

This is the post-print version of the article eventually published in  
*Environmental Politics*, Vol 28, No 6, 2019, pp. 1039-1060.  
<https://doi.org/10.1080/09644016.2019.1625145>

## Creative and disruptive elements in Norway's climate policy mix: the small-state perspective

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**ABSTRACT:** Recent scholarship has argued that effective and credible national climate policy mixes should encompass measures that promote new low-carbon technologies alongside those instruments aimed at constraining and phasing out support for existing polluting industries. The creative and disruptive policy measures in Norway's climate policy mix are analysed by focusing on both national and international climate mitigation efforts. Norway's climate policy mix at home has been more ambitious in the transport sector with a growing electric vehicle market than in the energy sector where niche support and disruptive policies have remained weak. Abroad, Norway has been increasingly active in supporting new low-carbon technologies and disrupting the fossilfuel industry, especially coal. This is explained by the consensus-seeking and oil and gas dominated small-state social-investment political economy in Norway, combined with a forward-looking foreign policy based on normsetting and multilateralism.

**KEYWORDS:** Climate policy; policy mix; niche support; technology disruption; energy transition; Norway

### Introduction

As global attention towards mitigating climate change intensified following the Paris Agreement in 2015, so has the scholarly interest in national climate policies, their design and implementation challenges (Peters et al. 2017, Schoenefeld, Hilden and Jordan 2018). There is increasing understanding that the substantial transformation towards a low-carbon economy cannot be achieved with single policy interventions, but rather through a well-designed mix of mutually reinforcing policy measures (Rogge and Reichardt 2016). Recent scholarship has convincingly argued that effective and credible national climate policy mixes should encompass measures that promote new low-carbon technologies and sectors alongside instruments aimed at constraining and phasing out support for existing polluting industries (Kivimaa and Kern 2016, Geels et al. 2017). The conceptualization of climate policy mixes targeting 'niche support' and 'creative destruction' and how the scope and effects of such policy measures are shaped by broader political-economic factors is, however, yet to be fully developed and understood.

Here, we seek to advance this debate by investigating the ‘niche support’ and ‘creative destruction’ elements in the climate policy mix in Norway over time. Furthermore, we explore how political-economic and foreign policy features of Norway as a small, advanced and corporatist economy have influenced the relative weight of different elements in the climate policy mix. Empirically, we add to the existing literature by providing an empirically-rich account of the key ‘niche support’ and ‘creative destruction’ climate policy measures in Norway and their historical development. As a theoretical contribution, we further develop the conceptual framework for scrutinizing ‘niche support’ and ‘creative destruction’ climate policy instruments by proposing a more consistent and comprehensive framework for analysis. We also demonstrate how the small state-specific features of Norway’s political economy and foreign policy provide valuable insights into the factors that shape the creative and disruptive character of the climate policy mix. With this, we aim to address the gap in the literature as few studies have drawn on the insights from comparative political economy to explain national climate politics and policy (but see Lachapelle and Paterson 2013). By incorporating the foreign policy factor, we seek to contribute to the literature on the role of international affairs and symbolic politics in national climate policymaking (Harris 2002).

With its long history and remarkable activity in climate policy at home and abroad, Norway represents a pertinent case for studying climate policy design and policy change. Norway is a small European country, if measured by its direct contribution to global greenhouse gas (GHG) emissions, which lies around 0.1% of the global total. However, this figure hides the actual impact, capacity and responsibility of Norway with respect to climate change. Norway is the second-wealthiest OECD country in GDP per capita (OECD 2016), and most of this wealth comes from the production and export of carbon-intensive fuels: oil and gas. Norway is the world’s fifteenth largest oil producer and the sixth largest producer of gas. Around 16% of Norway’s GDP and 40% of its exports stem from the petroleum sector excluding the service and supply industry (Norwegian Petroleum 2019). Moreover, Norway is ranked the seventh largest exporter of GHG emissions globally (Oil Change International 2017). Not only does Norway hold considerable historical responsibility for driving global climate change, but it has also continuously expressed its commitment to contribute to mitigating climate change. The recent focus on combating climate change and decarbonizing the economy, at the EU and international level (via the ‘Paris Agreement’), has placed even greater demands on Norway to re-think its climate policy and diversify its dependence on fossil-fuel-based revenues.

Against this background, we explore two sets of questions. First, what policy mix has the Norwegian government employed to reduce GHG emissions, and how has that mix changed over time? The policy mix is understood as a combination of nationally defined climate-policy goals and means encompassing ‘low-carbon technology creation’ and ‘fossil-fuel destruction’ strategies. Second, what factors help explain the relative weight of creative and destructive elements in Norway’s climate policy mix, and their

stability and change over time? In addressing the first question, we conceptualize creative and destructive climate policies and their historical evolution by building upon the framework of 'niche support vs. creative destruction' outlined by Kivimaa and Kern (2016). We focus on climate mitigation measures in the energy and transport sectors (excluding aviation) as the largest GHG emitters in Norway (Statistics Norway 2017). In answering the second question, we draw on insights from studies of the comparative political economy and foreign behaviour of small states as important variables in explaining national policy responses to climate change.

### **Towards a theoretical framework**

In the subsequent sections, we develop our theoretical framework for conceptualizing and explaining the creative and disruptive features of the climate policy mix in Norway. In the first section we outline the framework for capturing the nature and evolution of the climate policy mix by drawing on the insights from the studies on sustainability transitions and climate policy innovations. In the second section, we briefly review the literature on the political-economy and foreign policy of small states, and Norway in particular. This will allow us to identify the key concepts and theoretical assumptions concerning the relationship between Norway's small-state characteristics and climate policymaking.

### ***Conceptualizing climate policy mix: between creation and destruction***

Despite growing investments and significant cost-reductions in renewable energy and other low-carbon technologies, global GHG emissions have failed to decrease substantially (IEA 2017). This raises the question of whether the stagnation or even rise in GHG emissions (Globalcarbonproject 2017) is a temporary feature of generally sensible lowcarbon transitions or whether it is a sign of ill-defined policies, lack of political resoluteness and carbon lock-in. Scholars have recently suggested the stronger focus on the disruptive character of sustainability policies. They have argued that a genuine transition can only be achieved if policy strategies for promoting low-carbon technologies are accompanied by credible policy efforts to constrain and eventually phase-out polluting industries and practices. Uncovering the creative and destructive elements of climate policy mixes thus offers important insights into the comprehensiveness and credibility of national decarbonisation strategies. The investigation of creative and destructive sustainability policy measures is still at the early stage. Kivimaa and Kern (2016) have proposed a framework for categorizing creative and destructive policy measures and applied it to understand the energy efficiency policy mix in Finland and the UK. They conclude that the policy mix in both countries is unbalanced in favouring niche creation over creative destruction. David (2017) has applied a similar approach to the energy transition in Germany, labelled 'innovation vs. exnovation, innovation referring to the creative part of the policy mix whereas exnovation refers to measures to destabilize the fossil-fuel regime. He established that the policy mix is quite developed but

suffers from inconsistency and incoherence, particularly on the exnovation side, which has hampered the decarbonisation efforts. By focusing on the interplay between destructive and creative policy instruments in the context of the German energy transition, Rogge and Johnstone (2017) found evidence of the positive effects of the destructive policy instruments and the phase-out of nuclear energy on technological change and innovations in the emerging renewable energy sectors. Despite the valuable theoretical and empirical insights contributed by the existing literature, there is a lack of consensus on how to classify and conceptualize the key policy instruments for niche creation and creative destruction to allow for more consistent investigation and comparison across national contexts.

Our investigation of the climate policy mix in Norway is inspired by the framework of Kivimaa and Kern (2016) but we modify and hopefully improve the framework in several important respects. First, rather than focusing on the quantity of all adopted policy instruments at a given time, we discuss the most important policy measures and their historical evolution. In so doing we seek to capture the stability and change of the policy mix over time, but also provide a more detailed account of the character and impact of different policy measures. Second, we include in the analysis not only domestic climate policy efforts, but also Norwegian policy measures aimed at promoting new technologies and disrupting established fossil-fuel industries internationally. This serves to enrich the ‘creation vs. destruction’ analysis and emphasize the scope and flexibility of policy instruments available to national governments to mitigate climate change. Third, we streamline the framework of Kivimaa and Kern by suggesting a focus on four main policy categories in both niche creation and creative destruction dimensions (see Table 1).

*Table 1. Taxonomy of niche support and creative destruction measures.*

	Niche support	Creative destruction
Energy production /Transport	Market formation Incentives for promoting demand for new lowcarbon technologies Support for low-carbon R&D Policy measures aimed at supporting the development and demonstration of new lowcarbon technologies Resource mobilization for low-carbon sectors Measures for mobilizing capital for low-carbon projects and technologies  Strategic goals for developing low-carbon technologies Time-frames adopted for expanding new lowcarbon sectors and technologies	Control policies Market and regulation-based restrictions on polluting sectors Constraints on carbon-based R&D Decrease in public spending on RD&D for carbon-based sectors Constraints on carbon-based investments Decrease in government subsidies and investments in carbon-based business operations Strategic goals for constraining carbon-based technologies Time-frames adopted for constraining and phasing out carbon-based sectors and technologies

Source: Adapted from Kivimaa and Kern (2016)

### ***Political economy and foreign policy of small states: the case of Norway***

What can the institutions of the small advanced economy of Norway tell us about the likely nature and evolution of its climate policy mix? We argue that two dimensions of small states are particularly important for understanding their climate policy strategies: corporatist political economy and ambitious forward-looking foreign policy.

#### ***Small-state political economy of climate policy in Norway***

Although not without its shortcomings, Katzenstein's (1985) seminal work on small states in world markets remains the chief reference point for understanding the politics and policy of small states (Ingebritsen 2010). In more political-economic terms, Keating and Harvey (2014) distinguish between the market-liberal and social-investment models among small states. Keating (2015) argues that the success of small, open economies hinges on two critical conditions. The first is access to external markets – essential for compensating for a small domestic market and low economic diversification. Such economies are often keen proponents of trade liberalization and non-discriminatory economic measures globally. Although not a full EU member, Norway has participated in the internal EU market since 1994 through the Agreement on the European Economic Area (EEA), which grants Norway access to the single market, conditional on Norwegian implementation of EEA-relevant EU legislation. Norway has become increasingly integrated with the EU mainly because the EU is seen as the major market for Norwegian products, especially natural gas. Around 75% of Norway's trade is with the EU while almost all Norwegian gas exports are directed to the EU market (European Commission 2017). As a non-EU member, Norway has limited formal influence over EEA-relevant EU legislation, including the ever expanding EU climate and energy policies. Norway has, however, used the available institutional and informal channels to inform EU energy policy and mediate its domestic effects (Hofmann et al. 2019).

The second condition for success is the existence of a consensus-based institutional setting combined with extensive public spending, serving to buffer and enable adaptation to volatile economic forces. Katzenstein (1985) describes such institutional arrangements as 'democratic corporatism'. Consensus-seeking and partnership-based policymaking arrangements tend to facilitate long-term policy planning and coordination, but may impede deeper reforms and neglect larger problems (Keating and Harvey 2014). It is worth noting that corporatism is not an exclusive feature of small states, as larger economies can also entail corporatist state-market structures (Hall and Soskice 2001). The democratic corporatism in small advanced economies is, however, distinctive due to closer state-market ties and a more inclusive policy process, which is also a result of a smaller population and often a unitary state structure. Existing research shows that corporatist structures in Norway have facilitated stable and long-term environmental and energy policies, but have prevented more radical and disruptive policy solutions

(Dryzek 2003, Četković, Buzogany and Schreurs 2017). While all small economies of the social investment model share some common features, they are not uniform in their adaptation strategies. These depend on many factors, including elite beliefs, social identity and the relative weight of different national economic sectors (Ingebritsen 2010). A closer look reveals at least four key elements that characterize the Norwegian political-economic landscape: first, a trade-oriented economy based on energy-intensive industries, exploitation of natural resources and close collaboration between established industrial clusters and domestic research institutes; second, a social welfare model based on comprehensive state–capital–labour wage bargaining, high taxation, low inequality and strong emphasis on balanced regional development; third, a proportional representation electoral system with a consensus-seeking policy style; fourth, an influential role for pragmatic thinking and the economics-dominated academic community (Fagerberg et al. 2009, Mjøset and Cappelen 2011, Dyrstad 2015). Since the first major discovery of oil in 1969, the petroleum sector has evolved into a cornerstone of the Norwegian welfare state. The electricity sector is almost entirely dependent on carbon-free hydropower, which reduces the domestic climate mitigation options to the transportation and oil and gas sectors.

From this literature, we expect a consensus-oriented and coordinated market economy such as Norway's to show considerable capacity for the development and adjustment of long-term climate policy instruments, not least because of the need to implement EU energy and climate policy and adapt its export-oriented economy to more exacting GHG emission standards. Further, strong petroleum sector corporate influence and tight and consensus-seeking policymaking should favour incremental niche support rather than radical destruction. In addition, more disruptive policy measures could be expected in the transportation sector given the considerable mitigation potential, lack of strong domestic corporate interests and the diffuse character of vehicle emissions, which makes policy change politically easier to implement.

#### *Small-state foreign policy of Norway and climate policy*

The importance of the national foreign policy strategy for the country's climate policy is an important but largely neglected issue (for exceptions, see Harris 2002, Cass 2008). Although foreign policies of small states have traditionally not received as much attention as those of great powers (Neumann and Gstöhl 2004), scholars have begun showing interest in the subject (Ingebritsen et al. 2006, Björkdahl 2008). The literature views foreign policy of small states as a product of structure or agency, or a mixture of both (Neumann and Gstöhl 2004). The structuralist approach emphasizes the rules and norms rooted in the dominant material and geostrategic relations in the international system which impact on national foreign policy strategies. Regarding foreign-policy behaviour of small advanced economies, several propositions from the structuralist approach can be formulated. Small states are more interested in maintaining and promoting international law as a means

of ensuring national security and compensating for their low military power. Here, the governments of small states typically employ soft power, norm-advocacy and reputation as key foreign policy instruments (Björkdahl 2008). With their constrained human and material resources, they often focus on a few 'progressive' foreign policy areas, such as environmental protection and peaceful conflict resolution. This is further related to the need and propensity of small advanced economies to adopt a proactive foreign policy stance for better control over agenda-setting in the international arena (Neumann and Gstöhl 2004). Whereas structural factors constitute important explanatory variables of foreign relations, the foreign policy of small states can be properly understood only when specific national characteristics are considered. These include material interests, institutional settings as well as elite and societal ideas and beliefs (Gvalia et al. 2013).

In line with the theoretical expectations, Norway's foreign policy has been part of the 'Nordic exceptionalism' characterized by a strong presence in multilateral institutions, high development assistance spending and keen support for environmental and social concerns (Hansen and Gjeffsen 2015). In the words of the Norwegian Minister of Foreign Affairs, 'Democracy, human rights, sustainable development and an international legal order form the basis of our foreign and development policy' (Brende 2015). Norway's active foreign policy and safeguarding of international rules and norms have been motivated largely by concerns for its own security and vulnerability (Norwegian Ministry of Foreign Affairs 2009, Pauly and Jentleson 2014). Beyond such interest-driven behaviour, concerns about international justice and peace seem deeply entrenched in Norway's identity and self-image (Skånland 2010). Sustainable development and environmental protection have constituted important elements of Norway's foreign policy ever since the former prime minister, Gro Harlem Brundtland, chaired the UN World Commission on Environment and Development. The ambition of being a global environmental leader spilled over to the issue of climate change (Eckersley 2016). Norway's active role in climate change negotiations has been motivated not only by the concerns for the country's international reputation as a norm-setter, but also by the desire to influence climate change agreements in line with Norwegian preferences and interests. Being a small, open, petroleum-based economy, Norway has advocated flexible, market-based climate policy solutions together with technologies that enable further use of fossil-fuels. An example of the latter is Norway's support for carbon capture and storage (CCS) (Roettereng 2016).

Against this background, we would expect Norway to maintain its ambitiousness in climate policy goals. While this should positively affect domestic climate mitigation efforts, Norway should be less constrained in mitigating climate change abroad than in its efforts to reduce GHG emissions at home, given strong vested interests and high abatement costs. Overall, Norway's climate policy mix is likely to particularly feature climate

mitigation measures abroad, possibly targeting both niche creation and creative destruction.

## **Methodology**

To identify the main climate and energy policy measures in Norway we used the IEA database and complemented it with analyses of official documents published on the websites of the ministry departments and relevant agencies. We also consulted existing scholarly analyses, expert reports and media coverage to triangulate the data. In the analysis of the effects and drivers of the identified policies, we follow the theory-guided processtracing method, which relies on established theoretical propositions to describe and explain the dynamic and interrelated role of institutions, ideas and interests in the policy process over time (Falleti 2016). Specifically, we employ a historical institutionalist perspective to trace the relationship between the adopted policy measures and actors, structures and processes at the level of national political economy and climate diplomacy of Norway.

## **Niche support and creative destruction in Norway's climate policy**

In this section we describe the major policy actions that Norway has taken to address climate mitigation, breaking them down into two main categories: niche support and creative destruction policies. In addition to describing the character, evolution and impact of different policy instruments, we also analyze the drivers behind the adopted measures by employing the political-economic and foreign policy insights on Norway as a small, advanced, social-investment economy.

### ***Niche support***

#### ***Market formation***

Given the projected increase in energy demand and shortage of new powerproduction capacities, Enova was established in 2001 to support the realization of new renewable energy-based production facilities. Since the focus was on cost-effective energy supply, only advanced technologies were supported. Onshore wind, for instance, came into focus only during 2008–2010. Enova funding was soon replaced by a green certificate scheme as the main renewable energy support mechanism. In 2012, Norway joined a green certificate system with Sweden, setting the 2020 goal of reaching 28.4 TWh in new renewable energy in both countries combined. Although Norway and Sweden share the costs of the support scheme almost equally – Sweden is financing 15.2 TWh and Norway 13.2 TWh – by 2016 Sweden reached 14.34 TWh and Norway only 3.43 TWh in renewable electricity supported by the scheme (NVE & Energimyndigheten 2016). Green certificates are a technology-neutral instrument favouring mature technologies (e.g. hydropower). In 2017, the Norwegian and Swedish governments agreed to extend the green certificate scheme until 2030 but only for Sweden. Norway



decided not to commit to new targets after 2020 (Norwegian Ministry of Petroleum and Energy, 2017).

Another market potential for renewable energy involves replacing the carbon-based power supply of offshore oil and gas installations with lowcarbon renewable electricity (Blindheim 2015). Electrification can be sourced from land (onshore wind and hydropower) or through offshore wind power installations. Since 1996, companies have been mandated to consider electrification in connection with the licensing process, and the 2012 White Paper on Norwegian climate policy emphasized increasing the electrification of petroleum fields (Norwegian Ministry of the Environment 2012). However, with a new centre/right coalition in power, the 2015 White Paper dropped this requirement (Norwegian Ministry of Climate and Environment 2015). In 2013/2014, there was a parliamentary debate on requiring full-scale electrification from the start for the major new North Sea oil project 'Johan Sverdrup'. Eventually, mandatory electrification of the project was postponed until 2022. Despite the rise in state R&D spending, broader legitimacy and a functioning market for new low-carbon technologies such as offshore wind and CCS have failed to develop (Normann 2014, 2015)

The key instrument for reducing GHG emissions in the transport sector has been purchase incentives for electric cars. These incentives have been gradually introduced over the past two decades, but the concerted government action and rapid increase in electric vehicles started in 2009 (IFE 2015). Passenger cars are heavily taxed in Norway, whereas electric vehicles are either fully exempted or subject to reduced tax rates. Electric vehicles are also allowed to drive in bus/taxi lanes and enjoy free public recharging stations. These measures have been successful in creating one of the most dynamic markets for electric vehicles in the world: by April 2015, Norway had more than 50,000 electric cars (IFE 2015). Promoting electric vehicles is an attractive climate policy instrument due to Norway's dominantly hydropower-based zero-carbon electricity production. Although the reductions in electric vehicle subsidies have been debated, the decision has been made to extend the support scheme until 2020 (Norwegian Ministry of Climate and Environment 2017).

Overall, creating the market for established renewable energy technologies through the green certificate scheme has been tied to Norway's climate foreign policy and political and economic linkages with the EU, but progress has been slow and Norway has accepted fulfilling its green electricity targets mainly by financing projects in Sweden. In the transportation sector, weaker incumbent actors and interests have enabled Norway's success in creating the lead market for electric vehicles and so reducing its GHG emissions and strengthening its international image as a climate policy leader.

#### *Support for low-carbon R&D*

State support for research on energy and transport technologies began with a technology-neutral approach but eventually included more targeted measures to promote infant low-carbon technologies. State R&D funding for clean

energy and transport reached a turning-point in 2008 following a broadly based political compromise ('the climate agreement') reached among all major political parties in the parliament, except for the neoliberal Progress Party (Government of Norway 2008). In the same year, a national energy R&D strategy 'Energi21' was announced, with the overarching vision of strengthening Norway's status as 'a climate-friendly energy nation'. The main novelty of Energi21 lies in its focus on promoting both mature and infant climate-friendly energy technologies where Norway has expertise and potential comparative advantages (ENERGI21 2014). The previous energy research programme, RENERGI, expired in 2013 and was replaced with ENERGIX, more closely aligned with Energi21. Since 2005, a programme for research on CCS has also been in place.

Enova, Norway's main energy funding agency, has worked to promote the demonstration and testing of infant and close-to-market technologies, such as offshore wind (ENOVA 2015). Funding demonstration and testing of clean transport technologies became the responsibility of Transnova, a state enterprise established in 2009. Its budget varied from NOK50 million in 2009 and 2010 to NOK74.8 million in 2012. Transnova was instrumental in creating the infrastructure for electric vehicles through financing free public recharging stations.

Although the government share of R&D in low-carbon technologies has increased sharply since 2008, stabilizing in recent years, overall R&D spending has actually declined. Total state and private R&D spending on renewable energy recorded a sharp decline in 2009–2013, due to lower private-sector involvement, as did that on CCS, where spending declined after peaking in 2011 (Research Council of Norway 2015). The increase in the R&D support was clearly associated with EU renewable energy policy and the binding national targets formulated in 2009. Norway's participation in the EEA has stimulated policy change towards more R&D support for niche technologies, but the unfavourable political-economic conditions reflected in the resistance of incumbent actors and low electricity prices have prevented the creation of the market for such technologies.

#### *Resource mobilization for low-carbon sectors*

The support for climate-friendly business has been channelled mainly through the state-owned enterprise 'Innovation Norway'. The budget of its Environmental Technology Programme has increased considerably since its creation in 2010, from NOK140 to 465 million in 2016 (Innovation Norway, n.d.). Exports of Norwegian companies, including those operating in clean energy and transport, are supported through 'Export Credit Norway', but the overall share of support secured by these industries is marginal. In 2014, the wind power industry received the most support, but amounted to only 1.13% of the overall budget (Export Credit Norway 2014). Strong state ownership in two major energy utilities, Statkraft (100%) and Statoil (67%), gives the government some influence in directing investments to priority energy sectors and projects. Although the two companies operate according to market rules,

there has been increasing pressure on energy utilities to support the government's efforts in climatefriendly technologies. In 2014 the parliament voted to support Statkraft with NOK 5 billion; an additional NOK 5 billion should come from reducing the dividend to the state in the period 2016–2018 (Statkraft 2014). The government expected Statkraft to invest in renewable energy projects. However, prior to the adoption of the 2016 budget, the government cut its support by reducing dividends, which forced Statkraft to abandon planned offshore investments and to reconsider the business model for several hydropower and onshore wind projects (Statkraft 2015).

Alongside domestic resource mobilization, Norway has played an important role in supporting climate change policies and technologies abroad. As one of the largest development aid donors, Norway has declared environment and energy as key priority areas in its development assistance. The previously stable development assistance budget for environment and energy hit a record high in 2008 and again in 2013, following the two national parliamentary climate agreements from 2008 and 2012 (Government of Norway 2014b). As an EEA member, Norway supports the development of less developed regions and countries in the EU. Around one third of the entire budget is dedicated to environmental protection and climate change (EEA Grants n.d.). Norway is also investing to reduce deforestation in developing countries. At the 2007 Bali climate conference, Norway launched a major deforestation programme, pledging to contribute NOK3 billion annually until 2015 to counter deforestation. In 2011, reduced deforestation in Brazil apparently amounted to 10–20 times Norway's annual GHG emissions (Norwegian Ministry of the Environment 2012), but some have queried whether this was due to the funds allocated. Ahead of the Climate Conference in Paris in 2015, the government made the decision to scale up its contribution to the Green Climate Fund to increase the prospects for reaching a global climate agreement (Government of Norway 2015).

The considerable investments in mobilizing resources for low-carbon technologies and climate change mitigation at the international level is in line with Norway's foreign policy concerns for its international reputation and interests in stable global climate agreement. Domestically, it has been more challenging to financially support low-carbon investments given the lack of bottom-up pressures but also due to low oil prices which constrained public finances.

### *Strategic goals for developing low-carbon technologies*

The first comprehensive objective for increasing Norway's share of renewable energy sources was adopted in 2012, transposing the requirement from the EU Renewables Directive. The national target is to increase the share of renewable energy consumption from 60.1% in 2005 to 67.5% by 2020 (IFE 2015). Further, the government aims to implement at least one full-scale CCS facility by 2020 (Norwegian Ministry of Climate and Environment 2015). Norway has no current formal targets for expanding its electric vehicle market, but it has recently set the target of zero-emission for all new passenger

vehicles and light vans from 2025 (see section on strategic goals for creative destruction below).

Norway has reluctantly transposed EU renewable energy policy through a binding national target. Domestically more important in political and economic terms is the development of CCS, which if commercialized would enable fossil-fuel industry to continue operating with a lower climate change impact. Building on the success in mainstreaming electric vehicles, the government has further raised its targets for decarbonizing transport as an important instrument for meeting national climate commitments.

### ***Creative destruction control policies***

Carbon pricing based on the cost-effectiveness principle has been Norway's overriding climate policy instrument since the early 1990s. Alongside the general purpose of revenue raising, the CO<sub>2</sub> tax has been designed to stimulate less carbon-intensive oil and gas extraction and to promote the use of low or zero-carbon transport models. The CO<sub>2</sub> tax covers about 55% of domestic emissions, with tax levels varying from about €3 to almost €50 per tonne. Petrol is subject to the highest tax rate, and land-based consumption of gas the lowest rate. The largest documented effect of the tax has been in the petroleum sector. It has, for example, facilitated CO<sub>2</sub> storage at Norway's Sleipner gas field, amounting annually to about 1 million tonnes of CO<sub>2</sub> since 1996 (Skjærseth and Christiansen 2006). In 2013, the carbon tax on offshore oil and gas was doubled, from NOK210 to NOK410 per tonne. The CO<sub>2</sub> tax was supplemented by a domestic emissions trading system in 2005, encompassing some 10% of emissions not covered by the CO<sub>2</sub> tax. From 2008, the Norwegian system became fully integrated in the EU Emissions Trading Scheme. Although some studies have presented an economic and environmental rationale for addressing the supply-side of GHG emissions by reducing oil and gas extraction (Fæhn et al. 2013), such proposals have been dismissed by the government. In addition to the CO<sub>2</sub> tax, Norway employs stringent emission standards for new motor vehicles in order to curb GHG emissions from transport.

Given the long-term oriented and consensus-driven policymaking in combination with active foreign climate policy, Norway has continued to rely on the carbon-tax as a key control policy. The CO<sub>2</sub> tax is not designed to structurally disrupt fossil-fuel industries, but to increase the environmental efficiency of the oil and gas companies and stimulate incremental innovations. This approach can be explained by the small-state character of Norway related to its corporatist structures and the government role in helping domestic companies to adapt to changing political and market conditions.

### ***Constraints on carbon-based R&D***

There is little evidence on the withdrawal of support for R&D in petroleum research; indeed, state R&D funding was strengthened with the introduction of a large-scale PETROMAKS research programme in 2004. The annual budget for petroleum research varied in subsequent years, but recently overall public spending on petroleum R&D has been further institutionalized with a

steady increase in the allocated funds. In 2013, the large-scale Petromaks 2 programme was launched, with a larger budget compared to the first Petromaks (ERKC n.d.). The central objective of petroleum R&D is to facilitate effective and environmentally sound extraction from remaining oil fields.

Overall, Norway has maintained support for R&D in the oil and gas industry in line with the established interests and the government policy of protecting and economically relying on the innovative oil and gas companies.

#### *Constraints on carbon-based investments*

The government has enhanced its efforts to promote the phase-out of subsidies for fossil fuels internationally. In 2010 Norway joined an initiative of several non-G20 countries, 'Friends of Fossil Fuel Subsidy Reform'. In 2014, the government adopted a national strategy for reforming international fossil fuel subsidies (Government of Norway 2014a). Another important initiative has been the 2015 decision of the Norwegian Government Pension Fund, the largest sovereign wealth fund in the world, to divest itself of shares in companies that have more than 30% of their portfolio in the coal business (Carrington 2015).

These efforts to reduce fossil-fuel subsidies globally stand in stark contrast to the extensive government subsidies and ambitious extraction policy for domestic oil and gas. Government subsidies for upstream oil and gas activities in Norway in 2009 were estimated at around US\$4 billion (GSI & IISD 2012). The government has also continued to support the expansion of oil and gas drilling in new areas in the Arctic zone. In 2016, it awarded ten new licenses to companies for oil and gas exploration, three of which are located in the so far unexplored areas in the Barents Sea close to the Arctic (Government of Norway 2016). According to some studies, the proposed new fields for oil and gas drilling would result in GHG emissions 150% higher than from the existing fields (Oil Change International 2017). Norway also has a favourable taxation regime, which allows companies to recover most of their costs invested in oil and gas exploration. The estimates show that Norway has subsidized oil and gas companies with €9.7 billion within a decade through this favourable tax regime (Bellona 2017).

In sum, Norway has demonstrated a strong willingness to disrupt carbon-based investments internationally, particularly coal that may compete with Norwegian gas exports. This policy has supported Norway's efforts to maintain visibility in the international arena and shape global climate governance. The corporatist structures with a strategic role in the oil and gas industry at home has meant that the systemic support for the domestic fossil fuel industry remained untouched.

#### *Strategic goals for constraining carbon-based technologies*

Early Norwegian climate policy, adopted in 1989, focused on stabilizing national CO<sub>2</sub> emissions at 1989 levels by the year 2000 (Hovden and Lindseth 2002). This approach was soon abandoned and replaced by flexible

international mechanisms as the most cost-effective instrument for reducing GHG emissions. Under the first Kyoto Protocol period, Norway committed not to exceed its 1990 level of GHG emissions by more than 1% through 2012. One should note the active role played by the Norwegian government in shaping the design of the Kyoto Protocol and ensuring full respect for the principles of cost-effectiveness and flexibility. The government voluntarily proposed increasing its target to 10% reduction by 2012, although Norway failed to achieve that goal, as its GHG emissions in 2012 were 4.5% higher than in 1990. It met the voluntary Kyoto target of 10% reduction only in 2015 (prior to the Paris Climate Summit) by purchasing international emissions credits. Under the second Kyoto Protocol period, Norway took on the target of 16% reduction by 2020 compared to 1990, pledging to meet two-thirds of this through domestic reductions. Norway continued to agree voluntarily to increasingly ambitious climate mitigation targets despite its very slow progress in meeting previous commitments. In 2012, Norway further raised its target to 30% emissions reductions by 2020 and to achieve carbon-neutrality by 2050 (Norwegian Ministry of Environment 2012). In 2015, a tentative goal of at least 40% reductions by 2030 (with the EU) was put forward (Norwegian Ministry of Climate and Environment 2015). In the transport sector, the government declared the goal of 85g GHG emissions per km on average for all new cars by 2020, which is 10% higher than the corresponding EU target (Figenbaum et al. 2013). Furthermore, according to the new National Transport Plan for 2018–2029, all new passenger cars and light vans should be zero-emission by 2025 (Norwegian Ministry of Transport and Communications 2017). The ambitious climate goals, an important part of Norway's foreign policy strategy, have not been fully met given the domestic political-economic challenges. Despite considerable efforts, Norwegian GHG emissions in 2016 were 3.3% higher compared to the baseline year 1990 (Statistics Norway 2017).

## **Discussion**

On the basis of our analysis we can distinguish three main phases in Norway's climate policy mix considering its creative and destructive dimensions. The first phase (1989–1995), termed 'symbolic destruction', emphasised cost-effective stabilization of domestic emissions, with a modest carbon tax as the main policy instrument. In the second phase (mid-1990s–2008) attention shifted towards incremental improvements in environmental efficiency, with the focus on cost-effective international flexibility mechanisms. Creative destruction remained modest and niche support weak. The third phase (since 2008) has been characterized by increasing efforts towards emissions-reductions at home combined with intensive global climate diplomacy and multiple initiatives aimed at promoting low-carbon niche technologies and disrupting fossil-fuel investments internationally. During this phase, the goal of industrial upgrading and exports based on low-carbon sectors and technologies has gained prominence. Existing instruments (CO<sub>2</sub> tax and electric vehicle subsidies) have been strengthened and new policy instruments

added, such as market incentives for established renewable-energy technologies and R&D spending on selected new low-carbon technologies. International creative and disruptive climate policy efforts have been reinforced and diversified. However, the actual impact of these cumulative changes on climate policy has been limited, and has hardly affected the prevailing 'policy equilibrium' (Cashore and Howlett 2007) based on the cautious creation and destruction policy efforts at home and high innovativeness and activity abroad.

We have sought to demonstrate how the mixed efforts for mitigating climate change domestically and high activity in the global climate governance regime have been tied to Norway's political economy and foreign policy strategy as a small, open, social-investment model of economy. Regarding creative destruction, democratic corporatism and inherited political pragmatism and cost-effectiveness combined with the exceptional economic clout of the petroleum sector, have ensured that control policies remained modest and systemic support for R&D and a favourable business climate for the oil and gas industry continued unchallenged. Driven by its foreign policy concerns to maintain and shape global climate agreements, Norway has launched multiple 'disruptive' international initiatives such as divestment from coal in its Pension Fund and the measures for reforming fossil-fuel subsidies globally. These have served to strengthen Norway's norm-advocacy in international climate diplomacy and ease the pressure for changes at home. On the niche creation side, Norway has hesitantly adopted the binding EU renewable energy target, which failed to create the dynamic domestic market for renewable energy with most projects implemented in Sweden through the green certificate scheme. Less-mature and more costly technologies such as offshore wind have found even less support from policy-makers and established industries. The political and economic consensus for supporting niche lowcarbon energy technologies has been present for CCS due to its attractiveness for the incumbent fossil-fuel industries. In the transport sector, the lack of strong vested interests and high taxation policy on vehicles have played a facilitating role in enabling effective niche creation for electric cars. The lead market for electric cars has contributed to mitigating domestic GHG emissions but has also empowered Norway's norm-setter role in international climate governance. In addition to generally modest domestic niche creation efforts, Norway has increased its global financial commitment to low-carbon technologies through developmental aid, EU funds and the Green Climate Fund.

Overall, these insights support the theoretical notion that small corporatist economies are successful in incremental long-term adaptation but prone to ignore larger structural problems. Whereas Norway has achieved a remarkably stable climate policy consensus and has continuously encouraged environmental improvements in the oil and gas sector, it has failed to formulate a plan for phasing out oil and gas extraction and reduce the country's economic dependence on oil and gas exports. Another important finding is the influential role of Norwegian foreign policy for national climate

policymaking. As noted by Cass (2008), climate policy provides fertile ground for symbolic politics as many governments feel obliged to abide by international climate norms but are often not willing or forced to act upon international commitments with tangible and costly policy reforms. Although Norway's climate policy can partly be described as symbolic, for instance the modest CO<sub>2</sub> tax, international climate policy pledges have motivated Norway to undertake some more structural reforms such as the extensive promotion of electric vehicles. This indicates that small countries with social-investment economies such as Norway may be more inclined to scale-up their climate policy efforts in the face of external pressure as they are more dependent on stable international agreements and a progressive self-image than are larger and more liberal-market oriented economies such as Australia and Canada (see Cass 2008). The extent to which international climate agreements will induce domestic policy change depends not only on the level of ambition of the goals but also on the implementation mechanisms. The existing international and EU climate governance regimes offer considerable flexibility for countries such as Norway to fulfil their climate commitments without engaging in deeper emission cuts and creative destruction at home.

## **Conclusions**

Here, we aimed to offer an updated and innovative analysis of the creative and disruptive character of Norway's climate policy mix, linking it to the theory-based concept of small states. We might highlight at least two major contributions that we believe we have made to the literatures on sustainable transition and climate policy and politics.

First, we have demonstrated the value of the 'niche support vs. creative destruction' categorization proposed by Kivimaa and Kern (2016) by providing a more nuanced understanding of the national climate policy mixes, their scope and impact. We have further developed the proposed framework by offering a more consistent way of categorizing key creative and destructive policy measures. We have also included Norway's climate mitigation efforts abroad in the analytical framework, which adds to the comprehensiveness and robustness of the analysis. The application of this framework has revealed important insights into Norway's climate policy mix, its strong international character, and particularly its failure to disrupt and constrain the domestic oil and gas industry as the major producer and exporter of GHG emissions. Important differences in the creative and destructive policy impacts have been detected between the energy and transportation sectors, which suggests the importance of sectoral differences and cross-sectoral comparisons in studying climate policies.

Second, we have made the case for linking the national political-economic setting and foreign policy strategy to explain the character and dynamics of climate policies. The structural political-economic and foreign policy features of Norway as a small advanced type of corporatist-investment economy together with some specific attributes of Norway's political-economic setting and foreign policy identity have greatly influenced the pace and design of



national climate policy, measured by niche creation and creative destruction policy measures. Overall, our analysis has demonstrated the value of conceptualizing different state models based on their material and ideational base to facilitate better understanding and comparison of the creative and disruptive potential of national climate policy mixes.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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