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Conflicts over carbon capture and storage in international climate governance

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ABSTRACT

In the Paris Agreement, ambitious emission targets are accompanied by insufficient mitigation measures. It lacks, in particular, strategies on how to reduce the use of fossil fuels. In this context the distinctive prospect of carbon capture and storage (CCS) – reducing emissions, albeit using fossil fuels on a large scale – is of particular interest. CCS technologies promise to solve the climate problem independent of drawn-out political disputes and without changing production and consumption patterns. Conflicts about CCS put the fundamental debate on the agenda, whether a comprehensive transformation of social structures is (un-)necessary and (un-)desired in order to solve the ecological crisis. Therefore, in this paper CCS-conflicts are analyzed with a broader perspective including their effects on general struggles about international climate governance. The key research question is to what extent established social practices and structures become politicized – i.e. challenged. Based on the presented empirical findings, I discuss two theses: First, that the future of climate governance is contingent on decisions about the continued use of fossil fuels. Second, that CCS-conflicts have an explosive force that could lead to massive cracks within the paradigm of ecological modernization and thus could politicize international climate policy.

1. Introduction

The success of international climate governance so far has been very limited. Global greenhouse gas emissions keep rising (IPCC, 2014, p. 6f). Carbon prices are at such a low level that carbon markets don't provide any incentives for reducing emissions. Furthermore, the ecological crisis[1] does not rank very high on the political agenda anymore since various economic crises determine day-to-day-politics. The willingness to adopt, implement, and finance environmental protection measures has declined in industrialized countries within recent years (Klein, 2014, p. 110). On top of that, the Paris Agreement – adopted at the climate summit in 2015 – does not include binding emission targets. Since the failure of the 2009 climate summit in Copenhagen, expectations regarding the negotiations within the United Nations Framework Convention on Climate Change (UNFCCC) have been scaled down. Overall, trusting politicians to manage the ecological crisis is at a low level. Against this background, more and more actors enhance the development of techno-fixes – technological solutions that promise to solve symptoms of complex problems without changing social structures (Methmann et al., 2013). In this context, CCS technologies are of particular interest as they are based on the established centralized fossil energy infrastructure (IPCC, 2005, p. 12).

> "With CCS it is entirely possible for fossil fuels to continue to be used on a large scale." (Rajendra Pachauri, the then-chair of the Intergovernmental Panel on Climate Change on the occasion of presenting the fifth assessment report)[2]

The distinctive prospect of CCS – reducing emissions, albeit using fossil fuels on a large scale – increased in value with the Paris Agreement which aims at achieving "a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century" (UNFCCC, 2015, p. 21). As the countries agreed on rather ambitious climate targets without presenting serious policy plans on how to significantly reduce the use of fossil fuels, CCS – being an artificial sink – could become even more important. That is why organizations like the *International Energy Agency* appraise the

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[1] The term 'ecological crisis' refers to the recognition that we are facing not just a few more environmental problems (like climate change or the loss of biodiversity), but that these problems reveal that our relationship with nature is in crisis (Brand, 2010, p. 143). It implies the assumption that conventional reactions (of established institutions) are not able to solve ecological problems (anymore). The term 'socio-ecological crisis' or 'crisis of societal relationships with nature' would be more accurate. But in order to increase the compatibility with different scientific and political debates, I use the common term 'ecological crisis'.

[2] Online: www.theguardian.com/environment/2014/nov/02/rapid-carbon-emission-cuts-severe-impact-climate-change-ipcc-report, last accessed 22.07.2016.

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Paris Agreement as a signal to step up efforts to develop and deploy CCS technologies[3]:

> "The headline message is to limit warming to 'well below' 2.0 C (by 2100) and pursue 1.5 C, thus needing more mitigation activities, including more CCS. [...] IEAGHG and our partners at COP [Conference of the Parties; T. K.] were happy to play our modest role in providing information to support the high level agreement (see our blogs from COP), but we all played a bigger role in our work over the years, such that the IPCC and UNFCCC now recognise the need and viability of CCS." (online: www.ieaghg.org/publications/blog, last accessed 22.07.2016)

Actually, CCS technologies become more and more important in the political consultancy by the Intergovernmental Panel on Climate Change (IPCC). In its latest *Assessment Report*, CCS and BECCS[4] technologies are receiving much greater attention as compared to previous reports (Petersen, 2014). In the Summary for Policymakers of the third Working Group's contribution, the discussion of CCS technologies starts with the following assessment:

> "Carbon dioxide capture and storage (CCS) technologies could reduce the lifecycle GHG emissions of fossil fuel power plants (medium evidence, medium agreement)." (IPCC, 2014, p. 22)

The appraisal of the current state of research ("medium evidence, medium agreement") foreshadows the potential conflict inherent to CCS. In general, CCS technologies are still far from being commercially feasible on a large scale with only very few exceptions (regarding the case of Norway cf. Krüger, 2015, p. 236ff). Nevertheless, already the hope for CCS technologies has had a great influence on the disputes about climate and energy policies – both on international as well as on regional and national scale in many countries (Markusson and Shackley, 2012, p. 36; Meadowcroft and Langhelle, 2009a, p. 267ff). The short-term effect is that new power plants are legitimized by labeling them as "CCS-ready".[5] Regarding long-term considerations, CCS technologies contain the already mentioned promise that it is possible to keep using fossil fuels while stabilizing the greenhouse gas concentration in the atmosphere. This is very appealing to many actors as fossil fuels stand for economic growth, prosperity, and the modern development model. Particularly, energy companies and governments of countries with fossil fuel reserves count on CCS in order to pursue established ways to maximize profits and wealth.

> "The temptation that CCS offers is the extension of the fossil-fuel era by perhaps a few 100 years." (Spreng et al., 2007, p. 853)

In the light of alleged practical constraints and path dependencies, CCS is regarded by a pro-CCS discourse coalition[6] as an irreplaceable bridging technology in the transition to a low-carbon economy. For them, a scenario of a large-scale application of CCS seems to be more realistic than a structural change of production and consumption patterns.

This position is objected by an anti-CCS discourse coalition (see footnote 6) that points to a twofold risk: first, the storage of CO_2 in geological formations contains environment and health risks; second, technological developments can only be planned and predicted to a limited degree. This concerns the use of CCS itself as well as its role as a bridging technology. According to the anti-CCS discourse coalition, it is unpredictable whether at all – and, if so, when – a large-scale deployment of CCS will be technically, economically, and politically feasible. In this context, the anti-CCS discourse coalition highlights the uncertainty of political and social factors that have great influence on the shaping of energy infrastructures which are usually underestimated in the scenarios and prognoses of technical developments and future energy systems (Hansson, 2012, p. 75ff). The neglected political and social factors are a significant source of uncertainty with regard to the probability of large-scale deployment of CCS as well as the notion that a particular technology could be a bridge towards an energy system in which the very technology itself is no longer needed. On the contrary, the large investment required for the construction of a specified infrastructure as well as the established legal and financial frameworks make the dismantling of this technology unlikely (Meadowcroft and Langhelle, 2009a, p. 279). Thus, there is the potential of reinforcing the so-called carbon lock-in (for a detailed discussion of the lock-in effect and possible ways of escaping it cf. Unruh, 2002). Stabilizing or even expanding the fossil energy infrastructure continues to deteriorate the conditions for subsequent transformation processes. With respect to this twofold risk the scientists Daniel Spreng, Gregg Marland, and Alvin M. Weinberg define the development and deployment of CCS technologies as a "Faustian Bargain":

> "CSS appears to be a classic Faustian Bargain. But, as in Faust's initial bargain, it need not mean that our soul is left to the devil. It should mean that we accept the challenge of continual striving and vigilance, striving for more durable answers to global climate change and vigilance in assuring that stored carbon is not subsequently released to the climate system." (Spreng et al., 2007, p. 854)

This pointed elaboration – of both the specific appeal and the twofold risk of CCS – illustrates the controversial nature of the dispute. Nevertheless, the interest (of very different players) in CCS technologies remains strong.

In conflicts about CCS, the question comes to a head: how fast and to what extent is a change of social structures absolutely necessary and an appropriate response to the ecological crisis. CCS technologies represent the quest for risky techno-fixes. However, this way of dealing with unintended secondary effects of industrial modernity is under pressure from demands (by different actors, e.g. environmental movements, NGOs, critical scientists, and politicians) for a reflexive modernity or for fundamental alternatives to the modern growth-based development model (Brand, 2010, p. 143). Therefore, CCS-conflicts are a particularly appropriate object of investigation regarding re- and depoliticizing processes in international climate governance – in other words, regarding the question to what extent established social practices and structures are being challenged. This has to be discussed against the background of the dominant paradigm in global environmental policy which can be grasped as *ecological modernization*.

[3] Online: www.bellona.org/news/climate-change/2015-12-paris-climate-deal-unites-world-in-a-common-goal-of-slashing-emissions-for-the-first-time, www.ieaghg.org/publications/blog, last accessed 22.07.2016.

[4] BECCS stands for the application of carbon capture and storage at bio-energy power plants. In this article I do not discuss BECCS because it is even less mature than CCS. Furthermore I focus on CCS as I develop the argument that the future of climate governance is contingent on decisions about the continued use of fossil fuels (and in this regard, BECCS is of less importance).

[5] The term "CCS-ready" is supposed to indicate that a new power plant is designed for a subsequent installation of CCS technologies. However, it is ambiguous which criteria a power plant has to meet in order to be approved as CCS-ready. De facto CCS-ready means in many cases that there is the space that would be needed for technologies capturing the CO_2. In addition, the proximity of a possible storage location or possible transport routes is crucial.

[6] The development and application of CCS technologies is accompanied by political struggles. The positions in these struggles can be grouped into two opposite (typecast) discourse coalitions: a pro-CCS coalition and an anti-CCS coalition. These coalitions are quite heterogeneous regarding their members and they are not necessarily the effect of intentional and strategic alliance building. But even if the actors don't perceive themselves as part of a coalition one can nevertheless detect patterns of argumentation and action that shape the discourse (for the term discourse coalition cf. Hajer, 1995, p. 65). The pro-CCS coalition is formed by governments, international climate and energy institutions, fossil fuel industry, modest NGOs (with affinity to technical solutions), as well as scientists that are involved in CCS research. The anti-CCS coalition consists of environmental research institutes, environmental groups, climate activists, local citizens' initiatives, as well as individual scientists. For a discussion of the coalitions cf. Markusson and Shackley, 2012, p. 36f; Meadowcroft and Langhelle, 2009a, p. 267ff.