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Analysis and comparison of the three biggest U.S. cities' (New York, Los Angeles and Chicago) climate action plans and adaptation strategies

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Abstract

Since international conferences and environmental treaties brought the issue of climate change to the world political stage in the early 1990s, many countries and cities have recognized the need for action to mitigate the harmful effects of the globally changing climate and to adapt to the unavoidable climate-related impacts. As a complementary part of the KLIMOPASS-AKLIM research program, my research during a three month internship at the Karlsruhe Institute of Technology (KIT) focused on collecting and analyzing examples of existing adaptation and mitigation strategies from the United States' three biggest cities: New York, Los Angeles and Chicago. My results are based on the evaluation of the collected federal, state and city climate action plans. The study will introduce the different planning and implementation practices of the cities mentioned above – New York City's comprehensive, detailed, action- and result-oriented long-term sustainability plan; Los Angeles' action plan that mainly focuses on measures within the control of city departments; and Chicago's climate action agenda with emphasis on community engagement and everyday actions.

Keywords: climate change, United States, strategies, action plans, mitigation, adaptation

Introduction

In the last decades discussions about the accelerating changes in the Earth's climate caused by the significant amount of greenhouse gas (GHG) emissions became louder and louder. Thanks to some international conferences and environmental treaties, the issue of climate change appeared on the world political stage in the early 1990s, and since then more and more countries and cities have recognized the need for action to mitigate the harmful effects of the globally changing climate and to adapt to the new circumstances that are already occurring due to the previous years' air pollution. Answering these unavoidable challenges is a common social responsibility all around the globe. We are all responsible to take steps today to avoid an even more serious pollution of our environment. Climate change is a fact that we cannot deny anymore. It manifests itself in more immoderate weather circumstances affecting properties, infrastructure and human lives as well. Recognizing the importance of our role in

reducing the pace of global warming and taking responsibility for the next generations' future is crucial and indispensable.

The United States of America (as one of the world's most important economy and biggest GHG emitter) has a huge impact on the globally changing climate thus its climate change policy is also of great importance. However, its policy differs from the common environmental policies of the EU countries. For example, we cannot find an unambiguous top-down strategy in its climate action planning and jurisdiction. This study's purpose is to give an overview on climate adaptation strategies of the United States through the examples of the nation's three biggest cities' climate action planning practices. The chosen cities are New York City (NY), Los Angeles (CA) and Chicago (IL) with relatively similar environmental circumstances and hazards like West-European countries can face as well. In those cases when statewide climate action or adaptation plans exist, these state plans were examined too, such as the President's newly announced Climate Adaptation Plan. Due to the limited time of the research compared to the enormous amount of information, a comprehensive comparison with Germany's adaptation strategy and practice cannot be within the scope of this paper – nevertheless it can provide some open questions about the different adaptation planning practices that can be the subject of further research in the future.

The background of the analysis

My research was a complementary part of the KLIMOPASS-AKLIM research program at the Institute of Regional Science (IfR) and Institute of Urban and Regional Planning (ISL) at the Karlsruhe Institute of Technology (KIT) in Karlsruhe, Germany. The research project is funded by the state of Baden-Württemberg and analyses the climate change impacts and adaptation measures of the critical infrastructure in the Stuttgart region and aims to develop climate adaptation strategies for these systems. My research focused on collecting examples of existing climate adaptation strategies in the United States, and looked for planning and implementation practices that can be compared to the actions and system operations in Germany and in the Stuttgart region. During my work, I studied three cities with different political and economic background from three different geographical regions: the City of New York in the State of New York, Los Angeles in the State of California and Chicago in the State of Illinois. All of the analyzed cities are above the population of 2.5 million inhabitants. The three chosen areas represent diverse climate regions and facing different climate risks but they also show similar challenges to the Stuttgart region (e.g. increased precipitation and floods, more frequent hot waves and droughts in summer, wildfires or landslides) that the infrastructure has to answer. My results are mainly based on the evaluation of the federal, state and city climate action plans, supplemented with information found on governmental, municipal or other institutional webpages.

Introduction of the chosen regions' key climate vulnerabilities

The following paragraphs shortly introduce the most important information about the chosen U.S. regions and their principal climate-related vulnerabilities. To localize

the regions, states and cities included in the analysis on the the map of the United States, see Figure 1.

Figure 1: The geographical regions, states and cities under the scope of the analysis



The first city in the focus of the research is the *City of New York*, the biggest city of the United States with more than 8 million inhabitants. It has a humid subtropical climate with warm summers and significant precipitation in all seasons. The city is situated in the State of New York, in the Northeast region of the States. This region has a various geography that extends from the coastal areas with densely populated cities to the inland plateaus and mountains with sparsely populated towns. According to the U.S. Environmental Protection Agency (EPA), the main climate threats of this region are the more frequent heat waves, heavy precipitation events, sea level rise, the destruction of coastal ecosystems and damaging floods and storm surges.¹ The State of New York also has to face demographic shifts like aging society, population growth and rapid urbanization.² These can damage coastal property and infrastructure and can put significant stress on the healthcare system. As for New York City itself, the re-

¹ United States Environmental Protection Agency (EPA): *Climate Impacts in the Northeast*. <http://www.epa.gov/climatechange/impacts-adaptation/northeast.html> (18/11/2013.)

² NYS2100 Commission: *Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure* (hereafter: *Recommendations*). 2013. pp. 22. Available at: <http://www.governor.ny.gov/assets/documents/NYS2100.pdf>

cent past showed the biggest environmental hazard to the city: the stronger and more frequent coastal storms like Hurricane Irene in 2011 or Sandy in 2013. After Sandy's attack to the region, initiatives improving the strength and resilience of the critical infrastructure and local communities are outstanding parts of the climate action planning both in the State and in the City of New York and also appear in the federal Climate Adaptation Plan recently announced by President Barack Obama.

Los Angeles is located in the Southwest region of the United States and with its population of around 3.8 million this is the largest city in the State of California. Just as New York, Los Angeles is also a coastal metropolis. It has an effect on the city's dry-summer subtropical/Mediterranean climate as well: in the coastal areas summers are calmer and milder than in the inland areas due to the nearby presence of the ocean. Despite of this, the region's climate is generally rather hotter and drier than other regions and warming means a serious threat to the Southwest affecting water resources, agriculture, forests and other ecosystems and energy supply as well.³ Higher temperatures lead to decreasing snowpack on mountains, earlier snowmelt and reduced groundwater storage. Due to the more intense heat waves and more frequent droughts the risk of wildfires can increase. In the quickly growing cities it is also a challenge to attain air quality standards and to meet the increasing energy and water demand during heat waves and dry periods. Climate change endangers the region's agriculture as well, causing crop failure, increased demand of irrigation water and more heat stress on livestock.

The third analyzed big city, *Chicago*, is located in the State of Illinois, in the Midwest region of the United States. The "Windy City" with its 2.7 million inhabitants is situated on the bank of Lake Michigan, which is part of the Great Lakes. The city and the region has humid continental climate, with the lack of the ocean's temperature-modulating effect, so with warm summers, cold winters and significant precipitation during the whole year. As for the climate projections, the weather circumstances can turn more immoderate: people can experience hotter summers with longer dry periods and heat waves causing worse air quality, and milder winters with less snowfall and earlier snowmelt. Increased evaporation due to higher temperatures may lower water level of the Great Lakes, meaning higher harbor maintenance costs – at the same time, precipitation events can become more intense and result in heavy downpours that can increase flooding likelihood, damage property and infrastructure systems and cause disruption in services.⁴

Top-down or bottom-up strategy?

After starting to evaluate the chosen states and regions and setting them in a timeline (see the chapter below) the following question arose: is there a top-down strategy in adaptation planning in the U.S. like in several European countries or does it work

³ EPA: *Climate Impacts in the Southwest*. <http://www.epa.gov/climatechange/impacts-adaptation/southwest.html> (18/11/2013.)

⁴ EPA: *Climate Impacts in the Midwest*. <http://www.epa.gov/climatechange/impacts-adaptation/midwest.html> (18/11/2013.)

differently? Under top-down strategy the research meant the practice when the international level of adaptation plans (e.g. international treaties and agreements, EU directives) is followed by the state level (i.e. statewide adaptation strategies) and then by climate action plans on the local (city) level. In many countries where national climate change policy exists, the national climate adaptation document determines many local adaptation planning efforts, appearing in similar measures or connected implementation actions nationwide.

Among the evaluated plans and strategies, there are agendas from the local, state and federal level as well. After having a look on the year of publishing the different plans, it turned out that in the United States the planning practice is different – the country did not have a nationwide climate action or adaptation plan for a long time, still the cities and states that recognized the need for action against the effects of the changing climate made their own, local plans. It is more like a bottom-up strategy where the federal action follows the state and the local actions. Even the climate change policy, announced by President Bush in 2002 was based on local voluntary actions⁵ but did not make nationwide efforts.

The states play an important role in climate protection. They have primary jurisdiction over the local infrastructure sectors and often develop strategies and initiatives to reduce greenhouse gas emissions before federal agencies do. Later these initiatives can serve as models for federal action or as a base of federal environmental laws. This way one state's commitment to environmental issues has significant impact on the United States' overall GHG emissions. According to the Georgetown Climate Center's available map and table, 13 out of the 50 states of the U.S. have a climate adaptation plan and in other 7 states the statewide adaptation planning is currently in progress.⁶

A good example for the bottom-up strategy's lowest stage besides the analyzed city action plans is the work of the U.S. Conference of Mayors and *The U.S. Mayors Climate Protection Agreement*, launched in 2005. Up to now the agreement was signed by more than 1000 mayors, showing a strong evidence of the consensus on the local political level to protect the climate and the urgent need for action – without waiting for top-down instructions from the Federal Government. The agreement was an answer to the States' rejection of the Kyoto Protocol and urges the federal government and state governments to reach the same targets that the international protocol sets up.⁷

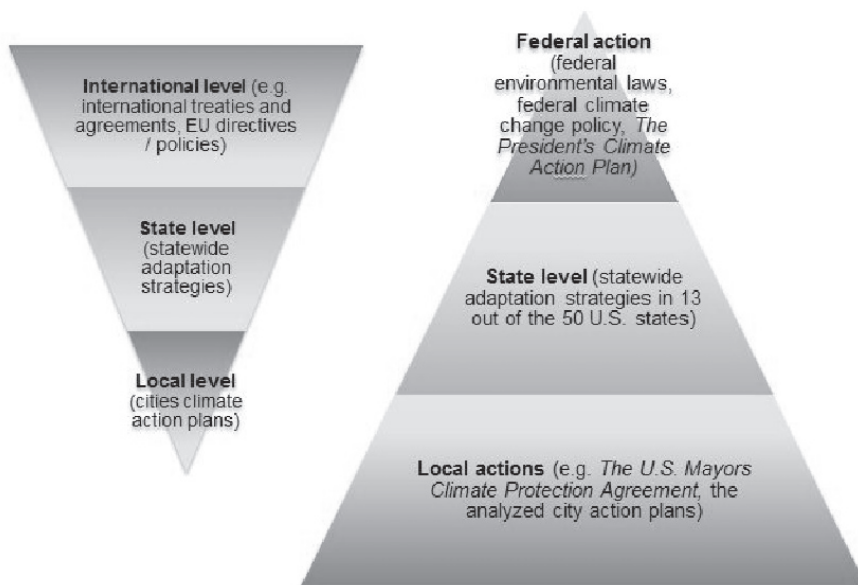
To understand the idea of the top-down and bottom-up strategies' system, see the diagrams on Figure 2.

⁵ Fletcher, Susan R.: *Global Climate Change: The Kyoto Protocol*. Congressional Research Service Report, July 21, 2005. pp. 12. Available at: <http://w1storage.net/file/crs/RL30692.pdf>

⁶ Georgetown Climate Center: *State and Local Adaptation Plans*. <http://www.georgetownclimate.org/adaptation/state-and-local-plans> (18/11/2013.)

⁷ The U.S. Conference of Mayors: *The U.S. Mayors Climate Protection Agreement*. 2005. Available at: <http://www.usmayors.org/climateprotection/documents/mcpAgreement.pdf>

Figure 2: Diagram of a top-down (left) and a bottom-up strategy (right)



The analysis of the chosen cities' climate action plans

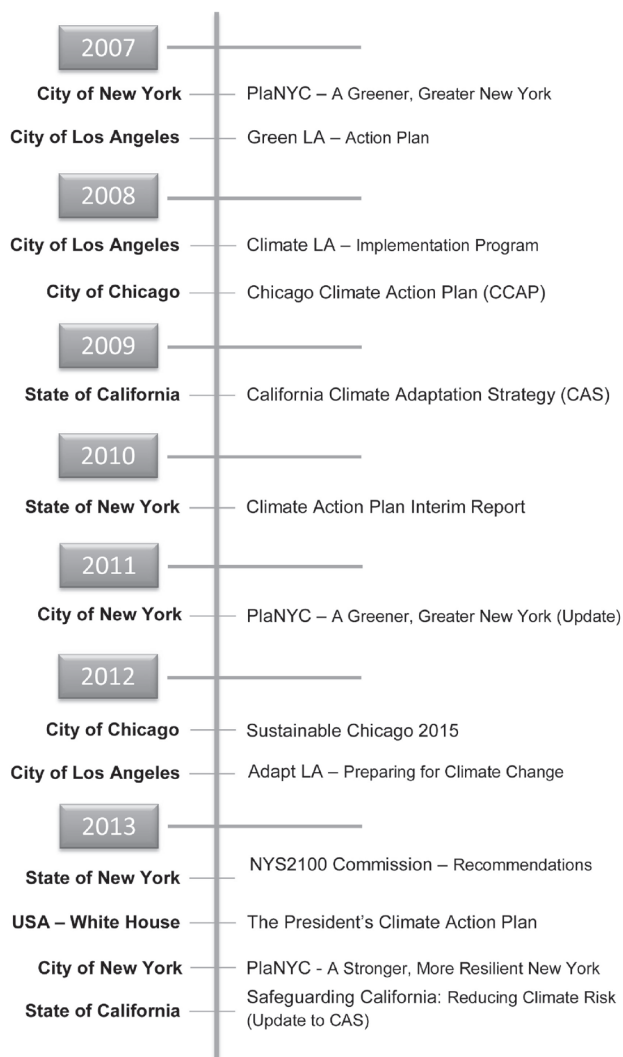
As the first step of the analysis, a timeline was set up to see which level of administration and which city was the pioneer in climate change adaptation planning. This chapter's first part will briefly summarize the observations based on the evaluation of the timeline and then shortly introduce the federal climate action policy.

Further on in the subsections each city's plans (and where the given state has a climate action plan, that one too) will be introduced and analyzed more in details. The analysis touched upon the triggers of the plans (where there is a special reason); the sectors mentioned in the strategies and their specific characteristics; the initiatives' elaboration (whether the plan gives detailed or just minimal information about each action) as well as the assessment of the actions by sector regarding to mitigation and/or adaptation efforts. Where it was possible, the institutional and legal background, the way and status of implementation of the measures and the connections with the state plans were analyzed too. Each strategy's analysis is depicted in tables where the most important topics of the plans are collected in the interest of easier comparison and understanding. The tables put together the groups of the selected city's different plans and the state's plan(s) where the given city is located in. The tables can be found as appendices at the end of the study

The timeline of the analyzed climate action plans

If one has a look on the timeline below (Figure 3), the above mentioned bottom-up progress in point of the cities under the scope of the study can be clearly seen.

Figure 3: Timeline of the analyzed climate action plans



The local climate action planning started even earlier than in the states where the cities are located in. Both New York City and Los Angeles made their first local climate action plans in 2007, earlier than the state strategies or plans were published. New York City has not only its comprehensive plan called *PlaNYC*, but other publications related to it (like progress reports, updates and sector-specific strategies). The last plan update was published in 2012. There were no available updates or progress reports found to the climate action plans of Los Angeles, only the incomplete fact sheet of the *Adapt LA* document from 2012. The city of Chicago published its *Chicago Climate*

Action Plan one year later than the cities mentioned above (in 2008) and prepared an update (*Sustainable Chicago 2015*) in the year of 2012.

In October 2012, Hurricane Sandy severely hit the coastal U.S. cities in the eastern, Mid-Atlantic States. This was a serious trigger to create new climate action plans at all levels of administration in the country to ease rebuilding after the storm's destruction and increase the resiliency of states and cities. Both the State and the City of New York came out with new documents regarding these efforts. In January 2013, the NYS2100 Commission, announced after Sandy by New York State Governor Cuomo, published its *Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure* (hereafter: *Recommendations*) and in June 2013, New York City Mayor Bloomberg introduced the *Stronger, More Resilient New York* plan. Most of the initiatives in both plans are determined by efforts to strengthen the infrastructure and build resiliency for the future.

Two out of the three states under the scope of the analysis have statewide adaptation plans: the State of California published its *Climate Adaptation Strategy* in 2009, and New York State made its *Climate Action Plan's Interim Report* available in 2010. New York announced new reports and recommendations related to climate action in January 2013, and California is now working on its strategy's update, the public draft document is available since December 2013. The State of Illinois does not have a statewide climate adaptation plan.

As for the federal level, the Obama Administration made a big change in the States' climate policy, underlining the importance of federal leadership in energy efficiency and climate protection actions. Since coming into office in 2009, President Obama established the Interagency Climate Change Adaptation Task Force and made the reduction of greenhouse gas emissions a priority for federal agencies with an Executive Order signed in October 2009. In 2011, a comprehensive Greenhouse Gas Emissions Inventory for the Federal Government was compiled, and Federal Agencies finished their first-ever climate change adaptation plans in February 2013.⁸

The United States' first federal action plan that clearly addresses climate change issues (*The President's Climate Action Plan*) was also announced by Barack Obama in June 2013. This plan collects the initiatives into three chapters around the following topics: cut carbon pollution of the U.S., prepare the States for the impacts of climate change and lead international effort to address global climate change.⁹ The first chapter focuses mainly on mitigation efforts by reducing greenhouse gas emissions in the energy and transportation sector and enhancing the usage of clean and renewable energy resources. Adaptation efforts appear in the second chapter in initiatives regarding (for example) insurance, public outreach and public health issues and climate science. Hurricane Sandy affected this plan as well – resiliency, rebuilding and community based recovery are key concepts in it too. The President's Climate Action Plan

⁸ The White House – Council of Environmental Quality: *Climate Change Resilience*. <http://www.whitehouse.gov/administration/eop/ceq/initiatives/resilience> (18/11/2013.)

⁹ Executive Office of the President: *The President's Climate Action Plan*. June 2013. Available at: <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>

is mostly related with the State of New York's and the City of New York's action plans, thanks to Sandy's effect.

The State of New York and the City of New York

In the State of New York, climate action planning started in 2009, when the Executive Order no.24 called upon the recently created Climate Action Council to write a *Climate Action Plan* towards reducing GHG emissions and responding to climate change.¹⁰ The *Interim Report* was released in November 2010. The Interim Report deals with both the natural and the built environment of the state. The main sectors covered by the plan can be seen in the tables (Appendix A and B). The plan has a separate chapter describing the climate adaptation measures that appear in the following topics: energy, transportation, water, public health, telecommunications, ecosystems, agriculture and coastal zones. The plan sets targets for the State's economy as well. Furthermore, it describes cross-sector recommendations like environmental justice, public participation, workforce training and education, etc.¹¹ Mentioning cross-cutting topics is not very common among the selected and analyzed plans, even though they can put mitigation and adaptation goals in a more comprehensive context.

This plan does not stand as a clear antecedent of the State's next document that addressed climate change issues, mainly because of the different trigger of the next action. After the hit of Hurricane Sandy in 2012, Governor Cuomo announced 3 commissions to examine existing risks and vulnerabilities and make recommendations to improve the State's resiliency against major weather impacts (e.g. big storms like Sandy or Irene) and enhance response capabilities. The commissions were: NYS Ready Commission, NYS Response Commission and NYS2100 Commission. The latter one published its *Recommendations* in January 2013. It contains 5 sector-specific recommendation areas (Transportation, Energy, Land Use, Insurance and Infrastructure finance) as well as 9 cross-cutting recommendations, addressing high number of adaptation measures.¹² This document gives more detailed targets to reach than the previous one, because it had a clear trigger (Hurricane Sandy's devastation) that made the need of action unambiguous.

New York City's plan (*PlaNYC – A Greener, Greater New York*) is an instructive example how a citywide strategic land use plan evolved to a comprehensive sustainability plan, including strong commitment to climate change mitigation efforts. In 2005, after the Department of City Planning's (DCP) report that estimated a significant population growth in New York City by 2030, the municipality began to work on a strategic land use plan that can help managing the city's growing needs within a limited amount of land. This first plan identified three key challenges as: population growth, aging infrastructure and the increasingly vulnerable environment. As these issues were inter-

¹⁰ New York State Department of Environmental Conservation: *Climate Action Planning*. <http://www.dec.ny.gov/energy/80930.html> (20/11/2013)

¹¹ New York State Climate Action Council: *Climate Action Plan Interim Report*. November 2010. Available at: <http://www.dec.ny.gov/energy/80930.html> (20/11/2013)

¹² *Recommendations...* 2013. Available at: <http://www.governor.ny.gov/assets/documents/NYS2100.pdf>

related with other environmental and economic sustainability concerns, the city realized the need to develop a comprehensive, distributed and long-term sustainability plan and in 2007, Mayor Bloomberg released the fully completed PlaNYC.¹³ The plan focuses issues related mainly to the physical environment of the city, considering the fact that every decision and action can help combating climate change but at the same time economic opportunity can and must come out of these actions and of the city's growth. PlaNYC covers 6 key areas (among them there is a separate chapter about climate change describing adaptation measurements) and contains 127 initiatives.¹⁴ One common goal cuts across all the issues: reducing the greenhouse gas emissions is the most important target, as it is defined in the Local Law 55 of 2007 as well.¹⁵

This plan has a strong legal and institutional background, supported by the municipal departments, businesses, community organizations and individual citizens too. Local laws obligate the city officials to regularly monitor the progress of implementation and update the plan in every 4 years – the last update was published in April 2011. It added extra initiatives and a separate key area (Solid waste) to the previous ones.¹⁶ It also provides more initiatives in the Climate Change chapter than the previous plan. Cross-cutting topics are added to the agenda too, their main initiatives are summarized in Table 1.

Table 1:

Sector initiatives advancing cross-cutting topic goals in PlaNYC Update 2011.

Sector initiatives advancing cross-cutting topic goals in PlaNYC Update 2011							
	Public health	Food	Natural systems	Green building	Waterfront	Economic opportunity	Public engagement
Energy	X		X	X		X	X
Transportation	X	X			X	X	
Water	X	X	X	X	X	X	X
Housing		X		X	X	X	X
Open space		X	X	X	X	X	X
Brownfields		X	X		X	X	X
Waste	X	X	X	X	X	X	X
Air quality	X			X	X		X
Climate change	X		X	X	X		X

¹³ ICLEI – Local Governments for Sustainability USA: *The Process Behind PlaNYC. How the City of New York Developed Its Comprehensive Long-Term Sustainability Plan.* April 2010. Available at: http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/iclei_planyc_case_study_201004.pdf

¹⁴ The City of New York: *PlaNYC – A Greener, Greater New York.* Full Report. 2007. Available at: http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/full_report_2007.pdf

¹⁵ See: Local Laws of New York City. [http://legistar.council.nyc.gov/Legislation.aspx\(12/12/2013\)](http://legistar.council.nyc.gov/Legislation.aspx(12/12/2013))

¹⁶ The City of New York: *PlaNYC – A Greener, Greater New York.* Update. Full Report. April 2011. Available at: http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf

The municipality established a leading and coordinating agency within its departments by course of Local Law 17 of 2008. The Mayor's Office of Long Term Planning and Sustainability (OLTPS) is responsible for developing and implementing the plan and assessing the progress permanently. The progress reports show that a high percentage of the actions are underway, many milestones have been achieved or mostly achieved and the action-oriented agenda has made a significant progress. There are several specific plans as well, with their legal background, like Greener, Greater Buildings Plan or the Brownfield Cleanup Program. Other important advisory boards are the New York City Panel on Climate Change (NPCC) and the Climate Change Task Force, both codified by Local Law 42 of 2012.

In 2013, the year after Sandy's attack, a new plan was published as the latest incarnation of PlaNYC: *A Stronger, More Resilient New York*. This plan unambiguously puts the most emphasis on adaptation among the previously analyzed plans. The main aim of this new plan was to help communities rebuilding after Sandy for a long term, to provide additional protection to the city's infrastructure and to prepare for the climate changes yet to come. The underlying goal of the plan is to increase the city's resiliency through 189 initiatives in 15 key areas.¹⁷ These areas cover special sectors that the previously mentioned plans did not include, like Insurance, Liquid fuels, Utilities, Telecommunications, Healthcare, Public engagement and Food supply. Due to this, this plan shows the strongest connection with the State's Recommendations and The President's Climate Action Plan, because of the overlapping strategies like flood insurance, secure fuel supply and resilient hospitals, among other aims. The Stronger, More Resilient New York Plan uses initiatives from the previous PlaNYCs too (e.g. brownfield cleanup programs, expanding green infrastructure systems, improving the energy efficiency of buildings).

The State of California and the City of Los Angeles

The State of California is a biologically diverse state, with various habitats, and a great number of unique and endangered species. Thanks to the crop diversity, California plays an important role in the States' agriculture, but is also very vulnerable to climate change. This vulnerability visibly showed itself in the beginning of 2014 when Governor Brown had to announce his proclamation of a state of emergency due to the severe drought throughout the state.¹⁸ Due to this the state understood quite early the importance of addressing climate effects and preparing itself for the expected climate impacts using the best known science. California's first-of-its-kind multi-sector strategy was published in 2009 after the Governor's Executive Order (EO S-13-08) in November 2008.¹⁹ The *California Climate Adaptation Strategy (CAS)*

¹⁷ The City of New York: *PlaNYC – A Stronger, More Resilient New York*. 2013. Available at: http://nytelecom.vo.llnwd.net/o15/agencies/sirr/SIRR_singles_Hi_res.pdf

¹⁸ Office of Governor Edmund G. Brown Jr.: *Governor Brown Declares Drought State of Emergency*. 17/1/2014. <http://gov.ca.gov/news.php?id=18368> (18/1/2014)

¹⁹ California Natural Resources Agency (CNRA): *2009 California Climate Adaptation Strategy (CAS)*. 2009. Available at: http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf

focuses on managing natural resources, planning for public safety, infrastructural and agricultural development, and reducing GHG emissions and the risk of natural hazards. This document introduces detailed actions in 7 sectors, with more than 50 strategies, including both mitigation and adaptation measures. The update to CAS (*Safeguarding California*) is under social reconciliation, the public draft is available since December 2013. The main aim of the update is to widen the previous strategies and actions in the light of advances in climate science and risk management possibilities. It defines the same sectors, extended by an extra sector (Emergency management).²⁰ Despite of the aim of the document, the analysis found *Safeguarding California* less detailed in describing specific actions than CAS, though it tells about the actions already taken.

As for the institutional and legal background, the leading and coordinating agency of the adaptation strategy planning is the California Natural Resources Agency (CNRA). According to EO S-13-18 Article 7, different state departments are responsible for the sector-specific strategies' implementation.²¹ Several state acts and bills secure the implementation of the main targets of CAS, e.g. water conservation, cool pavements, wildfire safety, new building and appliance energy efficiency standards.

The city of Los Angeles published its *Green LA – An Action Plan to Lead the Nation in Fighting Global Warming* document in May 2007 and one year later the *Climate LA – Municipal Program Implementing the Green LA Climate Action Plan*. The two plans cover the same focus areas. Their content is identical except two chapters: the Adaptation chapter with its 4 goals is missing from the implementing program, however it presents public education. *Green LA* is a short summary of strategies outlining measures to adapt to the effects of climate change and to reach the city's goals in reducing GHG emissions by a significant rate in the coming decades.²² The 9 focus areas' goals are described more in detail in *Climate LA* – in many of the sectors' strategies the emphasis is mostly on mitigation measures.²³ During the research period no updates or progress reports were found to these plans.

In 2012 the municipality of Los Angeles brought out a very brief fact sheet about an adaptation document called *Adapt LA – Preparing for Climate Change*.²⁴ The mentioned potential adaptation actions are almost the same like the measures presented in the previous plans or already taken by the city. Unfortunately no further information was found about this action agenda during the research.

²⁰ Natural Resources Agency: *Safeguarding California: Reducing Climate Risk. An update to the 2009 California Climate Adaptation Strategy*. Public Draft. December 2013. Available at: http://resources.ca.gov/climate_adaptation/docs/Safeguarding_California_Public_Draft_Dec-10.pdf

²¹ CNRA: CAS. 2009. pp. 11. Available at: http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf

²² The City of Los Angeles: *Green LA – An Action Plan to Lead the Nation in Fighting Global Warming*. May 2007. Available at: http://environmentla.org/pdf/GreenLA_CAP_2007.pdf

²³ Environmental LA: *Climate LA – Municipal Program Implementing the Green LA Climate Action Plan*. 2008. Executive Summary is available at: http://environmentla.org/pdf/ClimateLA_v5.pdf, Program Document is available at: <http://environmentla.org/pdf/ClimateLA%20Program%20document%202012-08.pdf>

²⁴ Office of the Mayor (City of Los Angeles): *Adapt LA – Preparing for Climate Change*. Fact Sheet. June 2012. Available at: <http://c-change.la/pdf/AdaptLA%20Fact%20Sheet.pdf>

The climate action plan of Los Angeles puts more emphasis on actions under the municipal departments' scope of authority rather than business and community outreach initiatives like the other plans do. The implementation of the strategies also represents this: the actions are taken mainly by city departments, like reducing energy use by energy efficient retrofits on city owned buildings, redeveloping underutilized city lands, convert city fleet powered by alternative fuels. The planning is led by the Environment LA (ELA) coordinating agency. Like the City of New York, the City of Los Angeles has an advisory board called Environmental Affairs Commission (EAC) to help city departments in climate adaptation planning and strategy implementation with expertise in different fields.

The City of Chicago

The *Chicago Climate Action Plan (CCAP)* was published in 2008. This plan rather acts as an easily understandable summary of the city' actions made more for informing the public than the professionals, therefore contains less detailed information about each action than many other action plans presented above. Besides the 35 actions under 5 key strategies, this plan presents leading examples of practical mitigation efforts and stakeholder engagement. The CCAP mainly focuses on mitigation, underlining the reduction of GHG emission with each action, except the chapter of Adaptation containing 9 climate adaptation actions. The plan's specialty compared to the other examined plans that it firmly encourages individuals to make their own everyday actions, declaring that the success of the plan strongly depends on the citizens. Stressing that each person can and must make a difference to create a more livable and sustainable city, the plan contains a short chart of small achievable steps for all Chicagoans.²⁵

After the change in the city administration, a new action agenda was made and published in 2012, called *Sustainable Chicago 2015*. Its main aim is to accelerate the progress towards the goals mentioned in CCAP by mitigating climate change impacts, strengthening the city and preparing for climate related risks. This plan's actions are very similar to those ones mentioned in the previous action plan, supplemented with new focus areas: Economic development and job creation and Parks, open space and healthy food. By bringing new topics to the agenda, the Sustainable Chicago plan has 24 goals and 100 actions under 7 key strategies.²⁶ The plan specifies economic development and sustainability as cornerstones, reinforcing other actions. Resident engagement continues to be essential: 16 goals are flagged as key opportunities for community action. The action agenda contains more adaptation measures than CCAP, but introduces them in a briefer way.

Both plans have publicly available progress reports about the implementation in the first few years. These reports (published in 2010 and 2013) show success, espe-

²⁵ Chicago Climate Task Force: *Chicago Climate Action Plan. Our City. Our Future.* 2008. Available at: <http://www.chicagoclimateaction.org/> (19/12/2013)

²⁶ Office of the Mayor (City of Chicago): *Sustainable Chicago 2015. Action Agenda.* 2012.

Available at: <http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf>

cially in introducing the MeterSave residential water conservation program, the first Bus Rapid Transit Line, developing a Green Stormwater Infrastructure Strategy, the amendment of the City's Zoning Code and Municipal Code, the Greencorps Chicago community engagement and training program, etc.

The City of Chicago has the Chicago Climate Task Force, formed by the municipality in 2006, to develop the climate action plan.²⁷ Like in New York City and Los Angeles, an advisory committee (Research Advisory Committee, formed in 2006) supported the planning process providing a scientific background and gave recommendations on criteria for choosing the best targets for emission reductions.

Conclusion

After analyzing the selected states' and cities' climate action plans and adaptation strategies, with a focus on the planning and institutional background, evaluating the elaboration of the actions and distinguishing between the mitigation and adaptation measures appearing in the documents, the observations can be summarized as follows.

Planning for climate adaptation is on the states' and cities' agenda in the United States. Thus there is no strong, nationwide top-down strategy, every city takes its own action. Among the cities under the scope of the research, special characteristics can be found. New York City has a detailed, action- and result oriented long-term sustainability plan with transparent institutional background. The strongest connection between the state and city level of planning was found in the case of New York. Though the update to California's statewide strategy is in progress, in Los Angeles the only available climate action plan is 6 years old. That plan mainly focuses on measures within the control of city departments – new measures can be added as soon as business and community engagement expands. The State of Illinois does not have any statewide climate adaptation strategy, still the state's most populous metropolis, Chicago developed its own sustainability plan. The city's effort can affect Illinois' climate change policies and planning efforts in the future. Chicago prefers to take smaller, everyday actions towards climate change mitigation and adaptation, involving the city's residents and strongly leans on community engagement.

As the earlier published strategies focused more on mitigation, in the updated action plans more adaptation measures can be found. The most likely reason of it is that the impacts of climate change turned more and more perceptible in everyday life and cities and states realize that managing these problems that put serious threats on society and ecosystems are unavoidable. A special trigger (like Hurricane Sandy) can create plans primarily focused on adaptation and resiliency. Sectors with mainly mitigation measures in most of the plans are: energy, transportation, housing (land use) and waste management, while those ones that contain significant adaptation measures besides mitigation efforts are: water management, coastal protection, and open

²⁷ Parzen, Julia: *Lessons Learned: Creating the Chicago Climate Action Plan*. July 2009. pp. 3. Available at: <http://coolcities.us/resources/ForumLinks/CAP/LessonsLearned.pdf>

space management. The most commonly emphasized topics that appear in almost every plan are summarized in Table 2.

Table 2: Commonly emphasized topics by sectors

Commonly emphasized topics by sectors	
Energy	energy efficiency, energy efficient buildings, the use of renewable energy
Transportation	cleaner fuels, expand transportation options and services, reduce congestion, strengthen resiliency
Water and wastewater	water use efficiency, stormwater management
Buildings / Housing	transit oriented development (TOD), develop underutilized city lands, promote affordable and sustainable housing
Open space	open new parks and open space for recreation, tree planting programs
Brownfields	cleanup programs, remediation, redevelopment
Waste	reduce waste production, divert waste from landfills, reuse and recycle
Economy	green/sustainable economy, job creation, education and training
Adaptation / Climate change	reduce GHG emission, reduce urban heat island effect (UHIE), green infrastructure, public engagement, increase community preparedness and resilience

After all, how can key factors leading to success in adaptation planning be defined? As planning comes to practice several questions can arise. It is worth to mention some of them for further thinking.

Is there a real need for a detailed nationwide top-down strategy? The selected cities' examples showed that adaptation planning can work well on the local scale without federal/national top-down instructions but a strong mayoral leadership was necessary in most of the cases (like in New York and Chicago).

Establishing a leading and coordinating agency supported with the help of external advisory boards was a common tactic. Stakeholder and community engagement was crucial to gain support from all stakeholders in New York and Chicago, and involving and educating the public was an aim in all cities. But the best and most efficient practice for this continues to be a question.

It is important to turn the climate action plans and adaptation strategies into visible results. One of the success factors of PlaNYC was definitely the immediate switch from planning to action as soon as the conditions made it possible. At a later stage, updat-

ing the plans regularly and defining milestones to reach within reasonable time limits help scanning and monitoring the implementation progress.

It is also crucial to realize what kinds of funds are needed and available for the implementation and to think rationally about what kind of efforts the municipal budget can finance. Encouraging small individual steps can be more effective in cities with less financial possibilities (like in Chicago) than aiming for large actions (e.g. New York City's Comprehensive Coastal Protection Plan). These considerations must be taken into account during the planning and implementing process for the sake of a well-functioning and efficient system for adapting to climate change impacts in the future.

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Appendix A: The elaboration of the actions in the climate action plans

sectors / plans	City of New York		State of NY		City of Los Angeles		State of California		City of Chicago		The Presidents Climate Action Plan (2013)	
	PlaNYC (2007)	PlaNYC Update (2011)	Stronger... NY (2013)	Climate Action Plan (2010)	MIS2/100 Recommendations (2013)	GreenLA (2007)	ClimateLA (2008)	AdaptLA (2012)	CAS (2009)	Sequestering California (2013)		CCAP (2008)
Energy	X	X	X	X	X	X	X	X	X	X	X	X
Transportation	X	X	X	X	X	X	X	X	X	X	X	X
Water and wastewater	X	X	X	X	X	X	X	X	X	X	X	X
LAND USE	Housing / Buildings	X	X	X	X	X	X	X	X	X	X	X
	Open space	X	X	X	X	X	X	X	X	X	X	X
	Brownfields	X	X	X	X	X	X	X	X	X	X	X
Waste	X	X	X	X	X	X	X	X	X	X	X	X
Adaptation / Climate change	X	X	X	X	X	X	X	X	X	X	X	X
Other sectors												
Economy			X	X	X	X	X	X	X	X	X	X
Insurance			X	X	X	X	X	X	X	X	X	X
Public engagement (Education, Outreach)			X	X	X	X	X	X	X	X	X	X
Public health / Healthcare			X	X	X	X	X	X	X	X	X	X
Food			X	X	X	X	X	X	X	X	X	X
Cross-cutting / Cross-sector topics		X	X	X	X	X	X	X	X	X	X	X
Plans with unique, separately mentioned topics	X ¹	X ¹	X ^{2,3,4,5}	X ^{3,5,6}	X ⁷	X ⁶	X ⁶	X ⁶	X ^{3,5,6}	X ^{3,5,9}	X ⁶	X ²

¹ Air quality, ² Climate analysis / Climate science, ³ Coastal protection, ⁴ Liquid fuels, Utilities, ⁵ Telecommunications, ⁶ Biodiversity and habitat / Ecosystems, Agriculture, Forestry, ⁷ Infrastructure finance, ⁸ Proprietary departments, Port and Airport of Los Angeles, ⁹ Emergency management

X	Detailed information about the actions
X	Less detailed information
X	Minimal information or actions only briefly mentioned

Appendix B: Mitigation / adaptation measures in the climate action plans

sectors / plans	City of New York			State of NY		City of Los Angeles			State of California		City of Chicago		The Presidents Climate Action Plan (2013)
	PlaNYC (2007)	PlaNYC Update (2011)	Stronger... NY (2013)	Climate Action Plan Interim Report (2010)	NYS2100 Recommendations (2013)	GreenLA (2007)	ClimateLA (2008)	AdaptLA (2012)	CAS (2009)	Safeguarding California (2013)	COAP (2008)	Sustainable Chicago 2015 (2012)	
Energy	X	X	X	X	X	X	X	X	X	X	X	X	X
Transportation	X	X	X	X	X	X	X		X	X	X	X	X
Water and wastewater	X	X	X	X	X	X	X	X	X	X	X	X	
Housing / Buildings	X	X	X	X		X	X						
LAND USE Open space	X	X	X		X	X	X	X				X	
Brownfields	X	X	X			X	X						
Waste		X	X	X		X	X				X	X	
Adaptation / Climate change	X	X		X	X	X		X			X	X	
Other sectors													
Economy			X	X		X	X					X	
Insurance			X		X								X
Public engagement (Education, Outreach)			X				X						X
Public health / Healthcare			X	X					X	X			X
Food			X									X	
Cross-cutting / Cross-sector topics		X		X	X				X	X			
Plans with unique, separately mentioned topics	X ¹	X ¹	X ^{2,3,4,5}	X ^{3,5,6}	X ⁷	X ⁶	X ⁶	X ⁶	X ⁶	X ^{3,6,9}			X ²

¹ Air quality, ² Climate analysis / Climate science, ³ Coastal protection, ⁴ Liquid fuels, Utilities, ⁵ Telecommunications, ⁶ Biodiversity and habitat / Ecosystems, Agriculture, Forestry, ⁷ Infrastructure finance, ⁸ Proprietary departments, Port and Airport of Los Angeles, ⁹ Emergency management

X Mostly mitigation measures X Both mitigation and adaptation measures X Mostly adaptation measures

Absztrakt

Amióta az 1990-es években kezdődő, környezeti témákat érintő nemzetközi konferenciák és egyezmények a világpolitika színterére emelték a klímaváltozás kérdését, számos ország és város ismerte fel a globális felmelegedés okozta hatások mérséklésének és az azokhoz való alkalmazkodásnak elkerülhetetlen szükségességét. A Karlsruhei Egyetemen töltött három hónapos gyakorlatom alatt a KLIMOPASS-AKLIM kutatási programba bekapcsolódva, annak kiegészítéseként a három legnagyobb amerikai város, New York, Los Angeles és Chicago klímaváltozással foglalkozó stratégiai dokumentumait vizsgáltam. Kutatási eredményeim az összegyűjtött és elemzett szövetségi, állami és városi akciótervek értékelésén alapulnak. Jelen tanulmány célja bemutatni az említett városok eltérő tervezési stratégiáit – New York városának átfogó, részletes, cselekvés- és eredményközpontú hosszú távú fenntarthatósági tervét; Los Angelesnek az elsősorban a városvezetés által irányított intézkedésekre fókuszáló akciótervét; valamint Chicagónak a városi közösség bevonására hangsúlyt helyező klímaváltozási- és fenntarthatósági terveit.

Kulcsszavak: klímaváltozás, Egyesült Államok, stratégiák, akciótervek, mérséklés, alkalmazkodás