituencies. Concerns over climate change prompt managerial responses from the authorities, but they also point to the need for wider transformations. The failure of crisis management exposes conscious inaction, politicising new fields of social life, exposing new responsibilities, culpabilities, and injustices, in the process creating new lines of political conflict. More specifically, the socialisation agenda becomes increasingly expressed in the 'commoning' of 'unburnable' fossil fuels, a push for renewables, and related 'energy democracy' agendas.

Interpreting this process as an emergent 'climate dialectic' allows consideration and evaluation of strategic intervention, both in sharpening the policy debates and in generating wider public engagement on the issue of greenhouse gas emissions reduction. This latter normative move is not fully addressed in this article, but certainly the analysis and discussion section, and the recommendations (Sections 4 and 5) point to a series of conclusions with regard to the policy agenda and how it may be developed. The next section (Section 3) seeks to highlight the climate-energy nexus, and outlines how it can be traced as an unfolding dialectic at the heart of state power, in two dramatically contrasting state policy-making contexts.

3) Evidence and analysis: Energy transformations in India and Germany

In examining the logic of energy transformations it is important to establish a broad comparative frame encompassing differing contexts for both climate and energy policy. Here we seek to draw conclusions from contrasting developmental contexts, from Germany's post-Cold War post-industrialism and India's post-colonial industrialism. These can be thought of as two worlds of fossil fuel dependence, defined by how the two societies are structured into the global economy. In both we find a policy mix driven by the desire to secure cheap energy to meet an anticipated rising demand, while at the same time allow for a reduction in greenhouse gas emissions. In terms of energy policy this translates into an effort to maintain or expand fossil fuel extraction, mainly coal, at the same time as to expand renewables. The contradictory policy stance generates considerable controversy, politicising energy in new ways. In the process, as outlined in the discussion and

analysis section, the article identifies aspects of the 'climate dialectic' and of the socialisation process that it produces, as the two states become increasingly enmeshed in political tensions over how to act effectively on climate change.

India

With a population of 1.1 billion, India has total annual emissions of about 1700 million tons of CO2-equivalent greenhouse gases (mt CO2e), and one of the world's lowest per capita greenhouse gas emissions rates, at 1.8 tons in 2008 (INCCA 2010:48; Gov. of India 2012a).). At least a quarter of the Indian population lives under conditions of absolute poverty, with several hundreds of millions people subsisting on marginal lands with little leeway. As a result, India is highly vulnerable to climate change, yet at the same time has minimal capacity to adapt (Adger 2009). A key factor is dry season dependence on Himalayan melt-waters, with hundreds of millions of people vulnerable to the loss of these waters (Parry et al, 2007). As an 'emerging economy', India has experienced rapid economic growth, currently at 8%. Growth drives emissions; even with falling emissions per unit of growth (emissions intensity), absolute emissions from India are predicted to rise by at least 50% by 2020 (Hohne, Moltmann and Hagemann 2010). Coal-fired power accounts for about 63% of total electricity generation in India and about 34% of India's total emissions (INCCA 2010). Consequently India's key challenge for emissions reduction is to reduce emissions from coal-fired power stations (UNDP 2010: 202).

In climate policy debates India is a leading player in the Group of 77 (G77), which draws together 131 countries and emphasizes the historical responsibility for climate change and greenhouse emissions as resting with industrialized countries (Kasa, Gullberg and Hegelund 2007). Having signed the Kyoto Agreement in 2002, and in the lead-up to the UN Copenhagen climate summit, in 2008 the Indian government elaborated its climate policy with an official 'Climate Action Plan'. In general terms the Plan emphasised the priority of maintaining national growth rates at eight per cent per annum, achieving an 'inclusive and sustainable development strategy, sensitive to climate change' (GoI 2008a:2). The Plan prioritised 'measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively', thus defining climate action as a secondary concern (GoI 2008a:2). In the process it embraced the tenets of ecological modernization, and specifically the belief that economic growth could be delinked from greenhouse gas emissions through efficiency measures and a falling emissions intensity of growth. Reflecting broad assumptions about the Indian development model, the need for faster growth was defined in terms of anti-poverty and sustainability. Growth was to be founded on seven principles, the first being 'protecting the poor and vulnerable sections of society through an inclusive and sustainable development strategy, sensitive to climate change' (GoI 2008a:2). The framing of growth as 'inclusive', as serving the poor, and of enabling climate sensitivity, offered the template for policy.

In terms of overall emissions, the Plan acknowledged that the pursuit of national development objectives would lead to rising emissions, but made the promise that India would not expand its per capita emissions beyond the average for industrialised countries: 'India is determined that its per capita greenhouse emissions will at no point exceed that of developed countries even as we pursue our development objectives' (GoI 2008a:2). In his speech outlining this commitment the Prime Minister stated 'This should be testimony enough, if one was needed, of the sincerity of purpose and sense of responsibility we bring to the global task on hand' (GoI 2008b:2). The PM ended with Gandhi's injunction 'The earth has enough resources to meet the needs of people, but will never have enough to serve their greed'. The approach outlined in the Plan would have allowed the country to expand its emissions from the then 1.5 tonnes per person to the OECD average of about 13 tonnes per person, creating additional annual emissions of 13.5gt, comparing with the then total global greenhouse gas emissions of about 45gt. This idea of a virtually unlimited carbon budget for India frames the overall statement, demonstrating the extent to which assumptions of historic ecological debt and national development rights were out-weighing concerns about the impact of climate change, either in India or elsewhere.

The Plan stressed uncertainties about the 'magnitude of climate change impacts' and throughout stated it 'could' or 'may' have serious impacts (not would or will). There was, it stated, 'no firm link' between documented impacts and anthropogenic climate change (GoI 2008a:15). In this context, the Plan argued 'it is not desirable to design policies exclusively for responding to climate change'; 'the need is to identify and prioritize strategies that promote development goals while also serving specific climate change objectives' (GoI 2008a:13). Direct impacts on development prospects were acknowledged but seen as a distant prospect, which may or may not eventuate. Indeed the approach relied upon the ability to downplay the impacts of climate change on India. While deemphasizing climate impacts, the Plan asserted the necessity for rapid growth, asserting a direct link between energy consumption and development. In terms of energy policy, the Plan deferred to the 2006 Integrated Energy Policy that anticipated an increase in coal consumption from 500mt in 2007 to 1475mt by 2032 (GoI 2006: 22). Reflecting this, the Plan anticipated that the bulk of increased electricity generation – a doubling on 2008 levels by 2013 - would be provided by coal-fired power, albeit 'clean coal' (GoI 2008a: 38). Overall, the Plan did not state an anticipated rate of growth for Indian emissions: it is consistent, though, with the rapid increase in emissions, to between 5.5gt and 3.9gt Co2e by 2031 (higher or lower depending on the extent of coal-fired power) that was anticipated in the 2006 Energy Policy Report (GoI 2006: 50).

The 2008 Climate Plan was followed by a commitment at the Copenhagen UNFCCC COP that India would reduce the emissions intensity of growth by 25 per cent, over fifteen years, 2005-2020. The commitment was

presented with great fanfare but is less than what would be achieved on a 'business as usual' trajectory extrapolated from the 17 per cent fall in emissions intensity over the previous five years, 2000-2005 (Hohne et al 2010: 23). The Netherlands Environment Assessment Agency and European Commission further estimated a likely BAU reduction in emissions intensity of 35% for this period (den Elzen et al 2012: 83; in the event India has reported an emissions intensity reduction of 12% from 2005 to 2010, GoI 2015: 8). To assist in achieving efficiencies, a series of incentives were put in place from 2012 to reduce emissions intensity across a total of 478 facilities covering 60% of total emissions (Sopher and Mansell 2013). Notwithstanding falling intensity of growth, absolute emissions from India were planned to rise. This was confirmed in 2011 by the Government's 'Expert Group on Low Carbon Strategies for Inclusive Growth', which stated that a fall in emissions intensity of growth by a third, combined with an 8 percent growth rate would increase total emissions by 100%, to 3bt by 2020 (Expert Group 2011: 108).

In this period, India's main source of reduced emissions had been from carbon credits via the UN-approved 'Clean Development Mechanism' (CDM). Soon after India signed the Kyoto Protocol in 2002 the government established a 'National CDM Authority' to source projects and seek approval under the scheme (IGES 2013; Ministry of Environment and Forests 2010). CDMs were deployed to help finance coal-fired power and up to 45mt in credits, annually, were to be funded from CDMs for more efficient 'super-critical' plants (Lazarus and Chandler 2011; IGES 2010). Following wide controversy in 2011 coal CDMs were suspended by the UN. By 2009 the EU had already decided to limit CDMs to projects in Least Developed Countries, excluding India from its main source of CDM credits (see the above section on Germany). From 2012 the demand for CDMs dried-up largely because of the UN's failure to agree a successor agreement to the Kyoto Protocol. Overall, 1,300 projects were UN-approved, costed at 1.6tln rupees, and yielding emissions reductions of 170mt Co2e (GoG 2014: ix).

At this time the priority for energy policy was not to reduce greenhouse gas emissions, but to secure energy supplies to feed Indian growth. The focus was almost exclusively on coal, and on generating an 'Indian Coal Rush' to quote the Chair of the India Energy Forum Coal Group (Doherty 2011). Expressing this priority, post-2012 the country embarked on a national-level effort to expand coal extraction domestically, to substitute for rising coal imports which had risen to a fifth of coal burnt for power in the country. Since 1990 India's growth had in large part been powered by coal and, reflecting this, the 2012-17 National Plan, 'Faster, More Inclusive and Sustainable Growth' planned for coal consumption to rise to 980mt annually by 2020, from about 660mt in 2010 (GoI 2012b: 33; WRI 2012). Nuclear power was seen as the main substitute for coal but was not pursued due to increased public concern about risk (GoI 2012b: 122); the National Plan thereby entrenched coal as the mainstay of Indian growth, and the main source of rising emissions.

The National Plan sought to remove any obstacles to expanded coal production, stating, 'most of our coal resources and hydro potential are in ecologically sensitive areas and a successful resolution of these problems is critical if we are to be able to exploit our potential energy resources' (GoI 2012b: 23). It was 'absolutely essential to ensure that domestic production of coal increases', otherwise India's energy needs would be 'in jeopardy' and 'investor sentiment [would] weaken irreversibly' (GoI 2012b: 33). Given the urgency, and to remove any regulatory obstacles to coal mining, the Plan proposed the creation of a 'special mechanism for inter-Ministerial coordination… to accelerate processing of these projects in a time bound manner' (GoI 2012b: 33). As such, from the highest political level, the coal rush was threatening long-established State and indigenous autonomies, undermining livelihood and living environments.

Yet the desired coal rush remained in abeyance following a major corruption scandal centred on coal allocations. In 2012 44bt of coal reserves that had been privatized as coal concessions from 2004 were found by the High Court to have been corruptly allocated. The Court annulled 204 private coal allocations in the national corruption scandal that came to be dubbed 'coalgate' (Comptroller and Auditor-General of India 2012). In the aftermath one of the key concerns of the government was that neither the nationalised Coal India, that produced 80% of India's coal, nor the private operators, were not exercising their right to exploit the coal that they controlled. Subsequent private concessions were issued on condition that the purchaser took action to extract the resources, and to widen the pool of investors, in 2015 commercialisation of mining was extended to affiliates of foreign companies (under the 'Coal Mines Special Provision Bill'). Ownership arrangements and licence conditions were assumed to have had a key impact on rates of extraction. There are, though, other background factors that had more importance in delaying coal exploitation – notably the cost of transporting coal from the northeastern coal states to the western industrialising centres, combined with the cost of washing and burning coal that generally has a high ash and low energy content; there is also a likely fifty-year limit on open-cast coal mining as most of India's coal reserves are deposited below 300 metres; and added to these factors, reserves are invariably in areas that are relatively densely populated, or of environmental significance, producing strong local opposition to the impacts of new mines (Kavalov and Peteves 2007: 34).

The exclusive focus on coal, though, was starting to be weighed against the renewable sector as an alternative means of replacing coal imports and providing for energy requirements. In contrast with the 2012 National Plan, the Final Report of the 'Expert Group on Low Carbon Strategies for Inclusive Growth', delivered in 2014, posed the possibility of increased renewables and nuclear power in the energy mix as part of a strategy to accelerate reduced emissions intensity of growth. Significantly, the Expert Group Report shifted away from the overly sanguine position on the impacts of climate change that had been adopted in the 2008 Climate Plan, stressing that India was already experiencing serious impacts from climate change. Although India was not historically responsible for greenhouse gas emissions, it was now facing serious impacts and to prevent further

deterioration had to ensure the emergence of a global agreement: this was 'of utmost importance' for India (Expert Group 2014: 5).

As to India's contribution, the Expert Group's Final Report reiterated the co-benefits approach, stating it was 'essential to adopt a low carbon growth strategy that seeks mitigation co-benefits from an accelerated and inclusive development perspective' (Expert Group 2014:9). As part of this the Report outlined the link between the government's emissions intensity commitment and the possibility of slowing growth in India's absolute emissions. In its modeling the Group showed that the business as usual (BAU) scenario, with a 22% reduction in emissions intensity 2007-2030, would deliver a rise in emissions from 1.7gt in 2007 to 5.2gt by 2030. Against this it outlined a more ambitious 'low carbon inclusive' development pathway founded on a 42% reduction in emissions intensity, reducing expected annual emissions to 3.8gt by 2030 (Expert Group 2014: 27). The Expert Group argued that both models would deliver a near tripling in energy supply, 2007-2030, with the key difference being greater reliance on renewables (24%) and nuclear power (subject to 'public acceptance', at 8%), producing up to a third of energy supply (Expert Group 2014: 84). In both scenarios coal would remain central: even under the 'low carbon' scenario coal would provide 63% of electricity and coal demand would rise from 540mt in 2011-12 to 1300mt by 2030 (as against 1500mt for the BAU pathway).

Commitment to a changing energy mix was formalized in 2015 with India's 'Nationally Determined Contribution' (INDC) for the Paris UNFCCC COP. This went further than the 'low carbon' pathway proposed by the Review; it marginally increased the target for reduced energy intensity (to 35% by 2030 from 25% by 2020), and it also pledged to raise 'non-fossil fuel based' sources to 40% of electric power generation, again, by 2030 (GoI 2015). The Review had projected emissions of 3.8gt by 2030 with its proposed 30% of non-fossil fuel energy for electric power; the INDC, it could be expected, would produce a better outcome than this (though one independent analysis suggested the 5.4gt by 2030 was more likely; Climate Action Tracker 2015). On the key issue of coal extraction, the 2014 Review had predicted a requirement for 1300mt by 2030 for its 'low carbon' scenario; the INDC reduced coal dependency by a further 10% to 53% of overall electricity generation, perhaps reducing coal extraction by as much as a sixth, to about 1100mt, still a doubling of the 2011-2012 levels of domestic coal production.

The policy realignment, simultaneously pursuing coal and non-fossil fuels, especially renewables, is significant, as it lends a new dynamism to the energy mix. This is reflected in the series of new energy policies announced by the government from late 2014. These are principally designed to reduce coal imports, enable energy security for the growing economy and extend energy access. At the same time they produce a new fluidity (Buckley 2015). The policies envisage both coal and renewables expanding exponentially, but over time the scale coal expansion may prove less feasible. The expansion in domestic coal production puts more pressure on

the local environment, especially on air quality, including for the urban middle classes. In 2014 the World Health Organisation found that six of the ten most polluted cities in the world in terms of air quality are in India, and in large part due to coal-fired power (Ramsay 2015). There is a also looming danger for water quality, given the water needs of thermal energy plants, which account for 88% of industrial water use, are set to double. As a result, the UN charts significant water conflicts centred on thermal power plants in the context of intensifying water shortages (UNESCO 2014). As noted, there is also the impact on land holdings, with significant opposition to new mines, as noted, and also to the 455 proposed new coal-fired plants, many of which may not come to fruition (WRI 2012).

Indeed, it has to be questioned, given the environmental impacts and the sustained and extensive local opposition to expanded coal mining, whether the increased target for coal extraction will be met. Already, the political backlash has disrupted the government's own political bloc. In 2014 the announced increase in coal production was followed by revised land-acquisition arrangements that would have allowed authorities to set aside the requirement that 80% of landholders consent to a mine (and other industrial projects). The government attempted to pass the changes through parliament, but failed. To sidestep opposition in late December 2014 it issued an Ordinance on the basis that economic development was being undermined (PRS Legislative Research 2014). But, following extensive political pressure, especially from rural voters, in August 2015 the ordinance was allowed to lapse, leaving the pre-existing consent requirements in place (Mandhana 2015).

If India's planned coal boom is averted, and the new coal-fired generating capacity is not 'locked in' for future generations, then it is possible that renewables may emerge with sufficient strength to, over time, reduce the need for coal. The government's 2014 announcement of extensive investment in renewable energy, and the INDC target of 40% non-fossil fuels, offers the possibility of a greatly expanded renewables sector, capable of gaining its own momentum. The announced 2022 target for renewables, in terms of power supply, is equivalent to the current coal and gas capacity, suggesting that renewables will indeed rise to account for at least a third of electricity supply. Reflecting this, and the parallel difficulties the government is encountering in expanding domestic coal production, some have argued that India is embarking on its own as yet unannounced 'Energy Transformation' (Buckley 2015).

Significantly, as with Germany, a key factor in this dynamic is the pressure to address climate change and reduce emissions. From 2002 the government has beenforced to define its position in relation to climate change and to allow an explicit linkage between climate policy and energy policy. Changing understanding of the impacts of climate change directly forces changes in energy policy, and ultimately in the energy mix. A dynamic is established between the forceful pursuit of domestic coal production, and the growing industry

policy directed at renewables. The twin imperatives produce contradictory energy policies, at least from the perspective of emissions reduction. Developmentalist rhetoric is deployed to manage and maintain coherence, but over time the policy direction is substantially recast.

Climate change is no longer a secondary consideration and this is disrupting existing frameworks for energy policy. Interestingly, the Expert Group attempted to present the shift as one from growth-climate 'co-benefits' into a model of 'multiple benefits', asserting no necessary tensions between the objectives of emissions reduction, minimising local environmental impacts, achieving social inclusion and advancing economic growth. It therefore favoured policy that 'prioritizes those development strategies that yield greater de-carbonisation – the development imperatives being equal' (Expert Group 2014: 101). Contradictions between how these aims are to be pursued are obscured under the on-going claim to falling carbon intensity. One important aspect is the mobilisation of energy justice claims against emissions reduction: here the priority of 'inclusive growth' is linked to rising emissions through extended access to the national grid, is itself a nationalist myth contradicted by the capture of private plants for industrial use, by the irrelevance of grid power to those living in absolute poverty and by the growing availability of viable local renewable alternatives.

More generally, the framing definition of 'climate justice' in terms of post-colonial carbon debts and development rights remains in place, though it is substantially revised from 'within'. The INDC is subtitled 'Working Towards Climate Justice', and it liberally quotes from Mahatma Ghandi to establish India as a low-emissions sustainable society that has legitimate development rights, namely to 'equitable carbon and development space to achieve sustainable development and eradication of poverty' (GoI 2015: 4). In doing so, it predicted a tripling of energy demand by 2030 in part driven by urbanization and electrification. These are defined as necessary anti-poverty measures, with 'universal energy access and energy security' presented as 'one of the fundamental development goals for the country' (GoI 2015: 8). The Government states its pledges constitute the 'utmost ambitious action in the current state of development', adding, 'Both in terms of cumulative global emissions (only 3%) and per capita emission (1.56 tCO2e in 2010), India's contribution to the problem of climate change is limited but its actions are fair and ambitious' (GoI 2015: 33).

Germany

In contrast with India, Germany has been strongly committed to the idea of the 'green economy', in part driven by post-Communist reunification and the desire to overcome 'rust belt' de-industrialisation. With a population of 80 million Germany's per capita emissions are substantially below the average for industrialised countries. The country has a high income industrialised country. German greenhouse gas emissions fell from 1040 to 944mt Co2e 2000-2010; on a per capita basis the fall was from 12.6 to 11.5 tonnes (GoG 2014: 17; Weidner

and Mez 2008). Emissions reduction is driven by a relatively lower growth rate, of about 1.5% before the 2008 recession, combined with energy efficiency measures. This translates into a falling demand for electricity, of 4% 2010-30, with coal projected to continue to supply 31% of power (down from 41% in 2010). In the same period, renewables are expected to grow from 18% to 54%, displacing nuclear (GoG 2014: 129). Given high income levels, Germany has a strong capacity to adapt to climate change; it is also relatively less susceptible to the immediate impacts of climate change and as such is less vulnerable. Yet, since the early 1990s Germany has developed a self-conscious plan to delink its economy from greenhouse gas emissions. Internationally, Germany has played a key role in bidding-up European Union commitments to reducing greenhouse gas emissions, to a degree acknowledging the historic responsibility of early industrialisers.

Historically in Germany there is strong support for local-level renewable power, and strong opposition to nuclear power. Rejection of the nuclear stalemate, on the frontline of the Cold War, had inspired the early West German Green movement in the 1970s. Following the Chernobyl disaster of 1986 a series of proposals for a renewable energy feed-in tariff were put to parliament, and the proposal was adopted in a cross-party consensus in 1991 along with a mixture of taxes and subsidies (Jacobssen and Lauber 2006). Efforts by energy industry groups to undermine the tariff saw major counter-mobilisations in 1997, and the Renewable Energy Act in 2000 legislated price stability in the tariff for twenty years. The policy framework established from 1991 ensured the emergence of a viable renewables sector, supplying 9% of power by 2005, with a target of 12.5% by 2005; over the five years from 2000 coal dependence fell from 51% to 43%, and nuclear from 29% to 26% (Chalvatzis and Hooper 2009).

The policy of nuclear phase-out was reversed in 2010 with the Governments 'Energy Concept' policy, which positioned nuclear power as a 'transition' fuel in the shift from fossil fuels to renewables. Yet, a year later, in the aftermath of the Fukushima disaster, the 'Energy Concept' policy was itself reversed, with the introduction of the 'Energy Transformation' (Energiewende), in which phasing-out nuclear power became the primary policy objective. In this context, coal gained the status of a transition fuel to ensure a phase-out of all nuclear power plants by 2022. Germany is the world's largest producer of emissions intensive soft brown coal, and in a post-nuclear 'dash for coal' (Pahle 2010), brown coal mining expanded, despite strong popular opposition. In 2012 ten new coal-fired power plants were proposed to meet the shortfall, boosting emissions by an estimated 10% (Knopf et al. 2011; WRI 2012: 59; Gloystein and Cowhig 2011). The main story, though, in line with the 'Energy Concept' was the rise of renewables. The 2011 measures were paired with an ambitious target of 35% of total energy use to be provided by renewables by 2020, 60% by 2050 (GoG 2011). This responds to wide public commitment to renewables: over half of the sector is owned by households and cooperatives, and these are increasingly joined by municipalities which have bought back generation capacity and the local grid, and directed it towards renewables (Buchan 2012). By 2015 the government was celebrating the success of the

sector, stating that by 2014 renewables were providing 27.8% of electric power and had become the country's 'leading source' of electricity (GoG 2015).

German policy is set in the context of EU climate policy, which itself strongly bolsters the shift to renewables, for instance through its binding Renewables Directive of 2009 which mandated a pan-EU target of at least 20% renewable energy, setting targets for renewables growth across all EU countries (European Parliament 2009: Article 3). By the same token, the the EUs Emissions Trading System (ETS) initially favoured renewables and gas by making coal relatively more expensive, athough its collapse from 2012 reversed the incentive. The 'Energy Transformation' though, has been variously criticized and delayed, especially by the four privatized energy utilities based in fossil fuels and nuclear power, and their industry associations and allies, that continue to produce three-quarters of Germany's electricity supply (Eon, Vattenfall, RWE and EnBW) (Buchan 2012). Against this, a strong sustainable energy bloc has emerged, across advocacy NGOs, both environment and energy- focused, such as the 'German Association for Renewable Energies' established in 1991, and the Klima-Alliance, a climate action NGO with over 10 million members. The two blocs compete for influence over the bureaucracy and over party politics, ensuring that renewable energy policy has become major stake in political rivalry, dramatically politicizing energy policy (Kamfert and Horne 2013).

Reflecting the on-going influence of the major private utilities, German energy remains fossil-fuel based, caught in a 'paradox' of perverse incentives favouring brown coal (Energy and Climate Intelligence Unit 2015). In 2007 the German Federal Government announced Germany would end the mining of black coal by 2018, as part of a European agreement to phase-out subsidies to uneconomic coal mines. However, black coal accounts for only a small proportion of coal mining in Germany: in 2011 for instance German mines produced 12 million tons of black coal, compared with around 171 million tons of brown coal (IEA 2013: 102). The collapse of the EU's ETS significantly advantaged coal, especially brown coal, as against gas, as did growing power exports from Germany to the wider EU, and indeed the need or a replacement fuel to supersede nuclear power. In this schema, renewables were set to expand to replace both gas and nuclear, not coal, ensuring that coal remained the mainstay of Germany's power supply, providing about 45% of the supply. From 2012, the collapse in the ETS carbon price in the context of a falling world coal prices, produced a 'coal resurrection… all over Europe' (Agora Energiewende 2015: 38). This produced a minor coal boom in Germany, confirmed for instance by the International Energy Agency, which noted in 2013 that in Germany 'several large new coal-fired power plants are under construction, representing one of the biggest investment waves into domestic coal capacities since the post-war reconstruction' (IEA 2013: 10).

In 2015 government projections continue to maintain lignite and hard coal for electricity at current levels, of about 45% of total supply, with 'new lignite and hard coal-fired plants to stay competitive for power generation

until 2030' (Schlesinger, Lindenberge and Lutz, et al 2015: 26). The projections shift the burden for achieving emissions reductions onto other sectors. By mid 2015, though, continued reliance on coal was creating concerns that Germany would fail to meet its 2020 emissions reduction target of 40% on 1990 levels, with some arguing coal had to fall below 28% of the energy mix by 2020 for the target to be met (Agora Energiewende 2015: 37). The concerns precipitated a policy reorientation with a number of additional emissions-reduction measures adopted, around the energy market, efficiency and the grid extension, with the key issue being additional emissions reductions from electricity generation (Energiewende Direkt 2015b).

In early 2015 the government proposal a coal levy to deliver reductions from coal-fired power was publicly opposed by the fossil fuel energy industry and by trade unions in the sector. After some political controversy the government opted for a more limited direct measure, which had been adopted in the UK, of paying companies to mothball some coal-fired plants in a 'carbon reserve'. This was favoured by utilities and trade unions in the sector, although the idea of an energy reserve was difficult to square with Germany's status as a substantial net exporter of electric power. The measure affects 13% of lignite-fired power and enables half of the required 22mt Co2e reduction in emissions (Heller and Käckenhoff 2015). Politically it enabled the first shut-down of coal-fired power. But at the same time it demonstrated the veto power of the sector, and the extent to which coal-fired power remained entrenched as the mainstay of energy production, still producing about 40% of German emissions. Into the future, the measure leaves the government to find emissions reductions by means other than by cutting coal, and as such prolongs the 'coal paradox', endangering the 2020 emission reduction target (Schlandt 2015).

Given the continuing commitment to the nuclear phase-out, the question of emissions reduction has loomed larger as a driver of energy policy, along with underlying questions of price competitiveness, energy security and reliability. Germany was first committed to reducing greenhouse gas emissions in 1990, when West Germany announced a cut of 25% on 1987 levels by 2005. As part of the EU Germany was committed to reducing its emissions by 21% on 1990 levels by 2012. In the event, German greenhouse gas emissions fell about 23% 1990-2012, partly reflecting the post-1989 collapse in the former GDR (Weidner and Metz 2008). As noted, Germany has since set the pace for EU and global emissions cuts, including its important 2007 commitment to a 40% cut on 1990 levels by 2020, which was announced in 2007 in the context of UN negotiations for a post-Kyoto agreement. But, as is about to be explained, the standard figures of emissions reductions omit 'embedded' emissions from international trade.

In the first instance, commitments to reduce emissions are made in the context of growing opportunities to offset or displace emissions obligations. Under the EU Emissions Trading Scheme Germany was permitted to offset its Kyoto obligations internationally, and did so extensively. The take-up of Kyoto-compliant

international offsetting, for instance through the Clean Development Mechanism, has been greater in Germany than in any other EU country. In the period 2008 to 2012 German companies offset 303mt Co2e through these officially-recognized international offsets, accounting for 29% of the EU's total allocation; the power sector alone accounted for 179mt, or 10% of the total emissions for the sector during this period (Hermwille, Elsworth and Fechtner 2013: 19-21). In 2011 alone Germany offset 74.7mt, or 17% of that year's total emissions, against the EU average of 13% (Elsworth, Worthington and Morris 2012: 31). In the third round of the ETS (2009-20) the EU raised the limit on offsetting to 50% of required emissions reductions, and the price fell to less than one Euro a tonne, creating a radically low-cost pathway for emissions 'reductions', suggesting a likely continuation in cost-shifting. Yet, as in India, the scheme has been heavily criticized, politicizing the practice of offsetting and forcing the EU to cease supporting some CDMs, for instance in the coal industry.

Growing reliance on carbon-intensive industrial imports has also allowed significant displacement of emissions. Independently of climate policy, Germany, and the EU with it, has outsourced industrial production to the new workshops of the world, principally in China, but also in India, distorting the claimed impacts of climate policy. For the EU as a whole Europe the net trade effect is estimated at close to double the claimed emissions reductions under Kyoto, 2008-2012. For Germany, the importation of emissions-intensive products – mostly manufactured products from China – has been growing exponentially, further off-shoring Germany's emissions. In 1990 imports of such products accounted for 154mt Co2e, or 8% of Germany's total emissions of 1,251 mt; in 2008 this had risen to 196mt, or 20% of total emissions, then at 994mt (Dataset, Appendix 7, in Peters et al 2007). This suggests that approximately 12% of Germany's emissions had been displaced in this period, and that, accordingly, Germany's target of 40% emissions reductions on 1990 levels is in fact a reduction of 28% (although Germany's net exports of electricity would have partially offset this effect). More generally, Germany's capacity to benefit from trade flows reflects its structural position in the world economy, and should arguably be factored into global emissions reductions requirements.

Squaring the circle between economic growth and emissions-reduction is a key preoccupation of the government. In the official account, the conflict between growth and emissions reduction is overcome by claims to rising efficiency in the wider German economy, said to offset energy-based emissions. As noted, the required structural transformations in Germany may be avoided inter-national displacement, in part through the CDM but also through the growing importation of carbon-intensive industrial products from newly industrialising countries, especially China. Despite these nationally-avoided emissions, Germany increasingly positions itself as a pace-setter, as the only large industrialized country to demonstrate the possibilities of de-carbonisation, and has mobilized this position to gain leverage in international contexts as well as to bolster legitimacy for the transition 'at home'.

In this respect, Germany promotes a specific form of developmentalist assumptions to bolster its contradictory climate and energy policy mix. Since at least 1991 the Federal Government has played a key leading role in Germany's 'Energy Transformation' and has regularly asserted this in the international arena (Weidner and Metz 2008). This assertiveness has become increasingly evident, and has intensified, as the pressures to reduce greenhouse gas emissions have grown. When it announced the 'Energy Concept', the government claimed that 'Germany is to become one of the most energy-efficient and greenest economies in the world while enjoying competitive energy prices and a high level of prosperity' (GoG 2010: 1). In 2011, Ottmar Edenhofer, Co-Chair of Working Group III of the IPCC, described the Energy Transformation as 'one of the greatest social experiments there has ever been in Germany, comparable with the process of reunification" (Online focus, 2011). By 2015, with the national review of the energy transition, its significance had grown, and had become a global demonstration effect, with Germany leading the way: 'The energy transition is one of the most important projects for Germany's future. It can demonstrate that a highly industrialised country can switch to a sustainable energy supply without losing competitiveness in a globalised world' (GoG 2015: 27).

The confidence is reflected the Energiewende's online logo and slogan, 'Switch to the Future'. At a more mundane level in early 2015 the German government started translating its Energy Transformation newsletter into English, retaining the German 'Energiewende Direkt'. The newsletter explained the concept is universal:

> 'The Energiewende in English? Energiewende! Even in the USA many editors do not translate the term any more: because the "Energiewende" has by now become a trade mark that attracts interest world-wide – and spotlights Germany as the pioneer of energy system transformation. In the quest for the energy for tomorrow, the challenges are the same everywhere in the world: the future energy supply system needs to be secure and affordable, while minimizing the impact on resources and the environment. The surest way to achieve this is by improving energy efficiency and making greater use of renewable energy sources, which are indeed gaining in importance around the globe'. (Energiewende Direkt 2015a)

Confidence is also reflected in more explicit global dissemination, for instance through the government's international 'transition dialogue' held in March 2015, which was titled 'Towards a Global Energiewende' (Federal Foreign Office 2015). The conference, organised by the Federal Foreign Office and the Federal Ministry for Economic Affairs, was the first of its kind. At it, the Federal Minister for Economic Affairs and Energy, Sigmar Gabriel, argued that the environmental issue of how reduce greenhouse gasses had turned into a debate about economic transformation. He stated unequivocally that:

> 'We have to show that a country like Germany and a continent like Europe can succeed in combining high levels of industrialisation, high-tech development and innovation with ecological sustainability and climate

> protection. Only if we in Germany and Europe are able to demonstrate that the Energy Transition and a sustainable energy supply system do not hamper but - on the contrary - can even boost economic success, only then will we get other countries to follow us. Only if we in Europe show that we are not producing fewer jobs in industry, but more, will we be able to convince people who are just embarking on the path to industrialization. (Energiewende Direkt 2015a)

Reflecting the government's confidence in the German model, and the sense of historic mission, the Foreign Minister, Frank-Walter Steinmeier, highlighted international interest in the German Energiewende, calling it Germany's 'Man to the moon' project, stressing 'Germany is a global pioneer of energy systems for the future' (Energiewende Direkt 2015a).

4. Results and discussion: New Energy Politics?

In the two countries we can track an unfolding climate dialectic in energy politics, producing cascading policy initiatives. In both India and Germany we see conflicts between economic growth and climate stability gaining growing political salience. Sharp policy conflicts emerge between the appropriation of fossil fuels for energy and emissions reduction. As the key site of governance in fossil fuel consumption, energy policy becomes especially politicised and subject to new forms of political exposure, debate and deliberation. In the process, energy policy becomes drawn into the climate policy dialectic, and vice versa, climate change is socialised into an object and effect of government policy. This process is centred on national policy-making and is reflects specific developmental contexts; at the same time there are shared themes and aspects are played out across industrialising and post-industrial countries.

The key common theme is the unfolding crisis of legitimacy as state policy enables greenhouse gas emissions to continue to rise in the face of growing climate risk. In this nexus, countries become bound into an intensifying 'climate dialectic' where the climate crisis remains unmanageable, and drives a legitimacy crisis that directly politicises energy. In bth India and Germany we find that the liberal democratic state, itself embedded in structures of influence and policy capture, is fractured between contending pressures for the fossil-fuel sector and emerging renewables. The policy collision between climate and energy policy is then managed and papered-over with various developmentalist claims: India asserts development rights against rich high emitters; Germany places its faith in technological efficiencies. Such claims are asserted against evidence of policy inadequacy and failure, creating ideological over-reach, accentuating instability.

These developments may be considered transitional, but the almost twenty-five year 'transition' since the first Earth Summit in 1992, appears to take-on all the appearances of permanency. There is indeed not much to

hope-for within the prevailing managerial status quo: as Malm recently charted, fossil fuels are constitutive of 'fossil capital', and as historically constituting industrial social forces within liberal democracy, fossil fuels remain sedimented into the power structures of state rule (Malm 2016). Certainly the status quo, and its advocates, explicitly anticipate climate breakdown. When coal industry advocates quote the International Energy Agency as predicting a rise in coal consumption, they are in effect encouraging governments to plan for 'business as usual', and for a 5-6°C increase in global temperatures. Such plans are already in place, with global management consultancy PwC in its candid 2013 report 'Too Late for Two Degrees?', arguing that decoupling has failed, and that 'the only way to avoid the pessimistic scenarios [of 4°C] will be radical transformations in the ways the global economy currently functions' (PwC 2013: pp).

The 'climate dialectic' points to just those 'radical transformations'. In the first instance, as outlined for the policies of India and Germany, it feeds back into the heart of state policymaking, forcing a socialisation process that transforms energy policy debates. As emissions continue to grow, and climate crisis begins to have its direct impacts, initial measures are seen to be inadequate, as 'false solutions' perhaps, and become the platform for more far-reaching initiatives. In this way the 'climate dialectic' has a cascading effect through and beyond energy sectors, to transform role of the state, and society.

Over time we can anticipate that policy will be forced to address the underlying causes climate change, and in the process transform wider social relations. Indeed, on the edges of current policy debate the climate dialectic is already establishing new linkages between climate, energy and livelihood, and charting policy agendas for energy socialisation, centred on precautionary climate policy, direct energy participation, energy democracy and autonomy. As reflected in the idea of a climate dialectic, the failures of prevailing policy vested in the 'green economy', are already generating legitimacy for new visions for socio-ecological living, such as in the 'de-growth' debate, and in the idea of 'living well' (Goodman and Salleh 2013). Whilst not wanting to idealise such initiatives, a future task would be to track the emergence of these more transformative approaches, and assess their influence on the climate and energy policy field, again as part of the intensifying 'climate dialectic'.

5) Policy Recommendations

This article sketched a conceptual model of the 'climate dialectic', and sought to illustrate how it can be used to interpret and analyse developments in energy policy. It did so drawing on evidence from two contrasting country cases – India and Germany – finding striking similarities in terms of policy change, against a background of substantially contrasting conditions. The article has argued that this mode of analysis yields insights into how climate crisis influences the dynamics of the policy process, and substantially alters it.

The climate dialectic has a specific bio-physical and temporal logic that imposes new imperatives on energy policy. These have driven substantial re-orientations in policy that broadly seek to progressively delink economic growth from fossil fuel dependence. Such policy shifts have transformed energy policy, and indeed wider social and public policy. In the process, multiplying dimensions of state authority become deeply enmeshed within the 'climate dialectic'. As crisis persists, the structural barriers to effective de-carbonisation are revealed, forcing more effective (and potentially transformative) measures onto the agenda.

The approach taken here emphasises the specificity of the climate dialectic, and thus how it produces new agendas. A key **first recommendation** then, is not to assume that climate change imposes requirements that can be managed through energy policy. A managerial approach may offer results for instance in relation to energy security or energy availability; with climate change a managerial approach only allows the problem to intensify. This especially reflects the temporal character of the crisis, as forcing the need to address its causes, not its symptoms.

A further, **second recommendation** would be to appreciate the extent to which re-gearing energy policy to address climate change poses a challenge to some key underlying assumptions and dominant interests, and hence is not without influential 'losers', and broad-scale public controversy. A **third recommendation** may be, therefore, the need to gear energy policy to strengthened public participation in decarbonisation, as a means of grounding legitimacy and overcoming entrenched interests. A corollary of this, and perhaps more strategic, a **fourth recommendation** is to expect present-day compromises on decarbonisation to immediately become tomorrow's 'failed solutions', spurring further policy innovation and transformation.

A final, **fifth recommendation**, would be to anticipate such transformations, and seek to model what would truly be required, and be possible, in terms of social and political formations, to achieve the de-carbonisation that climate science demands. The role and responsibility for sociologists is to exercise exactly this kind of 'sociological imagination', as Mills put it, which in this context becomes perhaps more clearly a form of socio-ecological imagination (Salleh, Goodman and Hosseini 2016). In policy terms climate change has already redefined and extended the realms of possibility for energy policy; in the context of an advancing crisis, what is defined as 'impossible' today may swiftly find itself on the political agenda as necessary and urgent tomorrow.

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