
This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.

Keskitalo, E. Carina H.; Juhola, Sirkku; Baron, Nina; Fyhn, Håkon; Klein, Johannes

Implementing Local Climate Change Adaptation and Mitigation Actions: The Role of Various Policy Instruments in a Multi-Level Governance Context

Published in:
Climate

DOI:
[10.3390/cli4010007](https://doi.org/10.3390/cli4010007)

Published: 29/01/2016

Document Version
Publisher's PDF, also known as Version of record

Please cite the original version:
Keskitalo, E. C. H., Juhola, S., Baron, N., Fyhn, H., & Klein, J. (2016). Implementing Local Climate Change Adaptation and Mitigation Actions: The Role of Various Policy Instruments in a Multi-Level Governance Context. *Climate*, 4(1), [7]. <https://doi.org/10.3390/cli4010007>

This material is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.

Comment

Implementing Local Climate Change Adaptation and Mitigation Actions: The Role of Various Policy Instruments in a Multi-Level Governance Context

E. Carina H. Keskitalo ^{1,*}, Sirkku Juhola ^{2,3}, Nina Baron ⁴, Håkon Fyhn ⁵ and Johannes Klein ^{6,7}

¹ Department of Geography and Economic History, Umeå University, Umeå 901 87, Sweden

² Department of Built Environment, Aalto University, P.O. Box 11000, Aalto FI-00076, Finland; Sirkku.Juhola@aalto.fi

³ Department of Environmental Sciences, University of Helsinki, P.O. Box 65, Helsinki FI-00014, Finland

⁴ Department of Environmental Science–Environmental Social Science, Aarhus University, Frederiksborgvej 399, Roskilde 4000, Denmark; niba@phmetropol.dk

⁵ Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim 7491, Norway; hakon.fyhn@ntnu.no

⁶ Department of Built Environment, Aalto University, P.O. Box 11000, Aalto FI-00076, Finland; Johannes.Klein@aalto.fi

⁷ Unit of Environmental Geology, Geological Survey of Finland, P.O. Box 96, Espoo 02151, Finland

* Correspondence: Carina.Keskitalo@geography.umu.se; Tel.: +469-078-650-80

Academic Editor: Jack Barkenbus

Received: 18 December 2015; Accepted: 22 January 2016; Published: 29 January 2016

Abstract: Recently, considerable focus, e.g., in the fifth IPCC (Intergovernmental Panel on Climate Change) Assessment Report (2014) has been trained on why adaptation and mitigation have not been developed more than at present, with relatively few local government actions taken compared with, for example, more discursive policy agreement on the importance of the issue of climate change. Going beyond a focus on general limits and barriers, this comment suggests that one important issue is that climate change has not yet been sufficiently integrated into the state regulative structure of legislation and policy-making. A comparison between three cases suggests that local developments that are not supported in particular by binding regulation are unlikely to achieve the same general level of implementation as issues for which such regulative demands (and thereby also requirements for prioritization) exist. This constitutes an important consideration for the development of adaptation and mitigation as policy areas, including on the local level.

Keywords: climate change; adaptation; mitigation; local government; municipality; Finland; Norway; Denmark

1. Challenges of Climate Policy

While increasing focus is placed on policy development in relation to climate change, it is yet unclear as to how successful or efficient these efforts developed so far are in terms of tackling climate change, both mitigation and adaptation. In reviewing the progress of adaptation, the latest report of the Intergovernmental Panel on Climate Change notes that implementation has so far been relatively limited [1] and discusses multiple potential limitations and barriers to this. With regard to mitigation, the need for further development within international commitments, as well as national and sub-national development, is highlighted. To a large extent, then, the social complexity of implementation and gaining political will for the development in the face of multiple stressors may be regarded as limiting progress towards managing climate change [2–4]. This limitation means that there is a need to problematize the structure of implementation further.

Climate policy, both mitigation and adaptation, by nature addresses a collective action problem, sometimes with no clearly identifiable organization or individual responsible to be steered to solve the problem. Within mitigation, the reduction of greenhouse gas emissions requires the participation, voluntary or involuntary, of all sectors of society from energy production to household energy consumption and from agricultural production to individual consumption habits. Within adaptation, the impacts of climate change are likely to affect all sectors of society and the natural world. The way in which this climate risk is realized depends on how individuals, societal sectors or ecosystems are exposed to hazards and how vulnerable they are.

Both adaptation and mitigation have emerged into an arena of environmental regulation, where related issues, *i.e.*, energy policy, have been addressed in the last three decades with increasing numbers of measures. This leads to a situation where consideration needs to be given to what types of instruments are suitable and not conflicting and what kinds of issues come up when these are applied jointly [5]. Thus, policy coordination with other policy arenas becomes crucial. The increasing focus on multiple ways of steering, ranging from regulative instruments to voluntary ones, opens up the debate whether there is a need for stronger regulation in terms of climate policy or whether non-mandatory measures are sufficient.

Recent research has shown that multi-sectoral strategies for both mitigation and adaptation in the EU context have been rather unsuccessful [6], potentially due to the complexity of integrating these into the existing policy environment. Studies have also shown that integration within similar agendas to that of climate policy, *i.e.*, sustainability measures, the use of voluntary measures, has been fraught with difficulty [7–10]. Issues such as project dependency, cost and integration into existing programmes have hampered progress. This has meant that implementation has mainly been short-term and piecemeal alongside normal day-to-day planning [11].

This note discusses the issue of integration of climate change with the help of reviewing and comparing the regulative environment in three Nordic cases: adaptation to climate change at the municipal level in Denmark and Finland, and a case of local level mitigation in Norway. The term “regulation” in this paper is used to apply to the regulative environment at large, and thus covers the same area as that to which policy instruments (see Section 2.1) can be applied [12–14]. Our understanding of regulation thus includes both stronger regulation through legal and regulatory instruments, economic and financial instruments, and soft measures. These three cases illustrate different patterns of implementation but share the feature that stronger overall regulation, through legal and regulatory instruments, is at present relatively limited. Hence, the cases provide a starting point for a critical inquiry into whether the current level of regulation is sufficient. In other words, if climate change policy is indeed a crucial consideration in public policy, is it enough that it (in particular on the adaptation side) has mainly been instituted through non-binding measures?

2. Implementation of Climate Policy: Mixing of Old with New

The development of decision-making has been expressed in political science literature as not only that of government—*i.e.*, steering by the state—but of governance, or steering amongst broader groups including not only state but also business and non-governmental organizations [15]. Multi-level governance has been defined as the negotiated exchange between institutions on multiple levels, including the local, regional and national organization of the state and other actors (*ibid.*). However, studies also with regard to areas other than the environment have noted that, while multi-level governance “enabled non-hierarchical linkages for interdependent policy coordination, it appeared scholars had underestimated the conditions needed to ensure effective policy co-ordination and, hence, convergence” [16].

Limitations have, among others, included “vertical co-ordination problems, including increasing transaction costs, which rose with ‘the number of administrative levels and degree of subnational autonomy’” [16,17]. The multi-level setting also adds complexity in that not only state but other means of organization are recognized: “the ‘geographical imaginary’ of environmental politics, where discrete

local, national and international arenas operated in parallel, needed to give way to an account which recognized the complex vertical linkages between state institutions and the emergence of new political spaces which exceed this lexicon" [18].

In particular, the EU structure has come to add to governance arrangements by resulting in new issue arrangements but also reconfiguring the state structure, for instance, through EU legislation, such as directives that are required to be enforced at state level. The formal structure of public policy and the instruments used are thus shifting from a purely state configuration to one that also includes the EU. As a result, we should also expect an increasing role of regulation and formal public policy instruments [19,20], despite much literature having focused on the increasingly networked nature of decision-making.

In addition to issues related to vertical coordination, it is also interesting to note that existing EU-level regulation can also significantly impact climate policy, whilst not directly addressing climate change concerns. A good example of this is the way in which the relatively far developed flood risk issue is dealt with in relation to an emerging policy issue of adaptation. This follows a pattern identified for emerging policy areas and also indicates that the largest regulative requirements for adaptation are emerging from other, better institutionalized policy areas [21,22]. In this, improvements in adaptation may largely result from a "download Europeanization," where cities revise their practices as a result of the required implementation of EU programs [20]. Much literature, however, has noted that, while these types of new arrangements are increasingly widespread, they supplement rather than replace the state structure [15,23]. The result is more complex as well, as binding regulation at EU level (directives) and national level are supplemented with more mixed and more increasingly "soft", *i.e.*, non-mandatory, instruments as well as with market-based, or other non-state measures.

Emerging Areas, Choice of Policy Instruments and Compliance

While the choice of public policy instruments to regulate an area is often unproblematized, it has been argued that "instrumentation is really a political issue, as the choice of instrument—which, moreover, may form the object of political conflict—will partly structure the process and its results" [24]. Generally, public policy instruments are differentiated into three major categories: (1) legal and regulatory instruments; (2) economic and financial instruments; (3) "soft" instruments; in other words, what could be conceived of as the "sticks", the "carrots" and the "sermons" of public policy [21,24]. Some also add a fourth type of instrument to the list above, highlighting the role of institutional instruments that set the ground rules for interaction: for instance, property regimes [25–27]. In addition, soft instruments are often supported by non-government centered, market-based or other forms of regulation *e.g.*, through development of standards or codes of conduct. These may be developed in coordination or with pressure from the state, or *e.g.*, in relation to the market (see [14] for a conceptualization of decentred regulation). Whilst these may be of crucial importance, our focus here is mainly on public policy by the state: that is, on how the state institutionalizes issues with high political agreement such as those of adaptation and mitigation. We thus focus our discussion on the three first categories.

The first of these, legal and regulatory instruments or binding regulation, require "actors to act within some clearly defined boundaries of what is allowed and what is not allowed" [21]. They are thus usually reserved for norms with the highest level of agreement: it takes time, for instance, for a new policy area to reach such a stage that it is given a mandatory nature [21,22]. While implementation may still be limited, for instance in cases where laws are not enforced, these instruments are typically backed by threat of sanctions, such as fines or withdrawal of rights that also support some level of implementation. Legal and regulatory instruments thus both play a normative role in supporting some actions and identifying them as acceptable, as well as further providing possibilities for sanctioning non-compliance. The utilization of economic and financial instruments may thus be applied to further support actions. However, as they usually result in a cost to the state in terms of implementation *e.g.*,

of systems for fines or perhaps costs for grants, they are also unlikely to be applied in policy areas that are more newly emerged or on which less agreement currently exists [22].

Finally, soft instruments are characterized by being voluntary and non-coercive. Rather than imposing sanctions or requirements, they utilize persuasion to develop mutual agreements, and may consist of recommendations or codes of conduct, public-private partnerships, information campaigns or voluntary/contractual agreements [21]. These are the instruments by which emerging policy areas are likely to be governed, and, so far, this is the area in which climate issues have been situated. For instance, “Most countries have opted, at least up to now, for ‘softer’ forms of governing and have abstained from intervening directly in local climate politics” [22]. However, this is despite that “the economic literature suggests that, in some contexts, voluntary approaches can be effective if carefully designed but are not likely to be effective otherwise” [28]. Thus, while developing towards potentially larger institutionalization would be a natural development for issues that gain large salience, reaching this level of institutionalization takes time. Before issues gain sufficient consensus on means and methods to become institutionalized in legislation, less hierarchical, soft instruments remain subject to voluntary agreement among actors. Thus, for example, “‘soft’ policy instruments not backed by EU legislation encourage coordination, benchmarking and best practice without any threat of sanctions” [16]. In the climate area, these have included guidelines for local authorities and dissemination of information on good-practice cases [22]. Subsequently, among such actors, agreement and integration of these areas may be limited to a discursive or general policy agreement level, including a general agreement on the importance of measures (such as sustainable development or adaptation, the level so far highlighted as most common for agreement on adaptation according to [1]).

Institutionalization through soft measures, however, also result in actors who do not agree with these, or de-prioritize work in these areas due to other priorities or issues that are regarded as more pressing, only have normative and non-binding claims on them to integrate this area. This may be particularly noticeable at the local level. While local government may be able to self-organize in its capacity as a relatively strong actor within the planning framework and generally within the areas of municipal jurisdiction (e.g., education or health care), national level may pose multiple other requirements than climate in these areas—requirements that are mandatory. Thus, it may only be that after all other, stronger, requirements are taken into account that voluntary climate issues might be able to compete for priority (and then almost by necessity for a very limited policy space and resources). Issues that are not subject to binding regulation may thus well be de-prioritized as time and resources focus on mandatory issues (of which implementation of EU directives is one)—in particular, if funding is limited to project funding, which may be the case even in well-resourced (capital) cities [29].

The consideration with regard to climate may thus not be that municipalities or local government are not formally able to act on these issues but rather that the regulative environment and incentive structure may result in a situation where prioritizing voluntary aims at the level of or higher than mandatory ones may be difficult, given limited resources. However, a large number of potential considerations can formally be taken by local government. For instance, it has been suggested that urban climate governance may self-govern or govern by provision with regard to the activities it controls and that “strong leadership in the integration of processes has the ability to compensate for a lack of guidance or supporting legislation from higher decision-making levels” [30]. Local government may, for example, demand specific procurement within existing procurement-requirements already adopted by higher levels. It may also influence action through its ownership share in municipal companies, or act to “improve energy efficiency in government offices and other municipality-owned buildings” [22]. Another possibility is to take initiative for, or participate in, networks on e.g., urban climate change policy [18], leading to the utilization of legal and regulatory instruments at the local level, such as planning instruments [22], in relation, for instance, to adaptation. In a similar manner, interaction with the EU level could result in a sort of “download Europeanization” at the urban level by cities changing their “policies, practices, preferences or participants within local systems of governance,

arising from the negotiation and implementation of EU programs”, complemented by an “upload Europeanization” whereby “innovative urban practices” may result in the “incorporation of local initiatives in pan-European policies or programs” [20].

3. Examples of Implementation in the Nordic Context: Crowding of Policy Space

The review of the use of instruments suggests that, as the policy arena matures and issues become more highly accepted, so may the use of instruments move from voluntary towards being institutionalized, and, if judged important, included within binding regulation (such as the climate laws that are now emerging in some European states). However, it would also appear that stronger regulation with regard to climate is found in terms of the more established areas of energy policy *vis-à-vis* mitigation, and flood management *vis-à-vis* adaptation.

In Denmark, combinations of actions mandated on the national and EU level are coordinated and partly prioritized at the local level. At the EU level, the EU Floods Directive (2007/60/EC) [31] has direct impact on the municipalities, especially those that have been identified as a risk area in Denmark under the Directive [32]. The Floods Directive requires extensive flood risk assessment analysis and action plans for all member states. A growing focus on climate change adaptation has been developed mainly in relation to large-scale flood event risk, considerations which resulted in a national requirement that all Danish municipalities must develop climate adaptation plans by the end of 2013 [33]. Subsequent changes in national law allow local utility companies the opportunity to invest in areas even if these are not directly related to waste water management—for instance, projects which prevent rainwater from reaching the sewage system, by using green areas, permeable surfaces and soakaways for retention and infiltration [34]. Another law opened up not only aesthetic or functional considerations but also climate-related issues to motivate restrictions in the compulsory local plans drawn up by municipalities [35]. The responsibility of practical climate adaptation at the local level has been designated to the individual municipality, where the role of the national government is to facilitate and control this process by providing information, advice and regulations. To this end, the Danish Ministry of the Environment is imposing a requirement that climate adaptation plans should, at a minimum, include risk assessment mapping and action plans developed in cooperation with the public and relevant stakeholders [36]. An advisory group of experts was created to visit municipalities and assist them in their climate adaptation planning. However, no specific funding exists beyond the opportunity to co-finance projects with utility companies. Large variations in how this legislation is implemented may exist across municipalities, as the level of institutionalization of climate change adaptation thereby centers on requiring development of climate change adaptation plans. Beyond that, it mainly provides possibility for, rather than mandates, consideration to climate (for example, allowing for climate-related issues to be included in compulsory local plans).

In Finland, adaptation has primarily been governed through soft policy instruments and has not resulted in any corresponding requirements for e.g., developing adaptation plans at the municipal level. Finland’s National Adaptation Strategy, published as early as 2005 [37], proposed adaptation action on a sectoral basis but was not coupled to implementation requirements. The Strategy was considered to provide little guidance for local adaptation [38,39]. In addition, the recently published National Adaptation Plan for Climate Change 2022 [40] stresses the sectoral and individual responsibility for adaptation, while the state’s role is restricted to safeguarding society’s most central functions and the provision of expertise. The Finnish Climate Act, passed in 2015 (HE 82/2014) steers the government in the preparation of a national plan for adaptation and has details on the reporting. However, it does not have influence on the local adaptation, nor measures to steer it. So far, despite not being compelled in a legally binding sense to do so, some municipalities have developed adaptation strategies or have addressed mitigation and adaptation in a common strategy [41–44]. All of these strategies also remain soft instruments, since their implementation is not compulsory, nor is the non-implementation of the strategy penalized by sanctions or the withdrawal of rights. However, city departments can make binding decisions in their role as public authorities, and the consideration of new knowledge in local

building codes or detailed plans can provide entry points for informed climate change adaptation [45]. Legislation also offers possibilities to shape climate change adaptation, especially when it comes to changes in the frequency and intensity of floods and precipitation patterns. However, few practical adaptation measures have been undertaken separately from flood protection measures based on the Land Use and Building Act requirement to promote a safe and healthy living environment (132/1999, Section 5). Financial governing instruments that may promote climate change adaptation by private individuals and companies are not widely used. The insurance of homes against flood damage offers, in theory, such an instrument, but in practice to date, premiums do not depend on the house location [46].

Issues of implementation that are relevant for comparison can be highlighted with regard to a case of mitigation in Norway. We chose the case of mitigation in the private housing sector as it constitutes one of the least strongly regulated sectors of what is otherwise a relatively strongly regulated national mitigation regime. However, as it is situated within the broader context of a strongly regulated sector, voluntary mechanisms—for instance with regard to house owners renovations—could be seen as underpinned by a context of stronger demands.

Generally with regard to mitigation in the housing sector, Norwegian climate and energy policy broadly follows that of the EU. National strategic documents reflect EU concerns for reducing climate gas emissions from buildings, as well as the challenge posed by existing building mass and private dwellings which tend to be renovated outside the sphere of regulation [47,48]. While home renovation is steered with soft instruments, such as information campaigns, counselling services, economic support for components such as energy efficient heating systems and work such as insulation and campaigns aimed at producers of building components [49], binding regulations play an essential role in coordinating the efforts of policy agents at different levels. One example is the ban on oil heaters in houses from 2020 which was initiated by the EU and adopted by Norway. This requirement has given policy actors in Norway a fixed point to coordinate their efforts around. The ban is also one of the few regulations that directly impact renovation in private dwellings as it requires the replacement of oil heaters. It motivates house owners to show up at meetings, seek information about technologies, and support programs and solutions. The regulatory instrument also provides a context for the application of financial and soft instrument, bringing climate policy into private homes. Another example of the importance of legal and regulatory instruments is the building code in which Norway, to a great extent, follows EU requirements. As the code establishes a concrete, specific standard, it has a coordinating effect for the various agents of policy implementation including builders, producers of building components, do-it-yourself stores and energy consultants. As such, the building code runs like a line from the EU, through national policy, to municipalities, thus forcing actors implementing climate policy to coordinate with each other.

Thus, while the energy area is both highly regulated—since the 1970s as part of the first environmental policy wave—and exerts considerable impact on mitigation [50], this “loophole” area of private housing could be regarded as an exception in this broader context. It demonstrates the interacting complexities of a difficult-to-regulate subarea, difficult-to-reach individual actors, and soft regulation. At present, energy policy for private dwellings is implemented in practice by policy actors representing various levels of government, as well as by private institutions such as DIY stores, building companies and independent energy consultants. Many of them take part in an informal network on the national level [51], or in local level networks. At the municipality level, many local initiatives are underway aimed at energy efficiency in private dwellings, for example support to local energy counselling services and financial support for energy upgrading. Legal and regulatory instruments are coordinated between municipalities first and foremost in the processing of planning permission applications which follows the national building code. However, these instruments do not affect renovation projects in private dwellings directly as they are not regulated in this context. Soft and financial initiatives are thus not coordinated between municipalities in Norway but are increasingly coordinated through public enterprises operation at the national level, most notably

Enova, an enterprise specifically set up to enhance the transition to greener energy at the national level, and the Housing Bank, providing affordable loans to house owners on the condition of ambitious energy standards [52]. As a result, a house owner engaged in a renovation project may experience that a number of policy agents have a say in the project, and they may provide different advice or express different requirements—and thus that an unclear policy situation with multiple potential choices limits action on mitigation in private housing. Even though policy agents tend to form networks in Norway, several actors have expressed their frustration over difficulties in coordinating their efforts, both between different levels of government but also between institutions at the same level.

4. Discussion

This note discusses implementation of climate policy in the Nordic context. The three examples show how the policy arena is created through the multilevel governance arrangements, resulting in the proliferation of instruments for steering. The case of Norway illustrates well the problematic nature of nested implementation within the more highly regulated and more traditional environmental energy policy area. In this case of reduction of energy use in buildings, significant cooperation was seen as developing as a result of binding regulations, requiring coordination between actors. However, given the large number of actors in the sector and the complexity and subsequently modestly regulated nature of energy use in family level dwellings, this area was subject both to multiple and uncoordinated actors and soft regulation with limited implementation. The case can thus be seen to illustrate the fact that governance (between multiple actors and using multiple types of instruments, in particular soft instruments) requires much more coordination between actors than does traditional government steering in order to be successful [16]. The problems with coordination of climate policy for buildings are first and foremost concerned with financial and soft instruments, as agents do not coordinate efforts. This is because they are not forced to do so, and house owners turn away from the voluntary policies as its focus on details (in line with broader regulation, but applicable there as mandatory) contradicts their own more fluid renovation practices, and they are often not considered consistent.

In the two adaptation cases, in Denmark and Finland, flood management imposes by far the greater regulative requirements compared to adaptation to climate change. In comparison to flood management, adaptation policy has not gained such a level of implementation in the EU (where it is so far only developed as a non-binding strategy [53]), nor at the national level. In both the Danish and Finnish cases, thus, adaptation is largely managed through considerations in relation to flood risk under the existing EU requirements. This raises concerns over how to coordinate these requirements with the national adaptation plan requirements. The two countries diverge in that Denmark has national level requirements for municipal development of an adaptation plan, while a development of an adaptation plan in Finland is voluntary. However, the requirements for adaptation developed through legal means largely open up for municipalities to consider adaptation in Denmark, rather than require them to do so, and place no binding requirements on municipalities.

Hence, the regulation that is becoming most important is not in the emerging area of adaptation but focused on the case of flood risk. This “add on” of a new policy problem, a complex one, results in multiple questions when considering the choice of policy instruments. If this new area, adaptation in this case, consists of already regulated policy areas addressing parts of the new concern, how does one integrate new steering mechanisms in a way that does not reduce, contradict or in other ways “mis-match” with existing ones? These considerations suggest that the possibility of “mainstreaming” or integrating climate change into an existing regulative context can not be taken as given, but should rather be problematized with regard to what can be done at what level of regulation and use of instruments, within the existing regulative context and the competing priorities or requirements that may exist [54,55]. These findings are partly supported elsewhere, as it has been found that, despite significant possibilities for the municipal level to self-organize such as through providing leadership on climate issues or utilizing planning instruments available on the local level, measures have often retained a relatively soft, guiding character [1,22,30,56–58]. While successful examples can be seen

for instance in the Netherlands, it could be argued that the high level of integration of water issues into legislative and planning systems [59] and their application in well-resourced larger cities, such as Rotterdam, as well as related existing spatial planning mechanisms and processes, together pose a context of well-developed instruments and practices without which the integration of adaptation in these cases cannot be understood [2].

While soft measures have often been highlighted as crucial to the local level, this comment thus calls to attention that there are inherent limits in such instruments, for instance in the absence of political will or given de-prioritization in relation to existing mandatory requirements [24]. Non-mandatory developments may be less likely to be well funded and will have to compete with all mandatory requirements for funding and implementation at any level [11,60]. Participation and bottom-up issue building will, while possibly locally effective, thus require high levels of agreement as well as coordination to attain uploading to European level [16].

5. Conclusions

Given that climate change has been emphasized as an area of broad societal risk, we thus highlight a need to develop approaches to integrate the emerging area of adaptation within a structure of mandatory regulation. These do not need to contradict the necessity to consider local variability [33]: first steps could, for example, include requiring explicit decisions on the role of adaptation in various council decisions where relevant. The role and application of mandatory adaptation planning now required in the Danish case may also be important to consider as a model for other countries. While it is difficult to pinpoint in what other specific ways stronger regulation could have been enacted in the Danish and Finnish cases, as multiple options exist, a comparison could be made with a UK case. In England, the integration of an indicator on adaptation within a national assessment system provided a reason for local government to prioritize adaptation, as adaptation could be selected as one of the indicators on which local government reported and was assessed for funding on the national level [60]. After the decommissioning of the indicator system and this national indicator with it, interviewees noted that it was becoming more difficult to prioritize adaptation [60,61] While the ways in which adaptation is more strongly regulated need thus not necessarily always be through legislation, increasing institutionalization will need to relate to existing systems providing for prioritization and setting requirements. Relevant measures will depend on and should be assessed within the types of regulative systems that already exist, with an eye to placing climate change at a level that reflects the importance it is accorded in that decision-making system.

Rather than making the limited implementation of climate change issues so far surprise us, we should thus instead review the regulative context and opportunities [24]—not least given the large variety of areas with which climate change issues intersect—for integration or mainstreaming that places climate not only rhetorically but also in practice at par with other issue areas.

Acknowledgments: The authors are grateful for funding from the Riksbankens Jubileumsfond and the Nordic Centre of Excellence NORD-STAR.

Author Contributions: The first author conceived of the article aim, theoretical framework and general article structure. The second author defined the final article structure and case descriptions. The following authors contributed case study descriptions.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. IPCC. Climate Change 2014: Impacts, adaptation and vulnerability. Part A: Global and Sectoral Aspects. In *Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*; Field, C.B., Barros, V.R., Eds.; Cambridge University Press: New York, NY, USA, 2014; pp. 1–32.
2. Root, L.; van der Krabben, E.; Spit, T. Bridging the financial gap in climate adaptation: Dutch planning and land development through a new institutional lens. *J. Environ. Plan. Manag.* **2014**, *58*. [[CrossRef](#)]

3. Urwin, K.; Jordan, A. Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. *Glob. Environ. Change* **2008**, *18*, 180–191. [[CrossRef](#)]
4. Naess, L.O.; Bang, G.; Eriksen, S.; Vevatne, J. Institutional adaptation to climate change: Flood responses at the municipal level in Norway. *Glob. Environ. Change* **2005**, *15*, 125–138. [[CrossRef](#)]
5. McEvoy, D.; Lindley, S.; Handley, J. Adaptation and mitigation in urban areas: Synergies and conflicts. *Proc. ICE-Munic. Eng.* **2006**, *159*, 185–191. [[CrossRef](#)]
6. Casado-Asensio, J.; Steurer, R. Integrated strategies on sustainable development, climate change mitigation and adaptation in Western Europe: Communication rather than coordination. *J. Public Policy* **2014**, *34*, 437–473. [[CrossRef](#)]
7. Lafferty, W.M.; Cohen, F. Conclusions and Perspectives. In *Sustainable Communities in Europe*; Lafferty, W.M., Ed.; Earthscan: London, UK, 2001; pp. 262–268.
8. Eckerberg, K. Sweden: Problems and prospects at the leading edge of LA21 implementation. In *Sustainable Communities in Europe*; Lafferty, W.M., Ed.; Earthscan: London, UK, 2001; pp. 15–40.
9. Rowe, J.; Fudge, C. Linking national sustainable development strategy and local implementation: A case study in Sweden. *Local Environ.* **2003**, *8*, 125–140. [[CrossRef](#)]
10. Emilsson, S.; Hjelm, O. Towards sustainability management systems in three Swedish local authorities. *Local Environ.* **2009**, *14*, 721–732. [[CrossRef](#)]
11. Keskitalo, E.C.H.; Liljenfeldt, J. Working with sustainability: Experiences of sustainability processes in Swedish municipalities. *Nat. Resour. Forum* **2012**, *36*, 16–27. [[CrossRef](#)]
12. Black, J. Critical Reflections on Regulation. *Aust. J. Legal Philos.* **2002**, *27*, 1–36.
13. Braithwaite, J.; Coglianese, C.; Levi-Faur, D. Can regulation and governance make a difference? *Regul. Gov.* **2007**, *1*, 1–7. [[CrossRef](#)]
14. Smith, D.K. Beyond the rule of law? Decentered regulation in online investing. *Law Policy* **2004**, *26*, 439–476. [[CrossRef](#)]
15. Hooghe, L.; Marks, G. Types of Multi-Level Governance. Available online: <http://eiop.or.at/eiop/pdf/2001-011.pdf> (accessed on 12 October 2001).
16. Stephenson, P. Twenty years of multi-level governance: “Where does it come from? What is it? Where is it going?”. *J. Eur. Public Policy* **2013**, *20*, 817–837. [[CrossRef](#)]
17. Kaiser, R.; Prange, H. Managing diversity in a system of multi-level governance: The open method of co-ordination in innovation policy. *J. Eur. Public Policy* **2004**, *11*, 249–266. [[CrossRef](#)]
18. Bulkeley, H.; Betsill, M.M. Revisiting the urban politics of climate change. *Environ. Pol.* **2013**, *22*, 136–154. [[CrossRef](#)]
19. Gualini, E. Challenges to multi-level governance: Contradictions and conflicts in the Europeanization of Italian regional policy. *J. Eur. Public Policy* **2003**, *10*, 616–636. [[CrossRef](#)]
20. Marshall, A. Europeanisation at the urban level: Local actors, institutions and the dynamics of multi-level interaction. *J. Eur. Public Policy* **2004**, *23*, 668–686.
21. Borrás, S.; Edquist, C. The choice of innovation policy instruments. *Technol. Forecast. Soc. Change* **2013**, *80*, 1513–1522. [[CrossRef](#)]
22. Kern, K.; Alber, G. Governing climate change in cities: Modes of urban climate governance in multi-level systems. In Proceedings of the Competitive Cities and Climate Change OECD Conference, Milan, Italy, 9–10 October 2008; pp. 171–196.
23. Jordan, A.; Wurzel, R.K.W.; Zito, A. The rise of “new” policy instruments in comparative perspective: Has governance eclipsed government? *Polit. Stud.* **2005**, *53*, 477–496. [[CrossRef](#)]
24. Lascoumes, P.; Le Gales, P. Introduction: Understanding public policy through its instruments—From the nature of instruments to the sociology of public policy instrumentation. *Governance* **2007**, *20*, 1–21. [[CrossRef](#)]
25. Appelstrand, M. *Miljömålet i Skogsbruket—Styrning och Frivillighet*; Lunds Studies in Sociology of Law, University of Lund: Lund, Sweden, 2007.
26. Nilsson, S. Experiences of policy reforms of the forest sector in transition and other countries. *For. Policy Econ.* **2005**, *7*, 831–847. [[CrossRef](#)]
27. Kassim, H.; Le Galès, P. Exploring governance in a multi-level polity: A policy instruments approach. *West. Eur. Politics* **2010**, *33*, 1–21. [[CrossRef](#)]
28. Segerson, K. Voluntary approaches to environmental protection and resource management. *Annu. Rev. Resour. Econ.* **2013**, *5*, 161–180. [[CrossRef](#)]

29. European Environment Agency (EEA). *Urban Adaptation to Climate Change in Europe: Challenges and Opportunities for Cities Together with Supportive National and European Policies*; Report No. 2/2012; EEA: Copenhagen, Denmark, 2012.
30. Wamsler, C.; Luederitz, C.; Brink, E. Local levers for change: Mainstreaming ecosystem-based adaptation into municipal planning to foster sustainability transitions. *Glob. Environ. Change* **2014**, *29*, 189–201. [[CrossRef](#)]
31. European Commission. Directive 2007/60/EC of the European Union and the Council on the Assessment and Management of Flood Risks. Available online: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0060> (accessed on 23 October 2007).
32. Endelig Udpegning af Risikoområder for Oversvømmelse fra Vandløb, Søer, Havet og Fjorde. Available online: http://naturstyrelsen.dk/media/nst/Attachments/Udpegningafrisikoomrder_NSTKDI.pdf (accessed on 18 December 2015).
33. Aftale om Kommunernes Økonomi for 2013. Available online: http://www.kl.dk/ImageVaultFiles/id_55201/cf_202/Aftale_om_kommunernes_%C3%B8konomi_for_2013.PDF (accessed on 10 June 2015).
34. Lov om Ændring af lov om Betalingsregler for Spildevandsforsyningsselskaber m.v. og lov om Vandløb. Available online: <https://www.retsinformation.dk/forms/r0710.aspx?id=145194> (accessed on 29 January 2013).
35. Erhvervs-og, V. Chapter 4: Kommuneplanlægning. In *Bekendtgørelse af Lov om Planlægning*; Available online: <http://www.viauc.dk/sygeplejerske/holstebro/Documents/Intranet/retningslinjer%20for%20skriftlige%20opgaver%20rev%20januar%202012.pdf> (accessed on 23 November 2015).
36. Klimatilpasningsplaner og klimalokalplaner—Vejledning. Available online: <http://docplayer.dk/3776-Klimatilpasningsplaner-og-klimalokalplaner-vejledning.html> (accessed on 18 December 2015).
37. Marttila, V. *Finland's National Strategy for Adaptation to Climate Change*; Ministry of Agriculture and Forestry of Finland: Helsinki, Finland, 2005.
38. Evaluation of the Implementation of Finland's National Strategy for Adaptation to Climate Change 2009. Available online: http://mmm.fi/documents/1410837/1721034/Adaptation_Strategy_evaluation.pdf/043c0964-58c5-4fce-8924-cc47748cf766 (accessed on 18 December 2015).
39. Juhola, S.; Haanpää, S.; Peltonen, L. Regional challenges of climate change adaptation in Finland: Examining the ability to adapt in the absence of national level steering. *Local Environ.* **2012**, *17*, 629–639. [[CrossRef](#)]
40. Kansallinen Ilmastonmuutokseen Sopeutumissuunnitelma 2022. Available online: http://mmm.fi/documents/1410837/1516663/2014_5_Ilmastonmuutos.pdf/1716aa76-8005-4626-bae0-b91f3b0c6396 (accessed on 20 November 2014).
41. Helsingin Seudun Ympäristöpalvelut-Kuntayhtymä (HSY) Pääkaupunkiseudun Ilmastonmuutokseen Sopeutumisen Strategia. Available online: https://www.hsy.fi/sites/Esitteet/EsitteetKatalogi/Julkaisusarja/10_2012_paakaupunkiseudun_ilmastonmuutokseen_sopeutumisen_strategia.pdf (accessed on 20 April 2015).
42. Helsingin Kaupungin Ympäristöpolitiikka, Kaupunginvaltuuston Hyväksymä. Available online: <http://www.hel.fi/static/ymk/esitteet/ymparistopolitiikka.pdf> (accessed on 26 September 2012).
43. Keski-Pohjanmaan Ilmastostrategia 2012–2020. Available online: [https://www.kokkola.fi/palvelut/kaavat_ja_kiinteistot/kaavoitus/yleiskaavoitus/kokkolan_kestustaa_jama/fi_FI/selv_ymparistohaitat/_files/92461515146004114/default/Keski_Pohjanmaan_ilmastostrategia_2012_2020.pdf](https://www.kokkola.fi/palvelut/kaavat_ja_kiinteistot/kaavoitus/yleiskaavoitus/kokkolan_keskustaajaman_yk/perusselvitykset_kestustaa_jama/fi_FI/selv_ymparistohaitat/_files/92461515146004114/default/Keski_Pohjanmaan_ilmastostrategia_2012_2020.pdf) (accessed on 3 November 2011).
44. Oulun Seudun Ilmastostrategia. Available online: <http://www.ouka.fi/documents/64417/6b35350e-08ef-411a-b904-abfa45d89544> (accessed on 19 May 2012).
45. Klein, J. Embeddedness of climate change adaptation: Established procedures and contending discourses for flood protection in Espoo, Finland. *Local Environ.* **2014**, *8*, 1–18. [[CrossRef](#)]
46. Tulvat Hiipivät; Kotivakuutuksiin. Available online: <http://www.hs.fi/kotimaa/Tulvat+hiipiv%C3%A4+kotivakuutuksiin/a1402465110828> (accessed on 12 June 2014).
47. Meld. St. 28 (2011–2012): Gode Bygg for Eit Betre Samfunn. Available online: <https://www.regjeringen.no/no/dokumenter/meld-st-28-20112012/id685179/?ch=1&q> (accessed on 18 December 2015).
48. Lavenergiutvalget: Energieffektivisering. Available online: http://www.regjeringen.no/upload/OED/Rapporter/OED_Energieffektivisering_Lavopp.pdf (accessed on 18 December 2015).
49. Solli, J.; Fyhn, H. Socialising energy policy for home renovation. *Energy Policy Soc. Sci.* **2016**, in press.

50. Lieferink, D.; Andersen, M.S. Strategies of the "green" Member States in EU environmental policy-making. *J. Eur. Public Policy* **1998**, *5*, 254–270. [[CrossRef](#)]
51. Simon, G.; Shove, E. *The Sociology of Energy, Buildings and the Environment: Constructing Knowledge, Designing Practice*; Routledge: London, UK, 2004.
52. Potensial-og Barrierestudie: Energieeffektivisering i Norsk Bygg. Available online: http://www.enova.no/upload_images/A319D657AFC34028B18D5C74BA4F0094.pdf (accessed on 18 December 2015).
53. The EU Strategy on Adaptation to Climate Change. Available online: http://ec.europa.eu/clima/publications/docs/eu_strategy_en.pdf (accessed on 30 July 2013).
54. Ayers, J.M.; Huq, S.; Faisal, A.M.; Hussain, S.T. Mainstreaming climate change adaptation into development: A case study of Bangladesh. *WIREs Clim. Change* **2014**, *5*, 37–51. [[CrossRef](#)]
55. Uittenbroek, C.J.; Janssen-Jansen, L.B.; Runhaar, H.A.C. Mainstreaming climate adaptation into urban planning: Overcoming barriers, seizing opportunities and evaluating the results in two Dutch case studies. *Reg. Environ. Change* **2013**, *13*, 399–411. [[CrossRef](#)]
56. Wejs, A. Integrating climate change into governance at the municipal scale: An institutional perspective on practices in Denmark. *Environ. Plann. C Gov. Policy* **2014**, *32*, 1017–1035. [[CrossRef](#)]
57. Lonkila, K. *Aspects of Strategic Climate Work in Nordic Municipalities: NordLead Project Final Report*; Nordic Council of Ministers: TemaNord, Helsinki, Finland, 2012.
58. Mossberg Sonnek, K.; Johansson, B.; Lindgren, J. Risk and vulnerability analysis: A feasible process for local climate adaptation in Sweden? *Local Environ.* **2013**, *18*, 781–800. [[CrossRef](#)]
59. Scholten, P. Dutch approaches to flood risks: Developments in integrative water management and the synchronization of public and private agendas for climate adaptation in the Netherlands. In *Climate Change and Flood Risk Management: Adaptation and Extreme Events at Local Level*; Keskitalo, E.C.H., Ed.; Edward Elgar Publishing: Gloucestershire, UK, 2013; pp. 258–289.
60. Dupuis, J.; Keskitalo, E.C.H.; University of Lausanne, Lausanne, Switzerland, unpublished work, 2014.
61. Keskitalo, E.C.H. Climate change adaptation in the United Kingdom: England and South-East England. In *The Development of Adaptation Policy and Practice in Europe: Multi-Level Governance of Climate Change*; Keskitalo, E.C.H., Ed.; Springer: Dordrecht, The Netherlands, 2010; pp. 97–147.



© 2016 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons by Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).