Universiteit Utrecht

Student name:	Daniël van Lavieren
Student number:	3253368
Student address:	Lage Morsweg 91, 2332 XB, Leiden
Tel:	06-29041512
Email:	danielvanlavieren@gmail.com
Programme:	Sustainable Development
Track (ES/SUSD/Joint programme only):	Environmental Policy and Management (EPM)
Annotation Sustainable Entrepreneurship & Innovation?	~~Yes~~/No
Internship:	~~Yes~~/No
Thesis title:	Towards Climate Neutral Cities! Analysis and assessment of the extent to which municipalities use an integrated approach for creating climate neutral cities
Supervisor(s): **Second Reader:**	Prof. dr. Peter (P.P.J.) Driessen dr. Mendel Giezen
Number of ECTS:	30
Start date research proposal:	05-10-12
Date:	28-05-13

Towards Climate Neutral Cities!

Analysis and assessment of the extent to which municipalities use an integrated approach for creating climate neutral cities

Daniël van Lavieren (3253368)
Sustainable Development
Environmental Policy and Management (EPM)
28-05-13

Acknowledgements

This thesis marks the end of my study of the Master programme Sustainable Development at Utrecht University. During this program I studied, and learned, many different theories and concept about Sustainable Development, governance, environmental ethics, policy integration etc. This thesis allowed me to apply these theories in one of my field of interests, climate neutral cities. This thesis was a long and challenging, but fulfilling, process.

However, this thesis would not have been realized without the help of some people. Therefore I want to especially thank my supervisor, Peter Driessen, for his supervision patience and feedback that he has given me. I am also especially grateful for the time and feedback provided by: Pieter Biemans of the municipality of Tilburg; Paul van Dijk and Wim Caron of the 'Klimaatbureau' Tilburg; and Fred Akerboom of the municipality of Rotterdam. Without their help this thesis would not have been possible.

Finally, I am thankful to my family and friends for providing moral support and feedback. Especially my family, without their support I would have not been able to study in the first place.

Daniël van Lavieren
May, 2013

Abstract

A climate neutral city is an emerging concept and not much have been written about climate neutral cities and how one should organize this in theory. Although many theories are available on different roles for the state, market and civil society and about what type of approaches are available. But most do not deal with climate neutral cities. Those that do address climate neutral cities often address that it should be organized through an integrated approach. In the Netherlands more cities have declared that they want to become climate neutral. That will most likely not be realized before 2040. In this research an analytical framework is developed containing objects for integration, like common understanding, commitment, goals, instruments/tools, participation and leadership. This analytical framework is used in order to answer the research objective of this research, which is to yield descriptive, explanatory, evaluative and prescriptive knowledge to understand which factors contribute to developing an integrated approach, to understand to which extent an integrated approach is used for creating climate neutral cities and to give insights in the implementation process by analyzing/assessing/using the approaches of leading Dutch municipalities. This research combines theoretical knowledge with practical knowledge gained form case studies in the Netherlands, namely the municipalities of Tilburg and Rotterdam, who have declared to be one of the frontrunners in the Netherlands. Both the municipality as whole as a specific project within the city will be used for analyses. In Tilburg this is the 'Klimaatschap' and for Rotterdam project Heijplaat. Both Tilburg and Rotterdam, show a great extent of policy integration. Regarding the extent to which an integrated approach is being implemented, the case studies vary slightly. Tilburg is showing features of an interactive and a self-governing mode and Rotterdam mostly the features of a interactive governance mode. But both case studies were quite able to implement an integrated approach. Some of the main factors/conditions found in this research are: that a good monitoring system is required; that a network should exist, consisting many actors with similar interests; the presence of a 'core team', or catalyst; having equal roles and power; and the ability for the municipality to adapt its role to the needs of specific situations.

Key Concepts

Climate neutral cities, integrated approach, (environmental) policy integration, role of authority and governance modes.

Table of content

List of Tables

List of Figures

Chapter 1: Introduction

1.1 Background information

The emission of greenhouse gases (GHG), and climate change in general, still poses a major threat. In order to reach the commitments of the Kyoto Protocol - and other post-Kyoto agreements - improvements in the energy efficiency, and reduction of GHG emissions, in cities are vital. Despite of the existence of numerous initiatives to address (the impacts of) climate change and climate variability, however, only a few consider that urban planning needs to be integrated into climate change action plans (Economic and Social Council, 2009). Including urban planning and dealing with the increasing urbanization is important. Even though cities only make up two percent of the earth's surface, the majority of the world's population lives in these urban areas (Bulkeley & Betsill, 2003). In Europe it is expected to grow even further, approximately towards 80 percent in 2020 (EU, 2010). This increasing urbanization, and therefore cities, can have an enormous impact on sustainability. Given the urban nature of the global production, cities are sites of high consumption of energy and production of waste (Bulkeley & Betsill, 2003) and cities are the major consumers of natural resources (Nijkamp & Pepping, 1998). This can lead to increased GHG emissions and contribute to climate change. Climate change directly affect cities, due to extreme weather conditions, floods, drought, soil damage and erosion, which all can lead to risks for the health and well-being of its citizens (European Commission, 2009). It is estimated that cities are responsible for a large proportion of GHGs. It varies widely from 20 percent up to 75-80 percent. Recent studies, however, indicate that this number is closer to 40 percent (Economic and Social Council, 2009). For these reasons literature suggests that cities are an important part of the solution and should be central to the pursuit of sustainable development (Bulkeley & Betsill, 2005; Nijkamp & Pepping, 1998; (Economic and Social Council, 2009; European Commission, 2009).

Sustainable development, or sustainability, is a general used concept and can be applied in many different areas. Sustainability covers three main dimensions: people, planet and profit. From the point of view of cities, Campbell (1996) identified three different perspectives for the city, namely from an economic development planner, an environment planner and an equity planner. These perspectives can often collide with each other and should therefore be addressed in collaboration with each other. The integration of these perspectives (economical, social and environmental), together with global and local issues, make cities a key arena in which the concept of sustainable development could be applied (Bulkeley & Betsill, 2005).

In recent years, the idea that a city should be a part of the solution, has become more significant. Various policy initiatives highlighted the importance of sustainability in cities. This has led to various new concepts combining cities and sustainability, such as: the 'green city', the 'eco-city', the 'eco-polis', the 'liveable city', the 'resourceful city', the 'environmental city', the 'sustainable city' and finally the 'climate neutral city' (Nijkamp & Pepping, 1998). The concept of the climate neutral city is the focus of this research.

As described above, it is vital that the energy efficiency of cities should improve and that the GHG emissions by cities should decrease. One way of addressing these issues is by the concept of the climate neutral city. Climate neutrality means that, in this case, a city is not contributing to climate change (Economic and Social Council, 2009). Climate neutral cities aim to move towards net zero emissions of GHGs by reducing GHG emissions as much as possible and by developing trade-off mechanisms to offset the remaining unavoidable emissions, since (at least for now) some emissions are still unavoidable (UN, 2011). However, it is necessary that climate neutrality is pursued with caution. It should not be the case that climate neutrality in one city affects another city (area or country) negatively. Therefore, climate neutrality must be pursued within a framework of balanced actions that addresses all dimensions of sustainability. Not only should cities aim to move towards

zero emissions of GHG, but they should also aim to become climate-proof, or resilient to the negative impacts of climate change (UN, 2011). Furthermore, reducing GHG emissions should also be a means to address some of the major environmental, economical and social challenges (Economic and Social Council, 2009). By addressing the spatial and density attributes of communities and cities, the energy use of these cities can be reduced drastically (Economic and Social Council, 2009). Climate neutrality can be achieved by addressing various policy areas/sectors and with different tools. In the industry sector new technologies and better insulation of industrial and office buildings will lead to a considerable rise of energy efficiency (Nijkamp & Pepping, 1998). Buildings alone represent nearly 15 percent of GHG emissions (residential building 9.9 and commercial buildings 5.4). They also account for over a third of the total energy consumption (Economic and Social Council, 2009). Therefore energy efficiency for buildings is one of the most important areas for intervention. By using new technologies, new standards for energy efficient buildings, better insulation, low energy appliances, appropriate construction materials, effective heating/cooling systems, GHG emissions and energy consumption can be reduced between 30-50 percent, without greatly increasing the investment costs (Economic and Social Council, 2009). In the transport sector considerable savings are possible, for instance, by more energy-efficient engines, vehicle weight reduction, increasing the use of public transport and by investing in renewable fuels (Nijkamp & Pepping, 1998**;** Economic and Social Council, 2009). By a more integrated and intermediate level of urban planning various possibilities exist with central heat distribution, with the recycling of energy from heat and with combined heat and power (Nijkamp & Pepping, 1998). But also by improving the urban greenspace (more green public spaces and green roofs in areas with a high proportion of buildings) and by managing the urban infrastructure (controlling waste management and improving water distribution systems), the GHG emissions of cities can be reduced (Economic and Social Council, 2009).

In the Netherlands the EU targets, 20 percent CO_2 reduction and 14 percent sustainable energy in 2020, need to be met. One way of doing that is by focusing more on local and regional climate policy. Partly for that reason the 'Klimaatagenda 2011-2012' is established. This agenda is a joint collaboration between municipalities, provinces, Dutch water boards and the national government. In this agenda five different topics (themes) are formulated, namely the sustainable build environment, sustainable mobility, sustainable businesses, sustainable e-production and the climate neutral city (IenM, 2011b). It is stated that in order to create a climate neutral city an intensive collaboration between the city, and its environment and region, municipalities, provinces and the Dutch water board is required, but also with civilians and businesses. An integrated approach is necessary in which climate policy should be integrated in the organizations. This also asks for changes within the organizations, institutional changes, changes in policies and financial changes (IenM, 2011b). Within this topic eight municipalities have taken a leaders role. The goal is that by the time of 2020 at least ten municipalities are climate neutral and that in the coming years more municipalities will translate their climate neutrality ambitions into concrete policy plans (IenM, 2011). This research will focus on how an integrated approach for developing climate neutral cities can be applied.

1.2 Problem Definition
Many of today's policy problems, such as low carbon urban development (climate neutral cities), are ill structured, meaning that they consist of multiple dimensions and cause-and-effect chains which are complex and difficult to determine unambiguously (van Bueren & ten Heuvelhof, 2005). The problems are dealt with at different administrative levels, such as local, regional, and national or international levels, and there are different issues at stake that receive attention from actors from different networks. To overcome this, and to create a climate neutral city, cities should play an active role. The exact role of cities is frequently described within scientific literature regarding (sustainable) urban development. The forms that cities should take (Jabareen, 2006), governance in cities (van Bueren & ten Heuvelhof, 2005; Campbell, 1996; Bulkeley & Betsill, 2005), planning tools (Runhaar et

al., 2009) and the roles that cities should take (Bulkeley & Betsill, 2005; Nijkamp & Pepping, 1998). Regarding cities, many scholars have focused on sustainable or green cities (van Bueren & ten Heuvelhof, 2005; Campbell, 1996; Bulkeley & Betsill, 2005; Nijkamp & Pepping, 1998), but not much has been written in regard to climate neutral cities. However, when climate neutral cities are addressed it is often recommended that an integrated approach is used (Economic and Social Council, 2009; European Commission, 2009; UN, 2011). Integrated approaches is a topic that has been frequently addressed by many scholars. In regard to what an integrated approach, and interactive governance (or governance) is (Bulkeley & Betsill, 2005; Stoker, 1998; Jessop, 1998; Sherer et al., 2006; Lemos & Agrawal, 2006; Kersbergen & van Waarden, 2004; Driessen et al., 2012). In the context of climate neutral cities, an integrated approach seeks to coordinate the different sectoral policies that have an impact on cities, and it means the simultaneous and fair consideration of concerns and interests which are of relevance to creating climate neutral cities. Strong local involvement and public participation in the design and implementation of cross-sectoral projects and programmes is therefore essential (European Commission, 2009).

Closely related to an integrated approach is the concept of (environmental) policy integration, meaning that all relevant policies, policy decisions, goals and values (and participants) should be in accordance with each other and that it should realize mutual benefits, for achieving sustainable development. This topic is also frequently addressed in literature. An introduction to what it is and what it entails (Persson, 2004; Nilsson & Persson, 2003; Briassoulis, 2004; Underdal, 1980; Laverty & Hovden, 2002; Nillson et al., 2009; Nillson, 2005; Persson, 2009), different dimensions, namely: HEPI and VEPI, (Persson, 2004; Lafferty & Hovden, 2003; Briassoulis, 2004), different perspectives (Nilsson & Persson, 2003; Persson, 2004; Persson, 2009; Nillson et al., 2009) and different assessment criteria (Persson, 2004; Briassoulis, 2004; Underdal, 1980; Lafferty & Hovden). Less attention, however, has been given to (e)pi regarding to implementation at the local or regional level (Nillson et al., 2009).

So, in order to make a structural change, climate change policy and energy efficiency policy need to be integrated properly into the organizations and this asks for different types/levels of integration. First, it should be integrated on a sectoral level. Climate change policy and energy efficiency should be integrated into, and with other, sectors. It should be focusing on integrating, amongst others, economical values, environmental protection, social capital to promote city life, training and employment objectives, transport and mobility and cultural values and activities (European Commission, 2009). However, this must be addressed carefully, since integrating on a sector level can be complex and difficult. It is possible that different sectors conflict win one another which could lead to trade-offs and that can be complex and controversial (Persson, 2004). Secondly, it should be integrated on an organizational level. As stated in the background section, it is essential that different stakeholders can participate. Not only between the government, businesses and civilians, but also within the different levels of government (Ibid). Cooperation and coordination between different levels is an important factor for policy integration especially when, in the case of a climate neutral city, multiple levels have an influence and a responsibility. Therefore, as stated in the background section, an intensive collaboration between the city, its environment and region, municipalities, provinces and the Dutch water board is required. Cooperation between different stakeholders can, however, be difficult, as conflicts regarding power, resources, knowledge and objectives/priorities can occur (Persson, 2004; briassoulis, 2004). Partly for these reasons, there should also be a third type of integration, namely integration of goals, instruments and issues. This is important because some issues need to be dealt with by several sectors together, like with climate change, since it is too complex for one sector alone (Persson, 2004). Furthermore, by integrating goals and instruments, burdens can be shared, more instruments can be used, and conflicts can be reduced.

Proponents of an integrated approach, and environmental policy integration, argue that integration on these three types/levels can eliminate redundancies, constrain conflicts and reduce the number

of system elements and their interactions (Briassoulis, 2004; Nilsson & Persson, 2003). As became clear, policy integration also rises a few problems/challenges. Especially the second level of integration, between stakeholders, is a highly debated topic. While some scholars advocate for an integrated approach, others advocate for a more local approach. The latter state that local authorities have more influence over local emissions, that local authorities are willing and able to deal with the complex sustainable development agenda, that local authorities are the key actors in terms of coordinating action and that some local authorities have more experience in addressing environmental issues (Bulkeley & Betsill, 2005). However, in the past different stakeholders often worked alone, which then often resulted in failed projects or policies. This problem can be solved by including the private sector and private regulations. This raises questions to the role of the local authority (in this research the municipality) and the role of other actors. Different actors can have an influence on the policy-decision process and the outcomes. Proponents of an interacted approach state that the private sector can improve the effectiveness and legitimacy of global governance by creating win-win situations for the state and non-state actors. So, for effective implementation of an integrated approach for creating climate neutral cities, it is stated that cities should not only cooperate with other cities and between different administrators, but that they should seek a broader participation of stakeholders and the involvement of the population in climate related decision-making processes (UN, 2011). This can be achieved, for instance, by partnerships and through networks (UN, 2011). However, this should be done with caution, since this is a highly sensitive subject. With this multi-level governance different forms of interactions are possible between the different actors. The position of the actors, the power that they have and the rules of interaction are all important features that will be discussed in this research.

It is mostly within those two aspects of an integrated approach that this research will seek to make a contribution. Firstly, by looking into the process of (environmental) policy integration on a local scale/municipality level. Secondly, by looking at the factors/conditions necessary for implementing an integrated approach by examining the role of the municipality (local authority) and the interactions with/between the different stakeholders.

Knowledge gap
This research can make several contributions. First, there is a lack of literature looking at (climate neutral) cities using an integrated approach. Since the concept of a climate neutral city is relatively new, not much has been written on climate neutral cities. Furthermore, there is a lot of information available on (environmental) policy integration in general, but less focuses on the local or regional level. This research can therefore make a significant contribution by combining the two subjects. Furthermore, less has been written on how far cities actually are in using an integrated approach and how this process is developing.

Secondly, there is a lack of literature in regard to cities using an integrated approach for becoming climate neutral looking at the exact role that the municipality (local authority) and other stakeholders can have, what strategies are being used and how exactly the public is involved. More precisely about the mode of governing that promotes/enables the use of an integrated approach for becoming climate neutral. By focusing on these aspects this research can make significant contributions by providing information about what factors and conditions are necessary for municipalities to successfully use an integrated approach for becoming climate neutral.

1.3 Scientific relevance and connection to the theoretical debate(s)
This research mainly connects with two scientific areas/debates. Firstly, it connects with the general governance debate. Secondly, it connects with the (environmental) policy integration debate. This research also connects with a more in depth governance debate regarding governance modes/features and the role of different actors.

Over the last decades, (low carbon) urban environmental planning in the Netherlands has shown a gradual change from generic, sectoral, and norm-based planning to more decentralized and integrated forms of planning (Runhaar et al., 2009). With these 'new' ways of planning a more governance approach is being used. Although there is no agreed upon definition, governance can be seen as a change in the meaning of government, referring to a new process of governing; or a changed condition of ordered rule; or the new method by which society is governed (Stoker, 1998). It refers to the development of governing styles in which boundaries between and within public and private sectors have become blurred (Stoker, 1998). Within sustainability it can also be addressed as environmental governance, in which it refers to the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes. It includes the actions of the state and, in addition, encompasses actors such as communities, businesses, and NGOs (Lemos & Agrawal, 2006).

This also has influenced the discussion about the role of cities and, moreover, what roles cities should take. In regard to climate neutral cities an integrated approach is often recommended. Integrated approaches, and environmental policy integration in general, is a topic that has been frequently addressed by many scholars, as to what it is, what it entails, the different dimensions, perspectives and assessment criteria (Briassoulis, 2004; Persson, 2004; Nilsson & Persson, 2003; Underdal, 1980; Laffery & Hovden, 2003; Persson, 2009; Nillson, 2005; Nillson et al., 2009). In this research it is more addressed from an institutionalist, actor-centered perspective, which fits more, and is more responsive, to the policy needs of complex problems, described by Briassoulis (2004). This perspective places emphasis on the values, goals, theories about the problem, resources, information-processing capabilities, and multiple memberships of actors, their stakes in particular action situations, and the diverse ways through which they pursue their interest within a shared power world (Briassoulis, 2004). This research mostly connects with the theories and concepts developed by various authors about the different elements and factors of policy integration that can be used for assessing the extent to which policy is integrated.

As stated in the problem definition, a shift towards more decentralized and integrated forms of planning has occurred. In the last decades a shift is notified between government to governance, meaning that the roles that different parties can take often switch. Policy is formulated and implemented in dynamic contexts where multiple actors interact at multiple levels (Driessen et al., 2012). Because of the globalisation the world is becoming more complex and often one party alone cannot solve it (Stoker, 1998; Jessop, 1998). Therefore different forms/modes of governance can be applied. Runhaar et al. (2009) made the distinction between different substance-oriented tools, process-oriented tools and hybrid planning tools. Van Kersbergen & van Waarden (2004) described nine approaches, relating to partnerships and networks. Partnerships and networks are identified as possible ways for implementing an integrated approach. This research, however, mostly connects with the governance modes/features described by Driessen et al. (2012). They identified five governance modes found within environmental policy according to the roles and relations between the state, the market and civil society. These modes of governance will be used in this research to analyze the conditions necessary for implementing an integrated approach at a municipality level by looking closely at the interactions between the local authority and the various actors involved**.**

1.4 Research objective(s)

The objective of this research is to yield descriptive, explanatory, evaluative and prescriptive knowledge to understand which factors contribute to developing an integrated approach, to understand to which extent an integrated approach is used for creating climate neutral cities and to give insights in the implementation process by analyzing/assessing the approaches of leading Dutch municipalities.

- By examining what is meant by a climate neutral city, what is meant by an integrated approach, what is meant by (environmental) policy integration, what is meant by governance modes and how such an approach can be implemented in regards to a climate neutral city;
- By creating an analysis framework that can be used for analyzing/assessing the extent to which policy is integrated and to investigate which governance mode is applied by the chosen municipalities (investigating the conditions necessary for an integrated approach to be implemented);
- By giving suggestions on how municipalities should continue and what can be learned from the case studies.

This research provides data on how municipalities/cities are dealing with becoming climate neutral through an integrated approach by looking at case studies in the Netherlands. Information is given on the factors and dimensions of policy integration, by focusing on various theories, concepts and factors of different authors. Furthermore, information is given on the conditions necessary for implementing an integrated approach by looking at the modes of governance/features. From theories about these subjects an analysis framework is developed consisting of these two parts (factors on policy integration and necessary conditions (mode of governance) for implementing an integrated approach). By using case studies this analysis framework is being applied to determine whether the chosen municipalities are using an integrated approach and to understand which factors account for this (first by looking at the first part and secondly by looking at the second part of the analytical framework) . In this way the theoretical knowledge gained in this research will be supplemented with practical knowledge.

1.5 Central research question(s) and sub-questions
This research will answer the following central research question:

"To what extent are municipalities using an integrated approach for becoming climate neutral and which factors account for this"?

In order to answer this central research question several sub-questions need to be answered. These sub-questions deal with both theory and practice. Theory is used to create an analytical framework and subsequently case studies will be used in which this analytical framework is applied. In this way it is expected to find the factors/conditions that will explain the extent to which an integrated approach is being used, by looking at the factors for policy integration and by looking at which conditions are necessary for implementing an integrated approach. The sub-questions are presented below:

1. What factors from literature are relevant for creating an analysis framework that can be used for assessing/explaining the extent to which cities use an integrated approach for becoming climate neutral? (Descriptive knowledge)
- What exactly is a climate neutral city? (Descriptive knowledge)
- What is an integrated approach? (Descriptive knowledge)
- What is (environmental) policy integration? (Descriptive knowledge)
- What is the role of authority and what modes of governance can be identified? (Descriptive knowledge)
- What factors/elements of policy integration and conditions for implementing an integrated approach should be used to assess to which extent an integrated approach is being used? (Descriptive knowledge)
2. To what extent is policy integrated in the chosen cities/municipalities (Explanatory and evaluative knowledge)

- What goals, policies, tools and programs are the selected cities using in order to become climate neutral? (Descriptive knowledge)
- Which factors account for the extent of policy integration (Explanatory and evaluative knowledge)

3   Which conditions determine the extent to which municipalities are able to use an integrated approach for becoming climate neutral? (Explanatory knowledge)

- What roles are the chosen municipalities (the local authority), and other stakeholders, taking to become climate neutral? (Descriptive knowledge)
- Which governance mode is applied by the chosen municipality? (Descriptive knowledge)

4   What are the opportunities and pitfalls for implementing an integrated approach for creating climate neutral cities (Explanatory knowledge) and how should municipalities continue (Prescriptive knowledge), i.e. what are the lessons learned from the case studies?

These questions will provide sufficient information to fulfill the aim of this research.

1.6 Research approach

The approach used for this research is shown below in figure 1.1. This figure shows which steps need to be taken in order to reach the research objective, namely the extent to which an integrated approach is being used and which factors account for this. The first step is a literature review. By looking at different theories and concepts about climate neutral cities, interactive governance and integrated approaches, (environmental) policy integration and governance modes, an analytical framework can be developed (step 2). This framework will contain the factors that will describe/explain the extent to which policy is integrated and the conditions necessary to implement an integrated approach (describing the governance mode/features). Subsequently this framework is used for analyzing, and to assess, the extent to which the chosen cities/municipalities are using an integrated approach by conducting a case study analysis (step 3) and it will provide information about the factors that explains it. The case studies will look at the implementation of an integrated approach by focusing on both the municipality level (factors of policy integration) and a project within the city (conditions/governance mode). With the result of the analysis the objective of this research will be obtained and the opportunities and pitfalls will be identified in order to make recommendations (step 4).

Figure 1.1: Research approach
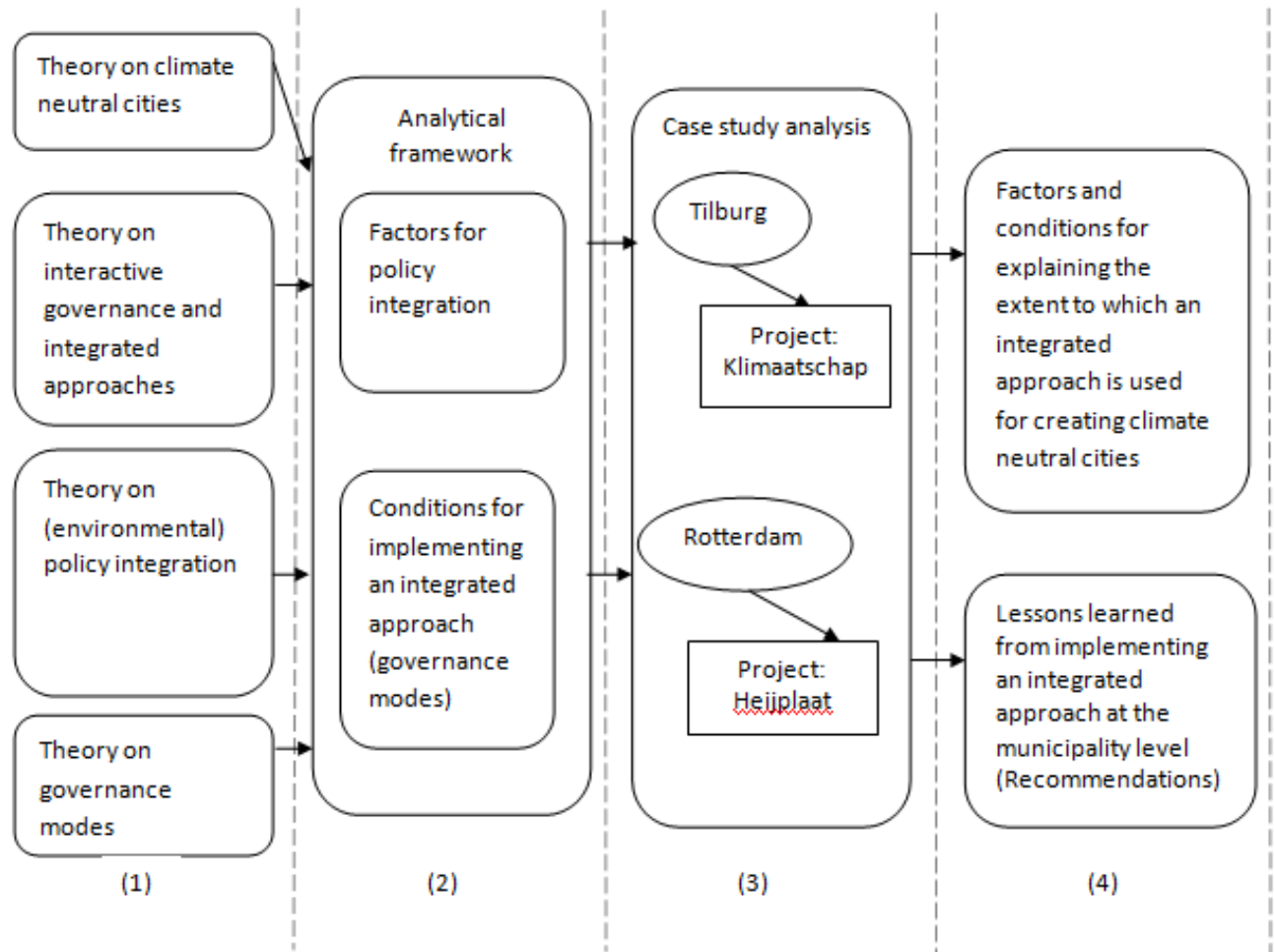
1.7 Societal relevance

The societal relevance of this research is that it will help researchers, policy developers and implementers, NGO's and other stakeholders, living in, and dealing with, climate neutral cities. Given the problems that cities are experiencing (and causing) relating to GHG emissions and climate change, becoming climate neutral is very urgent. This research provides information on how an integrated approach can be applied. By making an analytical framework and by making an assessment of the extent to which cities are using an integrated approach for becoming climate neutral, and by giving insights in the opportunities and pitfalls, this research can be used throughout the transition towards a climate neutral city. This can be useful for the cities investigated, but also for other cities with ambitions for becoming climate neutral. Policy makers may use the outcomes of this research in creating new plans for becoming climate neutral. The analytical framework (list of factors) developed in this research can be used by policy makers as well. It can be used as a guideline that will make it more clear what is needed by policymakers, what roles they can and should take and how stakeholders can be involved.

1.8 Delimitations

The most important delimitation is the geographical delimitation. This research focuses on the extent of policy integration and conditions necessary for using an integrated approach on a local/regional/municipality level. To examine the factors, and to apply the analytical framework developed in this research, it is necessary to understand the interactions between the actors, their functions, powers and interests. In order to understand this correctly this research requires

sectoral/local case studies (Nillson et al., 2009). By using cities as case studies it can be applied on a municipality level. These local case studies will be located in the Netherlands. Partly because Dutch cities are perfectly suited for analysis and partly because it is considered more appropriately to have two case studies in the same country in order to reduce external influences which might alter results. A second delimitation is that only two case studies are analyzed. These delimitations provides more possibilities for a more in depth analysis of the chosen case studies.

1.9 Overview of the thesis

In the next chapter (2) the research methods are described and the case studies are selected. This is followed by a chapter (3) about the theories and concepts used in this thesis, which will conclude with the presentation of the analytical framework. Subsequently, two case studies are analyzed and assessed according to the analytical framework. First a chapter (4) about Tilburg and secondly a chapter (5) about Rotterdam. The following chapter (6) provides a case study comparison with an overview of the key findings, a discussion of the factors and conditions according to literature and the opportunities and pitfalls of using an integrated approach. Lastly, this research contains a chapter with the main conclusion (answer of the research question) and with a discussion (7).

Chapter 2: Research methods

The approach used for this research was shown in figure 1.1. This figure shows which steps need to be taken in order to reach the research objective. In the figure a distinction can be made between four different steps. The first step is to look at different theories regarding climate neutral cities, interactive governance and integrated approaches, (environmental) policy integration and governance modes. This step is necessary in order to create an analytical framework (step 2). In this framework a distinction can be made between factors for policy integration and conditions for implementing an integrated approach (governance modes). This provides the research with theoretical knowledge. After creating this analytical framework the next step is to apply this framework by doing a case study analysis. In this step it is analyzed/assessed to what extent the chosen municipalities have integrated policy, and what conditions are necessary for the municipalities to implement an integrated approach. Subsequently, it will provide information about the factors that account for it. This will provide the research with practical knowledge as well. Combining the literature knowledge and the practical knowledge, makes it possible to make the final step of this research, which is to reach the objective of this research (see paragraph 1.4) and to make recommendations. Basically these steps can be divided in two groups: one group will provide literature knowledge and the second group will provide practical knowledge. These two methods should make it possible to reach the objectives. Paragraph 2.1, 2.2 and 2.3 will discuss these methods in further detail.

2.1 Literature review

In this research a literature review was conducted in order to understand, and elaborate, the concepts studied in this research. A literature review helps with understanding the different processes that occur in the context of climate neutral cities. Furthermore, this helps in understanding what is meant by an integrated approach, (environmental) policy integration, interactive governance and governance modes. First, literature regarding climate neutral cities is discussed. By focusing on this, it is possible to exactly understand what is meant by a climate neutral city and more specifically what kind of problems these cities have to deal with. Knowing the kind of problems is very important for the rest of this research, since certain problems ask for different kinds of solutions. For climate neutral cities an integrated approach is suggested. Therefore, the second theory discussed will be on integrated approaches and interactive governance. By explaining what this exactly is, and what is entailed by this, it is possible to describe what is meant by an interactive approach in regard to climate neutral cities and what is needed to know in order to make an analysis/assessment of the extent to which municipalities are using an integrated approach. The first part will handle the extent to which policy is integrated. For this part literature regarding (environmental) policy integration (EPI) is discussed. In this part the difference between policy integration and environmental policy integration will be given and different concepts of EPI will be discussed. Furthermore, a perspective will be chosen that best reflects the needs of an integrated approach for climate neutral cities. Finally, the most important factors will be discussed which are necessary to analyze the extent to which policy is integrated. The second part will consist of conditions necessary to implement an integrated approach by municipalities. Here, literature regarding governance modes and the relations/interactions between different actors will be analyzed. Identifying the features of the relevant governance mode will help to determine which conditions are necessary in order to implement an integrated approach by the municipality. In this part the ideal governance mode will be described and this mode will be used when analyzing the results. The result of this literature review will be an analytical framework. This framework will consist of the two parts addressed above. The obtained knowledge thus far is necessary for the second method, the case study approach. The knowledge gained from the literature review forms the basis of the assessment of the case studies. The analytical framework will be used in order to highlight the stronger and the weaker

points of the case studies, which will help in giving recommendations. The discussion of the literature, and the analytical framework, is presented in chapter three.

Most of these sources were gathered from the database of Utrecht University by using terms like 'low carbon urban development', 'Climate neutral cities', 'Sustainable cities', '(Environmental) policy integration, integrated approach and interactive governance, as well as from readers used for previous courses and by google scholar. By using the citation function on Scopus, more interesting scientific research was found. In selecting the different scientific research attention is paid to what was written, how useful it was for the scope of this research and how often it is quoted.

2.2 Case study analysis

The second strategy used in this research is a case study approach. The choice for a case study approach is that this will help to test the analytical framework derived from theory. In turn this will help to add knowledge to the lack of theory on an integrated approach in the context of climate neutral cities. A case study approach is a strategy whereby the researches can gain a profound and full insight into one or several objects or processes that are confined in time and space (Verschuren & Doorewaard, 2010). This approach is chosen to gather more information about using an integrated approach for becoming climate neutral on a municipality level. It will give insight in the extent to which policy is integrated in the selected municipalities and to help identifying the applied mode of governance. This will in turn provide information about the interactions between different stakeholders.

Using a case study analysis means that a relatively small amount of units (or cases) are used. In this research two case studies are chosen. By limiting the scope of this research to two cases, this research focuses more on in depth than breadth results. This means the emphasis of this research will not be on counting and calculating, but on comparing and interpreting the results of the observations (Verschuren & Doorewaard, 2010). With this choice, to only have two case studies, the intention of this research is not to generalize the results of these case studies to other municipalities in the Netherlands, but to generalize it regarding to the literature. It is often stated that a small number of cases is not suitable for making a generalization and that it is therefore more difficult to make a contribution to scientific development (Flyvbjerg, 2006). However, this is not correct. Even with a small amount of cases it is possible to make contributions. The strength of this approach is that it provides a useful example of how the literature will stand in practice. Also with this example more information can be given about the factors/conditions that will help to analyze/assess the extent to which an integrated approach is used by municipalities for creating climate neutral cities (Flyvbjerg, 2006). Depth is realized by using various and intensive methods of data gathering. In this research this is achieved by using different methods and sources. The most important method of data gathering is the analysis and assessment of various policy plans, documents, agreements, statements etc. These sources will reveal the plans, ambitions, goals and strategies that the chosen municipalities are using for becoming climate neutral and it will help to determine the extent to which policy is integrated. The information gained from this method is supplemented with information from interviews. Interviews are conducted with experts on the topic. A combination of more intensive face-to-face interviews and interviews by telephone and e-mail are conducted, consisting of mostly open questions. A downside of this data gathering technique is that some of the answers may be open to interpretation. Subsequently, using different sources means that in this research multiple, various, sources about different parts of the municipality/stakeholders/projects have been used in order to gather the data needed. Another characteristic of this case study approach is that a strategic sample, instead of a random sample, is used in order to avoid the risks of having two similar cases.

In this research the chosen case studies are executed on two levels. First there is the municipality level. Here the municipality as a whole is analyzed. The first part of the analytical framework is used to analyze the extent to which policy is integrated and the different factors that account for this will be described. Since this research opted for a rational view on (environmental) policy integration it is possible to determine the extent to which policy was integrated or not. This can vary from weak (environmental) policy integration to strong (environmental) policy integration. However, emphasis in this research is placed on the factors that explain it, rather than on the extent measurement. The indicators derived from theory, mostly indicate which factors will increase the likeliness of strong (environmental) policy integration. Therefore, the extent to which policy is integrated, is only assessed in an abstract way. This is done by looking at each factor/indicator separately and by attributing each factor/indicator a +; +-; -. With this rating system a + means that the factor was clearly evident in the case study; a +- indicates that the factor was only partly evident in the case study; and a – indicates that the factor was clearly not evident in the case study. More information about how the scores will be attributed is given in the next chapter (paragraph 3.6). Secondly, there is the project level. On this project level a project is analyzed and assessed within the chosen municipality. Here, the second part of the analytical framework is used to identify the applied mode of governance in this project. Information will be given about the actors involved and their interactions. This helps providing information about the necessary conditions for implementing an integrated approach.

Both levels are following the same strategy and data gathering technique. As explained above the most important method of data gathering is the analysis and assessment of various policy plans, documents, agreements, statements etc. Since this information alone is not enough to make a solid analysis/assessment it is supplemented with information from interviews. In total four interviews were held in this research. In Tilburg the first interview was held with the project leader, also an official of the municipality. With this interview more information was gained on the municipality as a whole. This interview resulted in information about the goals, ambitions and strategies of Tilburg for becoming climate neutral (necessary for the first part of the analysis). Furthermore, since the interviewee is de project leader, this interview also provided insights in the project of Tilburg. This interview provided a lot of information, but mostly from the perspective of the municipality. As will be explained later on, the project of Tilburg aimed to establish the 'Klimaatschap'. A part of this 'Klimaatschap' is the 'Klimaatbureau'. This agency deals with the different stakeholders and projects that are going on in Tilburg. Therefore two more interviews were held with two members of this 'Klimaatbureau' about the interaction with/between different stakeholders. This resulted in more information and a better analysis of the project level. More information about the 'Klimaatschap' and the 'Klimaatbureau' is given in the next paragraph and in chapter four. In Rotterdam only one interview was held with an official of the municipality. With this interview more information was gained on the municipality as a whole. This interview resulted in information about the goals, ambitions and strategies of Rotterdam for becoming climate neutral and it also resulted in more descriptive information about the project of Rotterdam. Only one interview was held in this case study because of the existence of various very informative policy documents and agreements about the project. This provided the research with a lot of information on the organization and the structure of the project and information on the interaction between different stakeholders. More information about the project in Rotterdam is given in the next paragraph and in chapter five. The precise list of the interviewees, and the questions asked, are included in appendix A. When in the case studies information is being used based on the analysis of the policy plans, documents, statements etc., a reference is made to the appropriate file. Subsequently, when information is used from the interviews, this is made clear by either stating that the information was evident from the interviews, or by citing the interviewee. In each case a reference is made to the appropriate interviewee.

2.3 Case study selection

For this research two different case studies will be used. As described above, the choice of limiting the amount of case studied to two cases, means that this research focuses more on in depth than breadth results. Furthermore, it is not the intention of this research to make a generalization towards all Dutch municipalities, but the two chosen case studies are used as examples. The knowledge gained from the literature review and the developed analytical framework, can be tested with these case studies. This will result in practical knowledge about the extent to which municipalities use an integrated approach for becoming climate neutral, but most importantly about the factors/conditions that account for this. The intention is to use two front running case studies. Also explained above is that the case study analysis consists of two levels. The first level is the municipality as a whole in order to analyze the extent to which policy is integrated in that municipality. The second level is the project. Here, a project within the chosen municipality is analyzed and assessed in order to identify the applied mode of governance in this project. By focusing on the role of the local authority (the municipality) and the interactions between various stakeholders, information will be provided about the necessary conditions for implementing an integrated approach. A few criteria were used to select the case studies:

1   They should be a member of the 'Klimaatagenda 2011-2014 or the 'Innovatieprogramma Klimaatneutrale Steden (IKS)'
2   The scope, inclusiveness and the type of project currently taking place in the municipality.

The first criterion is that both cities are a member of the 'Klimaatagenda 2011-2014' or the 'IKS'. The former is the joint collaboration between municipalities, provinces, Dutch water boards, the national government, businesses and civilians, as described in paragraph 1.1. The latter is an agenda aimed at accelerating the transition towards climate neutral cities. The different members/municipalities of the programmes and projects that are currently taking place in those municipalities, are listed in table 2.1.

Table 2.1: Municipalities and projects IKS

City	Project	Description
Amsterdam Zuid	Co-operatie Zuid: 'Wij krijgen kippen'	Building of 50 sustainable energy companies, through an own corporation
Breda	Mobility project 1: CO_2-reduction	Project to make the traveling of citizens more sustainable
	Mobility project 2: public transport	Building of a new, more sustainable public transportation system
	Project built environment	Reduce CO_2 emissions of houses
Heerhugowaard	Sustainable neighborhood	Building of a more sustainable neighborhood
Lochem	Sustainable energy flows in Armhoede	Making the community Armhoede a sustainable energy landscape
Nijmegen	From diesel to biogas	Transition to generate own biogas
	Sustainable distribution of goods	Making the flows of goods in and out of Nijmegen and Arnhem more sustainable
Rotterdam	Heijplaat	Transition to make the neighborhood Heijplaat a climate neutral district together with civilians, businesses and knowledge institutes.
Tilburg	Network 'Klimaatschap'	Association of civilians, businesses

		and the government in network 'Klimaatschap' for making Tilburg climate neutral
Wageningen	Solar energy	Maximum energy reduction with an innovative financial construction for solar-energy
Source: Agentschap NL EL&I, 2012		

In general, these are the cities/municipalities that have taken an interest in becoming a climate neutral city.

The second criterion is the scope, inclusiveness and the type of project currently taking place in the municipality. The scope and the inclusiveness of the project relate to the amount of issues involved. In paragraph 1.1 different policy fields are described regarding climate neutrality (more information will be given in chapter 3 and in table 3.1). For the selected case study it is important that the project is not focused on only one of these aspects, but that it deals with a number of different issues/sectors. Projects focused on more policy fields are more interesting to investigate and will provide more information about the extent of policy integration and the necessary conditions for implementing an integrated approach. Furthermore, is it a requirement that there is participation/involvement of numerous different actors. An important part of case study analysis focuses on the relations and interactions between different stakeholders. Without a lot of stakeholders involved in the project, this cannot be investigated. Many scholars have highlighted the fact that strong local involvement and public participation in the design and implementation is essential (European Commission, 2009). The effectiveness of policy making can be increased, win-win situations increase, more knowledge, skills and resources will become available etc. The last part of the second criterion is the type of project. For the analysis it is more interesting to have two different kind of projects, because the chance of identifying different explanatory factors is higher in such a scenario.

By looking at the projects of the eight municipalities, regarding the scope and inclusiveness of the project, some of the municipalities can be rejected. The rejected municipalities are: Amsterdam, Breda, Lochem, Nijmegen and Wageningen. In Amsterdam the projects consist of building 50 sustainable energy companies. This project does not contain much different policy fields and the amount of different kind of stakeholders is limited. In Breda three different projects are taking place, but none of these projects focus on multiple policy fields. The first project only deals with reducing the CO_2 emissions of traveling citizens. The second project focuses on building a more sustainable transportation system and the third project only deals with reducing CO_2 emissions of houses. In Lochem the project is only focused on sustainable energy flows. The two projects in Nijmegen are also limited in the amount of policy fields. The first project only deals with the transition towards generating biogas and the second on the sustainable distribution of goods. Lastly the municipality of Wageningen. In this municipality a project is taking place focusing only on solar energy.

With this rejections there are only three municipalities left: Heerhugowaard, Rotterdam and Tilburg. To make a final decision, the type of project in these municipalities is used. With the requirement that the chosen municipalities have different types of projects a final decision needs to be made between the municipalities of Heerhugowaard and of Rotterdam. The project of Tilburg is of a different nature than the other two projects and is therefore selected as the first case study.

Tilburg is one of the frontrunners within the 'Klimaatagenda 2011-2014' and the 'IKS'. Tilburg started a special collaboration network, the 'Klimaatschap', in order to become a climate neutral city. Already more than 80 parties have signed a climate declaration in which they declare to collaborate

towards a climate neutral and resilient Tilburg. It is a local collaboration between organizations, businesses, civilians and knowledge institutes to achieve the climate ambitions. The municipality took the initiative, but now other stakeholders and partners have taken over. They ensure new projects and financial resources. The 'Klimaatschap' will provide supervision and will help to start projects and will act as a knowledge broker (IenM, 2011b). More information about Tilburg, and especially about the 'Klimaatschap', is given in chapter four. Tilburg has some ambitious goals and policy documents available. The municipality of Tilburg started a process in which it collaborated with different parties (Interpolis, Province of Noord-Brabant, GGD, AM Energy and BuildDes) to make a multiannual climate program (Kernteam Hotspot Tilburg, 2008). Furthermore, there is a climate monitor and several other documents are available. Besides this climate program, several other stakeholders are participating within, or by means of, the 'Klimaatschap'. In 2011, Tilburg was declared to be climate city of the year. Which meant that the public was best convinced of the climate ambitions of Tilburg and of the capacity of Tilburg to realize these ambitions (Tilburg, 2011). Since Tilburg has declared to be one of the frontrunners on this topic, this city fits well within the scope of this research to be one of the two case studies.

To choose the second case study an additional criterion is used, namely whether the city is a front runner on the area of climate neutrality. Based on this last criterion Rotterdam is chosen as the second case study. The municipality of Rotterdam expressed its interest in becoming climate neutral in an early stage. In the coming years the neighborhood Heijplaat will become a climate neutral (example)district. Together with the civilians, businesses and knowledge institutes, the city wants to bring various sustainability issues together in this district, resulting in four subprojects about sustainable buildings, a responsible outdoor environment and green public transportation (IenM, 2011). The findings of these projects should help the city with future projects. More information about Rotterdam, and especially about project Heijplaat, is given in chapter five. Rotterdam has some ambitious goals and policy documents available. The municipality of Rotterdam started an adaptation program and together with the Rotterdam Climate Initiative - a collaboration between the municipality of Rotterdam, Port Rotterdam, DCMR and Deltalings – a report ia made about how to make Rotterdam climate proof (Rotterdam Climate Initiative, 2010). Furthermore, there are several other sustainability reports and also more formal documents about the Heijplaat project. Within the Heijplaat project several different stakeholders are participating, including civilians. Citizens of Heijplaat even received an award from the World Wildlife Fund for their sustainable approach, and help, to make the neighborhood a climate neutral neighborhood (ANP, 2012). With this approach, and the strong involvement of different stakeholders, Rotterdam fits well within the scope of this research and is therefore selected as a second case study.

Chapter 3: Theories and concepts: towards an analytical framework

The theories and concepts described in this chapter will form the basis for creating an analytical framework which will be used to analyze the case studies. This chapter will consist of elements of different theories and concepts concerning climate neutral cities, integrated approaches and interactive governance, (environmental) policy integration and governance modes. This chapter deals subsequently with the following concepts/theories: (3.1) the concept of a climate neutral city, this section will also shortly describe the chances for cities for funding of the EU and briefly describes the context of climate neutral cities in the Netherlands; (3.2) the concept of an integrated approach and interactive governance; (3.3) (environmental) policy integration; (3.4) important factors that will explain the extent of policy integration; (3.5) mode of governing; and (3.6) a conclusion in which the analytical framework is presented. In this chapter the first sub-question is answered:

"What factors from literature are relevant for creating an analysis framework that can be used for assessing/explaining the extent to which cities use an integrated approach for becoming climate neutral?"

3.1 Climate Neutral City

"What exactly is a climate neutral city?"

A climate neutral city is hard to define, since there is not a clear definition of the concept. However, as described in the background section (paragraph 1.1), climate neutral cities can be seen as cities who are not contributing to climate change (Economic and Social Council, 2009). These climate neutral cities aim towards net zero emissions of GHG. According to the Economic and Social Council (2009) climate neutral cities are the goal that all urban areas should aspire. Not only should it try to reduce global warming and climate change, but it must also address environmental, economic and social challenges of urban areas. Therefore, climate neutrality in cities should be seen as: "a strategic goal whose tools and actions will trigger beneficial effects for several sectors, and for the community as a whole as well as for individuals. Efforts should be geographically focused, allowing for a local balance of emissions and their management" (Economic and Social Council, 2009, p. 4). It is also described in the background section that cities are part of the problem, since cities are responsible for a significant part of GHG emissions. Both directly as generators of emissions and indirectly as end-users of fossil fuel based energies and other goods and services (UN, 2011). For these reasons cities are perfect areas to implement climate change mitigations policies and projects. However, these cities are also vulnerable to climate change. Cities and urban areas often experience some of the largest impacts from both climate change and natural occurrences. Therefore should these cities also focus on climate adaptation policies and projects (UN, 2011). So, a climate neutral city, seen as a strategic goal as described above, should (UN, 2011):

- aim to move towards net zero emissions of GHG by reducing GHG emissions as much as possible and by developing trade-off mechanisms to offset the remaining unavoidable emissions;
- aim to become climate-proof, or resilient to the negative impacts of the changing climate by improving their adaptive capacities.

Climate neutrality can be achieved by addressing various policy areas/sectors and with different tools. As described in the background section some of these areas are the industry sector, buildings, the transport sector and by improving the urban greenspace. By addressing these sectors different energy savings can be realized and GHG emissions can drastically be reduced. An overview is given in table 3.1. This can be achieved by using different instruments, like regulation (legislation,

performance standards etc.), financial incentives (subsidies taxes etc.), promotion of new markets, research and development programmes, and by area-based investment programmes (Economic and Social Council, 2009.

Table 3.1: Trickle-down benefits of climate neutral cities

Policy	Tools	Environmental sustainability	Overall sustainability (including welfare and health gains)
Energy efficiency in housing	Low energy appliances Use of appropriate construction materials Better insulation Use of renewable energy sources	Reducing emissions in buildings: 29 per cent estimate by IPCC	Reduced use of energy consumption Better living conditions: increased housing comfort and better air quality
	Effective heating/cooling system (including passive housing) Optimize the life cycle of buildings		
Sustainable transport	Increase public transport opportunities Encourage investment in renewable fuels Promote cycling and walking	Less GHG emissions from reduced traffic Reduce pollution	Competitive gain from reduced expenditures and time in transport Save money at the individual level, from less money spent on transport Health gains from healthier lifestyles Time-saving: better quality of mobility
Urban greenspace	Urban forest Greening roofs in areas with a high proportion of buildings Green public space	Absorb emissions of carbon dioxide Enable evaporative cooling Increase biodiversity	Better living conditions: increased recreational opportunities and a healthier environment Conserve natural ecosystem value
Reduce urban sprawl (neighborhood planning)	Protected open space Smart growth Greenbelts Densification: encourage polycentrism Mixed land-use	Reduce emission from buildings Diminish the need for individual transport Increase green areas	Improve city "efficiency" and competitive gain Reduce the formation of unsustainable informal settlements Socially functional city; encourage social integration Create living communities
Manage urban infrastructure	Control waste management: create waste-to-energy systems at landfills Improve water distribution systems and leak management	Protect water sources from pollution Reduce pollution from waste	Better water for human consumption Improve living and sanitary conditions Save money

Source: Economic and Social Council (2009)

For the second aim, to become climate proof, the climate adaption ladder can be used. This ladder is shown below in figure 3.1. Five different steps can be taken, namely: (1) prevent further climate change (mitigation); (2) deal with uncertainties by incorporating flexibility for unpleasant or unpredicted scenarios; (3) prevent negative effects of climate change, but utilize the positive effects; (4) prevent damage when effects do occur; and (5) make sure that there is enough capacity for resilience (Kernteam Hotspot Tilburg, 2008).

Figure 3.1: Climate adaptation ladder

Climate adaptation ladder

5. Allow for resilience/capacity for recovery
When damage does occur, arrange for resources for making a quick recovery. For example through insurance, funds, or by building with water resistant materials so that when recovery from flooding is necessary this will cost less.

4. Prevent damage
Try to be prepared for possible damage or nuisance so that the effects are kept to a minimum. For example by preparing a heat plan, an evacuation plan and by making plans/scenarios/roadmaps for when a crisis occur.

3. Prevent negative effects % utilize positive effects
Where climate change is already occuring or will occur can negative effects be avoided and positve effects be utilized by using targeted measures. For example: design buildings in such a way that overheating is avoided - by shading, insulation and smart ventilation. And: create more space for outdoor recreation - on the water on in the shades.

2. Incorporating flexibility
Because future impacts of climate change are still uncertain it is advisable to take into account that the effects are more numerous and severe than what is now predicted. For example more space should be reserved for more water storage than in the current scenario's.

1. Prevent climate change
The first priority is to prevent further climate change. For example by no longer using fossil fuels.

START

Source: Kernteam Hotspot Tilburg, 2008)

As explained, cities are a part of the problem and are therefore also a central part of the solution. However, becoming climate neutral is tricky and should be pursued with caution. Most of the problems, and issues within climate neutral cities, are ill structured and are dealt with at different administrative levels (local, regional and national) and by different actors. Furthermore, should it also include major environmental, economical and social challenges. These problems must be overcome

in order for cities to become climate neutral. These complex problems require complex cross-sectoral, holistic solutions. As mentioned different issues need to be included and it need to be supported and implemented by different actors. Therefore, an integrated approach is recommended (IenM, 2011b; UN, 2011; Economic and Social Council, 2009).

3.1.1 International (EU) programmes and funding

The European Union encourages and support cities in their effort to achieve climate neutrality. Cities can apply to different programmes and fundings including the Cohesian Policy Funds, LIFE+ for environmental projects, the Framework Programmes for Research and Technological Development (FP) and the Competitiveness and Innovation Programme (EU, 2010). The Cohesion policy funding focuses on sustainable urban areas, good local governance, social inclusion and equality, and boost economic growth. This fund finances environmental infrastructure in the poorest EU countries. Furthermore, will it help to improve citizens skills and job prospects (EU, 2010). The LIFE+ programme finances innovative environmental and nature conservation projects. It focuses on supporting with new technologies, policy approaches, methods and instruments for urban environmental management. It supported over 3000 projects and has a total budget of two billion euro's for the period of 2007-2013 (EU, 2010). The EU Research Framework Programmes support research and development. It provides financial support for projects relating to cultural heritage, the clean-up of brownfield areas, renewable energy and green urban transport.

3.1.2 Climate neutrality in the Netherlands

As described in the background section the EU targets in the Netherlands - 20 percent CO_2 reduction and 14 percent sustainable energy in 2020 - need to be met. The transition to a low CO_2 economy provides multiple grow chances for the Dutch economy. In order to reach these targets the 'Klimaatagenda 2011-2012' is established. One of the five different topics formulated is the climate neutral city. This program is part of a more broad sustainability agenda together with the Green Deal, which concerns plans and agreements on a project level. The financing of these kind of projects often proofs to be difficult. On the one hand because of a high risk profile or low yield ratio and on the other hand because of lack of knowledge (IenM, 2011b). The Holland Financial Center (HFC) tries to establish a green investment society to support municipalities with making green investments. The government will try to support the municipalities with the execution of the 'Klimaatagenda' by establishing a structure which allow municipalities and provinces to inspire each other and to discuss their progress. Furthermore, by providing practical tools and instruments and by setting up a monitoring protocol (IenM, 2011b).

Within this program eight municipalities have taken a leaders role for becoming climate neutral. It is stated that in order to create a climate neutral city an intensive collaboration between the city, and its environment and region, municipalities, provinces and the Dutch water board is required, but also with civilians and businesses. An integrated approach is necessary in which climate policy should be integrated in the organizations. This also asks for changes within the organizations, institutional changes, changes in policies and financial changes (IenM, 2011b).

3.1.3 Conclusion

Climate neutral cities can be seen as cities who are not contributing to climate change. Furthermore, a climate neutral city should:

- aim to move towards net zero emissions of GHG by reducing GHG emissions as much as possible and by developing trade-off mechanisms to offset the remaining unavoidable emissions;
- aim to become climate-proof, or resilient to the negative impacts of the changing climate by improving their adaptive capacities.

Regarding climate neutral cities it is suggested that an integrated approach is necessary/will be used, since this approach fits best with the complex nature of the issues that a climate neutral city will have to deal with.

3.2 The concept of an integrated approach and interactive governance

"What is an integrated approach?"

As explained above, in order for cities to become climate neutral it must include major environmental, economical and social challenges and it should be addressed by multiple actors. Therefore, an integrated approach is necessary in order for cities to become climate neutral. An integrated approach is an approach that seeks to: *"coordinate the different sectoral policies that have an impact on cities and city-dwellers, and it means the simultaneous and fair consideration of concerns and interests which are of relevance to urban development. Strong local involvement and public participation in the design and implementation of cross-sectoral projects and programmes is therefore essential. Citizens need to play an active role in shaping their immediate environment"* (European Commission, 2009, p. 54). In the 'Klimaatagenda' this is also recognized as the main solution for becoming climate neutral. It is stated that an intensive collaboration between the city, and its environment and region, municipalities, provinces and the Dutch water board is required, but also with civilians and businesses. An integrated approach is necessary in which climate policy should be integrated in the organizations (IenM, 2011b).

However, an integrated approach also rises some problems/challenges. Opponents state that all stakeholders have their own interests and preferences and that politics is mostly about pursuing and advancing their own interests and preferences (Dryzek, 1996). Opponents also state that most citizens do not have the resources or the knowledge to understand the complicated environmental issues. Furthermore, are there limits to the capacity of citizens to handle such technically demanding issues (Meadowcroft, 2004). Therefore, some advocate for a more local approach. They state that local authorities have more influence over local emissions, that local authorities are willing and able to deal with the complex sustainable development agenda, that local authorities are the key actors in terms of coordinating action and that some local authorities have more experience in addressing environmental issues (Bulkeley & Betsill, 2005). However, in the past different stakeholders often worked alone, which then often resulted in failed projects or policies (Stoker, 1998; Jessop, 1998). Therefore, proponents of more stakeholder interaction, and proponents of more influence for the private and public sector, state that the state alone cannot handle everything. In modern society, the state is incapable of recognizing and anticipating all possible conflicts and coordination issues that arise from an interconnected, complex and power-shared world, and because of the decline in state power state systems are failing in adequately govern the global commons (Scherer et al., 2006; van Kersbergen & van Waarden, 2004; Stoker, 1998;). Proponents of an integrated approach argue that an integrated approach can eliminate redundancies, constrain conflicts and reduce the number of system elements and their interactions (Briassoulis, 2004; Nilsson & Persson, 2003; Jessop, 1998). An integrated approach can also increase rationality and effectiveness of policy making. By bringing together different policy actors the pool of knowledge grows and chances for identifying win-win situations increases (Nilsson & Persson, 2003; stoker, 1998). So, the problem can be solved by including the private sector and private regulations. This raises questions to the role of authority and

in general the role that different stakeholders can have, and the strategies used. Proponents of an interacted approach state that the private sector can improve the effectiveness and legitimacy of global governance by creating win-win situations for the state and non-state actors. They can manage the collective goods by using their resources, skills and expertise. More stakeholders also mean that the relevant technical, regional, social and political information necessary to increase the problem-solving capacity of governance increases. So, for effective implementation of an integrated approach for creating climate neutral cities, it is stated that cities should not only cooperate with other cities and between different administrators, but that they should seek a broader participation of stakeholders and the involvement of the population in climate related decision-making processes (UN, 2011). This is to inform, and to be informed by, the local community's knowledge about climate challenges and to share the ownership of new strategies with a larger group of stakeholders, thus ensuring more successful implementation. This can be achieved, for instance, by partnerships and through networks (UN, 2011). Networks can be formed between public or private organizations and of mixes between the two. They are considered to be self-organizing, and to resist government steering, develop their own policies and mould their environments. Furthermore, they are characterized by an exchange of resources and negotiations, and by game-like interactions rooted in trust and regulated by rules of the game negotiated and agreed by network participants (Van Kersbergen & van Waarden, 2004).

Two critical elements can be derived from the definition of an integrated approach described above. Firstly, that it is necessary that all relevant sectoral policies and all different issues, goals and resources, actors and policies need to be coordinated and integrated with each other. As explained in paragraph 1.2 three different types/levels are necessary. There should be integration on a sectoral level (all policies), on an organizational level (coordination and cooperation between different stakeholders) and an integration of goals, instruments and issues. Secondly, the relations/interactions between different stakeholders. It was recognized that strong local involvement and public participation in the design and implementation is essential. The role of the local authority (the municipality) and the relation/interactions between different stakeholders need to be organized in such a way that it reduces conflicts and stimulates the advantages associated with an interactive approach. Therefore, it is necessary to study the mode of governing. These two elements will form the basis of the analytical framework presented at the end of this chapter (paragraph 3.6) and are described in the next paragraphs. First by addressing (environmental) policy integration (3.3) and secondly by addressing governance modes (3.5).

3.2.1 Conclusion

Regarding climate neutral cities, an integrated approach is an approach that seeks to: *"coordinate the different sectoral policies that have an impact on cities and city-dwellers, and it means the simultaneous and fair consideration of concerns and interests which are of relevance to urban development. Strong local involvement and public participation in the design and implementation of cross-sectoral projects and programs is therefore essential. Citizens need to play an active role in shaping their immediate environment"* (European Commission, 2009, p. 54). Meaning that in order to become climate neutral, cities must integrate climate change policy and climate change related issues with all other issues, it must be coordinated with all relevant actors, and that all actors need to work together. This research approaches this by looking at (environmental) policy integration and by looking at the mode of governing.

3.3 (Environmental) policy integration

"What is (environmental) policy integration"?

This paragraph describes the meaning of policy integration and describes what the difference is with environmental policy integration. Subsequently, are different concepts/ideas/dimensions of (environmental) policy integration described and are the most important factors, which will be used in the analytical framework, highlighted.

3.3.1 Policy integration

Underdal (1980) defines policy integration with the help of three criteria that should be satisfied in order for a policy to be integrated. The three criteria are: comprehensiveness, consistency and aggregation. Together an integrated policy can be defined as one where *"all significant consequences of policy decisions are recognized as decision premises, where policy options are evaluated on the basis of their effects on some aggregate measure of utility, and where the different policy elements are in accord with each other"* (Underdal, 1980, p. 162). The first criterion is in terms of inclusiveness of space (the correct geographical area), time (adopting a long-term view), actors (inclusion of relevant actors) and issues (inclusion of relevant issues). The second criterion means that all components of the policy should be in agreement, by all levels and by all actors. This means, that in order for a policy to be integrated, that the policy - or the goals and objectives – should be in agreement amongst all different sectors and with all the different stakeholders involved. The third criterion means that an overarching criterion should be used to evaluate different policy elements. A relating view is offered by Briassoulis (2004). Briassoulis (2004) views policy integration more from an institutionalist, actor-centered perspective, which fits more, and is more responsive, to the policy needs of complex problems. This perspective places emphasis on the values, goals, theories about the problem, resources, information-processing capabilities, and multiple memberships of actors, their stakes in particular action situations, and the diverse ways through which they pursue their interest within a shared power world (Briassoulis, 2004). In this research this perspective is chosen, since this perspective fits best with that of an integrated approach for climate neutral cities.

3.3.2 Environmental policy integration

The definition given by Underdal (1980) is a good starting point, but it does not really deal with environmental policy. The work of Collier (1997), however, did include the environmental element. Collier (1997) defines environmental policy integration with three objectives that should be achieved, namely that it should: (a) achieve sustainable development and prevent environmental damage; (b) remove contradictions between policies as well as within policies; and (c) realize mutual benefits and the goals of making policies mutually supportive. The elements of sustainable development are clearly included in this definition, but it lacks an exact and clear definition of policy integration. Lafferty and Hovden (2003) continue with this work and combines it with the definition of policy integration of Underdal (1980), since the definition of Underdal is well developed. However, the definition of Underdal (1980) lacks the concept of sustainable development. One of the key defining features of sustainable development is that environmental objectives should be integrated into non-environmental policy sectors (Lafferty & Hovden, 2003). It stresses the fact that the environmental sector alone will not be able to reach the environmental objectives and that other sectors must address those environmental objectives as well. Environmental policy integration is therefore defined as (Lafferty & Hovden, 2003, p. 9):

- the incorporation of environmental objectives into all stages of policy making in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy;
- accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimize contradictions between environmental and sectoral policies by giving principled priority to the former over the latter.

3.3.3 Concepts/ideas/dimensions of (environmental) policy integration

(Environmental) policy integration can be interpreted/developed in different ways. Several of these concepts/ideas/dimensions are discussed below.

<u>EPI as a rational versus a normative concept</u>

EPI can both have a normative basis as a rational basis. A normative view of EPI will give priority of environmental goals above other goals, meaning that the environment needs higher priority in sector policy making. In this case it will include a specific weight in comparison with other issues (Persson, 2004; Nillson, 2005). However, it is quite difficult to determine what exactly, or how high, this weight should be. A different concept is to view EPI from a rational view, like the definitions described above from Underdal (1980) and Briassoulis (2004). From this view EPI contributes to greater efficiency and coherence of policymaking (Nillson, 2005). In this case environmental implications are considered earlier and closer to the sector driving forces of environmental problems, as well as removing contradictions and realizing mutual benefits (Persson, 2004). Since it is difficult to give weighting, this research takes on a rational view and sees EPI as a matter of degree (Persson, 2004). In this way it can be determined whether EPI is present or whether it is not. This view has its advantages especially when multiple actors are involved. EPI can, for instance, be reached when policies are formed in networking processes with multiple actors (both public and private), which have different ideas and interests. Actors depend on each other and on the exchange of resources to develop sufficient political support to have policies developed (Nillson, 2005; Nillson & Persson, 2003). Important are the interactions between the actors. As explained above this research follows the perspective of Briassoulis (2004), since this perspective is more actor centered, which places emphasis on the values, goals, theories about the problem, resources, information-processing capabilities, and multiple membership of actors, their stakes in particular action situations, and the diverse ways through which they pursue their interests within a shared power world (Briassoulis, 2004). Briassoulis (2004) also identified five different objects of policy integration that are necessary in order to analyze/assess policy integration. The object of policy integration summarizes the multi-part content of integration among policies in both the same, as different, stages of the policy process and influences the execution of policy integration. The five objects are summarized below and an overview of the objects with the associated criteria is given in appendix B (Briassoulis, 2004):

- *The policy object:* Policies have chances of being integrated if they have common scope, treat similar facets and/or accommodate or respect one another's concerns about different features;
- *Goals and objectives:* Goals and objectives should be congruent, compatible, consistent, common or complementary;
- *Actors and actor networks:* Common actors should be included and the relationships among the actors should be cooperative, collaborative, non-conflicting, and non-adversarial in general. Actors should have shared values, common visions, common goals and abide by the same rules;
- *Policy structures and procedures:* There should be common, congruent, non-conflicting, cooperative and coordinated structures and procedures, to create proper solutions. Not only between state and non-state actors, but also between different parts of the governments;
- *Instruments:* There should be compatible, non-conflicting, coordinated and/or complementary and mutually reinforcing policy instruments. Not only amongst instruments of the same type, but also of different types and integrative instruments.

EPI as a process, output or outcome

EPI can be studied from different perspectives. It can be studied as an issue of process in which it focuses on policy coordination between agencies, intragovernmental relations, communication processes and systems for issue mainstreaming into sector decision-making procedures (Nillson & Persson, 2003). EPI can also be studied as outputs. Here the statements, objectives, strategies, actions and regulatory instruments are studied (Nillson & Persson, 2003). Finally, can EPI be studied as outcomes. With this perspective the emphasis is on the results of EPI, what should be a contribution towards a better environment. So, it studies to what extent EPI has resulted in better environmental behavior (Nillson & Persson, 2003). This research only focuses on the process and the output perspectives and not on outcomes, since the focus of this research is on the extent to which policies are integrated, and not on the actual effects of EPI on environmental behavior. The definition of policy integration by Underdal (1980) also contains the elements of process and outputs. The criteria comprehensiveness and consistency can be attributed to process and output EPI. In this case it means that the factors of inclusiveness of space, time, actors and issues – as well as that every policy have to been in agreement with each other can be viewed as important factors for determining policy integration.

Vertical environmental policy integration versus Horizontal environmental policy integration

EPI can be viewed amongst different dimensions. Two of these dimensions are vertical environmental policy integration (VEPI) and horizontal environmental policy integration (HEPI). VEPI indicates the extent to which a particular governmental sector has adopted and implemented environmental objectives as central objectives. With this dimension EPI is only considered in the sector itself and is cross-sectoral. It only looks at the domain of its own sector and tries to integrate policy in this sector as much as possible (Laverty & Hovden, 2003). The second dimension, HEPI, indicates the extent to which a central authority has developed a comprehensive cross-sectoral strategy (Laverty & Hovden, 2003). It will seek to integrate environmental concerns in the overall policy goals and procedures. In this research the focus will be more on HEPI, cross-sectoral integration, and not on VEPI. But it will not only look at integration with different sectors, but with different actors as well. But HEPI does provide a list of factors that should be included for EPI, namely (Laverty & Hovden, 2003):

- the existence of a long-term sustainable development strategy;
- the existence of a central authority specifically entrusted with the supervision, coordination and implementation of the integration process;
- relatively clear designations as to sectoral responsibility for overarching goals;
- timetables and targets for environmental policy (included in the SDS or elsewhere);
- periodic reporting of progress with respect to targets at both the central and sectoral levels;
- an active and monitored usage of EIA and SEA for all governmental policies.

Types of integration

Lastly, a distinction can be made between different types of integration. Eggenberger and Partidario (2000) identified five types of integration which are summarized in table 3.2 below. The five types of integration are substantive, methodological, procedural, institutional and policy. The substantive form represents objectives of integration (as output), while the other four types of integration deal with how EPI can be achieved (as process). This clearly shows that realizing EPI can involve different types of integration.

Table 3.2: Forms of integration

1. Substantive	- The integration of physical or biophysical issues with social and economic issues - The integration of emerging issues such as health, risks, biodiversity, climate change and so on - The (appropriate) integration of global and local issues
2. Methodological	- The integration of environmental, economic and social (impact) assessment approaches such as cumulative assessment, risk assessment, technological assessment, cost/benefit analysis, multi-criteria analysis - The integration of the different applications, and experiences with the use of particular tools such as GIS (geographical information system) - The integration and clarification of (sector) terminologies (including the element of 'strategic')
3. Procedural	- The integration of environmental, social, economic planning/assessment, spatial planning and EIA - The integration of sector approval/licensing processes, spatial planning and EIA - The adoption of coordination, cooperation and subsidiarity as guiding principles for (governmental) planning at different levels of decision-making - The integration of affected stakeholders (public, private, NGO (non-governmental organization)) in the decision-making process - The integration of professionals in a truly interdisciplinary team
4. Institutional	- The provision of capacities to cope with the emerging issues and duties - The definition of a governmental organization to ensure integration - The exchange of information and possibilities of interventions between different sectors - The definition of leading and participating agencies and their respective duties and responsibilities
5. Policy	- The integration of 'sustainable development' as overall guiding principle in planning and EIA - The integration of sector regulations - The integration of sector strategies - The timing and provisions for political interventions - Accountability of government
Source: Eggenberger & Partidario (2000)	

Persson (2004) also made a distinction between three types of integration, namely: normative, organizational and procedural. Normative integration refers to values, norms and traditions that set the general parameters for policy-making. Organizational integration refers to the way how policy-making has been organized in the government system and deals with the government architecture, interaction of actors both within as outside of the government, power structures, resource allocation and budgeting, and capacity. Procedural integration refers to the procedures needed to effectively implement EPI. A distinction can be made between (a) measures for implementing a system for EPI in a sector government department or authority and (b) routine procedures to be applied continuously as tools for decision support (Persson, 2004). This research will deal more with the forms of

integration described by Persson (2004) and not the forms described by Eggenberger and Partidario (2000), since these forms fit better within the scope of this research. The factors belonging to these three types of integration are summarized below (Persson, 2004):

Normative factors:

- High-level political commitment
- Societal backing
- Definition of a policy framework for EPI or sustainable development
- Fundamental change in policy paradigm and tradition
- Time perspective
- Use of knowledge and science

Organizational factors:

- Changes in governmental architecture to overcome sector compartmentalization, e.g. integrated departments, new institutions, new mandates
- Accountability mechanisms
- Coordination and communication mechanisms, e.g. environmental correspondents, networks among bureaucrats
- Restructuring of the government budgetary process
- Training and awareness programmes
- Interaction with external actors

Procedural factors
- Implementation of an EPI system: sector report, consultation forum, sector strategy, action plan, monitoring
- Change of routine procedures: impact assessment of policy proposals, consultation and participation, rules of decision-making

3.3.4 Conclusion

Policy integration is addressed/analyzed from an institutionalist, actor-centered perspective, which fits more, and is more responsive, to the policy needs of complex problems. This perspective places emphasis on the values, goals, theories about the problem, resources, information-processing capabilities, and multiple memberships of actors, their stakes in particular action situations, and the diverse ways through which they pursue their interest within a shared power world (Briassoulis, 2004). An addition to policy integration is environmental policy integration. Environmental policy integration is derived from the broader concept of sustainable development. Environmental policy integration is defined as (Lafferty & Hovden, 2003, p. 9):

- the incorporation of environmental objectives into all stages of policy making in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy;
- accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimize contradictions between environmental and sectoral policies by giving principled priority to the former over the latter.

Different concepts/ideas/dimensions of (environmental) policy integration have been discussed throughout this paragraph. This research takes on a rational view of EPI, since it is difficult to give a weighting to EPI. This view has its advantages especially when multiple actors are involved. EPI can, for instance, be reached when policies are formed in networking processes with multiple actors

(both public and private), which have different ideas and interests. Actors depend on each other and on the exchange of resources to develop sufficient political support to have policies developed (Nillson, 2005; Nillson & Persson, 2003). Important are the interactions between the actors. Furthermore, are the perspectives of EPI seen as a process and as an output taken into account in this research, since the focus of this research is on the extent to which policies are integrated and not on the actual effects of EPI on environmental behavior. Subsequently, will horizontal environmental policy integration be used in this research. HEPI, cross-sectoral integration, focuses on integration among different sectors and this will be supplemented by looking at integration with different actors as well. Lastly, are the three types of integration made by Persson (2004), normative, organizational and procedural integration, included in this research.

There is quite some overlap between these different perspectives/concepts/dimensions of (environmental) policy integration. The next paragraph will highlight the most important factors found within these perspectives, which will form the basis of the analytical framework presented in paragraph 3.6.

3.4 Important factors that will explain the extent of policy integration

Throughout the previous paragraph different views and dimension of (environmental) policy integration were discussed and with each of the different concepts/dimensions several factors for (environmental) policy integration were mentioned. Much overlap is found and this paragraph will sort and group the most important factors into three different categories.

As mentioned above this research takes an institutionalist, actor-centered perspective (rational perspective). With this perspective the values, goals, theories about the problem, resources, information-processing capabilities, and actors and the interaction between actors are the most important aspects of policy integration. These are central aspects in this research and are recognized by most authors/concepts of EPI. But, these will be supplemented by looking at the factors of the different concepts/ideas/dimension of (environmental) polity integration. The factors found are in *italic*.

Underdal (1980) described three different criteria for policy integration (1) comprehensiveness, (2) consistency and (3) aggregation. From these criteria different factors for policy integration were found, namely:

- inclusiveness of *space* (the correct geographical area);
- *time* (adopting a long-term view);
- *actors* (inclusion of relevant actors);
- *issues* (inclusion of relevant issues).
- Agreement between all policies, in all levels, and by all actors;

Briassoulis (2004) described five different objects of policy integration, namely:

- The policy object: Policies should have a *common scope* and should *treat similar facets* and;
- Goals and objectives: *congruent, compatible, consistent, common or complementary goals and objectives*;
- Actors and actor networks: *inclusion of common actor;, cooperative, collaborative, non-conflicting and non-adversarial relationships between actors*; and *actors should have shared values, common visions, common goals and abide by the same rules*;
- Policy structures and procedures: There should be *common, congruent, non-conflicting, cooperative and coordinated structures and procedures*;

- Instruments*: There should be *compatible, non-conflicting, coordinated and/or complementary and mutually reinforcing policy instruments*

From the dimension of HEPI, indicating the extent to which a central authority has developed a comprehensive cross-sectoral strategy, Laverty and Hovden (2003) provided a list consisting of the following factors:

- the *existence of a long-term sustainable development strategy*;
- *timetables and targets for environmental policy*;
- *active monitoring*.

Regarding the types/forms of integration this research mostly focuses on the forms described by Persson (2004). However, the factors associated with the substantive type of integration described by Eggenberger and Partidario (2000) are included in this research. These factors addresses the integration of issues very clearly and are therefore considered very useful, the factors are described below (Eggenberger and Partidario, 2000):

- *the integration of physical or biophysical issues with social and economic issues;*
- *the integration of emerging issues such as health, risks, biodiversity, climate change etc*;
- the integration of *affected stakeholders (public, private, NGO (non-governmental organization)) in the decision-making process*;
- the integration of professionals in a *truly interdisciplinary team*;

Finally, Persson (2004) described several normative, organizational and procedural factors. Not all of the factors are taken into account, but only those that fit best within the scope of this research. The factors are listed below (Persson, 2004):

- *commitment*;
- *societal backing;*
- *time perspective*;
- use of *knowledge and science;*
- *integrated departments*
- *network*
- *training and awareness programmes;*
- *interaction with external actors;*
- *monitoring;*

3.4.1 Conclusion

A lot of similar, and different factors are found throughout literature. These factors can be grouped into three different categories/types of integration, namely:

- Normative integration: this category consists of common understanding and commitment;
- Integration of goals, instruments and issues: this category consists of the factors goals and instruments;
- Organizational integration: this category consists of participation (Inclusion of involved stakeholders (public, private, NGO etc.) in the decision-making process) and leadership.

These groups/factors form the basis of the analytical framework presented in paragraph 3.6.

3.5 Mode of governing

"What is the role of authority and what modes of governance can be identified?"

As described in earlier parts of this research there is an emergence of new forms of governing. No longer is it possible to ignore the context wherein policy-making is being constructed and implemented (Bulkeley & Kern, 2006). The role of authority, which usually refers to the role of the local government, is affected by this. In this research the role of authority means the role of the municipality. Bulkeley & Kern (2006) identified four different modes of governing which will explain the different roles that the local authority can have. They focused on modes of governing in the context of climate protection. The four different modes are described below (Bulkeley & Kern, 2006):

- *Self-governing*: the capacity of the local government to govern its own activities. It relies on the processes of organizational management;
- *Governing by provision*: the shaping of practice through the delivery of particular forms of services and resources. It focuses on the role of authority as a provider and it is accomplished through practical, material and infrastructural means;
- *Governing by authority*: local authority has the traditional role as regulator by the use of traditional forms of authority such as regulation and through the use of sanction;
- *Governing through enabling*: the role of authority as facilitator, coordinator and encourager of action through partnerships with private- and voluntary sector agencies, and to various forms of community engagement. It works though persuasion, argument and by giving incentives.

An overview of the table provided by Bulkeley and Kern (2006) is included in appendix C. These modes of governing show the various roles that the local authority (municipality) can have. Basically the role of the municipality various between the extent to which the municipality is able to handle everything on its own, without the involvement of different actors, to a scenario in which different stakeholders are necessary. In this scenario the role of the municipality can vary between being a provider, a regulator or being only a facilitator. In case of the latter, are the different stakeholders more powerful/more involved and is the municipality only indirectly involved. Even though these modes give a good picture of the various roles that the municipality can have, it does not become clear how these roles can be identified within a municipality. Since one of the objectives of this research is to investigate which governance mode is applied by the (chosen) municipality, more information is necessary about the factors/conditions that determine the role of the municipality and other actors. With the modes described by Bulkeley and Kern (2006) it is not possible to determine the roles of the different stakeholders, since these modes provide no insights in the factors/conditions that determine the mode. In order to get insights in the factors/conditions necessary to implement an integrated approach, the work of Driessen et al. (2012) is studied. Driessen et al. (2012) identified five main modes of governing, which can be identified according to the roles and relations between the state, the market and civil society, namely:

1. Centralized governance: mode of governing in which the central government take the lead and act as the main or sole protagonist; the market and civil society act more as recipients;
2. Decentralized governance: this mode of governing is similar to the first mode except here the central government have off loaded tasks to lower levels of government;
3. Public – private governance: this mode of governing is characterized by the joint efforts of both the public as the private domain, although cooperation is mainly between the state and market actors;

4. Interactive governance: this governing mode is similar to the third mode and the actor base is broader and governments, markets and civil society collaborate on more equal terms. However, this is mostly done within predetermined boundaries set by the government;

5. Self-governance: in this governing mode the government takes a less prominent role and primarily actors of the private domain participate. Actors from the market and civil society have far-reaching autonomy and are able to initiate new approaches themselves;

Similar as to the modes described by Bulkeley and Kern (2006), is that the role of the municipality can vary between being able to handle everything on its own (the first two modes) to a mode in which all actors are similar (third mode) or wherein other actors have more influence (mainly the fourth and fifth mode). A big difference, however, is that Driessen et al. (2012) also describe eleven features belonging to three dimensions, namely: (1) actor features (regarding the level of participation of the different actors and how much influence they have), (2) institutional features (regarding the form, and the rules, of interactions) and (3) features concerning content (goals and instruments). With the help of these features/dimensions it is possible to determine the mode of governance that is used in the municipalities and will help to describe the conditions/requirements necessary for implementing an integrated approach. An overview of the different governance modes presented according to these dimensions/features is given in table 3.3 below.

3.5.1 Conclusion

With the new emerging forms of governance, the role of authority (in this research the local municipality) is changing. According to Bulkeley & Kern (2006) four different modes of governing (roles for the local authority) are possible, namely (Bulkeley & Kern, 2006): Self-governing, governing by provisions, governing by authority (as a regulator) and governing through enabling (as a facilitator/coordinator). Driessen et al. (2012) identified five main modes of governing: (1) Centralized governance; (2) Decentralized governance; (3) Public – private governance; (4) Interactive governance; and (5) Self-governance. These modes are determined by different features belonging to three groups: actor features, institutional features and features concerning content. The modes described by Driessen et al. (2012), as well as the different features, are used in this research and these features will form the basis of the second part of the analytical framework presented in paragraph 3.6.

Table 3.3: Modes of (environmental) governance and key features

		Centralized governance	Decentralized governance	Public - private governance	Interactive governance	Self-governance
Actor features	Initiating actors	Central gov't agencies (or supra national bodies)	Gov't at its various levels of aggregation (subsidiarity)	Central gov't agencies; private sector is granted a preconditioned role also	**Multiple actors: gov't, private sector and civil society**	Private sector and/or civil society
	Stakeholder position	Stakeholder autonomy determined by principal agency	High likelihood of stakeholder involvement	Autonomy of market stakeholders within predetermined boundaries	**Equal roles for all network partners**	Self governing entities determine the involvement of other stakeholders
	Policy level	(Supra) national state	Lower levels of gov't	Local to international level	**Multiple levels**	Local to international level
	Power base	Coercion; Authority; Legitimacy (democratic representation at the national level)	Coercion; Authority; Legitimacy (democratic representation at lower levels)	Competitiveness (prices); Contracts and legal recourse; Legitimacy (agreement on relations and procedures)	**Legitimacy (agreement on roles, positions, procedures and process); Trust; Knowledge**	Autonomy; Leadership; Group size; Social capital; Legitimacy (agreement on relations and procedures)
Institutional features	Model of representation	Pluralist (popular (supra) national election and lobbying)	Pluralist (popular local election and lobbying)	Corporatist (formalized public-private governing arrangements)	**Partnership (Participatory public-private governing arrangements**	Partnership (Participatory private-private governing arrangements)
	Rules of interaction	Formal rules (rule of law; fixed and clear procedures)	Formal rules (rule of law; fixed and clear procedures)	Formal and informal exchange rules	**Institutions in its broadest form (Formal and informal rules)**	Informal rules (norms; culture); Self-crafted (non-imposed) formal rules
	Mechanisms of social interaction	Top-down; command-and-control	Sub-national governments decide autonomously about collaborations within top-down determined boundaries	Private actors decide autonomously about collaborations within top-down determined boundaries	**Interactive: social learning, deliberations, and negotiations**	Bottom-up: social learning, deliberations and negotiations
Features concerning content	Goals and targets	Uniform goals and targets	Uniform and level specific goals and targets	Uniform goals; targets actor specific	**Tailor-made and integrated goals and targets**	Tailor-made goals and targets
	Instruments	Legislation, permits, norms and standards	Public covenants and performance contracts	Incentive based instruments like taxes and grants; performance contracts	**Negotiated agreements; trading mechanisms; covenants; entitlements**	Voluntary instruments; private contracts; entitlements; labelling and reporting
	Policy Integration	Sectorial (policy sectors and levels separated)	Sectorial (policy sectors separated)	Sectorial (branches and industries separated)	**Integrated (policy sectors and policy levels integrated)**	Sectorial to integrated (depends on problem framing by communities of interest)
	Policy-science interface	Primacy of generic, expert knowledge	Primacy of generic expert knowledge. Room for issue and time-and-place specific knowledge	Dominance of issue and time-and-place specific knowledge; expert and lay (producers and consumers)	**Transdisciplinarity: expert and lay knowledge in networks. Emphasis on integrated and time-and-place specific knowledge**	Dominance of issue and time-and-place specific: expert and lay (citizens)

→ = dominant role; ←→ = equivalent role; - - - = background role; S = central state; s = decentralized state; m = market; cs = civil society; Source: Driessen et al. (2012)

3.6 Conclusion

In this paragraph the analytical framework will be presented, which also answers the first sub-question:

 "What factors/elements of policy integration and conditions for implementing an integrated approach should be used to assess to which extent an integrated approach is being used?"

The analytical framework consists of two parts, which are presented on the basis of the second and the third sub-question of this research. The second sub-question was formulated as follows:

"To what extent is policy integrated in the chosen cities/municipalities?"

This part of the analytical framework is developed based on the factors that were found in paragraph 3.3 and 3.4 which will explain the extent of (environmental) policy integration regarding climate neutral cities. The third sub-question was:

 "Which conditions determine the extent to which municipalities are able to use an integrated approach for becoming climate neutral?"

The second part of the analytical framework consists of the conditions which need to be met in order to implement an integrated approach by using the governance modes and features described in paragraph 3.5.

3.6.1 Analytical framework part one: Factors for (environmental) policy integration

Paragraph 3.4 identified three categories with factors, namely:

- Normative integration: this category consists of common understanding and commitment;
- Integration of goals, instruments and issues: this category consists of the factors goals and instruments;
- Organizational integration: this category consists of participation (Inclusion of involved stakeholders (public, private, NGO etc.) in the decision-making process) and leadership.

In order to create the first part of the analytical framework, two checklists/lists of criteria are being used. The first is a checklist developed by the OECD (in Persson, 2004). This checklist is made for improving policy coherence and integration for sustainable development. The checklist consists of five checkpoints about: (1) common understanding of sustainable development; (2) clear commitments and leadership; (3) conditions to steer sustainable development integration; (4) encouragement of stakeholder inclusion; and (5) diversity of knowledge and scientific input. The exact list is given in appendix B. Regarding the three categories with factors this checklist deals with the normative integration (common understanding and commitment) and the organizational integration (stakeholder participation and leadership), but less with the integration of goals and instruments. Not all of the criteria of this checklist will be used, since not all of the criteria in the checklist relate to the three categories. The European Environment Agency also developed a list with criteria for EPI (in Persson, 2004). This list describes a total of eight groups with different indicators, namely:

1. commitment;
2. governance (organizational changes to break down walls);
3. resource and capacity building;
4. tools to improve decision-making;

5. policy instruments to implement EPI;
6. monitoring;
7. greening of sector policies;
8. changes in drivers, pressures, states and impacts.

The groups with the exact criteria are also included in appendix B, in the table the most relevant indicators, that will be used for the analytical framework, are presented in bold. Regarding the three categories of factors these evaluation criteria deal with the normative category (commitment), with the integration of goals, instruments and issues (instruments) and the organizational category (stakeholder inclusion and leadership). Despite the numerous indicators addressed so far with the help of the checklist of the OECD and the list of criteria provided by the EEA, not all of the factors of the three categories are completely included yet. Therefore, the work of Eggenberger and Partidario (2000) and Briassoulis (2004) are used to complete the analytical framework. In paragraph 3.3 and table 3.2, it was explained that Eggenberger and Partidario (2000) identify five forms of integration. The first type, substantive integration, contains useful criteria for the second category of factors of this research (integration of goals, instruments and issues). Therefore the criteria belonging to this substantive form are used in the analytical framework as well. Finally, to complete the analytical framework, the criteria developed by Briassoulis (2004) are used. As explained in paragraph 3.3 Briassoulis (2004) identify five different object of policy integration. For each of these objects Briassoulis (2004) also identify numerous indicators. These indicators are also presented in appendix B, again the most important criteria are presented in bold. The criteria found here deal, with all three categories of factors.

So, with the addition of the criteria described by Briassoulis (2004), all of the factors in the three categories derived from literature, are dealt with. From these criteria the most useful ones that fit best within the scope of this research, are selected and combined to form the first part of the analytical framework. This part of the analytical framework is presented in table 3.4 below. This will be used in the first part of the case study analysis to analyze/assess the extent to which policy is integrated on a municipality level.

Table 3.4: Analytical framework – factors/indicators for policy integration

Level/type of integration	Object	Explanation	Source
Normative	*Common understanding*	Clear understanding by the public, public organizations and levels of government	Persson
	Commitment	Commitment at the highest level	Persson
		Long term (SD) strategy	Persson, Briassoulis
Goals, instruments and issues	*Goals*	Common, shared, congruent, compatible, complementary goals and objectives	Briassoulis
		Common and consistent concepts and terminologies	Briassoulis Underdal
		Integration of environmental issues with social and economic issues	Eggenberger & Partidario
		Integration of emerging issues, such as health, risks etc.	Eggenberger & Partidario
	Instruments/ tools	Integration SD staff and resources	Persson Briassoulis

		Training and awareness raising, including inter-departmental exchange programmes	Persson
		Public consultation processes	Persson
		Monitoring	Persson Briassoulis
Organizational	*Participation*	Inclusion of affected stakeholders (public, private, NGO) in the decision-making process	Persson Briassoulis
		Clearly defined roles and responsibilities	Persson
		Public participation	Persson
		Interaction between policy actors and actor networks	Briassoulis
		The integration of professionals in a truly interdisciplinary team	Persson
	Leadership	Existence and location of institutional 'catalyst'	Persson

As became clear throughout this paragraph, this research opted for a rational view on (environmental) policy integration. With such a view it is possible to determine the extent to which policy was integrated or not. However, emphasis in this research is placed on the factors that explain the extent of policy integration rather than on the exact measurement. Nevertheless the extent of integration can vary from weak (environmental) policy integration to strong (environmental) policy integration. In table 3.4 the three different categories are presented and a total of six main objects of integration consisting of a total of 17 indicators, are given. The first object is common understanding (one indicator), the second object is commitment (two indicators), the third object is goal (four indicators), the fourth object is instruments/tools (four indicators), the fifth object is participation (five indicators) and the sixth object is leadership (one indicator). These indicators will mostly point at the likeliness of strong (environmental) policy integration. If all indicators are found it can be stated that the integration is strong. For all of the objects of integration it will be determined if the integration is strong or weak by looking at whether or not the indicators belonging to each object are found within the case studies. For example, the object commitment is strongly integrated when both indicators – commitment at the highest level and whether or not there is a long term (SD) strategy – are present in the case study. This is done by looking at each indicator separately and by attributing each indicator a +; +-; -. With this rating system a + means that the factor was clearly evident in the case study; a +- indicates that the factor was only partly evident in the case study; and a – indicates that the factor was clearly not evident in the case study. The scores are established by looking at the different policy plans, documents, reports, agreements, statements etc. and by using the information gained from the interviews. Using the second indicator – commitment at the highest level – as example, it can be stated that this indicator is present when the different documentation and interviews reveal that there is commitment at the highest level, which would result in a + score. When the information does not reveal a high commitment, or when there is room for improvement, the indicator would get a score of +-. Lastly, when it becomes clear from the information that there is no commitment at the highest level the indicator would receive a – score. All indicators are analyzed following the same procedure.

3.6.2 Analytical framework part two: conditions determining the extent to which an integrated approach is used

Paragraph 3.5 identified five different modes of governing according to eleven features belonging to three dimensions provided by Driessen et al. (2012). These features provide information about the conditions that need to be met in order to implement an integrated approach and will help to describe the roles of the different stakeholders. In order to create the second part of the analytical

framework these dimensions/features need to be further elaborated upon. These eleven features, and the three dimensions to which they belong, are described below:

1. Actor features
   - Initiating actors: the key actors that initiate action;
   - Stakeholder position: amount of participating stakeholders, their position and roles;
   - Policy level: level at which the actors operate (local, regional, national, international);
   - Power base: Basis of power for the actors.

2. Institutional features
   - Model of representation: who is represented and how;
   - Rules of interaction: formal and informal rules created by which actor to organize rules and implementation;
   - Mechanisms of social interaction: mechanisms for how the rules are formed and implemented.

3. Features concerning content
   - Goals and targets: types of goals and targets;
   - Instruments: types of instruments used for implementation;
   - Policy integration: extent to which policies are integrated or not;
   - Policy-science interface: type of knowledge used.

This research will focus on these three dimensions in order to analyze the conditions necessary for implementing an integrated approach by the chosen cities for becoming climate neutral. This part of the analytical framework will be used to analyze the case studies on a project level. The chosen projects in the case studies are analyzed according to these dimensions and the table is filled in for each case study. From the first chapter and the literature review, it became clear that an interactive approach is necessary in order for cities to become climate neutral. The fourth governance mode, interactive governance, is most similar to an interactive approach. Therefore, it is hypothesized that this mode will mostly be found in the case studies. For this reason the information regarding the interactive governance mode is presented in bold in table 3.3 above. This hypothesis will be tested in the case studies and will be reflected upon in the concluding chapter (the discussion).

Chapter 4: Case study – Tilburg

In this chapter the extent to which Tilburg uses an integrated approach for becoming climate neutral will be analyzed and assessed, using the analytical framework described in chapter three. This chapter deals subsequently with (4.1) an introduction about Tilburg; (4.2) Tilburg's efforts to become climate neutral; (4.3) the Klimaatschap; (4.4) the results of the analysis; and (4.5) a conclusion. Firstly, the first part of the analytical framework will be analyzed (the extent to which policy is integrated) and secondly, the second part of the analytical framework will be analyzed (the conditions determining the extent to which Tilburg is able to use an integrated approach). This chapter deals with the second and the third sub-question:

"To what extent is policy integrated in the chosen cities/municipalities?"

"Which conditions determine the extent to which municipalities are able to use an integrated approach for becoming climate neutral?"

4.1 Introduction

Tilburg has a total number of residents of 207.579 in 2012 and the population forecast for 2030 is that this number will grow to 222.750. But its current number makes Tilburg the sixth city of the Netherlands (Gemeente Tilburg, 2012). Tilburg, therefore has a lot of people who may become victims of climate change. Some of the threats that Tilburg may face are: more sickness and death because of increased heath and smog; more damage because of irregularities in the weather; and storms, fires by drought etc. (Schneider et al., 2007). Furthermore, a city like Tilburg consumes a lot of energy. Because of the increasing costs, the energy dependency and the fact that most sources are getting depleted, climate policy becomes quite urgent. Tilburg has always been very active with its energy and climate policy. Tilburg aspires to be one of the frontrunners with energy developments and with the ambition to become climate neutral (Kernteam Hotspot Tilburg, 2008). In 2010, Tilburg was declared to be the most climate-friendly municipality of the Netherlands (Tilburg, 2010) and in 2011, Tilburg was declared climate city of the year (Tilburg, 2011). The public was convinced of the climate ambitions of Tilburg and had confidence in the capacity of Tilburg to realize these ambitions. Throughout the years it became more and more clear that in order for Tilburg to become climate neutral, the municipality needs help from all actors and that the municipality cannot do it alone. The idea is to collaborate with businesses, citizens and other municipalities on the basis of joint ambitions and targets (Kernteam Hotspot Tilburg, 2008). In fact, it is stated that collaboration is the strength of Tilburg's approach towards climate neutrality. Actors actively search each other, make connections, generate ideas and start projects to make Tilburg climate neutral (Tilburg, 2011). The next paragraph will describe Tilburg's effort of becoming climate neutral by looking at the goals, ambitions and plans made by Tilburg.

4.2 Tilburg's effort to become climate neutral

"What goals, policies, tools and programs are the selected cities using in order to become climate neutral?"

Tilburg is participating within the IKS and has expressed its interest in becoming climate neutral. Therefore, the municipality has started a process in which the municipality works together with other local actors to formulate its first multiannual climate program: 'Eerste Klimaatprogramma Tilburg 2009-2012'. This program is developed by a 'core team' (Kernteam Hotspot Tilburg), a team composed of members from different actors. Multiple actors were included based on the idea that addressing climate change is not solely the duty and the responsibility of the government. Therefore, a cooperation was started with all those involved ranging from businesses to NGO's, knowledge institutes and civilians (Kernteam Hotspot Tilburg, 2008).

'Eerste Klimaatprogramma Tilburg 2009-2012'

The ambition and aim of the municipality of Tilburg, and the climate program, is that in 2045 the region Tilburg, and all of her businesses, organizations and civilians, are climate neutral and climate-proof (Kernteam Hotspot Tilburg, 2008, p. 9). Climate neutrality is here defined as that there should be no CO_2 and other GHG's released within the municipality, possibly with an offset by generating renewable energy elsewhere. So, in total there can no longer be emissions of GHG's and in that case Tilburg is not contributing to climate change. In order to meet the 2045 target several sub-targets are set, which are presented in table 4.1.

Table 4.1: Sub-targets CO_2-neutral Tilburg

Sub-targets CO_2-neutral Tilburg	
2012	5 %

2020	30 %
2030	60 %

Source: IenM (2011a)

Climate-proof is defined as being able to counter the effects of climate change, to overcome the effects or to exploit the effects by adapting flexible to the climate system. So climate-proof is about robustness, resilience and adaptability and flexibility (Kernteam Hotspot Tilburg, 2008).

Goals of the program

As mentioned above the overall goal/ambition of Tilburg is to be climate neutral and climate-proof in 2045. To achieve this, three different goals are set (Biemans, 2013; Kernteam Hotspot Tilburg, 2008; IenM, 2011a):

1. mitigation: reducing emissions of GHG's;
2. adaptation: adapting the city to, and preparing for, the effects of climate change;
3. organization: creating an organization of local actors with shared responsibility for becoming climate neutral (project 'Klimaatschap').

These different goals mean different things. Mitigation is focused on energy efficiency, energy reductions, the use of sustainable energy etc. Adaption means preparing for the climate changes that are happening, and those who are going to happen in the future, by making sure that the systems can adapt to more rainfall, changing water levels, more heat etc. The goals and strategies for mitigation and adaptation are further described below. The third goal will be thoroughly be discussed and analyzed in paragraph 4.3.

Mitigation based on Trias Energetica

The strategy of Tilburg for mitigation is based on the Trias Energetica, shown in figure 4.1 (Kernteam Hotspot Tilburg, 2008).

Figure 4.1: Trias Energetica
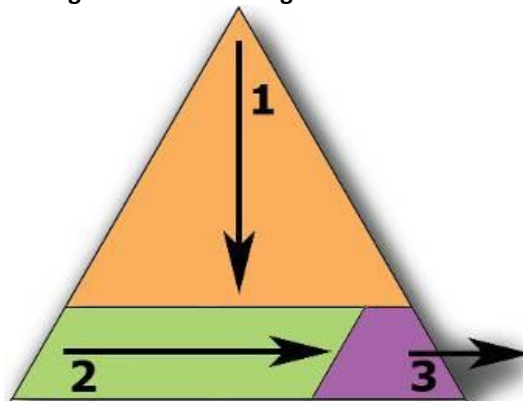
The first step in this triangle is to lower the energy demand. The energy demand has to be reduced drastically. This can be achieved by assessing the behavior of (individual) citizens and thereby reducing the amount of energy they use. Furthermore, it should be questioned whether or not some functions are really necessary, like patio heaters (Kernteam Hotspot Tilburg, 2008). Since it is not possible to reduce the energy demand to zero, the second step is to use and produce sustainable (green) energy for the remaining energy demand. Thirdly, should the remaining use of fossil energy

sources be efficient. Till 2045, fossil energy sources will be used to provide for the energy demand, however this will decrease over time.

Adaptation based on the climate adaptation ladder

The strategy of Tilburg regarding adaptation is based on the climate adaptation ladder. This ladder is described in paragraph 3.1 and shown in figure 3.1. For Tilburg it is important to focus on local and regional water management, health, energy and the economy. As stated above this will be done by using the climate adaptation ladder. Firstly, this means that further climate change has to be prevented. Secondly, Tilburg will have to deal with uncertainties by incorporating flexibility for unpleasant or unpredicted scenarios. Thirdly, Tilburg should prevent negative effects of climate change, but utilize the positive effects. The municipality should think about creating more space for rivers, green roofs, climate buffers, more climate-proof buildings and to give education to citizens. Fourthly, damage should be prevented or reduced when negative effects do occur (like heat plans, evacuation plans, contingency plans, crisis management and flexible transportation. Finally, Tilburg has to make sure that there is enough capacity for resilience (Kernteam Hotspot Tilburg, 2008).

Climate change policy is a large and important theme. However, it is not addressed alone, but it is integrated with other policy areas. In table 4.2 a summary is given of types of projects of mitigation and adaption in which climate policy is connected to other policy areas.

Table 4.2: mitigation and adaptation measures within other policy areas

Policy area	Type of measure	Measure
Economy	Mitigation	- Stimulate employment in energy reduction and sustainable energy production - Cost reduction by energy savings for households and businesses - Stimulate an attractive business climate
	Adaption	- Creating more chances for outside recreation - More robust agriculture - Cost reduction by heat resilient designs for buildings
Ecology and green	Mitigation	- Use of green and waste for bio-energy - Cultivation of energy crops
	Adaptation	- Combination of water storage, nature and agriculture - Use of stored rainwater for cooling buildings
Health & Comfort	Mitigation	- Energy efficient cooling and ventilation of buildings - Balanced ventilation with heat recovery - Geothermal heat pump
	Adaptation	- Use shadows of trees, night ventilation and green roofs
Mobility	Mitigation	- Stimulate slower traffic - Improving public transportation - Electric transport
	Adaptation	- More creative cycling and walking routes - Prevent flooding on roads

Source: Schneider & Schouw (2012)

Monitoring

For all the projects formed (38 projects), a measurable goal is set. In this way they can be monitored. The projects are monitored in four different ways, namely:

1. input (resources and measures);
2. output (results in forms of documents, hardware, instruments etc.);
3. outcome (the outcomes and results for the programme);
4. effect (contribution to the goal).

To monitor the projects the municipality will use the already existing monitoring systems like the 'Klimaatmonitor' Tilburg (Kernteam Hotspot Tilburg, 2008). The 'Klimaatmonitor' exists of two parts. The first part will monitor the data and the second part will monitor the process (Gemeente Tilburg, 2011).

Kernteam Hotspot Tilburg

To create an ambitious and integrated climate policy, political commitment and active political involvement is necessary. Tilburg already has a long history of successful local environmental and energy policy. The municipality is familiar with it and knows that it can get positive results on multiple issues. The project of the 'Eerste Klimaatprogramma Tilburg 2009-2012', a joint effort between the municipality (who started the process) and other local actors, was guided by a so called 'core team'. This team consists of multiple parties of important organizations together with the alderman of Tilburg, causing a direct link to the municipality. These parties are each represented by a member of their own organization in which this representative is highly involved in climate change. Multiple actors were included based on the idea that addressing climate change is not solely the duty and the responsibility of the government. Therefore, a cooperation was started with all those involved, ranging from businesses to NGO's, knowledge institutes and civilians (Kernteam Hotspot Tilburg, 2008). These actors are:

- Interpolis: insurance company which wants to stop the causes of climate change and help its customers with preparing on the possible effects of climate change;
- The province 'Noord-Brabant: Regarding the goals of the province, the province wants a strong local economy and a viable and sustainable society;
- GGD: involved because of the (possible) effects of climate change. The increase of nuisance and stress due to heat, the emergency of new pests, more infectious diseases, more aero allergies, a further deterioration of the (swimming) water quality and of the indoor environment, all causes health issues. The GGD has a role in early signaling (detection and warning), preventing and curing possible health problems, especially for the more vulnerable groups;
- AM ENERGY: this company develops homes and other buildings for a sustainable future. Actively involved with energy efficiency, developing sustainable energy and stopping the use of fossil energy;
- Municipality of Tilburg: the municipality tries to seek ways to share the responsibility with other actors. Working on a collaborate climate neutrality program, therefore, fits well within the goals of the municipality;
- BuildDes: is a consultancy company focusing on a sustainable future in the build environment. Cities, neighborhoods or buildings need to become climate neutral and climate-proof. In order to achieve that, knowledge, human resources, organizations, creativity, money and willpower is necessary. Bringing this together, is the specialty of BuildDes.

For many of the measures the municipality is not the leading organization, but one of these other actors are, especially for mitigation projects (Schneider & Schouw, 2012). Also for adaptation projects these actors are often leading. For these reasons it is very important that there is good and clear communication between those involved. For these projects communication is often started in an early phase with all the key stakeholders, including citizens, and meetings are held (Schneider & Schouw, 2012; Kernteam Hotspot Tilburg, 2008; Biemans, 2013). With this kind of setup there is support for climate neutrality from both the municipal organization as within civil society (stakeholders). More about this type of organizational structure is discussed in the next paragraph, as Tilburg is discussed from a project level instead of from the municipality level.

4.3 Klimaatschap

"What goals, policies, tools and programs are the selected cities using in order to become climate neutral?"

As mentioned above, one of the goals of Tilburg is to create an organization consisting of local actors with shared responsibility for becoming climate neutral: project the 'Klimaatschap'. In order to reach the climate targets the municipality wants shared responsibility between the municipality, organizations and businesses. In order to accomplish this, the 'Klimaatschap' has started. This is a 'movement' in which, at first, the municipality was the initiating actor. It initiated coalitions and alliances to start climate neutrality related networks/projects. After the first phase all the actors involved, together, share the responsibility for the progress (IenM, 2011a) and will form a network of local organizations. This means that actors from civil society, businesses and governmental institutions come together to find a common solution to a problem that affects all of them. This network will operate on a regional level, in Tilburg and in its surroundings (Schneider, 2011). An overview of Tilburg's network is given in figure 4.2 below (Kernteam Hotspot Tilburg, 2008).

The center is the 'Klimaatschap Regio Tilburg'. The proposed Legal form is the one of an association. Actors who want to become a member can do this on a voluntary basis. However, by signing the declaration, the declares to support the vision, help with the execution and help financially. In return they may become a member of the board and will be allowed to participate (Kernteam Hotspot Tilburg, 2008). Millward and Provan (2008) stated that the best way to organize a network is to set up a separate administrative entity to support the network, its alliances and activities. This is what has been done for the 'Klimaatschap'. Here the Climate Board is selected and plays a key role in coordinating and sustaining the network. Actors preferred to have an independent project office to support the network. This has become the 'Klimaatbureau Tilburg'. Connected to the 'Klimaatschap' are the alliances in which actors are connected with each other in regard to certain themes. The alliances are supported by the 'Klimaatbureau'. There are eight different alliances:

1. Common sustainable energy services company
2. Covenant Housing sector
3. Health and Climate change
4. Water and Climate change
5. Behavioral change
6. Climate and Spatial Planning
7. Sustainable Companies & business areas
8. Municipal buildings and installations

Each of these alliances consist of different stakeholders. These stakeholders often need commitment from their own companies. This is sometimes quite difficult. However, one way to achieve this commitment is to manage the shared responsibility in the network, to make sure that all parties are

equal and all endorse the goals of the network (Schneider, 2011). In table 4.3 the different tasks, formation and powers of the 'Klimaatschap' organization are described.

Figure 4.2: Overview of Tilburg's multi-actor network organization, 'Klimaatschap'

Setting up such a network, however, was not without a struggle. In the first phase the municipality was the initiating actor, but after a while the network was supposed to be completely self-governing without steering from the municipality (Biemans, 2013). However, this was not the case, at least not immediately. It initially failed with setting up a self-governing network. The municipality then had to steer some more in order to repair. This did not immediately succeed and it was even considered that perhaps it was not going to work. But after telling the alliances, there was decided that they wanted to continue nonetheless. From that point forwards the 'Klimaatschap' is now becoming more and more a self-governing network. From the interview with Biemans (2013) became clear that the initial failure perhaps could be explained from the lack of ideas in the beginning. Furthermore, the municipality maybe had too high expectations about what businesses wanted to do to become sustainable and what businesses wanted to do to make Tilburg climate neutral (Biemans, 2013).

Table 4.3: Tasks, formation and powers of 'Klimaatschap'

Klimaatschap organization	Tasks, formation and powers
Klimaatschap Regio Tilburg	Exists of members from Klimaatschap Regio Tilburg, membership is

		bound to some rules
		Municipality is the initiating actor
		Members select a board
		The board reports annually about the progress
		Members vote on a year program proposed by the board during a climate congress
		Organizes at least two times a year a network day for all members
	Regionaal Klimaatbureau	Consists of a few substantive, a supportive and an execute employee
		Facilitates the alliances
		Tasks: - Will draft the year programs - Secretariat - Monitoring - Communication - Request for subsidy - reporting - Project support
		Funding from subsides and contributions from participants
	Climate alliances	Exists of different actors
		Actors are preferable a member of the 'Klimaatschap'
		Actors work in alliances on projects from own and shared perspective
		Work together with 'Klimaatbureau', receive support and report about the progress. Make a contribution, through projects, at realizing the mission of the 'Klimaatschap'

Source: Kernteam Hotspot Tilburg (2008).

4.4 Results

"Which factors account for the extent of policy integration?"
"What roles are the chosen municipalities, and other stakeholders, taking to become climate neutral?"
"which governance mode is applied by the chosen municipality?

In this paragraph the analytical framework will be applied on the case study and the sub-questions above will be dealt with. In order to make this chapter more clear, the analytical framework will be given again, but this time the different criteria will get a reference which will be used throughout the rest of this chapter and chapter five and six to refer to that criteria. This is shown in table 4.4.

Table 4.4: Part one of the analytical framework with numbers

Level/type of integration	Object	Explanation	Criteria
Normative	*Common understanding*	Clear understanding by the public, public organizations and levels of government	1
	Commitment	Commitment at the highest level	2
		Long term (SD) strategy	3
Goals, istrumentes and issues	*Goals*	Common, shared, congruent, compatible, complementary goals and objectives	4
		Common and consistent concepts and terminologies	5
		Integration of environmental issues with social and economic issues	6

		Integration of emerging issues, such as health, risks etc.	7
	Instruments/ tools	Integration SD staff and resources	8
		Training and awareness raising, including inter-departmental exchange programs	9
		Public consultation processes	10
		Monitoring	11
Organizational	*Participation*	Inclusion of affected stakeholders (public, private, NGO) in the decision-making process	12
		Clearly defined roles and responsibilities	13
		Public participation	14
		Interaction between policy actors and actor networks	15
		The integration of professionals in a truly interdisciplinary team	16
	Leadership	Existence and location of institutional 'catalyst'	17

Now subsequently the first part and the second part of the analytical framework will be applied. Firstly, the extent to which policy is integrated and the factors that account for this (4.4.1), followed by a summary (4.4.2). Secondly, the conditions determining the extent to which an integrated approach is being used (4.4.3), followed again by a summary (5.4.4)

4.4.1 The extent to which policy is integrated

As mentioned above this paragraph will deal with the first part of the analytical framework. Firstly, the normative type of integration: common understanding and commitment. Secondly, it will discuss the integration of goals, instruments and issues: goals and instruments/tools. Finally, it will discuss the organizational type of integration: participation and leadership.

<u>Normative type of integration</u>

The objects belonging to this category are *common understanding* and *commitment*. The results are shown and discussed below

Common understanding	Commitment	
1 +	2 +	3 +-

Common understanding:
The first criterion, that there should be a clear understanding by the public, public organizations and by the levels of government about the climate problems that Tilburg faces and what needs to be done regarding climate neutrality, received a + rating. In Tilburg, the awareness among the actors is quite high. As described in paragraph 4.2, communication between different actors started in a very early stage. All key stakeholders, including citizens, could be present and other meetings were held (Schneider & Schouw, 2012; Kernteam Hotspot Tilburg, 2008; Biemans, 2013). This resulted in support for climate neutrality from both the municipal organization as from the civil society. Furthermore, as became clear from the interview with van Dijk (2013), the 'Klimaatbureau Tilburg' is being used to help citizens with its own initiatives regarding climate neutrality. Lastly, Tilburg was declared the most climate-friendly city in 2010 and was declared climate city of the year in 2011

(Tilburg, 2010; Tilburg, 2011). The latter meaning that the public has a lot of trust in the climate ambitions and believe that the targets are going to be met.

Commitment:

The second criterion, that there should be commitment at the highest level, received a + rating. It is clear that there is commitment at the highest level, otherwise Tilburg would not have been one of the leading Dutch municipalities regarding climate neutrality and a member of the IKS and the 'Klimaatagenda 2011-2014'. But even otherwise there is a clear sense of commitment. Throughout the years Tilburg always had a very active climate policy. Now one has real targets for becoming climate neutral, with well thought out and detailed plans, amongst others by initiating a 'core team' (Kernteam Hotspot Tilburg, 2008). Even though many projects, and the whole project of becoming climate neutral, is still in its infancy phase, it is clear that Tilburg is highly motivated to reach the intended targets.

The third criterion, having a long-term (SD) strategy, received a rating of +-. Even though the aim for climate neutrality is a long-term goal, and Tilburg has a lot of projects with long-term effects and short-time benefits, there is no clear Sustainable Development or climate neutrality, overarching, strategy. Even though a lot of projects in Tilburg focus on sustainability, and are all related to climate neutrality, no clear overarching concept can be found. The vision and strategy relating to projects of adaptation and mitigation, although, is very clear. Furthermore, as became clear from the interview with Biemans (2013), in the coalition agreement sustainability is a core principle and should be a leading principle for the development of Tilburg, but no clear strategy like that can be found for climate neutrality. Even though it is not clear, the city, and its ambitions for climate neutrality does not seem to be bothered by that.

Integration of goals, instruments and issues

This type of integration exists of two elements, *goals* and *instruments/tools,* and concerns the fourth to the eleventh criteria. The results are discussed below.

Substantive/policies							
Goals				Instruments/tools			
4 +	5 +	6 +-	7 +	8 +-/+	9 +-	10 +-	11 +

Goals:

The fourth criterion, having common, shared, congruent, compatible and/or complementary goals and objectives, received a rating of +. In Tilburg the goals for climate neutrality are created with the help of the Kernteam Hotspot Tilburg. This teams consists of members of both the municipality, the province and energy, insurance and advisory companies. They have agreed upon goals and targets for Tilburg which they share, believe in and are committed to (Kernteam, Hotspot Tilburg). Also there were early meetings organized where the public was involved. Subsequently, the goals for Tilburg are complementary. Adaptation and mitigation are complementary and are both necessary to reach the common goal. The third goal, establishing a network with shared responsibility, is actually used to generate new ideas for projects regarding mitigation and adaptation, and to execute them with multiple, committed actors. Lastly, most projects have targets that are agreed upon by all actors involved.

The fifth criterion, having common and consistent concepts and terminologies, received a + rating. This criterion is actually quite similar to the fourth criterion, since the main reasons for giving a +

rating are because of the Kernteam Hotspot Tilburg and because of the way the 'Klimaatschap' works, as described above. Also this criterion is met because of the alliances. Biemans (2013) stated that these alliances often consist of actors who have the same interests and ideas and when two businesses decide to work together towards a goal, they often have the same vision for what needs to be done.

The sixth criterion, integration of environmental issues with social and economic issues, received a rating of +-. On a municipality level the integration of social and economical issues with climate change, or sustainability in general, is still taking place. Therefore, it is not ideal yet and there is room for improvement. On a project level, however, there is a good integration between the different issues. Looking at the different adaptation and mitigation projects, lots of overlap and integration can be found. Especially when looking at the end goal, namely climate neutrality and being climate-proof.

The seventh criterion, integration of emerging issues, such as health, risks etc. is similar to the sixth criterion, however, it received a rating of +. This is because all of the emerging issues are a big part of becoming climate neutral. By simply looking at the different alliances most of these issues are dealt with.

Instrument/tools:
The eight criterion, integrating SD staff and resources, received a rating of both a +- and a + rating. This is because the results for this criterion are quite different. When you focus on a municipality level not a lot of resources are shared and there is not a lot of integration of SD staff within the municipality itself. From the interview with Biemans (2013) became clear that here for instance is no sustainability fund. Although within the municipality it is becoming more and more integrated. On the other hand when focusing on interaction on a project level the rating is a +. The whole idea of the projects is shared responsibility (Biemans, 2013; Kernteam Hotspot Tilburg, 2008). A lot of staff is integrated with the staff of businesses etc. In the 'core team' and within the 'Klimaatschap' members from all actors participate together, and most of the projects are financed together as well (Biemans, 2013).

The ninth criterion, training and awareness raising, including interdepartmental exchange programmes, received a rating of +-. As explained above Tilburg has a lot of awareness raising projects and some projects to help (train) people with becoming climate resilient (Gemeente Tilburg, 2011). Interdepartmental, however, is only found with other actors and not much within the municipality itself.

The tenth criterion, public consultation processes, received a rating of +-. From the interview with van Dijk (2013) became clear that citizens play a big role, especially with its own initiatives, in helping Tilburg become climate neutral. However, not a lot of formal public consultation programmes are found. The public is consulted in programmes, especially when needed. But in projects, consisting of only businesses, there might not be a need for public consultation in the development part of the project, even though some citizens might want to be involved. Since the government does not want to impose rules on businesses, or make restrictions, one cannot force them to include formal public consultation processes. However, this is one of the tools used by Tilburg, only not a lot of formal consultation processes are found.

The eleventh criterion, monitoring, received a rating of +. As explained in paragraph 4.2 there are a lot of different monitoring tools used by Tilburg. One especially focused on climate change and the goals of climate neutrality: the 'Klimaatmonitor'. All the projects the alliances are involved in, and some others, are monitored in four different ways in order to gather data and to help the process of the project (Gemeente Tilburg, 2011). The functioning of the 'Klimaatschap' is also closely monitored.

Organizational type of integration

This type of integration exists of two elements, *participation* and *leadership* and concerns the twelfth to the seventeenth criteria. The results are discussed below.

Organizational					
Participation					leadership
12 +	13 +	14 +	15 +	16 +	17 +-

Participation:
The twelfth criterion, inclusion of affected stakeholders (public, private, NGO) in the decision-making process, received a + rating. As explained in paragraph 4.2 and 4.3 a lot of different stakeholders are included during all phases of decision-making. In fact, the municipality does not want sole responsibility and for that reason all kind of stakeholders have equal roles. The municipality does not want to impose rules on projects and often let stakeholders decide for themselves. Biemans (2013) explained that projects often emerge in two different ways. One way is that an idea for a project is generated through one of the alliances. In that case, almost all relevant stakeholders are included and have equal roles. A second way is independent from the 'Klimaatschap'. It can also occur that two businesses meet agree upon a common interest that they want to exploit. They can decide then to ask for support at the 'Klimaatschap' or conduct the product on its own. Either way, the stakeholders involved have decision-making power. Van Dijk (2013) stated that for civilians it is quite similar. They can start their own initiatives and receive help and support from the 'Klimaatbureau'. The 'Klimaatbureau' will provide a knowledge input and will, for instance, advise the civilians on the use of a certain locations and in some occasions decide that a location cannot be used, but the citizens still have a role in the decision-making. In fact, they have quite some power.

The thirteenth criterion, clearly defined roles and responsibilities, has received a rating of +. The roles of the different stakeholders are quite clearly defined and it is also quite clear what kind of responsibilities they have. In principle all parties have equal roles, although it might differ a bit from project to project. When a business has signed the climate agreement, and/or became a member of the 'Klimaatschap' one agreed to help to make Tilburg climate neutral, and to play an active role, but in general it is on a voluntary basis.

The fourteenth criterion, public participation, received a rating of +. Public participation is one of the strong points of Tilburg. Especially with the help of the 'Klimaatbureau' (van Dijk, 2013; Caron, 2013; Biemans, 2013), the public is able to actively participate in getting Tilburg climate neutral. This rating is different from the tool 'public consultation processes', because this is much broader and more elaborated upon in Tilburg. The public is active in a lot of projects and much is expected from the public as well.

The fifteenth criterion, interaction between policy actors and actor networks, received a rating of +. As described in this chapter, the municipality was the initiating actor of the network 'Klimaatschap'. Even though one took a step back after the establishment of the network, the municipality is still present in many of the alliances and can often provide guidance. Next to this network, the municipality was also the initiating actor for the 'core team'. This team also proved to play an important role in setting up documents, visions, projects etc.

The sixteenth criterion, the integration of professionals in a truly interdisciplinary team, is closely related to the previous - and the next – criteria, and received a rating of +. As explained, there are a

lot of teams, with the 'core team' as one of the biggest, consisting with specialists from all kind of organizations, varying from the alderman of the municipality to directors of businesses. Also in the climate board of the 'Klimaatschap' a lot of specialists of major stakeholders are participating and are working together.

Leadership:
The seventeenth – and last – criterion, the existence and location of institutional 'catalyst', received a rating of +-. The 'Klimaatschap' can be seen as a catalyst. One has the alliances in which different networks are created for different fields. With the 'Klimaatbureau' one has a facilitating bureau to help stakeholders. However, it is too early to say whether or not it is really going to work, but after the troubling start it does look promising (Biemans, 2013).

4.4.2 summary

A summary of the results of sub-paragraph 4.4.1 are provided in table 4.5 below.

Table 4.5: summary of case study results on the extent of policy integration

	Normative			Integration of goals, instruments and issues								Organizational					
	Common understanding	Commitment		Goals				Instrument/tools				Participation					Leadership
Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Tilburg	+	+	+-	+	+	**+-**	+	+-/+	+-	+-	+	+	+	+	+	+	+-

4.4.3 Conditions determining the extent to which an integrated approach is being used

As mentioned this paragraph will discuss the conditions determining the extent to which an integrated approach is being used. This will happen by looking at the governance mode applied and by looking at the role of authority and the interactions with and between various stakeholders. Starting by looking at the actor features and will subsequently deal with the institutional features and the features concerning content.

<u>Actor features</u>

The actor features consist of the initiating actor, the stakeholder position, the policy level and the power base.

Initiating actors:
The initiating actor for the project 'Klimaatschap' is the municipality of Tilburg (Kernteam Hotspot Tilburg, 2008; Biemans, 2013). The municipality initiated coalitions and alliances to start climate neutrality related networks/projects. The networks formed, the alliances, consist of different actors each belonging to a certain field. After the initial phase all of the actors involved, together, share the responsibility for the progress of these networks and for new reports (IenM, 2011a). This network is supposed to be self-governing, meaning that all the different actors initiate projects. So, for the projects the initiating actor is all the actors participating in the network based on equality. However,

as explained in this chapter and as became clear from the interview with Biemans (2013), this self-governing was not the case from the beginning. The municipality had to steer more before the 'Klimaatschap' was able to become a self-governing entity (Biemans, 2013), but without the commitment of the actors involved this would not have been succeeded.

Stakeholder position:
The amount of stakeholders participating in this project varies widely. As mentioned, most of the stakeholders are members of the 'Klimaatschap' and active in one, or more, of the alliances. From these alliances many different projects are formed, some with overlapping, and some with new actors involved (Kernteam Hotspot Tilburg, 2008; Gemeente Tilburg, 2011). Basically in these projects all partners have equal roles and the alliance can be seen as a self-governing entity. However, there are also projects started outside of the alliances and in these projects stakeholders form self-governing entities as well (Biemans, 2013). As became clear from the interviews with van Dijk (2013) and Caron (2013), the 'Klimaatbureau' can be seen as a facilitator. It facilitates, and sometimes steers, businesses, but mostly citizens on the initiatives started by the (businesses) citizens.

Policy level:
The level at which the 'Klimaatschap', and the projects emerging from this organizations, operate is mostly on a regional level, namely in Tilburg and in its surroundings (Schneider, 2011), but they will not stop a business if that business is requiring the help of a business in another region.

Power base:
The power is based on several things. One important base of power is legitimacy. The climate board has legitimacy based on an election. The different stakeholders, however, through an agreement on their roles and positions (Kernteam Hotspot Tilburg, 2008). Furthermore, power is gained by trust, since the actors have equal roles.

Institutional features

The institutional features consist of the model of representation, the rules of interaction and the mechanisms of social interacting.

Model of representation:
The model of representation for the 'Klimaatschap' project is through a partnership, except for the climate board which is selected by an election. But these partnership mostly exists of participatory private-private and public-private governing arrangements. However, in the projects, businesses more often have the pioneering role than the municipality (or the government). The municipality preferable leaves that role to the other stakeholders. Within the citizens initiatives the municipality only takes a facilitating, and sometimes steering role.

Rules of interaction:
As stated before most is on a voluntary basis. However, stakeholders can sign a climate declaration, with this declaration a stakeholder declares (Gemeente Tilburg, 2013):

1. taking responsibility on preventing further climate change by working on a local level;
2. taking responsibility in adapting to the effects of climate change on a local level;
3. to support the goal of being climate neutral and climate-proof in 2045;
4. to pursue this goal in his own business;
5. wanting to collaborate with other local actors to realize the climate goals.

So, most of the projects only consists on formal and informal rules either created by joining the 'Klimaatschap', or they are self-crafted.

Mechanisms of social interaction:
There are two main ways of social interaction. In the alliances, and for a lot of other projects, these are interactive and are agreed upon by negotiations and by social learning. However, the local initiatives of the citizens can be seen as a bottom-up mechanisms. As became clear from the interview with Biemans (2013), these latter kind are becoming more and more important.

Features concerning content

The features concerning content consist of the goals and targets, instruments, policy integration and policy-science interface.

Goals and targets:
The goals and targets set in the projects are tailor-made and mostly integrated. Since most projects are initiated by the various actors, they have to come to an agreement regarding the goals and targets of the project. With the making of business plans, and by having equal roles, all actors involved have the possibility to have their say and the goals are set after negotiation (Kernteam Hotspot Tilburg, 2008).

Instruments:
The mostly found instruments in Tilburg are negotiated agreements (Kernteam Hotspot Tilburg, 2008). Furthermore, private contracts are sometimes found between businesses, but as stated before most agreements/involvements are on a voluntary basis. Between businesses it is also possible that private contracts are signed.

Policy integration:
Based on the analysis in the previous sub-paragraph it can be concluded that most policy sectors and policy levels are integrated. However, it can depend on the type of project started by, for instance two businesses, in which the extent of integration can be a bit less.

Policy-science interface:
With the use of the 'core team', consisting of specialists from all kind of organizations (businesses, knowledge institutes and civil society), and with the network created, expert and lay knowledge are both present. The emphasis hereby lies on time-and-place specific knowledge.

Based on these features the governance mode applied in Tilburg can be identified. In Tilburg it is mostly a combination of the last two modes, namely interactive governance and self-governance. The former was expected, since literature and Tilburg self stated to use an integrated approach. However, it is a little surprising that Tilburg shows more signs (albeit not many) of a self-governance mode.

4.4.4 Summary
A summary of the results of sub-paragraph 4.4.3 are provided in table 4.6 below.

Table 4.6: summary of case study results on the extent that an integrated approach is being applied

		Tilburg	
		Interactive governance	Self-governance
Actor features	Initiating actor	'Klimaatschap':	Projects: businesses and

		Municipality	citizens
	Stakeholder position	Equal roles in projects within alliance	- Alliance is self-governing entity - Self governing entities in projects outside of alliance
	Policy level	Local-regional	Local-regional
	Power base	- Legitimacy through agreement on roles - trust	- Legitimacy - Agreement on procedures
Institutional features	Model of representation	Partnership (participatory public-private governing arrangements)	Partnership (participatory private-private governing arrangements)
	Rules of interaction	Formal and informal rules by 'Klimaatschap'	- Voluntary basis - Self-crafted formal and informal rules
	Mechanisms of social interaction	Interactive by social learning, deliberations and negotiations	- Bottom-up - by social learning, deliberations and negotiations
Features concerning content	Goals and targets	Tailor-made and integrated goals	Tailor-made and integrated goals
	Instruments	Negotiated agreements	- Voluntary instruments - Private contracts
	Policy integration	Integration of policy sectors and policy levels	Extent of integration can depend on the type of project started by different actors
	Policy-science interface	- Expert and lay knowledge in networks with the 'core team' - Emphasis on integrated and time-and-place specific knowledge	- Expert and lay knowledge

4.5 Conclusion

Tilburg is an interesting case which provided this research with interesting knowledge. A few conclusions can be given based on the findings in this chapter.

The goals of Tilburg are threefold: (1) mitigation (reducing emissions of GHG's); (2) adaptation (adapting the city to, and preparing for, the effects of climate change); and (3) organization (creating the 'Klimaatschap'). The main tools can be linked towards these three goals. The first tool of Tilburg's strategy for mitigation is based on the Trias Energetica. The second tool is the adaptation ladder and

the third tool is to create a self-governing entity capable of starting projects between actors from civil society, businesses and governmental institutions. The formed projects can be classified as either mitigation projects or adaptation projects.

Based on the results of the first part of the analytical framework (table 4.5) it can be concluded that in the municipality of Tilburg policy is integrated fairly well. 11 out of 17 factors were strongly present in Tilburg and the remaining 6 factors were only partly found. It is found that the normative type of integration is clearly present in Tilburg. In Tilburg there is in general a common understanding of the problems of climate change and what has to be done to overcome these problems. This is paired with a high level of political commitment, despite that there is no clear overarching SD, or climate neutrality, strategy. Also for the integration of goals Tilburg does score rather high. Only the sixth criterion, the integration of environmental issues with social and economic issues was only partly found, due to the fact that Tilburg is still working on this issue. On the integration on instruments Tilburg scores a bit lower. Mainly because Tilburg does not have an own department for climate related policy and therefore resources are less shared between different sectors. However, on monitoring Tilburg scores rather high. This can be explained by the effective way of monitoring in Tilburg. For the organizational type of integration Tilburg again has a very high score. Stakeholders are often included in an early stage and the stakeholders each have clearly defined roles and responsibilities. This can mainly be explained by the fifteenth and the sixteenth criterion. In Tilburg the network the 'Klimaatschap' is established, a network in which actors with similar interests work together on various projects towards the same goal: a more climate neutral Tilburg. The sixteenth criterion is the integration of professionals in a truly interdisciplinary team. Tilburg has such a 'core team'. This team really helped with bringing actors together in various stages which resulted in more support, more understanding, commitment etc. So, the main factors found in Tilburg are:

- a good monitoring system;
- availability of the network the "Klimaatschap";
- a 'core team' consisting of many different professionals

Based on the second part of analysis of the case study, a few conclusion can be made. Given the high overall integration of goals, objects, resources, expertise etc. with and within stakeholders, it is not very surprising to see that one of the governance modes is that of an interactive perspective. However, the high resemblance with the self-governing mode was a bit surprising, although the governance modes do have similar features, overlap and one does not exclude the other. The high resemblance with the self governance mode can easily be explained, by looking at the role of the local authority (the municipality), since the approach of the municipality was based on shared responsibility. However, the municipality often was not involved, or at least not in an imposing role, or only when the help of the government was needed (a facilitating role). The intention was to create self-governing entities, with their own ideas and that worked in the end. Furthermore, the different stakeholder in Tilburg are equal to each other within the projects. All actors have an equal role and no stakeholder have more power over the other. This feature is clearly a prerequisite for implementing an integrated approach. Other important aspects are the power base (agreement on roles and trust), the model of representation (through a partnership/network), integrated and tailor-made goals, the voluntary agreements and the availability of both expert and lay knowledge in networks. So, even with a slightly different role of authority (than the ideally interactive one)) Tilburg manages to use an integrated approach well. Lastly, having two types of roles available, can also be a condition for success. In times of need the government can take more responsibility, steer more and be a more active stakeholder, and when this is not longer necessary it can easily go back to its previous, more facilitating role.

Chapter 5: Case study – Rotterdam

In this chapter the extent to which Rotterdam uses an integrated approach for becoming climate neutral will be analyzed and assessed using the analytical described in chapter three. This chapter deals subsequently with (5.1) an introduction about Rotterdam; (5.2) Rotterdam's efforts to become climate neutral; (5.3) project Heijplaat; (5.4) the results of the analysis; and (5.5) a conclusion. Firstly, the first part of the analytical framework will be analyzed (the extent to which policy is integrated) and secondly, the second part of the analytical framework will be analyzed (the conditions determining the extent to which Rotterdam is able to use an integrated approach). This chapter deals with the second and the third sub-question:

"To what extent is policy integrated in the chosen cities/municipalities?"

"Which conditions determine the extent to which municipalities are able to use an integrated approach for becoming climate neutral?"

5.1 Introduction

Rotterdam has a total number of residents of 616.528 in 2013 and the population forecast for 2017 is that this number will grow to 632.500. But, its current number makes Rotterdam the second city of the Netherlands (Gemeente Rotterdam, 2013a). Rotterdam is already experiencing more heavier rainfall and more flooding because of it climate change. This is expected to increase further, together with a rise in sea level and a temperature rise. Especially for a delta city this can be troubling (Gemeente Rotterdam, 2013c), but it also provides Rotterdam with an opportunity for becoming a sustainable, and climate neutral, harbor city. With leading research, innovative ways of gathering more knowledge and with a decisive implementation, it can result in strong economical impulses. Together with leading partners Rotterdam will try to become one of the most innovative water knowledge cities of the world and it will try to be an inspiring example for other delta cities (Gemeente Rotterdam, 2013c). The municipality states that Rotterdam is the leading Dutch city with its sustainability policy (Gemeente Rotterdam, 2013b). To be a decisive and innovative world port city, the municipality recognized it has to work together with its citizens, businesses and institutions. In 2012, citizens of the neighborhood Heijplaat received an award from the World Wildlife Fund for their sustainable approach and help to make the neighborhood a climate neutral neighborhood (ANP, 2012). The next paragraph will describe Rotterdam's effort at becoming climate neutral by looking at the goals, ambitions and plans made by Rotterdam.

5.2 Rotterdam's effort to become climate neutral

"What goals, policies, tools and programs are the selected cities using in order to become climate neutral?"

Rotterdam has expressed its interest in becoming neutral and is participating within the IKS. In Rotterdam the municipality started a cooperation with three other parties: Havenbedrijf Rotterdam NV, DCMR Milieudienst Rijnmond and Deltalings. Together they form an ambitious climate program, the Rotterdam Climate Initiative (RCI). The RCI provides a platform where the government, organizations, businesses and citizens can collaborate (Rotterdam Climate Initiative, 2013). A part of the RCI is Rotterdam Climate Proof, this is the adaptation program ('Adaptatieprogramma') of the municipality. The last version of this report is of 2010.

Adaptatieprogramma 2010

The ambition and aim of the municipality of Rotterdam, and the adaptation program, is that in 2025 Rotterdam should be 100 percent climate proof. By responding/adapting to climate change the city will still be safe, approachable and attractive in the future. Besides this goal to adapt to climate change, Rotterdam also wants to prevent further climate change. The second aim, therefore, is to have a fifty percent CO_2-reduction from the 1990 levels by 2025 (Rotterdam Climate Initiative, 2010). In order to become climate-proof, Rotterdam needs to protect itself against flooding. Since Rotterdam is a port city, sea level rising will have considerable impacts. Besides flooding, Rotterdam needs to protect itself against more heat, heavier rainfall, possible changes in transport over water etc. Therefore, it is of utmost importance that an adaptive strategy is used that is proactive and can adjust to changing conditions. For that reason Rotterdam developed a climate adaptation strategy: the 'Rotterdamse Klimaatadaptatiestrategie' (RAS) (Rotterdam Climate Initiative, 2010).

'Rotterdamse Klimaatadaptatiestrategie'

In figure 5.1 the climate adaptation strategy is shown (Rotterdam Climate Initiative, 2010). Three key pillars (shown in the middle) are identified in order to achieve the ambitions of Rotterdam. These are

knowledge, profiling and actions. Knowledge means that Rotterdam is conducting leading research in the field of theoretical and applied delta technologies. But Rotterdam is also exchanging knowledge, for instance trough the international knowledge network 'Connecting Delta Cities', a network that is even established by Rotterdam (Rotterdam Climate Initiative, 2013). The second pillar, actions, means that Rotterdam will conduct case studies to test these technologies. This will make contributions to a more safe, healthy and attractive living environment. The last pillar means Rotterdam will put itself right on the map, internationally, by being an inspiring example.

Figure 5.1: 'Rotterdamse Adaptatie Strategie' (RAS)
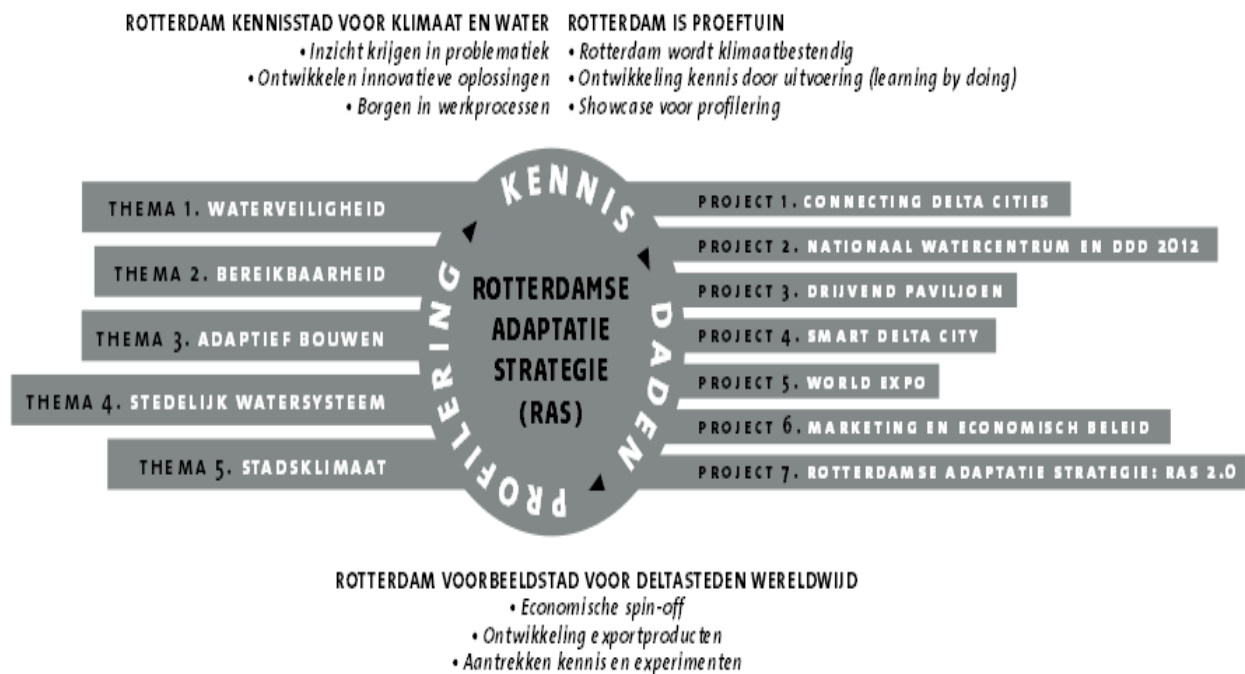
Besides the pillars the strategy also consists of 5 themes (on the left) and 7 projects (on the right). The themes are:

1. Water safety
2. Accessibility of the city
3. Building adaptively
4. Urban water system
5. City climate

These are the five themes within the program and the focus is on gaining more knowledge and on the execution. The projects are important for the image of Rotterdam as a safe port city and as a decisive and innovative delta city (Rotterdam Climate Initiative, 2010).

Monitoring

Al the measures are monitored. In this way all the effects on climate change can be measured and it can be determined whether or not these measures also have a positive spin-off for the goals of Rotterdam. The monitoring takes place in such a way that the progress of the projects can be monitored and the execution of the projects be evaluated. Different monitoring tools are available, like the 'klimaatatlas' for monitoring region specific climate effects, scenario's and the measures taken in that region. Another tool is the 'Barometer', this one will provide insights on how climate-proof Rotterdam really is.

<u>Rotterdam Climate Initiative</u>

To create an ambitious and integrated climate policy, political commitment and active political involvement is necessary. In Rotterdam, multiple climate adaptation programs have been written, all by the Rotterdam climate initiative. As mentioned above they provide a platform in which the government, organizations, businesses and citizens can come together and to collaborate on the CO_2-reduction mission of Rotterdam. They also developed a lot of different documents. The group consists of members of the municipality of Rotterdam, Deltalings (they represent the collective interests of the industrial and port operators in the Mainport Rotterdam), the DCMR (the environmental service of Rijnmond) and the 'Havenbedrijf Rotterdam NV (they also represent the interests of the harbor community). These parties are each represented by a number of members of their own organizations.

'Programma Duurzaam'

Besides the climate adaptation program, there is also another important policy document in Rotterdam, namely the 'Programma Duurzaam'. This report focuses on sustainable development, but also contains elements of climate neutrality. Especially the mitigation aspects are dealt with in this program. So, despite that it is not a climate change document, this document will be taken into account. Also the sustainability strategy of the municipality is described in the program (Gemeente Rotterdam, 2011)

5.3 Project Heijplaat

"What goals, policies, tools and programs are the selected cities using in order to become climate neutral?"

Heijplaat is a small neighborhood in de harbor of Rotterdam. It is decided that this neighborhood will be redeveloped into a sustainable, climate neutral neighborhood (IenM, 2011b). Three distinctions can be made in regard to the development goals: (1) a sustainable Heijplaat, (2) a climate resilient

Heijplaat and (3) an energy neutral Heijplaat. In order to reach these goals a vision is made for 2020 based on people, planet and profit (Stadshaven, 2012a). The '3p' method is part of the broader sustainability strategy and will be used to determine whether or not a project will make a contribution to either the social side, the environmental side or the economical side.

Different parties are involved in project Heijplaat, namely:

- the municipality of Rotterdam;
- the 'Havenbedrijf' Rotterdam;
- Woonbron (Housing corporation);
- 'Programmabureau Stadshavens';
- Eneco BV (Eneco);
- Netbeheerder B.V. (Stedin);
- RDM Campus (Hogeschool Rotterdam, Albeda College).

There will also be a lot of communication with the neighborhood association and with another organization in which citizens are united (Heijplaat Vitaal). The 'programmabureau' Stadshavens, a collaboration between the municipality of Rotterdam and the 'Havenbedrijf Rotterdam', is the initiating actor. Both want a redevelopment in the area for economical and sustainable gain. The groups described above will participate in a joint consultation structure, consisting of a consultation platform Heijplaat and the program group Heijplaat. All the parties described above are present in those two groups supplemented with 'Heijplaat Vitaal', the 'programmabureau Duurzaam' and 'Stadsbeheer'. The first is usually represented by the director of the organization and the latter by a program manager. The first platform makes the final decisions and ranks above the latter group. The decisions are made based on consensus (Stadshaven, 2012b). So, no citizens are directly involved within these decision-making group. This is partly because one of the goals is to involve the citizens during all the steps of the projects. In that case they do not have to participate in the group, but their expertise will be used in all the phases prior to the decision.

Within the part of the project relating to climate neutrality, either the municipality or 'Woonbron' or Eneco (with energy neutrality) is the project leader. In all situations, however, it is expected that the citizens of Heijplaat will be able to participate in all phases of the project (Stadshaven, 2012b).

5.4 Results

"Which factors account for the extent of policy integration?"
"What roles are the chosen municipalities, and other stakeholders, taking to become climate neutral?"
"which governance mode is applied by the chosen municipality?

In this paragraph the analytical framework will be applied on the case and the sub-questions above will be dealt with. Now subsequently the first part and the second part of the analytical framework will be applied. Firstly, the extent to which policy is integrated and the factors that account for this (5.4.1), followed by a summary (5.4.2). Secondly, the conditions determining the extent to which an integrated approach is being used (5.4.3), followed again by a summary (5.4.4).

5.4.1 The extent to which policy is integrated
As mentioned above this paragraph will deal with the first part of the analytical framework. Firstly, the normative type of integration: common understanding and commitment. Secondly, it will discuss

the integration of goals, instruments and issues: goals and instruments/tools. Finally, it will discuss the organizational type of integration: participation and leadership.

<u>Normative type of integration</u>

The objects belonging to this category are *common understanding* and *commitment*. The results are shown and discussed below.

Common understanding	Commitment	
1 +	2 +	3 +-

Common understanding:
The first criterion, that there should be a clear understanding by the public, public organizations and by the levels of government about the climate problems that Rotterdam faces and what needs to be done regarding climate neutrality, received a + rating. In Rotterdam the actors are quite aware. The problems that Rotterdam faces are well-known by the actors/the public and actors could often participate in an early stage. Partly because of the amount of monitoring tools and because of the availability of sustainability/climate neutrality plans, the possible effects are known (Rotterdam Climate Initiative, 2010). Furthermore, the citizens of the neighborhood Heijplaat received an award from the World Wildlife Fund for their sustainable approach and help to make the neighborhood a climate neutral neighborhood (ANP, 2012), showing much involvement and understanding.

Commitment:
The second criterion, that there should be commitment at the highest level, received a + rating. Rotterdam is active with climate policy and mostly with energy efficiency, for a long time already. Furthermore, Rotterdam is a member of the IKS and the 'Klimaatagenda 2011-2014'. The Rotterdam Climate Initiative and the sustainability bureau can be seen as a sign of commitment. The first already exists for quite some time and is highly active towards the climate goals of Rotterdam. However, the same can be said as for Tilburg, most of the climate neutrality plans are not that far developed, but the signs do look promising.

The third criterion, having a long-term (SD) strategy received a rating of +-. Rotterdam has long-term projects, with a long-term vision about both sustainable Development (Gemeente Rotterdam, 2011; Akerboom, 2013) and climate neutrality (Rotterdam Climate Initiative, 2010). The latter, however, is not really an overarching one. The plans about adaptation and the RAS are very detailed and clear. For mitigation, however, this is a bit less clear.

<u>Integration of goals, instruments and issues</u>

This type of integration exists of two elements *goals* and *instruments/tools* and concerning the fourth to the eleventh criteria. The results are discussed below.

Substantive/policies							
Goals				Instruments/tools			
4 +	5 +	6 +	7 +-	8 +-	9 +-	10 +-	11 +

Goals:
The fourth criterion, having common, shared, congruent, compatible and/or complementary goals and objectives, received a rating of +. The goals of Rotterdam are clear, common and shared, but not that much consistent/complementary. The first goal is about becoming 100 percent climate-proof in 2025; the second is about a CO_2-reduction of 50 percent from the 1990 level. The goals, however, are very ambitious. The work of the Rotterdam Climate Initiative is very clear, and those are shared between actors as well.

The fifth criterion, having common and consistent concepts and terminologies, received a + rating. The concepts and terminologies are consistent for Rotterdam and because of the work of the Rotterdam Climate Initiative, also shared. Within Heijplaat the same concepts and terminologies were used by the actors involved (Stadshaven, 2012a; Stadshaven, 2012b).

The sixth criterion, integration of environmental issues with social and economic issues, received a rating of +. On a municipality level the integration of social and economical issues with climate change, or sustainability in general, is implemented. It can be seen in both the sustainability report, as the sustainability bureau (Gemeente, 2011; Akerboom, 2013). On a project level, however, there is a bit less integration between the different issues.

The seventh criterion, integration of emerging issues, such as health, risks etc. received a rating of +-. At a municipality level the reasons are the same as for indicator six, but on a project level it was less clear. The '3p' are found, but not all emerging issues were found, however, also for this aspect it can be said that the project has still only just began.

Instrument/tools:
The eight criterion, integrating SD staff and resources, received a +- rating. On a municipality level, as became clear from the interview with Akerboom (2013) there is quite some integration of SD personnel and resources with a large sustainability fund (Rotterdam Climate Initiative, 2010), but less on a project level. Of course because of the IKS, but furthermore not much is found on a project level. Some of the costs are assigned to one of the actors, but it is not clear to what extent resources are shared.

The ninth criterion, training and awareness raising, including interdepartmental exchange programs received a rating of +-. Rotterdam has some awareness training and interdepartmental exchange programs, although not many.

The tenth criterion, public consultation processes, received a rating of +-. Citizens play a very big role in Rotterdam at the project level. It is stated that in every phase citizens should have the possibility to make a difference and public consultations have to be organized (Stadshaven, 2012b). However, Akerboom (2013) stated that some civilians do complain that the consultation meetings were not happening quickly enough and sometimes it was not clear about the when and/or the how.

The eleventh criterion, monitoring, received a rating of +. Rotterdam uses a lot of different tools for monitoring, like the 'Barometer, a climate monitor and the 'klimaatatlas' (Rotterdam Climate Initiative, 2010). They are used for both predictions, processes and outputs. Also for Heijplaat evaluations are held numerous times.

Organizational type of integration

This type of integration exists of two elements, *Participation* and *leadership* and the twelfth to the seventeenth criteria. The results are discussed below.

Organizational					
Participation					leadership
12 +-	13 +	14 +	15 +-	16 +-	17 -

Participation:
The twelfth criterion, inclusion of affected stakeholders (public, private, NGO) in the decision-making process, received a +- rating. As explained in paragraph 5.2 and 5.3 a lot of different stakeholders are included during all faces of decision-making. For the Heijplaat project a lot of actors are part of the board that makes the final decision. However, citizens are not a member of that board, and even though they are frequently consulted, it is not the same. However, for the local citizen initiatives this is not the case and here the citizens have a lot of influence. This will probably not be much of a problem later on in the project, since it is stated that the purpose for citizens is to create the climate neutral neighborhood mostly on own initiatives. Furthermore, the 'Havenbedrijf' in heijplaat sometimes has more power.

The thirteenth criterion, clearly defined roles and responsibilities, has received a rating of +. The roles of the different stakeholders are quite clearly defined and it is also quite clear what kind of responsibilities they will have. Since the projects in Heijplaat are assigned with project leaders along with a very detailed job description, it will be quite clear for them what kind of responsibilities they will have. Furthermore, do they have quite equal roles. However, citizens should get more power later on (Akerboom, 2013).

The fourteenth criterion, public participation, received a rating of +. Public participation is one of the most important points in Heijplaat as described above. This received a different rating than the twelfth criterion based on the ambitions of having public participation during every stage of each project (Stadshaven, 2012b).

The fifteenth criterion, interaction between policy actors and actor networks, received a rating of +-. Not many actor networks have been found. In Heijplaat the actors participate together in the platforms (Stadshaven, 2012a; Stadshaven, 2012b), but besides those platforms not many networks have been found.

The sixteenth criterion, the integration of professionals in a truly interdisciplinary team received a rating of +-. The Rotterdam Climate Initiative is a good example of such a team, but the team did not have that many diversity and is therefore not considered that interdisciplinary.

Leadership:
The seventeenth – and last – criterion, the existence and location of institutional 'catalyst', received a rating of -. An institutional 'catalyst' was not (really) found in Rotterdam.

5.4.2 summary
 A summary of the results of sub-paragraph 5.4.1 is provided in table 5.1 below.

Table 5.1: summary of case study results on the extent of policy integration

	Normative			Integration of goals, instruments and issues								Organizational					
	Common understanding	Commitment		Goals				Instrument/tools				Participation					Leadership
Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Rotterdam	+	+	+-	+	+	+	+-	+-	+-	+-	+	+-	+	+	+-	+-	-

5.4.3 Conditions determining the extent to which an integrated approach is being used

As mentioned, this paragraph will discuss the conditions determining the extent to which an integrated approach is being used. This will happen by looking at the governance mode applied and by looking at the role of authority and the interactions with and between various stakeholders. It will start by looking at the actor features and will subsequently deal with the institutional features and the features concerning content.

Actor features

The actor features consist of the initiating actor, the stakeholder position, the policy level and the power base.

Initiating actors:
The initiating actor for the project Heijplaat is the 'Programma bureau Stadshaven'. Since this is a collaboration between the municipality of Rotterdam and the 'Havenbedrijf Rotterdam', it is also possible to state that the government is the initiating actor. They both share the same urgency for redevelopment, partly from financial reasons as from wanting a pilot case for developing more knowledge on delta cities.

Stakeholder position:
The amount of stakeholders participating in this project varies a bit. The actors described in paragraph 5.3 are part of the board, but not necessarily involved in the execution of each project. The board with the directors makes the decision, but every party is involved in that group, so the roles are mostly equal. However, Akerboom (2013) stated that the 'Havenbedrijf' Rotterdam owns most of the ground and therefore has a bigger say in what is going to happen together with the municipality. Broader decision-making is done by 'Stadshaven' (Stadshaven, 2012a).

Policy level:
The level at which the projects operate is at the local level, the Heijplaat neighborhood, and on a regional level (Stadshaven, 2012a; Akerboom, 2013).

Power base:
The power is based mostly on the agreement on roles, positions and procedures. But also on trust with the more or less equal roles between most actors.

Institutional features

The institutional features consist of the model of representation, the rules of interaction and the mechanisms of social interacting.

Model of representation:
The model of representation for the project is through a partnership. As became clear from the interview with Akerboom (2013), the projects all consist mostly of public-private governing arrangements (Stadshaven, 2012b).

Rules of interaction:
It is mostly on a voluntary basis, however, after signing the collaboration agreement you do have formal responsibilities. But nothing is defined/bounded by law. By signing the agreement you agree that:

-    you take responsibility;
-    you give active support.

Mechanisms of social interaction:
From the interview with Akerboom (2013) it became clear that there are two main ways of social interaction. During the projects, as described above, there is interactivity with possibilities for negotiation and public participation. But through the IKS it is mostly bottom-up, own initiatives of the citizens of Heijplaat.

Features concerning content

The features concerning content consist of the goals and targets, instruments, policy integration and policy-science interface.

Goals and targets:
The goals and targets are agreed upon by a negotiation by the different actors involved with project Heijplaat. Therefore, the goals within the project are integrated and tailor-made (Stadshaven, 2012b). Goals and targets are made for the neighborhood.

Instruments:
As stated above the most used instruments are negotiated agreements and private contracts.

Policy integration:
Based on the analysis in the previous sub-paragraph it can be concluded that most policy sectors and policy levels are integrated.

Policy-science interface:
With the different platforms and program groups knowledge from different actors is combined. The public can provide information throughout the numerous consultation opportunities, however, some citizens have stated that their input, sometimes, is not used. This can happen because some complain that the consultation meetings do not happen quickly enough and that it is sometimes not clear about the when and how (Akerboom, 2013).

Based on these features the governance mode applied in Rotterdam can be identified. In Rotterdam it is mostly interactive governance, but does show some characteristics of self-governance, at least

when the public is concerned. But overall it can be stated that an interactive governance mode is applied.

5.4.4 Summary

A summary of the results of sub-paragraph 5.4.3 is provided in table 5.2 below.

Table 5.2: summary of case study results on the extent that an integrated approach is being applied

		Rotterdam	
		Interactive governance	Self-governance
Actor features	Initiating actor	'Stuurgroep' Stadshaven (municipality and 'Havenbedrijf'	
	Stakeholder position	Equal roles for those involved	- Bit more influence for 'Havenbedrijf'
	Policy level	Local-regional	
	Power base	- Legitimacy through agreement, roles, positions and procedures - trust	
Institutional features	Model of representation	Partnership (participatory public-private governing arrangements)	
	Rules of interaction	Formal and informal rules	- Voluntary basis - Self-crafted formal and informal rules
	Mechanisms of social interaction	Interactive by social learning, deliberations and negotiations	- Bottom-up
Features concerning content	Goals and targets	Tailor-made and integrated goals	Tailor-made and integrated goals
	Instruments	Negotiated agreements	Private contracts
	Policy integration	Integration of policy sectors and policy levels	Integration of policy sectors and policy levels
	Policy-science interface	- Expert and lay knowledge through different platforms and project groups, combined with consultation meetings - Emphasis on integrated and time-and-place specific knowledge	Expert and lay knowledge

5.5 Conclusion

Rotterdam is an interesting case which provided this research with interesting knowledge. A few conclusions can be given based on the findings in this chapter.

The goals of Rotterdam are twofold: (1) in 2025 Rotterdam should be 100 percent climate proof; and (2) to have a fifty percent CO_2-reduction from the 1990 levels by 2025. Besides these goals Rotterdam also has the ambition to become one of the leading harbor cities in the world in regard to climate neutrality. The main tool used by Rotterdam is the 'RAS' (the 'Rotterdamse Klimaatadaptatiestrategie'). With this strategy Rotterdam tries to conduct leading research in field of theoretical and applied delta technologies; Rotterdam will conduct a number of case studies to test these technologies. Furthermore, Rotterdam tries to put itself on the map, internationally, by being an inspiring example.

Based on the results of the first part of the analytical framework (table 5.1) it can be concluded that in the municipality of Rotterdam, policy is integrated fairly well. Eight out of seventeen factors were strongly present in Rotterdam, eight factors were only partly found and only one factor was not found in Rotterdam. It is found that the normative type of integration is clearly present in Rotterdam. In Rotterdam there is in general a common understanding of the problems of climate change and what has to be done to overcome these problems. This is paired with a high level of political commitment. Rotterdam even has a sustainability, or climate neutrality, strategy, however, it is not really an overarching one. Also for the integration of goals did Rotterdam scored rather high. Only the seventh criteria, the integration of emerging issues, was only partly found. Not all emerging issues were found, but the same can be said for Rotterdam as what was said for Tilburg, namely that there still is time to improve this. On the integration on instruments Rotterdam did score a bit lower. Mainly because Rotterdam does have integration of staff and resources on a municipality level, but less on a project level. Furthermore, Rotterdam has some awareness training and interdepartmental exchange programs, although not many. For the organizational type of integration Rotterdam has a high score. A lot of different stakeholders are included during all faces of decision-making. For the Heijplaat project a lot of actors are part of the board that makes the final decision. The roles of the different stakeholders are quite clearly defined and it is also quite clear what kind of responsibilities they will have. Since the projects in Heijplaat are assigned a project leaders, with a clear job description, it will be quite clear for them what kind of responsibilities they will have. Lastly, public participation is one important point. The ambition of Rotterdam is to have public participation during every stage of each project. Furthermore, there is integration of policy objects, goals etc. with other goals, with other actors etc. Finally, Rotterdam did also have a high integration on participation. In other words Rotterdam has the combination of a clear strategy, there is common understanding, and there is commitment amongst all the stakeholders. This is a good combination to have and will it make it more likely for Rotterdam to meet its targets. Only downside for Rotterdam is that they do not really have an institutional 'catalist' available. The Rotterdam Climate Initiative comes close, but it is not clear how it will bring people together. So, the main factors found in Rotterdam are:

- good and multiple monitoring systems;
- a combination of having a clear strategy, common understanding, commitment amongst all stakeholders and good participation possibilities.

Based on the second part of analysis of the case study a few conclusion can be made. Given the availability of a sustainability strategy, the integration of goals, objects, expertise, the integration with and within stakeholders, it is not surprising that the dominant governance mode found in Rotterdam is the interactive governance mode. Given the amount of overlap between an interactive governance mode and a self-governing mode, Rotterdam did also show signs of a self-governing mode. However, the interactive governance mode is clearly the most dominant mode. Surprising in Rotterdam is that the public is not directly involved with the decision-making process by giving them

a seat at the board. Now they do have the 'Heijplaat Vitaal' present at the meetings. But given the fact that Rotterdam really wants public consultation during every stage of the research it is surprising that they are not directly involved in the projects. However, there are numerous of own initiatives from citizens in Rotterdam. The dominance of the interactive governance mode can easily be explained by looking at the role of the local authority. The municipality formed a collaboration with the 'Havenbedrijf Rotterdam' and is therefore one of the initiating actors together with market actors and sometimes with civil society. Furthermore, the different stakeholder in Rotterdam are equal to each other within the projects. All actors have an equal role and no stakeholder has more power over the other, except the 'Havenbedrijf' has a bit more power, since they are the owners of most of the ground. Other important aspects are the power base (agreement and trust), the model of representation (through a partnership), integrated and tailor-made goals, the negotiated agreements and the availability of both expert and lay knowledge.

Chapter 6: Comparison between case studies

The case studies described in the previous chapters provided this research with practical knowledge about the extent to which policy is integrated on a municipality level and the factors are described that account for this. Furthermore, the case studies have provided this research with practical knowledge about the conditions that determine the extent to which municipalities are able to use an integrated approach. This was achieved by looking at the roles of the different stakeholders (and the local authority), the interactions between the stakeholders and the applied governance mode(s). The combination of the information gained from literature and the practical information gained from the case studies will help to answer the research questions of this research. The central research question will be answered in the next chapter (the conclusion), but the sub-questions will be dealt with in this chapter, except for the first sub-question. The first sub-question was formulated as follows:

"What factors from literature are relevant for creating an analysis framework that can be used for assessing/explaining the extent to which cities use an integrated approach for becoming climate neutral?"

This sub-question was already discussed in great detail throughout chapter three and answered in paragraph 3.6. Table 3.4 and paragraph 3.6.2 give a good picture of the relevant factors. The next paragraphs will subsequently answer the second (6.1), third (6.2) and fourth (6.4) sub-questions. In paragraph 6.3 the results of the first two sub-questions are discussed on the basis of literature.

6.1 Case study comparison based on the extent of policy integration
The second sub-question was formulated as follows:

"To what extent is policy integrated in the chosen cities/municipalities?"

For this sub-question the first part of the analytical framework was used and the different factors that explain the extent of policy integration are described. The evaluation will be discussed per city, therefore first Tilburg will be described (6.1.1), subsequently Rotterdam will be described (6.1.2) and lastly a comparison will be given of the similarities and differences between the cities (6.1.3). Table 6.1 provides an overview of the results for the two case studies combined.

Table 6.1: case study comparison based on the extent of policy integration

	Normative			Integration of goals, instruments and issues								Organizational					
	Common understanding	Commitment		Goals				Instrument/tools				Participation					Leadership
Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Tilburg	+	+	+-	+	+	+-	+	+-/+	+-	+-	+	+	+	+	+	+	+-
Rotterd	+	+	+-	+	+	+	+-	+-	+-	+-	+	+-	+	+	+-	+-	-

am														

6.1.1 Tilburg

Based on the results of the first part of the analytical framework it can be concluded that in the municipality of Tilburg policy is integrated fairly well. As stated in chapter four, 11 out of 17 factors were strongly present in Tilburg and the remaining six factors were only partly found. All three types of integration are found in Tilburg. The normative type of integration is clearly present in Tilburg. In Tilburg there is a common understanding of the problems amongst all stakeholders. This became clear when Tilburg was declared climate-friendliest city of the year and climate neutral city of the year the year after that. The latter meaning that the plans of Tilburg are being recognized by a wider public and that they also have faith in those plans. Furthermore, there is a high level of political commitment, given the ambitious goals set by the municipality. In the conclusion of chapter four it is also stated that Tilburg scored high for the integration of goals and that monitoring in Tilburg is done in a very good way. Also for the organizational type of integration Tilburg scored high. Stakeholders are often included in an early stage and all the stakeholders have clearly defined roles and responsibilities. This was mostly explained due to the existence of the 'Klimaatschap' and by having a 'core team', consisting of many professionals from different fields. Three main factors were found in Tilburg that mostly explain the high level of policy integration, namely:

- a good monitoring system;
- availability of the network the "Klimaatschap';
- a 'core team' consisting of many different professionals.

As explained monitoring in Tilburg is organized in a good way. Projects are monitored in four different ways, namely: (1) input (by monitoring the resources and measures); (2) output (results in forms of documents, hardware, instruments etc.); (3) outcome (the outcomes and results for the programme); and (4) effect (the contribution of the project towards the goal). With these types of monitoring, interventions can be done quickly when it is realized that a project might start to fail. Opponents of an integrated approach often state that bringing in many actors, which all have their own interests, might result in less effective policy-making, or project (Jessop, 1998; Stoker; 1998). This risk, however, can be reduced by using good monitoring systems. Subsequently, it will help to have common understanding and commitment. With the help of a 'core team' this process was accelerated resulting in more motivated actors. It also helped with bringing different actors together, which is also seen in the 'Klimaatschap', with a network the pool of knowledge grows and the chances of identifying win-win situations increase (Stoker, 1998). Furthermore, it can eliminate redundancies, constrain conflicts and reduce the number of system elements and their interactions.

6.1.2 Rotterdam

Based on the results of the first part of the analytical framework it can be concluded that in the municipality of Rotterdam policy is integrated fairly well. Eight out of seventeen factors were strongly present in Rotterdam, seven factors were only partly found and only one factor was not found in Rotterdam. It is found that the normative type of integration is clearly present in Rotterdam. In Rotterdam it is identified that there is a common understanding of the problems of climate change and what has to be done. This is recognized by multiple actors. Also resulting in many citizens initiatives to make Heijplaat a climate neutral neighborhood. The citizens of Heijplaat received an award of the World Wildlife Fund for their efforts and approaches of making Heijplaat climate neutral. This common understanding is supplemented with a high level of political commitment. The aim of Rotterdam is not only to become climate neutral, but they want to be one of the best harbor cities in the world and want to serve as an example. Furthermore, Rotterdam does have a sustainability strategy. Having such a strategy also increases the chances of more understanding and

commitment among different actors. Lastly, there are many opportunities in Rotterdam to participate. In the conclusion of chapter five it is also stated that Rotterdam scored high in the integrations of goals and with monitoring. Rotterdam uses many different monitoring tools, like the 'Barometer, a climate monitor and the 'klimaatatlas'. They are used for both predictions, processes and outputs. Also on a project level, for Heijplaat, evaluations are held numerous times. As stated Rotterdam did also score well for the organizational integration. Stakeholders are often included in early stages and they have clearly defined roles and responsibilities. Two main factors were found in Rotterdam that mostly explain the high level of policy integration, namely:

- good and multiple monitoring systems;
- a combination of having a clear strategy, common understanding, commitment amongst all stakeholders and good participation possibilities;

Especially the second combination of factors was very important for Rotterdam. Having these factors present will strengthen each other. A higher commitment may result in more political momentum and can create a more democratic basis (Persson, 2004). Together with social backing and public support the chances are much higher to be able to make changes. Without support, resistance may occur. Having a good sustainability strategy, or at least a long-term view, can improve policy coherence (Persson, 2004). Furthermore, a lack of a long-term view will make it difficult to appreciate the link between present behavior and future conditions and to redefine problems and opportunities in the light of new circumstances (Ibid). Also, having this factors integrated, the pool of knowledge increases.

6.1.3 Similarities and differences between Tilburg and Rotterdam

There are not many differences between the two case studies when you briefly study the table, but the case studies nonetheless, are quite different. Both cities score high for the total extent of policy integration. Many similarities can be found between the case studies. In both cities there is a good common understanding about the problems of climate change and about the solutions. One difference, however is the presence of a SD strategy for the city of Rotterdam. But nonetheless both case studies do show a great level of integration between different sectors of the government and with different actors. Both also score very high with the integration of goals. Having these aspects, gives the opportunity to get successful projects. For this reason it might not be surprising that both Tilburg and Rotterdam made some kind of achievement on the topic of climate neutrality as described in the paragraphs above. Only on the part of the integration of instruments more differences are found. Tilburg for instance does not have a sustainability fund, while Rotterdam has. Such a fund can be useful for creating more projects. But it can also be a reason to have more influence on a project, because if you compare the municipalities it is clear that Tilburg has decided not to have a big role during projects, while the influence of Rotterdam is bigger. This can be explained because Rotterdam has more funds available for projects. A lack of funds might be a reason not to have an active role. However, the biggest difference between the two is how they score on the last indicator: have an institutional 'catalyst' to steer things along. Tilburg has initiated the 'Klimaatschap' and with the 'Klimaatbureau' they have a facilitator for projects, while the alliances indirectly generate many ideas for new climate projects by bringing together actors with similar interests. Rotterdam does not have such a catalyst. One last similarity is that both cities have a good system for monitoring. Combining the factors found in both cities that mostly explain the high level of policy integration result in the following list:

- a good monitoring system;
- availability of a network consisting of many actors and different types of knowledge;
- a 'core team' (or catalyst) consisting of many different professionals;

- a combination of having a clear strategy, common understanding, commitment amongst all stakeholders and good participation possibilities.

6.2 Comparing the conditions for implementing an integrated approach

The third sub-question was formulated as follows:

"Which conditions determine the extent to which municipalities are able to use an integrated approach for becoming climate neutral:"

For this sub-question the second part of the analytical framework was used and the different conditions and the applied mode of governance are described, as well as the relations between different stakeholders. The evaluation will be discussed in the same way as the previous paragraph, therefore first Tilburg will be described (6.2.1), subsequently will Rotterdam be described (6.2.2) and lastly a comparison will be given of the similarities and differences between the cities (6.2.3). Table 6.2 provides an overview of the results for the two case studies combined.

Table 6.2: case study comparison based on the extent that an integrated approach is being applied

		Tilburg		**Rotterdam**	
		Interactive governance	*Self-governance*	*Interactive governance*	*Self-governance*
Actor features	*Initiating actor*	'Klimaatschap': Municipality.	Projects: businesses and citizens.	'Stuurgroep' Stadshaven (municipality and 'Havenbedrijf'.	-
	Stakeholder position	Equal roles in projects within alliance.	Alliance is self-governing entity. Self governing entities in projects outside of alliance.	Equal roles for those involved.	Bit more influence for 'Havenbedrijf'.
	Policy level	Local-regional.	Local-regional.	Local-regional.	-
	Power base	Legitimacy through agreement on roles. Trust.	Legitimacy. Agreement on procedures.	Legitimacy through agreement, roles, positions and procedures. trust .	-
Institutional features	*Model of representation*	Partnership (participatory public-private governing arrangements).	Partnership (participatory private-private governing arrangements).	Partnership (participatory public-private governing arrangements).	-
	Rules of interaction	Formal and informal rules by 'Klimaatschap'.	Voluntary basis. Self-crafted formal and informal rules.	Formal and informal rules.	Voluntary basis. Self-crafted formal and informal rules.

	Mechanisms of social interaction	Interactive by social learning, deliberations and negotiations.	Bottom-up . by social learning, deliberations and negotiations.	Interactive by social learning, deliberations and negotiations.	Bottom-up.
Features concerning content	*Goals and targets*	Tailor-made and integrated goals.	Tailor-made and integrated goals.	Tailor-made and integrated goals.	Tailor-made and integrated goals.
	Instruments	Negotiated agreements.	Voluntary instruments Private contracts.	Negotiated agreements.	Private contracts.
	Policy integration	Integration of policy sectors and policy levels.	Extent of integration can depend on the type of project started by different actors.	Integration of policy sectors and policy levels.	Integration of policy sectors and policy levels.
	Policy-science interface	Expert and lay knowledge in networks with the 'core team' Emphasis on integrated and time-and-place specific knowledge.	Expert and lay knowledge.	Expert and lay knowledge through different platforms and project groups, combined with consultation meetings Emphasis on integrated and time-and-place specific knowledge.	Expert and lay knowledge.

6.2.1 Tilburg

Based on the second part of analysis of the case study, a few conclusions can be made regarding the conditions determining the extent to which an integrated approach is being used. In Tilburg the applied governance mode is a combination between the interactive governance mode and the self-governing mode, more tending to the latter than the former. The biggest reason for this lies in the role of authority (the municipality). Since the municipality has chosen to apply an approach based on shared responsibility it took a less active role. The municipality was the initiating actor, but only to set up a network that has to become a self-governing entity over time, whit its own ideas. After succeeding this, the municipality took the role of a facilitator, only steering in times of trouble. But by taking a less active role, the municipality now shifted towards a self-governance mode. Next to the role of authority the roles and interactions of/with different stakeholders are considered important. In Tilburg the different stakeholders are equal to each other within the projects. All actors have an equal role and no stakeholder has more power over the other. This feature is clearly a prerequisite for implementing an integrated approach. Another important aspect is the power base. Trust and

agreement in roles is very important in order to minimize risks en to reduce possible conflicts (UN, 2011). Lastly the model of representation is important. Partnerships and networks will help enabling trust, increasing knowledge, overcoming barriers, integrating goals etc. The most important conditions are summarized below:

- role of the municipality;
- having equal roles and shared responsibility;
- equal power among actors;
- power base (trusting each other and coming to agreements);
- availability of a network (containing multiple actors with similar interests and having both expert and lay knowledge.

6.2.2 Rotterdam

Based on the second part of analysis of the case study, a few conclusions can be made regarding the conditions determining the extent to which an integrated approach is being used. In Rotterdam the applied governance mode is clearly the interactive governance mode, although it does also contain elements of a self-governance mode. This can be explained by the availability of a sustainability strategy, the integration of goals, objects, expertise and the integration with and within stakeholders. But the best explanation again, is regarding the role of the local authority. The municipality formed a collaboration with the 'Havenbedrijf Rotterdam' and therefore is one of the initiating actors together with market actors and sometimes with civil society. In Rotterdam the municipality takes an active role, but its role is equal to the other actors. All stakeholders have a delegation during project workgroups and at the different platforms. Furthermore, the different stakeholders in Rotterdam are equal to each other within the projects. All actors have similar roles and no stakeholder has more power over the other, except the 'Havenbedrijf' has a bit more power, since it is the owner of most of the ground. Therefore it might be able to make the final decision. What stands out is that the public is not directly represented in the board. In Rotterdam it is aimed to have public participation by means of participation processes (meetings etc.) during every stage of the projects. Other important conditions found in Rotterdam are similar to those in Tilburg, namely the power base (agreement and trust), the model of representation (through a partnership), negotiated agreements, tailor-made and integrated goals and the availability of both expert and lay knowledge. The most important conditions are summarized below:

- role of the municipality;
- having equal roles and shared responsibility;
- equal power among actors;
- power base (trusting each other and coming to agreements);
- partnerships;
- tailor-made and integrated goals;
- negotiated agreements;
- availability of both expert and lay knowledge.

6.2.3 similarities and differences between Tilburg and Rotterdam

As can be seen from the table 6.2, the case studies show a lot of similarities but also some differences. The biggest difference between the two cities concerns the role of the local authority. The municipality of Tilburg takes a more self-governing approach by letting most actors do things on their own. While the municipality of Rotterdam is having equal roles with the other actors. At first both Tilburg and Rotterdam were the initiating actors. But after the establishment of self-governing entities Tilburg took more of a backseat, only interfering when necessary. One big similarity is how

they deal with citizen initiatives. Both municipalities put emphasis on the strength of citizens to do things on their own and both encourage/facilitate them to do things and start their own projects. Both municipalities try only to facilitate them and try to prevent troublesome interference. But when citizens need expertise or when they need money, the municipalities will try to help them. Also in both case studies, most agreements are on a voluntary basis. Both municipalities do not feel the need to impose rules and regulations upon the involved stakeholders. What may not become clear from the table, but what is quite important, is that although both municipalities show many similarities, both with the role of authority as within the level of (policy) integration, they do follow a different approach. One of the goals of Tilburg is the establishment of the 'Klimaatschap'. Subsequently, should this evolve into a self-governing entity. This is something completely different than the approach of Rotterdam. They did not create such an entity as part of their objective in becoming climate neutral, but Rotterdam was more involved with projects and is trying to make an example out of its neighborhood Heijplaat by making it climate neutral. Combining the conditions found in both cities explaining mostly the extent to which an integrated approach is implemented result in the following list:

- a municipality being able to adapt its role to the role needed in certain situations ;
- having equal roles and shared responsibility;
- equal power among actors;
- power base (trusting each other and coming to agreements);
- availability of a network or a partnership (containing multiple actors with similar interests)
- tailor-made and integrated goals;
- negotiated agreements;
- availability of both expert and lay knowledge.

6.3 Discussion of found factors and conditions

This paragraph will discuss the factors/conditions found in the case studies on the basis of literature. There is much overlap between the different factors described in paragraph 6.1.3 and the different conditions described in paragraph 6.2.3. Therefore, the different factors and conditions are divided into five topics. These five topics subsequently will be discussed with literature. These five topics are: (1) monitoring; (2) networks and partnerships, dealing with a 'core team', availability of actors with similar interests and actors with different knowledge (both expert and lay knowledge); (3) understanding, commitment, strategies, integrated goals and agreements; (4) equality and power (trust); and (5) a flexible role of the municipality.

The first topic is monitoring. In both case studies a good monitoring system is present. In literature several advantages of monitoring systems are given, for instance that good monitoring can determine the extent to which the project is on track and whether or not it is necessary to intervene; it will help with making better and more informed decisions; it will help to ensure the most efficient use of resources; and it can evaluate the extent to which projects are having the desired outcomes (Persson, 2004; Jessop, 1998; Meadowcroft, 2004); Briassoulis, 2004). In the both case studies the project is being monitored throughout all the stages of the project. Therefore, it is possible to address possible negative effects/outcomes early on. Since the information is available during each stage of the process and for those involved, the projects become more transparent. So, in both case studies the monitoring system can lead to better policy-making.

The second topic is networks and partnerships. This topic deals with both networks and partnerships between actors with similar interests and networks consisting of expert and lay knowledge. Furthermore, is the presence of a 'core team' closely related to this topic. In literature, the various advantages of partnerships and networks are frequently addressed. It is stated that through partnerships and networks different actors can unite and that by bringing together different actors

the pool of knowledge will grow. Furthermore, can this increase the chance of win-win situations, it will increase rationality and effectiveness of policy-making and that it will improve the legitimacy. More stakeholders mean that the relevant technical, regional, social and political information necessary to increase the problem-solving capacity of cities will be present (Nilson & Persson, 2003; Stoker, 1998; Jessop, 1998; Briassoulis, 2004; van Kersbergen & van Waarden, 2004). Lastly, it can eliminate redundancies, constrain conflicts and reduce the number of system elements and their interactions (Briassoulis, 2004; Nilsson & Persson, 2003; Jessop, 1998). This is also found in both case studies. Especially in Tilburg, with the 'Klimaatschap', a network emerged consisting of different actors. Through those networks a lot of different projects are developed and executed. Regarding having a 'core team', it was found that in both case studies the presence of such a team ensured that both market actors and citizens were more aware of what was happening within the city regarding climate neutrality. In literature, the presence of networks with both expert and lay knowledge is recognized. Such networks can consist of government planning bureaus, universities, ministerial research organizations, consultancy agencies and accountants (van Kersbergen & van Waarden, 2004). As seen in both case studies, having such teams and platforms where different actors can come together, often resulted in more involvement, more understanding, commitment and better policy making in general. This last advantage is closely related to the next topic.

The third topic is common understanding, commitment, strategies, integrated goals and agreements. As is stated throughout this research, these topics are very closely related. As is seen in both case studies (especially in Rotterdam), it is very important to have these factors present and having these factors will also strengthen each other. This is also recognized in literature. Having a high commitment by all actors on various levels can result in more political momentum (Persson, 2004). Usually, more commitments means more clearer and more concrete agreements and goals, which can create a more democratic basis. Especially when there is also social backing and public support, the chances are much higher for policies to be implement and increases the chance of policy-making in general (Meadowcroft, 2007; Persson, 2004). Without commitment and understanding (support), resistance may occur. In literature, opponents of interactive approaches state that most stakeholders have their own interests and preferences and that these interests often collide (Dryzek, 1996; Jessop, 1998; Stoker, 1998; Meadowcroft, 2007). Such collisions may lead to delays in the project and less policy-making in general. Therefore, it is essential that there is a high level of commitment and understanding among all stakeholders (Persson, 2004). Having a 'core team', as described above, can improve this process. Furthermore, it is recognized that all actors should understand the policy problems (Meadowcroft, 2007; Jessop, 1998). Without a proper understanding of the problem, no adequate solutions can be found. Therefore, different stakeholders need to combine their knowledge and resources and formulate integrated goals. This also reduces the risk of collisions between stakeholders, since the goals set are based on consensus (Persson, 2004). Subsequently, the presence of a long-term view and a sustainability strategy will also improve policy coherence (Persson, 2004, Underdal, 1980). Lastly, it is very important that all actors can participate. Involvement of all stakeholders will increase a pool of knowledge, will increase the legitimacy and support and ensures a correct reflection of all interests in a city (Meadowcroft, 2004; Meadowcroft, 2007; Eckersley, 2004; Stoker, 1998). In both case studies it was found that the municipalities stimulate and facilitate the involvement of citizens.

The fourth topic is equality and power. In literature, it is stated that the state alone cannot handle everything. In modern society, the state is incapable of recognizing and anticipating all possible conflicts and coordination issues that arise from an interconnected, complex and power-shared world (Scherer et al., 2006; van Kersbergen & van Waarden, 2004; Stoker, 1998;). Other actors often have more resources and knowledge available. Therefore, the state should cooperate with other stakeholders. This is to inform, and to be informed by, the local community's knowledge and to share the ownership of new strategies with a larger group of stakeholders, thus ensuring more successful policy-making (UN, 2011; Stoker, 1998). In both case studies, the municipalities recognized this and

started a collaboration with different actors. In Tilburg, the municipality even took a more facilitating role and the projects are being developed and implemented by businesses and citizens. Furthermore, the municipality of Tilburg recognized that becoming a climate neutral city is not only their responsibility, but the responsibility of the entire city. In both case studies the roles of the different stakeholders are mostly equal. This implies that one actor usually has no more power than the other actors. The actors are working with an agreement about their roles and trust each other. This also means that these actors mostly use voluntary agreements and that decisions are made based on consensus. In literature, the importance of trust and consensus is recognized. It is stated that trust and consensus can help implementing policies, reducing conflicts and constrains and improve policy-making in general (Briassoulis, 2004; Nilsson & Persson, 2003; Jessop, 1998). Voluntary agreements are agreements between industry and public authorities on the achievement of environmental objectives (Jordan et al., 2005).

The fifth topic is a flexible role of the municipality. The municipality of Tilburg switches between various roles during the initial phase of the project. At first, the municipality had a steering role, but after the realization of a self-governing entity, the municipality took a back seat. However, as became clear from the previous paragraphs/chapters, the municipality has switched back to a more steering role when the project experienced some problems. After that difficult phase, the municipality again took a more facilitating role. Having flexibility in the role of the municipality during a project has its benefits. Especially when dealing with climate change is flexibility very advantageous. Even though a lot is known about the effects of climate change and many different climate scenario's exist, there is still a lot of uncertainty. Therefore, it is a good thing if a municipality is able to adapt to new situations. Regarding the role of the municipality, Bulkeley and Kern (2006) identified four different roles for the local authority (in this case the municipality) and it is recognized that different types of problems usually ask for a different role. However, in most research regarding climate neutral cities, it is stated that an integrated approach is necessary and an interactive approach is closely related to an interactive governance mode. In such a mode more equal roles are presumed between the state, the market and civil society, as was the case for Rotterdam. The role of the municipality of Tilburg, however, shows that also a self-governing mode can be used in order to become climate neutral. This is further discussed in the next chapter (paragraph 7.2).

6.4 lessons learned from case studies

The fourth sub-question is formulated as follows:

"What are the opportunities and pitfalls for implementing an integrated approach for creating climate neutral cities and how should the situation continue, i.e. what are the lessons learned from the case studies?"

A few lessons can be learned from the case studies, both for later stages of the projects of Tilburg and Rotterdam, as for future projects. Both approaches, used by Tilburg and Rotterdam, have shown some stronger and weaker points. First the strong points will be discussed, subsequently the weaker points, finally some lessons will be provided.

One of the strong points shown by both case studies is to have a good common understanding and clear commitment at the highest levels. This can reduce conflicts and will result in better policy-making. In Rotterdam this is further strengthened by having a clear sustainability strategy. Another strong point, seen in the case of Tilburg, is to have an institutional 'catalyst'. The case study of Tilburg has shown that having such a catalyst usually results in more understanding, commitment etc. This subsequently results in the generation of more project ideas and will increase the number of actors brought together in a network or partnership. A closely related point is the integration of professionals in a truly interdisciplinary team. In the case study of Tilburg with their 'core team' - and

in lesser extent in Rotterdam with the Rotterdam Climate Initiative - such a team exists which further improved support from different actors which make it more possible to make policy. It was shown that they developed multiple studies on the problems on the one hand and about possible solutions on the other hand. They were able to convince other stakeholders. Since this was a team consisting of members of completely different types of organizations and with different kind of expertise, they helped with integrating goals, helped with consistency and they helped with generating support from both politic as from civil society in an early stage. Another related strong point in Tilburg is to have actors together with similar interests. In the 'Klimaatschap', trough the alliances, multiple actors are brought together regarding different topics. Actors with similar interests will find each other more easily which will result in more projects. As described in this research, the monitoring systems in both case studies are excellent. Regarding the power relations, and the roles of different stakeholders, an important strong point found in both case studies is that the actors all have equal roles. Other strong points/conditions were the use of voluntary agreements and trust. One last interesting point is the role of authority. In Tilburg the role of the municipality was adaptive. In times more steering was needed, the municipality participated as a leader and when it were no longer needed one shifted back to a more background role. Being able to switch between roles can have a major advantage when dealing with climate neutrality given the complex nature of the problems and the solutions.

A few negative points found in the case studies is the lack of a sustainability, or climate neutrality strategy in Tilburg. However, Tilburg does have clear long-term ambitions. In Rotterdam some citizens believe that they are not being able to participate in an easy way. Some citizens complain that either they do not know when they should participate or they believe they were not being heard. A small negative point is the lack of a clear leader. Since all actors basically have equal roles some of the projects might come to stand still when there is no 'authority' to make a final decision or a clear leader that will take the initiative. Finally, regarding policy integration, not all emerging issues are fully integrated in Rotterdam.

Below are listed some learning points (derived from both the strong and the weak points):

- to have an overarching SD or climate neutrality strategy/perspective;
- to have funding especially for climate change or climate neutrality related projects
- to have good monitoring systems, like the 'klimaatmonitor';
- to utilize expertise of the public;
- to encourage and facilitate local initiatives;
- to integrate all aspects of sustainable development and emerging issues;
- to have an institutional 'catalyst';
- to have a team with experts from different fields;
- to form networks consisting of actors with similar interests;
- being able to adapt your role to the role needed in specific situations.

Chapter 7: Conclusion & Discussion

After the detailed discussion in the previous chapter, this chapter will answer the main research question of this research. This will be followed by a reflection on the used literature (7.2) and a reflection on the research methodology (7.3).

7.1 Conclusion

The central research question was formulated as follows:

"To what extent are municipalities using an integrated approach for becoming climate neutral and which factors account for this"?

The extent to which an integrated approach is being applied is explicitly discussed in the previous chapters. With the use of an analytical framework, both the extent of policy integration and the conditions determining the extent to which an integrated approach is being applied, were analyzed. These two elements were identified throughout a literature review and helped to delineate the meaning of an integrated approach. The cases, Tilburg and Rotterdam, both showed a high policy integration. Almost all the factors identified were strongly integrated or at least partially. Regarding the implementation of an integrated approach, it became clear that Tilburg showed forms of an interactive governance mode and a self-governance mode, tending more to the latter than the former. This was explained by the role of authority (the municipality). It became clear that the municipality of Tilburg opted for a more hands-off approach. They did initiate the project, but that was with the intention to create a self-governing entity. After that phase other stakeholders were more actively involved. Rotterdam also showed signs of both an interactive approach as a self-governing approach, however, in Rotterdam the interactive approach was clearly the dominant mode. This was mostly explained by the fact that all parties have equal roles throughout all the stages of the project. Regarding the factors accountable, here is a summary of the factors found through literature and with the case studies:

- Having a good monitoring system for the input, process, output and outcome stage of a project.
- Creating a network consisting of many actors with similar interests.
- Having a 'core team' (or catalyst) consisting of many different professionals, with both expert as lay knowledge.
- Having a combination of a clear strategy, common understanding, commitment amongst all stakeholders and good participation possibilities
- The ability to adapt your role to the role needed to deal with specific problems/situations.
- Having equal roles, power and shared responsibility.
- Having trust in each other and negotiate (work with consensus).
- Having tailor-made and integrated goals.
- Having an overarching SD or climate neutrality strategy/perspective.
- Having funding especially for climate change or climate neutrality related projects.
- Utilizing the expertise of the public.
- Encouraging and facilitating citizens with local initiatives

7.2 Reflecting on theories and literature

In paragraph 1.2 the knowledge gap was described. It was outlined that since the concept of climate neutral cities is quite new, not much has been written on climate neutral cities. In the literature dealing with climate neutral cities, it is often stated that an integrated approach is necessary, but none of the literature actually deal with such an integrated approach. Subsequently, there is a lot of literature about (environmental) policy integration in general, but less focuses on the local level (or climate neutrality). Therefore, this research tried to make a contribution in this area by combining the two subjects. Secondly, there is a lack of literature regarding cities using an integrated approach for becoming climate neutral and a lack of literature focusing on the exact role the municipality can have in such an approach. So, this research also tried to make a contribution in this area by providing information about the factors and conditions necessary for municipalities to successfully implement an integrated approach for becoming climate neutral.

In this research several theories and concepts were used in order to create an analytical framework. First, literature was studied to understand the issues and policy problems relating to climate neutral cities. After understanding the types of problems (complex policy problems), a perspective was chosen on (environmental) policy integration. In this research a more rational (institutionalist and actor-centered) perspective was chosen, since such a perspective fits more, and is more responsive, to the policy needs of complex problems. With this perspective different factors were identified in literature regarding different dimensions and types of (environmental) policy integration. With the help of these factors, the first part of the analytical framework was created and is again presented in table 7.1 below. In the next part of this research, this framework was tested and used as an example to gather data about the most important factors on a municipality level for determining the extent of policy integration. In the analysis of the case studies it was found that this framework was very useful for determining the extent of integration and four main factors were identified: (1) good monitoring system; (2) availability of a knowledge network; (3) presence of a 'core team'; and (4) the combination of having a clear strategy, common understanding, commitment amongst all stakeholders and good participation possibilities. As became clear in paragraph 6.3, most of the advantages found in the case studies regarding these factors, were supported by literature. So, with this analytical framework for assessing the extent to which policy is integrated on a municipality level regarding climate neutral cities, this research could make a contribution to the existing literature about (environmental) policy integration and climate neutral cities.

Table 7.1: Analytical framework – factors/indicators for policy integration

Level/type of integration	Object	Explanation	Source
Normative	*Common understanding*	Clear understanding by the public, public organizations and levels of government	Persson
	Commitment	Commitment at the highest level	Persson
		Long term (SD) strategy	Persson, Briassoulis
Goals, instruments and issues	*Goals*	Common, shared, congruent, compatible, complementary goals and objectives	Briassoulis
		Common and consistent concepts and terminologies	Briassoulis Underdal
		Integration of environmental issues with social and economic issues	Eggenberger & Partidario
		Integration of emerging issues, such as	Eggenberger &

		health, risks etc.	Partidario
	Instruments/ tools	Integration SD staff and resources	Persson Briassoulis
		Training and awareness raising, including inter-departmental exchange programmes	Persson
		Public consultation processes	Persson
		Monitoring	Persson Briassoulis
Organizational	*Participation*	Inclusion of affected stakeholders (public, private, NGO) in the decision-making process	Persson Briassoulis
		Clearly defined roles and responsibilities	Persson
		Public participation	Persson
		Interaction between policy actors and actor networks	Briassoulis
		The integration of professionals in a truly interdisciplinary team	Persson
	Leadership	Existence and location of institutional 'catalyst'	Persson

However, the key factors described above should be carefully addressed. For instance with the second factor: the existence of a knowledge network. Such a network should be organized in a good way. All different actors should be able to participate in such a network and all actors should also be able to use such a network. Furthermore, it is necessary that all types of knowledge are included in such a network. One last important aspect is that having only one of the factors present often is not sufficient. As explained in chapter four, five and six, these factors strengthen each other. For instance the existence of a 'core team' helps with gaining understanding and commitment at various levels.

However, a remark must be made about the framework. As explained above, this research used a specific line of thought and used a specific perspective. In chapter three it was explained why certain concepts/dimensions are best suited within the scope of this research. This automatically means that there is also a different way to view (environmental) policy integration. If a different view/perspective was used, the analytical framework would have changed as well. This means that the framework presented in this research is not the only possible framework, but that there are other possibilities as well. Nevertheless, the chosen framework was capable to reach the objective of this research.

Regarding the mode of governing and the second part of the analytical framework, the work of Driessen et al. (2012) was used in this research to determine the conditions necessary for implementing an integrated approach. In chapter three it was hypothesized that, because of the existing information about climate neutral cities, an interactive governance mode would be found in the case studies. In Rotterdam this was mostly the case, but in Tilburg a more self-governing mode was found, which was unexpected. In both case studies the eleven features often contained elements of both an interactive governance mode and of a self-governing mode. This can be explained by the fact that there is quite some overlap between the two governance modes. Even though the interactive governance mode shows more resemblance with an integrated approach, a self-governing mode can also be viewed as an integrated approach. However, the state (in this case the municipality) in the self-governing mode often has less interaction with different stakeholders than what was originally assumed for an integrated approach. Nevertheless, this approach proved sufficient in determining eight useful conditions for implementing an integrated approach. These eight conditions were: (1) a municipality able to adapt its role; (2) having equal roles and shared responsibility; (3) equal power among actors; (4) power base based on trusts and consensus; (5)

availability of a network or a partnership (containing multiple actors with similar interests); (6) tailor-made and integrated goals; (7) negotiated agreements; and (8) availability of both expert and lay knowledge. As became clear in paragraph 6.3, most of the advantages found in the case studies regarding these conditions, were supported by literature. With this second part of the analytical framework this research was able to provide insights in the role that the municipality and other stakeholders should have. Furthermore, this research was able to provide insights in the factors/conditions necessary for municipalities to implement an integrated approach for becoming climate neutral. This second part of the analytical framework was therefore able to make a contribution to the existing literature about implementing an integrated approach for becoming climate neutral.

7.3 Reflecting on research methodology

In this paragraph the research methodology will be reflected upon by assessing the effectiveness of the used methodology for reaching the research objectives. The research objective of this research was stated as follows:

To yield descriptive, explanatory, evaluative and prescriptive knowledge to understand which factors contribute to developing an integrated approach, to understand to which extent an integrated approach is used for creating climate neutral cities and to give insights in the implementation process by analyzing/assessing the approaches of leading Dutch municipalities.

- By examining what is meant by a climate neutral city, what is meant by an integrated approach, what is meant by (environmental) policy integration, what is meant by governance modes and how such an approach can be implemented in regards to a climate neutral city;
- By creating an analysis framework that can be used for analyzing/assessing the extent to which policy is integrated and to investigate which governance mode is applied by the chosen municipalities (investigating the conditions necessary for an integrated approach to be implemented);
- By giving suggestions on how municipalities should continue and what can be learned from the case studies.

In this research, a literature review and a case study analyses were conducted to reach these objectives. The literature review consisted of academic literature regarding climate neutral cities, integrated approach, (environmental) policy integration, governance modes and the role authority. With this method the first objective could be achieved and could an analytical framework be created which is necessary to reach the second objective. As mentioned, the literature review, provided this research with information about climate neutral cities. A definition of, and insights about the issues/types of problems associated with, climate neutral cities were given. Subsequently, could a definition of an integrated approach be given relating to climate neutral cities. This step revealed two important elements of an integrated approach which were used in this research, namely: (environmental) policy integration and the mode of governing (role of the municipality). These two elements formed the basis of the analytical framework. The third step was to chose a perspective for (environmental) policy integration. In this research a rational (institutionalist and actor-centered) perspective was chosen, since such a perspective fits more, and is more responsive, to the policy needs of complex problems. Subsequently, were different factors indentified regarding different dimensions and types of EPI. The fourth step was to give a definition of the role of authority and to describe the different governance modes. Lastly, could the analytical framework be created. The first part of the framework deals with the factors that explain the extent to which policy is integrated and the second part of the analytical framework dealt with the conditions necessary for implementing an integrated approach. With the framework seventeen different criteria were identified and used to test the case studies. With this approach an analysis could be made about the approaches of Dutch municipalities. However, by focusing on a literature review, a choice had to be made about which theories to include and which to ignore. After a long deliberation, theories/concepts/ideas were used mostly looking at a rational view of EPI and an actor-centered approach. It was found that this perspective better enables you to make an assessment about EPI and it connected better with the use of an integrated approach. The particular literature is chosen on the basis of how often it is quoted and used in regard to policy integration and by what it has meant in the field of policy integration, but foremost because the particular authors carried out a very extensive literature review themselves. By using these authors the best available information could be used. The results could have been different when another perspective was chosen, but with this perspective this research was able to reach the first objective of this research.

Subsequently, a case study approach was chosen. Given the scope of my thesis, and the amounts of ECTS, only two case studies were selected. Originally the plan was to have three case studies, but this was not possible given the time. With two case studies, this research was more about depth than breadth results. The aim of the case study also was not to make a generalization towards all municipalities in the Netherlands, but to have practical knowledge which could be used as an example. By using different ways of data gathering it was tried to gather as much information as possible about these cases. But also for this method different choices could have been made. One of the case study selection criteria was about the type of projects, since it was preferred not to have similar projects. In regard to this, it would also have been interesting to gather cases around Europe, or the world, since here the context will be different and more information can be obtained about the usefulness of the analytical framework. With this case study analysis, the analytical framework was tested. The case studies provided this research with information about the most important factors for determining the extent of policy integration and the conditions necessary for implementing an integrated approach. So, by creating an analysis framework and by using case studies, both literature knowledge and practical knowledge was gathered/gained about the analytical framework and the extent to which an integrated approach is begin used on a municipality level. With this information the second objective of this research was met. Furthermore, by analyzing the case studies, several strong and weak points could be identified. These were used to provide lessons that can be learned by these cases, but also lessons for municipalities that want to become climate neutral in the future. With this, the third objective of this research was met.

In the previous paragraph, the contributions of these research for existing literature was given. But this research not only has a scientific relevance, but also a societal relevance. This was described in paragraph 1.7. The most important relevance is that this research can help researches, policy developers and implementers, NGO's and other stakeholders dealing with climate neutral cities. With the analytical framework information is given that can be used by policy makers to assess the extent of (environmental) policy integration. The second part of the analytical framework can be used by all stakeholders. This part reveals information about the conditions necessary for implementing an integrated approach and about the roles that different stakeholders can/should have. Therefore, this research can be used throughout the transition towards making a city climate neutral. It can both be useful for municipalities (cities) who are already becoming climate neutral (like Tilburg and Rotterdam) and for municipalities (cities) who wants to become climate neutral in the future.

References

Agentschap NL Ministerie van Economische Zaken, Landbouw en Innovatie (EL&I), (2012). 'Projecten Klimaatneutrale steden', obtained on: 25-10-2012, from: http://www.agentschapnl.nl/programmas-regelingen/projecten-klimaatneutrale-steden

Akerboom, F. (2013). Personal communication on 04-04-2013

ANP, (2012). 'WNF geeft pluim aan Duurzaam Heijplaat', obtained on: 4-02-2013, from: http://www.rtl.nl/components/actueel/rtlnieuws/2012/05_mei/09/opmerkelijk/wnf-geeft-pluim-aan-duurzaam-heijplaat.xml

Biemans, P. (2013) interview held on 12-03-2013

Briassoulis, H. (2004). 'Policy Integration for Complex Policy Problems: What, Why and How', *Paper presented at Greening of Policies: Interlinkages and Policy Integration*, Berlin, 3–4 December

Bueren, E. van & ten Heuvelhof, E. (2005). 'Improving governance arrangements in support of sustainable cities', *Environment and Planning B: Planning and Design*, 32, p. 47-66

Bulkeley, H. & Betsill, M. (2005). 'Rethinking sustainable cities: multilevel governance and the 'urban' politics of climate change', *Environmental Politics*, 14(1), p. 42-63

Bulkeley, H.& Kern, K. (2006). 'Local Government and the Governing of Climate Change in Germany and the UK', *Urban Studies*, 43(12), p. 2237-2259

Campbell, S (1996). 'Green cities, growing cities, just cities. Urban planning and the contradictions of sustainable development', *Journal of the American Planning Association*, 62(3), p. 296-312

Caron, W. (2013). Personal communication through email

Collier, U. (1997). 'Energy and Environment in the European Union', *Aldershot: Ashgate*

Dijk, p. van (2013). Personal communication on 03-04-2013

Driessen, P.P.J., Dieperink, C., van Laerhoven, F., Runhaar, H.A.C., & Vermeulen, W.J.V. (2012). 'Towards a Conceptual Framework for the Study of Shifts in Modes of Environmental Governance – Experiences from The Netherlands', *Environmental Policy and Governance,* 22, p. 143-160

Dryzek, J.S. (1996). 'Strategies of ecological democratization', in: Lafferty, W.M. & Meadowcroft, J. (eds.) *Democracy and the Environment. Problems and prospects*, Edward Elgar, 1996, p. 108-123

Eckersley, R. (2004). 'The limits of the Liberal Democratic State' and 'From Liberal to Ecological Democracy' in: R. Eckersley: *The Green State. Rethinking Democracy and Sovereignty*, MIT Press, 2004, p. 85-138

Economic and Social Council, (2009). 'Towards climate neutral cities: a regional perspective', *United Nations seventh meeting*, ECE/HBP/2009/2

Eggenberger, M., & Partidario, M. (2000). 'Development of a framework to assist the integration of environmental, social and economic issues in spatial planning', *Impact Assessment and Project Appraisal*, 18(3), p. 201-207

European Commission, (2009). 'Promoting sustainable urban development in Europe', *European Union Regional Policy*, Brussels

EU, (2010). 'Making our cities attractive and sustainable. How the EU contributes to improving the urban environment', *Luxembourg: Publications Office of the European Union*, obtained on 15-09-2012, from: http://ec.europa.eu/environment/pubs/pdf/urban/cities_of_the_future.pdf

Flyvbjer, B. (2006). 'Five Misunderstandings about Case-Study Research', *Qualitative Inquiry*, 12(2), p. 219-245

Gemeente Tilburg, (2011). 'Klimaatmonitor 2010', obtained on: 3-03-2013, from: http://bis.tilburg.nl/upload/notas/2011/110823-20-BO-02%20Klimaatmonitor%202010%20rapportage%20definitief%2031%20mei_cntb.pdf

Gemeente Tilburg, (2012). 'Tilburg in cijfers', obtained on: 24-02-2013, from: http://www.tilburg.nl/stad/ep/channelView.do?channelId=-8206&displayPage=%2Fep%2Fchannel%2Ftl_channel_default_program.jsp&pageTypeId=8537

Gemeente Tilburg, (2013). 'Klimaatverklaring Tilburg' obtained on: 17-03-2013, from: http://www.klimaatbureautilburg.nl/getmedia/7a899e1f-1fc8-453f-99d3-28df806b25ec/Klimaatverklaring_2010_proef_def_2.pdf.aspx

Gemeente Rotterdam, (2011). 'Programma Duurzaam', obtained on: 23-03-2013, from: http://www.rotterdam.nl/BSD/Document/Perskamer/Programma%20Duurzaam%20gemeente%20Rotterdam.pdf

Gemeente Rotterdam, (2013). 'Feitenkaart Bevolkingsmonitor, januari 2013', obtained on: 25-02-2013, from: http://www.rotterdam.nl/COS/publicaties/Vanaf%202005/12-3582.bevolkingsmonitor%202012-4.pdf

Gemeente Rotterdam, (2013b). 'Rotterdam zet volgende stap in verduurzaming stad en haven', obtained on: 25-02-2013, from: http://www.rotterdam.nl/nieuws:rotterdam_zet_volgende_stap_in_verduurzaming_stad_en_haven

Gemeente Rotterdam, (2013c).'100% Klimaatbestendig', obtained on: 25-02-2013, from: http://www.rotterdam.nl/klimaatbestendig

Jabareen, Y. R. (2006). 'Sustainable Urban Forms: Their Typologies, Models, and Concepts'. *Journal of Planning Education and Research,* 26, p. 38-52

Jessop, B. (1998). 'The rise of governance and the risks of failure: the case of economic development', *International Social Science Journal*, 155, p. 29-45

Jordan, A., Wurzel, R.K.W. & Zito, A. (2005). 'The rise of 'new' policy instruments in comparitive perspective: Has governance eclipsed government?', *Political Studies*, 53, p. 477-496)

Lafferty, W. M. & Hovden, E. (2003). 'Environmental policy integration: towards an analytical framework', *Environmental Politics*, 12(1), p. 1-22

Lemos, M.C. and Agrawal, A. (2006). 'Environmental Governance', *Annual review of Environment and Resources*, 31, p. 297-325

Kernteam Hotspot Tilburg, (2008). 'Eerste klimaatprogramma Tilburg naar een klimaatneutrale en klimaatbestendige stad', obtained on: 24-01-2013, from: http://www.milieucafe.nl/media/documents/klimaatprogramma-tilburg-2009-2012-november-2008.pdf

Kersbergen, K. van and van Waarden, F. (2004). "'Governance' as a bridge between disciplines: Cross-disciplinary inspiration regarding shifts in governance and problems of governability, accountability and legitimacy", *European Journal of Political Research*, 43, p. 143-171

Meadowcroft, J. (2004). 'Deliberative Democracy', in: Durant, R. F., Fiorino, D. J. & O'Leary, R. (eds.) *Environmental Governance Reconsidered: Challenges, Choices, and Opportunities*, MIT Press, 2004, p. 183-217

Meadowcroft, J. (2007). 'Who is in Charge here? Governance for Sustainable Development in a Complex World', *Journal of Environmental Policy & Planning*, 9(3-4), p. 299-314

Ministerie van Infrastructuur en Milieu (IenM), (2011a). 'Klimaatschap Tilburg verbindt duurzame initiatieven', obtained on 20-01-2013, from: http://www.rwsleefomgeving.nl/onderwerpen/lokaal_klimaatbeleid/praktijkvoorbeelden/vb/klimaat schap-tilburg/

Ministerie van Infrastructuur en Milieu (IenM), (2011b). 'Werk maken van klimaat. Klimaatagenda 2011-2014', obtained on 10-09-2012, from: http://www.rijksoverheid.nl/onderwerpen/klimaatverandering/documenten-en-publicaties/rapporten/2011/11/02/lokale-klimaat-agenda-2011-2014-werk-maken-van-klimaat.html

Nijkamp, P. & Pepping, G. (1998). 'A meta-analytical evaluation of sustainable city initiatives', *Urban Studies*, 35(9), p. 1481-1500

Nillson, M. (2005). 'Learning, frames, and environmental policy integration: the case of Swedish energy policy', *Environment and planning C: Government and Policy*, 23, p. 207-226

Nilsson, M., Eklund, M. & Tyskeng, S. (2009). 'Environmental integration and policy implementation: competing governance modes in waste management decision making', *Environment and Planning C: Government and Policy*, 27, p. 1-18

Nilsson, M. & Persson, A. (2003). 'Framework for analyzing environmental policy integration', *Journal of Environmental Policy and Planning*, 5(4), p. 333-359

Persson, A. (2004). 'Environmental Policy Integration: An Introduction', *Stockholm Environment Institute*, Stockholm

Persson, A. (2009). 'Environmental policy integration and bilateral development assistance: challenges and opportunities with an evolving governance framework', *International Environmental Agreements: Politics, Law and Economics*, 9(4), p. 409-429

Provan, K. G. & Kenis, P. (2007). 'Modes of Network Governance: Structure, Management, and Effectiveness'. *Journal of Public Administration Research and Theory Advance Access*, 2, p. 10-24

Rotterdam Climate Initiative, (2010). 'Rotterdam Climate Proof. Adaptatieprogramma 2010. The Rotterdam challenge on water and climate adaptation', obtained on: 25-01-2013, from: http://www.rotterdamclimateinitiative.nl/documents/RCP/RCP_NL_def.pdf

Rotterdam Climate Initiative, (2013). 'Rotterdamse waterkansen met Rotterdam Climate Proof', obtained on: 02-03-2013, from: http://www.rotterdamclimateinitiative.nl/nl/100_klimaatbestendig/over_ons/rotterdam_climate_pr oof

Runhaar, H., Driessen, P.P.J., & Soer, L. (2009). 'Sustainable Urban Development and the Challenge of Policy Integration', *Environment & Planning B: Planning and Design*, 36, p. 417-431

Scherer, A.G., Palazzo, G. and Baumann, D. (2006). 'Global Rules and Private Actors: Towards a New Role of the TNC in Global Governance', *Business Ethics Quarterly*, 16(4), p. 505-532

Schneider, H., Dicke, D. & Rovers, V. (2007). 'Adaptatiescan Tilburg. Klimaatadaptatie in de Hotspot', *BuildDesk Nederland BV*, 0727/2007/Delft

Schneider, H., (2011). 'Eindreportage Hotspot Tilburg', *BuildDesk Nederland BV,* rapport nummer 60150/hs/101203, p. 1-54

Schneider, H. & Schouw, J.C. (2012). 'Geïntegreerd en ambitieus lokaal klimaatbeleid, Een handreiking voor gemeenten naar aanleiding van de Hotspot Tilburg', *BuildDesk Nederland BV,* KvR rapport nummer 033/12, ISBN/EAN 978-90-8815-030-2, p. 1-30

Stadshaven, (2012a). 'Duurzaam Heijplaat / RDM. Afsprakenkader- ambities and processen', obtained on: 15-03-2013, from: http://www.stadshavensrotterdam.nl/_files/Files/Samenwerkingsovereenkomst%20Heijplaat/Afspra kenkader%20Heijplaat%20Definitief.pdf

Stadshaven, (2012b). 'Samenwerkingsovereenkomst Gebiedsontwikkeling Heijplaat', obtained on: 15-03-2013, from: http://www.stadshavensrotterdam.nl/_files/Files/Samenwerkingsovereenkomst%20Heijplaat/DEF% 20-%20SOK%202%20Heijplaat%20-%2029%20oktober%202012.pdf

Stoker, G. (1998). 'Governance as theory: five propositions', *International Social Science Journal*, 155, p. 17-27

Tilburg, (2010). 'Tilburg klimaatvriendelijkste gemeente van Nederland', obtained on: 02-02-2013, from: http://www.tilburg.com/web/Informatie/Nieuws/Nieuws/Tilburg-klimaatvriendelijkste-gemeente-van-Nederland.htm

Tilburg, (2011). 'Tilburg uitgeroepen tot Klimaatstad 2011', obtained on: 2-02-2013, from: http://www.tilburg.com/web/Informatie/Nieuws/Nieuws/Tilburg-uitgeroepen-tot-klimaatstad-2011.htm

UN, (2011). 'Climate Neutral Cities. How to make cities less energy and carbon intensive and more resilient to climatic challenges', obtained on 22-10-2012, from: http://www.unece.org/fileadmin/DAM/hlm/documents/Publications/climate.neutral.cities_e.pdf

Underdal, A. (1980). 'Integrated marine policy. what? why? how?', *Marine Policy,* 4(3), p. 159-169

Verschuren, P. and Doorewaard, H. (2010). Designing a Research Project, *Lemma*, Utrecht.

Appendix A: Interviews

List of interviews

Case study	Interviewee	Function	Type of interview and date
Tilburg	Pieter Biemans	Project leader and program manager energy and climate at the municipality of Tilburg	Formal interview on 12-03-2013
	Paul van Dijk	Project manager Klimaatbureau Tilburg	Interview through phone and email on 03-04-2013
	Wim Caron	Project manager Klimaatbureau Tilburg	Interview through email exchange
Rotterdam	Fred Akerboom	Programme manager sustainability Rotterdam (municipality of Rotterdam	Interview through phone on 04-04-2013

Questions for the interviews with Pieter Biemans from the municipality of Tilburg and Fred Akerboom of the municipality of Rotterdam:

General questions	
	What are the climate ambitions of Tilburg/Rotterdam?
	Are there any difficulties or problems?
	Within which sectors of the municipality Is climate policy integrated? Is there an own department?
	Is there an overarching (climate) strategy?
	Are there different and overarching goals within or between sectors?
	Do the sectors use similar resources? Or do they share resources and measures?
	Do sectors have conflicting interests?
Questions about the project level of the municipalities, So the Klimaatschap for Tilburg and project Heijplaat for Rotterdam	
	Which party is the initiating actor?
	Which roles can actors take and how larges can these roles be?
	At which level do the actors operate (local-regional-national-international)?
	How are the power relations between different parties? Is this with pre-determined boundaries or stated by someone, somewhere?
	How much do the different actors have to say with the final decision-making? How is this determined?
	What are the rules of interaction? Are they determined by law; formal/informal; can actors come with own rules?
	What are the mechanisms of social interaction? Top-down; bottom-up; is it interactive (by means of negations and learning from mistakes)? Which party has autonomy?

Questions for the interviews with Paul van Dijk and Wim Caron from the Klimaatbureau Tilburg:

General questions	
	What is the exact task of the Klimaatbureau?
	How is the process going so far?
	How is the Klimaatbureau involved? What resources does the Klimaatbureau have?
	How much influence does the Klimaatbureau have?
Questions regarding projects:	
	How many projects are currently active? Are they all own initiatives (at what scales – local, regional etc.)?
	What are the power relations with such projects?
	Do the actors have equal roles?
	How is the interaction with different actors?
	Do actors set concrete goals?
	Is it known how the different actors work together? Trough contracts etc.?
	Are there sometimes conflicts during the projects or conflicting interests between the parties? If so, how are they resolved/how will they try to resolve these conflicts?

Appendix B: Criteria used for analytical framework

Figure X.1: Checklist on improving policy coherence and integration for sustainable development

I.   **Is there a common understanding of sustainable development?**
   - Clear and accepted operational objectives and principles of sustainable development
   - Clear understanding by the public, public organisations and levels of government
   - Clear examples illustrating benefits

II.   **Is there clear commitments and leadership?**
   - Clear commitment at the highest level
   - Effective communication of commitment within government
   - Efforts to bridge gaps between administrative and political agendas
   - Expression of leadership through a sequence of priorities over time
   - Maintenance of a sense of urgency of the issues
   - Encouragement, reward and dissemination of pioneer activities by agencies and local communities

III.   **Are conditions in place to steer sustainable development integration?**
   - Existence and location of institutional "catalyst"
   - Specific reviews of new and existing laws and regulation to check compatibility with sustainable development objectives
   - Mechanisms for effective feedback between government levels
   - Reorientation from sectoral perspectives to a more "issues-oriented" agenda in organisations
   - Integration of sustainable development in regular government exercises, e.g. the budget process
   - A framework for assessing performance of organisations in relation to sustainable development
   - Evaluation mechanisms to support sustainability appraisal in the public sector and use of these evaluations

IV.   **Is stakeholder involvement in decision-making encouraged?**
   - Mechanisms for consumer information
   - Legal provisions and guidelines for consultation and participation
   - Mechanisms for monitoring the influence of participation and evaluation of consultations
   - Mechanisms for ensuring transparency of decisions

V.   **Is the diversity of knowledge and the scientific input to problems adequately managed?**
   - Mechanisms for managing conflictual knowledge
   - Framework for constructive focus on areas of disagreement such as developing scenarios and options
   - Attention to the effectiveness and efficiency of information flows between scientific community and decision-makers
   - Efforts to promote "joined-up" research between disciplines and support forward-looking and policy-relevant knowledge

Source: OECD (in Persson, 2004)

Table X.1: EEA's new evaluation criteria

Type of response	Examples of key responses that could be used as evaluation criteria
Mechanisms to support environmental policy integration	
1 High level political commitments	• Constitutional commitment • **Sustainable Development Strategies and/or integration strategies** • Public statements
2 Governance: Organizational changes to break down walls	• **Clearly defined roles and responsibilities** • **Core executive responsible for SD and environmental integration** • Linkage to multi-annual planning, budgetary and auditing processes • Internal communication structures and feedback mechanisms • Political and administrative inter-departmental committees/structures
3 Resources and capacity building	• **Integration/SD staff and resources** • **Training and awareness raising, including inter-departmental exchange programmes**
4 Tools to improve decision-making	• Ex-ante assessment of policies (impact assessment, SIA, strategic environmental assessment, regulatory impact assessment, etc) • **Public participation/consultation processes**
5 Policy instruments to implement EPI	• Funding • Financial instruments • Voluntary agreements • Legislation • Spatial planning • Trade measures • Research
6 Monitoring, reporting and information	• Monitoring against indicators • **Regular review and evaluation systems** • Information on future implications of integration
Results of environmental integration	
7 Greening of sector policies	• Minimizing conflicts between sector and environmental objectives • Maximizing synergies • Application of the polluter pays, precaution, prevention principles
8 Changes in drivers, pressures, states and impacts	• Improved eco-efficiency • Distance from targets

Source: EEA (in Persson, 2004)

Table X.2: Forms of integration

5 Substantive	- **The integration of physical or biophysical issues with social and economic issues** - **The integration of emerging issues such as health, risks, biodiversity, climate change and so on** - **The (appropriate) integration of global and local issues**
6 Methodological	- The integration of environmental, economic and social (impact) assessment approaches such as cumulative assessment, risk assessment, technological assessment, cost/benefit analysis, multi-criteria analysis - The integration of the different applications, and experiences with the use of particular tools such as GIS (geographical information system) - The integration and clarification of (sector) terminologies (including the element of 'strategic')
7 Procedural	- The integration of environmental, social, economic planning/assessment, spatial planning and EIA - The integration of sector approval/licensing processes, spatial planning and EIA - The adoption of coordination, cooperation and subsidiarity as guiding principles for (governmental) planning at different levels of decision-making - The integration of affected stakeholders (public, private, NGO (non-governmental organization)) in the decision-making process - The integration of professionals in a truly interdisciplinary team
8 Institutional	- The provision of capacities to cope with the emerging issues and duties - The definition of a governmental organization to ensure integration - The exchange of information and possibilities of interventions between different sectors - The definition of leading and participating agencies and their respective duties and responsibilities
9 Policy	- The integration of 'sustainable development' as overall guiding principle in planning and EIA - The integration of sector regulations - The integration of sector strategies - The timing and provisions for political interventions - Accountability of government
Source: Eggenberger & Partidario (2000)	

Table X.3: Criteria derived from Briassoulis

Type of criteria	Criteria
General criteria	**Political commitment and leadership for PI in general**
	Need for compliance with international and EU commitments
	Existence of long term SD strategy (or a relevant Report or Forum)
	The environmental, social, economic agendas of different sectors form a consistent overall strategy (perhaps guided by a SD strategy)
	Favorable policy tradition and administrative culture (open, participatory, horizontal)
	Shared core belief systems and communication across policy sectors
	Absence of intra-governmental power relations and of vertical alliances hindering
	EPI/PI and horizontal networking
	Flexible general taxation.
Criteria related to policy objects	**Congruent, compatible, consistent and/or complementary policy objects and related theories**
	Multidimensional policy objects and related integrated/interdisciplinary theories
	Common and consistent concepts and terminologies
Criteria related to policy actors	**Common formal actors on and across various spatial/organizational levels**
	Common informal actors on and across various spatial levels
Criteria related to policy goals and objectives	Political commitment/ leadership for PI in the case of the policies analyzed
	Common, shared, congruent, compatible and/or complementary policy goals and objectives
	Stipulation of quantitative, measurable, indicator-based targets and timetables for PI (included, for example, in the Sustainable Development Strategy)
Criteria related to policy structures and procedures	Administrative capacity for PI; it concerns, among others: - Organization in charge of PI; such as, a central unit entrusted with supervision, coordination and implementation of the integration process; or assigning existing institutions a new mandate, responsibility and accountability for PI - Special unit for PI in the competent organization - Officials charged with integration tasks - Administrative reform (restructuring) in favor of PI - Presence of *horizontal administrative structures* as opposed to vertical and departmentalized structures; e.g. inter-ministerial committees and task forces, issue-specific *joint* working groups, networking schemes, regular circulation of staff between sectoral departments
	Formal/institutionalized interaction among policy actors and actor networks
	Informal interaction among formal policy actors and actor networks
	Interaction among state and non-state policy actors
	Consistent, compatible and coordinated procedures and rules of decision-making in competent administrative bodies
	Strengthening existing administrative units with regard to procedural rights and rules relevant for coordination and *joint* problem-solving
	Joint decision making and joint responsibilities of the policy sectors considered
	Provisions for implementing PI requirements (e.g. compliance, enforcement and accountability mechanisms for PI among competent agencies)
Criteria related to policy instruments	Institutionalizing PI; existence of a legal framework for PI among the policies analyzed
	Common legal and institutional instruments

Compatible, consistent and coordinated legal and institutional instruments
Use of one policy as an instrument to achieve the goals of another policy
Use of integrative instruments; such as, legal, economic, financial, planning
Market-based integration between the two policies
Environmental and/or Social Fiscal Reform
Use of financial mechanisms/ incentives, such as, subsidies for PI
Favorable budgetary process (e.g. for 'greening' budgets)
Common or coordinated/compatible sector Action Plans (e.g. forest, biodiversity, desertification, transport)
Common, shared research resources
Common, or compatible and consistent, data and information bases
Common assessment and evaluation methodologies, and tools (PI indicators)
Common monitoring programmes and infrastructure
Use of communication instruments for PI
Education and training services for civil servants, bureaucrats, etc. on PI issues

Source: Briassoulis (2004)

Appendix C: Modes of governing by Bulkeley and Kern

Table of Bulkeley and Kern (2006): Modes of governing and local climate change policy

Self-governing	Governing by authority	Governing by provision	Governing through enabling
Energy			
Energy efficiency schemes within municipal buildings (such as schools)	Strategic planning to enhance energy conservation	Energy efficiency measures in council housing	Campaigns for energy efficiency
Use of CHP within municipal buildings	Supplementary planning guidance on energy efficiency design	Energy Service Provider[*] (*Stadtwerke*) (Germany)	Provision of advice on energy efficiency to businesses and citizens
Purchasing green energy	Supplementary planning guidance on CHP installations or renewables	Energy Service Companies (UK)	Provision of grants for energy efficiency measures
Procurement of energy-efficient appliances	Supplementary (private) contracts to guarantee connection to CHP or renewable energy installations (Germany)	Community energy projects (UK)	Promote the use of renewable energy
Eco-house demonstration projects			Loan schemes for PV technology
Renewable energy demonstration projects			HECA report (UK)
(Internal) contracting (Germany)			
Transport			
Green travel plans	Reducing the need to travel through planning policies	Public Transport Service Provider	Education campaigns on alternatives
Mobility management for employees	Pedestrianisation	(*Verkehrsbetriebe*)	Green Travel Plans
Green fleets	Provision of infrastructure for alternative forms of transport	(Germany)[a]	Safer Routes to School
	Workplace levies and road-user charging (UK)		Walking Buses
			Quality partnerships with public transport providers
Planning			
High energy efficiency standards in new buildings	Strategic planning to enhance energy conservation		Guidance for architects and developers on energy efficiency
Use of CHP and renewables in new council buildings	Supplementary planning guidance on energy efficiency design		Guidance for architects and developers on renewables
Demonstration projects—house or neighbourhood scale.	Supplementary planning guidance on CHP installations or renewables		
	Supplementary (private) contracts to guarantee connection to CHP or renewable energy installations (Germany)		
Waste			
Waste prevention, recycling and reuse within the local authority	Provision of sites for recycling, composting and 'waste to energy' facilities	Recycling, composting, reuse schemes	Campaigns for reducing, reusing, recycling waste
Procurement of recycled goods	Enable methane combustion from landfill sites	Service provider (*Stadtwerke*) (Germany)	Promote use of recycled products