

The role of port cities and networks: reflections on the World Ports Climate Initiative

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Notes and acknowledgements

This is a Working Paper at an early stage of development. Parts of the paper are based on unreferenced source material from the author's own archive and personal recollections. The author wishes to thank the ÅForsk fund for providing a travel grant to attend the conference *Shipping in Changing Climates: provisioning the future*, on 18-19 June 2014 in Liverpool, UK.

Abstract

This paper explores how port cities and municipal networks can contribute to reducing the climate and environmental impacts of shipping. Specifically, the paper reflects on the process of developing the World Ports Climate Declaration during 2007-2008 and the work of the World Ports Climate Initiative (WPCI) in subsequent years.

The Declaration was a voluntary undertaking, adopted by 55 of the world's largest ports, to individually and jointly work to reduce the climate and environmental impacts of port operations, the global shipping industry and related sectors. To do so, the Declaration highlighted a number of themes. The International Association of Ports and Harbours adopted a resolution in support of the Declaration and committed to long-term work on implementation through the WPCI, with thematic working groups and support tools including biannual conferences and a dedicated website. These working groups have subsequently not just implemented measures with regard to particular topics (e.g. installed onshore power supply systems or hybrid cargo handling equipment, or adopted an index for green shipping), but also developed guidance documents and provided support to other ports attempting to begin work with such measures.

The impetus for the initial Declaration came from the City of Rotterdam and their engagement in the C40 Large Cities Group. The author will reflect on the origins of the initiative and his personal involvement in development of the Declaration, in order to assess the progress made by participating WPCI ports in subsequent years. Moreover, the author will consider the questions: where did the cities go? What role can port cities and municipal networks play in further developing and expanding the scope of the WPCI or similar initiatives? How can municipalities work together to transform ports and shipping whilst avoiding first mover problems?

Introduction

Ports operate at the nexus of the world economy and are vital nodes in the countries and regions in which they are located, facilitating and enabling flows of information, materials, resources and peoples within countries, between countries, and across seas and oceans. Ports have traditionally been located in close proximity to urban areas and played an important role in the consolidation and growth of many port cities, not only in economic terms, but also with regard to culture, ideas and people. The urban life of port cities is often rich and unique in its character, contestations and diversity (OECD, 2013; Fusco Girard, 2013; Jacobs et al., 2010; Sassen, 2010).

Whilst port operations have enriched – in multiple senses – the quality of life in many urban areas, ports also present challenges for the cities in which they are located, e.g. in terms of issues such as local air pollution from ships or inland transport, traffic and congestion, co-location of risky or polluting industrial facilities around ports. Such challenges interact with related urban dynamics and impact upon urban planning and other sectors, e.g. in terms of “upstream” investments in new infrastructure, changes to labour markets, or influxes of workers to informal settlements located in close proximity to ports (Inoue, 2012; OECD, 2013; PIANC, 2013).

The shifting, dynamic nature of such challenges means many problems are considered in isolation, as atomised, context-specific issues requiring local action and resolution. Nonetheless, some challenges have global implications and require the overcoming of barriers that create “first-mover” problems in multiple contexts. Few individual ports have the economic independence to refuse customers or dictate their terms to global markets when operating in isolation; the majority of ports are, to varying degrees, dependent on each other to solve complex, global challenges (OECD, 2013; PIANC, 2013).

Climate change is an example of an emerging global challenge with profound implications for ports, port cities and maritime transportation (Eyring et al., 2010; OECD, 2011; Smith et al., 2014). Climate change is a multi-faceted challenge, innately linked to the patterns of urbanisation, population growth and human impacts of the industrial age (UN-Habitat, 2011; UN 2010). The complexity of mitigating and adapting to climate change has stimulated a diverse range of experiments in communities around the world (Bulkeley and Castán Broto, 2013; Feldman, 2012).

Many ports and port cities, as well as other stakeholders, have joined or formed networks focusing on climate change and/or related topics, such as sustainable development (e.g. EcoPorts, WPCI, ICLEI). Network governance through Transnational Municipal Networks, it is assumed, provides opportunities for knowledge transfer and capacity-building among diverse groups of stakeholders, whilst providing the opportunity for collective or synergetic actions, or the mobilisation or representation of common agendas. Becker et al. (2012)

consider such collective, participatory enterprise essential for ports in the fight against climate change.

This paper explores the role of port cities and municipal networks in efforts to reduce the climate and environmental impacts of shipping. To do so, the paper presents an overview of discussions on Transnational Municipal Networks and network governance in municipalities, before describing the development of the World Ports Climate Declaration and its subsequent implementation through the World Ports Climate Initiative. This informs a Discussion on challenges and opportunities for the WPCI and similar initiatives, and Conclusions on possible future possibilities for cooperation between municipalities, ports and other stakeholders to combat climate change and tackle environmental problems.

Transnational Municipal Networks

Climate change and the need for sustainable development are discussed in an extensive body of literature, much of which emphasises the role of municipalities as participating actors in multi-level governance (see e.g. Betsill and Bulkeley, 2007; Kern and Alber, 2009). In recent decades, various transnational municipal networks (TMNs) have been formed to facilitate municipal work for sustainable development and, in recent years, such networks have given significant emphasis to efforts to mitigate and adapt to climate change (Niederhafner, 2013; Kern and Bulkeley, 2009; Keiner and Kim, 2007).

TMNs usually have multiple objectives and fulfil a range of roles, which Bouteligier (2013b, p. 251) categorises as “(1) to exchange information, knowledge and best practices; (2) to increase cities’ capacity; and (3) to voice cities’ concerns in the international arena”. Feldman (2012, p. 789) offers a variation, stating “Networks perform three vital functions in regard to environmental problems: (1) generating and diffusing information; (2) undertaking effective policy evaluation strategies; and (3) initiating local response efforts without waiting for national efforts” (both formal and informal).

TMNs may be considered as “quasi-governmental” entities, with strong links to conventional, top-down models of government (Bulkeley et al., 2003); as flexible and dynamic alternatives to such hierarchies (Bouteligier, 2013b); or as “governing from the middle” (Román, 2010) and mediating boundaries between other stakeholders. TMNs may be global or regional in scope, addressing multiple or single themes, or be formed of specific categories or type of member (e.g. C40 Large Cities Group, Eurocities, Eurotowns). Typically, TMNs are associations to which member municipalities pay subscription fees in return for a range of services, including e.g. networking, knowledge transfer and capacity-building, the

coordination of interests and representation in international processes such as the UNFCCC¹, participation in events or projects, promotion or dissemination of information.

Hakelberg (2014) highlights the capacity of TMNs to enable “governance by diffusion” in an “increasingly fragmented, polycentric and transnational” system of global climate governance. According to Feldman (2012), the convening power of TMNs (as a platform and a forum) can “empower local levels of governance to develop the capacity to manage problems, prompting what we term “glocal” cooperation”, with “broad diffusion of experience” an inevitable consequence. In a similar vein, Giest and Howlett (2013) note that “TMNs are the institutional foundation for a concerted effort in climate change within and between countries”, whilst recognising that TMNs provide added value when working in specific regions and with the support of national governments (a similar point is made by Aall et al., 2007). In other words, TMNs may provide an opportunity to provide a framework for municipal climate change action, yet the framing context will influence the extent to which those frames are filled with content.

TMNs may thus provide a potential forum for coordination of interests, knowledge transfer, experimentation and other collaborative action concerning climate change. Despite this, TMNs are sometimes perceived as representing the “usual suspects” (Fenton, 2014; Bouteligier, 2013b; ICLEI, 2012) or as consolidating or over-emphasising particular types of cultural or institutional context, themes or solutions. For example, Acuto (2013) and Bouteligier (2013b) note the presence of a “core-periphery” dynamic in the internal geography of the C40 Large Cities Group, both in terms of representation, activity and thematic focus. McFarlane (2010), Robinson (2011) and Ward (2010) note that certain categories of cities and municipalities tend to be over-represented, or dominate, TMNs. A large group of cities are not represented or are under-represented in TMNs. These “invisible cities” can be variously interpreted as being silenced in TMN agendas, less active than prominent TMN members, or in some cases, as “free riders”.

Others challenge the supposed benefits of TMN activities to disseminate information and transfer knowledge. For example, Dolowitz et al. (2012) challenge proponents of “governance by diffusion” (e.g. Hakelberg, 2014; Feldman, 2012) by contending that when moving from inspiration to implementation, U.S. municipalities tend not to draw upon international or high-profile examples. Rather, when identifying policies options, “instead of a directed and purposeful search occurring, leading to the best possible policy being borrowed... searches were less about best practice and more about convenience and perceptions of similarity” (Dolowitz et al, 2012). Posing the question “Why don’t cities learn?” in a global study, Campbell (2009) suggests that in the best cases, “deliberate and systematic” collection of hard and soft data occurs and facilitates municipal learning. Thus,

¹ For example, ICLEI – Local Governments for Sustainability plays a similar consultative role to the UN as the International Association of Ports and Harbours (IAPH).

TMNs face the challenge of assisting the typical municipalities, as observed by Dolowitz et al., to achieve the best practice observed by Campbell. This may require a re-conceptualisation of some TMN approaches or activities.

As previously noted, Giest and Howlett (2013) argued that the added value of TMNs is linked to the context in which they operate, and a regional (or continental) focus may facilitate action in certain contexts. In the U.S. context, Krause (2012) suggests some municipal networks appear to have stronger leverage power or influence on their members' actions than others, albeit to a very limited extent. However, the “leakage” of knowledge and norms” through publicly-available information may “may increase the average GHG relevant activities being taken by all cities, and in doing so, decrease the impact able to be attributed directly to membership” (Krause, 2012, p. 602). In other words, “free rider” municipalities may achieve as much or more as TMN members; however, this interesting question lies outside of the scope of this paper.

The contribution of TMNs to network governance in municipalities

The practice of network governance and role of collaborative intermediary organisations (CIOs) within municipalities has been studied in recent work (see e.g. Khan, 2013; Hamann and April, 2012). As actors in local-level processes of network governance, municipal organisations and CIOs face similar challenges (in terms of e.g. capacity, resources or representational issues influencing perceived legitimacy) to those of TMNs operating between municipalities and across borders.

TMNs, by playing a similar mediating role to CIOs, albeit in a wider context, may be able to increase municipal organisations' awareness of other perspectives and transform them into participants in (rather than the owners of) local processes. This is important, because municipal organisations have multiple and varying roles, and may be participants in processes, lead processes, control them or be subject to their outcomes; in other words, they may be the regulated or the regulator, the beneficiary or the claimant, and in some instances, these roles co-exist (Kern and Alber, 2009).

Developing this point, Porter and Kramer (2006) and Porter and Reinhardt (2007) refer to the importance of “inside-out” and “outside-in” perspectives for organisational strategy. An “inside out” perspective involves organisations attempting to understand the full impacts of up- and downstream effects, thereby extending the scope of their analysis (e.g. environmentally, geographically, temporally, but also in terms of partnerships, production and end-use), whereas an “outside in” perspective involves considering the unstable, dynamic operating context and implications of external forces on not only the organisation's scope or mandate to act, but also its willingness, capacity and resources to act. (Searchinger et al, 2008, propose similar concepts of attributional and consequential life cycle assessment for these purposes).

Porter and Reinhardt note that “firms can address outside-in effects strategically if they can manage them in ways that competitors cannot readily match” (Porter and Reinhardt, 2007, p. 26). From a municipal perspective, this reasoning suggests that municipal organisations should attempt to adopt a strategic approach to sustainable development and success in doing so will provide competitive advantages, as well as environmental benefits. TMNs provide a framework and forum for more clearly understanding, integrating and responding to “outside-in” influences. Applying these perspectives may thus help municipalities to think and work “beyond city limits” to extend the scope of municipal processes (Seitzinger et al., 2012) and address the out-of-sight effects of unsustainable development that Seto et al (2012) call “teleconnections”.

Table 1. Overview of processes and interactions between municipalities.

Process	Scope	Network governance (Khan, 2013)	Strategic perspective (Porter and Kramer, 2006; see also Searchinger, 2008)
Intra-municipal	Within geographic zone	Municipality or CIO as facilitator of local network; TMN as a participant	Inside-out (attributional)
Inter-municipal	Between municipalities; Across borders	TMN or CIO as facilitator; municipalities as participants	Outside-in (consequential)

Table 1 provides an overview of the interaction between municipalities and TMNs in network governance. As we have seen, TMNs may potentially to add value to municipal efforts to combat climate change and improve environmental conditions in urban areas. However, TMNs are not a panacea in themselves, but rather a platform for mediation and exchange which, if used effectively, may generate positive outcomes. Having said that, TMNs are constituencies composed of, and to a large extent reflecting, the experiences of their members. TMNs face multiple challenges, not least with regards to capacities and resources, yet also in terms of issues such as their geographic and thematic coverage. With these issues in mind, we can proceed to explore the experiences of the World Ports Climate Declaration (WPCD) and World Ports Climate Initiative (WPCI).

The World Ports Climate Declaration

Background

In 2006, the City of Rotterdam adopted a target to reduce the city’s greenhouse gas emissions by 50% by 2030. A CIO - the Rotterdam Climate Initiative (RCI) - was established as a platform to initiate diverse activities in the city (Vellinga and de Jong, 2012; OECD, 2011).

As the industries and operations in and around the Port of Rotterdam - Europe's largest port - were the main source of emissions in the urban area, RCI quickly focused attention on the port and related stakeholders. Other influences, such as recent changes to national legislation on transport emissions and ongoing legal challenges concerning the extension of the port, also influenced the context and highlighted the need for Rotterdam to adopt a systemic approach with a wide scope.

However, as a central node in the Dutch and European economy, any measures to reduce the environmental impacts of the port would have to be achieved without damaging the port's competitive status. This meant cooperation with other ports and stakeholders would be essential, as individual actions by a lone first-mover potentially risked generating negative socio-economic impacts, whilst moving environmental problems elsewhere. Other ports faced similar challenges, making collective action essential and win-win solutions desirable if ports were to effectively mitigate and adapt to climate change and other environmental problems.

With this in mind, Rotterdam approached the C40 and Clinton Climate Initiative (CCI), requesting support in developing a programme for world ports to combat climate change, as well as in fostering political support in large port cities to address climate change. C40 was a relatively young TMN, created in 2005 by the then Mayor of London, Ken Livingstone. The network was formed of an invited group of the world's megacities and associate members representing municipalities at the forefront of efforts to combat climate change (Bouteligier, 2013; Hoffmann, 2012; C40).

In 2006, C40 established a partnership with the Clinton Foundation, which designated CCI as the implementation partner of the C40 network (Bulkeley and Schroeder, 2012). In practice, this meant that the Cities Programme of CCI stationed City Directors in each of the C40 member cities and established "programme" teams to provide expertise and support to City Directors across different themes (e.g. waste management, lighting, building retrofits). This partnership aimed to increase the possibility for synergies, exchange and replication within the C40 network and thereby contribute to reducing greenhouse gas emissions both within the C40 cities and beyond (see e.g. Acuto, 2013; Bouteligier 2013a; Lee, 2013).

Developing the WPCD

Rotterdam and C40-CCI agreed to work together to develop a World Ports Climate Conference and Declaration and, in early 2007, established project teams to work on the initiative. Rotterdam agreed to host two events, a pre-conference and main conference. To prepare these events, C40-CCI - said to possess significant "convening power" - would operate as CIO, liaising with stakeholders and encouraging mobilisation. Together, Rotterdam, C40-CCI and participating stakeholders would co-develop an agenda for the two

events and the principles of a practical, workable Declaration, around which a wider programme of activities could be structured.

From an early stage, it was envisaged that the content of any programme would address clean ports (trans-shipments within the port area, sustainable transportation to and from the port), clean shipping (port policies for fairways, dock, etc; ship engines and fuels), and clean energy and industry (CO₂ sequestration, energy efficiency in industrial companies, reuse of industrial waste energy, biomass certification). During autumn 2007, staff from the Port of Rotterdam began planning the events, whilst CCI staff studied the shipping industry, ports and cities in order to identify potential new approaches, methods and technologies that could reduce greenhouse gas emissions, local air quality and other environmental considerations.

The CCI approach consisted of two stages – a research stage and a solution stage. In the research stage, the scope of the initiative and target groups were defined as including sea shipping, port activities and logistics and industrial activities in ports. Profiles of ports and emission inventories were also developed in this stage. Desk analysis was conducted and a series of individual and group interviews were held with stakeholders from ports, industry, cities, the scientific community, NGOs, international organisations, etc. Key practitioners and stakeholders and good examples were identified and contacted, with information being disseminated to wider groups of port cities via the C40 network.

The research stage informed the solution stage, in which possible interventions were identified and measures taken - in the form of agreements with stakeholders, suppliers, financiers, etc - to enable viable future actions. Discussions evolved to develop structures and mechanisms through which possible actions could be implemented. Throughout this process, CCI worked closely with staff from the Port of Rotterdam, ensuring an integrated approach. In parallel, Rotterdam informed C40 port cities and other important ports about the initiative and invited a select group to the pre-conference, which was held on 25-27 November 2007. The pre-conference provided an opportunity for port representatives to meet and informally discuss climate change and other challenges, paving the way for future collaborative work between port cities. Moreover, the pre-conference provided an opportunity to present, discuss and agree upon a provisional draft of the Declaration.

In the months prior to the main conference, the topics discussed at the pre-conference were more clearly defined as: exploring ways to reduce CO₂ emissions from deep sea vessels calling at ports (i.e. ocean-going shipping); exploring ways to reduce CO₂ emissions from port operations (i.e. terminal operations); exploring ways to reduce CO₂ emissions from inland shipping and other modes of transport (i.e. logistic chains); exploring ways to promote the use of alternative energy sources (i.e. energy savings and renewables); CO₂ footprint calculation for ports. Opportunities for ports to work with biomass and carbon sequestration were to be also discussed as special topics at the main conference.

On 9-11 July 2008, representatives from many of the world's largest ports met in Rotterdam, together with a diverse range of stakeholders including shipping companies, shippers, terminal operators, fuel suppliers, logistics providers, environmental NGOs, service and equipment providers, etc. Cities were also represented, both directly and through the presence of C40 staff and CCI city directors and programme teams. The aforementioned topics were discussed in greater detail, with the conference culminating in a declaration on behalf of conference participants to individually and jointly address climate change and reduce environmental impacts of shipping and port operations. The declaration highlighted the potential of ports to influence supply chains and the opportunities to implement measures with additional co-benefits, whilst recognising the need for differentiation. By adopting the WPCD, ports indicated their intention to use the document to “guide action to combat global climate change and improve air quality” (World Ports Climate Declaration, 2008).

WPCI: implementing the WPCD

In advance of the WPCD, the Board of Directors of the International Association of Ports and Harbours (IAPH) adopted a resolution supporting the initiative and committing to long-term work on implementing the Declaration, with support tools including biannual conferences and a dedicated website (Inoue, 2012; World Ports Climate Declaration, 2008). Thus, when the Declaration was adopted by 55 ports in Rotterdam, the IAPH was ready to facilitate their interaction and develop working groups dedicated to specific topics and actions.

This process - known as the World Ports Climate Initiative (WPCI) - was formally launched on 24-25 November 2008 in Los Angeles (Inoue, 2012). The WPCI identified five principle areas in which to work (ocean-going shipping; port operations; logistic chains; alternative energy; and environmental auditing/CO₂ inventories) and has led to specific initiatives between ports addressing e.g. intermodal transport, leasing agreements, cargo-handling equipment, LNG fuelled vehicles, onshore power supply, and the clean shipping index. Moreover, the WPCI ports committed to increasing and strengthening support for its activities among the world ports community.

It is unclear to what extent this latter undertaking has been achieved. Nonetheless, ports in the working groups have subsequently not just implemented measures with regard to particular topics (e.g. installed onshore power supply systems and hybrid cargo handling equipment, or adopted an environmental ship index), but also developed guidance documents and provided support to other ports attempting to begin work with such measures (e.g. concerning carbon footprinting or a toolbox for air quality and greenhouse gas emissions).

The Environmental Ship Index (ESI) was the focus of significant attention during the process to develop the WPCD, and its continued development and increasing use represents one of

the main achievements of the WPCI (OECD, 2013). The basic idea was to develop a transparent system to improve the environmental performance of shipping. This would enable ports to incentivise accelerated adoption of cleaner shipping techniques, and shippers (and their customers) to introduce similar demands into their purchasing criteria, thereby increasing demand for clean shipping and influencing supply chains. During the research phase of CCI's work, similar initiatives were identified, such as the successful Clean Shipping Project in Sweden, with knowledge transfer and opportunities for cooperation explored in multiple ways.

Wuisan et al. (2012) categorise the Clean Shipping Project as a private governance initiative and identify factors enabling and constraining its success as relating to legitimacy, trust and robustness. Interestingly, the recommendations Wuisan et al. (2012) make concerning the future development of the Clean Shipping Project primarily concern increasing the “critical mass” of the network through expanded membership, and improving the added-value, benefits and synergies offered by the system, in order to expand its reach across supply chains. Similar statements could be made about the ESI, particularly with regard to shippers (i.e. cargo owners and their clients). Indeed, it was precisely for these reasons that, from autumn 2007 and onwards, the CCI, Rotterdam and WPCI staff preparing the ESI worked in partnership with the Clean Shipping Project. Similarly efforts were made to work with other initiatives, such as the Clean Cargo Group and its member companies (BSR; for more information, see analysis by Lai et al, 2011).

At this stage, it was hoped that it would be possible to align some activities of these different initiatives under the ESI umbrella. In addition, the possibility of linking the ESI to real-time data monitoring systems was investigated. Such monitoring would enable monitoring of ship performance at sea, and thus potentially enable shippers (and their customers) to formulate more specific demands concerning ship performance not just in port, but across the entire logistics chain, and link these to revolving funds aiming to finance investments in clean technologies (something Gibbs et al. (2014) note is critical). However, following the WPCD, the role of C40-CCI as CIO in the process diminished, in part due to the increased role of IAPH in WPCI, yet also due to staff changes and restructuring at CCI (Bouteligier, 2013a, p. 122). Such changes were not envisaged, and it appears that some of these initiatives lost momentum in the absence of a CIO to facilitate and broker discussions.

Nonetheless, the ESI was established and is currently used by over 30 ports (mainly in Europe, but also in North America and Asia). The ESI is a voluntary system enabling automatic calculation of the environmental performance of ships' air pollutants and CO₂ emissions. Ships reporting data through the system must achieve performance levels exceeding current international regulations and are eligible for discounted fees in ports. By May 2014, 2562 ships were registered in the system².

² World Ports Climate Initiative Environmental Ship Index, 7 May 2014 (<http://esi.wpci.nl/Public/Ships>).

Onshore power supply (OPS) of electricity to ships at berth (also known as Alternative Maritime Power, Cold Ironing, Shoreside Electricity) was also the focus of considerable attention during the WPCD development process. The Port of Gothenburg, Sweden, became an important reference point, due to its early introduction of onshore power supply for regular passenger ferry and freight lines operating from the port and its use of renewable energy. Indeed, in the years since WPCI was launched, Gothenburg has received a number of awards and commendations for its work with OPS, such as a Global Energy Award in 2011³.

In recent years, Gothenburg and other WPCI ports have developed a highly-informative website on OPS and an increasing number of ports have introduced or plan to introduce OPS systems. Many of these ports are located on the West Coast of the USA, or in Europe (the Baltic and North Seas). These areas are all Emission Control Areas under MARPOL Annex VI Regulations for the Prevention of Air Pollution from Ships⁴, suggesting that – despite the efforts of WPCI – regulations remain an important driver influencing adoption of OPS. Similarly, the EU and California have banned the use of heavy fuel oil in ports, and since November 2011, the EU has allowed Germany and Sweden to reduce the rate of electricity tax for electricity used in OPS systems⁵. Such measures have increased the cost-efficiency of using OPS in these contexts; yet OPS has not yet been widely adopted elsewhere.

Discussion

As we have seen, the WPCD represented a statement of responsibility and identified themes, approaches and actions to guide ports towards lower emissions of greenhouse gases and air pollutants, and in general terms, more sustainable development. The WPCI is a voluntary initiative which recognises and illustrates the need for interdisciplinary collaboration between stakeholders and across sectoral boundaries to reduce negative environmental impacts of shipping and related activities. WPCI has developed and in some cases extended the scope of the WPCD, and helped influence the adoption of new practices in some ports and by stakeholders including shipping companies.

Nonetheless, WPCI appears to focus more on some parts of the WPCD (e.g. ocean-going shipping and terminal operations) whilst focusing less on other issues, such as hinterland transport and supply chains or renewable energy. Of course, this is not true for all participating ports, but rather a general observation concerning WPCI activities based on the available information about developments in the six years since WPCD. Moreover, the presence of first-mover problems was a driver influencing the entire process. The WPCD noted the need for individual and collective action and recommended approaches that avoid

³ <http://www.ops.wpci.nl/Nieuws-Overview/> (accessed 7 May 2014)

⁴ <http://www.imo.org/OurWork/Environment/PollutionPrevention/SpecialAreasUnderMARPOL/Pages/Default.aspx> (accessed 7 May 2014)

⁵ <http://www.ops.wpci.nl/costs/operational-costs/>

“one-size fits all” solutions or technological lock-in (an issue discussed in more detail in e.g. Gilbert, 2014; Corvellec et al., 2013).

In practice, there are examples of individual and collective action, although these appear to be concentrated in particular geographic clusters located in or around MARPOL Annex VI ECAs. It was, as previously noted and recognised in the WPCD, always anticipated that some port authorities would be more engaged than others in WPCI. However, there appears to be a core group of active WPCI members, whilst other WPCD ports appear less engaged. This tends to reinforce the claims of Acuto (2013) concerning the internal political geography of TMNs such as C40, and highlights an apparent “core-periphery” challenge facing the WPCI.

This outcome was considered a strong possibility during the development of WPCD. Indeed, it was partly for this reason that the Declaration’s contents - and those of the WPCI - were broad-ranging. WPCD aimed to inspire a myriad of actions of varying scale, diversely spread across the globe, which when implemented - individually and collectively – would generate significant benefits in terms of reduced emissions, costs, etc. However, WPCD anticipated that C40-CCI would play a role as CIO, facilitating partnerships and brokering agreements with stakeholders, to help overcome some of the obstacles to collaborative or joint actions. Moreover, C40-CCI would encourage city-to-city exchanges and learning and disseminate information widely within and outside its networks.

In practice, this does not appear to have occurred in a substantive manner and, in the absence of a CIO, the WPCI (and IAPH) has itself had to assume this role. This is somewhat problematic, not least because WPCI member ports may have limited resources (both in terms of resources or capacities) to engage in often extensive processes of consensus-building and co-development, but also because C40-CCI provided independent, cost-free services on a global basis with direct links to decision-making processes in the C40 cities. In the absence of such a CIO, it appears as if the WPCI has largely focused on developing the WPCD to achieve transitions within shipping and port operations, that is to say, within and between individual ports and involving actors operating *within* the traditional ports and shipping industry.

Whilst this is commendable, WPCD envisaged a wider process of engagement and action involving diverse groups of other stakeholders and addressing issues of wider scope (e.g. hinterland/inland/upstream transportation; energy systems; industries; and port-city integration). In other words, WPCD envisaged ports adopting both inside-out and outside-in approaches to reducing greenhouse gas emissions and local air pollution, in order to enable deep and wide system changes both within the port, port-city and its surrounding regions, and also between ports across geographical divides.

This paper thus considers the WPCI to have achieved mixed results. A core group of active ports are achieving positive results and doing commendable work in particular geographic clusters. It is desirable that (a) more WPCI ports adopt these approaches and (b) more ports

subscribe to the WPCD principles and actively work in WPCI. At the same time, there is significant potential for current WPCI ports to “unfold” their approaches and work from the outside-in, by involving diverse groups of stakeholders in efforts to reduce emissions. There are examples of good practice concerning such work (ESPO, 2013; FNAU, 2011) and opportunities to benefit from collaboration or synergies with other initiatives (e.g. PPCAC, RETE) or projects (e.g. EPIC). New such initiatives are emerging, and sub-global governance structures are perceived as increasingly desirable (EPA, 2014; Gilbert and Bows, 2012).

The presence of an active and committed CIO could potentially assist such processes, either locally (as in the case of RCI) or regionally/globally (through municipal networks or similar organisations). As noted earlier, TMNs are considered to thrive in regional contexts where political support is strong (Giest and Howlett, 2013), implying there is potential to consolidate and diversify ports’ work for sustainable development in the near future. In the case of WPCI, C40 could potentially increase its engagement and attempt to stimulate some currently inactive WPCD signatories, or other C40 port cities, to engage more⁶. It is clear that - with engaged cities and a strong CIO - the WPCD was developed and WPCI launched; it is also striking that, in the subsequent years, both cities and CIO have been prominent by their invisibility.

Conclusions

The WPCI is one of various initiatives aiming to reduce greenhouse gas emissions and other negative environmental impacts of maritime transport both at sea, in ports, port cities and their hinterlands. Such network governance initiatives appear to be essential and important processes in a world of multi-level governance. The WPCD and WPCI recognise that ports have a responsibility to act, whilst accepting the need to work collaboratively both within and between sectors, as ports operate within the context of a wider economy and many of the most significant environmental impacts of ports occur outside of the territorial boundaries of cities or even nations.

A series of interacting measures across multiple sectors is required and, in the current context, ports can be more creative in their use of the instruments they have (e.g. leasing agreements) and make use of frameworks such as WPCI to guide their strategic work to enable collaborations and synergies. Nonetheless, despite the potential to involve more ports and help stimulate a wider range of actions within WPCI, the adoption of an outside-in perspective (both in ports and for WPCI as an initiative) appears challenging in the absence of a strong and committed CIO who can act as an intermediary and liaise with diverse groups of stakeholders. It is quite possible that other initiatives face a similar challenge.

⁶ Indeed, C40 continues to work with many of the WPCI cities through the Connecting Delta Cities network, focusing on climate change adaptation (www.deltacities.com/).

Thus, this paper argues there is considerable potential to (a) increase links and synergies between existing initiatives within the ports sector; (b) increase the links and levels of coordination between port sector organisations such as IAPH, and TMNs such as C40 or ICLEI; (c) systematically involve key stakeholders throughout processes (e.g. deeper involvement of cargo owners in ESI) to ensure maximum leverage of initiatives; and (d) increase the scope, range and number of activities aiming to reduce emissions from shipping-related activities on land and at sea. By doing so, cities will be able to play a more active and influential role in the maritime sector, and - through collaborative approaches - help ensure individual ports are not acting in isolation, but rather as part of a wider movement of regional or global port cities.

Of course, it is relatively easy to make such statements, yet much harder to translate words into sustained action. As much as this paper highlights the potential of a more integrative, systemic interaction between ports and cities through or in partnership with TMNs, it should be noted that although many port cities are currently active in TMNs, many TMNs have not addressed port issues in a structured way. Thus, there is considerable scope to improve the links between ports and cities, and thereby develop the role of cities and TMNs in reducing the climate and environmental impacts of shipping.

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