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The foreign policy of carbon sinks: Carbon capture and storage as foreign policy in Norway

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Abstract

Norway is among a handful of countries with an explicit policy to promote carbon capture and storage (CCS) at both national and international levels. This paper investigates the internal and external driving forces behind Norway's efforts to advance CCS as a global climate change mitigation option. The ambition is twofold: First, a mapping of Norway's public CCS policy with emphasis on the externally directed efforts is offered based on interviews and document studies. Second, it is explained how CCS foreign policy was chosen as a prioritized means of climate change mitigation policy in Norway. The study is conducted with the application of Foreign Policy Analysis. From the outside-in perspective, the international climate regime is emphasized. From the inside-out perspective, bureaucratic politics is in focus. It is found that the winning coalition behind the domestic CCS agenda also directed CCS foreign policy design and implementation. The CCS foreign policy offers a means to fulfil Norway's regime obligations on terms that harmonize the potential conflict of maintaining a political economy reliant on petroleum exports with a credible climate change mitigation policy. It is shown how technology R&D for global use has been a key ingredient in this context. It is also explored how the CCS foreign policy was materialized with the means of official development assistance and other funding mechanisms.

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Nomenclature

4KI	Four Kingdom Initiative
BECCS	Bio-Energy with Carbon Capture and Storage
CCM	Clean Capture Mongstad
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilization, and Storage
WB CCS TF	World Bank Carbon Capture and Storage Trust Fund
CDM	Clean Development Mechanism
CSLF	Carbon Sequestration Leadership Forum
EEA	European Economic Area
EERP	European Economic Recovery Plan
EUETS	European Union Emissions Trading Scheme
FPA	Foreign Policy Analysis
GCCSI	Global Carbon Capture and Storage Institute
GHG	Greenhouse Gases
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
MFA	Ministry of Foreign Affairs
MoE	Ministry of the Environment (also covering 2013 name change to Ministry of Climate and Environment)
MoF	Ministry of Finance
MoU	Memorandum of Understanding
MPE	Ministry of Petroleum and Energy
NER300	New Entrants Reserve 300
NSBTF	North Sea Basin Task Force
NGO	Non-Governmental Organization
NZEC	Near Zero Emission Coal
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OPM	Office of the Prime Minister
REDD+	Reduced Emissions from Deforestation and forest Degradation in Developing countries and carbon stock conservation, enhancement, reforestation and afforestation
TCM	Technology Center Mongstad
UNIDO	United Nations Industrial Development Organization
UNFCCC	United Nations Framework Convention on Climate Change
WB CCS TF	World Bank Carbon Capture and Storage Trust Fund

1. Introduction

The need for widespread CCS application as a means to mitigate GHG emissions causing anthropogenic climate change has been reaffirmed by the latest IPCC and IEA assessments [1, 2]. While global CCS deployment in various forms² has been recognized as vital within most two-degree scenarios, actual implementation has to date been

² Such as related to EOR; other CCUS and; BECCS or other forms of CO₂ capture and storage with prolonged avoided emissions to the atmosphere

limited [3]. Norway is among a handful of countries with an explicit policy to promote CCS at both national and international levels.

This paper illuminates the internal and external driving forces behind Norwegian governments' efforts to advance CCS as a *global* climate change mitigation option since 2008. The substantive objective is twofold. First, an updated mapping of Norway's extensive public CCS policy is offered, with an emphasis on the externally directed efforts. Second, it is sought explained how the winning coalition behind the domestic CCS agenda has been able to make CCS part of Norwegian foreign policy. This has taken CCS into new policy arenas, including international climate change negotiations, development assistance, Norway's policy towards the EU and high-level diplomacy in dedicated bilateral and multilateral forums. For these purposes, Foreign Policy Analysis is applied within the fields of climate change and CCS policy. Few contributions are available from this perspective to date [4].

Prioritization of CCS is part of a wider range of externally oriented policies designed to harmonize Norway's climate and energy targets. The potential conflict between the maintenance of a political economy reliant on petroleum production and exports and a credible GHG mitigation policy is Norway's *climate political Gordian knot*. At the domestic arena, CCS has been linked to this agenda for almost three decades [5]. The relatively high marginal costs of abatement in Norway are keys to understanding Norwegian governments' strategy on climate policy. Based on the principle of cost-effectiveness in mitigation action, Norway has positioned itself as a firm supporter of the market-based mechanisms of the UNFCCC, ideally under a globally binding regime. In addition, Norway has worked actively towards a mechanism for reduced deforestation (REDD+) as part of the international climate regime [6, 7].

Previous studies of Norway's *national* CCS efforts since the 1990s, found the CCS concept to function as a "technological glue" to reconcile opposing parties of the energy-climate divide in the debate over the eventual construction of natural gas fired power plants in Norway [8]. As domestic innovation policy, CCS R&D in Norway has been pointed to as a preferred climate political solution when industrial interests have been confronted with potential economic sanctions as a means to curb emissions from these sources [9].

The literature has shed light on the function of CCS for political goal attainment in various polities [10-13]. The importance of winning coalitions of actors to shape policy development and implementation stands out as an insight from these studies [11, 14, 15]. While non-specific climate policy measures have been insufficient for CCS implementation in most cases, deliberate public policies in the domains of innovation, regulations, and even implementation of energy and industry policies, have been critical factors for the political and practical potentials of CCS in industrialized countries [12, 16, 17]. Others have noted that CCS, traditionally a highly specialized epistemic community, over time has moved into mainstream political discourse in some instances [18, 19]. At the conceptual level, the political feasibility of CCS in certain political economic circumstances has been explained by path dependency effects as a state of carbon-lock-in [20]. As literature on the policy and politics of CCS remains an evolving, although limited, field, several avenues of interest remain uncharted to date. Despite the apparent need for CCS deployment in emerging economies, few have studied the prospects for CCS in these countries [21, 22]. Similarly, few studies have addressed states' externally oriented policies to advance CCS internationally – that is CCS as foreign policy. The present study is a contribution to rectify this state of offering.

1.1 CCS as Environmental Foreign Policy: Analytical approach and methods

This is a single case study of foreign policy output at the case level exploring the choice of CCS foreign policy in terms of climate policy output in Norway. FPA is a useful analytical tool since it offers a broad approach to explaining externally directed policies, using both outside-in and inside-out explanations. These include the external (international) and internal (domestic) environments of the state, as well as attributes of the executive government (bureaucratic politics). Herein lies the potential to account for the framework conditions and motivations which may otherwise fall between or overlap set political systems: "Thinking about foreign policy focuses our attention on interactions among domestic political preferences and positions governments take in negotiations" [23: 8]. As such, FPA provides a framework as to how decision making and implementing processes may be studied [24]. The aim is to identify robust causal explanations based on empirical process tracing and guided by relevant theory at the respective levels of analysis [25].

Climate policymakers seek on the one hand to adhere to international commitments while simultaneously paying attention to what is feasible within the domestic political system [26-30]. From the outside-in perspective, the UNFCCC represents an international framework condition for Norwegian policymakers. We will look into how successive Norwegian governments have attempted to argue for CCS on terms of its potential to fulfill Norway's obligations under the international climate change regime. At the same time, Norway has worked actively to adjust the same regime and also other international treaties to allow for CCS as a legitimate mitigation option [31, 32].

At the national political level, emphasis is put on the development and execution of CCS foreign policy among agencies of the executive government. The assumption is that various ministries of the government direct sector interests that are partially overlapping, representing domestic interest formation at large. The aggregated outcome of such bureaucratic politics is what constitutes the state's foreign policy and national interests [26, 33, 34]. Key agencies in focus in this regard are the MPE, MoE, and OPM. In this political space, between domestic and international restraints and commitments, the climate political room of maneuvering will be identified. This room of maneuvering is the space within which the available actions and strategies are found. It is from this repertoire of means that action is composed, based on the prevailing preferences of policymakers. This line of reasoning is illustrated in figure 1 below.

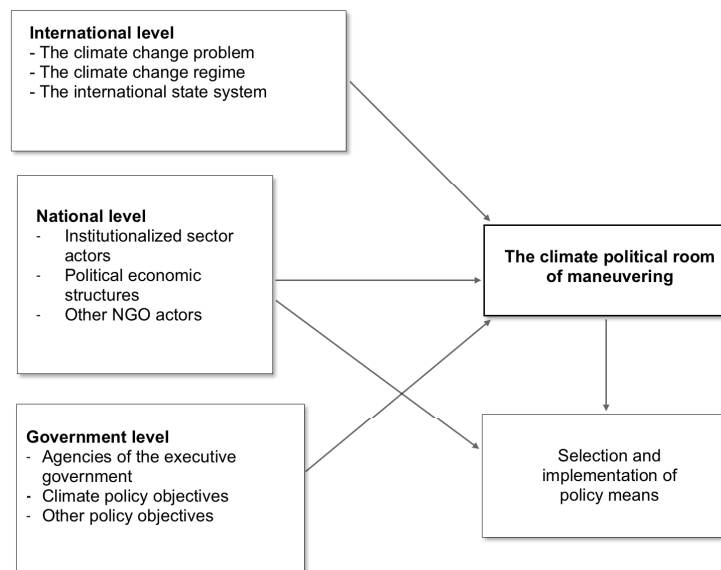


Figure 1. The FPA approach to the climate political room of maneuvering

In addition to studies of existing academic literature and public documents (state budgets, white papers and ministerial archives), data gathering is based on eleven interviews with representatives of the executive branches of government, current and former policymakers, industry, research institutions, NGOs and others that have been parties or close to the relevant processes (identities are kept anonymous, see appendix for institutional affiliations). The present accounts are based on a minimum of two informants' independent reporting or one written and one oral source of information. Citations are translated from Norwegian by the author. The following chapter (2) maps the evolution of CCS as climate policy in Norway in order to identify and place the CCS foreign policy in context. Based on the analytical framework presented above, Norway's CCS foreign policy is thereafter analyzed in the subsequent chapter (3). The conclusive chapter underlines key findings and proposes alleys of further inquiry (4).

2. Norway's evolving CCS engagement as climate policy: The four pillars

It is here suggested that Norway's CCS policy evolved around four distinct pillars in terms of implemented policies and their effects, whereof the fourth constitutes Norway's CCS foreign policy. These pillars were arguably materialized following changes in the climate political room of maneuvering in Norway and prompted by changes in the scope and aims of the government's policy: Initially in the 1990s, Norway's climate policies were aimed at the national level using directed sector-wide economic sanctions. Later, a principle adjustment came with a shift towards cost-effectiveness across economic sectors and on a global scale. With the Kyoto protocol, Norway and its negotiating block eventually succeeded in having an international regime that accepted the approach of a global scope in mitigation action [38, 39]. As such, the flexible mechanisms of the Kyoto protocol relieved the conflict potential related to abatement costs at the national level in Norway. In 2012, Norway also signed onto the 2012-2020 Kyoto II period [40]. When analyzed on the basis of domestic politics, the dynamics in Norway's climate policies have been explained as political solutions that not only accommodated Norway's mitigation targets and international commitments, but also key interests administered by members of domestic winning coalitions notably including those of the petroleum industry [7, 35-37]. As we shall see, with these framework conditions in place, technology development, such as CCS R&D, gained traction as a viable climate political approach in Norway [7, 9].

The *first* out of the four CCS pillars was the deployment of CO₂ re-injection and permanent storage at the Sleipner and Snøhvit gas fields. For Sleipner 1996, this was an all-industry adjustment to the national CO₂-tax regime introduced in 1991, a result of Norway's first climate policy. It stated that Norway's GHG emissions was to be "stabilized at 1989 level by the year 2000" and that Norway would lead by example in mitigation action [7, 36]. In 2004, the Snøhvit project was set-up for CO₂ separation and storage mainly due to the CO₂ tax regime [5]. As natural gas processing plants, Sleipner and Snøhvit were both fitted with gas separation facilities for industrial needs. The introduction of CCS in these cases was thus primarily a question of permanent storage. When operating at capacity, the two plants sequester 1.4 MtCO₂/year, accounting for >2% of Norway's annual emissions [43]. Sleipner, and later Snøhvit's, important political contribution was to demonstrate that CO₂ storage could reconcile environmental and petroleum interests in that natural gas production could be maintained at significantly lowered GHG emissions. The Sleipner and Snøhvit experiences contributed significantly to the standing of CCS as a climate political solution in Norway: Sequestration actually worked.

A parallel argument for CCS was brought on land and into the "gas power conflict"; the controversy over the eventual construction of natural gas fired power plants. During the 1990s and early 2000s, industrial actors, tempted by the idea of supplying mainland industry with abundant natural gas power, faced environmentalist interests. Advocates of the latter pointed to Norway's national climate political obligations, arguing that natural gas fired plants would unacceptably contribute to carbon footprint of Norway's electricity mix [44]. It was the manifestation of the climate political Gordian knot and CCS came to the rescue. Carried forward by an alliance of industry, NGOs, labor unions, and with backing in parliament, CCS attracted broad political appeal as "technological glue" for its promise of "CO₂ free" power plants [5]. For now, carbon sequestration in Norway was a proven win-win solution to a national problem, capable of harmonizing industrial and environmental concerns and interest groups. This is further discussed in chapter 4 below.

The introduced drift towards global cost-effectiveness in Norway's climate policy required a refined approach to CCS as a mitigation option too. This prompted the *second* pillar of Norway's CCS policy, namely a dedicated public CCS R&D programme to make CCS technologies a cost-effective alternative. When the Labor government in 2000 allowed non-CCS power plants, it as meditative action established a public fund for CCS technology R&D, giving birth to the dedicated CLIMIT CCS R&D programme [44]. Similarly, after the coalition government in 2013 cancelled the CCM full-scale project, funding for CLIMIT was boosted [45]. The initial aim of the R&D programme was to enable technology developments that would make CCS a feasible option for the purpose of gas fired power plants. CLIMIT's mandate was from 2010 expanded to cover coal fired and industrial sources, also beyond Norway [46]. This second pillar underlines the important function of technology R&D in Norway's CCS policy. The *promise* of technology development has increasingly been linked to Norway's climate policy at large and to the global diffusion of CCS technology; to Norwegian CCS foreign policy.

The *third* pillar of the Norwegian government's CCS efforts came with the government's significant ownership and participation in CCS projects at natural gas fired power plants in Norway. Crucial activities in this record were

the government's remarkably deep involvement into the 2009-aborted full-scale Kårstø project, the 2012-operational CO₂-capture TCM and related 2013-aborted full-scale CCM projects. As shall be discussed, these efforts reflected the coalition government of 2005's commitments to natural gas fired power plants with CCS. The TCM-CCM projects, by the prime minister labeled "Norway's moon landing" for its technological complexity and novel innovation, was the result of a risk minimizing strategy: In step one, TCM was to be built for the development of affordable, reliable capture technologies. In step two, the CCM would sequester CO₂ emissions from the Mongstad plant as a contribution to reduce national emissions [47]. Together, these manifested the new aims of the CCS effort: In light of the "gas power conflict", to contribute to lowered from sources in emissions in Norway, and now equally; to contribute to the development of cost-effective CCS technologies for global use [48: 9].

As the *fourth* and final pillar; in 2008, an *explicit CCS foreign policy* found its way into Norway's climate political toolbox. The relevancy of CCS in an international context was highlighted in two respects: The potential contribution of *CCS technology development* to facilitate the formation of the international climate regime post-2012, and CCS as a prioritized "environmental technology" in the field of *ODA*. An important milestone for the launch of Norway's CCS foreign policy was the 2009 Bergen CCS conference, where the Norwegian Prime and Foreign ministers hosted international high-level participants in the energy and climate fields [49]. The priorities and portfolio of this pillar is further described in sub-chapter 2.1.

Following the 2013 cancellation of the CCM and national elections, Norway's new government of 2014 decided to revise Norway's entire CCS strategy. While the particular policy instruments are still under development, an explicit position is already taken on the ambition of the effort. The "materialization of a full-scale CCS project by 2020" is a stated goal combined with a "broad initiative for a cost-effective technology for capture and storage of CO₂" [50: 61]. CCS materialization is no longer limited to relate to the function of CCS applied on natural gas power plants in Norway. In fact, it is not specified whether the CCS project to be materialized should be located in Norway at all. Instead, the CCS 2020 goal is argued on the grounds of CCS as a *global solution to a global problem*, which is that of reconciling the two-degrees target and global need for fossil energy and heavy industry [48]. The current government regards CCS as a crucial global mitigation option to which Norway has comparative advantage given its plus 20 years' CCS legacy, as expressed in the four pillars briefly described above [51].

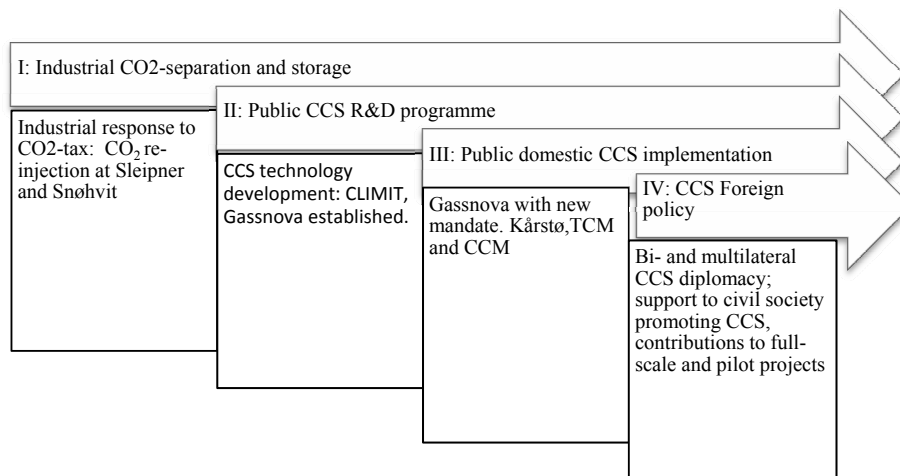


Figure 2. Norway's CCS policy pillars 1993-2014

2.1 Mapping Norway's CCS foreign policy

2008 was a landmark year for the development of Norway's CCS foreign policy.³ The Norwegian parliament requested the government to develop and implement an "action plan for the international work to promote CCS as a climate change mitigation option" [52]. This was part of the cross-parliamentary "First Climate Settlement", where Norway's overall climate change mitigation targets and means were set towards 2020 and beyond [53]. A similar "Second Climate Settlement" in 2012 reaffirmed the same goals, emphasizing the importance of the international CCS effort: "(...) Norway shall be a country leading the way for international acceptance for CCS as a necessary mitigation option. Norway has built up a significant position in this field. A strengthened commitment to CCS internationally, in particular in countries that are expected to experience high economic growth (...), will be especially important. The materialization of real demonstration projects can make a significant contribution to technology development and, over time, also towards the commercialization of the technology. In this way, preparations are undertaken for CCS to become an important mitigation option that leads to real, global mission cuts." [40: 15]

The objectives of Norway's CCS foreign policy are formulated for stepwise implementation. An objective common for all steps of implementation is to communicate the need for CCS deployment in context of the two-degrees target. In the short and medium term, 2008-2015, Norway should actively contribute to i) international mechanisms for the implementation of CCS; ii) have CCS included as part of the post-2012 climate regime; iii) EU and international framework and regulations for CO₂ storage; iv) map potential cooperation projects in selected countries and regions, and later consider to support implementation of mapped projects. In the long term, transfer of technology and experience from Norwegian CCS projects should be prioritized. It is also stated that these interventions should be financed through ODA as the "main source of funding" [52]. In addition to the above, I also add the externally oriented argument for the TCM and the CLIMIT R&D programme to the list; Norway sought through its domestic efforts to contribute the development of globally replicable, affordable CCS technologies [48]. The relationship between Norway's domestic and external CCS activities is elaborated below.

By 2014, Norway's CCS foreign policy may be grouped into four thematic categories: i) Efforts to include CCS into the CDM of the UNFCCC; ii) contributions to full-scale and pilot projects in the EU, China and South Africa; iii) financial support to global and European civil society promoting CCS acceptance and favorable regulations and; iv) bi- and multilateral "CCS diplomacy" at the ministerial and technical levels. Table 1 below lists key aspects of Norway's international CCS efforts within the four categories.

³ Although 2008 was the year of the formalization of the CCS foreign policy action plan, several of the listed portfolio items were initiated earlier

Table I. Norway's CCS foreign policy portfolio 2008-2014

<i>Thematic category</i>	<i>Forum or channels of implementation</i>	<i>Key activities or channels of implementation</i>
<i>Inclusion of CCS into the CDM of the UNFCCC</i>	<i>UNFCCC negotiations and UNFCCC secretariat</i>	<i>UNFCCC negotiations, sponsored workshops and “capacity building” among convention parties [54] .</i>
	<i>DNV</i>	<i>“CCS in CDM in Africa” status assessment project in Tanzania, Mozambique, Angola [55]</i>
	<i>ECN</i>	<i>CCS in CDM in Africa, South Africa CCS Centre [56]</i>
<i>Contributions to pilot and full-scale implementation</i>	<i>EEA Grants</i>	<i>CCS implementation in Poland and Romania [57-59] CCS R&D in Czech Republic [60]</i>
	<i>NZEC</i>	<i>Pilot CCS implementation in China with EU [40]</i>
	<i>WB CCSTF</i>	<i>Pilot CCS implementation in South Africa with UK [61]</i>
<i>Financial support to civil society, capacity building and technical conferences</i>	<i>Civil Society support</i>	<i>Global: ZERO, Bellona Foundation, GCCSI, IEA, UNIDO. EU: ZERO, Bellona [48, 62-64]</i>
	<i>WB CCSTF</i>	<i>World Bank capacity building activities in 10 developing countries [65]</i>
<i>CCS diplomacy beyond UNFCCC</i>	<i>Dedicated multilateral forums and regimes</i>	<i>4 Kingdom Initiative [66] Carbon Sequestration Leadership Forum Clean Energy Ministerial North Sea Basin Task Force [48] Bergen High-Level CCS Conference [49] OSPAR convention IMO, London Protocol [13]</i>
	<i>Bilateral CCS diplomacy (selection)</i>	<i>MoU with UK [67] MoU with US [68] MoU with South Africa [69] Foreign stations' efforts</i>

As a technology neutral regime, the UNFCCC leaves the choice of mitigation options to the convention parties. The CDM mechanism, however, had a more limited set of accepted activities based on its methodological guidelines. The global standing of CCS would be reinforced if it were allowed into the CDM. CCS was eventually included in the CDM in 2010 after extensive negotiation among the Kyoto Protocol parties [70]. CCS also found its way to the ODA budget and thus increased the footprint of CCS in the MFA's portfolio of climate related activities beyond the function of diplomatic facilitation. These ODA activities were mainly aimed towards CCS “capacity building” and “technology transfer” in developing countries. Also a World Bank trust fund was initiated by Norway to this end, primarily funded by ODA [71]. The World Bank gained an agency within the CCS agenda that was helpful in order to build international support among developing countries, in particular for the purpose of allowing CCS into the CDM. At the regional level, a priority was to promote joint CO₂ storage solutions in the North Sea among regional partners, notably with the UK, Dutch and German governments and industry [72]. This required

modifications of the OSPAR and London Protocol marine pollution agreements. Within the EU, significant Norwegian funding was offered Eastern-European states as part of the 2009-2014 “Norway and EEA grants”, which are part of Norway’s obligations under the agreement regulating access to the European Economic Area [73]. Notably, some EUR 180 million in Norway/ EEA grants were offered Polish and Romanian full-scale CCS project [57, 58, 74]. In terms of support for civil society, Norwegian NGOs Bellona and Zero Foundation received funding with a European and a global mandate to promote CCS. Funding also reached international organizations preoccupied with the provision of epistemic terms, such as the IEA, GCCSI, UNIDO and UNFCCC secretariat, which have delivered international CCS road maps, workshops and conferences. For the 2008-2014 period, some EUR 200 million was set-aside for the purposes of the international CCS portfolio. While this externally oriented budget in its own right represents significant resources, it amounts, however, to less than 10% of Norwegian budgeted funding to domestic CCS activities over the same period [47].

3 Explaining Norwegian CCS foreign policy- 2008-2014

When applying the foreign policy analytical framework introduced above, how may the external projection of Norway’s CCS policies 2008-2014 be explained? Starting with the outside-in perspective, this chapter provides an analysis of the phenomenon under scrutiny.

3.1 *Outside-in: Steady course through a dynamic global environment*

During the period Norway developed its CCS foreign policy, the international context shifted significantly. Initially, CCS won acclaim among the international community. At the ministerial level, the CSLF, launched by the US in 2003, gave CCS high-level attention [75]. At heads-of-state level, the G8 leaders in 2005 stated strong support for CCS as a legitimate and necessary mitigation option [76]. In policy practice, the EU followed up by providing incentives for CCS implementation and a regulatory framework [77-79]. Policymakers had epistemic support in the IPCC, IEA and the Stern Review, all underlining the importance of CCS as a bridging technology towards the two-degree target [80-82]. By 2008, Norway’s CCS foreign policy was seemingly on top of the international climate political wave.

What later happened, however, struck the international CCS agenda severely. As expected, several countries were skeptical towards CCS as a mitigation option under the CDM – reportedly for reasons of safety concerns but also for claims of CCS being a blind alley imposed by the global North obstructing the road towards “sustainability” [15, 83, 84]. These hurdles were eventually overcome, with CCS included into the CDM of the UNFCCC in 2010 [85, 86]. It was finally a legitimate mitigation option within the only functioning mechanism set up to promote international “climate technology” transfer. Meanwhile, other more important obstacles towards global CCS acceptance and implementation had arisen. For one, the UNFCCC negotiations stalemated in 2009 and the expected post-2012 regime was delayed [87]. As a critical undercurrent, the 2008 economic downturn effectively discouraged many policymakers from bearing the risks and costs of specific CCS flagship projects or sufficient incentive structures. In the EU, the policy tools implemented to move CCS deployment forward, notably the NER300, EUETS, and EEP, were eventually proven inadequate [88].

Despite the obstacles CCS faced at the regional and international level, Norway did not shift course. In 2010, fresh funding for CCS implementation was offered Eastern European states under the EEA Grants and also ODA funds were repeatedly allocated for the purposes of CCS “readiness” in developing countries. As late as of November 2013, Norway allocated EUR 2 million to a 2017 pilot project in South Africa. In short, Norway’s CCS foreign policy was maintained throughout varying international currents throughout the covered period. However, informants close to policymakers report that international CCS implementation was less common on the Norwegian ministers’ talking points under bilateral and multilateral meetings after 2012. Instead of pointing at the shifts at the international level as a reason, this is explained by the developments of Norway’s CCS efforts at home, as shall be pursued in the following section.

In context of the UNFCCC, Norway’s CCS foreign policy may be interpreted as a means for Norway to honor its regime obligations on terms that harmonize with its petroleum exports oriented political economy. Hence, having

CCS accepted under the UNFCCC fits well with Norway's views on the importance of CCS as a tool needed to achieve the regime's overall objective and for post-Kyoto regime formation. But also in an alternative perspective, independent of a globally binding regime, focus on specific mitigation options rather than the desired carbon cap end state, could yield significant mitigation results. Some states have taken this "action approach" in their focus on "short lived climate forcers" and "REDD+" [89-91]. Norway's focus on CCS could thus contribute to "problem solving results" within a weaker regime or in a stretched out phase of regime formation. From the inside-out perspective, however, it would be highly negative for the Norwegian government if its domestic CCS efforts, most notably at Mongstad, were not recognized as legitimate mitigation action. In such a situation dismissal would not happen explicitly – but through other countries' lack of replication of Norway's supposed CCS innovations. Demand for capture technology, a foreseen business opportunity, would not increase and CO₂ from continental Europe would hardly find its way to Norwegian North Sea reservoirs.

3.2 Inside-out: The TCM fallback position and CCS foreign policy

As argued above, Norway's initial CCS policies were designed mainly as an instrument to harmonize the climate political Gordian knot, where the "gas power conflict" particularly manifested the existing cleavages. Early CCS practice was the outcome of the domestic political system in the sense that political opposing parties in the "gas power conflict" throughout the late 1990s and 2000s had to govern together in various constellations. Common ground was often found thanks to the promise of CCS in different forms, such as scaled-up R&D [41, 44]. Perhaps surprisingly, this implies that there was no single, long-term "master plan" behind Norway's CCS policy pillars of the first decades. Instead, implemented policy was the result of a *project per project* based political struggle for solutions that would accommodate winning coalitions of actors as contextualized by "the gas power conflict." Hence, the Kårstø and TCM-CCM projects resulted from political struggle among the political parties in government. The government had the stance that no non-CCS plants would be built while powerful political decision-makers and industrial actors (notably Statoil, trade unions and the ruling Labor party) were still in support of non-CCS plants. As a compromise, the power plants were built and the government was to bear costs and risks related to a *retrofitting* a CCS plant to the operational Mongstad industrial site [48, 92-96]. The state's direct involvement in the TCM-CCM undertaking was the ad-hoc solution to a dire situation. In the Mongstad case, the Labor party supported Statoil's intent to build a new power plant. Coalition partner in government, the Socialist Left party, could not accept this. The political compromise reached was one of risk mitigation, in that the TCM for the purpose of capture technology development was built first, and the CCM, for the purpose of permanent storage from the Mongstad plant, was to follow [92, 94]. While the TCM was operational from 2012, the CCM plan was abandoned due to high costs in 2013 [97]. With TCM being the principal and "only" Mongstad result, technology development became an even more important argument. Following the line of reasoning behind the principle of global cost-effectiveness in Norwegian climate policy, the case for curbing national emissions from CCS at Mongstad weakened.

What remained was the importance of the internationally oriented technology development effort undertaken at the TCM, what I label the "TCM fallback position". The output of Norway's CCS policy was no longer a means to lower national emissions and demonstrating a full-scale plant, but rather technology development for a global constituency. As for the validity of the international CCS argument, a CCS foreign policy promoting the case for global CCS use was a prerequisite. From the above, one important insight stands out: Fostered by the "gas power conflict", it was the commitment to curbing domestic emissions that was the initial driving force of the CCS agenda in Norway. Yet, for CCS to function as climate policy in Norway, technology development for the international scene is what has actually proved necessary and a sufficient argument to broker political solutions. R&D served the purpose as "technological glue" in the "gas power conflict" and later fitted the case for global CCS deployment.

This is the *technology shift* in Norway's CCS policy, one that could also be labeled the *CCS foreign policy shift*. The technology to be developed was now mainly meant for application outside Norway. This shift is evident in at least two ways. The government in its white paper, "Full scale CO₂-handling" of 2010 (St. Meld. No. 9 2010-2011), put emphasis on the international objectives of its CCS policy while downplaying the importance of the CCM. Parliament, too, as part of the Second Climate Settlement of 2012 lowered its national ambitions. Here, the government was instructed to look into the opportunities for "CO₂ value chains in Norway" without further

commitments, while announcing a “strengthening” of the ongoing international efforts. This is by my informants explained as when “the realities of CCS sunk in.” By 2012, it had proven difficult to succeed with the CCM as an effective full-scale project and the international wind was no longer blowing the CCS direction. The technology shift, highlighted by the TCM fallback position and the foreign policy agenda, was the remaining CCS policy output. To place the CCS foreign policy pillars in context, table 3 highlights selected milestones of Norwegian CCS and climate policy.

Table 3. A summary of key aspects of Norway's CCS efforts in the context of climate political macro drifts

Time period	Overall climate policy objective	System scope, preferred solutions	Instruments introduced in relation to CCS	Selected CCS milestones
1989-1996	Stabilize Norway's emissions at 1989 level by 2000 [42]	National, Lead by example [98]	Carbon tax	Steipner operational 1996
1996-2008	Contribute to the objective of the UNFCC [99]	Global, cost-effectiveness within cap Technology development [7] CCS as technological glue at national level	Domestic, regional and global quota markets Gas power conflict: Shifting governments had shifting policies towards natural gas fired power plants [44]	CLIMIT 2000 Concessions for non-CCS plants 2000, 2002 Gassnova 2004 Kårstø full-scale 2005. Later cancelled. TCM and CCM 2006, 2007
2008-2012	The First Climate Settlement: 70% of 1990 levels by 2020 and 2050 carbon neutral [53]	As above. Climate change development assistance	Regional and global flexible mechanisms; EU ETS, CDM. Norway's global mitigation efforts: CCS, REDD+, “Energy+” [100]	International CCS strategy 2008 CCS as ODA and EEA
2012-	The Second Climate Settlement: Previous target reaffirmed [40].	As above but lowered ambitions for a global regime post 2020.	Up-scale of domestic technology fund, including CLIMIT	TCM operational 2012 CCM cancelled 2013 [101] Feasibility study for CCS projects beyond CCM and Kårstø 2012
2013-	A “strengthening” of the Climate Settlement as part of the new Government's initial declaration [50]	As above		Ambition of a materialization of a full-scale CCS project by 2020 [50] Revision of entire CCS policy 2013 [51]

3.3 Bureaucratic politics: Foreign Policy at the hands of the Ministry of Petroleum and Energy: CCS as a national interest

Since the state seeks to fulfill its international obligations on terms that are acceptable or even appealing at the domestic level, multiple arguments are combined to attract what may establish winning coalitions of actors behind policy. In this case, these arguments include the importance of CCS in the context of the global two-degree target,

business opportunities from CCS technology exports, opportunities from regional CO₂ storage in the North Sea, CCS, bilateral development opportunities and more. A political economic argument was precisely put by the then minister of Foreign Affairs when addressing the Norwegian Oil and Gas Association in 2011: “The long term attraction of natural gas in a Europe underway towards sustainable energy solutions requires success in CCS, nothing less.” [102]

At the level of bureaucratic politics, the development and implementation of Norway's CCS foreign policy is one where CCS as a topic of national energy policy, within the MPE's mandate [13, 36], expanded and migrated into new arenas beyond those of “energy and petroleum” [33]. CCS became a topic of the multilateral climate change negotiations, development assistance policy, regional economic cooperation, and international innovation policy. Indeed, CCS became part of high-level diplomacy and foreign policy in various constellations. The grip of the MPE however, has persisted throughout this expansion. It's section for “Climate, Industry and Technology” has led Norway's CCS foreign policy both in terms of budget allocations and political priorities. Since 2008, the international CCS policy was, according to my informants, developed and implemented in close cooperation between the OPM and civil servants of the MPE. In this phase, the Center party political leadership of the MPE was not participating proactively. Instead, the prime minister and his team from the Labor party were engaged together with the MPE bureaucrats. In this process, the MFA was a facilitator rather than a provider of terms. The MFA sought for multilateral participation at the Bergen conference, for diplomatic contributions at relevant Foreign Service stations and, most importantly, for the ODA and EEA chapters. Surprisingly, but in line with the argument of the MFAs constrained agency, CCS is not even mentioned in the MFA's own relevant white papers of 2009 and 2011; “Climate, conflict, capital – Norwegian development policy in a changing room of maneuvering” and “Towards a greener development – On the relations between environmental and development policy”. The secondary role of the MFA is also underlined in that the MPE holds Norway's seat in the multilateral CCS forums and that the current revision of Norway's CCS strategy reportedly is undertaken largely without the involvement of the MFA. The MoE has even less control over the priorities and events within the portfolio of what is “a cornerstone in our climate policy”, in the words of a previous Minister of Foreign Affairs [102]. Its domestic role has historically been to administer political steered allowances to emit CO₂. On the international level Norway's UNFCCC delegation is headed by the MoE, while a representative of the MPE leads the negotiations tracks related to CCS.

The prominent role of the MPE in all CCS foreign policy is contrasted by the organization of other Norwegian international climate policy programmes. Examples are the International Energy and Climate Initiative and the International Climate and Forest Initiatives, both ODA funded, which are led by the MFA and MoE, respectively. This is a consequence of the domestic origins of Norway's CCS policy. In fact, some informants reported that the CCS foreign policy is a result of the Mongstad projects in the sense that the deliberate CCS foreign policy would not have been implemented if it were not for the government's involvement in the TCM and CCM. A suggested explanation is that the foreign policy programme was to prove the international legitimacy of the Mongstad projects; if no international support for CCS, the case for the TCM-CCM projects and the North Sea as a regional CO₂ deposit would fall.

3.4 Making a fit within the climate political room of maneuvering: CCS as development assistance, the ODA track and the Norway and EEA Grants

The diffusion of the CCS agenda into Norway's development cooperation and regional EU policies, illustrates an important aspect of the toolkit available to Norwegian climate policymakers. The 2008 CCS international action plan states that “ODA funding should be the principle source of funding” for Norway's CCS external CCS activities [52]. Parliament in the Climate Settlement, and later the MFA, found Norway's CCS foreign policy to fit within the mandate for ODA funding, which is requires the economic development and welfare of developing countries to be a main objective of the effort. The prevailing argument is that of the importance of CCS as a global mitigation option and the reduced costs related to CCS implementation in developing countries. There are also examples where the MPE's and the MFA have co-funded international CCS activities over the past years.

The use of ODA funding was also intended to underpin the efforts made to have CCS included into the CDM. These resources were in particular allocated to sub-Saharan Africa and certain developing countries countries, like South Africa and Indonesia, in line with the priorities of the international CCS action plan. Some informants have

emphasized this international turn as a consequence of Norway's overall climate policy in line with principle cost-effectiveness under a globally binding regime with a price on emissions. In a CCS context, it would imply that more CO₂ could be sequestered at lowered cost beyond Norway. To date, no full-scale CCS projects have been materialized with the use of Norwegian funding.

ODA funding for international CCS efforts, together with the explicit priority given CCS under the 2009-2014 Norway and EEA Grants, underlines a willingness by Norwegian policymakers to allocate significant financial resources for the purpose of a global CCS rollout. The two mentioned sources of funding have in common not only that they are administered by the MFA, but also that their respective budgetary ceilings are given based on set criteria. Consequently, policymakers direct allocations towards prioritized policy areas within the predefined ODA and EEA budget lines. The ODA budget ceiling is dictated by overall development policy goals and the EEA 2009-2014 cap was a result of negotiations with the EU. Given their mandate to prioritize CCS, Norwegian policymakers effectively made their cause within the ODA and EEA resource pools. This in turn materialized into the various externally oriented CCS activities described above, funded by the Norwegian government.

4 Conclusion

The ambition of this study was twofold; to map Norway's CCS foreign policy portfolio, to explain it as a choice of climate policy means, and to do so with FPA as the analytical method of choice. From the outside-in perspective, the international climate regime as a framework condition for Norwegian CCS foreign policymaking was emphasized. Together with insights from the literature on Norwegian climate policy, the bureaucratic politics model was used to identify actors and to project domestic interest formation from the inside-out perspective. As we have seen, Norway's CCS policies have evolved over time within a dynamic climate political room of maneuvering influenced by internal and external drivers. Between international and domestic restraints and obligations, winning coalitions utilize what is feasible in order to harmonize the potentially conflicting agendas of Norway's climate political Gordian knot. From these accounts, the following take-home messages stand out:

From the outside-in perspective, this is a case where the state in question does not behave passively towards its obligations. Instead, the actor seeks to influence the framework structure. Norway takes a pro-active stance to shape the UNFCCC's attitude towards CCS. This takes place within the regime negotiations directly and also by use of other multilateral channels. Norway's CCS foreign policy portrays a small state with a willingness to flag and accommodate its interest within the climate regime.

From the inside-out perspective, Norway's CCS foreign policy serves to illustrate how "all politics is local." This externally directed policy, a climate change mitigation policy in this case, mirrors national concerns. The present findings suggest that the foreign policy pillar of Norway's CCS efforts functioned to legitimize the on-going domestic efforts. From the prevailing economic perspective of global cost-effectiveness too, building momentum for CCS in less cost intensive environments makes sense given the relatively high costs of implementation in Norway. Although Norway's domestic CCS policy during the 1990s and 2000s emphasized solutions to the domestic "gas power conflict", it is now the international and technology R&D oriented pillars that constitute Norway's most active CCS chapters. This is noteworthy as the latter at first derived from the national agenda. It adds to the narrative of how CCS in Norway went from being a national solution to a largely national political problem, to become a global technical solution to a global problem – and perhaps in part to legitimize the government's significant involvement in the Mongstad projects?

At the bureaucratic level, this study has highlighted how national agents, notably the MPE (and implicitly its sector specific constituency), followed along from domestic politics and into the foreign policy domain. Together with the OPM, the MPE's take on CCS entered the realms of multilateral climate change negotiations, development policy, regional cooperation and other diplomatic spheres. With the extensive use of ODA and EEA funds for the purpose of CCS foreign policy, we have seen how tapping into "no-regret" budget lines may effectively mobilize resources for novel purposes. It underlines how the technology R&D and ODA arenas may serve multiple policy goals, including climate policy targets.

The present study has attempted to illuminate the choice of CCS foreign policy as climate policy in Norway. But to better understand this case, further contributions are needed. First, as focus here has been on government agencies

as agents, the roles of political parties, individual decision-makers and other domestic actors, like NGOs, have not been explored in depth. In particular, how may the prominent presence of CCS foreign policy in parliament's 2008 and 2012 cross-political climate settlements be explained on such terms? Second, previous studies have described the development of Norway's domestic CCS policy as a one with clear path dependency effects [8]. Examination along a similar line of reasoning may yield fruitful also for the foreign policy case.

Finally, the *effects* of Norway's CCS foreign policy have *not* been covered in the above. A further inquiry into the effects of Norway's CCS foreign policy is recommended. At a glance, indications point to a higher degree of acceptance for CCS as a legitimate mitigation options at the international level. However, the *mitigation effects*, in terms avoided emissions, from international CCS deployment is marginal to date. A further analysis of the actual effects of Norway's CCS foreign policy would be timely. Put to the extreme in light of the climate political Gordian knot, is this merely aimed to implement measures that contribute to Norway's climate political credibility by the means of diplomacy, R&D funding and ODA spun around the "promise of CCS"? Or is this a comprehensive strategic approach to mitigation action that will yield tangible results in due time?

Finally, the fact that Norway's entire CCS policy now is at crossroads should be of our interest. The current situation indicates that the historical main engine of the CCS agenda in Norway, CCS from natural gas power plants, is less relevant. We have instead seen how the external and technology branches of Norway's CCS policy have become more important. It is at the time of writing undecided how the government will follow-up on its commitment to materialize a full-scale CCS project by 2020. The question remains as to what motivations will guide Norway's CCS policies in light of the two-degrees target and other explicit and implicit policy goals.

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Appendix

List of informants:

- Informant A: Senior official of the Stoltenberg II government
- Informant B: Senior official of the Stoltenberg II government
- Informant C: Representative of Bellona Foundation
- Informant D: Senior official of the Ministry of Climate and Environment
- Informant E: Official of the Ministry of Climate and Environment
- Informant F: Senior official of the Ministry of Foreign Affairs
- Informant G: Official of the Ministry of Foreign Affairs
- Informant H: Senior Representative of the Ministry of Petroleum and Energy
- Informant I: Representative of SINTEF Energi AS
- Informant J: Senior official of the Solberg I government
- Informant K: Senior official of the Stoltenberg II government
- Informant I: Senior official of an industrial company.