



# Capacities for Transformative Climate Governance in New York City

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## 6.1 INTRODUCTION

In this chapter, we revisit the research done in New York City (NYC) earlier in 2015 and 2016. We do that in a period that the United States (US) Government has officially withdrawn from the Paris Agreement and a critical mass of American cities remains not only committed to climate action but declaring climate emergency. In this context,

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understanding what can move cities to decisive action for dealing with climate change impacts is paramount and timelier than ever. Despite the zealous narrative of urban opportunities for addressing global challenges such as climate change, little is known about whether and how climate action in cities is indeed living up to these expectations. So far, even the most ambitious efforts to address climate change in cities seem to be countered by the negative impacts of urbanisation, unsustainable production and consumption, pollution and inequality (Ürge-Vorsatz et al. 2018; Rink et al. 2018; Roberts et al. 2018).

One way forward is to engage with new knowledge, evaluate what are the ‘policy hurdles’ or ‘policy gaps’ and invest in establishing capacities to move forward. We explore how the current activities of NYC contribute adequate means and are supported through effective institutions to deal with climate change impacts using the lens of capacities. Introducing a new lens, a new conceptual framework such as the capacities framework, allows for a new understanding of dynamics, actors and their actions and how they are mobilised and interact in making new governance systems for climate change action. This emerging research community investigates how urban phenomena and processes, patterns and pathways of transformation occur, unfold and are accelerated, casting an eye on dynamics and drivers. It is stimulated and triggered by the ‘urban’ in its local and global scale, and we find our research strongly inspired by this community.

Providing research insights to cities that are on the forefront of climate action is vital so as to further understand how their actions play out for responding to climate change and for making a compelling case for continuation in investments for climate adaptation. Even in cities that are leading with ambitious climate agendas, action for climate change frequently draws the short straw when competing with ‘pressing’ urban needs and it relies on easy investments in low-hanging fruits that do not fundamentally question existing behaviours and interests (Ürge-Vorsatz

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et al. 2018; Gouldson et al. 2015). In the USA, recent developments of the government's agenda for climate change have found cities operating in an 'institutional void' and at the same time, on the forefront of climate action that works. Think that 'in June 2018, at the start of the hurricane season, the Department of Homeland Security diverted 10 Million dollars from the Federal Emergency Management Agency, which is tasked with responding to natural disasters at home, and moved it over to Immigration and Customs Enforcement, to pay for migrant detention' (Klein 2019, p. 49).

Cities around the world have become key players in addressing climate change and pressing sustainability challenges. Diverse governance initiatives in cities to address climate change have started to proliferate in the 1990s and often go above and beyond the ambitions set by their respective nation states (van der Heijden 2018; Amundsen et al. 2018). However, there is a gap in detailed knowledge about the conditions manifest in urban climate governance that contributes to sustainable and resilient cities in the long-term, as well as how to create such conditions to overcome the barriers that are entrenched in existing urban governance systems.

This chapter builds on the notion of transformative climate governance to create an understanding about urban climate governance as part of the quest for urban transformations towards sustainability and resilience (Hölscher and Frantzeskaki, Chapter 1, this volume). Transformative climate governance means that climate mitigation and adaptation are not any more isolated objectives, but integrated within the need for radical structural changes in urban systems to create and maintain environmental integrity, social equity, human well-being and economic feasibility on the long-term. This implies a fundamental change of urban governance systems to take more seriously the complex, uncertain and contested dynamics of urban transformations under climate change that unfold across scales and sectors (Rink et al. 2018; Romero-Lankao et al. 2018).

Specifically, in this chapter we apply the framework of transformative governance capacities (Hölscher, Chapter 2, this volume) to explain whether and how climate governance efforts in NYC in the USA have created new governance capacities. NYC is an example of a city providing global leadership for climate change adaptation and mitigation, sustainability and resilience (Solecki et al. 2016; Forgione et al. 2016; McPhearson et al. 2014; McPhearson and Wijsman 2017; Depietri and

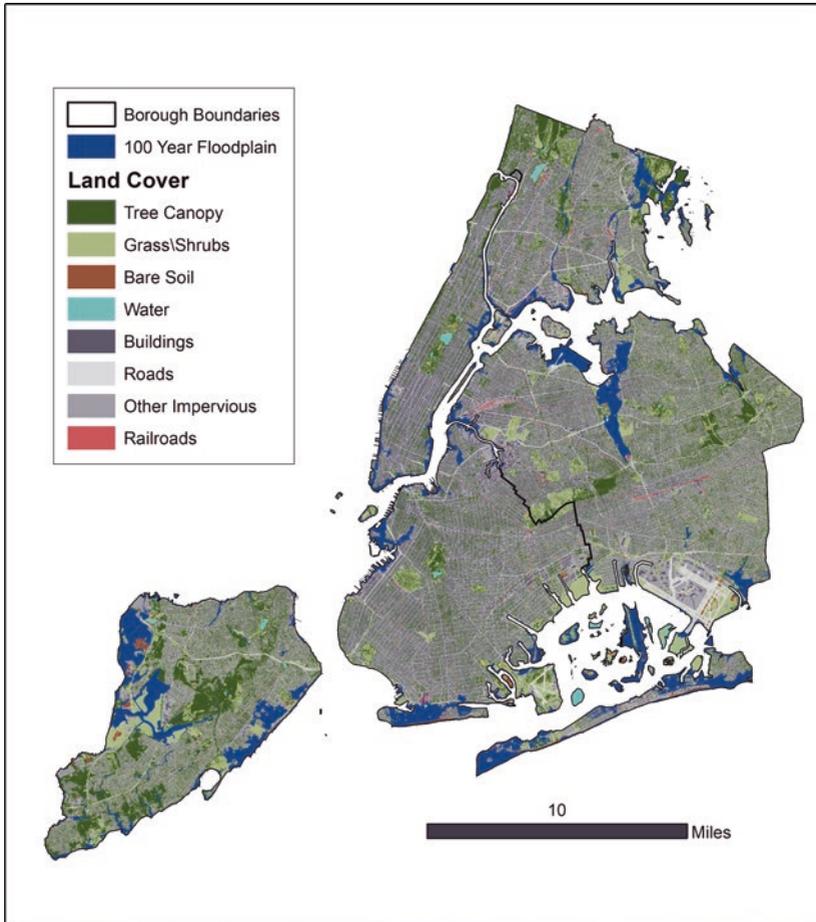
McPhearson 2018). Our case study approach is comprehensive: we looked at the integration of climate change mitigation and adaptation in multiple policy sectors (water, transport, energy, health, buildings, parks and recreation, environmental protection, emergency management and housing).

Extending the work by Hölscher et al. (2019), we first introduce the climate governance landscape in NYC (Sect. 6.2). We then present the analysis of whether, what type and how capacities for transformative climate governance are developing in NYC (Sect. 6.3). In our discussion section, we reflect on the insights that the capacities framework offers to understand the development of climate governance in NYC in terms of the enabling conditions, by whom and how they were created, as well as what are key opportunities and capacity gaps and barriers (Sect. 6.4). We conclude by providing a future outlook on the applicability of the framework and the implications for transforming urban climate governance (Sect. 6.5).

## 6.2 THE CLIMATE GOVERNANCE LANDSCAPE IN NEW YORK CITY

NYC is a delta and port city and an important global economic centre (Fig. 6.1). It is a diverse city with five boroughs, 59 community districts and hundreds of neighbourhoods, an estimated population of over 8 Million people speaking 174 different languages (Jabareen 2015). It has recently withstood the economic downturn of the late 2000s and is celebrated as one of the most sustainable cities worldwide. NYC is still among the largest greenhouse gases (GHG) emitting city and faces air pollution, scarce affordable housing, a growing population, rising income inequalities and ageing infrastructures.

Climate change impacts are likely to worsen these issues and threaten well-being and liveability (Fig. 6.1). Expected climate impacts in NYC include rising sea levels, increasing severity of heavy downpours and storms, flooding, heatwaves, droughts and extreme wind events (NPCC 2015). The city has already experienced climate extremes, most notably tropical storm Irene in 2011 and Hurricane Sandy's landfall in October 2012. Sandy caused an estimated \$19 billion in damage and 43 deaths, flooded sewer systems, roads and subway stations, disrupted vital transport networks and power and water supply (NYC 2013). 6500 patients



**Fig. 6.1** Land cover and Flooding in New York City. Land cover data elaborated in 2017 by the Department of Information Technology and Telecommunication of New York City. Floodplain data refers to the 100-year floodplain used to define the currently effective Special Flood Hazard Area, mapped by the Federal Emergency Management, last updated in 2007

were evacuated from hospitals and nursing homes, and more than one million children were unable to attend school for a week (NYC 2013; Adams-Schoen 2014a). Sandy especially underscored the vulnerability of low-income, coastal communities, which have been severely affected

while struggling with rising rents, increasing depth and delays in repairs (Cowan and Hogan 2014).

Since the mid-2000s, the NYC government has successively developed and expanded its approach to address climate change, sustainability and resilience, and engaging diverse actors in the process. In the following sections, we first describe the evolution of climate governance (Sect. 6.2.1) and initiatives in NYC (Sect. 6.2.2), and then, the key actors involved (Sect. 6.2.3).

### 6.2.1 *The Evolution of Climate Governance in New York City*

The city government's approach to climate governance started with integrated climate mitigation and sustainability goals in 2007. This focus was successively expanded towards climate adaptation and broader resilience pursuits. Mayor Bloomberg (2002–2014) commissioned the cross-cutting sustainability and climate mitigation plan PlaNYC, which was released in 2007 and tied goals such as emissions reductions, improving air quality, managing population growth, modernising infrastructure to the city's long-term quality and global competitiveness (NYC 2007). In response to extreme weather events, the 2011 update of PlaNYC included goals and initiatives on heat stress reduction, storm water management and infrastructure protection (NYC 2011). After Hurricane Sandy, the public–private Special Initiative for Rebuilding and Resiliency (SIRR) was convened to develop a programme for reducing the city's vulnerability to coastal flooding and storm surge and for rebuilding communities affected by Sandy (NYC 2013). When Mayor de Blasio took office in 2014, he introduced affordable housing and social equity as top priorities in the next PlaNYC update, called OneNYC (NYC 2015).

The 2007 PlaNYC 2030 plan integrates sustainability, climate change, population growth and ageing infrastructure with the city's long-term quality and global competitiveness and lays out 126 initiatives to achieve these goals, including investments green infrastructure, including energy, transport and housing and the establishment of the Mayor's Office of Long-term Planning and Sustainability to oversee implementation. In 2011, the city updated the report with new initiatives that placed greater emphasis on climate resilience in response to changes in weather that were already taking place (NYC 2011). PlaNYC was initially based principally on emission reduction and improvements of air quality, by focusing especially on buildings, and failed to prepare the city and its

infrastructure for (recovering from) the disasters that could stem from climate change. For example, rather than proposing infrastructure design or development projects along the city's vulnerable 570 miles of coastal zone, it proposes to intensify development wherever possible, in waterfront and other areas without considering the risks posed by climate change (Jabareen 2015). The main approach to climate adaptation has been on institutions: in 2008, with funding provided by the Rockefeller Foundation, Mayor Bloomberg assembled the New York City Panel on Climate Change (NPCC), which is an advisory body of climate science, legal and risk management specialists to provide projections and technical analysis of climate change risks based on scaling down IPCC's global climate models.

In the wake of Hurricane Sandy, which has revealed the city's vulnerabilities to climate impacts such as flooding and sea level rise, in December 2012, the city convened the Special Initiative for Rebuilding and Resiliency (SIRR) as part of PlaNYC to address long-term climate change resilience. In June 2013, SIRR released 'A Stronger, More Resilient New York' that is based on the second NPCC (2013) and other risk assessments (NYC 2013). The plan outlines a 10-year, over \$20 billion programme with 257 initiatives that seek to reduce the city's vulnerability to coastal flooding and storm surge and to rebuild communities affected by Sandy (NYC 2013). About 80% of the plan was to go to repairing homes and streets damaged by Sandy, retrofitting hospitals and nursing homes, elevating electrical infrastructure, improving ferry and subway systems and fixing leaky drinking water systems. The rest would go to adapt and protect NYC from storm surges and flooding through an increase in sand nourishment, construction of large-scale storm surge barriers, flood-proofing basements but also insurance, better forecasting and development of special evacuation plans. The coastal protection chapter of 'A Stronger, More Resilient New York' reviews and rejects the 'silver bullet' of a massive, harbour-wide storm surge barrier, and instead proposes a broad, diverse range of discrete coastal protection measures inspired by the historic natural features that once protected the coastline throughout the city or by combinations of traditional and newly developed technologies. A focus was on ensuring that the subway, transit, sewer and water, healthcare, energy and food distribution systems would continue to function for the city's inhabitants well into the future.

When Mayor Bill de Blasio took office in New York City in 2014, he continued the sustainability and climate change legacy of his predecessor

by linking sustainability and climate resilience to his top goal of poverty reduction. In April 2014, the city committed to enhancing and expanding the resiliency and housing recovery programmes with the release of ‘One New York: The Plan for a Strong and Just City’, a comprehensive plan for a sustainable and resilient city that encompasses and builds on the social, economic and environmental goals and initiatives under the previous plans (NYC 2015). Improved air quality and the maintenance of the city’s world-class water system remain priorities, as does the implementation of the \$20 billion shoreline resiliency plan developed after Hurricane Sandy. The resilience plan adopts the approach from the 100 Resilient Cities initiative of the Rockefeller Foundation (of which NYC is a member city), recognising the need to address acute shocks such as superstorms, blackouts, heatwaves as well as ongoing stresses including high unemployment, ageing infrastructure and growing inequality in securing the city’s growth and sustainability. OneNYC seeks to protect the city from climate change, to adapt to mitigate most climate change impacts and to enable quick recovery when defences are breached, by strengthening coastal defences, upgrading buildings, protecting infrastructure and critical services and making neighbourhoods and businesses safer and more vibrant. In addition, the 2015 One City: Built to Last programme established the city’s commitment to cut its GHG emissions 80% by 2050 focusing on reductions in buildings.

### 6.2.2 *Climate Governance Initiatives and Actions in New York City*

These efforts resulted in diverse measures, including green infrastructure projects and designs, regulations (e.g. on energy efficiency in buildings) and community resilience building. The main focus of climate governance initiatives in NYC is on developing knowledge, measuring progress with stringent indicators, amending building codes, rules and regulations, implementing projects on city-owned properties, communication and committing a variety of actors in developing and implementing initiatives. Many initiatives outlined in PlaNYC and OneNYC remained the same apart from the shift from emphasising sustainability in relation to a more energy-efficient and climate-resilient city with cleaner air, renewable energy sources and water and beautiful public spaces could help the city attract wealth and business towards the benefits of sustainability and climate resilience for working families in the outer boroughs. A major

focus of the programmes' GHG reduction remains on increasing the energy efficiency of the city's built environment, which is now framed as an extension of the city-wide focus on income inequality. In the implementation processes, they collaborate with city departments, regional and national governmental bodies, knowledge institutes, businesses and community organisations.

The target area for reducing GHG emissions is on buildings. The city has implemented a Greener Greater Buildings Plan (NYC 2009), Clean Heat programme, raised awareness of building owners and tenants about energy use and retrofitting through for example GreeNYC's marketing campaigns and the launch of the Green Light New York (GLNY) education centre for building professionals. NYC also launched an ambitious suite of policies to reduce energy use in large buildings, passed regulations to phase out highly polluting fuel oil and passed the city's Zone Green Zoning Text amendment. In 2008, the New York City Green Codes Task Force was convened to review the current building and construction codes and make recommendations on how they could be amended to promote more sustainable practices.

Beyond code and law enforcement, the Department of Buildings (DOB) administers New York State's Solar Property Tax Abatement Program and Green Roof Tax Abatement Program, which helps eligible property owners offset the cost of their photovoltaic and green roof installations. A report on the energy savings potential of retrofitting advanced lighting controls in office buildings was conducted and released in January 2013, resulting in two demonstration projects for advanced lighting systems. The Carbon Challenge seeks to encourage businesses, universities and other private organisations to cut GHG emissions. In April 2015, the city administration, HUD and the New York City Housing Authority (NYCHA) announced the launch of the competitive Energy Performance Contracts, a programme to reduce GHG emissions from buildings.

To reduce emissions from transport and improve air quality, the administration operates now over 600 plug in electric vehicles and 153 charging station and has installed 300 miles of bike lanes. In an effort to create consumer engagement, GreeNYC developed and produced signage to alert drivers to locations of charging stations as well as bumper stickers to alert drivers to the city's growing fleet of electric vehicles. The city is also testing electric taxis. Together with the Department of Parks and Recreation (DPR) and the New York City Economic Development

Corporation (NYCEDC), PlaNYC develops and maintains parks and public spaces throughout the city. DPR is now transitioning from the design and construction of green streets to retrofitting parkland to better manage storm water. Vision Zero has expanded the transportation focus on safety, health, well-being and economic prosperity (NYC 2014b).

In terms of climate adaptation, the city government focuses on green infrastructure investments to improve infiltration and detention techniques. The NYC green infrastructure plan (NYC 2010) has been released as part of PlaNYC 2030 in 2010 and involves the implementation of green roofs, cool roofs and swales, cost-effective grey infrastructure and the optimisation of the existing wastewater system. In partnership with NYC Service, the city established NYC CoolRoofs, which helps building owners coat their roofs with a reflective material. Part of the infrastructure plan, in combination with the Parks and Public Space plan, is the Million Trees programme and the design of the Brooklyn Bridge Park and the Halets Coastal Defence. The Million Trees programme was a partnership between the New York Restoration Project (NYRP), a NGO and PlaNYC to plant and care for one million new trees throughout the cities' five boroughs by 2015. In 2013, the Department of Environmental Protection (DEP) expanded the city system of Bluebelt wetlands in southeast Queens and constructed more than 200 bioswales. In addition, climate adaptation includes initiatives to strengthen coastal defences, fortify crucial infrastructure and make buildings more resilient by changing building codes and reaching out to building owners and tenants.

The devastation of Hurricane Sandy in late 2012 has boosted the attention on climate adaptation needs in NYC and has drawn in several new funding sources and new initiatives especially for rebuilding and future protection. As part of the city's recovery from Sandy, Build it Back, run by the Mayor's Office of Housing Recovery Operations under PlaNYC and supported by federal funding, was established in 2013 to oversee housing recovery in NYC. Build it Back developed several programmes to provide financial or construction assistance for rebuilding of destroyed or damaged houses and cover out-of-pocket expenses for homeowners and businesses incurred because of the Storm. However, there have been delays and inefficiencies in handing out financial assistance and in a confusing application process. Under the de Blasio administration, the plan One City, Rebuilding Together (NYC 2014c) implemented critical improvements, including expedited reimbursement

checks and more construction starts, to the Build it Back programme and expanded economic opportunities for residents impacted by Sandy, such as the expansion of Sandy Recovery Workforce, and developing a pipeline for pre-apprenticeship programmes in the construction trades.

However, the implementation of projects takes time and not all of the required funding is yet secured. While some parts of the city are now better prepared to withstand extreme events and notable progress has been made in restoring damaged beaches and boardwalks along the New Jersey shore and in the New York's Rockaways as well as flood-proofing big office buildings in flood zones, it was especially harder for residential compared to commercial areas to recover from Sandy. Income inequality is another factor contributing to struggling recovery, and the storm had a worse impact on personal finances of low- and middle-income people. Apart from the delays in financial support provided in the Build It Back programme, many projects to rebuild and adapt the city to climate change are still in the initial stages of implementation. Bay communities like Jamaica Bay, where low- and middle-income people live, still find it much harder to recover from Sandy. They are still vulnerable to flooding and are also vulnerable from a socio-economic perspective. In contrast, in lower Manhattan, the financial district and the hospitals are back up and running. Complex rules, multiple layers of government and other stakeholders and high stakes contributed to delay and lag in helping displaced vulnerable populations to rebuild (Adams-Schoen 2014b).

The Federal Department of Housing and Urban Development (HUD) initiated the Rebuild-by-Design (RbD) competition to develop and implement innovative projects for rebuilding, community resilience and sustainability in the region affected by Sandy. This is resulted in three innovative projects located in NYC: the BIG U integrates green infrastructure and liveability for flood protection in Lower Manhattan, the Living Breakwaters project envisions living reefs along Staten Island's south shore to accommodate flooding, and the Hunts Point Lifelines project in the Bronx integrates flood protection, recreation, health, local livelihood development and emergency management (RbD 2016; Grannis et al. 2016).

### 6.2.3 *Key Actors in Climate Governance in New York City*

A diverse set of individual actors, organisations and networks is involved in shaping climate governance in NYC, spearheaded by the city government's ambitious strategies and actions. While the city government

takes up a coordination role, develops long-term strategies, stimulates knowledge generation, enacts changes to regulations and implements projects. Especially the cross-cutting Mayor's Offices of Sustainability (MOS) and Recovery and Resiliency (ORR) spearhead the city government's efforts on climate change, resilience and sustainability. The city government works closely together with business networks (e.g. the NYC Waterfront Alliance, Urban Green Council), sets up, oversees and collaborates in cross-sectoral and cross-scale knowledge platforms and partnerships, and participates in international city networks (e.g. C40, 100 Resilient Cities [100RC]). NGOs and community organisations are mostly informally involved, engaging in knowledge development, community organising, advocacy and project implementation. There are also diverse actors and actor group that the city government does not collaborate with, yet which nevertheless engage in efforts to address climate change in the city.

The following outlines the key actor (groups/organisations) with regard to governmental bodies at different scales, businesses, community groups, NGOs, research and knowledge institutes and network platforms. Given the multifarious number of actors and organisations involved in climate governance in NYC, we do not claim comprehensiveness, but focus on the main organisations included in this research.

### **a. Local governmental bodies**

While the MOS and ORR spearhead the city government's activities, multiple city departments are involved in developing plans and agendas as well. Here, we only name few of these—others include the Department of Environmental Protection (DEP), Department of Parks and Recreation (DPR), the Department of Buildings (DOB), the Department of Health and Mental Hygiene (DHMH) and the Department of Transportation (DOT).

#### ***The Mayor's Office of Sustainability (MOS) and the Mayor's Office of Recovery and Resiliency (ORR)***

The cross-cutting Mayor's Offices of Sustainability (MOS) and Recovery and Resiliency (ORR) spearhead the city government's efforts on climate change, resilience and sustainability. They are charged with knowledge and strategy development, fostering partnerships and enlisting

in and overseeing projects' implementation. Multiple city departments contribute to the city's overarching strategies and goals and put in place departmental sustainability and resilience offices and strategies.

### *New York City Department of City Planning*

The New York City Department of City Planning revised the city's Waterfront Revitalization Program (WRP) that is the city's principal coastal zone management tool to include climate resilience. It proposes to use the waterways as part of a larger strategy to make the city more sustainable and resilient. Specifically, the plan proposes to use storm water management, and protection and restoration of wetlands, beaches and natural shorelines to improve the ecological health of its water bodies. The plan recognises the connection between these measures and protection of coastal neighbourhoods from flooding and storm surges. The Department of City Planning also produced two reports to help New York City, and other urban waterfront communities improve their resilience to coastal flood risks, *Designing for Flood Risk and Urban Waterfront Adaptive Strategies*. *Designing for Flood Risk* identifies design principles to guide flood-resistant construction, provides an overview of regulatory requirements for construction in flood zones under the National Flood Insurance Program, recommends changes to zoning to enable more versatile and desirable design solutions for flood-resistant construction. *Urban Waterfront Adaptive Strategies* identifies and analyses potential adaptive strategies, including interventions inland, at the shoreline and in the water. Both reports informed *A Stronger, More Resilient New York*.

### *New York City Department of Emergency Management*

In January 2014, the NYC Department of Emergency Management, in partnership with the Department of City Planning, released the 2014 New York City Hazard Mitigation Plan (NYC 2014a) that identifies the range of hazards facing the city and strategies to reduce the effects of these hazards.

## **b. Research institutions and partnerships**

### *New York City Panel on Climate Change (NPCC)*

Mayor Bloomberg set up the NYC Panel on Climate Change (NPCC) under PlaNYC to report on climate risks and adaptation needs. It

comprises academic and private sector experts in climate science, infrastructure, social science and risk management. The NPCC released a set of climate projections specific to New York City in 2009 (NPCC 2009), concluding that the city must make substantial preparations for climate-related changes. It also established a risk management framework for the city's critical infrastructure throughout the extended metropolitan region under climate change (Bloomberg et al. 2010). In September 2012, the NPCC was established as an ongoing body that is by law required to meet at least twice a year to review scientific data on climate change, recommend projections for the 2020s, 2050s and 2080s within one year of the publication of the IPCC Assessment Reports, recommend a framework for stakeholders to incorporate climate change projections into their planning processes, and advise the City's Office of Long-Term Planning and Sustainability on a communications strategy related to climate science. Following Hurricane Sandy, the city convened the Second New York City Panel on Climate Change (NPCC) in January 2013 to provide up-to-date scientific information and analyses on climate risks for the creation of 'A Stronger, More Resilient New York' (NYC 2013).

### *Science and Resilience Institute at Jamaica Bay (SRI@JB)*

The Science and Resilience Institute at Jamaica Bay (SRI@JB) has been initiated in 2011 by the Mayor of New York City and the Secretary of Interior to restore and revitalise Jamaica Bay and Rockaway Park. In 2012, the City of New York and the National Park Service came together around a unified vision of Jamaica Bay as an urban park that included the integration of research from across the natural and social sciences. Part of this was commitment to a partnership with the research institutes to set up the Institute. The City University of New York leads the institute's research consortium of academic and non-profit organisations. The SRI@JB is aligned with the City of New York and National Park Service's vision for a revitalised, restored Jamaica Bay. It is a research centre that performs different functions to promote the understanding of resilience in urban ecosystems and adjacent communities and engage government and community stakeholders in the translation of that knowledge towards a more resilient system. It conducts research to understand the temporal nature and robustness of the resilience of Jamaica Bay, New York Harbor, Hudson Raritan Estuary and Gateway National Recreation Area, to develop models for studying the fundamental nature of resilient systems and to determine how best to manage ecosystems to ensure

resilience and sustainability. Secondly, the institute provides technical assistance and guidance to the institute's governmental partners, including the National Park Service, New York City Parks and the New York City Department of Environmental Protection. Finally, the SRI@JB serves as a node for education and knowledge dissemination on processes that affect resilience and contribute to the changes in the urban ecosystem as well as for engaging the communities of the bay. The activities of the institute are funded by, for example, the Rockefeller Foundation and the Department of the Interior's Hurricane Sandy Mitigation Funding.

### **c. Regional and national governmental bodies**

In the post-disaster responses to Sandy, the city has acted within the larger context of federal and state government programmes and policies instituted at higher territorial and jurisdictional scales in relation to the city (McArdle 2014). These include the New York State 2100 Commission's preliminary report addressing ideas to improve the resilience of New York State's infrastructure (NYS 2100 Commission 2013) and the Hurricane Sandy Rebuilding Task Force that promotes regional coordination to infrastructure development and strategies for enhancing the ability of state and local governments to develop long-term approaches to recovery and resilience following the storm (Hurricane Sandy Rebuilding Task Force 2013). These collaborations contribute to shaping the city's efforts both to mitigate and adapt to the impact of climate change by (1) providing financial assistance, technical expertise and crucial data, (2) approving city proposals that are linked to that assistance and (3) serving as a source of policy guidance (McArdle 2014). For example, the city has had access to federal funding including grants from the Federal Department of Housing and Urban Development (HUD), the Federal Emergency Management Agency (FEMA), Small Business Administration Disaster Loans and National Flood Insurance Program disbursements. At the same time, the city needs to cooperate with federal and state agencies to achieve certain reforms (McArdle 2014). To implement 'A Stronger, More Resilient New York', the city needs assistance and funding from the US Army Corps of Engineers to implement various beach re-nourishment and floodgate repair projects, review by FEMA of flood-related building standards, and FEMA's authorisation of a more flexible building classification in the National Flood Insurance Program (NYC 2013). To secure changes in price gouging laws and

laws regulating gasoline supply contracts, the city must call on New York State to adopt legislation.

In response to Hurricane Sandy's devastation in the Northeast United States and supported by federal funding, US Department of Housing and Urban Development (HUD) Secretary Donovan launched Rebuild-by-Design in June 2013 together with the Institute for Public Knowledge at NYU, the Municipal Art Society, the Regional Plan Association and the Van Alen Institute. The design competition sought innovative, implementable solutions to respond to the region's most complex needs. Placing substantial collaboration between designers, researchers, community members and government officials at the heart of an iterative design process provoked a paradigm shift in the way planners and governments approach disaster response and emergency preparedness. Several of the winning designs are to be implemented in New York City. The Big U foresees the instalment of a 10-mile system of berms and other protections around Manhattan. Another winning design, Living Breakwaters, focuses on Staten Island to develop living reefs along the island's South Shore to protect against future flooding. Hunts Point in the Bronx is another area designated for protection in the winning designs. Rebuild-by-Design seeks to keep communities connected to the implementation of the funded designs, explores changes needed in policy, regulation, and operations, and researches the best practices in developing resilience. Based on its success, Rebuild-by-Design has been used as a model for other processes.

#### **d. Public-private partnerships**

There are a variety of public-private partnerships, including regional and national knowledge programmes, research partnerships, research-industry collaborations and private stakeholder platforms, participate in the generation of knowledge, the formulation of strategies and agendas and the development of innovative solutions. New Jersey-New York Harbor Estuary Program (HEP) is a federally authorised programme that brings together federal, state and local agencies and citizen groups to define common goals and priorities for action around the management of the shared harbour and estuary. The NYC Green Codes Task Force brings together key actor groups (e.g. large homeowner associations) to make recommendations for the building and construction code changes. The Metropolitan Waterfront Alliance is an independent

organisation bringing together more than 1000 activists, businesses, foundations and civic organisations with the goal to make the region's waterways and shoreline accessible, sustainable and resilient.

Climate governance in NYC is also marked by the city's participation in international networks such as Connecting Delta Cities, the C40 Cities Climate Leadership Group, 100 Resilient Cities and, most recently, the Carbon Neutral Cities Alliance that promote knowledge sharing, and identifying opportunities to accelerate best practices through collaboration.

### **e. Non-profit and community-based organisations**

Non-profit and community-based organisations contribute to generating knowledge, raising awareness and criticising existing policies and business-as-usual. In NYC, there is a strong culture of community-based organisation. The role of this type of organisations was especially illustrated in NYC, where neighbourhoods with strong community organisations, such as Redhook, benefited from their substantial support in the aftermath of Hurricane Sandy when local, state and federal agencies struggled with providing relief. The New York Restoration Project (NYRP) and New Yorkers for Parks are research and advocacy organisations dedicated to transforming open space into greener and more sustainable spaces. The Municipal Art Society of NYC is an advocacy organisation that mobilises support for urgent city matters—it also acts as a facilitator of community-based climate resilience processes. The NYC Environmental Justice Alliance (EJA) is a city-wide membership network linking grassroots organisations from low-income neighbourhoods and communities of colour in the struggle for environmental justice. The North Star Fund brings together a community to address social justice and by mobilising donors for justice initiatives. The fund was involved in research on the aftermath of hurricane Sandy in Redhook.

## **6.3 CAPACITIES FOR TRANSFORMATIVE CLIMATE GOVERNANCE IN NEW YORK CITY**

In the following, we show how the capacities framework helps to understand whether and how new conditions for delivering different functions of urban transformation governance are developing. In NYC, a

long-term, systemic, collaborative and experimental approach to climate governance is emerging that crosses multiple policy sectors and domains (e.g. transport, energy, health, justice), involves multiple actors and facilitates innovative solutions. This has helped to move beyond single climate innovation programmes or solutions and to address climate mitigation and adaptation in the context of broader urban transformation processes. We call this a starting approach for transformative climate governance, which itself acts transformative, because it challenges existing governance regimes in NYC that tend to make decisions in sectoral siloes (Hölscher 2019).

Different data were collected for the study (Hölscher et al. 2019). We performed desk research to review policy documents (strategies, visions and programmes from 2007 to 2017, including, e.g., NYC 2007, 2010, 2015), media articles and scientific papers about climate and sustainability governance in NYC. From October 2015 to January 2016, we conducted 38 semi-structured and in-person interviews with climate governance actors in NYC. The interviewees included policy officers from the city government ( $n=12$ ), regional ( $n=4$ ) and national ( $n=2$ ) governmental bodies, as well as representatives from knowledge institutes and partnerships ( $n=7$ ), local businesses, architects and stakeholder platforms ( $n=6$ ), NGOs and community-based organisations ( $n=7$ ). We covered different sectors: water, transport, energy, health, buildings, parks and recreation, environmental protection, emergency management and housing.

The collected data was analysed in reference to the capacities framework (Hölscher, Chapter 2, this volume). We outline how each of the capacity functions—stewarding, unlocking, transforming and orchestrating—is addressed and delivered in NYC and identify the key conditions that deliver the respective function, the activities by which these have been created and capacity gaps and challenges. A detailed overview of results, including how activities were related to sub-functions and conditions, is given in Appendix A.

### 6.3.1 *Stewarding Capacity*

The main stewarding objectives of climate governance policies, plans and actions in NYC are the protection and recovery of the population and infrastructure from climate impacts like flooding, storms and heat-waves while contributing to liveability, economic development and social

equity. The practical approach combines long-term infrastructure protection with community resilience and short-term emergency relief through participation, knowledge generation and partnerships. The NYC government revised hurricane evacuation zones, placing a greater focus on the varying angles of approach for different storms, and employs regulatory instruments, including building codes and zoning, to ensure that building and area developments take future climate impacts into account, and establishes community-planning processes.

Stewarding capacity is manifest in the vast amount of knowledge about climate risks and socio-economic vulnerabilities for different issue areas (e.g. emergency planning, coastal resilience, buildings). This includes projections on long-term sea-level rise and flood safety risks, heat and health stresses and infrastructure risks. The Hazard Mitigation Plan considers how climate change may change the physical, social and economic vulnerabilities from natural and non-natural hazards including coastal storms, disease outbreak, drought, flooding and cyber threats (NYC 2014a). Diverse partnerships between actors from academia, local, regional and national governments and local communities support the generation of knowledge. The NPCC regularly reports on climate impacts and adaptation needs in NYC (NPCC 2015). NYC city departments contribute to creating knowledge on emergency planning, coastal resilience and ecosystem services. The Department of Parks and Recreation (DPR) collaborates with knowledge institutes such as the Urban Field Station and Natural Areas Conservancy and local communities to monitor the social-ecological values of nature in the city (Forgione et al. 2016).

The NYC government adapted the systemic, long-term and context-specific perspective on risks, vulnerabilities and uncertainty in planning and management approaches to facilitate adaptive management and self-organisation. ORR coordinates and oversees the implementation of the multi-layered strategy for strengthening resilient communities and infrastructures including legislative, community support and investment actions. Different departments implement initiatives in a decentralised way. The Department of Environmental Protection (DEP) leads green infrastructure developments as a cost-effective tool to manage storm water while contributing social-ecological value.

Community-specific strategies and community engagement gain increasing momentum to develop place-based interventions, access local knowledge and foster social resilience. The Economic Development

Corporation (EDC) facilitates neighbourhood-based visioning processes to integrate climate adaptation with community concerns. DRP engages communities in maintaining the city's green, for example through the GreenThumb programme (Campbell et al. 2016; NYC Parks 2016).

An unclear distribution of responsibilities across multiple jurisdictions and a lack of mainstreaming adaptive and long-term risk strategies constrain stewarding capacity. The former became visible in the aftermath of Hurricane Sandy, when local, state and federal agencies struggled with providing relief. In neighbourhoods with strong community organisations, such as in Redhook, these could fill this void (Cowan and Hogan 2014). The lack of mainstreaming and multi-scale integration results in contradictory rules and investments especially in flood-prone waterfronts where developments continue to be allowed. Effective flood-zoning policies and building codes require cooperation among the Federal Emergency Management Agency (FEMA), the Department of Buildings and the Planning Department.

### 6.3.2 *Unlocking Capacity*

Unlocking climate governance efforts in NYC focus on reducing emissions from buildings, which are responsible for over 70% of the city's total emissions, and from transport while improving health, well-being and economic prosperity (NYC 2014b, 2015). Unlocking outputs include changes in regulation and physical structures and awareness raising to facilitate renewable energy production, energy efficiency in buildings and sustainable and safe transport.

Various knowledge input mechanisms, including emissions inventories and information disclosure mandates, help to reveal structural drivers of emissions (e.g. energy use in buildings) and relationships with other risks (e.g. health). This was critical to identify target areas for action and synergies between different issue areas and to generate political and societal support. The new building plan outlines a roadmap for making NYC's buildings low-carbon and reducing emissions by 80% by 2050. Reporting mechanisms and partnerships facilitate reporting and data analysis. The Greener Greater Buildings Plan (GGBP) (NYC 2009) mandates owners of buildings over 50,000 ft<sup>2</sup> to annually disclose their energy and water consumption and identify target areas for policies and cost-effective upgrades.

Legislative changes and incentives for behavioural changes and sustainable investments required social and political support. This could be enhanced by involving key actor groups—for example, the involvement of large homeowner associations in the development of recommendations for building code changes ensured their buy-into the GGBP requiring such changes. A remaining challenge is to facilitate energy retrofitting in buildings under 50,000 ft<sup>2</sup>, which are more heterogeneous in their ownership and energy structure—thus making the target audience of key actors less clear. Other types of awareness raising activities by MOS to achieve a wider outreach include the Retrofit Accelerator, which offers free advisory services on energy efficiency improvements. Additionally, training is provided to build the skills for using new energy technologies.

The high-level political support for climate mitigation and sustainability legitimised the integration of sustainability standards into public procurement. Political lobbying and the fact that MOS directly reports to the Mayor supported the building code changes. Communicating the benefits and the availability of cost-effective alternatives help to make strong cases for changing regulation. The NYC Health Department's data on the health benefits of reducing air pollution substantiated the DEP's push to regulate the phase-out of high sulphur heating oil, which also reduced emissions.

A central challenge for unlocking capacity in NYC is the implementation of decisive measures that challenge existing economic structures and vested interests. Existing regulations hamper more decisive action to change energy use and transport patterns. This is exacerbated by political disputes between city and state agencies that have overlapping jurisdictions. For example, the Department of Transportation's (DOT) plan to impose congestion charges for entering the core of Manhattan was blocked by the New York State government for political reasons.

### 6.3.3 *Transformative Capacity*

Transformative capacity in NYC is evident in the continuous innovation of how climate change is addressed on strategic, operational, institutional and organisational levels. Strategic goals and agendas were redefined to position climate mitigation and adaptation as opportunity for sustainable and resilience and innovative, multifunctional solutions were

implemented. The integrated goals were institutionalised through new governance structures for more open-ended and hybrid decision-making and planning.

The initiative and high-level political support from the Mayors and individual departments' Commissioners created space for formulating new strategies and testing new solution approaches like green infrastructure. Hurricane Sandy demonstrated urgency for resilience and resulted in the establishment of SIRR as a heterogeneous network to develop a resilience plan (NYC 2013). This created informal space for diverse actors to come together and share ideas and resources in open and collaborative innovation learning processes. The RbD competition pioneered a novel process design to co-develop innovative and multi-functional solutions. The competition asked for innovative projects to support long-term rebuilding, community resilience and sustainability in the Sandy-affected region. It demanded far-reaching expert and community engagement.

The integrated goals were anchored in institutional and organisational practices. Action programmes on specific topics were developed to lay out new solution options in alignment with long-term strategic approaches (e.g. NYC 2010; NYC Planning 2011). In an effort to embed the integrated thinking into organisational processes, MOS and ORR and dedicated sustainability and resilience offices within city departments were established. To ensure optimal implementation of new energy reporting technologies and standards, the Department of Citywide Administrative Services (DCAS) trains building operators on energy reporting. DEP continuously explores new options for implementing and upscaling the implementation of green infrastructure, also by engaging in international knowledge exchange.

However, the strategic goals and innovative solution approaches do not yet permeate city-wide planning and policy activities. Existing institutions that still dominate funding decisions constrain mainstream implementation of innovation. In moving towards the implementation phase, the RbD-projects were confronted with complex regulatory barriers and conflicting interests of local, regional and federal public agencies and private stakeholders. This could partially be eased by strategically selecting sites with less regulatory constraints (e.g. avoiding imminent domains) and fewer jurisdictions and by intensive multi-stakeholder communication.

### 6.3.4 *Orchestrating Capacity*

Orchestrating capacity is evident in the city-wide long-term and integrated climate, sustainability and resilience goals and the formal and informal conditions and processes that were established to mediate priorities, knowledge and resources of multiple actors across sectors and scales in line with these overarching goals. These conditions support the alignment, oversight and collaboration of diverse actors and networks in line with shared, strategic and long-term goals and the development of co-beneficial climate solutions that make use of multiple synergies.

A key condition for orchestrating capacity is the strategic and integrated climate, sustainability and resilience policy agenda, which facilitates strategic alignment across city-wide and departmental policy documents and ways solutions. This goal integration is achieved by co-creative agenda setting processes at multiple governance levels. MOS and ORR coordinate issue-specific cross-departmental, public–private task forces (e.g. climate adaptation, built environment) to align priorities, foster trust and spark new relationships for synergistic project implementation. Through these heterogeneous collaborations, synergies and trade-offs could be identified. For example, green infrastructures could be put forth as a cost-effective way to manage storm water while contributing to social-ecological value (McPhearson et al. 2014). The collaboration of DPR and DOB in the Urban Heat Island group resulted in the requirement to plant street trees as part of building development. An identified trade-off is between restricting air conditioning to reduce emissions and the vulnerability of low-income populations having neither access to air conditioning nor green space to be protected from heatwaves.

Diverse formal and informal networks, nodes and communication channels were established to integrate and mediate priorities and pool resources for implementation. MOS and ORR are central nodes with multiple tasks: facilitate strategy development, oversee and streamline implementation processes, channel information and knowledge, connect to other ongoing processes, assign responsibilities, search funding and lobby for support. They participate in cross-scale partnerships to align goals and mediate knowledge and resources across local, regional and federal levels. The Chief Resilience Officer is a key position and contact point for pooling all resilience efforts in the city by working across departments and with local communities. Similar positions have been created within individual departments to bring the agenda into the

departments. An informal cross-departmental group of sustainability and resilience ‘peers’ informally exchanges experiences.

Diverse actors and partnerships support mediation efforts by acting as intermediary to facilitate knowledge exchange and trust building. The Harbor Estuary Program is a federally authorised programme that brings together federal, state and local agencies and citizen groups to define common goals and priorities for the management of the harbour estuary. Private partnerships such as the Waterfront Alliance integrate and represent the interests of business actors to the city government. Non-governmental organisations and knowledge institutes take up roles as facilitators of knowledge sharing, trust building and community engagement. The Science and Resilience Institute @ Jamaica Bay (SRI@JB) mediates scientific and community knowledge between universities, local communities and public agencies by creating an informal space that is not politicised to share ideas and concerns, doing transdisciplinary research and introducing research results into the discussion.

Delivering the orchestrating function is time demanding. Due to time, staff and resource limitations, the ability to align and reach out to the public and to mainstream the strategic perspective is hindered. Community-based organisations such as the NYC Environmental Justice Alliance generate knowledge on climate risks and lobby for more support of vulnerable communities, but feel insufficiently engaged by the city government. Additionally, while processes like RbD experimented with new funding options, the strategic orientation is not translated into consistent long-term and multi-beneficial financing mechanisms. Establishing such mechanisms requires support from federal and state governments. For example, FEMA’s funds for post-disaster relief are still tied to rebuilding what was there before rather than ensuring protection from future risks.

#### 6.4 DISCUSSION: TRANSFORMING CLIMATE GOVERNANCE IN NEW YORK CITY?

We sought to understand whether and how new capacities for transformative climate governance are developed as cities like NYC experiment with urban climate governance.

The analysis of the different types of governance capacities shows that diverse institutional, knowledge, network and social conditions were created in both cities to systemically address mitigation and adaptation in policy and planning (Table 6.1). In this way, in NYC an integrated,

**Table 6.1** Transformative climate governance capacities (conditions and activities) in New York City

<i>Institutional conditions</i>	<i>Knowledge conditions</i>	<i>Network conditions</i>	<i>Social conditions</i>
<i>Stewarding capacity</i>			
<i>Conditions:</i>			
Fit-to-context, flexible and knowledge-based institutions	Co-production and integration of knowledge	Polycentric and multi-actor networks across scales and sectors	Social capital and empowerment for local self-organisation
<i>Activities:</i>			
Integrating long-term, systemic risks and uncertainties	Long-term forecasting of systemic risks and uncertainties	Creating issue-specific, multi-level and multi-stakeholder programmes and partnerships	Raising awareness about risks and response options
Adopting problem-based, fit-to-context and no-regret approaches	Problem-based and context-specific knowledge	Involving communities in joint and context-specific visioning, planning and implementation processes	Strengthening social networks to enable self-organised response and social resilience
Providing flexible regulation and incentives to facilitate fit-to-context risk protection	Continuously updating plans and resilience and sustainability indicators		
Assigning and communicating responsibilities	Mandating knowledge generation to ensure access to data Science-policy-community interface		

(continued)

**Table 6.1** (continued)

<i>Institutional conditions</i>	<i>Knowledge conditions</i>	<i>Network conditions</i>	<i>Social conditions</i>
<i>Unlocking capacity</i>			
<i>Conditions:</i>			
Dismantling of institutional path-dependency and competitive advantage of business-as-usual	Linking past, present and future to identify path-dependencies and mal-adaptation	Support networks with an explicit mission for change	Social and political awareness and support for departing from business-as-usual
<i>Activities:</i>			
Setting standards and providing incentives for sustainable investments	Road mapping and scenario analyses to explore phase-out options	Setting up public-private partnerships for issue-specific action	Raising awareness and providing assistance for sustainable investments and behaviour change
Integrating sustainability into public tendering	Conducting regular emissions inventories	Setting up support networks with key stakeholders (groups)	Lobbying for political support
Implementing regulation to control unsustainable practices	Mandating knowledge generation to ensure access to data	Identifying key stakeholders and groups to know whom to reach out to	
<i>Transformative capacity</i>			
<i>Conditions:</i>			
Space for experimentation as governance approach	Learning institutions for harvesting knowledge from experimentation	Multi-actor and inclusive innovation and advocacy networks	(Trans-)local support for the innovation story
<i>Activities:</i>			
Temporary lifting or avoiding existing regulations	Identifying proof-of-concept lessons from innovations to facilitate replicating and embedding	Forming informal and formal 'coalitions of the willing' for strategic and operational innovation	Mobilising political leadership to put new and ambitious goals on the agenda

(continued)

Table 6.1 (continued)

<i>Institutional conditions</i>	<i>Knowledge conditions</i>	<i>Network conditions</i>	<i>Social conditions</i>
<p>Creating open mind-set for taking up innovations in tactical agendas and daily practices</p> <p>Allocating budget to developing and maintaining innovation, upscaling and replicating</p> <p>Leadership for creating and using opportunities for change</p>	<p>Identifying opportunities from innovation for upscaling</p> <p>Identifying bricolage of solution elements to mainstream innovations into urban planning processes and decisions</p>	<p>Involving communities in design and implementation of experiments</p> <p>Creating advocacy coalitions to carry the innovation story</p> <p>Setting up cross-sectoral networks and partnerships tasked with (embedding of) innovation</p> <p>Participating in regional, national and international networking, best practice and knowledge exchange</p>	<p>Piggy-backing and quickly expressing potential of a new solution</p> <p>Creating and advocating an inspiring innovation story</p> <p>Showcasing innovations as market potential for the city</p>
<p><i>Orchestrating capacity</i></p> <p><i>Conditions:</i></p> <p>Long-term nexus approach when drafting, implementing and financing (sectoral) policies and solutions</p> <p><i>Activities:</i></p> <p>Developing long-term climate mitigation and adaptation, sustainability and resilience goals</p>			
	<p>Co-creation of social-technological-ecological systems knowledge</p> <p>Employing a systems perspective to aggregate knowledge about drivers, risks, opportunities and challenges</p>	<p>Formal and informal connection channels, network brokering and intermediary spaces</p> <p>Establishing central and cross-cutting connection nodes for pooling knowledge, actions and resources</p>	<p>Co-ownership over shared and long-term visions</p> <p>Involving multiple actors from different city departments and private organisations in strategy formulation</p>

(continued)

**Table 6.1** (continued)

<i>Institutional conditions</i>	<i>Knowledge conditions</i>	<i>Network conditions</i>	<i>Social conditions</i>
Redefining responsibilities for carrying costs	Identifying opportunities, synergies and trade-offs between different goals	Designating theme-leads and contact persons	Public outreaching and participation
Creating competitions to leverage innovative, long-term and co-beneficial solutions	Pooling and integrating knowledge and resources across scales and sectors	Identifying private and community-based initiatives	
		Creating neutral co-creation spaces and knowledge partnerships to build trust for knowledge sharing	

experimental and inclusive approach to climate governance is emerging, which crosses multiple policy sectors and domains (e.g. transport, energy, health, justice), involves a variety of actors and facilitates innovative solutions. This has helped to move beyond single climate innovation programmes or solutions for responding to climate risks and uncertainty and phasing-out high-emission and unsustainable path-dependencies.

However, NYC is currently confronted with moving beyond the initial momentum for integrated and experimental approaches to climate governance. The capacity gaps signify a lack of mainstreaming and prioritising climate-related concerns in city-wide policy and planning processes. The majority of existing incentive structures and regulations still favour short-term economic interests and investments, pre-empting co-beneficial protection from long-term risks and decisive phase-out of the root causes of emissions and sustainability. This perpetuates counter-acting investments (e.g. building developments in flood-prone areas) and undermines the contribution of innovative solutions into the policy mix as they remain disconnected from mainstream policy and planning.

The next-step challenge in NYC is to move beyond the initial conditions created by the formulation of a long-term and systemic strategic agenda, setting up partnerships and coalitions and the experimentation with innovative solutions. We highlight three central challenges for strengthening the capacities for transformative climate governance by moving beyond envisioning, beyond coalitions of the willing and beyond experimentation and enabling to more decisively prioritise long-term climate investments and actions, better fund collaboration mechanisms and improve space for (learning from) experimentation:

### **Mainstreaming long-term and systemic visions through ‘hard’ instruments**

Long-term and systemic visions provide a shared orientation for aligning priorities, motivating actors and designing co-beneficial climate solutions while taking the interests of multiple, including most vulnerable actors into account (Nevens et al. 2013; McPhearson et al. 2017; Shaw et al. 2014). Systemic financing frameworks such as enabled by the RbD competition helped to develop multi-beneficial projects in NYC. However, as long as business-as-usual is (financially) viable, sustainable business models remain thin and climate-proofing is perceived as more expensive. Ultimately, tough decisions about what goals are to be prioritised need

to be made and mainstreamed into institutional frameworks at multiple levels of governance (Moloney and Horne 2015). Although urban climate governance has proliferated despite the absence of leadership at national levels (Bulkeley and Betsill 2013), the nestedness of local climate governance in institutional frameworks at regional, national and international levels requires alignment of priorities and legislation across governance levels (Dąbrowski 2017; Keskitalo et al. 2016).

### **Extending beyond coalitions of the willing through investing in organisational skills and resources for coordination and collaboration**

A diversity of cross-sectoral, cross-scale and public–private partnerships and networks, including regional and national knowledge programmes, research partnerships, research–industry collaborations and private stakeholder platforms, participate in the generation of knowledge, the formulation of strategies and agendas and the development of innovative solutions in NYC. Coordination is required to accompany such decentralised and hybrid climate governance implementation to enhance cooperation between city departments and across governance scales, start initiatives when needed, pool knowledge, information and guidance and pool monitoring (den Exter et al. 2014; Pahl-Wostl and Knieper 2014). In NYC, the local government—particularly the MOS and ORR—takes up a central role as facilitator and ‘orchestrator’ of climate, sustainability and resilience action. However, while these orchestration processes facilitate trust building, interest mediation and cooperation, they are faced with time and resource constraints visible in the limited connection to actors and networks outside of the immediate climate and sustainability domains. Developing orchestrating capacity requires new types of knowledge, skills and organisational structures and resources (Brown 2017; McPhearson et al. 2017). Increasing budget cuts of local governments and particularly limited staffing capacity and a high turnover of staff exacerbate the development of new skills, processes and knowledge (Nordgren et al. 2016). Simon and Leck (2015) find that the time frame for most local participatory adaptation interventions exceeds most local election and donor funding cycles, which makes it difficult to persuade elected leaders and donor agencies to buy-in and (financially) support participatory processes.

### **Embedding learning-based governance approaches that allow to spread and institutionalise collaborative innovation**

In NYC, the creation of space for experimentation by lifting regulatory requirements and providing systemic financing frameworks, has allowed to test new solutions in co-creative ways. However, the experiments are still sparse and not connected to mainstream urban governance processes. This manifests in the ‘innovation gap’ (Hölscher and Frantzeskaki, Chapter 4, this volume): while opening up new political spaces for governing climate change in the city, collaborative and learning-based governance approaches still remain add-ons to conventional, command-and-control style and siloed governance approaches and are not sufficiently supported by organisational structures that provide space and resources for long-term follow-up and learning. A key challenge is to create space in a governance system that is oriented towards optimising efficiency. There is a need for new institutional structures and organisational ways of working that allow for learning from experimentation and co-creation, long-term collaboration and partnerships and the embedding of new roles and responsibilities (Ehnert et al. 2018).

## 6.5 CONCLUSION

Our case study illustrates the explanatory power of the capacities framework to explain and qualitatively assess whether and how new types of capacities for transformative climate governance are developing in NYC, and to identify capacity gaps that restrain the full potential of this type of governance.

Capacities for transformative climate governance in NYC are visible in diverse institutional, knowledge, network and social conditions that have been created to address mitigation and adaptation in a more innovative, systemic and collaborative policy and planning. Yet, while new conditions are developing—and the insights into what and how conditions are developing inform also other cities in how to move forward—evidently these need to be strengthened vis-à-vis the existing governance regime in NYC. Overall, the majority of existing incentive structures and regulations in NYC still favour short-term economic interests and investments, which pre-empts systematic and synergistic protection from long-term risks and decisive unlocking and phase-out of the root causes of emissions and unsustainability.

The perspective of the capacities framework allows us to identify several avenues forward for strengthening the sprouting governance capacities. Specifically, NYC needs to invest in more decisive legal and regulatory changes that facilitate experimentation, collaboration and prioritisation of long-term co-benefits over short-term and largely isolated and powerful economic interests. This also has important implication for the role of the local government in NYC to take up more, calling on it to take a more pro-active and formalised role in taking bold policy and planning decisions, develop partnerships and invest in organisational resources and skills for innovation, learning, communication and collaboration.

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