White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of York.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/96286/

Version: Submitted Version

Book Section:
Tobin, Paul Alexander (2015) Blue and Yellow Makes Green? Ecological Modernisation in Swedish Climate Policy. In: Bäckstrand, Karin and Kronsell, Annica, (eds.) Rethinking the Green State. Routledge Studies in Sustainability. Earthscan from Routledge, Abingdon, Oxford, pp. 141-155.

Reuse
Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

UNIVERSITY OF LEEDS
University of Sheffield
UNIVERSITY of York

Proof

8 Blue and yellow makes green?

Ecological modernization in Swedish climate policy

Paul Tobin

Introduction

Climate change increases distributional conflicts, creates tension between policy objectives, and challenges the viability of the existing dominant economic model (Gough and Meadowcroft 2011: 493–95). Eckersley (2004: 91) argues that "[g]iven the seriousness and urgency of [climate change] … building on the state governance structures that already exist seems to be a more fruitful path to take" than dissolving the existing patchwork quilt of states. A green state builds on existing capitalist structures and adds environmental principles to the core aim of the state (*ibid.*: 83). At the formation of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, 23 states, all capitalist, were identified as 'developed,' thus sharing the greatest responsibility to reduce greenhouse gas emissions (UNFCCC 2014a). Sweden is one of the 23 states and has frequently been identified as a pioneer regarding its environmental policies (Lafferty and Meadowcroft 2000; Lundqvist 2004) and its climate legislation (Friberg 2008; Burck *et al.* 2009). Thus, if any state may be considered a green state regarding climate change, it is likely to be Sweden. However, being a relative leader is not the same as becoming a green state.

Taylor & Francis
Not for distribution

Meadowcroft (2005) argued that it would be at least 15 to 20 years before a green state would be realized. To avoid the two degree increase in global temperatures, identified as the maximum change the world can endure, however, states must adopt the properties of the green state much sooner. According to Christoff's (2005) typology of states' environmental performance, Sweden was classified as only one 'level' short of being defined as a green state in 2005. In 2006, Sweden saw a change in government from the traditionally dominant Social Democrats (*Socialdemokraterna*) to the Conservative/Liberal Alliance (*Alliansen*) of four center-right parties (Aylott and Bolin 2007: 621). I use Christoff's typology to analyze the new government's response to climate change during its first term of office, until 2010, and ask whether Sweden evolved to become a green state. Climate policy has been selected for exploration as climate change arguably represents the greatest current environmental threat (DiMento and Doughman 2007), yet has been neglected in the current green state literature.

Proof

Proof

To become a green state, it is increasingly argued that a state must exhibit the characteristics of ecological modernization (EM) (see also Eckersley 2004; Barry and Eckersley 2005; Christoff 2005; Meadowcroft 2005). For Christoff (2005: 41) *strong* EM must be present in a green state, which is EM in combination with biocentric values. As such, this chapter will begin by outlining the theoretical foundations of EM and the green state. Next, a cursory methodology of how to measure whether Sweden was a green state will be developed. The bulk of this chapter assesses how the Alliance government dealt with four key climate policy areas during 2006–10, according to the principles of strong EM. The primacy of the policy areas – overall emissions reductions, renewable energy production, energy efficiency, and renewable transport development – is evident as they are prioritized in the four headline goals of Sweden's 2009 Energy Bill, which was the standout piece of legislation during the Conservative/Liberal Alliance's first term of office. Finally, it will be argued that Sweden did not become a green state during the period studied, but instead continued to be what Christoff (2005) has termed an 'ecological welfare state': sufficiently ambitious to be a global leader, but not a green state regarding climate change.

Ecological modernization and the green state

Taylor & Francis
Not for distribution

Ecological modernization is presented as a means by which capitalism can accommodate the environmental challenge (Chapter 1, this volume; Gouldson and Murphy 1997: 75). Due to the reliance of EM on the market, the concept has been seen as a tacit endorsement of pre-existing economic inequalities (Eckersley 2000: 239). Additionally, as the paradigm seeks to improve efficiency, rather than reduce overall consumption, environmental degradation is almost certain to occur; "[i]n short, it seeks more environmentally efficient ways of expanding output" (Barry and Eckersley 2005: 262). Expansion of output is clearly incompatible with mitigating climate change. EM has been described as ineffective for transboundary issues because economies are not transformed as much as polluting industries are simply relocated to states with weaker environmental legislation (Schnaiberg *et al.* 2002: 21). Moreover, according to Davidson (2012: 32) and Gouldson and Murphy (1997), the presumption that sufficiently effective technology will be developed is technologically deterministic, necessitating that a degree of biocentrism is at least partly employed in order to avoid drastic resource shortages, and transform weak EM into strong EM (Christoff 2005). Biocentrism emphasizes equality between the species by challenging assumptions of anthropocentrism; all aspects of nature are argued to possess an inherent value, regardless of their utility to humanity (Taylor 1981; Sterba 2011). Thus, policies that protect the environment because of its intrinsic value, rather than instrumental benefits for humanity, will be seen as biocentric. This chapter therefore posits that if a country is to become a green state, policies reflecting the principles of strong EM must be developed.

For Eckersley (2004: 3), the green state is a normative idea as well as a theoretical framework, and thus she helps us conceptualize how states 'should'

Proof

Proof

act in order to achieve sustainability. Yet while localized issues may be more easily addressed by the state, transboundary challenges such as climate change require a green state that is willing to pursue policy solutions for both localized and international environmental challenges (Meadowcroft 2005: 5). Although climate change may be complex, its high-profile status draws greater awareness to environmental threats, and has pushed the environment up the political agenda. Eckersley (2004: 169) acknowledges that the green state she theorized may never be finalized, because of inherent conflicts between environmental and developmental priorities. Christoff (2005: 44) argues that states which *almost* exhibit the necessary criteria for being a green state – namely 'environmental welfare states' – "engage in weak ecological modernization," of which an example was Sweden, alongside Netherlands. They have already achieved a high commitment to human welfare environmentalism, underpinned by moderate budgetary commitment and state capacity regarding ecological issues (*ibid.*: 40). Therefore, in order to minimize the inherent weaknesses within EM described above, a state must develop a high commitment to biocentric values (i.e. *strong* EM; *ibid.*: 41).

Methodology

Taylor & Francis
Not for distribution

'Environmental policy' concerns many areas of a state's activity, such as biodiversity protection, air and water pollution mitigation, and the minimization of greenhouse gases, among others. As such, determining whether Sweden may be considered a green state across all of these areas is beyond the scope of this chapter. Climate policy is not a proxy for the green state, but rather a single – yet highly significant – constituent part and has been selected because of the many threats posed by climate change if left unchecked (DiMento and Doughman 2007). More specifically, the four headline policy areas identified within the 2009 Energy Bill are examined, as their prominence in the Bill demonstrates their significance to climate change mitigation. While it is unlikely that any state would become a green state in the space of one term of government, Christoff's (2005) identification of Sweden as an environmental welfare state suggests that if any state made the transition during 2006–10, it would be Sweden.

I share Christoff's (2005) argument that in order for a state to be considered a green state, it must exhibit the features of strong EM. Therefore, this chapter interprets EM as a means of technological adjustment in narrow terms, and so EM is assumed to be inadequate for a green state. Thus, for Sweden to be considered a green state, it must have employed not only the pro-capitalist and pro-technology principles of EM, but also a biocentric concern for nature in its own right (Sterba 2011; Taylor 1981). In order to be a green state, overall consumption levels and the production of greenhouse gases must not merely be made more efficient, but reduced in absolute terms (Eckersley 2004: 76).

Proof

Proof

Swedish climate policy

Sweden has long been seen as an environmental leader (cf. Chapter 9, this volume), having been the first state in the world to create an Environmental Protection Agency in 1967. By 2006, Sweden had halved greenhouse gas emissions from electricity and district heating since the 1970s, thanks in part to an energy portfolio dominated by hydropower (45%) and nuclear energy (44%) (Regeringskansliet 2009: 20–21; Sarasini 2009: 639). Electricity production was almost carbon-free by the start of the period under investigation, reflecting Sweden's pioneering approach to climate change. Sweden was found to be the most ambitious state in the world in 2009 for its climate policy (Burck *et al.* 2009).

In 2006 there was a change in government from the traditionally dominant Social Democratic Party to a center-right coalition that remained in power throughout the period covered in this chapter, before being replaced by a minority Social Democrat government in September 2014. The willingness of the center-right parties to co-operate as a new Conservative/Liberal Alliance was a shift in Swedish politics. In June 2006, the Alliance agreed a common position on energy policy, which ended the Centre Party's long-held opposition to nuclear power (Aylott and Bolin 2007: 626). The Alliance won the 2006 election comfortably, becoming the first surplus majority coalition government in Sweden since 1981 (Widfeldt 2007: 1118). Even prior to the election of the more pro-market Alliance in 2006, climate change had already begun to be seen as a means of providing economic development in Sweden and not just a constraint on existing lifestyles. Political parties across the spectrum were building a narrative that "more and more construct[ed] climate change as an Opportunity rather than a Sacrifice" (Lundqvist 2004: 104). The chapter will assess four policy areas to determine the extent to which the principles of EM and biocentrism have been married.

Taylor & Francis
Not for distribution

Overall emissions reductions

The Social Democrats, in government until 2006, demonstrated a strong commitment to both environmental protection and economic growth, with an ambitious overall greenhouse gas emissions reduction target for 2020 of 25 percent from a 1990 baseline. The Coalition Government built on the ambition of Energy Bills passed in 2002 and 2006 and raised this target considerably, to a world-leading 40 percent in the 2009 Energy Bill. The 40 percent target related to emissions produced outside the EU Emissions Trading Scheme, in sectors such as housing, transport and waste (Regeringskansliet 2009: 2). "The former opposition, now in government, here seemed to have higher ambitions (40 percent versus 25 percent) than the former Social Democratic government" (Zannakis 2009: 118).

The bold increase from 25 percent to 40 percent may initially suggest that the Conservative/Liberal Alliance was demonstrating much greater climate ambition than both its Social Democrat predecessor and contemporary governments

Proof

Proof

around the world (UNFCCC 2014b). Yet Zannakis (2009: 118) notes that while the 25 percent target of the Social Democrat government referred to greenhouse gas reductions made purely in Sweden, one third of the Alliance's 40 percent target could be met by flexible mechanisms, such as the Clean Development Mechanism (CDM) and Joint Implementation (JI). CDM and JI are market based emissions reductions tools, whereby CDM refers to the funding of emissions reductions in developing states, and JI encompasses joint projects between two developed states (UNFCCC 2014c). The ability to use CDM or JI to meet the 40 percent target was not well-received by opposition parties, the Church or environmental groups, as it was seen as a disincentive to the development of more radical domestic policies (Zannakis 2009: 119). The perception of the Alliance was that policy-makers must make ambitious goals, but that these must be affordable to the Swedish population in the short term and not facilitate a loss of industry to states with less strict emissions goals.

By enabling investments via JI or CDM to count towards the state's 40 percent target, Sweden only slightly increased its overall target for domestic emissions reductions. Indeed, under the EU's 'burden-sharing agreement' as part of the Kyoto Protocol, those states that failed to meet their emissions reductions goals were required to make up for the remaining emissions via JI and CDM. The instruments were thus associated with less radical attempts to reduce emissions, and were seen by some as not counting towards 'genuine' emissions reductions. As such, the inclusion of flexible mechanisms reflected a paradigm shift regarding attitudes towards climate change in Sweden. Zannakis (2009: 150) argues that, "[t]he shift of Government in 2006 … slightly marked Swedish climate policy, which is manifested in the Climate Commission report from 2008" that led to the Energy Bill of 2009. This 'slightly marked' change of approach reflected movement towards the greater flexibility and market assumptions of EM. Such a change was in keeping with the more market-friendly ideologies of the Coalition Government.

Taylor & Francis
Not for distribution

In sum therefore, it must be remembered that the 40 percent goal, despite including flexible mechanisms, equated to a 26.6 percent reduction in domestic emissions, which was greater than the 25 percent reduction goal introduced by the Social Democrats, and still placed Sweden at the forefront of global climate policies. The geographical location of reductions makes little difference to a transboundary issue such as climate change, in which catastrophic climate change may only be prevented if global emissions levels are reduced. However, when seeking to assess the extent to which an individual state lives up to ideals of the green state, such decisions play a crucial role. By including flexible mechanisms, the pressure for greater domestic climate ambition was reduced, thus weakening Sweden's progress towards becoming a green state. Had a more biocentric commitment been present, Sweden would have employed flexible mechanisms as additional tools, rather than including them with the emissions target. Instead, little domestic change was required, as a third of the emissions reductions could be simply 'purchased' through CDM and JI. A fear of being exploited by free riders engenders more incremental policy responses to climate change, which

Proof

Proof

in turn stymies the development of the green state. As such, the realization of the green state may be more challenging for transboundary environmental issues, such as climate change, than more local environmental issues. For overall emissions reductions goals, therefore, while Sweden was world-leading, its target reflected the principles of weak rather than strong EM.

Renewable energy policy

The production of hydropower and nuclear energy alongside a lack of coal in the Swedish energy mix had already placed the state in an unusually low-carbon position prior to 2006. Underlining his support for technological investment, Moderate Prime Minister Reinfeldt stated alongside European Commission President Barroso that climate change could be a 'profit machine' for Sweden and Europe (Sarasini 2009: 645). Such statements emphasize the pro-market foundations of EM; Sweden continued to invest in renewables technology over 2006–10, which in turn supported the state's exports across the world (Regeringskansliet 2011). With solar power able to offer little due to Sweden's geography and climate, this section will survey the state's renewables policy with regard to hydropower and wind power, before turning to how nuclear energy policy decisions affected renewables development.

By 2006, Sweden already had over 700 large hydropower stations, each with capacity over 1.5 MW, while 1200 small stations collectively generated 1.5 TW (Wang 2006: 1211). However, as expansion of hydropower is constrained by the number of previously untapped free-flowing rivers, by 2006, the possibility of expanding hydropower generation into 'untouched rivers' was almost impossible (Zannakis 2009: 138). As a result, the 2009 Energy Bill sought neither to increase nor decrease hydropower provision, despite EU pressure to increase renewables. However, Sweden did invest in a small-scale hydropower plant in Malaysia to reduce its greenhouse gas emissions production, as another example of more flexible solutions being favored in Sweden when facing a politically challenging domestic situation (Regeringskansliet 2009: 55). In a boost to domestic transformation, the Swedish Electricity Certificate System (ECS) was expanded in 2009, such that consumers were required to buy renewables certificates corresponding to 15.1 percent of their electricity use (cf. *ibid.*: 42; Chapter 9, this volume). The investment in a Malaysian hydropower plant and expansion of the ECS reflect small policy changes to a sector that had already received significant support for several decades prior to 2006. Regarding hydropower, therefore, I argue that Sweden demonstrated the hallmarks of the green state. By balancing the expansion of renewable energy production elsewhere via hydropower with the protection of remaining rivers, Sweden reflected a strong commitment to technological innovation and biocentric values. In order to 'expand' renewable energy provision, however, Sweden was forced to look beyond hydropower.

Wind power offered the only means for Sweden to increase significantly its renewables provision. Decision-making on turbines in the state was already highly decentralized, essentially giving veto power to those affected locally by

Taylor & Francis
Not for distribution

Proof

Proof

the installations. As Söderholm and Petterson (2011: 523) argued, decentralized decision-making made offshore wind production much more favorable than onshore installation. Therefore, relying on the market to determine whether people would choose to pay a premium for wind power and also accept the construction of turbines in their local area would not be effective (Ek 2005: 1688). As such, the 2009 national planning framework to increase wind power to 30 TWh by 2020 demonstrated a strong example of leadership on climate change by giving greater municipal powers. Additionally, the 2010 Bill (2009/10:1335) to extend the existing ECS until 2035 gave greater stability to the market – thus stimulating investment – and reflected ambitious and long-term policy-making by the Conservative/Liberal Alliance (see Energimyndigheten 2010a: 10).

Without subsidies, however, the Swedish wind market was perceived as too unstable to be worthy of investment (Wang 2006: 1217). The Alliance met this challenge by investing SEK 20 million directly into a network for wind producers each year (Rudberg *et al.* 2013: 3). The Bills simplifying the concession granting process (2008/09:146) and aiding the connection of wind power to the national grid (2009/10:51) further introduced stability into the domestic wind market. More could have been done to support offshore construction financially (see Söderholm and Petterson 2011: 524) – suggesting the financial constraints associated more with an environmental welfare state rather than a green state – but overall, the Alliance expressed a strong commitment to developing wind energy through a variety of measures. As such, the Alliance successfully demonstrated principles grounded in strong EM, as required to be considered a green state (Christoff 2005: 40). In addition to Sweden's status as a green state regarding hydropower during 2006–10, therefore, Sweden exhibited the credentials of the green state towards wind power as well.

Taylor & Francis
Not for distribution

Yet an analysis of renewables policy would not be complete without considering Sweden's other dominant energy source; nuclear power. The 1980 moratorium on the expansion of nuclear energy necessitated strong support for the renewables sector, in order to prevent a shortfall of energy for the growing economy (cf. Chapter 9, this volume). However, the decisions of the Conservative/Liberal Alliance on nuclear policy during 2006–10 highlighted a sharp divergence from its Social Democrat predecessors. The 1980 referendum was seen at the time as a partial victory for nuclear power, as the moratorium did not require an immediate phase-out, such as that of Austria in 1978 (see Marshall 2007: 148; Martinovsky and Mareš 2012: 349). Moreover, the fears over nuclear safety that once dominated the environmental-political agenda were replaced during the 1990s by the threat of climate change. This reprioritization posed a dilemma; Nordhaus (1997: 44) argued in 1997 that "[i]f Sweden chooses to phase out its nuclear power plants, meeting… [its Kyoto Protocol] commitment will go from difficult to near impossible." As such, nuclear power rapidly regained acceptance in a new guise as a climate-friendly energy source (Sailor *et al.* 2000).

The Conservative/Liberal Alliance reflected the change of perception towards nuclear power as a low-carbon energy source in 2009. The government overturned the 1980 moratorium on Sweden's nuclear portfolio enabling the construction of

Proof

Proof

replacement reactors for pre-existing plants (see Sarasini 2009: 639). With the Centre Party and Christian Democrats having previously expressed opposition to nuclear power, low electricity prices were cited as a key factor in their decision (see Zannakis 2009: 141). The desire to reduce prices via nuclear power in order to protect industry does not bear the hallmarks of strong EM outlined earlier (Eckersley 2004: 76). While nuclear power may enable emissions per unit of electricity to be reduced, the energy source does not facilitate a reduction in overall consumption. As Eckersley (*ibid.*: 77) argues regarding the green state, "many industries are inherently environmentally degrading, such as the nuclear and fossil fuel industries, and therefore must be phased out rather than merely modernized." Furthermore, by enabling newer, more efficient nuclear power stations to replace older reactors, the need to invest in further renewables was reduced. Therefore, the nuclear U-turn significantly dented the likelihood of Sweden going beyond its 50 percent renewables target. The U-turn can thus be seen as a missed opportunity in hastening the development of the green state. Regarding renewable energy policy overall, while hydropower and wind power reflected a successful merger of biocentric values with technological innovation, Sweden remained an ambitious 'environmental welfare state' due to the U-turn over nuclear energy production.

Taylor & Francis

Energy efficiency

Not for distribution

Improvements in energy efficiency are problematic with regard to the green state, as improved energy efficiency does not necessarily entail a reduction in overall emissions. When seeking to mitigate climate change, it is vital that overall emissions are reduced, rather than their production simply becoming more efficient, if a state is to progress from an environmental welfare state to a green state (Eckersley 2004: 76). With a low population density and low temperatures, Swedish energy consumption is likely to be higher than that of other states. As with the previously discussed policy areas, the Conservative/Liberal Alliance ensured that Sweden remained a pioneer by building on existing ambition, but did not facilitate significant structural transformations. This incremental ambition will be analyzed regarding the state's policy decisions on district heating, industry and housing.

First, Sweden generates much of its heating and some of its electricity from Combined Heat and Power (CHP) (cf. Chapter 9, this volume). Almost half of houses are heated using district heating, with around half of this energy sourced from biomass (Jewert 2012: 15). Increasing the percentage provided by biofuels would reduce the greenhouse gas production resulting from CHP. As the Government stated in 2009 (Regeringskansliet 2009: 6), "[d]istrict heating has been … crucial in enabling national policy instruments for renewable energy to bring about the extensive phasing-out of fossil fuels." CHP electricity generation grew steadily from 11.43 TWh in 2006 to 15.07 TWh by 2011, yet it can be argued that this was more to do with previous policies than Alliance leadership (Eurostat 2011). Sweden failed to implement the policies that had led Finland to

Proof

Proof

becoming a world leader in biofuel production (see Ericsson *et al.* 2004). Indeed, there were no further policies to hasten the transition towards biofuels during 2006–10, suggesting that while energy efficiency in CHP was not undermined, the reduction in absolute consumption that is necessary to translate weak EM into its stronger form (Eckersley 2004: 76), was neglected.

Second, a voluntary program for energy efficiency in energy-intensive industry was introduced in 2005, in which companies were exempted from the national energy tax for five years in exchange for implementing an energy management system (see Energimyndigheten 2011). As such, from December 2009, energy audits in energy-intensive companies were subsidized by up to 50 percent (with a maximum SEK 3 billion budget overall). However, the government was reluctant to force businesses to cut emissions too quickly for fear of harming competitiveness. For example, while the original program reduced emissions by around 1.45 TWh across 180 power-intensive industries, its successor featured only 90 such industries (Swedish Institute 2013). As a result, the program showed all the hallmarks of EM by facilitating industry reductions, but failed to introduce a state-required obligation to make significant overall cuts. Moreover, the scheme essentially placed a price on emissions, whereby companies could simply pay to continue existing energy practices, rather than acknowledge an intrinsic value for nature. With industry representing around 45 percent of the country's electricity consumption, the reduction of emissions in this sector was crucial to overall greenhouse gas levels, yet few policies were developed over the period. As such, protection of the status quo for industry – and the jobs and profits it offered – continued to be the dominant paradigm around which the Alliance based its policies, reflecting the lack of biocentric values.

Taylor & Francis
Not for distribution

Finally, two new building efficiency policies were introduced in 2008. Prior to 2006, Sweden had already possessed ambitious housing standards, whereby renovated buildings needed to meet the same efficiency requirements as new buildings. The first of the Conservative/Liberal Alliance's responses was a new energy declaration law – in force since January 1, 2008 – that built upon an EU Directive and was designed to raise awareness of a building's energy consumption (see Swedish Institute 2013). The second was the first National Energy Efficiency Action Plan or NEEAP (a successor followed in 2011), set in November 2008 that sought to realize energy savings of 41 TWh by 2016 across buildings and also transport and small industries (SOU 2008: 11). However, the Alliance did not formulate a plan to support zero energy buildings, indicating a similar complacency to that found regarding industrial efficiency policies (see WWF 2010). Housing therefore represented another area of incremental improvements, when significant policy changes were needed to reduce overall consumption rather than merely improve efficiency while building more houses and watching energy consumption within these houses rise.

As such, it can be seen that the government of 2006–10 built on pre-existing efficiency policies rather than reversing them, thus incrementally increasing climate ambitions. Yet in many ways these exploited rather than consolidated Sweden's existing status as a pioneer, thus failing to continue previously high

Proof

Proof

levels of ambition at the same rate. Sweden's high proportion of renewable energy arguably lessened the pressure to reduce consumption of electricity. Overall, Sweden performed poorly regarding efficiency throughout the period, and by 2011, total energy consumption in Sweden was still 55 percent above the EU average at 5.1 ton per capita, while electricity consumption per capita was around 2.5 times higher than the EU average (ABB 2013). As such, Sweden's attitude to energy efficiency – despite a call for a 20 percent improvement by 2020 and the biocentric views of 90 percent of its population – prioritized industry and growth over a reduction in consumption. Indeed, Sweden's continued high consumption levels placed the state at the less ambitious end of the 'environmental welfare state' capacity, let alone close to progressing to the green state.

Transport policy

Since the oil crisis of 1973, Sweden has sought to develop alternative fuels to support its domestic infrastructure, which is heavily reliant on the transportation sector (Hillman and Sandén 2008: 1287). Due to its location on the 'edge' of Europe, cheap transportation is crucial for the Swedish economy. As a result, transport remains the fastest growing sector regarding emissions in Sweden (Åkerman and Höjer 2006: 1944) and accounted for around 40 percent of Swedish CO_2 emissions in 2008 (Friberg 2008: 171). Despite a growth in the use of biofuels that has given Sweden the largest fleet of hybrid vehicles in the world, transportation remains heavily dependent upon fossil fuels, which in turn makes Sweden dependent on imports (Nordic Energy 2012). However, as Lindfeldt *et al.* (2010: 1843) argue, Sweden "is comparably rich in terms of biomass and renewable electricity… [meaning that] an import-independent road transport system based on renewable energy sources is realistic." More than 75 percent of all person kilometers travelled in Sweden were made by car in 2010 (*ibid.*: 1840), ensuring that small changes in this crucial sector could make a significant difference to emissions. At the national level, some progress was made during the period that reflected strong EM, but the norm of individual freedom and the role of market incentives to drive policy decisions maintained the dominance of car ownership and thus ensured that overall consumption remained high (Zannakis 2009: 187).

Taylor & Francis
Not for distribution

The most significant policy to reduce car emissions was the April 2007 introduction of a SEK 10,000 rebates on all purchases of 'environmentally friendly' hybrid cars. By September 2008, such vehicles accounted for 41 percent of Swedish new car sales. This approach again highlighted the presence of the principles of EM in policy decisions, as individuals' preferences in the market were allowed to shape the number of green vehicles in the national fleet (albeit with some direction from the state). Indeed, by encouraging individuals to buy new cars, Sweden offered a classic techno-fix to the issue, rather than seeking to radically change lifestyle behaviors regarding transportation. Moreover, in December 2008, it was announced that SEK 875 million would be provided to facilitate research and development of second-generation biofuels and other

Proof

Proof

energy sources over a period of three years by the government, again demonstrating a long-term commitment to renewable transport policies, with the potential bonus of increasing exports (Energimyndigheten 2010b). By requiring all biofuels used in transport to be sustainable in line with the Renewable Energy Directive, a more top-down, regulatory approach was also developed by the government, which sought to facilitate a reduction in overall emissions production.

It can be argued that Swedish transport policy between 2006 and 2010 demonstrated innovative policies at the national level. These policies represented a mixture of theoretical underpinnings, from the more ecological modernization-aligned pro-market and individualized focus of the tax rebate for green vehicles and research into biofuel technologies, to the more biocentric principles of strong EM that ensured that all biofuels be proved sustainable. Therefore, steps were taken towards reducing emissions in the sector responsible for the largest share of Swedish CO_2 emissions. Yet these steps were not sufficient to transform Sweden into a green state during 2006–10. The Government has estimated that emissions from the transport sector will continue to increase between 2007 and 2020 (Regeringskansliet 2009: 10), meaning that while efficiency was improving, overall consumption was not. The overall share of biofuels – although growing – remained small (Lindfeldt *et al.* 2010: 1840). As such, the findings in this section support Åkerman and Höjer's (2006: 1955) argument that "[i]mproved technology in conjunction with renewable fuels is important, but transport volume growth also has to be curbed." As long as car ownership continues to be seen as a rite of passage in Sweden, a societal transformation of the kind needed to become a green state will not have occurred. Although the transport sector demonstrated perhaps the biggest improvement of the four areas explored in this chapter, it also remained the area where the most work was needed to reduce overall consumption, and thus, during 2006–10, continued to represent the principles of weak, rather than strong, EM.

Taylor & Francis
Not for distribution

Conclusion

Climate change poses a catastrophic threat to the planet and its inhabitants. Yet with the world's biggest greenhouse gas emitters almost exclusively capitalist, this chapter has sought to assess the extent to which a capitalist economy can become a green state. The chapter began by summarizing the principles of ecological modernization and the green state. It was argued that while EM may be a crucial feature of the green state, a strong version of EM must be pursued, alongside biocentric values, such as the protection of remaining river areas and reductions in overall consumption levels. This chapter examined the extent to which Sweden displayed the characteristics of the green state with regard to the most significant environmental threat, climate change. The chapter analyzed policy action in each of the four main emissions reductions areas prioritized between 2006 and 2010, according to the principles of strong EM.

First, the headline goal of the 2009 Energy Bill was the 40 percent greenhouse gas emissions reduction target which clearly increased ambition,

Proof

Proof

yet the inclusion of flexible mechanisms enabled 'business-as-usual' policies to be pursued domestically while exporting reductions abroad. Next, renewable energy policy was examined, in which the pro-growth benefits of renewables technologies were highlighted by the Prime Minister as well as by policies incentivizing their introduction domestically. By not expanding hydropower while investing in wind power during 2006–10, Sweden could thus be said to reflect the biocentric yet technologically advanced requirements of the green state. Yet these developments clashed with the Government's 2009 U-turn over nuclear energy, which tacitly weakened the renewables sector and facilitated the continued production of nuclear waste. Thirdly, regarding energy efficiency, support for CHP and voluntary measures for reducing emissions in heavy industry showed progress, but not at the rate required to see a transformation to the green state. To be considered a green state regarding climate change, not only should energy efficiency be improved, but overall emissions should be reduced significantly. Sweden's policies did not facilitate such a reduction to take place. Finally, transport policy showed the greatest amount of improvement during the five year period, thanks to a requirement that all biofuels be renewably sourced and the introduction of rebates on environmentally friendly cars. However, this quick progress was partially due to the sector's weak starting point. Carbon emissions continued to grow in the Swedish transport sector, ensuring that any policy successes were far from sufficient to consider Sweden a green state on the issue.

Taylor & Francis

During the first term of the Conservative/Liberal Alliance Government, Sweden continued and developed many policy decisions that drew from weak EM, while also reflecting some of the principles of strong EM. This mix was sufficient to protect Sweden's status as a climate pioneer, while also offering additional development opportunities for its economy via exports, but not enough to facilitate a transition from environmental welfare state to green state. If Sweden had produced more ambitious policies, however, businesses may have moved abroad, while other states could have exploited Sweden's ambition by failing to reduce their greenhouse gases as significantly. These problems reflect the challenges faced by a potential green state in responding to transboundary issues such as climate change. Future theorization of the green state must therefore seek to conceptualize how the framework can respond to transboundary issues. If even the most climate-friendly states, such as Sweden, are not yet green states regarding climate change, avoidance of the catastrophic two-degree increase in global temperature appears unavoidable. Sweden may be a green state regarding other environmental policy areas. However, regarding climate change, it appears that the argument of Dryzek (*et al.* 2003: 2) remains valid: "[a]t present there are no green states. But some states are greener than others."

Not for distribution

Proof

Proof

References

ABB 2013 *Sweden: Energy Efficiency Report*. Retrieved March 2, 2014 from www05.abb.com/global/scot/scot380.nsf/veritydisplay/8f166ef5fbcf55a7c1257be9002bb822/$file/Sweden.pdf.

Åkerman, J., and Höjer, M., 2006 How much transport can the climate stand? Sweden on a sustainable path in 2050. *Energy Policy* 34: 1944–57.

Aylott, N., and Bolin, N., 2007 Towards a two-party system? The Swedish parliamentary election of September 2006. *West European Politics* 30(3): 621–33.

Barry, J., and Eckersley, R., 2005 W(h)ither the green state? In Barry, J., and Eckersley, R., (eds) *The State and the Global Ecological Crisis* 255–72. MIT Press, Cambridge, MA.

Burck, J., Bals, C., and Ackermann, S., 2009 *The Climate Change Performance Index 2009*. Retrieved January 22, 2013 from http://germanwatch.org/klima/ccpi09res.pdf.

Christoff, P., 2005 Out of chaos, a shining star? Toward a typology of green states. In Barry, J., and Eckersley, R., (eds) *The State and the Global Ecological Crisis* 25–51. MIT Press, Cambridge, MA.

Davidson, S., 2012 The insuperable imperative: a critique of the ecologically modernizing state. *Capitalism, Nature, Socialism* 23(2): 31–50.

DiMento, J.F.C., and Doughman, P., 2007 Climate change: what it means to us, our children, and our grandchildren. In DiMento, J.F.C., and Doughman, P., (eds) *Climate Change: What it Means for US, Our Children, and Our Grandchildren* 181–92. MIT Press, Cambridge, MA.

Dryzek, JS., Downes, D., Hunold, C., Schlosberg, D., and Hernes, H.K., 2003 *Green States and Social Movements: Environmentalism in the United States, United Kingdom, Germany, and Norway*. Oxford University Press, Oxford.

Eckersley, R., 2000 Disciplining the market, calling in the state: the politics of economy–environment integration. In Young, S.C. (ed.) *The Emergence of Ecological Modernisation: Integrating the Environment and the Economy?* 233–52. Routledge, London.

Eckersley, R., 2004 *The Green State*. MIT Press, Cambridge, MA.

Ek, K., 2005 Public and private attitudes towards "green" electricity: the case of Swedish wind power. *Energy Policy* 33: 1677–89.

Energimyndigheten 2010a Sweden energy 2010. Retrieved July 25, 2013 from http://webbshop.cm.se/System/TemplateView.aspx?p=Energimyndigheten&view=default&id=b4cea7b00212456b9bdbdbe47a009474.

Energimyndigheten 2010b Seabased receives SEK 139 million for wave power project. Retrieved March 4, 2013 from www.energimyndigheten.se/en/About-us/Press-/Press-releases/Seabased-Receives-SEK-139-Million-for-Wave-Power-Project.

Energimyndigheten 2011 The programme for improving energy efficiency in energy intensive industries "PFE." Retrieved March 2, 2013 from www.energimyndigheten.se/en/Sustainability/Companies-and-businesses/Programme-for-improving-energy-efficiency-in-energy-intensive-industries-PFE.

Ericsson, K., Huttunen, S., Nilsson, L.J., and Svenningsson, P., 2004 Bioenergy policy and market development in Finland and Sweden. *Energy Policy* 32: 1707–21.

Eurostat 2011 Combined heat and power (CHP) data 2005–2011. Retrieved March 2, 2013 from www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&ved=0CDcQFjAC&url=http%3A%2F%2Fepp.eurostat.ec.europa.eu%2Fportal%2Fpage%2Fportal%2Fenergy%2Fdocuments%2FCHPdata.xlsx&ei=jG8TU6fXIcVhQfe7oGgDQ&usg=AFQjCNGco4FnkcuS5Sv0VarYhX1d7fsoZw.

Taylor & Francis
Not for distribution

Proof

Proof

Friberg, L., 2008 Conflict and consensus: the Swedish model of climate politics. In Compston, H., and Bailey, I., (eds) *Turning Down the Heat: The Politics of Climate Policy in Affluent Democracies* 164–82. Palgrave Macmillan, Basingstoke.

Gough, I., and Meadowcroft, J., 2011 Decarbonizing the welfare state. In Dryzek, J.S., Norgaard, R.B., and Schlosberg, D., (eds) *The Oxford Handbook of Climate Change and Society* 490–503. Oxford University Press, Oxford.

Gough, I., Meadowcroft, J., Dryzek, J., Gerhards, J., Lengfeld, H., Markandya, A., and Ortiz, R., 2008 JESP symposium: climate change and social policy. *Journal of European Social Policy* 18: 325–44.

Gouldson, A.P., and Murphy, J., 1997 Ecological modernisation: restructuring industrial economies. In Jacobs, M., (ed) *Greening the Millennium: the New Politics of the Environment* 74–86. Blackwell, Oxford.

Hillman, K.M., and Sandén, B.A., 2008 Exploring technology paths: the development of alternative transport fuels in Sweden in 2007–2020. *Technological Forecasting and Social Change* 75: 1279–1302.

Jewert, J., 2012 Swedish climate policy: lessons learnt. Retrieved July 20, 2013 from http://en.globalutmaning.se/?p=2885.

Lafferty, W.M., and Meadowcroft, J., 2000 Patterns of governmental engagement. In Lafferty, W.M., and Meadowcroft, J., (eds) *Implementing Sustainable Development. Strategies and Initiatives in High Consumption Societies* 337–421. Oxford, Oxford University Press.

Lindfeldt, E.G., Saxe, M., Magnusson, M., and Mohseni, F., 2010 Strategies for a road transport system based on renewable resources – the case of an import-independent Sweden in 2025. *Applied Energy* 87: 1836–45.

Lundqvist, L.J., 2004 *Sweden and Ecological Governance: Straddling the Fence*. Manchester University Press, Manchester.

Marshall, K.E., 2007 Sweden, climate change and the EU context. In Harris, P.G., (ed) *Europe and Global Climate Change* 139–60. Edward Elgar, Cheltenham.

Martinovsky, P., and Mareš, M., 2012 Political support for nuclear power in central Europe. *International Journal of Nuclear Governance, Economy and Ecology* 3(4): 338–59.

Meadowcroft, J., 2005 From welfare state to ecostate. In Barry, J., and Eckersley, R., (eds) *The State and the Global Ecological Crisis* 3–24. MIT Press, Cambridge, MA.

Nordhaus, W.D., 1997 *The Swedish Nuclear Dilemma: Energy and the Environment*. Resources for the Future Press, Washington, DC.

Nordic Energy 2012 Renewables and nuclear. Retrieved March 2, 2014 from www.nordicenergy.org/thenordicway/country/sweden.

Regeringskansliet 2009 *Sweden's Fifth National Communication on Climate Change*. Retrieved July 8, 2014 from http://unfccc.int/resource/docs/natc/swe_nc5.pdf.

Regeringskansliet 2011 *Environmental Technology – 13 Swedish Solutions*. Retrieved March 2, 2014 from www.regeringen.se/content/1/c6/17/61/39/67ff1a10.pdf.

Rudberg, P., Weitz, N., Dalen, K., and Haug, J.J.K., 2013 *Governing Growing Wind Power: Policy Coherence of Wind Power Expansion and Environmental Considerations in Sweden, with Comparative Examples from Norway*. Stockholm Environment Institute, Stockholm. Retrieved February 16, 2015 from www.sei-international.org/publications?pid=2329.

Sailor, W.C., Bodansky, D., Braun, C., Fetter, S., and van der Zwaan, B., 2000 Nuclear power: a new solution to climate change? *Science* 288(5469): 1177–8.

Sarasini, S., 2009 Constituting leadership via policy: Sweden as a pioneer of climate change mitigation. *Mitigation and Adaptation Strategies for Global Change* 14: 635–53.

Taylor & Francis
Not for distribution

Proof

Proof

Schnaiberg, A., Pellow, D.N., and Weinberg, A., 2002 The treadmill of production and the environmental state. *Research in Social Problems and Public Policy* 10: 15–32.

Söderholm, P., and Petterson, M., 2011 Offshore wind power policy and planning in Sweden. *Energy Policy* 39: 518–25.

SOU 2008 *Ett energieffektivare Sverige: Nationell handlingsplan för energieffektivisering* [*An Energy Efficient Sweden: National Action Plan for Energy Efficiency*]. Statens Offentliga Utredningar. . Retrieved March 2, 2014 from www.regeringen.se/content/1/c6/10/01/75/31e3b45a.pdf.

Sterba, J.P., 2011 Biocentrism defended. *Ethics, Policy and Environment* 14(2): 167–9.

Swedish Institute 2013 Energy use in Sweden. Retrieved March 2, 2014 from http://sweden.se/society/energy-use-in-sweden.

Taylor, P.W., 1981 The ethics of respect for nature. *Environmental Ethics* 198(3): 197–218.

UNFCCC 2014a Annex, II., *Full Text of the Convention*. Retrieved March 2, 2014 from https://unfccc.int/essential_background/convention/background/items/1348.php.

UNFCCC 2014b Appendix, I., – quantified economy-wide emissions targets for 2020. Retrieved March 2, 2014 from http://unfccc.int/meetings/copenhagen_dec_2009/items/5264.php.

UNFCCC 2014c The mechanisms under the Kyoto Protocol: emissions trading, the Clean Development Mechanism and joint implementation. Retrieved March 2, 2014 from http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php.

Wang, Y., 2006 Renewable electricity in Sweden: an analysis of policy and regulations. *Energy Policy* 34: 1209–20.

Widfeldt, A., 2007 Sweden. *European Journal of Political Research* 46: 1118–26.

WWF 2010 *Climate Policy Tracker for the European Union 2010*. Brussels: World Wide Fund for Nature. Retrieved March 2, 2014 from www.ecofys.com/files/files/wwf%20climate%20policy%20tracker%20final%20report_03%2011%2010_02.pdf.

Zannakis, M., 2009 *Climate Policy as a Window of Opportunity: Sweden and Global Climate Change*. University of Gothenburg Press, Gothenburg.

Taylor & Francis
Not for distribution

Proof