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Comparative Climate Change Governance: Lessons from European Transnational Municipal Network Management Efforts

Sarah Giest[1]* and Michael Howlett[1,2]
[1]*Simon Fraser University, Vancouver, Canada*
[2]*Lee Kuan Yew School of Public Policy, National University of Singapore, Singapore*

ABSTRACT
Cities and municipalities are vital actors in addressing climate change. Because they are directly affected by the consequences of environmental transformations, cities are motivated to shape adaptation and mitigation. This paper looks at the possible mechanisms which cities can use to engage in climate change issues without decoupling themselves from the national or sub-national level and while remaining consistent with other local initiatives. The paper analyses the European approach towards transnational municipal networks (TMNs) and community collective efforts and assesses its possible application in other jurisdictions. We argue that while TMNs are the institutional foundation for a concerted effort in climate change within and between countries; they are also subject to provisions from national and regional governments, which might hamper their benefits. Based on a typology of TMNs and an analysis of the national contexts, the paper finds that those networks that target a specific region and are supported by government have the most benefits for climate change. Copyright © 2013 John Wiley & Sons, Ltd and ERP Environment

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Introduction

NETWORKING PROCESSES HAVE THE POTENTIAL TO ADDRESS THE WIDE RANGE OF CONCERNS AND COMPLEX interactions between multiple levels of government, state and non-state actors in climate change settings. Collaborative efforts initiated and managed properly are able to develop solutions tailored to local contexts while offering information and best practice models for others (Innes *et al.*, 1994). There is no blueprint to tackle environmental challenges in different locations. Networks are more flexible and less limited than, for example, rigid government programmatic restrictions to tackle place-based characteristics. They also have an increased reach to connect with knowledgeable actors, resources and multiple government entities (Goldsmith and Eggers, 2004). The European Union (EU) has established networks for transnational knowledge transfer on environmental issues, the so-called transnational municipal networks (TMNs). Practical lessons are shared across cities and levels of government. TMNs create an organizational structure with multiple, relatively independent centres,

*Correspondence to: Sarah Giest, Simon Fraser University, 8888 University Drive, Vancouver, BC V5A 1S6, Canada. E-mail: sgiest@sfu.ca

which open up opportunities for locally appropriate institutions to evolve by tightening monitoring and feedback loops and by enhancing associated institutional incentives (Carlsson and Sandström, 2008).

This paper specifically focuses on an aspect that has been lacking in the discussion of these networks: multi-level network management guiding the collaborative climate change process. We argue that while TMNs are the institutional foundation for a concerted effort in climate change within and between countries, they are also subject to provisions from national and regional governments, which might hamper their benefits. Based on a typology of TMNs and an analysis of the national contexts, we find that those networks that target a specific region and are supported by government – especially in the European context – have the most benefits for climate change.

By the 1990s, the EU had already developed a multi-level governance framework by using networks to implement place-sensitive programmes. Furthermore, mostly in Western Europe, national and supranational scales of government support locally initiated regional cooperative networks. The EU also actively implemented a policy framework to facilitate regional cooperation at a supranational level. Thus, many cooperative networks in Europe today are the result of the top-down stimulus of the EU and regional cooperative efforts by regions or cities (McCarthy, 2000; Bradford, 2004).

Overall, Europe is an example for coordination across government levels playing a key role in designing wider policies. Also, city or municipal collaborations have become the centre for adopting specific climate change goals. European networks are based on the idea that:

> Cities can exert an influence reducing climate impacts in at least two ways. They are responsible for making sure that in their own administration and activities (their governance role) they are moving towards climate-neutrality as fast as they can. They also influence their citizen's and other actor behaviour, for example industry and transport. This is their role as payers in the community. [United Nations Environment Programme (UNEP), 2008: 116]

The EU exemplifies how multi-level governance arrangements can be designed to enhance local community resilience, and suggests that key concepts such as subsidiarity might be applied to other countries. The EU also possesses some distinct features that can provide insights into possible alternative configurations of the interrelationships of competences and also the links between different issues, if 'political arenas are (to be) interconnected rather than nested' (Marks *et al.*, 1996: 346). In general, within EU climate change policy-making, there has been a shift towards self-organizing networks that reach beyond national and sometimes even European boundaries, TMNs being an example. The European system is one which entrenches the de-centralization and de-concentration of powers, allowing state, regional and local governments more powers to react and adapt to pressing policy issues such as climate change, and thus providing a range of practices and experiences which can be emulated in other jurisdictions (Bennett and Howlett, 1992).

In contrast, cities in other jurisdictions in North America and elsewhere have so far been unable to efficiently coordinate and channel their climate change efforts and the argument presented here is that they may be aided in so doing by examining the EU experience. A networking approach based on the European model and linked to existing legislation or strategies for key climate change goals can open up opportunities for cities in these jurisdictions, helping them perform better and creating more coherence in climate change adaptation and mitigation efforts across levels of government. Both adaptation and mitigation can be developed through local input and initiatives. 'Adaptation is planning (either reactively or proactively) to account for the positive and negative effects of climate change' (Picketts, 2010: 17). Mitigation,[1] by contrast, focuses on the root causes of climate change problems and aims to reduce the amount of greenhouse gases (GHGs) emitted into the atmosphere or to increase the Earth's ability to absorb them (Crabbe and Robin, 2006).

Climate Change Networks in European Context

A multi-level network management framework is a valuable starting point for understanding how central governments and other public and private actors connect, to design and implement climate change policies at various

[1]In recent years, most governments have favoured adaptation strategies, partly because mitigation efforts have failed to reverse global warming. For all that, lessons learned from mitigation initiatives are relevant to adaptation even if they are largely negative (Crabbe and Robin, 2006).

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government levels (Hooghe and Marks, 2003; Corfee-Morlot *et al.*, 2009). The framework encompasses at least two dimensions of climate change action and influence. The first is the vertical dimension across scales or levels of governance and the second is the horizontal dimension of governance (Bulkeley and Betsill, 2003; Hooghe and Marks, 2003). Focusing on the horizontal dimension and regional and local networking, it becomes increasingly evident that 'places' are essential in the design and implementation of adaptation and mitigation strategies. Also, effects of environmental changes are felt locally; thus, adapting to climate change will require a variety of local changes. This highlights the importance of a place-based support structure by national governments around the world, spanning a continuum from global and European measures to the city and everything in between. Thus, 'attention directed to intermediate decision-making and local government does not diminish the need for, or the importance of, federal and state government' (Castle and Weber, 2006: 11).

Current European efforts reflect this goal of including and accommodating several levels of government. The place-based process is replacing the strong cohesion element of the EU in the area of environmental policy. This gives room for adapting region-specific frameworks and connecting to other states in terms of bilateral cooperation of communities or networking. The collaboration structure manifests itself in policy networks or more specifically in TMNs. TMNs have three defining characteristics: (1) member cities are autonomous and free to join or leave; (2) because they appear to be non-hierarchical, horizontal and polycentric, such networks are often characterized as a form of self-governance, although they have a significant government component and membership; and (3) decisions taken within a network are directly implemented by its members (Kern and Bulkeley, 2009: 309–310).

With these elements, TMNs have adapted to the opportunity structure present in the subsidiarity-driven EU multi-level system to have access to key decision-makers as well as resources (Ladrech, 2005). Most of these networks concentrate on two goals: (1) representing the interest of their members at the European level and (2) facilitating the exchange of experience and transnational learning among their constituents (Giest and Howlett, 2012: 137). The European Commission (2012: 6) states that 'due to the regional variability and severity of climate impact, most adaptation measures will be taken at national, regional or local level. However, these measures can be supported and strengthened by an integrated and coordinated approach at EU level.' This points towards the different roles national, regional and local governments play. The national level is responsible for setting boundary conditions that address the national interest in specific places while also providing resources, based on which local governments are able to develop community agendas and tap into information from other jurisdictions. Local autonomy caters to place-based needs and allows putting national resources into use in ways that appear most beneficial to those directly affected (Castle and Weber, 2006).

European TMNs generally describe two governance modes which prevail in the European climate change context: a 'self-governing' and 'governing through enabling' mode in which municipalities have high levels of discretion and decision-making power. Self-governing is based on 'the capacity of local government to govern its own activities, such as the improvement of energy efficiency in governmental offices and other municipality-owned buildings' (Alber and Kern, 2008: 5). An example for this general trend in the policy-making process at the EU level is the effort to develop a climate and energy package with a legally binding target for 2020 on greenhouse gas emissions, an increased share of renewable energy and energy efficiency, and a revised emission trading system. In January 2008, the European Commission proposed binding legislation to implement 2020 climate targets. This 'climate and energy package' was agreed upon by the European Parliament and Council in December 2008 and became law in June 2009. The core of the package comprises four pieces of complementary legislation: (1) a revision and strengthening of the Emissions Trading System (ETS), the EU's key tool for cutting emissions cost-effectively; (2) an 'Effort Sharing Decision' governing emissions from sectors not covered by the EU ETS, such as transport, housing, agriculture and waste; (3) binding national targets for renewable energy which collectively will lift the average renewable share across the EU to 20% by 2020; and (4) a legal framework to promote the development and safe use of carbon capture and storage (CCS) (European Commission, 2012). A White Paper entitled 'Adapting to climate change: Towards a European framework for action' followed in 2009. The document promotes a local, place-based approach to adaptation, offering a framework for adaptation measures and policies to reduce the vulnerability of the EU to the impacts of climate change. Generally, a multi-actor structure is supported in EU documents based on grass-root developments, which then takes form in transnational municipal networks.

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European TMNs

TMNs have adapted to the opportunity structure in the EU's multi-level system to connect and have access to key decision-makers as well as resources (Ladrech, 2005). Most networks concentrate on two goals: representing the interest of their members, at the European level in particular, and facilitating the exchange of experience and transnational learning among their constituents (Bennett and Howlett, 1992).

Nation-wide examples of such bottom-up efforts include France, Germany and Norway. The French government encourages local governments in their adaptation strategy to formulate their own goals while at the same time coordinating with the national level. In Germany, select cities have engaged in climate change strategies to develop and implement adaptation measures. Norway focuses on the development of cross-level approaches and drawing lessons from experiences in other countries. At the same time, municipalities are able to apply for funding to develop specific projects, such as the coordination of an adaptation network (Westerhoff, 2010). Municipalities in Austria, by contrast, participate in the 'Climate Alliance Austria'. This Alliance is part of the larger Climate Alliance of European Cities with Indigenous Rainforest Peoples. It is a non-governmental network that aims to reduce GHG emission by 50% by 2030 and support sustainable forestry in participating towns and cities and provinces (Westerhoff, 2010; Climate Alliance Austria, 2013). Thus, the Climate Alliance is a European network of local authorities committed to the protection of the world's climate. The member cities and municipalities aim to reduce GHG emissions at their source (Climate Alliance, 2013). Eurocities, another European-wide network, unites local governments of more than 140 cities in over 30 countries. Policy priorities in this network are the climate, the economy and inclusion while reinforcing the role of local governments (Eurocities, 2013). The network's 'Declaration on Climate Change' highlights Eurocities commitment to fighting climate change and provides a framework for cities to adopt climate change action – ranging from planning to reduce sprawl and increase green spaces to investing in the development of renewable energy production. Another aspect to the Eurocities approach is 'integrating the concepts of the prevailing global objectives, based on input from the scientific and international policy negotiation communities into their climate work' (Corfee-Morlot *et al.*, 2009: 82).

Both networks support the exchange of best practices between cities or regions and help to coordinate different levels of government by connecting local, national and European level. In more detail, the Climate Alliance offers a 'climate toolbox' as well as a roadmap, and a benchmarking and emission calculating system for members. The toolbox contains a database for climate change projects and events, advertising material and the opportunity for nation-wide campaign participation. The 'climate compass' gives advice on how to develop a local climate action plan and the 'climate cities benchmark' is a systematic approach for visualization and analysis of local actions – learning from other cities or regions. Both networks started with few members and have grown ever since: the Climate Alliance, founded in 1990, now has more than 1600 cities, municipalities and districts in 18 European countries as members, while Eurocities, founded in 1986, started with six large cities (Barcelona, Birmingham, Frankfurt, Lyon, Milan and Rotterdam) and spans the local governments of more than 140. In summary, both networks bring advantages for their members in the form of promoting experience exchange, showcasing achievements, providing recommendations, aids and tools, lobbying for improved framework conditions for local climate change policies and developing and coordinating European projects and campaigns (Climate Alliance, 2013). Also, the Climate Alliance gears its activities towards helping to organize campaigns for the awareness of citizens towards climate issues or providing advertising material. This makes cities active participants in the area of climate change, instead of solely implementing policies established at other levels, a development which is also possible in other countries despite the formally hierarchical relationships existing between levels of government in many of these countries (Bulkeley and Betsill, 2003).

Beyond Eurocities and the Climate Alliance, there are two more networks in the area of climate protection that developed since the early 1990s. Cities for Climate Protection and Energie-cités were founded shortly before the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 (Kern and Bulkeley, 2009: 17). The Cities for Climate Protection (CCP) programme is part of the Local Governments for Sustainability initiative (ICLEI). ICLEI is an international coalition of local governments committed to advancing climate protection and sustainable development and it provides tools, technical expertise, software training, policy assistance, and national and international peer networks. The organization works through CCP, which emerged as a network of local governments engaged in the international climate dialogue (Corfee-Morlot *et al.*, 2009). 'The

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European CCP Campaign covers the EU-27, the rest of Europe (Iceland, Norway, Switzerland...), the Middle East and Newly Independent States (NIS) – currently with 176 cities, towns, counties and provinces from 19 countries in this region' (ICLEI Global, 2013). The programme further offers packages to cities based on the CCP '5-milestone methodology', which contains five steps: (1) a baseline inventory and a climate impact assessment is conducted; (2) targets are set and possible adaptation responses identified; (3) actions plans are developed; (4) those action plans are implemented; and (5) results are evaluated and reported before the cycle of the previous steps is repeated. Ideally, the goals are to optimize mitigation efforts, and to off-set final GHGs and adaptation to improve community resilience as far as possible (ICLEI Global, 2013).

Energie-cités is a European network primarily focused on energy transition. The association was created in 1990 and today represents more than 1000 towns and cities in 30 countries. The main objectives include strengthening the role and skills of those cities in the field of sustainable energy as well as representing their interests and influencing the policies and proposals made by the EU institutions in the fields of energy, environmental protection and urban policy. Another goal is to develop and promote initiatives that enable cities to exchange experiences, transfer know-how and implement joint projects. Beyond the networking aspect of the programme, Energie-cités pursues the transition from a system dominated by finite (fossil and fissile) energy towards (renewable) flow energy-based systems. Thereby, the association highlights the strengths of a local network by involving a multitude of players at all levels and in all fields, which includes the 'Covenant of Mayors' as one of the projects:

> The Covenant of Mayors is the mainstream European movement uniting local and regional authorities in the fight against climate change and in the implementation of sustainable energy policies. After the adoption, in 2008, of the EU Climate and Energy Package, the European Commission supported the launch of this bottom-up movement which is now endorsed by all European institutions and a large spectrum of stakeholders. (Energie-cités, 2013)

Overall, the diverse TMNs emphasize the importance of involving multiple, relatively independent actors and creating opportunities for local leaders and institutions to get involved. It also shows that the European context offers a setting in which TMNs can flourish while the national and regional government provisions give the opportunity to engage in collaborations. There are similar trends in North and South America, Australia and Asia, but the idea of using municipal networks to move forward in climate change adaptation and mitigation has not yet been fully established.

National and Regional Provisions in Other Jurisdictions for TMNs

The following examples of networking dynamics in Canada, Australia, the US, South America and Asia do not aim to detail the entire environmental system in those regions, but rather to give an idea of what is done to pursue climate change adaptation and mitigation at the regional level and how these current efforts stack up against, and can learn from, the EU example.

Canada

In Canada, the exact distribution of power between the federal and the provincial level can be ambiguous, and there is substantial overlap between the powers of the federal and those of the provincial government (Harrison, 1996). 'As a result, both federal departments and provincial ministries are concerned with the management of natural resources, the environment, health, agriculture' (Westerhoff, 2010: 319). Thus, both provinces and federal governments act as gatekeepers, which leads to a lack of lower level agents who can create non-binding forms of action and lower level entry points for new actors. 'While there is some evidence that local governments can play this lower non-binding role in creating dialogue, given the fact that local governments remain under provincial control and the national level is relatively reticent to engage with local governments directly, the opportunity for local

DOI: 10.1002/eet

governments to create a non-binding structure of dialogue is severely limited' (Curry, 2012: 14). In fact, the process of tackling climate change has largely been driven from the bottom up in the absence of national action (Westerhoff, 2010). This can be seen for British Columbia (BC), a western province, which has made an independent and voluntary effort to meet more ambitious climate change goals than has the federal government. BC was able to set itself apart not only from other Canadian provinces, but generally in North America by introducing a carbon tax (Crossman, 2010; Schreurs, 2010a, 2010b) and the province also has ambitious goals in this area, involving local communities in the State. These goals include GHG emission reduction of 33% below 2007 levels by 2020 and 80% by 2050. BC also became the first Canadian province to join the Western Climate Initiative (WCI) – a group now composed of one US state and four Canadian provinces although it had larger US representation in the past. Ongoing networking attempts in BC include the membership of the City of Vancouver in the 'Sustainable Cities Network' and the 'ICLEI – Local Governments for Sustainability'. The United Nation's Climate Neutral Network also invited Vancouver as one of its four original member cities. However, BC is facing a lack of critical mass in the region in terms of cities joining such networks from the US or neighbouring provinces. Also, there are no national common goals in Canada that could make climate change efforts more consistent across levels and stimulate further bottom-up designs.

Australia

Australia is another federal state that typifies multi-level governance approaches outside of the EU context. But – unlike Canada – the Council of Australian Governments has indicated that coordination between state and local governments must occur to achieve best outcomes for climate change adaptation. Most climate change efforts focus upon the energy-based and resource-based nature of Australia's economy, including various governments in these economic sectors (Bulkeley, 2000). The most prominent climate change network in Australia is the ICLEI – Local Governments for Sustainability. The Regional Secretariat for the network, 'ICLEI Oceania', is hosted by the City of Melbourne and was established in 1999. This regional office of ICLEI focuses on local climate change action and strengthening social well-being. Current and past initiatives include projects on water management, international programmes – partnering with Indonesia and Asian cities, or 'Cities for Climate Protection', which emphasizes next-generation capacity-building frameworks for local government action on climate change. This includes mitigation as well as adaptation efforts (ICLEI Oceania, 2008).

In more detail, Australia's post-2009 national climate change strategy addresses these issues of climate change based on global and national assessments, but also acknowledges the need for a networked and innovative environment. The strategy states that 'climate change science is entering a new phase of complexity as decision-makers and the public demand greater insight into likely impacts and the effort required for mitigation and adaptation' (Department of Climate Change, 2009: 3). To fill the knowledge gaps and connect different actors, the report states that Australia 'cannot rely on others to produce all the science' (ibid.: 5) and needs 'efficient and effective mechanisms for access to climate change information' (ibid.: 11). However, this was not always the case and still does not apply to all climate change decisions. There was a process of restructuring of responsible government agencies at the Commonwealth and State/Territory levels, which led to an improvement of environmental management (OECD, 2007). Australia evolved from ad hoc cooperation structures to a networked approach with strong inter-jurisdictional and inter-agency cooperation as well as leadership functions at every level. The key bodies for intergovernmental environmental policy coordination and integration are the Commonwealth/State/Territorial Ministerial Councils (Ross and Dovers, 2008). And it was the Commonwealth Scientific and Industrial Research Organisation (CSIRO), who launched the National Research Flagship initiative in 2003. Today, the Flagship encompasses ten large multi-disciplinary research partnerships with other research institutions, industry and governmental agencies, addressing a range of major human, environmental and economic challenges. After a government-mandated review of the Flagships in 2006, which found the Flagships to be 'promising', three more Flagships were developed – one of them 'Climate Adaptation'. The overall concept for the initiative was developed through extensive consultation with government, CSIRO, partners in science, industry and opinion leaders in the community. 'The intent was to reinforce the collaborative research partnerships addressing issues of national importance' (Commonwealth of Scientific and Industrial Research Organisation (CSIRO), 2012). On top of that, the initiative is under regular independent review to secure its use for research, industry and environmental policy.

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The key feature of the Flagships is the idea of a networked approach, bringing together multi-disciplinary research teams from CSIRO and other research institutions under a partnership arrangement, which also engages industry and government (Australian National Audit Office (ANAO), 2009).

United States

In the US, several initiatives have emerged to take advantage of urban connectivity, 'stimulating inter-municipal dialogue and levering global influence' (Toly, 2008). These include the United States Conference of Mayors' (USCOM) Climate Change Protection Agreement (CPA) and ICLEI's CCP programme. Many American cities have joined these networks and have implemented policy mechanisms that address GHG emission. Under the ICLEI's Carbon Disclosure Project for example, at least 30 US urban centres, including New York, Las Vegas, Denver, West Palm Beach, St Paul and New Orleans, will use ICLEI's Local Government Operations Protocol and software tools to assess their GHG emissions profile and then will disclose this inventory data to the Carbon Disclosure Project (CDP) online reporting (ICLEI Global, 2013).

Based on two cities, Portland and Tulsa, Osofsky and Levit (2007–2008) highlight the development of regional networking in the US. They show that front-runners in climate change such as Portland, which was the first US city to develop a carbon reduction plan in 1993, play 'a crucial role in international coalitions of localities attempting to make progress on emissions' (p. 412). They also point out that – at least in their US cases – top-down decisions were not palatable or practical. Instead, lower level agreements carried the real legal sanctions referred to budgetary cuts, personnel decisions, long-term natural gas purchases and incentives. Also, the commitment of Portland to 'green' business created an environment in which 'companies felt encouraged to try to get ahead of the regulatory curve on climate change' (p. 431).

South America

Central America is especially vulnerable to climate change, due to its geographical location between the Atlantic and Pacific Oceans. Rising sea levels, the modification of coastal and marine ecosystems, and the predictions of strong hurricanes accompanied by high levels of poverty and a dependence on natural resources threaten the region. The Central American Environment and Development Commission (CCAD) is the organization responsible for the regional environmental agenda. 'In order to achieve its objectives, the CCAD has drawn up the Central American Regional Environmental Plan (PARCA), a medium- and long-term strategy that is implemented through (i) prevention and control of pollution; (ii) the conservation and sustainable use of natural heritage and (iii) the strengthening of institutions on matters concerning environmental policies and legislation' (EuropeAid, 2009: 21). The Latin American communities coordinate their actors and policies in the sector through regional organizations. These political associations aimed at economic integration include regional and/or international environmental matters as part of their agendas, although there is no network specifically targeting the region to create climate change action plans. Rather, European TMNs try to reach the region through financial support for environmental plans and pass on experiences from their history of climate change networking.

Asia

Four of the world's ten largest GHG emitters are in Asia, including China, India, Japan and South Korea (Boden *et al.*, 2006; Schreurs, 2010a, 2010b). This is mainly due to gas emissions, as fossil fuels are a dominant component of energy creation in Asia. Thus, changing energy consumption patterns will dominate climate change discussions in those countries. This requires the participation of local levels of government, as urban authorities influence emissions due to their position in urban public transportation, local land-use planning, construction, renewable energy use, energy efficiency measures, waste management policies and local education campaigns (Schreurs, 2010a, 2010b).

In Asia, 'cities are crucial to the implementation of national and international climate policies and goals. They are playing important roles as agenda setters influencing meaningful action at higher levels of government and as models providing best (and worst examples) to other cities or regions' (Betsill and Bulkeley, 2004: 88). Such

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regional-level involvement is not always entirely voluntary. For China and Japan, central governments have required regional authorities to establish climate action programmes. Some cities, by contrast, came up with agendas before this and even moved beyond national goals. In Japan, authorities were also drawing upon the popularity of the Kyoto Protocol to advertise sustainable measures in the city of Kyoto. Japan is currently the only Asian country that has an emission reduction target under the protocol. There are also several Japanese examples of regional and local governments taking the lead in climate change regulations and policies. Some cities, such as Kyoto and Tokyo, are even acting as regulators in climate change mitigation (Corfee-Morlot *et al.*, 2009). Another promising development is the Japanese idea of the 'Environmental Model City Project'. 'The cities were invited to submit proposals for certification as environmental model cities' (Schreurs, 2010a, 2010b: 97) and act as best practice examples. This project has now also been established in China. China created the 'National Climate Change Policy Coordinating Committee' as an inter-ministerial committee responsible for policies addressing climate change and the division of labour between national and local level of organization. However, the division of labour between national and local level of the organization is difficult to establish and laws are formulated in a way to let local administrators interpret them to their own advantage (Corfee-Morlot *et al.*, 2009: 89). Other East Asian countries have ratified Kyoto as non-Annex I parties, which means they do not have to make emission cuts.

Analysis

Canada and Australia share broad similarities with European examples. 'In both countries, the regional scale (provinces and states in Canada and Australia respectively) is conferred to the ability to design and implement independent policies and legislation in several matters. Adaptation measures at the regional scale have been undertaken in both cases, but to a greater extent in some states/provinces than others, resulting in an inconsistent degree to which adaptation is addressed across the country.' (Westerhoff, 2010: 324). Here, additional networks and transition management (Rotmans *et al.*, 2001; Rotmans and Loorbach 2009; Loorbach 2010) activities based on the European model could be part of the solutions to, on the one hand, motivate cities or municipalities that are not as active and, on the other hand, connect different levels of government from local to national to make climate change adaptation efforts in general more coherent.

Similar to Canada, Australia and Europe, the US is part of ICLEI's 'Cities for Climate Protection program', a network of about 550 local governments, including cities from the US, Australia, the UK, India, Italy, Mexico, the Philippines, South Africa and Canada. In addition, ICLEI has regional campaigns in Europe, Asia and Latin America. However, global high-profile networks, such as CCP, do not replace regional connections and cooperation. They can only complement what is ongoing at lower levels within a country, as they are 'champion-picking' rather than motivating more cities to participate. This means that those cities that are part of global networks such as CCP usually have had a prior interest in climate change activities and became members or were targeted as members based on this precondition. Also, knowledge about climate change and its consequences is often developed before joining the network. This 'raises questions about the ability of the CCP program to engage a broader range of local authorities, including those that lack individuals prepared to champion the cause of climate change' (Betsill and Bulkeley, 2004: 481). Thus, individual champions or front-runner cities have to be connected to less active cities regionally, to engage a wider network in their environment. In fact, CCP has shown that the best practice examples and information provided is in fact not relevant for all participating countries (Betsill and Bulkeley, 2004). This implies that for network learning to occur, cities still need examples and role models that are 'closer to home'.

A similar dynamic appears in South America and Asia regarding climate change – sporadic participation in global and regional high-profile networks, but not strong, continuous local engagement.

In South America the 'High Level Panel on Global Sustainability' (GSP) had warned that fragmented initiatives create silos around single issues, instead of combining them for the climate change cause. This leads to deficits in cooperation, leadership, political space and a lack of flexibility in adapting to challenges. Also mentioned in the GSP report is the missing coherence at sub-national, national and international levels. A coordinated or networked effort at the local level might help to make current attempts more connected and rich in regions that are participating.

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Finally, regarding global networks, Asian cities and governments are part of groups, such as ICLEI, Clinton's Climate Change Initiative, the World Mayors Council on Climate Change, Sustainable Cities: PLUS network, the Asian cities Climate Change Resilience Network and Cities Development Initiative for Asia. However, there is little information on whether some of these targets defined in the networks are being effectively implemented (Schreurs, 2010a, 2010b). In other words, participation does not imply implementation, especially if the network does not hold its members responsible.

Looking at motivational factors for cities to be engaged in network activities, there are different factors involved. First, a city has to have the opportunity to improve its reputation by being a front-runner of climate change in a certain region or country. Second, preparing for environmental changes can involve long-term cost for the members, which they must be willing to risk. Third, organized bottom-up initiatives can shape the national agenda; this is one of the stronger motivators, as seen in Canada and the US when regions become frustrated with measurements taken by provincial or national governments.

Based on the increasing number of sustainability-related city networks not only in the EU, but world-wide, Busse (2008) developed a typology in which TMNs are distinguished based on their territorial scope, their function as well as their temporal aspects. Type-1 and Type-3 networks, so-called global high-profile and regional high-profile TMNs raise awareness for one issue, but often fail to implement substantial policies. On a global scale, high-profile networks attract cities that are well-known in the area of climate change. Regional high-profile networks have similar characteristics, but are focused on one region, without having global impact (Kameyama and Kanie, 2008). In contrast to popular and well-known networks, global and regional in-depth networks are defined by intense cooperation with less publicity, but also limited scope. This cooperation dynamic mostly has some leaders or hubs and attract follower cities (Busse, 2008).

Based on the assessment of the above climate change efforts compared to European TMNs, it appears that many TMNs fall into the category of global or regional high-profile networks (Type-1 and Type-3). These networks often, as Busse (2008) points out, do not benefit the concrete action taken on the ground. As outlined in the US example, the information provided by the CPP programme is often not relevant or applicable for the participating regions in different countries. Recent empirical research on TMNs supports what is hinted in Busse's (2008) analysis, which is that regional in-depth networks are most effective. The study by Hakelberg (2011) takes into account the national and regional provisions on policy choice at the local level and the extent to which city governments can engage in transnational relations, and finds that – from the networks tested – CCP, the Climate Alliance and Energie-cités were successful while the C40 network[2] was rather weak. Success was measured in terms of the membership of a city in a TMN and the likelihood of introducing an action plan on climate change. The study also found that new entrants to a network either adopt a local climate strategy within the first years of membership or become less and less interested in network goals the longer they adhere, and so longer membership does not equal effectiveness (Hakelberg, 2011). The successful networks are all in the second row and columns of Table 1, while the rather unsuccessful TMN, C40, is part of the group of global high-profile networks. The limited number of cases in the empirical study constrains any kind of generalization, although it generally supports the claim and typology put forward by Busse (2008: 21) in the sense that for global high-profile networks:

> 'there is the danger that high-profile networks have the primary purpose of paying lip service to climate protection goals without implementing any substantial policies. In such cases, high-profile networks serve as means of symbolic politics for their member-cities.'

For global and regional in-depth networks, by contrast, Busse points out that 'cooperation in such networks is intense and substantial and less aimed at publicity' and for Type-4, he goes on to say 'its limited territorial scope can lead to a certain degree of specialization' (Busse, 2008: 21).

[2]C40 is a network of the world's megacities concerned with the reduction of greenhouse gas emissions. It works with local leaders to create sustainable climate-related initiatives with the goal of having a global impact on the environment. C40 was created in 2005 by former Mayor of London Ken Livingstone, and forged a partnership in 2006 with the Cities Program of President Clinton's Climate Initiative (CCI) to reduce carbon emissions and increase energy efficiency in large cities across the world. The current chair of C40 is New York City Mayor Michael R. Bloomberg.

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	Extent	
	Global	Regional
Small number of members	(1) Global high-profile networks • World Mayors Council on Climate Change (WMCCC) • C40 cities • International Solar Cities Initiative (ISCI) • Clinton Climate Initiative (CCI) • Sustainable Cities International Network (SCI) • The Global Legislators' Organisation (Globe)	(2) Regional high-profile networks • Eurocities • Cities Development Initiative for Asia • Asian Cities Climate Change Resilience Network (ACCCRN)
Large number of members	(3) Global in-depth networks • Cities for Climate Protection Campaign (CCP) • Local Governments for Sustainability (ICLEI) • United Cities and Local Governments (UCLG) • The Climate Group	(4) Regional in-depth networks • Climate Alliance • Energie-cités • Covenant of Mayors • Mayors Climate Protection Centre

Table 1. Examples of the different types of transnational municipal networks

Looking more closely at the different features of Type-1 and Type-4 TMNs, two main arguments emerge. First, global high-profile networks raise awareness for one issue without following up with concrete action – this can be defined as a form of network failure. As Schrank and Whitford (2011) outline, when a network fails, it was unable to sustain 'desirable' actions or to impede 'undesirable' actions. In other words, the network neither supported actions for nor restricted harming developments opposing climate change. The reasons for this are plenty; however, as cities or municipalities follow more locally profitable goals (opportunism) or they just do not have the competences to develop and sustain a network that profits climate change, they tend to harm the overall network they are part of. Another dimension is the legitimacy of the network. Legitimacy or credibility is seen as essential for establishing networks, attracting resources and opportunities, and ultimately for understanding network successes and crises (Human and Provan, 2000). Networks are unique organizational forms, as Powell (1990) and others have argued and they have legitimacy-building concerns different from a single entity or a city. Research shows that a concept for the network is not enough for success; there needs to be a recognizable identity that allows both members and outsiders to perceive the network as a legitimate entity (Whetten and Godfrey, 1998; Human and Provan, 2000). With both these aspects of possible network failure looming, network sustainability and success can only be accomplished through a broader (legitimacy-building) climate change strategy that addresses both internal and external stakeholders.

Second, as Table 1 shows, the category of regional in-depth networks consists mainly of European TMNs. This is not a coincidence as the European framework fosters the networking dynamics of cities across borders. Europe supports the bottom-up nature of cooperative action through legal, binding goals, the promotion of a local, place-based approach and enabling a multi-actor structure. In other words, the TMN structure is framed by top-down efforts enforcing compliance with climate change goals while at the same time supporting bottom-up cooperation, in which each city is autonomous. Municipalities and cities are able to join or leave a TMN, but also have to follow decisions taken by the network if a member. Embedding TMNs in this way has proven to be a successful path and can be an example for other jurisdictions. This implies not waiting for bottom-up cooperation among cities, but also not only enforcing climate change action from the top. This balance is a key to creating space for networks and reaching climate change goals.

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Concluding Remarks

The examples of (developing) TMNs in Europe and elsewhere show that there are different types – regional and global in-depth and high-profile – of networks and also that each type has its own advantages and disadvantages. High-profile networks, both regional and global, are able to raise awareness for climate change issues and attract leading cities and municipalities into a cooperative framework. Also, the elements developed by those networks can serve as a basic starting point for regions with less advanced approaches by participating in meetings or having general guidelines. The disadvantages of most high-profile networks are that, first, they often do not offer concrete action for a specific region, which means there are no tailored actions that can be taken once a city joins that kind of network. Second, not complying with the guidelines has no immediate effect, as there is no enforcing body or a responsibility towards other cities. Third, coherence with possible national goals is often not as strong, because those are not linked to the network – especially not for global high-profile networks.

Regional and global in-depth networks possess some of the qualities that high-profile networks are lacking, such as holding members being responsible in the area of climate change, due to the tighter connections among members and the defined guidelines. Also, in-depth networks can have a dynamic where they are directly linked to national goals or – the other way around – inform the country's policy from the bottom up. Often, there is frustration over a longer period with the current policy, and a network-dynamic is able to develop goals for the region, which then make their way into national or even global policy-making. In other words, 'bottom-up developments of "best practices" may for instance constitute the basis from which a government may establish binding measures once the voluntary application has become institutionalized' (Keskitalo, 2010: 362).

The analysis of various networks shows that environmental challenges are being addressed through network management efforts, because individual local governments lack the capacity or resources to address some issues without the cooperation of neighbouring municipalities while national and European governments deliver incentives. European networks were able to establish a variety of knowledge transfer and best practice learning mechanisms over the years by enabling collaboration (Bradford, 2004). The forms of cooperation range from sharing information ('learning from others') to deeper, more action-orientated activities ('doing things together') (McCarthy, 2000). This variation is connected to the form of TMN a city or region belongs to – while in high-profile networks, well-known cities lead by example, in-depth networks formulate climate change plans together and act on them individually and collectively.

However, the question of how effective TMNs are in the area of climate change needs further exploration. This includes not only determining for a larger set of networks if cities actually adopt climate change actions plans after joining a TMN, as attempted by Hakelberg (2011), but also finding a way to measure if those commitments are implemented and ultimately lead to lower emission levels in those regions. Also, transnational networks seem to capitalize on the theory that higher membership rates correspond to increased bargaining power, although the political benefits of these networks remains unclear (Corfee-Morlot *et al.*, 2009: 83). There seems to be considerable overlap between some of the networks and many pay lip service to climate change actions that are not translated into action. An undisputed trait of TMNs, however, is that such networks build regular channels of communication among public and private actors in the environmental field and that they contribute to a learning effect among cities. 'TMNs impact member-cities predominantly via the acceleration of learning processes, which they achieve by increasing the availability of information, by multiplying contacts among members and by enhancing their capacities to act locally on climate change' (Hakelberg, 2011: 73).

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