Governing Decarbonisation

The State and the New Politics of Climate Change

Hildingsson, Roger

2014

Link to publication

Citation for published version (APA):
Hildingsson, R. (2014). *Governing Decarbonisation: The State and the New Politics of Climate Change*. [Doctoral Thesis (compilation), Department of Political Science]. Lund University.

Total number of authors:
1

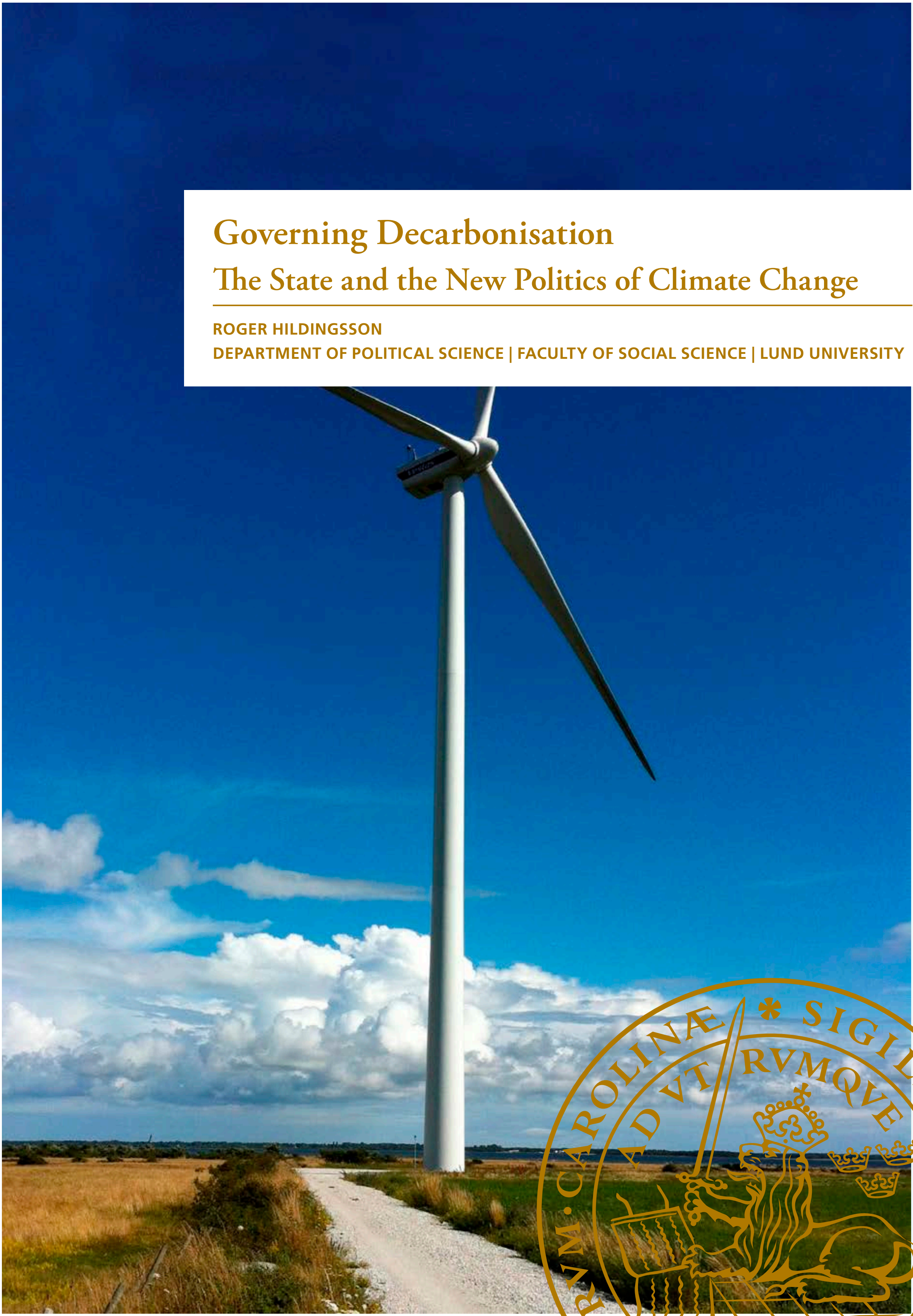
General rights
Unless other specific re-use rights are stated the following general rights apply:
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.
- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: https://creativecommons.org/licenses/

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117
221 00 Lund
+46 46-222 00 00



Governing Decarbonisation

The State and the New Politics of Climate Change

ROGER HILDINGSSON
DEPARTMENT OF POLITICAL SCIENCE | FACULTY OF SOCIAL SCIENCE | LUND UNIVERSITY

Governing Decarbonisation

The State and the New Politics of Climate Change

LUNDS
UNIVERSITET

Roger Hildingsson

Lund Political Studies 172
Department of Political Science

Copyright Roger Hildingsson

Cover page: Näsudden, Gotland (photo: Roger Hildingsson)

Faculty of Social Science, Department of Political Science
ISBN 978-91-7623-181-4 (print)
ISBN 978-91-7623-182-1 (pdf)
ISSN 0460-0037

Printed in Sweden by Media-Tryck, Lund University
Lund 2014

Intertek
MILJÖMÄRKT 341903
fti FÖRPACKNINGS & TIDNINGS INSAMLINGEN
KLIMATKOMPENSERAT PAPPER

Till Simon, Alexander och Alicia

Table of Contents (corrected)

Författarens tack 9

Acknowledgements 13

List of Papers 17

1. Introduction 19
    - 1.1 The New Politics of Climate Change 19
    - 1.2 The Transformative Agenda of Decarbonisation 22
    - 1.3 The New Climate Politics: Governing Low-Carbon Transitions 24
    - 1.4 Research Aims, Objectives and Questions 26
    - 1.5 Sweden as a Case of Decarbonisation 28

2. Theoretical Perspectives on Governing Decarbonisation 31
    - 2.1 The Governing Capacity of the Environmental State 31
        - 2.1.1 Perspectives on the Environmental State 31
        - 2.1.2 A State-Centric Understanding of Governance 38
        - 2.1.3 Concluding thoughts: Steering and Enabling Low-Carbon Transitions 43
    - 2.2 Transformative Change as Transitions 44
        - 2.2.1 Transition Studies and the Multi-Level Perspective on System Change 45
        - 2.2.2 The Governance Approach of Transition Management 48
        - 2.2.3 Concluding Thoughts: Governing Decarbonisation, Governing Transitions 49
    - 2.3 Conditions for Governing Change 51
        - 2.3.1 Evolutionary Perspectives on Institutional Change 52
        - 2.3.2 Public Policy as Discourse 54
        - 2.3.3 Policy Change as Progressive Incrementalism 55
        - 2.3.4 Governance Dilemmas as structural conditions 56
        - 2.3.5 Concluding thoughts: Conceptualising the Policy Space 57

3. Analytical Strategies 61
    - 3.1 Policy Analysis and Forward Reasoning 62

3.2 Discourse Analysis as Policy Analysis 62
3.3 Interviews 65
3.4 Making Sense of Policy Interactions 66
3.5 Engaging in Multidisciplinary Research 66
4. Summary of the Papers 69
4.1 Papers 1-6 69
4.2 List of Other Contributions 74
5. Conclusions 77
5.1 Conceptualising the Environmental State 78
5.2 How Can the State Govern Decarbonisation? 80
5.3 Conditions for Governing Policy Change 82
5.4 Towards a Decarbonised State? 83
References 85
Appendix 1 Swedish Interview Study 95
Appendix 2 Policy Interactions 99

Other corrections

p. 41, row 31:	Reference to Fig. 3 should be “(see Fig. 1)”.
p. 63, row 38:	“i.e. a concept with a” should be revised to “i.e. a concept which”.
p. 83, row 5:	Second word should be “Embarking... ”.

Omitted references (pp. 85 ff):

Abbott, K. W. (2012). The Transnational Regime Complex for Climate Change. *Environment and Planning C: Government and Policy* 30: 571–590.

Bergström, G. och K. Boréus, red. (2005). *Textens mening och makt: Metodbok i samhällsvetenskaplig text- och diskursanalys.* Lund: Studentlitteratur.

Hale, T and C. Roger (2014). Orchestration and Transnational Climate Governance. *Review of International Organizations* 9(1): 59–82.

Jørgensen Winther, M. and L. Phillips (2000). *Diskursanalys som teori och metod.* Lund: Studentlitteratur.

Rhodes. R.A.W. (1997). *Understanding Governance: Policy Networks, Governance, Reflexivity and Accountability.* Maidenhead: Open University Press.

Table of Contents

Författarens tack 9

Acknowledgements 13

List of Papers 17

Introduction 19

- The New Politics of Climate Change 19
- The Transformative Agenda of Decarbonisation 22
- The New Climate Politics: Governing Low-Carbon Transitions 24
- Research Aims, Objectives and Questions 26
- Sweden as a Case of Decarbonisation 28

Theoretical Perspectives on Governing Decarbonisation 31

- The Governing Capacity of the Environmental State 31
  - Perspectives on the Environmental State 31
  - A State-Centric Understanding of Governance 38
  - Concluding thoughts: Steering and Enabling Low-Carbon Transitions 43
- Transformative Change as Transitions 44
  - Transition Studies and the Multi-Level Perspective on System Change 45
  - The Governance Approach of Transition Management 48
  - Concluding Thoughts: Governing Decarbonisation, Governing Transitions 49
- Conditions for Governing Change 51
  - Evolutionary Perspectives on Institutional Change 52
  - Public Policy as Discourse 54
  - Policy Change as Progressive Incrementalism 55
  - Governance Dilemmas as structural conditions 56
  - Concluding thoughts: Conceptualising the Policy Space 57

Analytical Strategies 61

- Policy Analysis and Forward Reasoning 62

Discourse Analysis as Policy Analysis 62
Interviews 65
Making Sense of Policy Interactions 66
Engaging in Multidisciplinary Research 66

Summary of the Papers 69
Papers 1-6 69
List of Other Contributions 74

Conclusions 77
Conceptualising the Environmental State 78
How Can the State Govern Decarbonisation? 80
Conditions for Governing Policy Change 82
Towards a Decarbonised State? 83

References 85

Appendix 1 Swedish Interview Study 95

Appendix 2 Policy Interactions 99

Författarens tack

På ett tidigt stadium närde jag en önskan om att författa en tvåspråkig avhandling, tillgänglig för mina “peers” både inom och utom akademin. Avhandlingsmödornas realia, och en begränsad budget, satte beklagligtvis stopp för det. Men sånt är livet, att lära sig leva med begränsningar. Precis som i politiken; politik det är att vilja något, sa Olof Palme, men politik är lika mycket en konst i att bemästra de begränsningar som uppställs för våra strävanden och för vår vilja till förändring.

Hela mitt arbetsföra liv har jag ägnat mig åt olika projekt. Det här är utan tvekan det svårast projekt jag har givit mig i kast med. Att skriva en akademisk avhandling är alltid en svår uppgift och en lektion i att lära sig leva med begränsningar. De utmaningar på såväl intellektuellt som existentiellt plan en sådan uppgift ställer en inför är något alla forskarstuderande upplever, i större eller mindre utsträckning. Att författa en sammanläggningsavhandling är svårare än så, särskilt i en forskningsmiljö van vid bokavhandlingar. Det reser frågor om vad en statsvetenskaplig sammanläggningsavhandling är och bör vara, frågor som ligger bortom forskarstudentens bidrag och argument. Att i en sådan statsvetenskaplig avhandling föra samman forskning som bedrivits i ett flervetenskapligt sammanhang till ett sammanhängande argument är om möjligt än svårare. Det här är mitt försök att presentera ett sådant argument, om en högst allvarlig fråga. Ett argument om klimatpolitikens nya inriktning och om vad statens uppgift kan vara i att styra och göra den klimatomställning alltfler blir övertygade om är nödvändig möjlig, om mänskligheten ska undvika de mest allvarliga effekterna av pågående och framtida klimatförändringar.

Min avhandling startar där mitt projekt började, i Köpenhamn. Även om jag likt många andra vände den internationella klimatpolitiken ryggen i Köpenhamn, betydde de veckorna i december 2009 mycket. På ett intellektuellt plan bekräftade det mitt huvudsakliga forskningsintresse för klimatpolitikens utveckling på andra arenor och nivåer från vilka mellanstatlig eller transnationell politik hämtar sin näring och energi och får sin materiella betydelse. På ett personligt plan fick jag möjlighet att stifta bekantskap med många nya kollegor i det nätverk på Lunds universitet som jag uppskattar att ha fått tillhöra under dessa år. Detta breda nätverk av miljö- och klimatintresserade forskare och lärare är vad som gör Lunds universitet till en så spännande och stimulerande forskningsmiljö att befinna sig i, för den som är intresserad av miljö- och klimatpolitikens utmaningar och öppensinnig för mångvetenskapliga impulser.

Många personer i detta nätverk vill jag tacka, men några är jag mer än andra skyldiga evig tacksamhet och djup uppskattning. Först och främst mina båda handledare Annica Kronsell och Johannes Stripple; stort tack för all inspiration och allt stöd längs denna resa! Jag har inte alltid varit den enklaste doktoranden att handleda, varför jag uppskattar att ni tagit mig under era armar med sådant engagemang och tålamod! Och, för att ni hjälpt mig att fokusera på uppgiften. Ni bemästrar verkligen konsten att balansera utmanande kritik med konstruktiva råd och med kollegial omtänksamhet, sannerligen en akademisk standard att eftersträva. Lycklig är den som har sådana varma "kritiska" vänner som handledare! Min uppskattning vill jag också rikta till er för att ni invigt mig i den miljöpolitiska forskningsmiljön på Statsvetenskapen, en forskningsgrupp vars ambitioner man får lov att leta efter. Särskilt tack till Jakob Skovgaard och Mikael Kylsäter för er detaljerade genomgång och konstruktiva genomlysning under mitt mittseminarium och till Karin Bäckstrand, Tobias Nielsen och Fariborz Zelli för skarpa kommentatorer på slutet, men lika mycket till Emma, Åsa, Anna, Helena, Joshka, Kurtis och Samuel samt Rickard, med vilken jag inte bara delat handledare och avhandlandets vedermödor utan många och långa samtal i vårt "doktorandhostel" på Edens tredje våning! Tack också till tidigare kollegor Eva, Hannes, Lovisa och Rasmus samt gästforskare såsom Benjamin, Paul, Michele och inte minst Harriet Bulkeley, som kanske mer än någon annan inkarnerar akademisk stringens i kombination med ett stort hjärta!

Ett särskilt tack går också till en person som betytt mer för mig än han anar; Håkan Magnusson, som student min första uppsatshandledare och som tillsammans med Tomas Bergström introducerade mig till förvaltningslitteraturen. Håkan var den som först fick mig in i tankarna om forskarstudier, den där höstdagen för nio år sedan när du uppmanade mig att bevista en disputation om klimatpolitiken efter det internationella, och när du senare tipsade disputanten den dagen om en projektassistent. Därför gladde det mig särskilt att få ta del av din läsning av mitt manus på slutkonferensen; kul att höra att du kände igen mina tankegångar om miljöpolitikens diskursiva dynamik!

Lika djup tacksamhet vill jag rikta till Lars Nilsson, som *de facto* fungerat som något av en tredje handledare och varit en akademisk mentor för mig allt sedan vi tillsammans utformade LETS-programmet, det projekt som finansierat och definierat mycket av min forskning. Stort tack för allt stöd och inspiration, Lars, och för dina ständiga påminnelser om vad ens teoretiska förståelse betyder i mer konkreta termer, "på marken"! Min störst tacksamhet vill jag också rikta till Jamil Khan och Bengt Johansson, inte bara för våra alltid goda samarbeten i medförfattande av artiklar, bokkapitel, konferensbidrag, rapporter och ansökningar, utan också för ett ständigt utbyte av idéer och kritiska tankar om miljö- och klimatpolitikens styrningsproblem, för att inte tala om alla trevliga lunchsamtal om politik, samhällsdebatt och fotboll! Tack också till övriga IMES-kollegor, Eva, Max, Karin, Fredrik, Alexandra, Oscar, Christian och alla andra, för gästfriheten; hos er känner man sig alltid välkommen!

För fint samarbete vill jag också tacka mina andra medförfattare, Måns Nilsson (SEI), Per-Ove Eikeland (FNI), Patrik Söderholm (Luleå), Fredrik Wilhelmsson (AgriFood), Andrew Jordan (UEA), Rickard Andersson och Sebastian Garczyna Johansson. Tack också till alla kollegor i LETS-programmet samt i GreenGovern- och ADAM-projekten för meningsutbyten och perspektivskiften under dessa år. För finansiering är jag tacksam för stöd från Naturvårdsverket, Energimyndigheten, Vinnova och Trafikverket samt Knut och Alice Wallenbergs Stiftelse för resebidrag. Särskilt vill jag tacka de personer på dessa myndigheter som delat med sig av sina erfarenheter av och insikter om den svenska klimatpolitiska praktiken, utan vilka min forskning blivit mer distanserad från den policyverklighet jag försökt förstå. Av samma skäl vill jag tacka alla de personer på myndigheter, regeringskansli, i riksdagen och organisationer som ställde upp som intervjupersoner för min studie!

En viktig del i livet som universitetsanställd utgörs av undervisning. Som ny doktorand var jag tveksam till detta, men en person har mer än andra hjälpt mig att gilla att undervisa och uppskatta mötet med studenter. Stort tack, Åsa, för ditt mentorskap! Tack också till Eva och Per på IMES; till Maj-Lena, Yvonne, Åsa och övriga på Miljövetenskapen/CEC; och inte minst till bästa lärargänget, Carl Dalhammar, Tobias Linné, Tobias Nielsen och numera också Terese Göransson! Min tacksamhet går också till alla studenter som bidragit till att göra kurserna i klimat- och miljöpolitisk samhällsstyrning så stimulerande!

Ett viktigt inslag i det akademiska livet utgörs av de kommentarer som kommer en till del i samband med konferenser och seminarier. För sådana kommentarer vill jag rikta ett särskilt tack till Andreas Duit, Max Koch, Kristina Boréus, Sverker Jagers, Ingolfur Blühdorn och Hannes Stephan, som på avgörande punkter bidragit med synpunkter över de alster jag författat.

Min uppskattning vill jag också visa alla de statsvetenskapliga kollegor som anstränger sig för att upprätthålla en kollegialt varm och tillåtande kultur på vår institution, även i tider av förändring, akademisk karriärplanering och konkurrens om forskningsresurser. Här har doktorandkollegiet utgjort något av en fristad för oss som delar forskarstudiernas vedermödor och utmaningar. Tack alla, Emma, Nils, Michael, Tobias, Mikael, Rickard, Jonna, Petter, Mi, Niklas, Tony, Klas, Linda, Fabio, Ivan, Cecilia, Mia m.fl. för att ni gör och har gjort Statsvetenskapen till en trevlig arbetsplats! Bland övriga kollegor vill jag tacka särskilt Josef Chaib, Petter Narby, Maria Hedlund, Åsa Knaggård, Catia Gregoratti, Carlo Knotz, Moira Nelson, Anders Uhlin, Martin Hall, Ylva Stubbegaard, Jan Teorell och Ole Elgström för kommentarer och kloka synpunkter längs vägen. Ett speciellt tack till Magnus Jerneck för dina alltid utmanande kommentarer, och en oförglömlig intellektuell svärdfäktning på mitt planseminarium – följt av en högst uppskattad och konstruktiv eftersittning! Tack också till Magnus, Fariborz och Ylva för en noggrann grönläsning som bidrog till att förtydliga mitt argument! Till statsvetenskapens administrativa personal; Kristina, Stefan, Helen, Daniel, Margareth, Sahar, Amir och Praphasri samt Hanna och Linda på Sambib, stort tack för all hjälp i stort som i smått! Ni måste vara universitetets mest effektiva och trevliga administration! Tack också till Stefan, Niclas, Niklas, Josef m.fl. för en fantastiskt underhållande och lååång fotbollstråd som förgyllt många sena kvällspauser i avhandlingsskrivandet det senaste året!

På ett personligt plan, går min djupaste tacksamhet till alla de människor som bortom akademin fyller mitt liv med mening och nöje och så mycket omtanke och engagemang. Till släkt och familj, nya och gamla vänner; till Hallgrimur och Gunny för all vänskap, allt okonstlat umgänge och all hjälp med barnen; till Per och Petra, våra käraste grannar i Djingis-klanen, för er gästfrihet och för alla analogier och oavslutade samtal; till klanen Rodriguez-Spångberg, för alla upptåg och bästa Skype-festen; till Jocke och Jonas, Pablo och Tomas, för alla timmar tillsammans på Smörlyckan och i fotbollens övriga värld; till Maarten, Nino och övriga i LFF för ert engagemang och den goda fotbollskultur ni odlar; till morbror Johnny, som väckte mitt politiska intresse med dina engagerade berättelser; till Hasse och Niklas, som var där när det intresset utvecklades; till Pär och Jonas, som var med när mitt miljöpolitiska engagemang formades; och till Martha och Margareta (i din himmelska mylla) och alla andra som enträget kämpat under alla dessa år för att progressivt flytta fram positionerna i det svenska miljö- och klimatarbetet!

Men, främst av alla, står jag i tacksamhetsskuld till mina föräldrar, Janeth och Kjell, för er obrottsliga tro på mig vad jag än tagit mig för och för att ni alltid finns där! Och, till mina syskon, Angelica och Peter, tack för allt stöd; det kan även en storebror behöva! Till sist och allra mest, mina närmaste Simon, Alexander och Alicia, till er saknar jag ord för att uttrycka min uppskattning och kärlek. Jag vet hur ansträngande den här resan varit för er och till er har jag bara en sak att säga: Tack för att ni finns i mitt liv! Nu är det här projektet över och resten av livet kan börja!

Roger

Acknowledgements

The project of completing a doctoral dissertation is long and challenging. As the author of this thesis I am solely responsible for the end product, however this challenging task had been insurmountable without the support and assistance from others to which I owe a lot of gratitude and appreciation.

This dissertation takes its departure where my project began, in Copenhagen. Even if I, as many others, in Copenhagen turned my back to the hopes of international climate politics, those weeks in December 2009 meant a lot to me. Intellectually, the experience confirmed my research interest in the development of climate governance at other sites from which international politics and transnational initiatives derive their nourishment and energy and through which the material implications become manifested. Personally, I made a lot of new acquaintances, in particular with colleagues that today are part of the wider network of scholars involved in research related to environmental politics and climate governance at Lund University. This network of scholars is what makes Lund University such a thriving and stimulating research environment for those interested in the challenges of climate politics and open to cross-disciplinary influences and conceptual pluralism.

For the research endeavour of mine, I am indepted to so many people but some more than others. First of all, to my tutors, Annica Kronsell and Johannes Stripple, for being such immense sources of inspiration and support all along this endeavour. I can only imaging how complicated it has been to supervise me, why I appreciate the dedication and patience by which you have taken me under your wings! You master the art of balancing challenging criticism with constructive advice and considerate collegiality, truly an academic standard to strive for. Fortunate are those who have such warm-hearted “critical” friends! All my appreciation for also initiating me into the Environmental Politics Research Group (EPRG) at our department, a community of researchers whose ambitions are not easy to find and who have become my closest companions in the faculty over these years. A special thanks to Jakob Skovgaard and Mikael Kylsäter for your detailed comments and constructive thoughts during my mid-seminar, and to Karin Bäckstrand, Fariborz Zelli and Tobias Nielsen for your sharp comments at the final stage. To all of you and to Emma, Åsa, Anna, Helena, Joshka, Kurtis, my deepest gratitude for all companionship and especially to Rickard with whom I have not only shared tutor and the hardships of postgraduate studies but also many long conversations and brilliant thoughts in our office room at Eden! Thanks also to previous colleagues Eva, Hannes, Lovisa and Rasmus and guest researchers such as Benjamin Stephan, Paul Tobin, Michele Betsill and Harriet Bulkeley, who perhaps more than others personifies academic stringency combined with a generous heart!

Beyond the EPRG, I am immensely grateful to Lars J Nilsson for being a kind of third *de facto* supervisor and an academic mentor for me ever since we designed the LETS programme, which have funded and defined so much of my postgraduate research. Thanks, Lars, for invaluable inspiration, support and thoughtfulness all along the way, and for always reminding me about what our conceptualisations mean in real terms, "on the ground"! I would also like to extend my deepest gratitude to Jamil Khan and Bengt Johansson, not only for our always excellent collaboration in co-authoring articles, book chapters, conference papers, reports and applications, but as well for the constant interchange of ideas and critical thoughts about the challenges of environmental politics and climate and energy policy, not to mention all enjoyable lunch talks about politics, public debates and football! I extend my thanks to your colleagues at Environmental and Energy Systems Studies (IMES), Eva, Max, Karin, Fredrik, Alexandra, Oscar, Christian and all others, for your kind hospitality!

Further, I am grateful for the productive author collaborations with Måns Nilsson (SEI), Per-Ove Eikeland (FNI), Patrik Söderholm (Luleå), Fredrik Wilhelmsson (AgriFood) and Andrew Jordan (UEA). This gratitude I wish to extend to my former colleagues in the LETS2050 programme, the GreenGovern and ADAM projects as well as to my new partners in the Sustainable Welfare project. For funding I am grateful for the support from the Swedish Environmental Protection Agency, the Swedish Energy Agency, the Swedish Transport Administration and the Swedish innovation system agency Vinnova as well as the Knut och Alice Wallenbergs Foundation. A special thanks to the people at these national authorities for sharing your experiences and insights from climate policy-making in Sweden, invaluable for a scholar striving to understand the policy reality of yours. Similarly, I am grateful to all respondents at the government offices, national agencies, in the Parliament och in organisations for devoting time to participate in my interview study.

A central part of the academic life at a public university is teaching. As a novice postgraduate candidate I was a bit hesitant to this role but one person in particular has been very instructive and helpful in making me appreciate teaching and especially the exchange with students. Thanks, Åsa, for your mentorship in this regard! My gratitude to Eva, Per and Lotta at IMES and to Yvonne, Åsa and Maj-Lena and all others at Environmental Science/CEC for our teaching collaborations and not the least to the greatest team of teachers; Carl Dalhammar, Tobias Linné, Tobias Nielsen and Terese Göransson! In this respect, I also thanks all students that have contributed to make the courses in climate and environmental governance so stimulating!

A central feature in academic research is those comments and viewpoints you receive during conference presentations and seminars. For such comments, a special thanks to Andreas Duit, Max Koch, Kristina Boréus, Sverker Jagers, Ingolfur Blühdorn and Hannes Stephan, who have provided well-informed suggestions on essential aspects of the works I have authored. Similarly, I am grateful for such well-advised comments, ideas and support from colleagues at the Political Science department in Lund, for instance Josef Chaib, Petter Narby, Rickard Andersson, Jonna Pettersson, Niklas Altermark, Emma Lund, Nils Gustafsson, Carlo Knotz, Maria Hedlund, Åsa Knaggård, Catia Gregoratti, Moira Nelson, Anders Uhlin, Martin Hall, Ylva Stubbegaard, Jan Teorell, Ole Elgström and Magnus Jerneck, for always challenging comments, and not the least Håkan Magnusson, for being the first inspiring me for postgraduate research. A special thanks to Magnus, Fariborz and Ylva for your final readings and comments, which helped me to further elucidate my argument in this dissertation!

Furthermore, I would like to extend my appreciation to all those colleagues who strive to maintain a collegial warm and permissive culture at our department, even in times of change, academic career planning and competition over research funding. In this respect, the postgraduate community has provided a wholesome site for reflection and an invaluable source of support and loyalty. My deepest gratitude to all my postgraduate fellows for making our department such an enjoyable place! On another collegial note, all my thanks to our eminent administrative staff for making postgraduate life easier; you must be the most efficient and nice administrators at the university! At last, my greatest appreciation to Stefan, Niclas, Niklas, Josef et al. for a fantastic entertaining and looong football thread that have gilded many late night breaks during the last years efforts to write up this thesis!

On a personal level, I am deeply grateful to all the people that fill my life beyond the academia with so much meaning and pleasure, kindness and warmth. Thanks, Hallgrimur and Gunny for your dear friendship, uncomplicated company and all the help with the kids; to Per and Petra, our dearest neighbours in the Djingis clan, for your hospitality and for all analogies and unfinished conversations; to the Rodriguez-Spångberg family for all funny pranks and escapades; to Tomas, Pablo, Jonas and especially Jocke, for your enthusiasm and all leisure time together at Smörlyckan; to Maarten, Nino and others in LFF for your dedication to football and the good football culture you strive to foster; to uncle Johnny for sparking my political interest with your compelling stories; to Hasse and Niklas who were there when that interest seriously arouse; to Pär and Jonas who were there when my interest in environmental politics took shape; and to Martha, the late Margareta and all others that have strived so insistently to progressively advance environmental and climate politics in Sweden.

Foremost of all, I owe gratitude to my parents, Janeth och Kjell, for your unswerving belief in me and your endless support no matter what I have trown myself into! And, my warmest thanks to my siblings, Angelica and Peter, for all support in tough times, a support even a big brother may need sometimes! Finally but most, to my dearest, Simon, Alexander and Alicia, I lack words for expressing my appreciation, love and affection. I know this journey has been exhausting for you and to you, I have only one thing to say: thanks for being there in my life! Now, this project is over and the rest of life can begin!

List of Papers

Paper 1 (sole author, published):
Hildingsson, Roger (2010). The Deliberative Turn in Swedish Sustainability Governance: Participation from Below or Governing from Above? In: K. Bäckstrand, J. Kahn, A. Kronsell and E. Lövbrand, eds., *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance.* Cheltenham: Edward Elgar, pp. 145-164.

Paper 2 (lead author, published):
Hildingsson, Roger, Johannes Stripple and Andrew Jordan (2012). Governing Renewable Energy in the EU: Confronting a Governance Dilemma. *European Political Science* 11(1): 18-30.

Paper 3 (sole author, manuscript):
Hildingsson, Roger (2014). Too Many Targets or Too Few Measures? Discourses on Decarbonisation in Swedish Climate Policy-Making. Unpublished manuscript to be submitted to *Environmental Politics*.

Paper 4 (lead author, accepted for publication):
Hildingsson, Roger and Jamil Khan (2014). Towards a Decarbonised Green State? The Politics of Low-Carbon Governance in Sweden. In: A. Kronsell and K. Bäckstrand, eds., *Rethinking the Green State: Environmental Governance towards Climate and Sustainability Transitions*, Chapter 9. Accepted for publication at Earthscan/Routledge (forthcoming).

Paper 5 (co-author, published):
Nilsson, Måns, Lars J. Nilsson, Roger Hildingsson, Johannes Stripple and Per Ove Eikeland (2011). The Missing Link: Bringing Institutions and Politics into Energy Future Studies. *Futures* 43(10): 1117-1128.

Paper 6 (lead author, manuscript):
Hildingsson, Roger and Bengt Johansson (2014). Governing Low-Carbon Transitions in Sustainable Ways: Potential Synergies and Conflicts between Climate and Environmental Policy Objectives. Manuscript submitted to *Energy Policy*.

Introduction

Goodbye Copenhagen love
I left my heart I know it's not enough
Goodbye Copenhagen love
I'll be back in December
I hope you'll still be there
(New Politics)

This dissertation examines the new climate politics of decarbonisation and the role of the state as a critical site for progressive climate action, moving away from the current dependence on fossil carbon energy. The new politics of climate change concerns transformative social change aimed at deep reductions in the carbon intensity of modern economies and societies. In my view, the increasingly used notion of a low-carbon transition represents a particular view on the processes of change required to achieve such deep decarbonisation in the provision, distribution and use of energy. In this view, modern societies can reform themselves by restructuring key systems, structures and practices which generate carbon emissions. In this thesis, I claim that such transformative change will not materialise without appropriate political responses, public policy measures and authoritative societal steering. Engaging with theoretical perspectives on the state in environmental governance and its potential role in steering policy change and enabling system transformations, my interest is to explore what the new politics of climate change imply for the state in governing decarbonisation and low-carbon societal development.

The New Politics of Climate Change

Do you remember 19 December 2009? I do, I surely do. I had just become a novice post-graduate three months before. This was a pleasant time in many respects, especially for a political scientist with the task to study climate politics. Climate change was on the very top of the political agenda in the midst of the run-up to the Copenhagen Climate Summit (COP 15). After weeks of preparation, months of negotiation and years of propositions the momentum had built up, the stakes were high and the hopes even brighter. In Hopenhagen, the city of tomorrow, all building blocks would finally be put together in a new "grand bargain" and form the basis for a new climate politics. And so they did. Not as expected but, certainly, those days changed climate politics. Goodbye Copenhagen, you are not there anymore. But you will be remembered as a watershed for the new politics of climate change.

For me, those weeks were inspiring, and discouraging. I had been preparing for the summit for months, as the contact point to the United Nation Framework Convention on Climate Change (UNFCCC). Coordinating a huge delegation of observers from Lund University – researchers, scholars, lecturers and students, all in all, 230 people(!) – I went there on 7 December. Catching the morning train over the bridge, I ended up stuck in the long queue outside Bella Centre for hours, freezing in the cold winter breeze which blew through Örestad. A tough start to the journey, but I continued to commute every morning for the next two weeks, along with thousands of others. Except for one day – the 19th of December.

On that day I stayed, along with a hundred other observers allowed onto the premises, to await the outcome. After a long day of endless rumours, president Obama's message finally reached us. Aboard Air Force One he announced: “We have a deal!”. He did not take much notice of its legal status but as the saying goes: If you have a complicated message, just say it, then leave and let those left battle out its implications! Indeed, his statement became the prologue to a long and dramatic night. A night during which Venezuela's Saleno accidentally sliced her hands in order to express her right to speak; Sudan's Di-Aping accused the rich of committing genocide, condemning “Africa to sign a suicide pact, an incineration act”; and the widely popular Maldivian President Nasheed emotionally pleaded with his G77 friends to accept the deal in order to keep his nation above sea level. Even the Danish PM Rasmussen, who had been so close to killing the entire process, and perhaps would have if not for Ed Miliband's hasty request for adjournment. Approaching the worst case scenario, intense informal talks and pressure followed, but in the morning seven countries still blocked a deal and the conference could only “take note” of the document. That outcome went down in history as the Copenhagen Accord. A political declaration agreed behind closed doors by a self-selected group of leaders, never formally adopted, “without an institutional home and with highly ambiguous legal status in international law” (Dimitrov 2010: 21). Ever since, the Accord is on public view at the UNFCCC homepage. A year later its most substantial elements were inscribed in the Cancun Agreements. Few of us sitting in the observer seats that night, realised that this non-binding agreement should turn out to manifest such a key watershed for climate politics.

Since then much has happened, and less has been done, depending on the perspective. While those continuing to follow the negotiations find themselves adrift in search of a new global climate regime, global emissions continue to rise and climatic changes become more and more pronounced. Those focusing on activities beyond the international regime find openings in the great variety of initiatives emerging at other sites, while others like myself interested in the low-carbon transition see glimmers of hope in the simple fact that so few solutions have even been tried (Axelsson 2014). For us, Copenhagen provided two critical insights, illuminated below in an editorial piece apropos the recent UN Climate Summit in New York:

> The lesson of the failure in Copenhagen was, above all, that a wider perspective is needed. First, the issue is too crucial to put all eggs in one basket. Second, there are more ways to reach results that could be employed in parallel to the big UN negotiations. (DN 24/9 2014; *my translation*)

In saying this, the editorial-writer meant alternative multilateral instruments, a wise idea to exploit the wider regime complex (Keohane and Victor 2011; Abbott 2012) but not a way to rescue a regime that has lost its basic capacity to regulate responsibilities for – and meaningful responses to – climate change. Not after the watershed in Copenhagen which marked the end of the hope that international negotiations would solve the problems of climate change. But a wider perspective on the ways to achieve results could mean something different, if we allow our attention to be directed towards other levels for progressive action and authoritative steering. Another anecdotal experience makes that point:

In the late 1990s, I was employed as a city officer at a local Swedish municipality, Växjö, a renowned progressive climate city. At the time of signing the Kyoto Protocol, we received widespread attention for our local ambition to become a Fossil Fuel Free City. Delegations from all over, and not least from Japan, went on a climate action pilgrimage to visit us. What we could showcase were, basically, a newly constructed, biomass fuelled cogeneration plant serving the city with district heating and locally produced, green electricity, and a great ambition to halve carbon emissions. The plant cut around 20 % in emissions and further expansion in biofuels and other renewable energies cut another 15 %. These transformations were accompanied by lively engagement among local politicians, my colleagues, the municipal energy company and related businesses. However, what made real progress possible was state-sponsored investment subsidies. Despite local ambitions, the involvement of the state to support the local activities was an absolutely necessary condition. Meanwhile, other structures were beyond our control, patterns of transport and consumption largely prevailed and local experiments championed by us and others seemed hard to replicate. What made matters worse were that such challenges did not get sufficient recognition by national and international policy-makers, preoccupied with designing markets for carbon trading. Over the years that made me increasingly frustrated and, finally, brought me into academia, to understand the conditions for political change in the quest for society-wide transformations.

These anecdotal observations offer two key insights and points of departure for my research. First, that climate stabilisation has to be achieved through transforming and decarbonising societal structures, systems and practices that generate carbon emissions in the first place. To achieve real change on the ground, such structural change has to be addressed in a pragmatic but society-wide manner. Second, the governing capacity of the state seems key for supporting such transformative social change to a significant extent. This motivates me to redirect the spotlight towards what has traditionally been the basic entity for environmental policy development and innovation; *the domestic state level*. It was this political level which older generations of political scientists spent such energy attempting to characterise, but which we today have a much broader understanding of thanks to new insights on the political organisation and function of authoritative steering and exercise of power. The state level is where actors, interests and views meet in political debate and contestation; where social actors reflect upon and challenge arrangements of governance; where support is mobilised for advancing political priorities; and where public actors and state authorities exploit the authority and the capacities they possess to develop and deploy strategies for influencing societal development, including in response to ecological challenges such as climate change. What the new politics of climate change could mean for the current state in governing the transition towards decarbonisation is the focus of this dissertation. These insights provide points of departure for my research endeavour and are elaborated further in the following two sections on the transformative orientation of the decarbonisation agenda and on the critical importance of the domestic state level in such a new direction of climate politics, before I present the overall aim, objectives and research design of this dissertation.

The Transformative Agenda of Decarbonisation

It is widely recognised that persistent ecological sustainability problems demand profound changes in social practices and societal organisation. However, the ways to achieve such change is disputed. Political responses for mitigating ecological impacts in terms of environmental governance and regulation have progressed over the years in a piecemeal and incremental fashion to manage the side-effects of modernisation, industrialisation and late-capitalist consumerism. The scope and the scale of sustainability problems has made it clear that incremental change of prevailing systems and courses of action is largely insufficient. In relation to climate change, the Intergovernmental Panel on Climate Change (IPCC 2014) reports how gains in lowering energy and carbon intensities have so far been outpaced by drivers such as economic and population growth. This has generated calls for more radical change to transform the very ways in which human societies are organised to allocate and distribute resources for promoting prosperity and preserving the well-being of present and future generations, while respecting ecological limits. This indicates a need for decarbonising the economy and human societies over the course of the mid-century, at least in advanced economies and in key economic sectors such as energy, transport and industry. The centrality of such sectors in the current carbon economy has forced many to question the likelihood that sustainability problems can be handled within the current framework. As such, many positions asserted in environmental political debates – ranging from libertarian free-market environmentalism to systemic, anti-capitalist critiques or new eco-authoritarian accounts of expert rule – presuppose, explicitly or by implication, fundamentally different kinds of social orders. However attractive and defendable on philosophical grounds, the prospects for such propositions are doubtful considering, for instance, all the vested interests and the resilience of the capitalist economic order and the present liberal democracy in most advanced societies (Newell and Paterson 2010). In addition, pursuing radical social change is politically challenging and a risky strategy for policy-makers (Compston and Bailey 2008). The urgency in preventing dangerous climatic changes from occurring adds to this complexity of addressing the kind of transformative change implied by the decarbonisation agenda.

An intriguing feature in contemporary debates on ecological sustainability and climate stabilisation is related to the ambiguity inherent in the very rhetoric of the sustainability agenda when it comes to societal change. The objective of ecological sustainability implies a transformative orientation in its ultimate concern with the ecological limits of human development. According to recent insights from system ecologists, humanity is already on or beyond the threshold of critical planetary boundaries, notably on biodiversity losses, the nitrogen cycle and climate change (Rockström *et al.* 2009). Such indications of an impending ecological crisis clearly provide pressure for transformative change in the organisation and operations of society. While it could provide a basis for mobilising political protests, unrest and even revolutionary change (see e.g. Klein 2014; cf. O'Kane 2004), system ecological thinking has rather nurtured approaches of socio-ecological management and expert rule that tend to displace issues of politics and equity (see e.g. Raworth 2012). In a similar vein, it is interesting to note how the transformative agenda implied by exactly such alarmist accounts has been addressed in reformist rather than revolutionary terms in public discourse. The same goes for the decarbonisation agenda in climate politics. The implied large-scale energy system transformations are conceptualised in terms of low-carbon transitions possible to achieve through processes of technological change and incremental reforms of an increasingly progressive nature. This provides reasons to reflect upon exactly how radical and thorough the anticipated transformations must be, not to mention the efforts pursued to enable such change.

The transformative agenda of decarbonisation represents a new approach essentially different from traditional paradigms of environmental governance (Carter 2007). As indicated recently by James Meadowcroft, environmental politics is about to enter what he terms the “third maxim of the environmental state” in its orientation to “transform societal practices to respect ecological limits” (Meadowcroft 2012: 77). Attempts to develop coherent responses to climate change in terms of decarbonisation strategies fall into this category. Addressing decarbonisation by means of low-carbon transitions goes well beyond previous approaches to environmental governance such as those found in the environmental management of the 1970/80s, emphasising command-and-control regulations and pollution control; or in the implementation of sustainable development in the 1990s emphasizing policy integration and ecological modernisation. Compelled by this transformative orientation, my research interest is directed towards the avenues for pursuing processes of transformative social change by engaging the state in governing transformations in societal systems, functions and activities that have to be radically decarbonised for climate stabilisation to materialise.

The New Climate Politics: Governing Low-Carbon Transitions

Increased attention to the problems caused by climate change has spurred a lively debate about climate governance and the efforts to halt and mitigate climate change in order to avoid the most dangerous consequences while adapting to unavoidable climatic changes. Observations of on-going climatic changes and projections of a warmer future are alarming. Climate science, as synthesised by for instance the IPCC (2013), holds a message to policy-makers about a diminishing global carbon budget and climatic impacts on natural systems with severe consequences for human life. Meanwhile, a growing scientific consensus has established that stabilisation of atmospheric greenhouse gas concentrations at very low levels to limit global warming presupposes emissions to approach zero in this century, to be halved by the mid-century and to peak in the coming decade. The magnitude of this challenge directs attention to the need for putting modern societies on a trajectory towards low-carbon development and decarbonisation by means of, for instance, energy system transformations (Johansson *et al.* 2012), transitions to a low-carbon economy (Stern 2006), a green economy (NEF 2008; UNEP 2010), a new climate economy (GCEC 2014) or, even, new forms of climate capitalism (Newell and Paterson 2010). While many argue such system change to be feasible from technical points of view, a remaining key challenge is to envisage how such processes of change might be addressed politically and socially. My claim in this thesis, is that the state has a key role to play in governing such transitions.

The field of climate politics has long been geared towards the development of an international regime or a global system of governance, since the signing of the UNFCCC in Rio 1992 and the Kyoto Protocol in 1997. The main task of the international community has been to reach an agreement on an overarching institutional framework for regulating and organising concerted global action among states. But as indicated above, the hope for a new global climate policy regime languished away after Copenhagen, despite the propitious momentum for change and political resolution built up in the run-up. In the context of stalling international negotiations, and in the aftermath of the financial crisis, I argue the attention of climate policy debate to have shifted away from global climate governance arrangements and towards how national economies might enter low-carbon development paths by means of regional (e.g. EU) and domestic efforts. Transnational climate governance keeps its saliency as indicated by continued instances of climate diplomacy and by a range of civil, private and public efforts to regulate climate change by other means. But, the main emphasis has started to change as the climate change problem has been reframed into a broader agenda of promoting low-carbon technologies, enabling energy system change and steering societal development along more sustainable lines. When the international system of states and global institutions seem evidently unable to collectively regulate this global problem – besides addressing declaratory long-term objectives (such as the political 2 °C target) and transitional regimes (such as the Durban Platform) – political agents search for alternative ways of organising climate change governance.

In such a post-Copenhagen world, the locus of climate politics is shifting towards other sites for progressive climate action, not least to the domestic level where states operate not only as negotiating parties and guarantors for national implementation of internationally agreed upon norms and commitments, but as agents of change and facilitators of the societal transformations implied. Thus, the futile prospects for a coordinated global approach seem to give way for a new politics of climate change being defined by nationally derived strategies. Possibly, that might divert from the neoliberal orthodoxy of the Kyoto era, while providing leeway for the emerging discourse on decarbonisation (see Paper 3). For instance, the call for national strategies for low-carbon societal development made in the Cancun Agreements and in European and national roadmaps for a low-carbon economy points in that direction (see e.g. European Commission 2011; SEPA 2012). This motivates scholarly attention to the conditions for national strategies in the new politics of climate change.

Besides the international community of states, hopes are tied to initiatives and actions taken by other actors operating beyond the inter-state system and across transnational, regional and subnational levels (see e.g. Hoffmann 2011; Bulkeley *et al.* 2011; Oberthür and Pallemaerts 2010; Selin and VanDever 2009). Such activities will reasonably be of key importance for the low-carbon transition but it is doubtful whether non-state and market actors in and of themselves are capable of organising responses that are sufficiently comprehensive to deal with the magnitude of the tasks ahead. While providing innovative experiments as showcases for others and mobilising support for the transition (Hoffmann 2011), the capacity to scale up such efforts are indeed challenging. So, while the international community and global institutions are unable and market actors and civil society are incapable of organising the kind of change deemed necessary, domestic state institutions possess capacities for developing progressive responses to the challenges posed by climate change, for governing decarbonisation and supporting low-carbon transitions.

So far, national climate policy has to a large extent been directed towards meeting states' international commitments, i.e. in accordance with the Kyoto Protocol, achieving set emissions reduction targets and regulating climate mitigation as efficiently as possible. The new orientation of climate politics towards low-carbon transitions as the pathway to climate stabilisation brings forward other issues and raises intriguing questions about the politics of pursuing decarbonisation as a transformative change agenda and, as I argue in this dissertation, about the role of the state in steering and enabling such processes of societal change.

Research Aims, Objectives and Questions

The overall aim of this dissertation is to explore what the new politics of climate change imply for the state in navigating its way into a new role as an agent of change and facilitator for the transformative agenda towards decarbonisation. This could, as a general theme for my dissertation, be formulated in terms of an overarching research question:

How can the state govern decarbonisation?

This explorative question reflects my general ambition to analyse the ways in which the state is and could be engaged in governing decarbonisation, and what the role of state actors can be in steering and enabling the implied processes of transformative social change. Analytically, in exploring the ways in which such transitions are and can be achieved politically, I engage constructively with both how-is and could-be questions, not to be conflated with normative should- or ought-to-be questions. Rather my approach is to combine insights from conceptual and normative perspectives with empirical evidence in order to constructively explore how the state can engage in governing decarbonisation (Lundquist 1993).

As I have argued in the introduction, conceptualising decarbonisation as the path to climate stabilisation implies a transformative orientation. Thus, the new politics of climate change address processes of transformative social change and concern the ways to steer and enable societal development in the direction of decarbonisation. As decarbonisation encompasses efforts to radically reduce carbon emissions and liberate society from its dependence on fossil fuel energies, the change agenda is considered to imply transformations in socio-technical systems such as in the provision and use of energy as well as in the production, distribution and consumption of goods and services. For some, such transformations are impossible to achieve without the very reorganisation of the capitalist economic order, for instance by means of degrowth and downscaling the economy (see e.g. Latouche 2009; Jackson 2009; Victor 2008). For others, decarbonisation is indeed challenging but viewed as possible to achieve within the present order in a directed and planned fashion by means of low-carbon transitions. From this perspective, I argue transformative change to be regarded as a real possibility, while the challenges are *political* in terms of rethinking climate governance and its orientation, *institutional* in terms of reorganising climate policy and restructuring societal trajectories towards decarbonisation, and *instrumental* in terms of the policy strategies addressed for steering and enabling the transition.

My exploration of such challenges for the state to govern decarbonisation, is guided by two research objectives. First, my conceptual objective is *to understand the conditions for state institutions and public actors to engage in governing transformative change aimed at the decarbonisation of society.* For this purpose I engage with a selection of conceptual perspectives to understand the conditions for the state to address ecological concerns, to engage in governing transformative change and to alter the conditions for public policy making. Second, my analytical objective is *to examine how such conditions are manifested and institutionalised in arrangements of public policy and governance, and how they affect the state's capacity to steer and enable low-carbon transitions.*

In the papers that form the foundation of this compilation thesis, I address these objectives in different ways and from several conceptual perspectives. The contributions in the papers could in a general sense be understood as addressing the following analytical questions:

1. How are the conditions for the state to engage in greening and decarbonising society manifested and institutionalised in arrangements of public policy and governance? (see Papers 1, 2, 4, 6 + Chapter 2.1)
2. Which views on how to govern transformative change towards decarbonization are articulated in policy-making circles and in discourse? (see Papers 3, 5, 6 + Chapter 2.2)
3. What is the capacity of the state to steer and enable low-carbon transitions in Sweden? (see Papers 3-6 + Chapter 2.3)

The findings in relation to these questions are in this introductory essay brought together in an overarching claim about the state as a critical site for progressive climate action and for governing decarbonisation by means of steering and enabling the low-carbon transition. While the paper contributions are outlined in Chapter 4, the overarching argument is summarized in the concluding section in Chapter 5.

Theoretically, my exploration of how the state can govern decarbonisation is based on a multi-theoretical set of conceptual understandings drawing on various fields of literature on the (environmental) state, transformative change (as transitions) and conditions for policy change (institutional, discursive and public policy arrangements). More specifically, I develop my conceptual understandings of the role of the state in greening society, the governance of transformative change and the institutional space for governing decarbonisation by means of public policy. In Chapter 2, these conceptual perspectives are presented and reflected upon. First, I establish a conceptualisation of the state – understood as a set of institutions and actors embedded in the construction and operations of the modern state – in governing responses to environmental change. This is done by drawing upon scholarship in environmental politics that provide contrasting perspectives on the ways for greening the state (and society) as well as state-centric perspectives on governance. Second, I address a conceptualisation of transformative change understood as societal system transitions. For this purpose, I engage with transition studies, a novel transdisciplinary perspective in innovation theory emphasising the co-evolutionary dynamics involved in societal change and theorising transitions as system innovations leading to transformative change in socio-technical systems. This school of thought has nurtured a particular approach to governance (transition management) for promoting and managing sociotechnical change by supporting innovative actors and niche experiments, an approach I discuss and problematise. Third, I reflect upon various conditions for governing social change by means of public policy. This is informed by novel attempts in institutional theory, discursive institutionalism and policy theory, which I bring together to advance an understanding of what constitutes the space for public policy making and what enables (or constrains) policy trajectories towards decarbonisation, for instance by means of gradual policy change and progressive incrementalism. These perspectives provide different points of departure for the analyses presented in the papers, which also address additional conceptual perspectives specific for the papers (e.g. on deliberative and reflexive governance in Paper 1; on European integration in Paper 2; and on future studies in Paper 5).

My analytical strategy deploys a mix of qualitative and interpretive methods for examining the conditions for governing decarbonisation in the case of Sweden. The analytical strategies and methods employed are presented in each paper and expanded upon in Chapter 3. As for any single-case study (Yin 2014), the overarching strategy is to employ a combination of methods for qualitative inquiry and policy analysis such as discourse analysis, elite interviews, observations and text analysis of policy documents as well as reviews of secondary literature. Such methods of inquiry are employed for the purposes of both retrospective analysis of how the state has been involved in governing low-carbon transitions and exploratory to understand the conditions for the state to support processes of transformative social change towards decarbonisation by means of public policy and governance.

Sweden as a Case of Decarbonisation

Empirically, this dissertation is a case study of Sweden subject to the development of environmental and climate governance in various policy sectors (e.g. energy, transport and industry) in relation to processes for governing decarbonisation. The case selection is motivated by Sweden providing a critical case for ecological sustainability governance in general and for climate governance in particular. Sweden has traditionally been considered one of the pioneers in environmental policy (Jordan and Liefferink 2004; cf. Lundqvist 1980) and is often viewed as one of the most progressive countries in sustainability governance (see e.g. Lafferty and Meadowcroft 2000; Eckersley 2004; Lundqvist 2004) and climate policy (see e.g. Zannakis 2009; Tobin 2014).

A critical case could be defined as "having strategic importance in relation to the general problem" (Flyvbjerg 2006: 229) and could, for single-case studies, be justified on its potential for generalisation: "If this is (not) valid for this case, then it applies to all (no) cases" (Flyvbjerg 2006: 230; cf. Gerring 2008 on crucial cases). In some regards Sweden could even be considered a paradigmatic case – defined by Flyvbjerg (2006: 232) as "cases that highlight more general characteristics of the societies in question" – e.g. as an environmental welfare state in the similar sense as Sweden once was paradigmatic for the Scandinavian welfare model. This makes, for instance, Christoff (2005: 42; see also Meadowcroft 2005a) to view Sweden as an exemplar case of the administrative environmental welfare state and Duit (2011) and Koch and Fritz (2014) as an established ecostate. There are no green states yet, as emphasised already by Dryzek et al. (2003), but Sweden is reasonably among those states actively engaged in greening societal development and developing appropriate responses to ecological challenges such as climate change. This makes it an critical case for exploring also the conditions for how such an environmental state can govern decarbonisation.

The performance of Swedish climate policy is often top-ranked in international evaluations (see e.g. Burck et al. 2011; OECD 2014), although in recent years in competition with countries such as Denmark, the UK and Switzerland (see e.g. Burck et al. 2013). When it comes to reductions in carbon emissions (16 % lower than 1990; Sweden 2014), the expansion of renewable energy (over 50 %) and the decarbonisation of district heating and electricty (see Paper 4), Sweden could arguably be regarded as a critical case for understanding the characteristics that might explain such unique observations. In a longer term perspective, Sweden has almost halved greenhouse gas emission since 1970 (see e.g. Lindmark and Andersson 2010) while doubling economic output in terms of GDP. In policy circles this is taken as an indication of Sweden as a succesful case for the decoupling of carbon emissions from economic growth (see e.g. Jewert 2012). Patterns of international consumption and trade and carbon leakage complicate the picture, however the Swedish carbon footprint is yet disputed. For sure, it is not negligible but considerably lower than for comparable advanced economies (see e.g. WWF 2014). The lower levels of per capita emissions and carbon intensity (see e.g. OECD 2013) make the performance of Swedish climate governance since 1990 even more remarkable in comparison to other countries. That being said, when it comes to other explanatory factors, Sweden is not significantly different in context than other advanced economies and well-established welfare states. For instance, regarding the liberalisation of economic policy, the

Swedish case stands out as a typical case of marketization in climate governance. Thus, the significantly higher ambition and track record of climate policy in Sweden, makes it a critical case for exploring how a modern welfare state can govern decarbonisation in terms of steering and enabling the transition towards low-carbon societal development.

Theoretical Perspectives on Governing Decarbonisation

In this chapter I present and discuss the theoretical perspectives on the basis of which I develop my conceptual understanding of the conditions for the state to govern decarbonisation. This draws on literatures about the state in environmental governance and its capacity for steering and enabling transformative social change (section 2.1), about transformative change as transitions as conceptualized in innovation theory and transition studies (section 2.2) and, finally, about the conditions for governing social change by means public policy (section 2.3).

The Governing Capacity of the Environmental State

In the first section I engage with scholarship in environmental politics to develop an understanding of the environmental state and how public actors can engage in greening society and governing transformative change as implied by the decarbonisation agenda. First, I conceptualise the environmental welfare state and an understanding of its capacity to engage in greening society. Second, I establish what a state-centric perspective on governance imply for understanding the capacity of such a state to govern decarbonisation by means of steering and enabling transformative change.

Perspectives on the Environmental State

The key subject in the scholarship on environmental politics is how societal responses to ecological challenges can be organised and steered along more sustainable lines. This literature provides alternative conceptualisations of social change and of the state in greening societal structures and functions. Scholars disagree on, for example, what role the state can and should play in bringing about sustainability change, and whether the present liberal welfare state can be reformed to become a greener state or if more radical changes are needed. To account for the main perspectives in the debate on the ways to green the state, I structure the chapter according to three environmental states regimes distinguished by Christoff (2005); *the (neo)liberal* *environmental state*, *the green state* and *the environmental welfare state* subject to their different conceptions of the ecological modernisation agenda (very weak, weak or strong; cf. Christoff 1996).

Green political thinking clearly provides contrasting perspectives on how to respond to ecological challenges in terms of mitigating and preventing environmental degradation, instigating social and behavioural change, and collectively organising effective and legitimate institutional responses. Indeed, even if many accept that environmental change constitutes long-term threats to social progress and human prosperity, there is no agreement on whether these challenges are essential in the first place. For instance, hard-core libertarians argue against any kind of state policy interventions violating liberal norms such as value neutrality and individual autonomy. Liberal thinkers taking on "a shade of green" (Wissenburg 2006: 25) may agree to such incompatibilities between political liberalism and green politics, while asserting the potential of some versions of (social) liberalism to accommodate ecological concerns (see e.g. Wissenburg 1998, 2006). Others argue the contrary, that liberal states are incapable of pursuing systemic green transformations, and turn their focus towards eco-authoritarian regimes similar to those neo-malthusians had in mind in the 1970s and that attract renewed support in certain policy and academic circles. Others are deeply sceptical about the state to ever become a benevolent "ecological Leviathan" (Whitehead 2008) on the grounds that state-centred authority is a dominant force in the reproduction of environmental degradation and thus they promote eco-anarchistic or eco-communitarian social alternatives instead (see e.g. Paterson 2001).

Indeed, environmental political scholars have over time been largely doubtful about the state as a site for ecological emancipation. But, as contended by e.g. Paterson (2007), we are beyond the point of argumentation for abolishing the state in view of the radical transformations required. As we are likely "stuck with states for the foreseeable future" (Meadowcroft 2005b: 494), some scholars have engaged in a quest for revitalising the state by transforming liberal democracies as we know them currently into greener regimes (see e.g. Barry and Eckersley 2005). Radical green ideas embrace ecocentric values and calls for new regulatory ideals to address ecological rationality (Dryzek 1987), ecological citizenship (e.g. Dobson and Bell 2006) and ecological democracy (Eckersley 2004; Ball 2006) in order to enhance societal responsiveness to ecological concerns. To Eckersley (2004) the transition towards a new post-liberal order is thought to be achieved through processes of open public deliberation and sustainability reforms committed to systemic ecological modernisation (Christoff 1996). That is synonymous to fostering the kind of reflexivity that environmental sociologists (e.g. Giddens, Bech and Lash 1994; see further Voss et al. 2006) as well as deliberative democrats (e.g. Dryzek 2000; etc) have had in mind. In the words of Ulrich Bech, that might imply the very 'radicalization of modernity' in response to the side effects of modernisation, late capitalism, consumerism and globalisation. Although critical political ecologists put hope in such a second ecological Enlightenment, there are no guarantees that such a reflexive or 'deliberative turn' (Bäckstrand *et al.* 2010) will generate the kind of imperative and radical change of norms and values, behavioural patterns and structures desired. Even more importantly, it is doubtful whether such fundamental regime and value changes will be possible to achieve on a time scale compatible with the challenges posed by the urgency of many facets of environmental change (notably climate change). Thus, whether we like it or not, "any green transformation of the present political order will, short of revolution, necessarily be state-dependent" (Eckersley 2004: 5). The pivotal role of state authority in the green quest, raises critical questions about to what extent liberal welfare states are capable of accommodating the kind of transformative change implied by the decarbonisation agenda, and in what ways to make the state address priority to ecological sustainability concerns such as decarbonisation. The types of environmental states Christoff (2005) has classified differ in both these regards.

Green Liberalism: The (Neo)liberal Environmental State

The standard response to greening liberalism and the liberal state often comes down to classical liberal accounts of non-interventionist free-market environmentalism but as Jagers (2002) concluded in his dissertation, such orthodox models of liberalism are largely incompatible with pursuing sustainability objectives (see also Wissenburg 2006). Only a modified liberal development model seems compatible with the adoption of long-term sustainability objectives. For instance, Wissenburg (1998) has made a systematic attempt to explore how political liberalism can be greened. In short, his main contribution was the "restraint" and the concomitant "inverse restraint" principles thought to guarantee distributive justice and the avoidance of unavoidable damage and pollution (Wissenburg 1998: 123, 166). According to these principles no ecological damage should be produced unless unavoidable and, if done, should later be restored and the affected compensated. Such principles would relax the absolute right to private property, while fundamental values such as "the liberty of individuals to pursue their own life-plan" (Rawls) are preserved. The constitutional entrenchment of such principles would entail procedural provisions but not prescribe outcomes in any normative sense, which would conflict with liberal views on preference formation as "the responsibility of each and every single individual" (p. 226). Imposing "a substantive ideal of the good life is definitely incompatible with liberal neutrality", however "allowing ecological concerns for ethical or ontological reasons to *limit* the range of admissible lifestyles is an entirely different thing" (Wissenburg 2006: 25). This implies that it might be compatible with liberal approaches to pursue ecological limitations through weaker forms of ecological modernisation and environmental management, as long as it does not violate fundamental individual liberties. But, for sure, it does not amount to a green theory of the good and might, thus, be incommensurable with promoting structural transformations in the pursuit of ecological sustainability. Thus, it is doubtful whether environmental liberal states are, as stated by Eckersley (2004: 86), "reflexive enough in moving towards more ecologically sustainable societies".

Post-Liberal Ecologism: The Green Democratic State

The limited capacity of political liberalism to accommodate ecological concerns is what has caused critical political ecologists to argue for more radical ways to green the state. The most prominent representation of this is found in Eckersley's (2004) theory about 'the green state' in which she envisages a post-liberal ideal for an ecological democratic state. Contending that "it is difficult to imagine how such changes might occur on the kind of scale that is needed without the active support of states" (p. 6), she calls for the very reinvention of the state. Respecting liberal democratic norms, her model goes further in elaborating a new regulatory ideal that is thought to facilitate a discursive ecological democracy (cf. Dryzek 2000) and to transform the liberal state into a green democratic state committed to reflexive (Beck *et al.* 1994), or strong (Christoff 1996), ecological modernisation. In essence, such a green democratic state will have to both *steer* society effectively towards ecologically sustainable ends and *facilitate* the deliberative processes required to foster a culture of ecological responsibility and reflexivity. This is thought to enhance the state's responsiveness to ecological challenges and to foster an orientation towards more structural transformations (Eckersley 2004: 70). The kind of intentional reflexivity implied goes, as phrased by Stirling (2006: 227), "well beyond the 'deep serious considerations' of reflection on a 'full range… of attributes to the object in question" and is rather thought to represent a systemic and critical self-reflection that "involves recognition that the subject itself forms a large part of the object" (Giddens 1976 cit. in Stirling 2006: 227).

To nurture such reflexivity and social learning, Eckersley subscribes to a deliberative democratic ideal that might generate both "a risk-averse orientation" and "guard against *unfair* displacement of risks", what she calls the "double challenge of ecological democracy" (p. 118). A key component to this is the active involvement of civil society in "vibrant green public discourses" and the broad inclusion and representation of various interests in public deliberations through means of dialogue, contestation and critical self-reflection on ecological problems and shared norms. Eckersley's ideal of an ecological democracy is one according to which "all those potentially affected by a risk should have some meaningful opportunity to participate or otherwise be represented" (p. 111) in decision-making. That is widening the moral and political community beyond Habermas' communicative community to include "those potentially affected" not insofar as they participate but *as if* they were present (p. 112). This further implies that the demos need to be reconceptualised and made flexible to the actually "affected community or community at risk" in various situations. That will require new forms of representation, especially for those interests lacking communicative competences (the unborn and the non-human), e.g. through "(s)urrogate forms of advocacy, and decision rules that bring neglected interests into view" (pp. 126-127). That implies that an ecological democracy becomes not only a participatory, discursive democracy but also an essentially representative democracy. That would be similar to the kind of "transgenerational and trans-species representative democracy" Ball (2006: 144) has termed "biocracy", however different from the decentralised democracy many greens advocate (Dobson 2007).

A problem when it comes to green political thinking and transformative social change is "that until recently very little serious thinking had been done about it", as Dobson (2007: 103) said some years ago. An obvious reason is that ecologist strategies do not easily lend themselves to reformist approaches but go beyond that in calling for fundamental transformations in values, lifestyles, consumption and production. Not much has been done lately either and Eckersley's account is perhaps still the most elaborated attempt. Indeed, portraying her approach as an immanent critique of the present state of affairs, she provides a counterfactual ideal against which to contrast contemporary efforts of change (Eckersley 2004: 127) and fruitfully conceives of "the ways dominant political forces are currently transforming themselves" (Paterson 2007: 554) through green evolutions in terms of intensified environmental multilateralism, ecological modernisation reforms and new ecological discursive designs by means of administrative, constitutional and legal reforms. In her view, through processes of experimentation and diffusion and as long as the green movement is capable of maintaining the necessary pressure for such transformations, over time "the green democratic state might become a real possibility" (Eckersley 2004: 254). In my view, that is far from certain, as such a green state committed to the post-liberal ideal of ecological democracy will not materialise unless ecological governance is radically democratised and the liberal state is transformed beyond recognition by upgrading ecological rationality as a new defining state imperative (Dryzek *et al.* 2003). The inherently normative enterprise of reconstructing a new, green(er) social order in this and the commitment to systemic, reflexive ecological modernisation is what distinguish such a green state from other types of environmental states.

Green Welfarism: The Environmental Welfare State

Environmental politics scholars grounded in comparativist and institutionalist traditions have emphasised how developments in environmental policy have imposed an ecological dimension upon the frameworks of the modern welfare state. This provide a more pragmatic venue for greening the liberal state. Meadowcroft's (2005a) account of the genesis of the environmental state is such a key contribution (for others, consider e.g. Lundqvist 2001, 2004). In this view, the introduction of environmental management and regulation and the further evolution of environmental policy in modern states since the late 1960s represent the emergence of what is nowadays termed the environmental state. This evolution has *de facto* contributed to institutionalising environmental protection as an integrated function alongside other key state functions such as securing order and the rule of law, promoting economic prosperity and protecting social welfare (Meadowcroft 2012). Indeed, as recently stated by Meadowcroft, "(e)nvironmental management has nowadays become an essential component of state activity" to the extent that it is "publicly recognized as a fundamental part of what a civilized state should do" (Meadowcroft 2012: 67). Some see these evolutions in environmental policy as becoming integrated parts of contemporary welfare policy (e.g. Christoff 2005; Wurzel 2012), while others emphasise their commonalities with social welfare policy development (see e.g. Gough and Meadowcroft 2011) and even others address the need for new eco-social policies in response to environmental change (see e.g. Gough 2013; Koch and Fritz 2014).

In this view, the environmental state is portrayed as evolving in a gradual and protracted process of policy and institutional change, much in the same way as previously the social welfare state developed. Meadowcroft (2005a) presents a broad definition of such an environmental state but ascertains that it is a state "where ecologically oriented intervention comes to constitute [...] an essential responsibility of public power" and for which maintaining that societal impacts are kept within basic ecological limits "would be an essential objective" (Meadowcroft 2005a: pp. 4-5; see further Meadowcroft 2012). As indicated by Duit (2011), the chief commonality between the environmental state and the welfare state is the commitment to mitigate negative market externalities (ecological or socially distributional). Such definitions of the environmental state are broader in scope than, for instance, the one asserted by e.g. Christoff (2005) who restricts his definition to the state's commitment to the ecological modernisation agenda. In Christoff's view, a green state would put ecological rationality "at its heart" (Christoff 2005: 41), while in environmental welfare states ecological concerns are subordinated to other societal objectives. Thus, environmental welfare states (e.g. Sweden) are expected to apply strategies for ecological intervention that are weaker than what would be required of a green state. However, as I show in Paper 1, Sweden prove a case of how an administrative welfare state can go well beyond weak ecological modernisation in addressing ecological responsibilities (see also Lundquist 2004). Interestingly, Sweden has advanced its capacity to govern environmental change without necessarily strengthening the deliberative quality of environmental governance as suggested by green political scholars. This finding indicates that something else is at play; the institutional capacity of the environmental state.

In real world settings, Meadowcroft's and Duit's definitions reflect the emergence and institutionalisation of environmental governance arrangements. In striving to classify environmental states and explain cross-national variation, Duit directs attention to what he terms environmental governance regimes (i.e. the institutional settings and specific mix of policy instruments to handle environmental pressures). Clustering regimes along two fundamental dimensions, i.e. internalisation and institutionalisation, Duit distinguishes environmental states as thick, thin, hollow or soft ecostates. Thick ecostates represent those with a high degree of internalisation of externalised ecological costs (e.g. by means of environmental taxation and public spending) and with a high level of institutional capacity for regulating ecological concerns. Such states are typically found among the more advanced coordinated or Scandinavian welfare states such as Sweden. This indicates correlation between comprehensiveness in welfare state arrangements and progressive environmental governance (see also Gough and Meadowcroft 2011). Koch and Fritz (2014) find such correlation to hold for Sweden, Austria and Switzerland but only partially for other Scandinavian and coordinated welfare economies as well as for New Zeeland (a modified liberal welfare regime). The picture is not clear, nevertheless, these scholars are on the track of something crucial in analysing the institutional capacity for environmental governance. While the comprehensiveness of the welfare regime as such might be less important, the governing capacity of the environmental state is related to the established tradition for steering and intervening in the organisation of society by regulating economic relationships and the market.

To summarize, this has two critical implications for my understanding of the environmental state and its capacity to green and decarbonise society. First, that the environmental state is real and already evolving through the institutional arrangements of environmental governance. As long as environmental protection is addressed as an essential objective and function of the state, that means – in contrast to normative accounts of the green state – that the environmental state is a matter of degree rather than of kind. Thus, the green quest becomes primarily a task of maintaining pressure for the priority given to ecological concerns rather than a recipe for how to green the state and make it more capable to steer society towards ecologically sustainable ends such as decarbonisation.

Second, that the function of the environmental state is contingent upon the state's capacity to regulate and respond to environmental change and to anticipated ecological challenges. That is, the capacity of the environmental state to make society respect ecological limits is a function of the authority and legitimacy of state institutions to intervene in social and economic relationships. That provides a theoretical argument in favour of the commonality between the legitimation of the welfare state and state-led environmental policy intervention. Thus, the comprehensiveness in welfare state arrangements is an indication of the authority and potential capacity for the state to impose ecological restrictions and steer society towards ecologically sustainable ends. The institutional capacity for the environmental state to address such tasks is then, of course, dependent on the resources available for exercising such powers. But that is an empirical question that has to do with the material, institutional and political conditions for governing social change. In a similar vein, a decarbonised state could be understood as emerging through its commitment to prevent climate change and to engage in governing decarbonisation of social structures and practices. Thus, a green, decarbonised state is represented by the assembled efforts of state institutions and public policy actors to steer and enable processes of transformative change aimed at greening and decarbonising the economy and society.

A State-Centric Understanding of Governance

Modern governance theory is also relevant to this study as it provides new perspectives on authoritative steering and a broader view on the socio-political relationships involved in governing public concerns. In this section I engage with these perspectives to develop an understanding of the state in governance and its capacity to engage in governing social change as implied by decarbonisation.

The governance literature has over the last two decades profilerated and developed a rich set of conceptualisations of the ways in which society is governed (see e.g. Bevir 2011). In political science, contemporary understandings of governance have to a large extent been influenced by early modern governance scholars such as Kooiman (1993, 2003) and Rhodes (1993, 1996, 1997) picking up on, for instance, Rosenau's (1992) notion on governance in world politics as governing without government. In this view *governing* reflects those activities aimed at authoritative societal steering with a “purposeful effort to guide, steer, control, or manage sectors or facets of societies” (Kooiman 1993: 2), while *governance* reflect the patterns arising from these kind of governing activities among broader constituencies of social actors (Adger and Jordan 2009). In such a perspective, governance is portrayed as a shift in the ways contemporary societies are being governed in effect to globalisation, intensified economic integration, liberalisation and decentralisation making societies more complex to control and steer (see e.g. Lemos and Agrawal 2009). This raises critical questions about the role of the state and public actors in governance and about their governing capacity. The literature has developed broadly two main responses to such questions which I, along with others, view as society-centric and state-centric understandings of governance respectively. In the following I explore these perspectives to inform my understanding of how the state can engage in governing social change as implied by the decarbonisation agenda.

Society-centric views emphasise the increased complexity and horizontal nature of socio-political relationships and the rise of new forms of governance. These perspectives have been beneficial in bringing an explicit focus to non-state actors in the social organisation of collective steering and has emphasised arrangements that operate beyond the kind of institutions traditionally associated with politics. Such governance approaches have over the last two decades become relevant to the study of environmental governance. In environmental politics, scholars have conceptualised the rise of new modes of governance (e.g. Treib *et al.* 2007) such as market-based and networked forms of governance (e.g. Jordan *et al.* 2005; Duit *et al.* 2009), public-private partnerships (Andonova 2010; Bäckstrand 2010) and transnational governance (e.g. Bulkeley and Newell 2010; Hoffmann 2011). This includes attempts for making sense of governance operating beyond the state (Jagers and Stripple 2003) in terms of either market-based mechanism and processes of marketization delegating responsibilities to private actors (see e.g. Newell 2008) or voluntary initiatives and arrangements of carbon governmentality, fostering new means of carbon conduct (e.g. Stripple and Bulkeley 2014; Paterson and Stripple 2010). Governance arrangements of these kinds have attracted a lot of scholarly attention, as they provide sites for experimentation and innovation. However, many novel and hybrid forms of steering have yet to prove its effectiveness to spur system change and deliver substantial outcomes such as enduring emission cuts or efficiency gains. Evidence proves they seldom tend to, unless they rest on traditional forms of authoritative steering such as "hard law" policy and regulation (see e.g. Jordan *et al.* 2003; Jordan *et al.* 2013). Similar conclusions were drawn in a collaborative effort we made to examine the promise of new modes of environmental governance to resolve anticipated problems of governance (Bäckstrand *et al.* 2010; Paper 1 being one of the chapter contributions). While to some extent improving the deliberative quality, we found new initiatives to typically rest on hybrid forms of governance and to often operate in the shadow of hierarchy and administrative rationality.

Much of the modern governance literature has been concerned with what constitutes governance as opposed to government, to the extent that the concept of governance has received a position according to which it is often being understood as representing something phenomenally different than governing activities by governments and state institutions aimed at authoritative societal steering. Along with others I would argue this to represent a false dichotomy influenced by the (often implicit) normative bias of many modern governance scholars. Their society-centric ontology helped bring a broader view on the relationships and type of actors involved in the process of governance. However, as argued by Căjvăneanu (2011), the modern conceptualisation of governance as "governing based on networks and partnerships" (p. 52) is based on a specific ontology. Adhering to what was once referred to as "private government" in political science and to the notion in neo-institutional economics of markets and networks as alternative governance structures, the modern governance concept is inherently associated with "the emergence of a representation of society as highly complex and functionally differentiated" (p. 69) and the rise of the network society (Castells 2000). This rests on a system-theoretical and socio-cybernetic understanding of society as a complex web or system of self-regulating social units, which has influenced scholars in the interactive governance school to emphasise "that governing and governance itself should be dynamic, complex and varied" (Kooiman 1993: 36) as socio-political systems are dynamic, complex and diverse (*sic!*).

The problems of society-centric views on governance has been thoroughly debated in the literature (see e.g. Kjear 2004; Pierre and Peters 2000, 2005; Adger and Jordan 2009) and many have argued for state-centric understandings instead. *State-centric views* point out the critical, albeit changing, role of the state in governing social change in advanced societies, not only as governance-takers but as governance-shapers as well (Pierre and Peters 2000).[1] Even if one agrees that contemporary governance involves an increasingly complex range of processes, institutions, actors and relationships, the prevailing patterns of political authority and power involved in authoritative societal steering should not be underestimated. Rather traditional forms of political authority and state institutions are still central in governance (Pierre and Peters 2000), both as constituting the polity and as political actors in their own respects. In most Western contexts, political institutions provide not only the arenas for socio-political interaction, public deliberation, negotiation and conflict resolution on matters of public concern, but are also the dominant loci of authority and agency among social institutions (ibid). Thus, although the conditions and forms for political steering are continually changing, efforts to understand how advanced societies are being governed and steered has to examine how the relationships between societal actors and political institutions are interwoven in the very construction of the modern state and in the reproduction of its systems of government. This motivates stronger attention to state-centric views on governance, especially in contexts where societal change is strongly constituted by the state and agents operating within state institutions or at their margins, as in the case of Sweden. This indicates continued salience for hierarchical steering and vertical relationships alongside novel, hybrid forms of governance for enabling social change.

From this perspective, it seems hard to imagine structural change and socio-technical system transformations without the active support of state institutions (Lundquist 2004; Eckersley 2004), which through various forms of intervention provides authoritative mechanisms for policy change enabling certain actions while constraining others. Thus, to successfully govern decarbonisation may require both political commitment to provide direction and social coherence, and the capacity to steer social actors and mobilise resources. While being inclusive to various social interests, political governors and state institutions are key in such processes for providing the enabling institutional and governance arrangements and for expressing leadership, for instance by formulating visions and narratives that can generate legitimacy and attract popular support for the desired transition.

A key implication is that what characterises governance, understood as the assembled effort to steer and organise responses to societal problems with the purpose of affecting social outcomes, is an empirical question contingent on the actual relationships and institutions involved in the process of governing. Indeed, as comparative governance scholars such as Pierre and Peters (2000, 2005) have shown, the forms and functions of governance vary across political contexts and policy areas.

---

[1] Recall the question raised by Pierre and Peters (2000), whether the state is a dependent or an independent variable to the governance shift.

They distinguish five different kinds of governance systems that "constitute a continuum from the most dominated by the state and those in which the state plays the least role" (Pierre and Peters 2005: 11). Along this continuum they place on the one extreme *étatiste* systems (i.e. strong states, e.g. France) where the state is the principal actor for virtually all aspects of governance. On the other extreme we find the kind of self-governing conceptualised as *governing without government* by early modern governance scholars such as Rhodes (1996, 1997), who contended the state to have lost its capacity to steer and govern society, thus, at best, providing an arena for the interplay and interaction between social actors organised in self-steering networks. In between those two extremes Pierre and Peters categorise three other types of models; *liberal-democratic models* (i.e. representative parliamentary systems such as in the UK) in which various interests compete to acquire influence over state power but where the government dictates whose influence counts; *state-centric models* in which the state remains central in processes of governing but formalises and institutionalises its relationships with key social actors and interest groups (i.e. neocorporatist systems being the archetype of this pattern of governing); and the society-centric *Dutch governance school* emphasising a socio-cybernetic, interactive approach to governance.

In my understanding, the governing capacity of these types of systems is constituted by – and varies according to – two key dimensions or capacities (Pierre and Peters 2005: 46). The first represents the degree of authority and institutional capacity to make and enforce binding decisions upon society and across a wide range of social actors. In my view this dimension reflects the steering capacity of policy-making institutions and the overall system of governance. The second represents the degree of social involvement and interactions in governing and the capacity to collect and process information from actors in the surrounding society. The latter could be understood as a function of the inclusiveness and deliberative quality of the policy-making process and the overall governance system (as explored in Paper 1). The tension between these two capacities could be described as a non-linear and parabolic relationship according to which the collected governance capacity tends to be lower for the two models at the extreme ends than for the other three (see Fig. 3). In my view, these models provide a typology of different governance systems or regimes whose characteristics vary across polities and policy sectors.

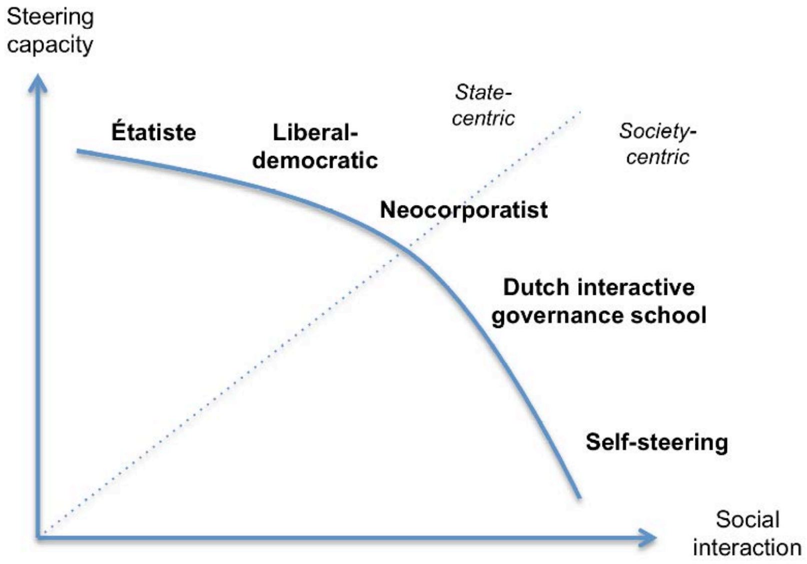


Fig. 1. Five Models of Governance (own illustration; based on Pierre and Peters 2005)

For my purposes, state-centric models seem most relevant for understanding Swedish governance. In general, the Swedish system of governance represent a neocorporatist model in which state institutions continue to play a vital role in governance while being inclusive at least to the extent that key social interests affected by interventions are being involved in the process of governing. In my research I have analysed the Swedish model of governance in relation to environmental, climate and energy policy, in particular in Paper 1 but partly also in Paper 6 (on steering-by-environmental-objectives) and Paper 3 (on climate policy discourse). As reflected in Paper 1, the Swedish model of governance is still neocorporatist, while entailing important deliberative elements, for instance in terms of mechanisms for transparency, accountability and public consultation. However, the inclusion of societal interests in public deliberations is partly circumscribed. I argue it to be only semi-open as participation is limited to established, well-organised and clearly identifiable interest groups. In Sweden, the implementation of sustainable development in the 1990s opened for experiments with participatory mechanisms, especially at the local level, but mainly institutionalised "new ways of governing from above" as concluded in Paper 1. Thus, rather than adhering to deliberative democratic ideals as emphasised by green political scholars (see section 2.1), the Swedish model of sustainability governance has contributed to strengthening steering capacity and environmental performance by making state authorities more responsive to ecological concerns and reflexive to the arrangements of public policy and governance. In Paper 6, we explore what that might imply in relation to decarbonisation. Examining the Swedish system of steering-by-environmental-objectives we discuss how the arrangements of governance could be further developed to integrate and handle conflicts between climate policy and other environmental objectives in anticipation of new knowledge and changing values.

That being said, my research also indicates how the Swedish system of environmental and climate governance has moved in the direction of a more pluralist, liberal-democratic model of decision-making. The liberalisation of social welfare provisions in general and the strong economic orientation of energy and climate policy over the past decade (see Paper 4), especially since the change in government in 2006 (see Paper 1), points in that direction. That is also confirmed in the interview study (see section 3.3). The analysis of actors involved in climate policy-making indicates a shift towards economic interests and business actors, while NGO representatives complain about their limited influence and diminished role in public deliberations (see Kronsell *et al.* 2012). These observations are further elaborated upon in as yet unpublished works on a narrowed Swedish model of neocorporatist arrangements and on the challenges posed for the environmental state by transformations in welfare state arrangements (as listed in section 4.2).

Concluding thoughts: Steering and Enabling Low-Carbon Transitions

In this chapter section I have elaborated on the governing capacity of the environmental state and its role in governance. Up to this point, I have described governing decarbonisation as involving two generic features, or functions, namely efforts aimed at steering and enabling processes of transitions and low-carbon societal development. These efforts correspond to the two key capacities identified by Pierre and Peters (2005; se Fig. 1) and that cut across the dichotomy of the two main conceptualisations of governance. In the process of governing decarbonisation, the state can deploy both these capacities. *Steering* reflects the capacity of public actors to authoritatively make and enforce binding decisions, rules and regulations upon social actors and sectors of society through hierarchical forms of authoritative steering mechanisms, for instance in terms of law-making, planning regulations, permitting, emission standards, taxation, fees and other compulsory economic instruments.

Enabling, on the other hand, reflects softer forms of activities involved in the process of governing, including mechanisms such as governmental subsidies, public procurement, public investments, planning, innovation policy, research and development support, information campaigns, labelling, standard-setting and voluntary agreements. In its broadest sense this includes all other governance activities than those associated with authoritative steering. Enabling could be restricted to the softer kind of governing activities public actors engage in for instigating, spurring, supporting, facilitating and promoting processes of transformative social change.

However, the wider array of efforts involved in enabling such processes of change can be understood in view of how the state is and could engage in orchestration of governance. While Abbott (2012) views orchestration as a purely non-hierarchical mode for supporting and softly steering governance activities and initiatives, Hale and Rogers (2014) view states as more active orchestrators in their capacity to both initiate and shape governance. In their view, states hold a number of normative, informational and material assets to deploy as tools for orchestration when they are unable to govern without engaging other constituencies. Private actors could also possess such capacities, however they rarely "combine so many of these essential attributes, or hold them to the degree that public actors do" (Hale and Rogers 2014: 80). More importantly, non-state actors lack the unique ability of public actors – their monopoly of legitimate coercion. Translating the concept of orchestration into domestic contexts of governance, public actors has the ability to govern through others in their capacity "to lead other actors toward collective solutions" (Hale and Rogers 2014: 79). Enabling low-carbon transitions by orchestration can also entail those softer forms of activities aimed at catalysing and coordinating initiatives, encouraging collaboration and networking and motivating actors. That can include "ideological steering" (Meadowcroft 2007: 311) and communicative and discursive strategies to create shared meanings and horizons, for instance by means of roadmaps and policy pathways for the transition (see e.g. Papers 3, 5).

Transformative Change as Transitions

In the previous section I established my conceptual understanding of the environmental state and its capacity to engage in governing social change. In this section I engage with the transition concept, which I argue to represent a particular notion about transformative change. Decarbonisation implies, as outlined in the introduction, a new orientation towards transforming the social structures and practices that generate carbon emissions in order to achieve low or very low carbon intensity. That encompasses processes of transformations in the provision, use and distribution of energy to liberate society from its dependence on carbon energy, e.g. for heating, electricity and transportation purposes. Interestingly, such large-scale societal transformations are increasingly viewed as possible to achieve through gradual processes of low-carbon transitions. So far, the most elaborated view on such societal transitions in scholarly debates is found in the transdisciplinary field of transitions studies, which I draw on in this section to discuss the transition concept and the suggested implications for governance.

"Transitions are transformation processes in which society changes in a fundamental way", Jan Rotmans, René Kemp and Marjolein van Asselt (2001: 15) stated in their article *More evolution than revolution*, which has been seminal to

Transition Management as a novel approach for bringing about sustainable development through system improvements, innovation and structural change. This notion of transformative change as transitions in response to persistent problems of environmental change rests on a dynamic, co-evolutionary perspective on sociotechnical system change and an open-ended approach to promote and accelerate transitions from the present state of affairs towards sustainable ends. The framework developed by Rotmans *et al.* (2001) and their followers, prescribes a strategic approach for managing and accelerating such transitions. In the following I will present its basis in transition studies, gaining ground especially among Dutch, Flemish and British scholars, before critically engaging with the governance approach of transition management. Finally, I discuss my approach to this understanding of transitions.

Transition Studies and the Multi-Level Perspective on System Change

The "transition thinking" approach, emanating from innovation studies, evolutionary economics and system theory, is based on a conception of technological innovation and change as situated in complex socio-technical system configurations (e.g. Geels 2004; Smith *et al.* 2005; Grin, Rotmans and Schot 2010). The approach builds on a basic understanding "that society changes in a rather evolutionary and organic way" (Kemp and Loorbach 2006: 105). That is, to view social change through the ontological prism of the organism metaphor classic in sociology (Sztompka 1993), in which society is conceived of as an integrated whole and as a system continuously adapting to changing circumstances (i.e. a socio-cybernetic ontology). As such it focus on the complex, co-evolutionary and dynamic "interplay of developments that sustain and reinforce each other" through processes of variation, selection and reproduction (Kemp and Loorbach 2006). This perspective on social change in transition studies rests on two key notions.

First, a transition is defined as "a gradual, continuous process of change where the structural character of a society (or a complex sub-system of society) transforms" (Rotmans *et al.* 2001: 16). This is based on an understanding of socio-technical change as a dynamic, non-linear process evolving over time. The key to this is the S-curve model, central to innovation system studies. This model denotes system innovation as a multi-phased process that, eventually, results in structural change (a transformation) in which one dynamic configuration (a socio-technical system) is replaced by another: In the *predevelopment* phase innovative experimentation is initiated and nurtured and continues to develop without visible change at the societal level. In the *take-off* phase the process of change gets under way and the (sub-)system begins to change. In the *breakthrough* phase change is accelerated and starts to affect established regimes and structural change takes place through an accumulation of socio-cultural, economic, ecological and institutional changes. Finally, in the *stabilization* phase the speed of change decreases and a new equilibrium is established.

Second, another central element is the multilevel perspective (MLP), which builds on Rip and Kemp's (1998) multilevel model of technological regime change distinguishing three analytical levels; the niche (micro), regime (meso) and landscape (macro) levels. In this perspective, technological transitions are portrayed as "interactive processes of change at the micro-level of niches and the meso-level of socio-technical regimes both embedded in a broader landscape of factors at the macro-level" (Markard and Truffer 2008: 601). In this literature, the societal *landscape* represent exogenous developments and trends (e.g. world market, worldviews, etc.) and technological and institutional *regimes* the dominant practices and established rules, belief systems and norms, while operational *niches* reflect the specific innovative practices, technologies and activities nurtured and developed by creative entrepreneurs and niche actors operating at the local/individual level. Sociotechnical innovations with potential to grow and challenge existing systems and regimes are thought to emanate from such niches of innovation and experimentation with e.g. low-carbon energy technologies.

These notions are brought together in a heuristic model of system innovation and change (see Fig. 2) for understanding the complex dynamics in which systems adjust to exogenous developments and endogenous co-evolutions in material and social structures such as technology, markets, policies and culture. The approach conceptualise the critical role of structural regimes (i.e. institutions) in enabling (or blocking) system innovation and change (Geels 2004; Markard and Truffer 2008) and to "unravel the complex interaction patterns between individuals, organizations, networks, and regimes within a societal context" (Loorbach 2010: 167). This interplay between systems (structure) and practices (agency) is understood in relation to structuration theory (Giddens 1984). To Grin (2010: 232) the dynamic interaction between patterns of action (niches), institutional structures (regimes) and external trends (landscape) adds a role of agency to the structural multilevel perspective in terms of a process he denotes as restructuration. From this perspective, the role of policy goes beyond the rational, command-and-control type of social planning and becomes an element of strategic governance to "influence the direction and speed of transitions by coordinating and enabling the processes that occur at different levels in a more systematic and evolutionary way" (Kemp and Loorbach 2006: 109).

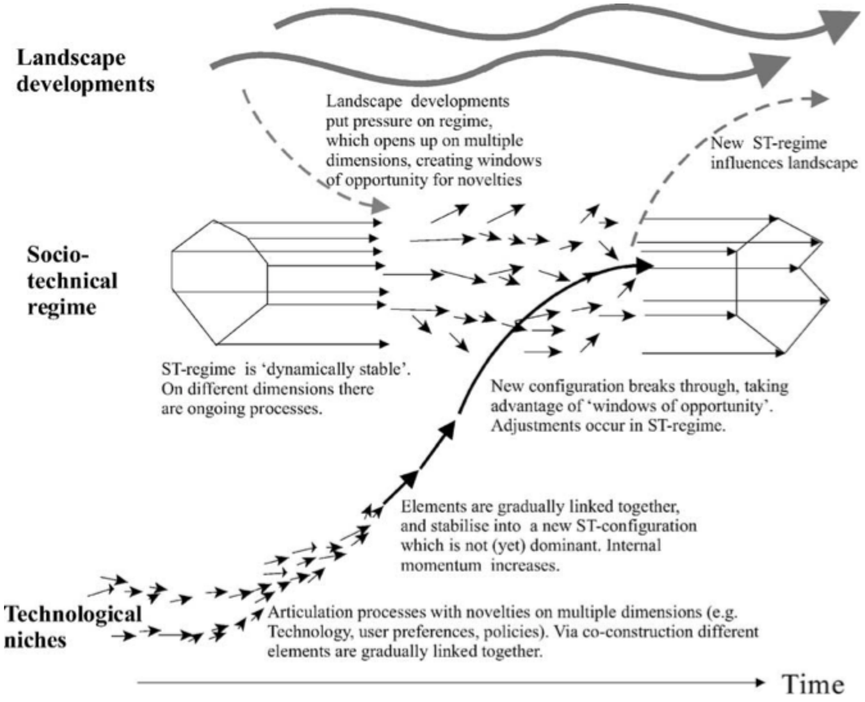

Landscape developments
Landscape developments put pressure on regime, which opens up on multiple dimensions, creating windows of opportunity for novelties
New ST-regime influences landscape
Socio-technical regime
ST-regime is 'dynamically stable'. On different dimensions there are ongoing processes.
New configuration breaks through, taking advantage of 'windows of opportunity'. Adjustments occur in ST-regime.
Elements are gradually linked together, and stabilise into a new ST-configuration which is not (yet) dominant. Internal momentum increases.
Technological niches
Articulation processes with novelties on multiple dimensions (e.g. Technology, user preferences, policies). Via co-construction different elements are gradually linked together.
Time

Fig. 2. The Multi-Level Perspective on System Change (Geels 2004: 915)

The MLP perspective has been further developed in response to criticism (see e.g. Berkhout *et al.* 2004; Smith *et al.* 2005) about, for instance, the unidirectional understanding of system change implied in the model. For instance, Geels and Schot (2007) have elaborated four ideal-type transition pathways[2] that differentiate between various scenarios and emphasises the importance of regime actors (e.g. incumbent industries and policy-makers) besides niche actors (e.g. innovators and newcomers) as key agents of change. In my research I have made attempts to engage with transition studies for analysing the extent to which public climate policy and governance has supported low-carbon transition processes in Sweden, as reflected in Paper 4. The TM perspective had limited bearing on the analysis, as niche actors were only found to have had limited influence, while the kindred Technological Innovation system (TIS) approach (see e.g. Bergek *et al.* 2008; Hekkert *et al.* 2007) was found more relevant. TIS emphasises more structural factors in the support infrastructure and system of innovation, including innovation policy to create nursing and bridging markets. In particular, the energy transitions in the Swedish system of district heating could be explained by a broad spectrum of public policy interventions being introduced along the whole innovation chain (Ericsson 2009), while being adjusted to market developments and technological maturity. A modified MLP perspective could also be applied, as done by Di Lucia and Ericsson (2014), to understand that transition as a pathway of de-alignment and re-alignment. But, as shown in Paper 4, such a transition could also be explained by a series of progressively incremental policy developments (see section 2.3.3).

---

[2] I do not intend to go into details here, but Geels and Schot (2007) term these pathways transformation, de-alignment and re-alignment, technological substitution, and re-configuration respectively.

The Governance Approach of Transition Management

Transition management (TM) is a specific approach in this tradition, most prominently developed in the Netherlands, informed by the conceptualisation of socio-technical system change in transitions studies as well as by practical experiences from the Dutch transition policy initiated in 2000. The TM approach aims to indirectly manage the transition process and make it "orchestrated in a way that it is geared to sustainable development" (Grin 2010: 231). As emphasised by Loorbach (2010), it is a specific governance response to the increased social complexity and the emergence of the network society in which hierarchical governance is substituted by co-governance (Kooiman 2003) as a half-way house between regulation and self-governance. As expressed by Meadowcroft (2005b: 493), "(t)ransition management represents exactly this type of approach: for, on the one hand, it foresees an active and interventionist role for government; while, on the other, it defines that role in interactive rather than directive terms". To Loorbach (2010), transition management reflects a prescriptive governance framework around four types of governance activities that he terms strategic, tactical, operational and reflexive. The first three relate to activities at the cultural/landscape, structural/regime and practical/niche level, while reflexive elements (monitoring, assessment, evaluation, etc.) are integral to all levels. TM is sometimes touted as "a strategy of reflexive modernization" (Rotmans and Kemp 2008) but should rather be understood as a *de facto* form of reflexive governance that developed independently of modernisation theory (Kemp and Loorbach 2006: 126). That being said, TM addresses conditions similar to the kind of intentional reflexivity emphasized by Voss *et al.* (2006) for which knowledge integration; anticipation of long-term systemic effects; adaptivity of strategies and institutions; iterative goal formulation; and interactive strategy development are critical elements. That is similar to the reflexive monitoring of Giddens which Grin (2010) considers essential for restructuration.

This framework prescribes a deliberative, reflexive approach to governance that is interactive and multi-actor, however selectively participatory (Loorbach 2010; Frantzeskaki *et al.* 2012). That is indicated by the focus on niche actors and regime players (transition managers) engaged in transition arenas. The latter could seem to bear resemblance to the kind of benevolent “technological citizenship” Hajer (1995b) once considered. But in contrast to Hajer’s five-step approach for democratic control of technological designs, TM appears more exclusive in involving stakeholders, in particular at the strategic level of problem definition, goal formulation and envisioning of transition paths. That denotes a specific model of network governance. Thus, while transition management might be promising in adding a new dimension to environmental strategies, some warrants caution, most critically regarding its managerial account and the neglect of the politics involved in managing transitions, e.g. the authority of transition managers and influence of incumbent regime actors. In recent years, scholars have tried to engage more closely with the institutional and political implications of transitions but, still, TM appears to be “a neat model of how managers might intervene (albeit reflexively) to shape and modulate processes of change... (that) can all too easily obscure their own politics, smoothing over conflict and inequality” (Shove and Walker 2007: 768). This is clearly problematic, although some scholars have tried to develop the governance approach, for instance Grin (2010) on the basis of modernisation theory. Nevertheless, the network-based governance approach could be criticised for not meeting its intention in practice (e.g. Smith *et al.* 2005; Meadowcroft 2009; Smith and Kern 2009; Scarse and Smith 2009) and for being biased towards a Dutch consensus-based model of decision-making.

Concluding Thoughts: Governing Decarbonisation, Governing Transitions

In this section I have discussed the increasingly used transition concept in terms of how it has been conceptualised in transition studies. From this perspective transitions are understood as “societal processes of fundamental change in the structure, culture and practices of a societal system” (Frantzeskaki *et al.* 2012: 23), which are thought be achieved by modulating and experimenting with co-evolutionary processes of social change to generate system improvements and innovation. Over time, this might lead to system change (i.e. a transition). As indicated above, I am largely sympathetic to the ontology of transitions as gradual societal changes and evolutions in sociotechnical structures and configurations. The MLP has been critised for being unidirectional, however for instance Geels and Schot (2007) have made a promising attempt at developing the model further. However, as emphasised above, in my study (see Paper 4) alternative approaches such as the TIS (and progressive incrementalism; see section 2.3.3.) are as well found to provide accurate explanations to the identified transitions in a Swedish context.

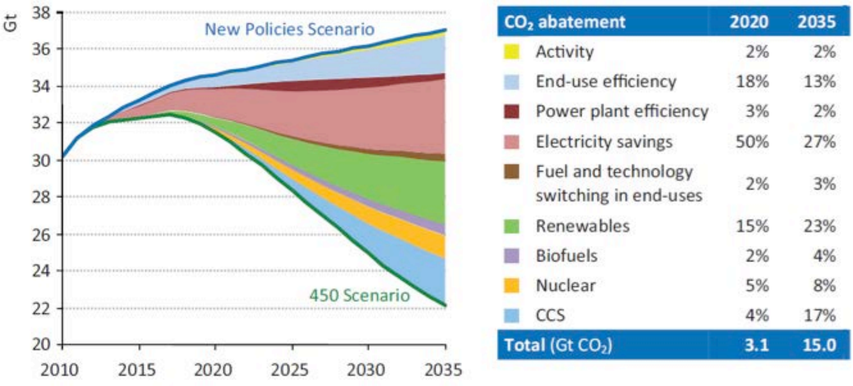
That being said, the managerial governance approach suggested by TM scholars is problematic. Its emphasis on "participatory exercises of envisioning, negotiating, experimenting and learning in order to deliberately accelerate and orient transitions for sustainability" (Frantzeskaki *et al.* 2012: 20) and the critical importance of entrepreneurs (i.e. frontrunners) and experimentation in reflexive and open-ended processes of social change, provide an approach for governing through enabling and orchestration. However, the interactive approach of governance tends to neglect one side of the coin, namely the political authority involved also in interactive forms of governance. Similarly, the capacities available for steering and supporting transition processes by traditional policy instruments are seldom accounted for (see e.g. Meadowcroft 2009 for similar points). In the next section I engage with dimensions of institutional, discursive and policy change in order to develop a conceptualisation of the policy space for steering and enabling low-carbon transitions by means of public policy. However, let me first address another source for articulation of low-carbon transitions which is also relevant to my research:

The proliferation over the last decade of low-carbon scenarios in policy-analytical and policy-making circles has contributed to articulate the transformative change implied by the decarbonisation agenda as transitions. To illustrate what this can entail, I present below a typical and well-established representation of these kinds of low-carbon scenarios, in terms of IEA's climate stabilisation scenario (see Fig. 3). Such low-carbon scenarios have, ever since the IPCCs first global emissions scenarios (Nakicenovic *et al.* 2000) and later Pacala's and Socolow's (2004) "stabilization wedges",[3] contributed to conceptualising notions about what decarbonisation may imply in terms of alternative pathways. In the same way that energy future scenarios once helped to articulate renewable energies as alternatives to carbon and nuclear energy, the recent "scenarios literature" (for a review, see e.g. Söderholm *et al.* 2011) have now constructed and envisaged decarbonisation pathways as being technologically feasible, economically viable and within reach by means of low-carbon transitions. Although different in characteristics and assumptions most scenario studies portray three or four main decarbonisation pathways such as large-scale deployment of renewable energy (wind, solar, biomass energy, etc), energy efficiency improvements, carbon capture and storage (CCS) and, in some scenarios, nuclear energy (as in the IEA scenario; see Fig. 3).

In my research, I have used explorative scenario analysis and forward reasoning with the purpose of analysing what such articulations imply in terms of political and institutional challenges for governing decarbonisation. In Paper 5 we employ both a qualitative policy scenario framework (on international climate policy) and an explorative backcasting method for analysing low-carbon energy scenarios and the institutional dynamics for a selection of decarbonisation pathways in Sweden. Paper 6 departs from similar backcasting scenarios to identify key low-carbon strategies. These strategies are then examined subject to the potential conflicts and synergies with other ecological concerns as expressed in the Swedish system for steering-by-environmental-objectives. While the decarbonisation strategies are found compatible with achieving most other ecological sustainability objectives, potential conflicts between the expansion of biomass energy and land-use related objectives (e.g. on biodiversity or sustainable forestry) can be problematic and pose challenges for governing decarbonisation.

---

[3] Pacala and Socolow (2004) has been seminal for this kind of "wedge science" modelling. For a recent review of such scenarios, see Söderholm *et al.* (2011).



CO_2 abatement	2020	2035
🟨 Activity	2%	2%
🟦 End-use efficiency	18%	13%
🟥 Power plant efficiency	3%	2%
🟥 Electricity savings	50%	27%
🟫 Fuel and technology switching in end-uses	2%	3%
🟩 Renewables	15%	23%
🟪 Biofuels	2%	4%
🟧 Nuclear	5%	8%
🟦 CCS	4%	17%
Total (Gt CO_2)	**3.1**	**15.0**

Fig. 3. Decarbonisation Strategies in the IEA 450 Scenario (IEA 2012: 253)

Conditions for Governing Change

In the previous two sections, I established my conceptual understandings of the environmental state, the state's capacity to engage in governing transformative change and the notion of decarbonisation as governing transitions in societal systems. In this third section I engage with policy studies and evolutionary approaches on policy change to develop an understanding of the conditions for governing such processes of decarbonisation. The dimensions of institutional, discursive and policy change emphasised is brought together into a conceptualisation of the policy space constituting the room to manoeuvre in steering and enabling low-carbon transitions by means of public policy.

A general insight from policy studies is that policy change take place in the reminiscence of foregone political decisions as sedimented in the institutional context of policy-making. Thus policy history constrains the room of manoeuvre for present policy-makers. Policy change is always up against prevailing patterns and norms embedded in institutionalised practices and public policy. Established rules, cognitions and norms (Scott 1995) are moulded into institutions that, as once expressed by Giddens (1984: 24), are "the more enduring features of social life", thus providing for stability and permanence. Historical institutionalists have emphasised how this creates change-resistant political institutions and policy inertia due to path dependencies that lock actors into certain policy pathways and courses of action. In Pierson's (2000) view, path dependency is to be explained by self-reinforcing processes and feedback mechanisms generating increasing returns "that make institutional configurations, and hence their policies, difficult to change once a pattern has been established" (Peters *et al.* 2005: 1276). This provides explanation to the bounded rationality of policy-making and the often incremental and step-wise fashion of policy adjustments and reform.

However, while historical-institutional accounts have emphasised the mechanisms preventing change, mechanisms for change have received less attention (see e.g. Thelen 1999; Peters *et al.* 2005). But institutions do change, either in effect to sequential processes unfolding over time or, sometimes, more rapidly due to critical events (revolutions, political turnovers or financial crises, etc.) or sudden changes in power relations and material conditions (resources, technology, knowledge) as well as changes in normative elements such as political discourse, social norms and values. This points to both the critical importance of timing in politics (Pierson 2004) as an explanation to gradual processes of change with transformative potential and the value of accounting for "some dynamic conception of agency, and... a greater role for political conflict" to understand the politics of path-dependency and policy change (Peters *et al.* 2005: 1277). Here, Levin *et al.*'s (2012) recent account of *progressive incrementalism* is intriguing as it provides a way forward to analyse how reformistic approaches over time might become entrenched and trigger the kind of paradigmatic policy change implied by, for instance, the decarbonisation agenda. In the following I will develop an understanding of the conditions for policy change towards decarbonisation by reconsidering such evolutionary and discursive accounts of institutional change and policy development. This conceptualisation is indicative for the kind of gradual and step-wise processes of change I have found in my analyses of European (Paper 2) and Swedish (see e.g. Paper 4) policy developments.

Evolutionary Perspectives on Institutional Change

Scholars in historical institutionalism have conceived of institutional change, and the institutionalised conditions for political and policy change, in broadly two ways. The traditional view conceives of change as revolutionary recasts occurring during formative moments or critical junctures (see e.g. Collier and Collier 1991) imposed by exogenous shocks or crises that generate punctuated equilibria and establish a new order followed by a new period of continuity. Viewed this way, rapid and discontinued institutional change takes place at the advent of critical moments in time during which windows of change (Kingdon 1984) open and create space for various change agents (e.g. Kingdon's type of policy entrepreneurs). Such moments of change provide opportunities for fundamental reforms and for entering new policy paths. The punctuated equilibrium model (see e.g. Baumgartner and Jones 1993) is significant for this understanding of institutional change. This traditional account of historical institutionalism has however been more successful in explaining institutional continuity than change. In this view change tends to be understood as occurring “either in a big bang or hardly at all through path dependence”, as Schmidt (2010: 4) puts it.

In the recent decade, more elaborated views on path dependency and institutional change have developed. Scholars in this new tradition conceive of change as *evolutionary* transitions from one stable order to another as the outcome of cumulative processes of gradual policy change, either in a series of smaller events unfolding over time (Thelen 2004) or in effect to incremental reforms with unintended consequences (Pierson 1996). This understanding is represented by recent developments in neoinstitutional theory emphasising the role of sequence (e.g. Pierson 2004; Thelen 2000, 2004) as an explanation to both institutional continuity and change. In particular, Kathleen Thelen has contributed to theorising evolutionary mechanisms of change in terms of displacement, layering, drift and conversion (see e.g. Thelen 2004; Streeck and Thelen 2005). To me, this evolutionary view on institutional change provides an alternative model for understanding policy change.

This has also been supported by works of scholars concerned with the role of ideas and discourse as an explanation to institutional and policy change (e.g. Hall 1993; Peters *et al.* 2005; Schmidt 2008, 2011; Arts and Buizer 2009; see further Schmidt 2006 for a review). Discursive-institutional approaches put explicit emphasis on “the ideas and discursive interactions of political actors engaged in structuring and reconstructing” (Schmidt 2010: 2) institutional contexts. Sharing the conception of change as evolutionary and cumulative, discursive accounts further contribute with an understanding of institutional change as endogenous by focusing on the role of strategic actors engaging in discourse to advocate, deliberate and challenge policy. Schmidt's concepts of background and foregone ideational abilities provide openings for understanding actors as not only being shaped by discursive structures and patterns of thought, but as sentient actors (thinking and speaking) with agency to influence discourse, for instance in the kind of discourse coalitions Hajer (1995a) has theorised.

Public Policy as Discourse

Policy discourses about knowledge claims and problem framings are key elements of politics in the sense that they contribute to constitute and reproduce prevailing power relations and manifest the dominance of particular norms, interpretations, policy paradigms and certain courses of action over others. Here the *argumentative turn* to policy analysis (Fischer and Forester 1993) and argumentative approaches to discourse analysis (see e.g. Hajer 1995a, 2009) have fruitfully conceptualised policy change (and the politics thereof) as constituted and constrained by discourse manifested in practices of argumentation. Hajer defines discourse as "an ensemble of notions, ideas, concepts and categorizations through which meaning is ascribed to social and physical phenomena, and that is produced in and reproduces in turn in an identifiable set of practices" (Hajer 2009: 60).

Understanding politics as a power struggle not only in material terms but also in terms of discursive contestations on knowledge claims and meanings directs attention to the way we collectively talk and think about particular problems (climate change) and how to respond to such problems (emissions reductions vs. decarbonisation), as reflected in Paper 3. In such a view, simply put, politics becomes a contest about dominance between various meanings and conflicting interpretations in the policy-making sphere. The settlement of such discursive controversy has material policy implications both for those governing and those being governed. Dominant discursive patterns affect both the ways certain problems are framed and how societal steering and collective action are constrained through processes of reproduction, structuration and institutionalisation. As reflected in Paper 3, this has profound implications for which policy alternatives get endorsed and institutionalised in practice, and which are being excluded as inappropriate or even "unthinkable".

Discourse analysis have primarily been applied retrospectively for analysing how political actors and institutions have made use of discursive tactics to promote storylines and build discourse coalitions in order to establish or reproduce and institutionalise certain ways of thinking and acting collectively (see e.g. Hajer 1995a; Hajer and Versteeg 2005). However, as shown in Paper 3, by combining middle-range concepts such as storylines and discourse coalitions (Hajer) with discursive-institutional approaches, the concept of discourse institutionalisation provides a theory of change that might be applied for analysing strategic efforts to both challenge and control policy discourse. My analysis of Swedish climate policy discourse indicates how policy actors linked to different discourse coalitions are currently involved in a discursive, argumentative struggle between a dominating carbon-pricing discourse and a counter-discourse on decarbonisation. The settlement of this controversy affects what policy strategies become institutionalised and, importantly, what approaches are even possible to pursue.

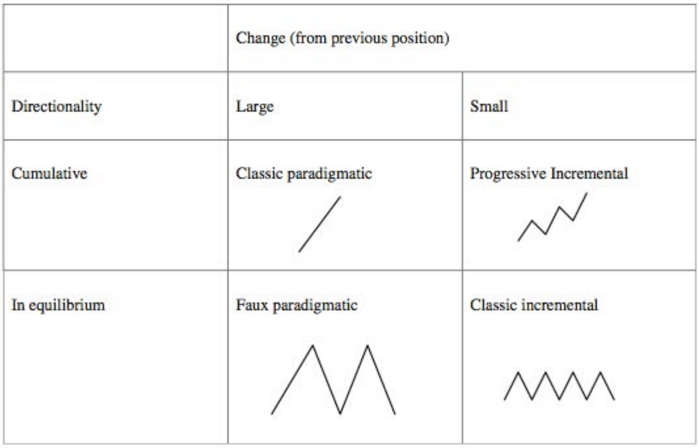
Policy Change as Progressive Incrementalism

The decarbonisation agenda implies large-scale transformations in the provision, use and distribution of energy to radically reduce carbon emissions and achieve long-term climate stabilisation. In policy studies, scholars have started to ask how policy making in itself can be redirected to support such radical social change within the current structures of governance. An intriguing example is found in Levin *et al.* (2012). Going beyond traditional forms of policy analysis, they elaborate on concepts of path-dependency and mechanisms for policy change to explore plausible policy logics "that may trigger and nurture path-dependent processes that lead to transformative change over time" (p. 131). Warning against the traditionally strong belief in "single-shot" policy interventions, they argue for "progressive incrementalism" as an alternative pathway. Single-shot policy reforms might be effective and have far-reaching consequences but can lead to shock effects and thus run the risk of resistance and back-firing. Alternatively, in path-dependent processes a series of incremental policy adjustments and reforms might assemble over time to gradually attract political acceptance and create conditions for entering new pathways, for instance, towards decarbonisation.

Informed by recent accounts of path dependency in neoinstitutional theory, as outlined above, emphasising policy change as the cumulative outcome of incremental and gradual policy developments rather than by grand design, Levin *et al.* (2012) indicate four mechanisms of path-dependency in terms of lock-in, self-reinforcing, increasing returns and policy feedback mechanisms (cf. Pierson 2000). Building further on policy development literature, e.g. Cashore and Howlett (2007), they present a heuristic model (see Table 1) in an effort to better understand and analysing when windows of change and triggers for progressive policy change occur. The classic paradigmatic scenario represents the kind of change caused by single-shot reforms or events punctuating stable policies that Baumgartner and Jones (1993) theorised. However, such grand designs run the risk of backlash and being reverted, as reflected in the faux paradigmatic scenario. On the other hand, many policy reforms are characterised by policy calibration and adjustments reproducing rather than changing the present policy, which is represented by the classical incremental type of scenario.

The progressive incremental type of scenario is less understood but represent the kind of gradual and step-wise processes of incremental policy change in which progressive forces accumulate over time to create new policy trajectories. Levin and her colleagues emphasise how such logics can be explored to craft sticky policy strategies that may entrench support over time and be expanded to cover broader constituencies. This resonates with arguments brought forward by e.g. Compston and Bailey (2008) about designing national political strategies for climate policy in ways that lower political risks for resistance while building momentum for more radical policy change over time. In my research, progressive incrementalism provides explanation to the identified transitions. In particular, the gradual transformation of district heating in Sweden (see Paper 4) provide such a case. This is a sector that over the course of the last three decades has gone through a transition from being fully dependent on fossil fuel energy to become almost fully decarbonised in effect to a combination of policies developing gradually over time.

Table 1. Taxonomy of Policy Change (Levin *et al.* 2012: 133; after Cashore and Howlett 2007)



	Change (from previous position)	
Directionality	Large	Small
Cumulative	Classic paradigmatic	Progressive Incremental
In equilibrium	Faux paradigmatic	Classic incremental

Governance Dilemmas as structural conditions

In Paper 2 I present another account of such a gradual and step-wise process of policy development, in analysing the development of European renewable energy policy. This historical-institutional policy analysis is based in another conceptual understanding of policy making and governance in terms of a generic set of “governance dilemmas” that policy-makers have to face in governing any kind of policy problem (see Table 2). The framework was developed as part of collaborative effort in the Policy and Governance work package of the ADAM-project (EU FP7) and is coherently presented in Jordan *et al.* (2010). The framework is based on a rational-institutional understanding of policy-making and emphasises six types of choices or dilemmas that governors have to handle in some way or another. In this view, decision-making entails making political choices between alternative courses of action, often between two or more unpleasant options, which might place governors in situations of a dilemma. In Paper 2 we called these governance dilemmas, however I think it is more correctly to understand them as critical policy choices that generate structural conditions for decision-making and processes of public policy-making.

Table 2. Six Governance Dilemmas (based on Jordan et al. 2010; see Paper 2)

Governance dilemmas (conditions)	*Policy choices (examples)*
1. Problem definition	What is the problem? What objectives to address?
2. Levels & Scales	At what level to act? How to coordinate across multiple levels?
3. Modes & Instruments	How to act? Which instruments are appropriate, feasible and accepted?
4. Timing & Temporality	In what sequence to act?
5. Costs & Benefits	What costs and benefits count? Winners vs. losers?
6. Implementation	How to secure policy change and ensure compliance? Enforce vs. encourage implementation?

In Paper 2 we investigate four such interrelated types of conditions critical for governing renewable energy in the EU. The first relates to how the policy problem is perceived and being addressed, e.g. whether renewable energy is articulated as a solution in response to the problem of climate change, energy security and/or market efficiency. This relates to the discursive dynamics discussed above and can generate the kind of discursive controversies analysed in Paper 3. The second relates to which level to act on, a particularly salient issue in multilevel systems of governance such as the EU. The third relates to choices about how to act in terms of which modes of governance and policy instruments are viewed appropriate to deploy. This condition further relates to two others about timing and in what sequence to act as well as to the costs and benefits to account for, which might generate political dilemmas in terms of distributional effects and conflicts over which policy approaches to address. The final condition is about how to secure policy change and ensure compliance, i.e. whether to enforce (e.g. by sanctions) or to encourage implementation by employing softer forms of activities and measures. These dilemmas or choices are generally applicable to various contexts of governance and provide a framework for understanding the conditions for public actors to govern by means of public policy and the structures that constrains (or enables) policy-making processes and progressive action.

Concluding thoughts: Conceptualising the Policy Space

The dimensions of institutional, discursive and policy change discussed above are in this section brought together into a conceptualisation of the contingent conditions constituting the space for policy action and governance. A few years ago, Bailey and Wilson (2009) made a similar attempt to bring together various perspectives on policy, institutional and ideological change in order to form a heuristic model for understanding what they termed “decision-making corridors” (see Fig. 4). In my perspective, their model provides a conceptualisation of the political room to manoeuvre in policy making. This institutionalised policy space is constituted and constrained by the enduring policy paths and institutional settings for decision making and governance. What set the boundaries for this space is what they term the “ideological spectrum for decision making”, but that I see as constituted by the discursive patterns and ideational structures that frame a particular policy field or policy problem. Such discursive configurations set the boundaries for “thinkable” pathways and constrain what are construed as appropriate or feasible policy options and which are “unthinkable” to even become subject to consideration. These configurations are difficult to change but are, as I argue above, mutable to some extent by actors engaging in discourse. Thus, the policy space might be widened (or narrowed) as the discursive configurations change, either in effect to endogenous dynamics or by exogenous trends (e.g. new knowledge, values and norms). This explains, for instance, how previously repudiated policy pathways over time might become “thinkable” options.

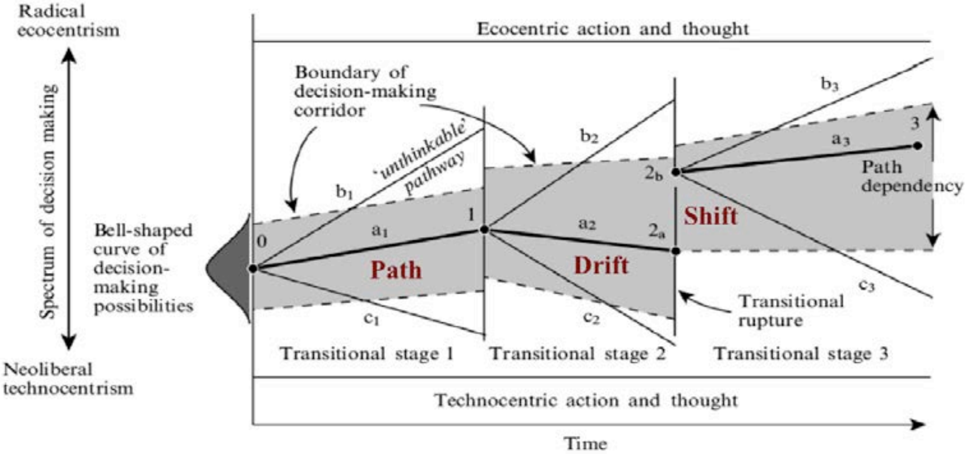

Radical ecocentrism
Spectrum of decision making
Neoliberal technocentrism
Bell-shaped curve of decision-making possibilities
Ecocentric action and thought
Boundary of decision-making corridor
'unthinkable' pathway
b_1
a_1
c_1
0
1
Path
b_2
a_2
c_2
2_b
2_a
Drift
Shift
b_3
a_3
c_3
3
Path dependency
Transitional rupture
Transitional stage 1
Transitional stage 2
Transitional stage 3
Technocentric action and thought
Time

Fig. 4. The Policy Space as Decision-Making Corridors (after Bailey and Wilson 2009: 2329)

Bailey's and Wilson's approach is informed by transition studies and by Peter Hall's (1993) policy paradigm theory providing a typology of first (policy adjustments), second (policy reforms) and third order (policy paradigms) policy change.[4]

---

[4] The concept of paradigm, used by Peter Hall and others (e.g. Peters *et al.* 2005), corresponds to Kuhn's theory on scientific paradigm change. It could however be problematic to specify

Conceptualising the policy space, or room to manoeuvre, in this way, is to conceive of policy change as contingent and path-dependent (see e.g. trajectory from point 0 to point 1) and thus, policy-making as predominantly incremental. The typically bell-shaped preferences among decision-makers lead to reform being prioritised over radical change both in institutional and discursive terms.

At the same time, this model accounts for change, either as evolutionary "transitional shifts" (see point 1 to point 2a) or as discontinuous change at "transitional ruptures" (see point 2a and 2b). Transitional shifts represent the kind of incremental, path-dependent processes of change unfolding over time that historical institutionalists have had in mind. While the explanations of path-dependency conceptualised by Pierson and others make policymakers likely to maintain a policy trajectory once entered, the policy might start to gradually change and drift away from its original intentions (Thelen 2004). By contrast, transitional ruptures represent the kind of sudden shifts and radical change that punctuates a stable equilibrium (Baumgartner and Jones 1993) due to formative moments or exogenous events, e.g. changes in power/government, technological breakthroughs or shifts in fundamental ideas, values and norms. While it might be hard to foresee analytically what generates such rapid shifts, the applied forward reasoning approach asserted by Levin *et al.* (2012) provides opportunities to advance a better understanding of what triggers policy change with a progressively transformative potential. This could entail policy developments of different orders (Hall 1993) or levels of change (Eckersley 2004) ranging from (1) calibration and adjustments of policy instruments and (2) reforms in policy instruments and goals to (3) paradigmatic changes in goal hierarchies and orientation or even, as addressed by Eckersley, (4) to changes in the imperative role of the state. While the first two orders of change might result from a series of gradual, incremental changes, the higher orders of paradigmatic or imperative change must be assembled over time in order to break path-dependencies, widen the discursive spectrum or require significantly radical changes in material conditions or normative values.

Conceptualising policy change in this way, one needs to take past policy developments, the prevalent institutional settings and configurations of policy discourse carefully into account in analysing the conditions for governing transformative change. In several contributions I apply such approaches for the purpose of exploring how different conditions for policy change are manifested in the Swedish polity. These articles are attempts to understand the policy space for low-

---

when, why and how such single paradigms change (e.g. Schmidt 2010), why it might be more fruitful to conceive of the more thoroughgoing policy reforms that Hall had in mind as changes in the discursive configurations in a given policy domain.

carbon transition policy and governance in Sweden. In Paper 5, key decarbonisation strategies are identified and their institutional challenges analysed. While the process industry and transport sector is dependent on international trends in market and technological development, the state asserts more control over energy policy and planning measures. In Paper 3, I analyse how the manifestation of climate policy discourses in institutional processes affect policy-making and which policy strategies are pursued. This analysis confirms the critical importance of understanding what ideational (discursive) structures dominate the policy space and frame what interventions are even thinkable in the first place. The carbon-pricing discourse presently dominating in Sweden provide leeway for economic incentives, but excludes other measures articulated as critical for steering and enabling longer-term transitions towards decarbonisation. In paper 4, we employ policy analysis, informed by transition and policy studies respectively, to analyse the extent to which present Swedish climate governance contributes to support innovative practices and to build momentum for policy change and new pathways towards a decarbonised green state. While the Swedish case gives mixed evidence for the prescriptions of transition management regarding the agents of change, progressive incrementalism stands out as an accurate explanation, notably with regard to transitions in the sociotechnical complex of Swedish district heating that during the last 30 years has been almost fully decarbonised. By contrast, it is harder to support decarbonisation in the process industry and transport sectors. These sectors represents cases in which public actors might have to engage more creatively to enable and orchestrate processes of change, for instance by means of supporting innovation and by promoting discourses on sustainable mobility and infrastructure planning.

Analytical Strategies

The overarching aim of this dissertation is to explore how the state can govern decarbonisation by means of steering and enabling low-carbon transitions. The overall research design for addressing this objective is outlined in the introduction (see section 1.4). In this chapter I present the analytical strategies and more specific methods employed.

The research objective of this dissertation requires an analytical strategy that explores the conditions for governing decarbonisation from several perspectives. So, while my research ambition is explorative, my analytical strategy is multi-theoretical and multi-methodological. Theoretically, I advance a conceptual understanding of how the state can engage in governing decarbonisation informed by various perspectives on key concepts of relevance, such as the environmental (or green) state, the governance concept, sustainability transitions, and institutional and discursive conceptions of policy change. Such conceptualisations inform my analyses of the empirical realities in focus, for instance the Swedish systems of climate governance (Papers 1, 3-4, 6) and the politico-institutional challenges of further decarbonisation strategies (Papers 5-6).

Analytically, in exploring the ways in which such low-carbon transitions are and can be achieved politically, I engage constructively with both how-is and what-could-be questions, not to be conflated with normative should- or ought-to-be questions as emphasized in the introduction. That is achieved by examining how the conditions for governing decarbonisation is manifested and institutionalized in the arrangements of public policy and governance and by exploration of the prospects for the state to steer and enable the implied processes of transformative change. To analyse these realities, I address a multi-methodological strategy in which I deploy a mix of methods and techniques for qualitative inquiry and interpretive policy analysis. For the analyses presented in the attached papers I have employed various analytical strategies and to a varying degree applied methods such as forward-oriented policy analysis (e.g. Papers 5-6) and discourse analysis (Paper 3) as well as techniques such as interviews, policy interactions (as observations) and text analyses of policy documents. This is further related to the empirical focus of the analyses ranging from the institutional (Papers 1, 4-6) and discursive (Paper 3) conditions for governance to more specific arrangements of public policy (Papers 2, 4) and policy-making (Papers 2-3). In the following I present these strategies separately, but one should bear in mind that the research conducted for different papers is based on a combination of these methods and techniques.

Policy Analysis and Forward Reasoning

In my research I have employed various forms of policy analysis for the purpose of forward-oriented reasoning about the conditions and prospects for state authorities to govern decarbonisation and enter low-carbon transition paths. These analyses are conducted both retrospectively to examine past policy developments (see e.g. Paper 1-2 for historical-institutional accounts) and in an exploratory manner to analyse the prospects of contemporary policies to support processes of change (see e.g. Paper 3-4). Furthermore, I have experimented with qualitative scenario analytics to explore plausible policy trajectories and their robustness to various policy contingencies and institutional factors (see e.g. Papers 5-6). In a recent attempt to come to terms with what might enable policy trajectories to ameliorate the "super-wicked" problem of climate change, Kelly Levin and colleagues (2012) developed what they term an applied forward reasoning approach based on insights from recent research on path-dependency and policy change (see further section 2.3.3). What they suggest is a forward-oriented policy analytical approach to explore "ways in which interventions might create particular policy pathways that move toward preferred outcomes" (Levin *et al.* 2012: 131) on the basis of "whether they contain 'plausible logics' to trigger one or more path-dependent process" (ibid, p. 125). Compelled by their approach, I apply such forward reasoning to explore conditions for public policy strategies aimed at decarbonisation. My aim is not policy prescription but exploration and constructive reasoning about how state authorities can govern decarbonisation, based on examination of relevant empirical realities. The methods and techniques for such examination are further presented in the following sections.

Discourse Analysis as Policy Analysis

To understand how notions of the low-carbon transition are manifested in the practices of policy-making, I have applied discourse analysis in Paper 3 as a policy analytical approach for studying the construction of meaning in the Swedish polity. My ambition has been to employ discourse analysis as a strategy for grasping and analysing how discursive patterns of argumentation constitute, and are constituted by, the institutionalised practices of policy making. In turn, this determines which policies are endorsed and which ones are not. Discourse analysis can be both a theoretical *and* a methodological approach, as maintained by Jørgensen and Phillips (2000: 10). In common-sense understandings, discourse is synonymous with discussions and "talk" and to analyse discourse is to engage with linguistic analysis of texts. However, in social science analysis discourse is broader than just text. Discourse is a concept to "make sense of the regularities and variations in what is being said (or written) and try to understand the social backgrounds and the social effects of specific modes of talking" (Hajer 1995a: 44). In this perspective, discourse is constructed in both language and social practices, or in both meaning and action, as Wagenaar (2011) frames it, and discourse analysis puts emphasis on how meaning is constructed in the context of social practices and interactions (Neumann 2003: 175). Thus, discourse could be understood as a "certain way of talking about and understanding the world" (Jørgensen and Phillips 2000: 7; own translation) and be defined as a "system for the construction of an ensemble of utterances and practices that, once gaining institutional footing, stands out as more or less normal" (Neumann 2003: 17; own translation). Such utterances do not only include rational categories such as ideas, concepts and categorisations but also notions such as storylines, metaphors and images, as pointed out by Hajer (2009):

> an ensemble of notions, ideas, concepts and categorizations through which meaning is ascribed to social and physical phenomena, and that is produced in and reproduces in turn an identifiable set of practices (Hajer 2009: 60)

There are no given recipes or methods for how to go about conducting discourse analysis. Instead discourse analysts tend to design their studies in different ways depending on the research problem at hand. That being said, various approaches provide a set of concepts and techniques that might be of use in doing discourse analysis. For instance, concepts such as empty signifiers, elements, moments, articulations and chains of equivalence are associated with Laclau's and Mouffe's discourse theory (Laclau and Mouffe 1985) but are applicable to discourse analysis in general (Bergström and Boréus 2005: 316-18). While different concepts and techniques are applied across various approaches, one has to keep in mind the different ontological and epistemological premises in order to provide a coherent analytical package (Jørgensen and Phillips 2000: 142). In my work, I apply discourse analysis to understand the dialogical relationship between discourse and public policy and policy-making as a process of argumentative struggle in which actors draw on different discursive elements to articulate certain meanings. In Paper 3 I analyse how discursive configurations are manifested and articulated in policy practices, informed by the concept of discourse institutionalisation associated with argumentative discourse analysis and discursive institutionalism. In this analysis, the notion of a low-carbon transition is found to represent an empty signifier, i.e. a concept with a meaning is not yet settled and to which conflicting interpretations are attached, and around which the new politics of decarbonisation is currently being formed.

Hajer provides a list of ten steps he thinks need to be part of analysing policy discourse (see e.g. Hajer 2005: 306-307). To summarise, these include: (i) scope and design of the study, based on desk-based research and informant interviews to gain an overview of the field; (ii) collection of texts and other material through document analysis and interviews; (iii) interpretive analysis of material to analyse positioning effects among actors and institutions, identify key incidents and events, and relate what is being said to the practices in which it is being said; and, finally (iv) revisit some key actors to provide feed-back and control for accuracy. For the analysis presented in Paper 3, I employed a similar kind of strategies, although the scoping and design of the interview study was not originally done for the purpose of conducting discourse analysis but was prepared for a more inductive enterprise of policy analysis for understanding the practices of Swedish climate policy-making (see next section 3.3). However, during the first reading of the transcribed interviews I started to identify the discursive structures, key storylines and elements re-occurring in the conversations.

In addition to this, Neumann (2003: 47) emphasises what he calls "cultural competence" as a key prerequisite for conducting discourse analysis. He argues that the analyst needs both a proper familiarity with the culture (and language) constituting the studied context and a sufficient pre-understanding of the particular field of interest. That is, an ability to comprehend the cultural codes sufficiently well to understand the metaphorical expressions embedded in the collective use of language in general and in policy-making circles in particular. Secondly, the analyst also has to be, or to become, acquainted with the policy context to the extent that one could comprehend the key lines of reasoning and identify instances of differentiation in the policy debate approached. Being well-acquainted with the Swedish climate policy debate, which I have followed closely over the last two decades, helped me in that regard. One has to, as Hajer once put it, "keep an eye on the change occurring in that domain" while focusing on "emblematic issues" (Hajer 2005: 308). This helps the analyst to identify which texts are canonical in a particular discourse (Neumann 2003: 49). As indicated in my analysis of Swedish climate policy discourse (Paper 3), this could include material such as governmental bills (e.g. the Climate Policy Bill), public inquiries (e.g. on a low-carbon roadmap; SEPA 2012) and assessment reports often referred to, as well as political statements such as in op-ed policy debates in media. If such discursive interpellations conflict with dominant articulations, what Hajer (1995a: 60) has termed "inter-discursive transfer-points", one might identify situations of discursive dislocation in which "routinized proceedings are interrupted and where new storylines are articulated to counter established meanings and representations" (ibid). That was confirmed in my analysis of the Swedish case subject to the notion of a low-carbon transition. This analysis was further based on insights from the interview study presented in the next section.

Interviews

An important part of the material for my research was collected through interviews. In 2011 I conducted, together with two colleagues in the LETS project, 59 elite interviews with Swedish policy makers, policy officials and policy advisors engaged in climate-policy related decision-making at the national level (in parliament, governmental ministries, national agencies as well as industrial and environmental NGOs). I conducted a majority of the interviews myself, as well as some in collaboration with my colleagues. More specifically, the aim was to interrogate what views and patterns of thought key policy officials and stakeholders held regarding policy, institutional and political challenges and future strategies for governing low-carbon transitions beyond the then current planning horizon (2012 or 2020).

The interviewees were sampled strategically to cover a broad representation of national policy actors and supplemented by snowballing sampling (Devin 2002). The interviews were semi-structured according to an interview prompt with 12 main questions (see Appendix 1). This was adjusted to the respondents' field of experience and in relation to how the conversations unfolded during the interviews. All interviews were recorded and then transcribed in order to analyse the conversations using standard methods of text analysis (see e.g. Bergström och Boréus 2005). A first reading of all interviews was conducted in the autumn of 2011 and summarised in an interview report. The first version of this report was presented at a seminar to which respondents were invited to provide feed-back and reflect upon, in a focus group format, our impressions and tentative conclusions.[5] Further readings in relation to different themes identified were done later on for the specific analysis of various publications (e.g. Papers 3 and 4). For these analyses, the interview material was supplemented by relevant reports and documents available in the public domain, and by statements made in public policy debates. For the analysis presented in Paper 2 on European renewable energy policy, I conducted 10 interviews with a selected number of policy advisors and experts in Sweden, Copenhagen, Amsterdam and Brussels. These interviews were conducted as part of the ADAM project in collaboration with my co-supervisor Johannes Stripple.

---

[5] For the final version of this report, see Kronsell, Hildingsson and Khan (2012; in Swedish), which provides more information about the questions posed and responses received along with our tentative conclusions after the first reading.

Making Sense of Policy Interactions

Aside from the elite interviews, I have also gathered information through other forms of interaction with policy-makers and stakeholders. Taking part in seminars, workshops, and meetings (see Appendix 2), sometimes as an observer but often as an active participant (presenter; project representative), affects your understanding of the particular field of study and provides the opportunity to collect material, insights and perspectives on policy debates. My participation in the LETS 2050 research programme enabled this and provided recurrent interactions with policy-makers and policy advisors at national Swedish authorities. My post-graduate research has been part of a broader multidisciplinary research endeavour on *Governing Transitions to Low-Carbon Energy and Transport Systems for 2050* (www.lets2050.se), a programme running during 2009-2013 coordinated by Lund University, commissioned and funded by four national authorities; the Swedish Environmental Protection Agency (Naturvårdsverket), the Swedish Energy Agency (Energimyndigheten), the Swedish Transport Administration (Trafikverket) and the Swedish innovation system agency Vinnova. Besides funding my post-graduate research, the programme was beneficial in providing easier access to relevant policy makers and actors subject to my research. Moreover, conducting research through such policy interactions provides opportunities for continuous policy updates and invaluable "reality checks", strengthening the empirical accuracy and extra-disciplinary relevance of the analysis.

Engaging in Multidisciplinary Research

Being involved in multi-disciplinary research implies engaging in interdisciplinary dialogues. As political scientists we bring to the table and share with others our perspectives on concepts such as politics, power, steering, institutions and so forth. Returning home to our own discipline we bring with us experiences, insights and concepts that might enrich our conceptual understandings and perspectives. My research has been conducted in close collaboration with researchers in other disciplines such as economics and engineering and particularly in environment and energy system studies. Multidisciplinary exchange and dialogue raise critical issues at the intersection between various fields of research and have, despite ontological and epistemological differences, been beneficial for my understanding of, for instance, energy systems and innovation. For my engagement with future studies, the collaboration with scholars in energy system studies and economics familiar with various scenario techniques and models has been crucial. This also provides opportunities to expose your research to a broader audience of interest and to achieve critical views on the extra-disciplinary relevance of one's research. However, engaging in multidisciplinary research is also challenging, and particularly so if you are a postgraduate. Multidisciplinary research of the kind exercised in the LETS programme always entails to a significant part, elements of synthesising and interdisciplinary translation. Different ontologies imply certain problem framings and understandings of empirical reality and what constitutes policy, institutional and political challenges. As a post-graduate doing interdisciplinary translation implies that you engage in some kind of balancing act between different disciplinary perspectives while trying to find your way forward intellectually within your own discipline. In more practical terms, it might also be challenging to pinpoint your own specific contribution (for your peers), for instance in co-authored synthesis publications. In a similar vein, multidisciplinary exchange might have epistemological consequences for the ways in which such issues are studied. The fact that I have chosen a multi-methodological research strategy for my dissertation project is a reflection of being in a multidisciplinary research setting where having multiple perspectives is heralded as a strength.

Summary of the Papers

Papers 1-6

Paper 1: The Deliberative Turn in Swedish Sustainability Governance: Participation from Below or Governing from Above?

The deliberative turn to environmental governance in political theory and policy rhetoric, i.e. the reconciliation of political thought on environmental governance and deliberative democracy, has fostered a cognition that new modes of environmental governance – typically market- and network-based ones thought to replace traditional, top-down regulation – could improve and ensure both the deliberative quality (democratic legitimacy) and environmental integrity (effectiveness) of governance. In this contribution I examine developments and policy reforms in environmental governance in Sweden during the last two decades to understand the Swedish model of governance for ecological sustainability. The main objective is to analyse whether such contemporary reforms bear evidence of a deliberative turn and, more specifically, what kind of rationalities that guide sustainability governance in Sweden (e.g. administrative, economic and deliberative rationalities; see Kronsell and Bäckstrand 2010). The main finding is that the capacity and performance of environmental governance are not necessarily outcomes of improved conditions for public deliberation as asserted in green political theory. On the contrary, the Swedish case proves how the reflexivity on ecological concerns within political and state institutions have improved and strengthened through reforms in state-led forms of environmental governance without necessarily resorting to new modes of governance. The study, thus, confirms how state authority still take centre stage in the Swedish system of ecological sustainability governance and points to the critical importance of their capacity for advancing more progressive environmental policy.

The paper is single-authored and published as a book chapter in an edited volume at Edward Elgar Publishing (Bäckstrand *et al.* 2010).

Paper 2: Governing Renewable Energy in the EU: Confronting a Governance Dilemma

Promoting renewable energy sources (RES) is articulated as a key decarbonisation strategy. In the second paper, I analyse, together with two colleagues, the conditions for governing renewable energy policy in the EU. The analysis is structured according to an understanding of policy making as framed by a set of generic governance dilemmas that policy makers face in steering any field of policy (to be understood as structural conditions; see section 2.3.4). Policy developments are not simply technocratic matters devoid of politics, but an outcome of politically contested debates on, for instance, problem perceptions (e.g. agenda setting) and ways to govern in particular instances and areas of social life (e.g. policy instruments). The multilevel governance system in the EU adds to this complex issues about policy coordination and harmonisation (i.e. at which level to act) in relation to the competences of various EU institutions. Empirically, I examine over thirty years of attempts to promote renewable energy from Brussels and across Europe, first in response to energy (in)security and later to anticipated problems of climate change. The article provides insights on the establishment of EU RES policy, which is found to represent a protracted and gradual process of policy development. The modes and means of policy coordination in this domain developed slowly and in a step-wise fashion from quite loose forms of cooperation in the 1980s towards a common policy framework as part of the EU's current climate and energy package. A general insight is that, while the combination of energy security and environmental concerns provided a profound rationale for crafting renewable energy policy, the main driver for EU policy coordination has been internal market concerns rather than an impending climate catastrophe or an anticipated energy crisis. More specifically, the paper shows the critical importance of public policy support mechanisms developed by Member States to promote investments in renewable energy across Europe. While enduring policy support seems key, the policy debate has centered around the two main types of deployment policies, i.e. feed-in tariffs and tradable quota obligations, the choice of which is heavily disputed.

For the paper, I am the lead author and responsible for the overall design of the article as well as the empirical analysis presented. The article is published in *European Political Science* and it was co-authored with Johannes Stripple and Andrew Jordan based on our research in the ADAM project (see Jordan *et al.* 2010).

Paper 3: Too Many Targets or Too Few Measures? Discourses on Decarbonisation in Swedish Climate Policy Making

What climate policy is and is (not) about, and how it is to be achieved are contested issues in policy debates. While being highly political, such controversies are not always obvious to discern in consensual policy discourse. In policy-making circles contrasting views over the proper means of intervention might unfold into formidable struggles over competing claims about the policy problem at hand and interpretations of the social reality to be governed. In this article I study how such a discursive controversy is manifested in and affects various approaches to climate governance in the case of Sweden. While the notion of a low-carbon transition is widely embraced, controversies over its meaning revolves around two main policy discourses; one emphasising the policy problem as a market failure to be corrected by carbon pricing; the other as an energy system problem to be handled by decarbonising societal systems. Which conceptualisation dominates the discourse has profound implications for the roads taken in policy terms, e.g. whether policy-makers think there are too many targets or too few measures in place for the transition. The discourse analysis presented in this paper is informed by the conceptualisation of discourse institutionalisation associated with argumentative discourse analysis and discursive institutionalism (see section 2.3.2). I also elaborate on the concept of agency in discourse and the key importance of certain agents operating as "discursive watchdogs" (gatekeepers) in discourse coalitions. The analysis is based on material from the Swedish interview study (see section 3.3) supplemented by analysis of relevant policy documents and interventions in the policy debate (see section 3.4).

The paper is single-authored and an advanced manuscript intended to be submitted to *Environmental Politics*. At an early stage the paper was presented at *the 3rd International Conference on Sustainability Transitions*, DTU, Lyngby, Denmark, 29-31 August, 2012.

Paper 4: Towards a Decarbonised Green State? The Politics of Low-Carbon Governance in Sweden

Climate governance provides venues towards decarbonisation and in this paper I argue, together with a colleague, for a decarbonised green state to represent a state committed to and engaged in promoting transformative social change (i.e. a decarbonising state). In the paper we present an empirical account of Swedish climate governance and its relevance for governing low-carbon transitions informed by the environmental state concept, transition studies and policy studies. With the aim to explore what a politics for low-carbon transitions imply for the state (i.e. how the state can govern decarbonisation), we examine how Swedish climate policy has contributed to reduce emissions, spur innovation and enter decarbonisation pathways in a selection of policy sectors (energy, transport and industry). In the study we find Sweden to be successful in supporting transitions in sectors such as heating and electricity for which progressive incrementalism stands out as an explanation, notably to the decarbonisation of district heating but also to the expansion in renewable electricity generation induced by, for instance, a green certificate scheme (renewable electricity quotas). However, in other sectors such as transport and the process industry, decarbonisation is not yet an institutionalised objective. In these sectors discourses on sustainable mobility and ideas about a green economy have not yet been established. Rather, climate policy is dominated by the market-liberal norm of cost-efficiency while lacking a strategic focus on long-term decarbonisation strategies. So, while being successful in reducing domestic emissions, it is our conviction that Sweden has yet to develop as a decarbonising green state.

I am the lead author of this paper, jointly authored with Jamil Khan, which is accepted for publication as a book chapter in an edited volume forthcoming at Earthscan/Routledge (Kronsell and Bäckstrand 2014). An early version of the paper was presented at the *11th NESS Conference*, Copenhagen, 11-13 June 2013.

Paper 5: The Missing Link: Bringing Institutions and Politics into Energy Future Studies

The proliferation of decarbonisation scenarios in recent years has contributed to establishing notions about the low-carbon transition as being technologically feasible and economically viable. In this paper I engage with this tradition to discuss how energy futures studies could be used for, and enhanced by, analysing politico-institutional dynamics associated with decarbonisation strategies. Together with my co-authors I present an explorative approach to combine low-carbon scenarios with elements of political and institutional analysis. As political and institutional factors are often conspicuously absent in future studies, low-carbon scenarios most often lack a proper understanding of the complexity involved in climate governance.[6] In the article, we argue that bringing an explicit treatment of political and institutional conditions (the missing link) into the analysis might enhance and render future energy studies more accurate for understanding the challenges of decarbonisation and the implied low-carbon system transformations. In this spirit we ask what it might imply to take Robinson's (1982) seminal backcasting ideal[7] seriously and illustrate how a sample scenario of systems-technical change can be combined with analyses of, first, plausible alterations in the international context (i.e. four scenarios of the future international climate policy regime) and, second, the institutional conditions (i.e. in regulations, cognitions and norms; Scott 1995) associated with a selected number of decarbonisation pathways. The article contributes with insights regarding both the interdependence and institutional dynamics of various strategies. As such, strategies in some sectors are found to be sensitive to international developments, e.g. competitiveness concerns for industry and innovation in vehicle technology, while state authorities exercise more control over energy policy measures and planning in other sectors. A critical insight from our analysis is that governing decarbonisation does not primarily have to do "with adjusting policy and price signals to induce change in behaviour in perfect market situations" but that it might be more effective "to instigate more evolutionary institutional change processes, including changes in framing and cognition as well as actor constituencies, organizational networks, and social norms" (Nilsson *et al.* 2011: 1127).

---

[6] In Söderholm *et al.* (2011) we present a review of 20 decarbonisation scenarios and point to a number of problems in modelling approaches. For instance, the applied models often reduce the impact of climate policy into ideal assumptions about a universal carbon price (as a proxy for all policy interventions) without any further specification of the policy mix. Policy alternatives and interactions with other policies (i.e. second-best policies) are seldom taken into account, neither are ancillary benefits. Political and institutional challenges associated with the envisaged pathways are thus often neglected, although they relate to the specific choice and design of policies and measures and their composition into broader policy portfolios. Therefore we argue, in line with Paper 5, that future energy scenarios supplemented with qualitative policy analysis could provide a deeper understanding of the political context and institutional conditions for policy change, both *ex ante* in modelling assumptions and the scenario construction and *ex post* in impact assessments and the policy analysis.

[7] In a criticism of forecasting (predictions and prognosis), Robinson proposed backcasting as an alternative and more accurate approach for energy future studies. In his 1982 article he outlined the backcasting method and suggested an explicit treatment of technical, environmental, economic, social and political concerns to be included in the policy analysis. However, more than thirty years of experience with backcasting has proven the difficulties to live up to his ideal and that, in practice, backcasting studies often represent technical feasibility assessments lacking a proper policy analysis.

The paper is a joint publication with five co-authors (with Måns Nilsson as coordinating author) published as a journal article in the 2011 Special Issue on Energy Futures in the *Futures* journal. As such, it exemplifies a multidisciplinary collaboration with colleagues from other disciplines, in this case involved in policy analysis, energy system and future studies. I contributed to both the conceptual and analytical parts of the paper and the policy and institutional analyses presented. I have also been involved in constructing the two scenario frameworks on which the analysis is based.

Paper 6: Governing Low-Carbon Transitions in Sustainable Ways: Potential Synergies and Conflicts between Climate and Environmental Policy Objectives

Although it is a central sustainability concern, climate change is often treated separately from other policy areas in environmental governance. This motivates us, my co-author and me, to study how low-carbon transitions might be governed in line with broader sustainability goals. In this paper we study the relationship between low-carbon strategies and the broader agenda of environmental governance by examining the Swedish system of steering-by-environmental-objectives as an arrangement of governance. We identify potential conflicts and synergies between decarbonisation and long-term sustainability objectives. Our analysis indicates that low-carbon strategies might be compatible with preserving other aspects of ecological sustainability, but that this is contingent on specific circumstances. Therefore we argue for a coherent and integrated system of governance, including relevant flanking policies for non-climate objectives, e.g. systems that control the expansion of biomass and ensure the use of sustainable methods. For such a governance system to be effective, it needs to be flexible in terms of adapting to specific and changing contexts, as well as reflexive enough to factor in new knowledge on requirements for sustainable development and potentially changing values of future generations.

I am the lead author of this paper, which is jointly authored with Bengt Johansson and based on research conducted within LETS2050. The paper is a journal article manuscript submitted to *Energy Policy*.

List of Other Contributions

A number of other contributions authored during the course of my post-graduate studies have been considered for inclusion in this dissertation but have for various reasons been excluded. Relevant publications to mention in this respect are the following ones:

Hildingsson, R. and J. Khan (2013). Greening the Welfare state: Confronting the Environmental State with the Realities of Welfare State Transformations. Paper presented at the *ECPR Joint Session*, Mainz, 11-16 March 2013 and at the *11th NESS Conference*, Copenhagen, 11-13 June 2013.

Kronsell, A., R. **Hildingsson** and J. Khan (2012). Climate governance in the absence of ecological democracy: Learning from climate policy making in Sweden. Paper presented at *3rd International Conference on Sustainability Transitions DTU, Lyngby, Denmark, 29-31 August, 2012*

Söderholm, P., **R. Hildingsson**, B. Johansson, J. Khan and F. Wilhelmsson (2011). Governing the transition to low-carbon futures: A critical survey of energy scenarios for 2050. *Futures* 43(10): 1105-1116.

Khan, J., A. Kronsell and **R. Hildingsson** (2011). The role of institutional innovations in the transition to low-carbon futures. Paper presented at the *2nd International Conference on Sustainability Transitions*, 13-15 June 2011, Lund, and in *the Green Politics WG at SWEPSA*, 30 Sept–2 Oct 2010, Göteborg.

Berkhout, F., C. Haug, **R. Hildingsson**, J. Stripple and A. Jordan (2010). Exploring the future: the role of scenarios and policy exercises. In: A. Jordan, D. Huitema, H. van Asselt, T. Rayner and F. Berkhout (eds), *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* Cambridge, UK: Cambridge University Press.

Stripple, J., T. Rayner, **R. Hildingsson** and A. Jordan (2010). Governance choices and dilemmas in a warmer Europe: what does the future hold? In: A. Jordan, D. Huitema, H. van Asselt, T. Rayner and F. Berkhout (eds), *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* Cambridge, UK: Cambridge University Press.

In Swedish, I have published a number of more policy relevant analyses based on my post-graduate research, for instance:

Hildingsson, R., J. Khan och A. Kronsell (2013). Politiska styrningsutmaningar på färden. I: L. J. Nilsson och J. Khan (red), *I ljuset av framtiden: Styrning mot nollutsläpp år 2050*, LETS2050, Lunds universitet, sid. 58-71.

Hildingsson, R. och L. J. Nilsson (2013). Framtidsbilder och visioner som strategiska verktyg på färden. I: L. J. Nilsson och J. Khan (red), *I ljuset av framtiden: Styrning mot nollutsläpp år 2050*, LETS2050, Lunds universitet, sid. 98-104.

Garzcyna Johansson, S. och **R. Hildingsson** (2013). Ursäkta, men hur löd klimatfrågan? I: M. Hall och I. Björck (red), *15 nedslag i klimatforskningen: Dåtid Nutid Framtid*, Centrum för Miljö- och Klimatforskning (CEC), Lunds universitet, sid. 29-44.

Hildingsson, R. och R. Andersson (2012). En (annan) hållbar utveckling. *Fronesis* nr 38-39, s. 196-203.

Kronsell, A., R. **Hildingsson** och J. Khan (2012). *Intervjustudie om förutsättningar för en svensk klimatomställning – preliminära resultat.* LETS-rapport, Lunds universitet.

Khan, J., **R. Hildingsson** och M. Klintman, red. (2011). *Vägval 2050: Styrningsutmaningar och förändringsstrategier för en omställning till ett kolsnålt samhälle.* LETS-rapport, nov 2011, Lunds universitet.

Khan, J., **R. Hildingsson**, B. Johansson, F. N. G. Andersson, L. J. Nilsson and P. Karpestam (2011). *Att styra mot ett klimatneutralt samhälle*. LETS-rapport, jan 2011, Lund University.

Conclusions

The key argument in this dissertation is that the state can provide a critical site for progressive climate action in the new politics of climate change and its orientation towards decarbonisation. Just as with any societal transformation towards ecological sustainability, low carbon transitions will require substantial structural changes to be made in the functions and operations of society and the economy. Compelled by the new orientation of climate politics, my ambition in this dissertation has been to explore how the state can govern decarbonisation. To achieve this, I addressed two research objectives. First, I developed a conceptual understanding of the conditions for state institutions and public actors to govern transformative change aimed at the decarbonisation of society. Second, I examined how such conditions are manifested and institutionalised in arrangements of public policy and governance and how they affect the state's capacity to steer and enable low-carbon transitions in the case of Sweden. Given the centrality of state authority in the social organisation of the modern society, at least in advanced economies, such transitions are unlikely to be achieved without the active support and involvement of public actors and state institutions, and especially so in light of the failure to regulate and develop significant responses to climate change by other means.

In this concluding chapter I present and summarise the theoretical and empirical insights from my research. This is done in an integrated manner and the chapter is structured according to three key themes. First, my conceptual understanding of the (environmental) state and its role in governing transformative change is presented. Second, my conceptualisation of the ways in which the state can engage in governing decarbonisation is discussed on the basis of empirical evidence from my papers. Third, the insights from my conceptualisation of the policy space and the conditions for governing policy change by means of progressive incrementalism are presented. Finally, I reflect upon the prospects for a decarbonised state in the new politics of climate change.

Conceptualising the Environmental State

In this thesis I have advanced a conceptual understanding of the environmental state and the ways that such a state can engage in governing transformative change as implied by the decarbonisation agenda. Building on perspectives in environmental politics on ways to green the state (see section 2.1) and in transition studies on the management of sustainability transitions (see section 2.2), I advance an understanding of the environmental state and its capacity to govern decarbonisation. In Table 3 I summarise my conceptualisation of the state and social change in these traditions.

Table 3. Conceptualisation of the State and Social Change in Four Traditions

School of thought (type of state)	**Political order in mind**	**View on social change**	**Strategies for policy change**	**Key change agents**	**Main rationality of governance**
Transition Management	N/A ("network society")	Socio-technical system innovation and 'regime shifts'; long-term restructuration	Goal-oriented modulation, variation-selection; transition experiments; reflexive monitoring	Frontrunners: niche actors and regime-players ('transition arenas')	Managerial (networked governance)
Green liberalism (Environmental neoliberal state)	Liberal democracy	Preferential and norm changes, emancipation	Public deliberation; Constitutional entrenchment (e.g. restraint principle, polluter pays, etc.)	Individual citizens and economic actors	Economic
Green welfarism (Environmental welfare state)	Social welfare state	Progressive incrementalism; gradual institutional change from 'within system'	Step-wise policy change and reform: policy integration; institutionalisation; ecological modernisation	Government, public authorities, bureaucracies	Administrativ e
Post-liberal ecologism (The Green state)	Discursive ecological democracy	Imperative norm and value changes, ecological emancipation and reflexivity	'Ecological discursive designs' (deliberative democracy); Legal, institutional and policy reforms for reflexive ecological modernisation	Civil society (green public discourses); State institutions as 'stewards' and 'facilitators'	Deliberative, Ecological

This conceptualisation provides contrasting views on how to engage the state in greening and decarbonising society. In Table 3 I illustrate the ontologies of the state and social change present in these traditions and elucidate how these models differ in terms of strategies for governing social change and the rationalities for governance (see further Kronsell and Bäckstrand 2010). As such, they represent different approaches on how the present (liberal) order can be made greener and how the state and other agents of change can be engaged in such a quest. Here I add transition management, although not representing a coherent approach for greening the state, it contributes with an influential bottom-up perspective on sustainability transitions and sociotechnical system change. These schools of thought build on different ontologies of social change addressing both system-theoretical and agency-based understandings, including processes of restructuration as emphasised in transition studies (see e.g. Grin 2010; cf. Giddens 1984; cf. Lundquist 1993). The conceptualisation developed in this thesis provides a perspective on the state as both a site for progressive climate action and a potentially progressive agent of change for the societal transformations implied by the decarbonisation agenda. As a site for political action, the state is constituted by the authority and structures of power embedded in the very construction of the modern state. Such structural conditions are institutionalised in the political organisation of authoritative steering and set the framework for governance. As political agents, public actors are constrained by such social contexts within which they operate while having agency to employ certain capacities to govern, transform societal systems and steer societal development in the direction of decarbonisation.

Among these models of change, green liberalism is largely a defence for the current (neo)liberal state possibly engaged in weaker forms of ecological modernisation, while transition management provides a managerial governance approach for supporting niche actors and innovative experiments that might generate system change. By contrast, post-liberal ecologism and green welfarism provide two alternative approaches for making the state actively address ecological responsibilities. Post-liberal ecologism developed as a critique of the incapability of liberal states to accommodate ecological concerns and provides a normative approach for transforming and radicalising the current state by means of discursive ecological democracy and reflexive ecological modernisation. What I call green welfarism represents a more pragmatic approach to gradually change the administrative state from within the present order by means of progressive incrementalism and evolutions in environmental public policy. Sweden, my main object of study, represents such a *de facto* environmental welfare state that has developed in the recent decades. The Swedish environmental welfare state is predominantly based on administrative rationality of governance and hierarchical forms of public policy but it pragmatically employs other rationalities and forms of governance as well in its neocorporatist model of governance (see Paper 1).

Central to such an environmental state is its capacity to steer societal development towards ecologically sustainable ends, for instance by means of decarbonisation. In this thesis, I claim that the environmental welfare state has such a capacity. A key implication of this is emphasised in Paper 4. Namely, that engaging in the quest for greening the state is engaging public actors and state institutions in processes of transformative social change in order to make society respect ecological limits. Thus, a decarbonising green state is reflected by the assembled efforts of state actors to steer and enable processes of transformative change aimed at greening and decarbonising society. This can be achieved in different ways. However, given the urgency of climate change, my claim is that developing such a decarbonised state upon the basis of the present environmental welfare state provides a way forward to significantly advance the capacity for steering and enabling the transitions.

How Can the State Govern Decarbonisation?

Second, a key insight is that the state is not a site which is stripped of agency for various interests to control. Quite the contrary, in advanced environmental welfare states such as Sweden, governmental authorities and agencies are populated by actors (i.e. policy makers and bureaucrats) with a certain amount of autonomy and who possess the political authority and administrative capacity to authoritatively steer society-wide developments within their fields of competence and responsibility. As such, the Swedish case shows how state authorities have been able to address concerns about ecological sustainability and climate stabilisation as essential responsibilities, e.g. through the Environmental Code or by institutionalising a comprehensive system for steering-by-environmental-objectives. In Paper 1, a key finding is that the performance and capacity for environmental governance is not necessarily an outcome of improved conditions for public deliberation as asserted in green political theory. Rather, the Swedish case proves how reflexivity on ecological concerns can be enhanced within political institutions through reforms in state-led forms of environmental governance without necessarily resorting to new modes of (deliberative) ecological governance. The steering-by-environmental-objectives reform has developed as a central strategy in terms of providing direction and a basis for environmental policy integration. Such integration is challenging in practice as climate change has often been treated as separate from other ecological sustainability concerns. As emphasised in Paper 6, low-carbon strategies can be compatible with preserving ecological sustainability, but whether or not this is achieved remains contingent on the specific circumstances in different policy sectors and over time. Thus, a coherent and integrated system of governance for steering and enabling decarbonisation in sustainable ways can be made effective by addressing relevant flanking policies for non-climate objectives. Such a governance system can also be made flexible in terms of being more reflexive and increasing the capacity to adapt to changing contexts, new knowledge and changing values.

That being said, in an era of globalisation and liberalisation society has become more complex to steer, which has changed the conditions for political governance and authoritative steering. This does not necessarily mean that the state's authority and capacity to intervene in the economy and to influence societal development has lessened, as suggested by some modern governance scholars. However, the modes and means of exercising political power have transformed and been reshaped. One indication of this is the dominance of market-based and economic policy mechanisms in public environmental and climate policy, for instance in terms of the focus on carbon taxation, emissions trading and other energy incentives (see Papers 3-4). Such carbon pricing mechanisms are important to induce changes in behaviour and provide necessary incentives to alter the (financial) conditions for investments, e.g. in renewable energies. However, such single-shot interventions seldom provide sufficient conditions for supporting transformative system change, as the analysis of the Swedish energy sector in Paper 4 proves. As has been detailed in innovation studies, successful sociotechnical transitions are often dependent on a broader set of support structures and enabling institutional arrangements for nurturing innovation, promoting market deployment and supporting infrastructure investments. Thus, to govern decarbonisation, state authorities have to address not only hierarchical forms of steering but softer forms or mechanisms for enabling and facilitating processes of change. One way to think about how the state can enable low-carbon transitions is, as discussed in section 2.1.3, through orchestration. Orchestration entails a broader range of strategies to encourage, catalyse and motivate other actors to take action.

Enabling by orchestration can be an essential activity in some instances, where developments are even more complex to steer and unwieldy for public actors to influence by traditional forms of regulation and public policy. As shown in Papers 4 and 5, national authorities can assert more control in some sectors. This is shown to be the case in the energy or construction sectors, while sectors such as the process industry and transport are more sensitive to international trends in technological innovation and market developments. Competitiveness concerns and anticipated risks for carbon leakage have provided arguments for policy-makers to refrain from regulating industrial carbon emissions, while discourses on sustainability mobility have not yet been established to challenge the mobility paradigm institutionalised in transport policy. To be able to promote low-carbon transitions in sectors that are dependent on international trends, public actors might have to address interactive and communicative strategies based on deliberative and argumentative rationalities. For instance, addressing discourses of decarbonisation by articulating narratives, visions and roadmaps for the transition (see Papers 3, 5) can contribute to attracting support and generating acceptance for the implied processes of change. Over time that can build legitimacy for decarbonisation, e.g. in a similar way as future energy scenarios once conceptualised renewable energies as alternatives to fossil carbon energy in the provision of electricity and heat. Other strategies can involve encouraging actors to engage in and to catalyse new initiatives and activities. Such interactive forms of public governance can generate support among actors, as well as bring new actors on board. This was evidenced by, for instance, the voluntary energy efficiency schemes in the Swedish PFE programme (see Paper 4). The programme addressed business actors in energy intensive industries as agents of change, while encouraging their participation with an energy tax exemption. However, a precondition for such efforts to prosper is to challenge prevailing assumptions about the anticipated costs and risks associated with decarbonisation strategies. That could entail questioning the notion in market-liberal climate policy discourse on, for instance, energy efficiency measures as inefficient and suboptimal to carbon pricing (see Paper 3).

Conditions for Governing Policy Change

A third key insight relates to the conceptualisation of the policy space and the conditions for policy change developed in this dissertation (see section 2.3). This conceptualisation has general applicability across the fields of public policy and could be further advanced for policy analytical purposes and applied forward reasoning. Related challenges are captured in the governance dilemma framework (see Paper 2 and section 2.3.4), that conceptualises a set of conditions that policy-makers have to face in striving to regulate and develop responses to anticipated policy problems. These perspectives provide an understanding of the conditions for policy-making and for governing social change as constituted by institutional structures and discursive configurations present in the actual context of governance. However, such conditions are not simply constraining policy change. They are mutable and could be reoriented to enable new directions. For instance, actors can engage in climate policy discourse to broaden the scope for and enlarge the horizon of thinkable policy paths. As discussed in Paper 3, one example involves the ways in which the dominant policy discourse on carbon pricing is presently being challenged by notions of a low-carbon transition and decarbonisation in Swedish policy-making.

A related insight concerns the observation that the policy space seldom changes rapidly. Sudden changes might occur, due to exogenous trends and shocks, however evolutionary and gradual processes of change are more likely to be the rule. Thus, in governing transformative change, policy-makers can explore ways to support other agents of change and to enable low-carbon transitions by means of progressive incrementalism. That is, to engage with incremental processes of gradual policy change in which policy-makers pragmatically try to find ways to advance strategies and policy reforms which, over time, might trigger more radical transformations in support of decarbonisation. For nurturing such change, similar kinds of mechanisms generating path dependency can be explored for the purpose of path creation. In the Swedish case study I have identified some cases that provide support for such progressively incremental processes of change. The Swedish transition to district heating is one and investments in renewable electricity generation is another. In both of these cases transformative change has been the outcome of a combination of policy measures developed in a step-wise fashion through a series of incremental policy adjustments and reforms unfolding over time (see Paper 4) and in relation to technological maturity and market developments, as suggested by innovation theory. The establishment of EU RES policy, as analysed in Paper 2, represents a similar case that developed slowly over several decades from very soft measures into a coherent policy framework for coordinating the promotion of renewable energy sources in Europe. Once institutionalised, such policies tend to provide for consistency and path dependency, for instance in steering and enabling transition pathways towards decarbonisation. Emarking on such paths might very well turn out to be a messy and protracted endeavour. But, to be sure, exploring pathways for progressive incrementalism rather than grand designs seems a more accessible route forward for climate governance and decarbonisation politics.

Towards a Decarbonised State?

"We are very close to a social tipping point regarding decarbonisation of the economy", Hans Joachim Schellnhuber[8] recently said in a Guardian commentary to Victor's and Kennel's intervention in Nature about abondoning the 2 °C target (see Vaughan 2014). What could he possibly mean by that? That the decarbonisation of the economy is already on its way? Well, science says not, yet. That decarbonisation is becoming socially accepted? Well, not significantly so. Rather, I think, Schellnhuber's statement should be seen as an indication of when an actor closely placed to politics read the signs on the political horizon. Presuming he is not insidious or naively engaged in wishful thinking, what he bears witness to is the emergence of a new era in the politics of climate change, moving ahead towards a new politics of decarbonisation. That is also how I read the signs.

The last one and half decades have, to a large extent, been a waste of time for climate politics. It has become obvious that the Kyoto approach (i.e. target and timetables) was a dead end in the current political economy. In that regard David Victor was right. However, the 2 °C target as addressed in the Copenhagen Accord and agreed upon in the Cancun Agreements is not part of that approach. It is not the kind of operational target that social actors and change agents benchmark their day-to-day achievements against. Rather it is an aspirational goal, a vision, yes, even an emblematic image of another future possible to achieve through low-carbon transitions. The 2 °C target is a political construct invented to provide direction for policy-makers but which has, more broadly, attached meaning to all efforts addressed by all actors to proceed in doing something about the fact that the planet is rapidly warming. Viewed this way, the watershed in Copenhagen was more than a failure. Interpellating a new orientation already in the making, the Copenhagen Climate Summit marked the tipping point of a new era for climate politics geared towards decarbonisation.

---

[8] Prof. Schellnhuber is a climatologist and the Director of The Potsdam Institute for Climate Impact Research (PIK), whose research on climate change and sustainability science has been seminal for the conceptualization of tipping points in Earth system analysis. As the Co-chair for the German Advisory Council on Global Change (WBGU) he is renowned as being one of the first to articulate the 2 °C target in the 1990s and recently he was the lead author of the report *Turn Down the Heat: Why a 4°C Warmer World Must Be Avoided* (World Bank 2012). He has also been a scientific advisor to, for instance, the German Chancellor Angela Merkel and the former EU Commission President José Manuel Barroso.

"I do believe in human progress, in our innovation capacity, yes sir, I'm optimistic", Schellnhuber continued. Well, it is not grand design, nor pure hope, that will rescue us. It is all efforts, initiatives and creative practices that various agents have experimented with during the lost years of the "old" climate politics. These activities aimed at challenging and altering high-carbon developments have functioned as sites of resistance and innovation which have prepared the ground for social change, or what Schellnhuber sees as a social tipping point to come. However, a single social tipping point might never occur. Social dynamics are more complex and less predictable than biophysical processes, which is why the pace of social change is expected to be varying across societal sectors. As shown in this thesis (see e.g. Paper 4), some social systems and sectors are more unwieldy to change than others due to inertia, sunk costs and vested interests. In fact, transitions are already well on their way in some sectors (e.g. renewable energy), while they remain at a standstill in others (e.g. the process industry). Thus, decarbonisation is not a unidirectional process but a set of partly related processes of social change.

In this sense, the new climate politics of decarbonisation might represent a political tipping point in terms of redirecting focus towards governing such processes of social change. So far, what has been lacking is political engagement with new forms of steering and enabling that can strengthen, bring together and scale up efforts to a degree significant enough to reorient societal development in various sectors. What I have argued in this dissertation is that the state and public actors are in possession of capacities which are key to such processes. These are capacities that, to some extent, are abandoned terrains and provide untapped resources for progressive climate action. Therefore, the state can be made more actively engaged in governing the decarbonisation of society by steering and enabling processes of low-carbon transitions and by being committed to orchestrate initiatives in that direction, when needed. That is the new politics of climate change and the way forward towards developing a decarbonising state.

References

Adger, N.W. and A. Jordan, eds. (2009). *Governing sustainability.* Cambridge: Cambridge University Press.

Andonova, L. (2010). Public-Private Partnerships for the Earth: Politics and Patterns of Hybrid Authority in the Multilateral System. *Global Environmental Politics* 10(2): 25–53.

Arts, B. and M Buizer (2009). Forests, discourses, institutions A discursive-institutional analysis of global forest governance. *Forest Policy and Economics* 11: 340–347.

Axelsson, S. (2014). *Vår tid är nu: 10 hoppfulla perspektiv på klimatkrisen.* Stockholm: Ordfront

Bäckstrand, K. (2010). The legitimacy of global public-private partnerships on climate and sustainable development. In: K. Bäckstrand, J. Khan, A. Kronsell and E. Lövbrand (eds.), *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance*, Edward Elgar, Cheltenham, pp. 85–104.

Bäckstrand, K., J. Khan, A. Kronsell and E. Lövbrand, eds. (2010). *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance*. Cheltenham: Edward Elgar.

Bailey, I. and G.A. Wilson (2009). Theorising transitional pathways in response to climate change: technocentrism, ecocentrism, and the carbon economy. *Environment and Planning A* 41: 2324–2341.

Ball, T. (2006). Democracy. In: A. Dobson and R. Eckersley (eds.), *Political theory and the ecological challenge*, Cambridge: Cambridge University Press.

Barry, J. and R. Eckersley (eds) (2005). *The State and the Global Ecological Crisis*. Cambridge, MA: MIT Press.

Baumgartner, F. R. and B. D. Jones (1993). *Agendas and Instability in American Politics.* Chicago: University of Chicago Press.

Beck, U., A. Giddens and S. Lash (1994). *Reflexive modernization: Politics, tradition and aesthetics in the modern social order.* Oxford: Polity.

Berkhout, F., A. Smith and A. Stirling (2004). Socio-technical regimes and transition contexts. In: B. Elzen, F.W. Geels and K. Green (eds.), *System innovation and the transition to sustainability*, Cheltenham: Edward Elgar, pp. 48–76.

Bergek, A., S. Jacobsson, B. Carlsson, S. Lindmark and A. Rickne (2008). Analyzing the functional dynamics of technological innovation systems: a scheme of analysis. *Research Policy* 37: 407–429.

Bernstein, S., R. N. Lebow, J. G. Stein, and S. Weber (2000). God gave physics the easy problems: Adapting social science to an unpredictable world. *European Journal of International Relations* 6(1): 43–76.

Bevir, M., ed. (2011). *The Sage Handbook of Governance.* Los Angeles, CA: Sage.

Bulkeley, H., V. Castán Broto, M. Hodson and S. Marvin, eds. (2011). *Cities and Low Carbon Transitions.* Routledge.

Bulkeley, H. and P. Newell (2010). *Governing Climate Change.* Routledge.

Burck, J., C. Bals and K. Bohnenberger (2011). *The Climate Change Performance Index: Results 2012.* Germanwatch and CAN Europe, December 2011. http://germanwatch.org/klima/ccpi.pdf

Burck, J. F. Marten and C. Bals (2013). *The Climate Change Performance Index: Results 2014.* Germanwatch and CAN Europe, November 2013. http://germanwatch.org/en/download/8599.pdf

Cashore, B. and M. Howlett (2007). Punctuating which equilibrium? Understanding thermostatic policy dynamics in Pacific Northwest forest. *American Journal of Political Science* 51(3): 532–551.

Căjvăneanu, D. (2011). *A Genealogy of Government. On Governance, Transparency and Partnership in the European Union.* Diss., University of Trento, March 2011.

Carter, N. (2007). *The Politics of the Environment. Ideas, Activism, Policy*. 2nd ed. Cambridge: Cambridge University Press.

Castells, M. (2000). *The Rise of the Network Society.* Blackwells.

Christoff, P. (1996). Ecological modernization, ecological modernities. *Environmental Politics* 5(3): 476–500.

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

Collier, R.B. and D. Collier (1991). *Shaping the Political Arena: Critical Junctures, the Labor Movement, and Regime Dynamics in Latin America.* Princeton: Princeton University press.

Compston, H. and I. Bailey, eds. (2008). *Turning Down the Heat: The Politics of Climate Policy in Affluent Democracies.* Basingstoke: Palgrave Macmillan.

Devin, F. (2002). Qualitative Methods. In: Marsh, D. and H. Stoker (eds.), *Theory and Methods in Political Science*, Basingstoke, Hampshire: Palgrave MacMillan, pp. 197–215.

Di Lucia, L. and K. Ericsson (2014). Low-carbon district heating in Sweden: Examining a successful energy transition. *Energy Research & Social Science* 4: 10–20.

Dimitrov, R. S. (2010). Inside Copenhagen: The State of Climate Governance. *Global Environmental Politic*s 10(2): 18–24.

Dobson, A. (2007). *Green political thought*. 4th ed. London: Routledge.

Dobson, A. and D. Bell, eds. (2006). *Environmental Citizenship.* Cambridge, MA: MIT Press.

Dryzek, J. (1996). Strategies of ecological democratization. In: W. Lafferty and J. Meadowcroft (eds.), *Democracy and the Environment: Problems and Prospects*, Cheltenham: Edward Elgar, pp. 108–123.

Dryzek, J. (1997). *The Politics of the Earth: Environmental Discourses.* Oxford: Oxford University Press.

Dryzek, J. (2000). *Deliberative Democracy and Beyond.* Oxford: Oxford University Press.

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

Duit, A. (2011). *The Ecological State: Cross-National Patterns of Environmental Governance Regimes.* Available at http://www.southampton.ac.uk/C2G2/media/Stockholm-Soton/Duit (2011).pdf, retrieved 2013-02-28

Duit, A., V. Galaz and A. Löf (2009). Fragmenterad förvirring eller kreativ arena? – från hierarkisk till förhandlad styrning i svensk naturvårdspolitik. In: J. Pierre and G. Sundström, red., *Samhällsstyrning i förändring*, Malmö: Liber, pp. 125–148.

Eckersley, R. (2004). *The Green State: Rethinking Democracy and Sovereignty.* Cambridge, MA: MIT Press.

Ericsson, K. (2009). *Introduction and development of the Swedish district heating systems. Critical factors and lessons learned.* Report for the IEE project RES-H Policy. Lund: Lund University

European Commission 2011. *A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.* COM(2011) 112 final.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry* 12(2): 219–245.

Frantzeskaki, N., D. Loorbach and J. Meadowcroft (2012). Governing societal transitions to sustainability. *International Journal on Sustainable Development* 15(1/2): 19–36.

GCEC (2014). *Better Climate, Better Growth: The New Climate Economy Report. The Synthesis Report.* The Global Commission on the Economy and the Climate (GCEC), www.newclimateeconomy.report

Geels, F. (2004). From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. *Research Policy* 33(6): 897–920.

Geels, F. and J. Schot (2007). Typology of sociotechnical transition pathways. *Research Policy* 36(3): 399–417.

Gerring, J. (2008). Case selection for case-study analysis: Qualitative and quantitative techniques. In: J. M. Box-Steffensmeier, H. E. Brady and D. Collier (eds.), *The Oxford Handbook of Political Methodology*, Oxford: Oxford University Press, p. 645–684.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration.* Cambridge: Polity Press.

Gough, I. and J. Meadowcroft (2011). Decarbonizing the welfare state. In J. S. Dryzek, R. B. Norgaard and D. Schlossberg (eds.), *The Oxford Handbook of Climate Change and Society,* Oxford: Oxford University Press, pp. 490–502.

Gough, I. (2013). Carbon Mitigation Policies, Distributional Dilemmas and Social Policies. *Journal of Social Policy* 42: 191–213.

Grin, J. (2010). Understanding Transitions from a Governance Perspective. In: J. Grin, J. Rotmans and J. Schot, *Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change*, New York: Routledge, pp. 223–319.

Grin, J., J. Rotmans and J. Schot (2010). *Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change*. New York: Routledge.

Hajer, M.A. (1995a). *The politics of Environmental Discourse. Ecological Modernization and the Policy Process.* Oxford: Clarendon Press.

Hajer, M.A. (1995b). Politics on the Move: The Democratic Control of the Design of Sustainable Technologies. *Knowledge and Policy* 8(4): 26–39.

Hajer, M.A. (2005). Coalitions, Practices, and Meaning in Environmental Politics: From Acid Rain to BSE. In: D. Howarth and J. Torfing (eds.), *Discourse Theory in European Politics: Identity, Policy and Governance*, Basingstoke: Palgrave Macmillan, pp. 297–315.

Hajer, M.A. (2009). *Authoritative Governance: Policy-making in the Age of Mediatization.* Oxford: Oxford University Press.

Hajer, M.A. and W. Versteeg (2005). A decade of discourse analysis of environmental politics: Achievements, challenges, perspectives. *Journal of Environmental Policy & Planning* 7(3): 175–184.

Hall, P.A. (1993). Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain. *Comparative Politics* 25(3): 275–296.

Hekkert, M.P., R.A.A. Suurs, S.O. Negro, S. Kuhlmann and R.E.H.M. Smits (2007). Functions of Innovation Systems: A New Approach for Analysing Technological Change. *Technological Forecasting & Social Change* 74: 413–432.

Hoffmann, M.J. (2011). *Climate Governance at the Crossroads: Experimenting with a global response after Kyoto.* Oxford, NY: Oxford University Press.

IEA. 2012. *World Energy Outlook 2012.* IEA/OECD, Paris.

IPCC (2013). Summary for Policymakers. In: Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, UK: Cambridge University Press.

IPCC (2014). Summary for Policymakers. In: O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, et al. (eds.), *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change,* Cambridge, UK: Cambridge University Press.

Jackson, T. (2009). *Prosperity without Growth: Economics for a Finite Planet.* London: Earthscan.

Jagers, S. (2002). *Justice, Liberty and Bread – For All? On the Compatibility between Sustainable Development and Liberal Democracy.* Gothenburg Studies in Politics 79. Gothenburg University.

Jagers, S., and J. Stripple. 2003. Climate Governance Beyond the State. *Global Governance* 9: 385–399.

Jewert, J. (2012). *Swedish Climate Policy: Lessons learned.* Stockholm: Global Utmaning.

Johansson, T.B., A. Patwardhan, N. Nakicenovic and L. Gomez-Echeverri, eds. (2012). *Global Energy Assessment: Toward a Sustainable Future.* Cambridge University Press.

Jordan, A., D. Huitema, H. van Asselt, T. Rayner and F. Berkhout, eds. (2010). *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* Cambridge, UK: Cambridge University Press.

Jordan A. and D. Liefferink, eds. (2004). *Environmental policy in Europe. The Europeanisation of national environmental policy.* Routledge: London.

Jordan, A., R. Wurzel and A. Zito, eds. (2003). *'New' instruments of environmental governance? National experiences and prospects.* London: Cass.

Jordan, A., R. Wurzel and A. Zito (2005). The Rise of 'New' Policy Instruments in Comparative Perspective: Has Governance Eclipsed Government? *Political Studies* 53(3): 477–496.

Jordan, A., R. Wurzel and A. Zito (2013): Still the century of 'new' environmental policy instruments? Exploring patterns of innovation and continuity. *Environmental Politics* 22(1): 155–173.

Kemp, R. and D. Loorbach (2006). Transition management: a reflexive governance approach, In: J.-P. Voss, D. Bauknecht and R. Kemp (eds.), *Reflexive Governance for Sustainable Development,* Cheltenham: Edward Elgar, pp. 103–130.

Keohane, R. O. and D. G. Victor (2011). The Regime Complex for Climate Change. *Perspectives on Politics* 9(1): 7–23.

Kern, F. and A. Smith (2008). Restructuring energy systems for sustainability? Energy transition policy in the Netherlands. *Energy Policy* 36(11): 4093–4103.

Kingdon, J.W. (1984). *Agendas, Alternatives and Public Policies.* Boston: Little, Brown.

Kjaer, M. (2004). *Governance.* Cambridge, UK: Polity Press.

Klein, N. (2014). *This Changes Everything: Capitalism vs the Climate.* Allen Lane.

Koch, M. and M. Fritz (2014). Building the Eco-social State: Do Welfare Regimes Matter? *Journal of Social Policy* 43: 679–703.

Kooiman, J., ed (1993). *Modern Governance: New government-society interactions.* London: Sage.

Kooiman, J. (2003). *Governing as Governance.* London: Sage.

Kronsell. A. and K. Bäckstrand (2010). Rationalities and Forms of Governance: A Framework for Analysing the Legitimacy of New Modes of Governance. In: K. Bäckstrand, J. Khan, A. Kronsell and E. Lövbrand (eds.), *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance*, Edward Elgar, Cheltenham, pp. 28–46.

Kronsell, A., R. Hildingsson och J. Khan (2012). *Intervjustudie om förutsättningar för en svensk klimatomställning – preliminära resultat.* LETS-rapport, Lunds universitet. http://www.lth.se/fileadmin/lets2050/Rapporter_o_Abstracts/120508_Intervjurapport_final.pdf (retrieved 2014-10-26).

Laclua, E. and C. Mouffe (1985). *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics.* London: Verso.

Latouche, S. (2009). *Farewell to Growth.* Cambridge: Polity Press.

Lafferty, W. and J. Meadowcroft, eds. (2000). *Implementing sustainable development: Strategies and initiatives in high consumption societies.* Oxford: Oxford University Press.

Levin, K., B. Cashore, S. Bernstein and G. Auld (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences* 45(2): 123–152.

Lemos, M. C. and A. Agrawal (2009). Environmental governance and political science. In: M. A. Delmas and O. R. Young, *Governance for the Environment: New Perspectives*, Cambridge, UK: Cambridge University Press, pp. 69–97.

Lindmark, M. and L. F. Andersson (2010). Unintentional climate policy: Swedish experiences of carbon dioxide emissions and economic growth 1950-2005. *CERE Working Paper* No. 14/2010. Institutionen för ekonomisk historia, Umeå University.

Loorbach. D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance* 23(1): 161–183.

Lundquist, L. (1993). *Det vetenskapliga studiet av politik.* Lund: Studentlitteratur.

Lundqvist, L. J. (1980). *The Hare and the Tortoise: Clean Air Policies in the United States and Sweden.* Ann Arbor: University of Michigan Press.

Lundqvist, L. J. (2001). A green fist in a velvet glove: The ecological state and sustainable development. *Environmental Values* 10: 455–472.

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

Markard, J. and B. Truffer (2008). Technological innovation systems and the multi-level perspective: Towards an integrated framework. *Research Policy* 37(4): 596–615.

Meadowcroft, J. (2000). Sustainable Development: a New(ish) Idea for a New Century? *Political Studies*, 48(2): 370–387.

Meadowcroft, J. (2005a). From Welfare State to Ecostate. In: J. Barry and R. Eckersley (eds), *The State and the Global Ecological Crisis*, Cambridge, MA: MIT Press, pp. 3–23.

Meadowcroft, J. (2005b). Environmental political economy, technological transitions and the state. *New Political Economy* 10(4): 479–498.

Meadowcroft, J. (2009). What about the politics? Sustainable development, transition management, and long term energy transitions. *Policy Sciences* 42: 323–340

Meadowcroft, J. (2012). Greening the State? In: P. Steinberg and S. VanDeveer (eds.), *Comparative Environmental Politics: Theory, Practice and Prospects*, Cambridge and London: MIT Press, pp. 63–87.

Nakicenovic, N. et al. (2000). *Special Report on Emissions Scenarios.* Intergovernmental Panel on Climate Change (IPCC), www.ipcc.ch/ipccreports/sres/emission/index.htm

NEF (New Economic Foundation) (2009). *A New Green Deal: Joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices.* London: NEF.

Newell, P. and M. Paterson (2010). *Climate Capitalism: Global Warming and the Transformation of the Global Economy.* Cambridge: Cambridge University Press.

OECD (Organisation for Economic Co-operation and Development) (2013). *Environment at a Glance 2013: OECD Indicators*. Paris: OECD Publishing, http://dx.doi.org/10.1787/9789264185715-en

OECD (2014). *OECD Environmental Performance Reviews: Sweden 2014*. Paris: OECD Publishing.

O'Kane, R. H. T. (2004). *Paths to Democracy: Revolution and Totalitarianism.* Routledge.

Oberthür, S. and M. Pallemaerts (2010). *The New Climate Policies of the European Union: Internal Legislation and Climate Diplomacy.* Brussels: Brussels University Press.

Selin, H. and S. D. VanDeveer (2009). *Changing Climates in North American Poli- tics: Institutions, Policymaking and Multilevel Governance.* Cambridge, MA: MIT Press.

Pacala, S. and R. Socolow (2004). Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies. *Science* 305(5686): 968–972.

Paterson, M. (2001). *Understanding Global Environmental Politics: Domination, Accumulation, Resistance.* Basingstoke: Palgrave.

Paterson, M. (2007). Environmental Politics: Sustainability and the Politics of Transformation. *International Political Science Review* 28(5): 545–556.

Paterson, M. and J. Stripple (2010). My Space: governing individuals' carbon emissions. *Environment and Planning D* 28: 341–362.

Peters, B.G., J. Pierre, and D.S. King (2005). The Politics of Path Dependency: Political Conflict in Historical Institutionalism. *The Journal of Politics* 67(4): 1275–1300.

Pierre, J. and B.G. Peters (2005). *Governing Complex Societies: Trajectories and Scenarios.* Basingstoke: Palgrave MacMillan.

Pierre, J. and B.G. Peters (2000). *Governance, Politics and the State.* New York: Macmillan.

Pierson, P. (1996). The path to European integration: A historical institutionalist analysis. *Comparative Political Studies* 29: 123–63.

Pierson, P. (2000). Increasing Returns, Path Dependence, and the Study of Politics. *The American Political Science Review* 94(1): 251–267.

Pierson, P. (2004). *Politics in Time: History, institutions, and social analysis.* Princeton: Princeton University Press.

Raworth, K. (2012). *A Safe and Just Space for Humanity: Can we live within the doughnut?* Oxfam Discussion Paper, February 2012. Oxford: Oxfam International.

Robinson J. B. (1982). Energy backcasting. A proposed method of policy analysis. *Energy Policy* 10(4): 337–344.

Rhodes, R.A.W. (1996). The New Governance: Governing without Government. *Political Studies* 44: 652–667.

Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, *et al.* (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society* 14(2): article 32.

Rosenau, J. N. (1992). Governance, Order and Change in World Politics. In: J. N. Rosenau and E.-O. Czempiel (eds.), *Governance without Government: Order and Change in World Politics*, Cambridge and New York: Cambridge University Press, pp. 1–29.

Rotmans, J., R. Kemp and M. van Asselt (2001). More evolution than revolution: Transition Management in public policy. *Foresight* 3(1): 15–31.

Selin, H. and S. D. VanDeveer (2009). *Changing Climates in North American Poli- tics: Institutions, Policymaking and Multilevel Governance.* Cambridge, MA: MIT Press.

Scott, R. (1995). *Institutions and Organizations.* Thousand Oaks: Sage.

Schmidt, V. (2006). Institutionalism. In: C. Hay, M. Lister and D. Marsh (eds.), *The State: Theories and Issues*, Basingstoke: Palgrave Macmillan, pp. 98–117.

Schmidt, V.A. (2008). Discursive Institutionalism: The Explanatory Power of Ideas and Discourse. *Annual Review of Political Science* 11: 303–26.

Schmidt, V.A. (2010). Analyzing Ideas and Tracking Discursive Interactions in Institutional change: From Historical Institutionalism to Discursive Institutionalism. *CES Papers - Open Forum* No. 3, 2010, Harvard University.

Schmidt, V.A. (2011). Discursive Institutionalism: Scope, Dynamics and Philosophical Underpinnings. In: F. Fischer and J. Forester, eds, *The Argumentative Turn Revised: Public Policy as Communicative Practice*, Durham, NC: Duke University Press (forthcoming; manuscript provided by author).

Scrase, I. and A. Smith (2009). The (non-)politics of managing low carbon socio-technical transitions. *Environmental Politics* 18(5): 707–726.

SEPA (2012). *Underlag till en svensk färdplan för ett Sverige utan klimatutsläpp 2050* [Basis for a Swedish roadmap for a Sweden without climate emissions 2050]. Report 6487. Stockholm: Swedish Environmental Protection Agency.

Shove, E. and G. Walker (2007). CAUTION! Transitions Ahead: Politics, Practice, and Sustainable Transition Management. *Environment and Planning A* 39(4): 763–770.

Smith, A. and F. Kern (2009). The transitions storyline in Dutch environmental policy. *Environmental Politics,* 18(1): 78–98.

Smith, A., A. Stirling and F. Berkhout (2005). The governance of sustainable socio-technical transitions. *Research Policy* 34(10): 1491–1510.

Sztompka, P. (1993). *The sociology of social change.* Oxford, UK: Blackwell

Stirling, A. (2006). Precaution, foresight and sustainability: reflection and reflexivity in the governance of science and technology. In: J.-P. Voss, D. Bauknecht and R. Kemp (eds), *Reflexive Governance for Sustainable Development,* Cheltenham: Edward Elgar, pp. 225–272.

Streeck, W. and K. Thelen, eds. (2005). *Beyond Continuity: Institutional Change in Advanced Political Economies.* Oxford: Oxford University Press.

Stripple, J. and H. Bulkeley, eds. (2014). *Governing the Climate: New Approaches to Rationality, Power and Politics.* New York: Cambridge University Press.

Sweden (2014). *Sweden's Sixth National Communication on Climate Change under the United Nations Framework Convention on Climate Change.* Ds. 2014:11. Stockholm: Ministry of the Environment.

Söderholm, P., R. Hildingsson, B. Johansson, J. Khan and F. Wilhelmsson (2011). Governing the transition to low-carbon futures: A critical survey of energy scenarios for 2050. Special Issue: Energy Futures. *Futures* 43(10): 1105–1116.

Thelen, K. (2004). *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States, and Japan.* New York: Cambridge University Press.

Thelen, K. (2000). Timing and Temporality in the Analysis of Institutional Evolution and Change. *Studies in American Political Development* 14: 101–108.

Thelen, K. (1999). Historical Institutionalism in Comparative Politics. *Annual Review of Political Science* 2: 369–404.

Tobin, P. (2014). Blue and Yellow Makes Green? Ecological Modernization in Swedish Climate Policy. In: A. Kronsell and K. Bäckstrand (eds.), *Rethinking the Green State: Environmental Governance towards Climate and Sustainability Transitions*, Chapter 8 (forthcoming at Earthscan/Routledge).

Treib, O., H. Bähr and G. Falkner (2007). Modes of Governance: Towards a Conceptual Clarification. *Journal of European Environmental Policy* 14(1): 1–20.

UNEP (United Nations Environment Programme) (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication.* Available at: http://www.unep.org/greeneconomy (retrieved 2014-10-21)

Vaughan, A. (2014). Could the 2C climate target be completely wrong? *The Guardian*, 2014-10-01.

Victor, P. A. (2008). *Managing without Growth: Slower by Design, Not Disaster.* Cheltenham, UK: Edward Elgar.

Voss, J.-P., D. Bauknecht and R. Kemp, eds. (2006). *Reflexive Governance for Sustainable Development.* Cheltenham: Edward Elgar.

Voss, J.-P. and B. Bornemann (2011). The Politics of Reflexive Governance: Challenges for Designing Adaptive Management and Transition Management. *Ecology and Society* 16(2), [online] http://www.ecologyandscoiety.org/vol16/iss2/art9/

Wagenaar, H. (2011). *Meaning in Action: Interpretation and dialogue in policy analysis.* New York: Sharpe.

Whitehead, M. (2008). Cold Monsters and Ecological Leviathans: Reflections on the Relationships between States and the Environment. *Geography Compass* 2(2): 414–432.

Wissenburg, M. (1998). *Green Liberalism. The Free and the Green Society.* London: UCL Press.

Wissenburg, M. (2006). Liberalism. In: A. Dobson and R. Eckersley (eds.), *Political theory and the ecological challenge*, Cambridge: Cambridge University Press.

Wurzel, R. (2012). The Environmental Challenge to Nation States: From Limits to Growth to Ecological Modernisation. In: J. Connelly and J. Hayward (eds.), *The Withering of the Welfare State: Regression,* London: Palgrave Macmillan, pp. 137–154.

WWF (2014). *Living Planet Report 2014: Species and Spaces, Peoples and Places.* London: WWF International.

Yin, R.K. (2014). *Case Study Research: Design and Methods*. London: Sage.

Appendix 1 Swedish Interview Study

Interview Prompt

Introduktion: Om syftet med studien;

- få en fördjupad bild av klimatpolitiska praktiken och dess politiska dynamik;
- diskutera förutsättningar och problem för att politiskt styra och genomföra en klimatomställning av energi- och transportsystemen till 2050.

Intervjufrågor (semi-strukturerade):

Q1. Kan du beskriva vad som är (har varit) din roll i klimatpolitiken?

- Hur är du inblandad i utformning och genomförande av klimatpolitiken?
- Hur har ditt arbete relevans för klimatpolitiken?

Q2. Hur tycker du att klimatpolitiken fungerar? Vad skulle du säga karaktäriserar den förda klimatpolitiken? Ge exempel från din egen erfarenhet/organisation.

Q3. Vilka problem ser du med den förda klimatpolitiken hittills? Ge exempel från din egen erfarenhet/organisation.

Q4. Många hävdar att ”policykostymen i stort sett är känd” medan utmaningen ligger i att införa, besluta och genomföra effektiva policyåtgärder. Håller du med? Isåfall, om policyalternativen är kända, varför införs de inte?

Q5. Vilka bedömer du vara de viktigaste aktörerna i klimatpolitiken? (överhuvudtaget, för din organisation/myndighet)

- Hur skulle du beskriva relationen mellan dessa aktörer?
- Hur ser du på deltagande av andra aktörer i klimatpolitiken?

Q6. Vilken betydelse har relationen mellan dessa aktörer för att bygga acceptans och legitimitet för en ambitiös klimatpolitik?

Q7. Är köns- eller genusperspektivet relevant för klimatpolitiken? På vilket sätt?

Q8. Framtida strategier: Vad anser Du vara det viktigaste som behöver göras för att påskynda och få igång långsiktiga omställningsprocesser – i korta resp. längre perspektivet?

- Vad krävs för att nå de klimatpolitiska målen (2020 resp 2050)?

Q9. Vilka policyreformer (policystrategier) anser du behövs/är mest avgörande?

Q10. Vilka politiska strategier ser du som betydelsefulla för att lyckas införa nya styrmedel och effektiva policyåtgärder?

Q11. Är de institutionella ramverken anpassade för klimatomställningen, och 'fit for purpose'? Eller, behövs institutionella reformer och kanske även nya institutioner?

Q12. Är det något du tycker vi har glömt diskutera? Är det någon fråga du trodde vi skulle ta upp som vi inte har ställt?

Q13. Vilka andra personer tycker du vi bör prata med i vår studie?

Respondents (Anonymised)

In the study, we interviewed 59 policy makers, experts and representatives from different organisations. The respondents were promised anonymity and therefore I will only list their affiliation to provide information about the type of respondents. For those readers and reviewers who would like more information, please send me a request for additional information. Further information is found in the interview report (Kronsell *et al.* 2012).[9]

Parliamentarians and Governmental Officers:
Riksdagen (Swedish Parliament): 6 Members of Parliament, 1 committee secretary
Näringsdepartementet (Ministry of Enterprise, Energy, Transport): 3 governmental officers
Miljödepartementet (Ministry of Environment): 2 governmental officers

National Authorities:
Energimyndigheten (Swedish Energy Agency): 7 policy officers, 4 policy managers
Naturvårdsverket (Swedish Environmental Protection Agency): 11 policy officers, 4 policy managers
Vinnova (Swedish Innovation System Agency): 3 policy officers, 1 policy manager
Trafikverket (Swedish National Transport Administration): 4 policy officers, 3 policy managers
Trafikanalys (Swedish Agency for Transport Policy Analysis): 1 policy analyst
Konjunkturinstitutet (National Institute for Economic Research): 1 policy analyst
Miljömålsberedningen (The Environmental Objectives Standing Committee): 1 policy officer

Business and NGO Representatives:
Svenskt Näringsliv (Confederation of Swedish Enterprise): 1 policy officer
Jernkontoret (The Swedish Steel Producers): 1 policy officer
Sveriges Skogsindustrier (Swedish Forestry Industries Federation): 1 policy officer

---

[9] http://www.lth.se/fileadmin/lets2050/Rapporter_o_Abstracts/120508_Intervjurapport_final.pdf

Svenska Petroleum & Biodrivmedel Institutet (SPBI): 1 policy officer
Energigas Sverige (The Swedish Gas Association): 1 policy officer
Naturskyddsföreningen (Swedish Society for Nature Conservation): 1 chief representative
Gröna Bilister (Swedish Association of Green Motorists): 1 chief representative

Appendix 2 Policy Interactions

List of Policy Interactions

In my post-graduate research I have, besides elite interviews and desk-based research, gathered information through other forms of interactions with policy-makers and stakeholders during workshops, seminars, meetings and presentations such as those listed here:

Annual meetings LETS Programme (w. stakeholders), Lund; 2 February 2009; 24 November 2009, 17-18 November 2010; 23 November 2011

Atomium Culture workshop on *Governance for a Low-Carbon Society*, Lund, 3-4 December 2009

Copenhagen Climate Change Summit (COP 15 / CMP 5), 7-19 December 2009

Scenario workshop, Swedish Environmental Protection Agency (SEPA), Stockholm, Jan 2010

Skånes Energiting, Malmö, 8 June 2010

Policy workshop *Att styra klimatomställningen* (Steering the low-carbon transition), LETS WP1, Lund, 7 September 2010

LETS Mid-term review hearing, SEPA, Stockholm, 21 October 2010

Scenario panel, Swedish Energy Agency (SEA), web seminar, 17 February 2011

Low-carbon roadmap meeting, SEPA, Stockholm, 28 February 2011

Lunch seminar, Steering the low-carbon transition, SEA, 29 March 2011

Energy policy open seminar w. Tomas Kåberger, General Director at SEA, Lund, March 2011

Low-carbon roadmap seminar, SEPA, Stockholm, 27 April 2011

LETS workshop on policy report *Vägval 2050*, Lund, 12 May 2011

SEPA Climate policy seminar, discussant to Patrik Söderholm's report Ett mål, flera medel (One target, several measures), Stockholm, 29 September 2011

Low-carbon roadmap inquiry, EcoMobility workshop *Carbon neutral transport system*, The County Board of Skåne, 1 February 2012

Low-carbon roadmap inquiry, The County Board of Dalarna, web seminar, 12 March 2012

Seminar w. Lena Ek, Environment Minister, LTH, Lund, 9 April 2013

AES research seminar, SEA, 15 January 2014

Printed by Media-Tryck | Lund University 2014

Governing Decarbonisation

The State and the New Politics of Climate Change

The new climate politics of decarbonisation address the prospects for moving society away from its current dependence on fossil carbon energy. In this compilation dissertation, Hildingsson explores the role of the state as a critical site for progressive climate action, and examines its capacity to govern decarbonisation by transforming systems, structures and practices that generate carbon emissions. Based on insights from the development of climate governance arrangements and institutional conditions for public policy in Sweden, Hildingsson proposes that the modern (environmental) state holds untapped capacities to govern decarbonisation. These capacities can be progressively explored to advance and scale up the efforts to reorient societal development. Thus, a decarbonising state can be made more actively engaged in steering and enabling the processes of low-carbon transitions, and in developing new ways for orchestrating a wide range of low-carbon initiatives and developments.

Roger Hildingsson works as researcher and teacher in environmental politics and climate governance at the Department of Political Science, and this book is his completed PhD thesis. His tutors have been Annica Kronsell and Johannes Stripple.

LUND
UNIVERSITY

Department of Political Science
Lund Political Studies 172
ISBN 978-91-7623-181-4
ISSN 0460-0037