MASTER THESIS

Organizational strategies in French local climate planning

A cross-case analysis of French local authorities' organizational strategies to address climate change through climate plans

SUBMITTED BY

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Organizational strategies in French local climate planning - A cross-case analysis of French local authorities' organizational strategies to address climate change through climate plans

"What organizational strategies can French city planning institutions deploy to respond to climate issues?"

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Preface

This thesis was written during the 4th semester of the Sustainable Cities Master Programme at Aalborg University. It is the culmination of my journey in higher education as it completes both my studies at Aalborg University Copenhagen and the Ecole Centrale de Nantes Engineering School in France.

A special thanks to my supervisor Jacob Norvig Larsen, who always provided me valuable advice and constructive feedback through the process of writing this thesis. Thanks to Géraldine Molina, who, as an additional advisor, provided me local and specific knowledge. Thanks to both of them for their availability and their judicious pieces of advice, which all contributed to my reflection.

I would also like to express my gratitude to all those who agreed to participate in the interviews, especially in the COVID-19 health crisis context. Without their cooperation, the conduct of this thesis would have been impossible.

Benjamin Moreau, Nantes (France), 04/06/2020

Reading Guide

In this thesis, all the references have been cited according to the Chicago Style. The references have been arranged alphabetically by the surnames of the authors in the bibliography.

The figures and tables presented in this thesis have been numbered and are gathered in the list of figures and the list of tables.

Regarding interviews, original French quotes are always mentioned as footnotes and are translated in English in the body text.

Summary

Today, the climate change challenge is changing the conditions under which urban planners operate. Indeed, in France, the actors and institutions in charge of urban planning have been developing policies to fight climate change for some years with tools such as the territorial climate-energy plans at the city level. As institutions are confronted with the plurality and complexity of climate and environmental issues, the effectiveness of the organizational strategies that are implemented has to be questioned as well as the variations of these strategies in different cities. Indeed, while some cities set examples in terms of organizational management of climate change adaptation and mitigation (that we call the pioneers or the leaders), others are still behind (the followers or the latecomers). As a consequence, this thesis dives into the processes of the climate-energy plans' creation by the French inter-municipal organizations (the EPCIs) and into the local actors' networks in both the cities that stand out as models and the others that are behind in the fight against climate change. This thesis focus on the organizational strategies and the governance of climate change planning at the local level in France. By looking at specific cases of climate plans production across the French territories, the thesis answers the following research question:

"What organizational strategies can French city planning institutions deploy to respond to climate issues?"

To answer this, a multiple case-study approach *is* adopted. Relationships between actors for climate change abatement in France are analyzed to put forward new causalities and results by using the actor-network theory as a framework of analysis. By looking into the implementation of local initiatives and the governance models of the climate planning departments of the local authorities selected as cases, this thesis produces knowledge and recommendations about organizational strategies and networks of actors. Two methods for collecting data are used in this thesis: document analysis of the local climate plans and semi-structured interviews with climate planners. The document analysis serves as the fundamental basis of information, and the interviews made with the climate planners will provide additional information. Together, they allow for a deeper understanding of the actors' relationships in the uncovered networks for climate change abatement.

Results show that the majority of the large EPCIs studied have often shown advanced structures of governance with serious attempts of including the majority of the actors concerned (public, private, and citizens). Smaller EPCIs, have seen different forms of mobilization of the territorial actors, with new roles emerging as new responsibilities appeared over time. The analysis identifies several organizational trends for large and small EPCIs. While every EPCI has faced its own challenges, mainly depending on its advancement, all EPCIs also shared some of the same organizational strengths, weaknesses, opportunities, and threats. The analysis has both confirmed elements from the already existing literature and provided additional perspectives in specific areas in the French climate planning context. In the future, some pressing organizational improvements could be implemented regarding three particular issues that are identified as the most problematic for now.

Improving co-creation with professional actors and with the civil society is one of the critical elements that will need improvements. One of the other trends identified in the analysis being the decrease in the mobilization of actors once the climate plan is wrapped, there is a pressing need to *keep the already existing networks alive and to extend those networks*. To do so, it is necessary to strengthen the role of all actors, especially those of the climate planners and the elected officials. Finally, *roundabouts ways regarding financial and human resources* need to be found as it remains one of the main difficulties that EPCIs face when elaborating and implementing the climate plans.

Table of contents

List of Figures

List of Tables

Introduction

This chapter aims at presenting the general context of the thesis and the questions raised by the actual situation. It will lead to the research question of this thesis which is :

"What organizational strategies can French city planning institutions deploy to respond to climate issues?"

A. Planning in the context of climate change

1. What is climate change?

Global warming is the observation of an increase in the earth's average temperature over long periods. It is also called climate change because we see significant changes in climatic phenomena such as more heatwaves, or conversely, more precipitation, more frequent storms, or hurricanes. (IPCC 2014)

Men have altered the natural balance of the greenhouse effect, which regulates the climate by emitting large quantities of greenhouse gases into the atmosphere from the first industrial revolutions to the present day. Mainly CO2 (77% of emissions) with the heavy use of fossil fuels (oil, coal, gas) but also methane with intensive agriculture are emitted. Deforestation is also a cause, as forests have a role in capturing CO2. Since 1850, CO2 emissions have increased by 40%. It was 270 ppm (parts per million) at the end of the 19th century. It reaches 400 ppm today, the highest concentration in 800,000 years. Its presence in the atmosphere can last several hundred years. The increase of carbon dioxide (or carbon gas) in the atmosphere is the leading cause of global warming.

As a result, the average temperature on the planet's surface is continuously rising. It has risen by about 0.8°C since the end of the 19th century (2° to 4°C in the polar regions). At the current rate of CO2 emissions, scientists expect an increase of between 1.5° and 5.3°C in the average temperature by 2100 if no action is taken, which would have harmful consequences for humanity and the biosphere. This implies a drastic reduction in CO2 emissions in the future, in particular by limiting the use of fossil fuels. (IPCC 2018)

2. The consequences of climate change

On a global scale, a 0.8°C rise in average temperature has considerable consequences at the local level, both on ecological balances and on our societies. (IPCC 2018)

- **Meteorological imbalances**: for decades now, meteorologists and climatologists around the world have been observing the effects of global warming on meteorological phenomena, which are: more precipitation or more drought, increasing heatwaves, and more and more extreme weather events: cyclones, storms, and hurricanes.
- **Oceans**: global warming is causing sea levels to rise. In one century, the increase has reached 18 cm (including 6 cm in the last 20 years). The worst-case scenario envisages a rise of up to 1 m by 2100. This is due to the melting of ice in the Antarctic and the retreat of glaciers. Also, of great concern is the acidification of the oceans. A large amount of CO2 captured by the oceans makes them more acidic, raising serious questions about the adaptive capacity of shellfish, coral reefs, and plankton.
- **Biodiversity**: rising temperatures and changes in climate and seasons disrupt ecosystems and alter the conditions and the reproductive cycles of plants. The scarcity of resources

and climate change are changing the living habits and seasonal cycles of animals. We are already witnessing the disappearance of a great many species, particularly endemic species or the intrusion of invasive species that threaten crops and other animals. Global warming is, therefore, impacting biodiversity. It is the balance of natural ecosystems that is being altered and threatened.

- **The consequences for humans**: These upheavals do not spare men. Climate change has consequences for the global economy. It is already upsetting social, health, and geopolitical balances in many parts of the world. The scarcity of resources is giving rise to new conflicts. Rising sea levels and floods are causing the migration of populations. Small island states are in the front line. It is estimated that there could be 250 million climate refugees in 2050.

3. Solutions to climate change: mitigation and adaptation

Two complementary strategies are already at work internationally and locally to tackle climate change: mitigating global warming by limiting emissions and adapting territories to the effects of climate change. (IPCC 2014)

Among the main greenhouse gas (GHG) emitting sectors are the energy (35%), transport (14%), agriculture (14%) and building (6%) ones. In these sectors, the revolution to reduce greenhouse gas emissions is already underway with the development of public transport, car sharing, electric vehicles, building renovation, low-energy buildings (BBC), the improved management of waste and water... Local authorities, citizens – and sometimes businesses - want to reduce their impact on the environment, save energy, and reduce waste. These strategies are *mitigation* strategies. (IPCC 2014)

However, as climate change is already here and is having real effects around the world, it is, therefore, necessary to adapt while mitigating global warming. This involves protecting property and people, maintaining and preserving natural heritage or urban planning (urban and built planning; fountains and refreshment points, green spaces, and vegetation, for instance). These strategies are *adaptation* strategies. Adaptation corresponds to all the changes in the organization, and techniques that societies must operate to limit the negative impacts of climate change or to maximize the beneficial effects. Adaptation can be interpreted in both directions: negative - most often mentioned – and positive. (IPCC 2018)

As climate change intensified, the two strategies mentioned above have started to be reflected in international, national, and local planning.

B. The state of the responses to climate change at the international and European level

At the international level, negotiations between States are progressing regarding climate issues. After the COP21 and the Paris Agreement adopted by 195 countries, there is hope of reducing GHG emissions and limiting warming to 2°C or even 1.5°C by 2100. Governments draft national strategies to tackle climate change, but there are also more local strategies implemented by local authorities.

As Reckien et al. explain, cities are important actors when it comes to fighting climate change. In Europe, this statement is even more relevant, as 74% of the population lives in urban areas. Even though scholars are not yet fully aware of the reasons for the cities engagement in climate abatement and the effects of national policies at the local level, they agree on the high stakes of city planning in addressing climate change. As cities are located at the interface of the different

levels - local, national, and international - they become key actors in implementing adaptation and mitigation measures. (Reckien et al. 2018)

In their paper, Reckien et al. draw a portrait of climate city planning in Europe. They conclude that there are different strategies to fight climate change across countries. The identified typology is the following one: while some climate plans are drafting standalone documents, climate initiatives can also be found in more comprehensive or operational documents that do not only focus on climate change. (Reckien et al. 2018)

In the countries where climate plans are standalone documents, they can either be autonomous (that is to say not mandatory and not relying on international networks), respond to national regulation, or be internationally induced by some networks. In Europe, only four countries have made the production of local climate plans mandatory: Denmark, Slovakia, the United Kingdom, and France. According to the literature, a national regulation enforcing the production of climate change plans makes a city 1,8 times more likely to have a mitigation plan and five times to have an adaptation plan: this is what is happening in France. (Reckien et al. 2018) The next section focuses especially on the Local French Climate plans: the PCAET, the main object of study of this thesis.

C. Local French climate planning: the PCAET

1. Brief history and contextualization

The local climate plans appeared for the first time in France to respond (among other actions) to the energy and climate issues. In the 2004 National Climate Plan, the Chapter 7, entitled "Territorial Climate Plans and Exemplary State" forces local authorities to develop the equivalent of the National Climate Plan at the local level. They contribute to the local implementation of UN commitments and the European Climate and Energy Package. (Ecology and Sustainable Development Ministry 2004)

The Grenelle 2 Act (art. 75) made the preparation of these procedures at the local level mandatory before 31 December 2012 for regions, departments, urban communities, and municipalities with more than 50,000 inhabitants. (French Parliament 2010)

At the time, this plan was a Local Climate-Energy Plan (called PCET), which was supposed to be a standalone document. It included sections on both mitigation and adaptation strategies. In 2015 (the 17 August), the law relating to the energy transition for green growth makes the PCET mandatory for the public establishments of inter-municipal cooperation with more than 50,000 inhabitants. In 2016, the PCET became the PCAET, the Climate-Air-Energy plan, by integrating the challenges of air quality. The PCAET now deals with the link between energy policy, air quality, and GHG emissions. In 2018, the threshold of 50 000 inhabitants was lowered to 20,000 inhabitants. The Energy Transition Act for Green Growth of 2015 entrusts the development, and the implementation of these climate plans to the EPCIs (public inter-municipality cooperation establishments) and not to the municipalities like this was the case before. (French Parliament 2015)

	Before the LTECV	After the LTECV
Name of the Plan	Climate-Energy Plan (PCET)	Climate-Air-Energy Plan (PCAET)
Frequency of production	Five years	Six years with a public report at the 3year milestone
Local authorities concerned	Communities of more than 50,000 inhabitants, whatever their status was	EPCIs (public inter-municipality cooperation establishments) of more than

	(Municipalities, Communities of municipalities, Agglomeration communities, Urban communities, Departments, Regions)	20 000 inhabitants
Perimeter of actions	On the authority's belongings (buildings, the fleet of vehicles, public lighting) and its responsibilities (urban planning, transport, waste treatment, etc.)	On all the activities of the territory

Table 1 – Regulatory changes regarding the Climate Plans over time

Before 2016, two fields of action for the PCET could be identified and had to be implemented by the EPCIs:

- the internal scale, that is to say, what is directly the responsibility of the EPCI, such as real estate assets, vehicle fleets, public contracts, etc.
- the public policy scale or competences that is to say what the local authority can influence more or less directly via its competences (city planning, transport, waste management, housing, etc.).

After the LTECV, a new field of action is included in the PCAET:

- the entire territorial scale - the areas over which the EPCI has no direct influence, but which it can influence through awareness-raising, mobilization, and facilitative measures. It often is the largest source of greenhouse gas emissions in the territory.

(Vie Publique 2016)

2. Content of the PCAET

French law makes it mandatory for the PCAET to be constituted of four parts:

- a **diagnosis of the territory** that must focus on territorial greenhouse gas and air pollutant emissions; the energy consumption of the territory; the energy distribution networks; the renewable energies in the territory, and the vulnerability of the territory to the effects of climate change.

- a **territorial strategy** which identifies the priorities chosen by the concerned EPCI and the objectives (strategic and operational) it sets in the three complementary domains: the mitigation of climate change, thus providing the means to fight global warming effectively; the adaptation to climate change; and the protection of air quality.

Figure 1 - Content of the PCAET

- an **action plan**, to improve energy efficiency, increase the production of renewable energy and reduce the effects of activities in terms of greenhouse gas emissions per the objectives arising from European legislation on energy and climate. This action plan covers all sectors of activity; it is the operational tool for coordinating the energy transition in the territory.

- and finally, a **mechanism for monitoring and evaluating results.**

(ADEME, n.d.)

The next section will provide for a state of the art of the advancement of the French territories regarding the elaboration of the PCAET.

3. An uneven advancement across French territories

The ADEME (French National Agency for the Environment) released in October 2019 the progression of the establishment of climate plans. These are the most recent figures to date. By law, 734 EPCI with more than 20,000 inhabitants must implement a territorial climate-air-energy plan (PCAET). As of the 1st September 2019, 736 local authorities have launched the development of a climate plan, including 118 with fewer than 20,000 inhabitants who have committed to a voluntary approach. It means that only 618 EPCIs that are obligated to produce a plan did so (84% of the amount obligated by law). Only 29 PCAETs have been approved under the regulatory framework resulting from the Energy Transition Act for Green Growth. (ADEME, n.d.)

The following figure presents the advancement in the production of Local climate change plans.

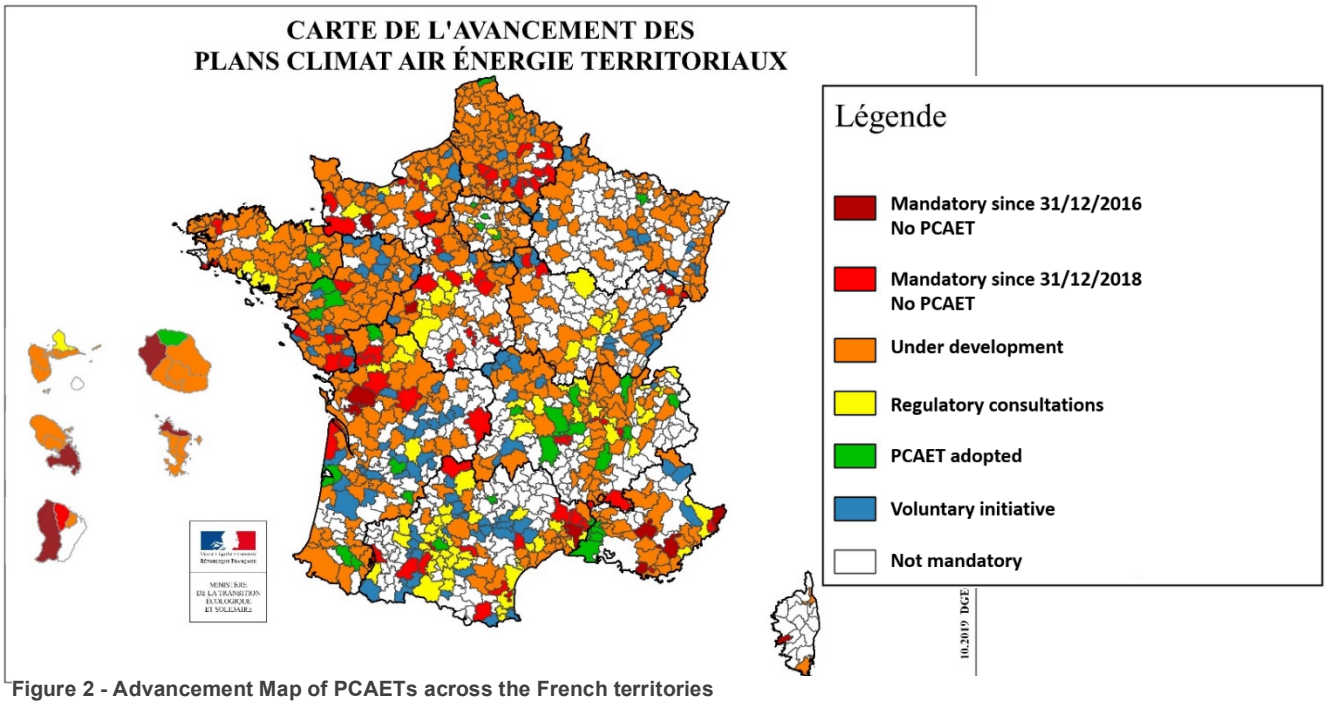

Figure 2 - Advancement Map of PCAETs across the French territories

When looking more precisely at the data available, regarding the EPCI where no plans are in the process of being produced and that are nevertheless obligated to produce one since 2016 or 2018, the following appears:

- 96 EPCIs are not in the process of producing a PCAET
- Among these EPCIs, 17 should have had a plan since 31/12/2016
- 79 should have had a plan since 31/12/2018

- 72% of the EPCIs (69 EPCIs) that are not in the process of producing or having produced a plan have between 20 000 and 50 000 inhabitants
- 19% (18 EPCIs) have between 50 000 and 100 000 inhabitants.
- 5% (5 EPCIs) have between 100000 and 250 000 inhabitants
- 3% (3 EPCIs) have between 250 000 and 500 000 inhabitants
- Only one EPCI has more than 500 000 inhabitants.

(ADEME, n.d.)

Biggest EPCIs, with bigger networks of actors involved, are more likely to have already produced a plan. One reason for this might be that bigger cities have a legal requirement since 2016; thus, they had more time to prepare a climate plan. Nevertheless, some large EPCIs have still not seen their plan approved yet by the state services such as Bordeaux Métropole for instance.

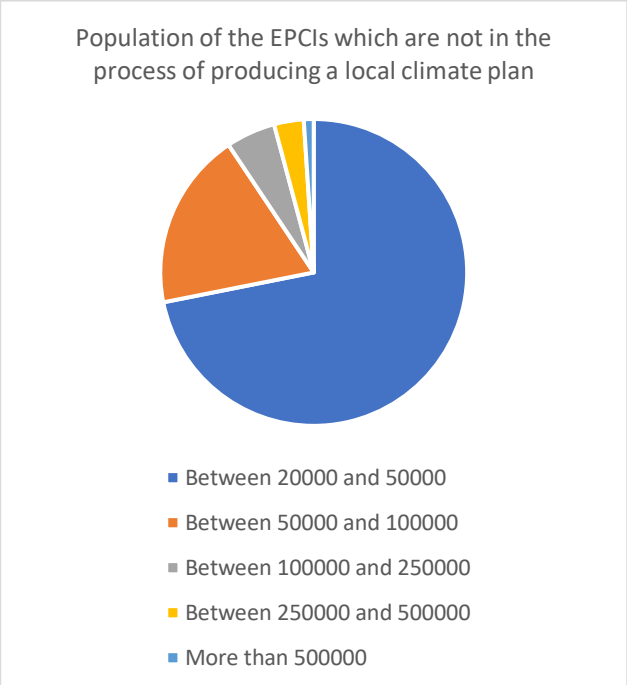

Figure 3 - Population of the EPCIs which are not in the process of producing a local climate plan

A first study came out in 2012 when climate plans started to appear in France. This study already identified difficulties for the municipalities (it was their responsibility at the time) when it came to producing climate plans. The main elements identified by the authors were the difficulties of finding funding: no additional funding was planned for the production of the plans. The climate plans also seemed difficult to write at that time because they were very comprehensive. Many stakeholders had to be identified, and specific structures with different planning officers had to be put into place. Therefore, new working practices had to be implemented. (Yalçın and Lefèvre 2012)

This study also underlined the fact that the authorities might see climate plans as opportunities and that the local authorities that had effective action on sustainable development are the first ones that launched climate plans. The paper, most importantly, calls for a "revision of governance methods" with new relations between the state, the local actors, and external stakeholders. (Yalçın and Lefèvre 2012)

4. Early identification of pioneers and latecomers

When looking at the history of local climate plans in France, it appears that cities or EPCIs can be classified into different groups. Some EPCIs began very early to think about planning for climate change: for instance, the Grenoble-Alpes Métropole plan was first drafted in 2005. The plan did not respond to the actual requirements for the PCAET, but the EPCI started very early to make a diagnosis of the territory and draft a local climate change abatement strategy. The study from 2012 also identified other cities that can be considered as pioneers or leaders because of their early commitments to address the issue of climate change at the local level. Therefore, Mulhouse Sud Alsace, Nantes Métropole, Rennes, Nanterre, Paris, and the Grand Lyon could also provide some interesting insights on the process of a plan production because of their early commitment.

As explained before, cities are not equally invested in this fight. Although leading cities have implemented effective climate actions, many EPCIs in France have not yet introduced appropriate mitigation and adaptation strategies. Latecomers might just have recently launched their climate plan or might not even have started to write it. Few big EPCIs such as Bordeaux Métropole or

Tours Métropole are late in the process of approving their plan, while most small EPCIs between 20,000 and 50,000 inhabitants started to write their plan a few months ago. The Vienne et Gartempe EPCI, for instance, with 41,031 inhabitants in 2016, just wrapped up their plan. The Pays de Fontenay Vendée EPCI, with 35,161 inhabitants, did not start the process of the plan production.

A typology of pioneers, leaders, followers, and latecomers can, as a first approach, be used to classify the EPCI. This classification will be used the remaining of the thesis when necessary.

5. Questions raised

Several questions are raised when looking at the production of the plans across the French territories.

Are all French cities able to respond to the plurality and complexity of the climate challenges they face by implementing a climate plan? Indeed, as seen before, climate plans are unequally produced across the territory, as bigger cities are more likely to produce a plan. Even in some territories with large cities and extensive networks of actors, plans are not produced as required, why? For the pioneer's cities and the successful followers, what makes it easier to create thriving networks of actors for climate change abatement?

This thesis will focus on the organizational strategies and the governance of climate change planning at the local level. Which resources and which organizational strategies are used and implemented by the EPCIs? What obstacles, blind spots, catalysts, action levers do the actors of urban policies in both leading EPCIs and latecomers face when producing and implementing a local climate plan?

D. Problem formulation

As seen previously, the climate change challenge is changing the conditions under which urban planners operate today, especially in large cities. Indeed, the actors and institutions in charge of urban planning have been developing policies to fight climate change for some years, such as the territorial climate-energy plans at the city level or the regional climate-air-energy schemes at the regional level. While some cities set examples in terms of efficient organizational strategies regarding climate change (the pioneers or the leaders), others are behind (the followers or the latecomers).

As a consequence, this thesis will dive into the processes of the climate-energy plans' creation by the French EPCIs and into the local actors' networks in both the cities that stand out as models and the others that are behind in the fight against climate change.

By looking into the implementation of local initiatives and the governance models of the climate planning departments of these EPCIs, this thesis will aim at answering the following research question:

"What organizational strategies can French city planning institutions deploy to respond to climate issues?"

Methodology

This chapter aims at presenting the methodological choices that were made during this thesis and their consequences on the results.

A. Scientific approach: multiple case study analysis

1. Multiple case-study approach

In this thesis, the multiple case study approach is the chosen scientific approach. A case study is a methodological approach that aims at collecting information about a person, an event, or a social system (e.g., group of individuals or organizations) to enable researchers to understand how it works or behaves *in* real-life situations (Berg 2001). Rigorous case studies allow researchers to explore or describe a phenomenon in its context by using a variety of data sources. For example, the case studies may focus on an individual, a group, or an organization, through the collection and analysis of written documents, interviews or direct observation that are used for the deconstruction and reconstruction of the complex phenomena that are studied (Yin, 2003).

According to Yin (2009), *the case study method can be used to explain, describe, or explore events or phenomena in their real context.* It is an approach that is different from the ones of controlled experimental designs, where researchers are testing hypotheses under clinical laboratory conditions, which allow them to manipulate the environment deliberately. According to Yin (2003, 2009), the use of the case is relevant when certain conditions are met. These requirements are the following ones:
- The study must answer research questions such as "what," "how" and "why";
- The researcher cannot manipulate the behaviour of informants involved in the study;
- The researcher deals with contextual factors of the phenomenon being studied that seem relevant;
- The boundaries between the phenomenon being studied and its context are unclear.

Local planning for climate change in France is a complex phenomenon that meets the requirements mentioned above. According to Yin (2009), this justifies the choice of the case study as a method of research. The work of Yin guided the methodological choices for the study of cases that are made in this thesis. Indeed, Yin (2009), in a post-positivist paradigm, proposes a vision where the study of the cases allows to generate a thorough understanding of a phenomenon that will then be tested and confirmed within the research process itself. There are different categories of case studies, the choice of the one which has to be used will be guided by the nature of the research question, and the scope of the study. The most used typologies are probably those of Yin (2009), which are represented in the table below. The case study research design may be relevant in a variety of circumstances depending on its purpose: the study of a phenomenon about which little is known or about which some of the aspects remain unexplored (exploratory purpose), the detailed and complete description of the case in its context (descriptive purpose) or the exploration of causal relationships (explanatory). (Yin 2009)

Explanatory	Descriptive	Exploratory
A case study that addresses a problem aimed at explaining presumed causal links between complex phenomena.	A case study used for describing a phenomenon and its context	A case study that explores a phenomenon representing a point of interest for the researcher and that aims at discovering new causalities or results.

Table 2 - Different types of case study

In this thesis, *an exploratory approach* will be adopted. Relationships between actors for climate change abatement in France will be analyzed to put forward new causalities and results. By looking into the implementation of local initiatives and the governance models of the climate planning departments of the local authorities selected as cases, this thesis will produce knowledge and recommendations of organizational strategies and networks of actors.

Beyond the different case study categories, it is necessary to choose between a design of research with a single case or with several case studies. It is more appropriate to study multiple cases when the research aims to understand a phenomenon that is to be generalized. Local planning for climate change takes place in the French territory for all the local authorities that need to produce a plan. An *exploratory study of different cases* will allow us to put forward nuances and comparisons between different organizations. As a consequence, in this thesis, the multiple cases' study is chosen as an appropriate way to *explore the networks of actors in different contexts across French local authorities*.

2. Reasoning upon cases selection

For Yin (2009), the use of multiple case studies must follow a logic of replication and not necessarily statistical sampling, and *every case must be carefully selected* for this purpose. The cases selected should lead to results that are either *similar* (what Yin call literal replication) or lead to *contrasting results* but for previously known reasons (what Yin then call theoretical replication). The thesis will intend to draw a *portrait of several organizational strategies*, and we expect the results to be contrasted because of different reasons. These reasons, already identified in the state of the art and the theoretical framework, might lead to different organizational strategies. This thesis intends to test out how those reasons might have an impact on the forms of the networks of actors in the fight against climate change at the local level in France.

The differences between the cases that might be relevant when studying our object of study, as pointed out by the literature are:
1) local authorities have different legal statuses – these different statuses will be elaborated upon in the analysis.
2) local authorities are responsible for areas that are more or less populated
3) local authorities are more or less committed to fighting against climate change
4) local authorities face different climate conditions and are located on either urbanized or rural territories
5) local authorities can either be pioneers, leaders, followers or laggards in terms of climate change abatement
6) local authorities might produce climate plans because of mandatory requirements or do it voluntarily

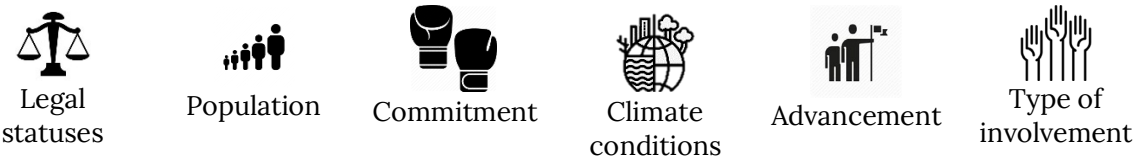

Figure 4 - Characteristics for cases selection

Those characteristics are the ones that have been taken into account when choosing the cases for this thesis. Eight *cases were then selected* to reflect the reasons that might have an influence on the networks of actors for producing and implementing climate plans at the local level. Choosing eight cases is consistent with the recommendations of Martinson and O'Brien (2015), which suggest that studying six to nine cases provides interesting variability that allows for greater confidence in the results obtained while keeping the volume of data at a level that will allow for easy analysis.

The following table summarizes the characteristics that were taken into account when choosing the cases and provides the answers that helped to classify the different local authorities.

Characteristics				
Preidentified typology	Pioneer	Leader	Follower	Laggard /Latecomer
Date of the first PC(A)ET	Early on (2005-2011)	Later (2012-2017)	Recently (2018-2019)	
Date of the last PCAET	After 2018	Before 2018		
Mandatory production of the climate plan	2018	2016	Voluntary	
Online availability of the last PCAET	Yes	No		
Inhabitants (INSEE, 2016)	> 1 000 000	Between 500 000 and 999 999	Between 50 000 and 500 000	
Type of local authority[1]	Metropolis	Urban Community	Community of municipalities	
Climate situation	Oceanic	Continental	Mediterranean	

Table 3 - Characteristics and classification of the EPCIs

The following table gathers the eight selected cases. The choices were made to have both a representative sample and useful variations of the different dimensions of the object of the study. Cases are presented alphabetically.

[1] The different denominations in French are respectively: Métropole, Communauté urbaine, Communauté de communes

Cases	Bordeaux Métropole	Grand Lyon	Grenoble-Alpes Métropole	Ile de Noirmoutier	Pays Midi-Quercy	Poitiers	Tours Métropole Val de Loire	Vienne et Gartempe
Typology	Follower/ Leader	Leader	Pioneer	Follower	Leader	Follower	Laggard	Follower/ Laggard
Date of first PC(A)ET	2011 (PCET)	2011 (PCET)	2005 (PCET)	2019 (PCAET)	2010 (PCET)	2015 (PCET)	2011 (PCET)	2019 (PCAET)
Last PCAET	2017	2019	2019	2019	2019	2019	2011	2019
Online availability of the last PCAET	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Mandatory production of the climate plan	2016	2016	2016	Voluntary	2018 and voluntary for some local authorities	2016	2016	2018
Inhabitants (INSEE, 2016)	774,929	1,374,964	451,752	9,380	50,000	191,791	293,123	41,031
Type of local authority	Metropolis	Metropolis	Metropolis	Community of municipalities	Pays (grouping of communities of municipalities)	Urban community	Metropolis	Community of municipalities
Climate situation	Oceanic	Continental	Continental	Oceanic	Mediterranean	Oceanic	Oceanic	Oceanic

Table 4 - Selected cases and their characteristics

B. Research design

The research design of this project aims at answering the following research question:

"What organizational strategies can French city planning institutions deploy to respond to climate issues?"

Our case study design (eight cases) will be composed of several units of analysis. Yin calls this type of design an embedded case study approach. Identifying several sub-units of analysis will provide for a more detailed level of inquiry. The next figure represents how this type of research design works:

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Sub-unit of analysis 1							
Sub-unit of analysis 2							
...							

Table 5 - Research design presentation

1. Literature Study

The literature study (state of the art and theory) will help to build the framework of analysis for this thesis. The literature will provide a theoretical overview of the knowledge around *organizational strategies for climate planning* but will also give *some insights into organizational responses in other countries*. The literature reviewed for the literature study mainly consists of peer-reviewed articles published as scientific papers. The focus of the reviewed literature is to present a foundation of what knowledge already exists, about the organizational strategies at the local level to tackle the issue of climate change.

The literature study will allow for the identification of some key concepts that will be used to analyze the data collected in the analysis. Those main concepts, introduced in the Theories chapter, are listed below:

- *The actor-network theory*
- *Multi-level governance and the different levels of upscaling in climate change planning*
- *The ladder of co-creation for public-private partnerships and citizen participation*
- *Coordination and cooperation inside the local authority*
- *The roles of the urban planner*
- *Identified drivers at the international level regarding climate change abatement*

2. Analysis

The literature study (state of the art and theory) helped to create the framework of analysis, presented below, for this thesis, thanks to the identification of some key concepts.

At the beginning of the analysis, as an introductory part, eight separate sections will provide a brief overview of the selected territories, presenting their specificities. The local context and the history of actions for climate change abatement will be touched upon. This introduction will be based on the *sub-unit 1* of the analysis presented below.

The following sections of the analysis will provide a network-based analysis of the actants involved in the PCAET elaboration and implementation. The three sub-units presented below helped to create the interview guide and structure the information gathered during those interviews.

The analysis chapter will address the three sub-units mentioned below by following a structure influenced by the ANT. The networks and different types of actors are sub-systems that are all involved in the elaboration and implementation of a PCAET. These different sub-systems will be elaborated in the four following dedicated sections structuring the analysis :

- Public actors in planning for the PCAET (as a part of sub-unit 2)
- Private actors in planning for the PCAET (as a part of sub-unit 2)
- Citizen participation in planning for the PCAET (as a part of sub-unit 2)
- Public, private and citizen participation: forms, evolution, and resources (as sub-unit 3)

Sub-unit 1: Local context and the history of action plans	
Topics	*Theory used*
- *Understand the genesis of the first climate plans* - *Understand how the local authority operates* - *Identify the specific characteristics that led to a climate plan elaboration* - *Identify leaders, followers, and laggards*	-

Sub-unit 2: Networks of actors around the PCAET		
Topics	*Theory used*	*Methods of data collection*

ACTORS AND ROLES
- *Identify the actors mobilized and the conditions of cooperation as well and their respective roles*
 	
DYNAMICS BETWEEN THE ACTANTS
- *Understand the role of "best practices", "models" and "references": systems, actors, projects, achievements, regulations…*
 	
- *Identify the relationships between actors and the nature of these relationships: competition, complementarity, support, divergent interests, conflicts, tensions, hierarchies, etc.*
 	
- *Identify knowledge and skill transfer processes:*
  o *Between the national, regional and local levels*
  o *Between the different departments in the local authority*
  o *Between different local authorities (networks of actors)*
	Actor-network theory
	
	Multi-level governance and the different levels of upscaling in climate change planning
	
	Coordination issues and solutions inside a municipality
	
	Co-creation
		Document analysis (PCAET) and interview with climate planners
		
		Document analysis (PCAET) and interview with climate planners

o *Between the public authority and private and research actors* ***FOCUS ON THE ROLES OF THE PLANNER*** - *Identify how the climate planner perceives his or her role* - *Identify the processes of knowledge and experience transfer that have led to an increase in competence and acculturation of climate planners (key individuals, communities, networks).* - *Understand the working modalities of the climate planner and its position in the networks of actors* - *Identify the characteristics of the pioneers* ***FOCUS ON PRIVATE COOPERATION*** - *Identify the role of private companies in the PCAET processes* - *Identify the strategies implemented to include the private actors across the territories* ***FOCUS ON CITIZEN PARTICIPATION*** - *Identify the role of citizen participation in the PCAET processes* - *Identify whether or not citizen participation is considered, in the end, in the planning documents* - *Identify the strategies implemented to develop citizen participation*	*The role of the planner* *Co-creation*	*Interview with climate planners* *Document analysis (PCAET) and interview with climate planners*

Sub-unit 3: Resources, evolution of the networks and modalities of exchanges		
Topics	Theory used	*Methods of data collection*
RESOURCES - *Identify the resources available and the resources missing* - *Identify the modalities of data collection and analysis* - *Identify the contribution of other actors* ***EVOLUTION OF THE NETWORKS*** - *Identify the evolution of networks of actors over time – threats and opportunities* ***MODALITIES OF EXCHANGES*** - *Identify the modalities of exchanges between the actors (meetings, workshops, seminars…) and their influence on the successes of the networks*	- *Actor-network theory* *Actor-network theory*	*Document analysis (PCAET) and interview with climate planners*

Table 6 - Presentation of the different sub-units of analysis

3. Discussion

The last chapter will introduce a cross-cases discussion around the organizational strategies that French local authorities can implement to improve their fight against climate change. The discussion will take the results from the analysis as a point of departure and provide some organizational recommendations for both large and small EPCIs.

Data collection

In this section, the methods for data collection will be presented. The way data will be used for the analysis has already been specified in the previous table (2 Research Design). To answer the research question, two main methods for collecting data are used in this thesis: document analysis and semi-structured interviews. The document analysis will serve as the fundamental basis of information, and the interviews made with the climate planners will provide additional information. Together, they will allow for a deeper understanding of the actors' relationships in the uncovered networks for climate change abatement.

1. Document analysis

The documents that will be analyzed in the thesis are mainly climate plans (PCAET) from the eight selected local authorities. These plans will provide a first glimpse of the networks of actors and will help to uncover the potential successes and difficulties for the different local authorities. The PCAET will be analyzed following the research design presented in the previous section.

2. Semi-structured interviews

For this thesis, 6 semi-structured interviews have been conducted with climate planners working in the selected EPCIs. The purpose of a semi-structured interview is to gain first-hand knowledge on a specific topic. The semi-structured interview, as defined by Kvale and Brinkmann, is not strict in its structure, nor is it completely free, but seeks to open a structured conversation about a defined topic (Kvale and Brinkmann 2009). The different interviews conducted during the thesis had the same objective: to supplement or qualify the information already available on the PCAET.

A baseline interview guide was drafted, based on the concepts and the state of the art that emerged during the literature study. The structure of the interview guide is inspired by the research design presented before, to facilitate the analysis of the data collected. The interview guide can be found in Appendix 1. Depending on the specificities of the local authority, the questions asked were, of course, adapted to the context.

The following interviews were conducted during the thesis :

- Pays Midi Quercy – BERTHELOT Gaëlle / Energy-Climate Officer (25/03)
- Ville de Grenoble – FOUVET Anne-Cécile / Air-Climate Project Director (25/03)
- Bordeaux Métropole – MEJRI Virginie / Climate Plan Project Manager (26/03)
- Grand Lyon – PONSAR Luce / Ex-Climate Plan Project Manager (26/03)
- Grand Poitiers – HONORE Thomas / Head of the Prospective-Climate Unit (31/03)
- Vienne et Gartempe – COLIN Olivier / Head of the Spatial Planning Unit (21/04)

C. Methodology reflection

In this section, a reflection of the methodological approach will be presented.

During the thesis process, it has not been possible to interview every EPCI studied as a case. 6 out of 8 EPCIs positively answered to an interview request. It was, therefore, necessary to find additional elements regarding the two EPCIs concerned. Press articles and PCAET reviews allowed for collecting data for those two EPCIs. Nevertheless, in the end, fewer elements have been available and analyzed in the thesis. It would have been more suitable to successfully conduct interviews for every case to get an exhaustive overview of the 8 cases selected for every theme of the analysis. It should be noted that for one EPCI, the lack of response was due to the COVID19 pandemic that took place during the completion of this thesis.

The representativity of the sample of EPCIs chosen can also be questioned. Mainly large EPCIs were selected for the analysis, partly because loads of them are frontrunners of climate abatement. The thesis aiming at identifying best practices in organizational structures, it made sense to have a significant amount of large EPCIs included. Nevertheless, since the small EPCIs are the ones having the most issues today, it could have been interesting to include more of them to pinpoint more precisely the difficulties that they face – especially considering that there are more small EPCIS than large ones across the French territories

The thesis is mainly based upon the PCAET planning documents and the interviews conducted with the climate planners. During the analysis, the subjective perspectives of the climate planners were confronted with the planning documents to make sure that their words were not directly taken for granted. The analysis has been written with the need to take a step back from the information provided by the planners. Nevertheless, the analysis being mainly based upon those planners' interviews, the private collaboration, and citizen participation aspects are only seen through the plans' and the planners' eyes. With more time, additional interviews with the other actors identified across the thesis could have been conducted to complete or qualify the analyses provided throughout the thesis.

Finally, as loads of conclusions are drawn from the analysis, a choice has been made to only focus on specific themes that seem to be the priority for the EPCIs in the next few years in the discussion chapter. With more time and with fewer academic constraints, the thesis could have provided more recommendations regarding all the themes identified during the analysis.

Theories

This chapter aims at presenting the theoretical framework that will be used to analyze the data collected in the Analysis. The chapter is divided into several sections, being the different theoretical elements framing the remaining of the thesis, as presented in the Methodology chapter.

A. Actor-network theory: the main theoretical framework

This first section focuses on Actor-Network Theory (ANT). This theory will be used to analyze the networks of actors in the climate change abatement strategies and plan production in the selected French EPCIs. ANT is a theoretical framework that focuses on the interactions inside networks. This is why this framework is interesting when looking at the local climate planning situation in France. The specificity of the ANT approach is that when looking at an organization, it does not only consider the mapping of interactions between individuals. ANT, more interestingly, intends to map the way actors consider their roles by looking at the definition and distribution processes of these roles. (Akrich et al. 2006)

ACTANTS, ACTIVITIES, AND ACTOR-NETWORK

Inside the ANT theory, Callon, Latour, and Akrich define what they call actors, actants, and actor-network. In the actor-network world, what is usually called an actor is named an "actant". An actant is simply a source of action: it can be either a human or a non-human element. The term is, therefore, less restricting than the "actor" term. These actants are involved in networks by acting. They also define networks or actor-networks as the activities being performed by actants. In the ANT theory, the actants are connected, to perform specific activities inside an actor-network. Networks can be of different sides. A large business can be a network, but so does a simple actor as long as networking activities are performed by this actor. (Akrich et al. 2006)

AN ACTOR-WORLD

An actor world is composed of several actor-networks. This actor world often relates to a specific field or object of study. Authors explain that inside this world, a specific actant is often considered as the main driver whose goal is to make changes in the landscape in which the actor-world in installed. This specific actant often decides the role of the other actants, their value, and how they are supposed to participate in the network. This main actant has to translate the different actants' abilities in their actor-world to achieve the initial changes. In the actor-world, the main actant intends to project his imagined new world with a proposition of new roles and identities to all involved elements. This world is composed of a juxtaposition of heterogeneous elements in a network such as technical elements, legal requirements, opinions, users, municipalities, or companies. (Akrich et al. 2006)

THE TRANSLATION INSIDE THE ACTOR-WORLD

In the ANT, the translations are all the efforts that are made by the actants so that the proposed actor-world becomes a reality. In other words, the translations are all the relations created between the elements of the network so that they form a new network of durable alliances. (Callon et al. 1986)

The authors note that a "translator spokesman" is often needed for a translation to take place. It is often the main driver actants who represent the other actants that he is composed of. The spokesman's capacity to define and engage the actants in the actor-world is what makes the networks successful or not. The spokesman has the responsibility to make the actants participate in the actor world. As the actants can be very different in their forms (human, opinions, objects) and their intentions, the work of the spokesman can be challenging and he might have difficulty to successfully translate all the elements of the network in the same actor-world. It has to be

noted that "the results of the actor-world are only as durable as the associations within it, meaning that both the translations and the actor-worlds can be vulnerable" (Callon et al. 1986)

OBLIGATORY PASSAGE POINTS

Inside the network, obligatory passage points may arise. These points emerge when specific problems are identified, and when they need to be addressed before any other translation can happen. To tackle those issues, an obligatory solution has to be found. The solution constitutes the passage points towards a network that will keep developing and existing. Not addressing those issues might put the network in danger. (Callon et al. 1986)

NETWORKS INSIDE NETWORKS

As explained before, the actor-worlds are constituted of different entities, which can sometimes be simplified but which can also be other networks in themselves. (Akrich et al. 2006) The figure below represents the anatomy of an actor-world and shows the existence of networks inside simplified networks.

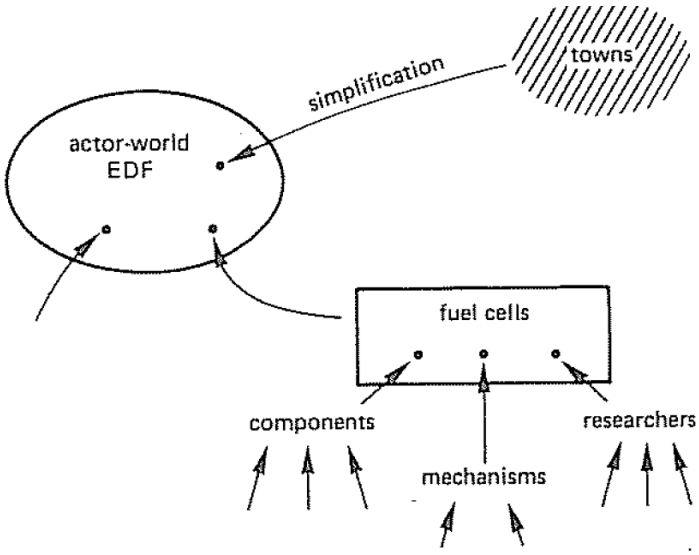

Figure 5 - The example of an actor-world: the EDF actor-world (Callon et al. 1986)

The takeaway from ANT :

ANT will be used to argue for the composition of actants within the French local climate planning organization by describing its actor-world. By analyzing the networks of actants in the French local climate planning world, this study will also describe the relevant points of passage necessary for the networks to keep developing and existing. The notions of actants, translators, and actor-world will provide the theoretical framework to analyze the difficulties encountered by the French EPCIs.

B. A first glimpse of networks of public and private actors in the fight against climate change

Many cities at the European level participate in different networks that were created to exchange knowledge and diffuse good practices. There are both transnational networks with cities involved in different countries and national networks inside a specific country. (Fuhr et al. 2018)

If we look at the Swedish case, two municipal networks of cooperation were identified: the Swedish Eco Municipalities and the Swedish Network of Municipalities on Climate Change. Their goals were to share knowledge and experience and raise the cities' level of awareness. The participating cities could receive help from a Climate coach, and municipalities had to sign a declaration of intent stating that they would write a climate strategy within two years. Then, they got support from a mentor municipality in the production and implementation of the climate strategy. It has to be noted that there is a difference between the image created by the municipality membership in one of those networks and the real engagement in fighting against climate change. Nevertheless, regarding the smaller communities, the study mentioned that the ones having achieved the most are those that participated in the programs and received help from other cities. Regarding engagement, it was difficult to know if the municipalities became more engaged after the application for assistance and the grant or if they were already motivated by environmental issues before application. (Langlais 2009) The following figure represents the existing international and national networks of public actors in the fight against climate change.

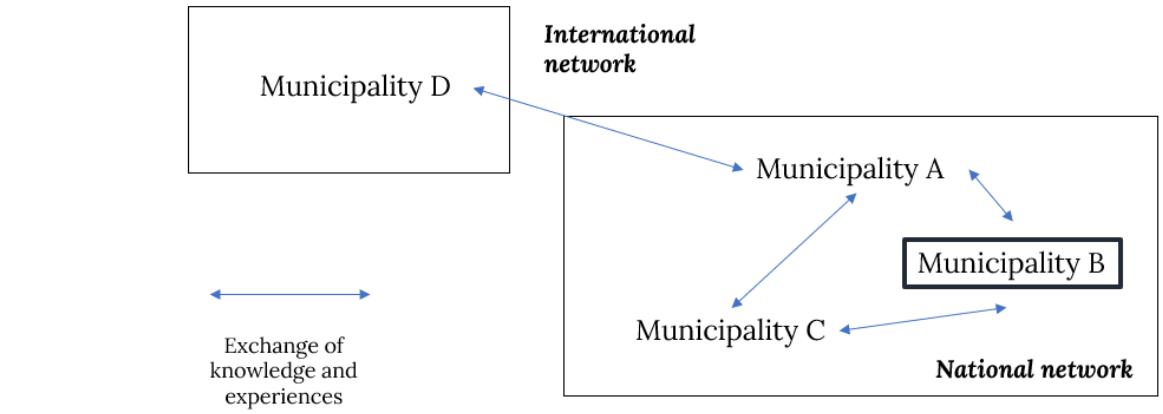

Figure 6 - National and international networks of public actors

In the Swedish example, the local initiatives to fight climate change also highlighted the increasing role of private collaboration in joint projects – climate change mitigation can, therefore, be fueled by a stimulus to entrepreneurship and innovation. (Langlais 2009) Cities sometimes have not that many responsibilities in the sectors that produce the most GHG and have limited capacities. Lack of resources in the communities, and national government not bound to climate change actions can be translated into no or little financial support. This is one of the reasons for the development of public-private partnerships. New non-institutional actors become an essential part of these new networks. (Fuhr, Hickmann, and Kern 2018). The figure below represents the intervention of private actors in the networks already identified.

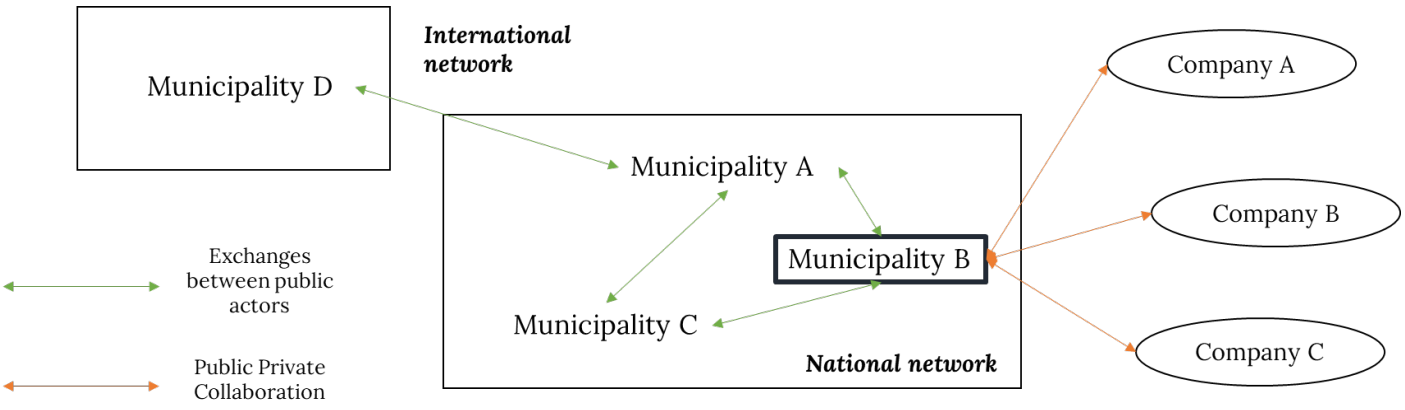

Figure 7 - National and international networks of public and private actors

C. The emergence of new governance settings: upscaling of local climate actions

The networks presented above are made possible because of new governance settings at the local level. They were developed in countries where multi-level governance is emerging. The multi-level governance (MLG) is a form of governance were programs are initiated and regulated by a central government, whereas planning and implementation are delegated to local governments. This is an organizational hierarchy. Even inside the municipal organization, there are different levels, with different administrations and teams that want to strive for coordination. Therefore, the multi-level governance corresponds to a hierarchy that goes both horizontally and vertically. More concretely, how can it be translated at the city level in the fight against climate change? (Torfing et al. 2019)

1. The external aspect of multi-level climate governance: cities, regions, state, and networks

a. Horizontal upscaling between cities on a voluntary basis

In climate governance, as seen before, there can be exchanges between cities. However, there also are exchanges between the different levels of governance of a country. In the theory of multi-level climate governance, what is called ***horizontal upscaling*** is the relationship between leading cities that consists of transfers of practice, replications, and policy mobilities. It can take place through networks, city to city discussions, national partnerships, or even associations. Horizontal upscaling comes from the diffusion of local experiments on a voluntary basis. This upscaling improves the transfer of good practices to cities that can follow the leaders. (Fuhr et al. 2018)

This upscaling between cities takes place at the local level and aims at exchanging experience and transferring knowledge. The horizontal upscaling is profitable for leading cities that can learn from each other. Successful experiments and practices can first be replicated in the same city, then in other cities in the same country and finally in other cities in different countries. Nevertheless, this type of upscaling can be a threat to the laggards as it may widen the gap between leaders and laggards because laggards do not have the capacities, alone, to follow the leaders. (Kern 2019)

Place-based experiments cannot always stimulate policy changes in other cities. There are some successful examples (such as the BRT) but also failed diffusion experiments. For successful transfers to happen, the networks have to be stronger in the places where experiments travel.

Leading cities join networks at different levels (European, national). These cities are often prosperous cities with a lot of adaptive capacities. They are capital cities, second cities, or regional centres. They are mostly Northern or from continental Europe. The dynamic of city twinning can improve those relationships between cities. By joining long-term networks, cooperation is fostered in the long run with more ambitious projects. (Kern 2019)

b. Vertical upscaling between the national, regional and local level

The relationships between the national, regional, and local level are the ***vertical upscaling*** of the multi-level climate governance. Action at the national and regional level help define strategies at the local level by stimulating actions in smaller cities. (Fuhr et al. 2018)

Vertical upscaling is based on the principles of multi-level governance. The governance in this type of upscaling is done through positive incentives and takes place through both top-down and bottom-up approaches. There are, at the same time, city networks and associations of cities in the

vertical upscaling but also the emergence of direct links between the EU, the state, the Regions, and the cities.

Vertical upscaling gives incentives for cities and towns that are not at the forefront of local climate action, but that want to catch up with the leading cities. The regional, national, and EU strategies will also be attracting the followers and help them to catch up. (Kern 2019)

c. Hierarchical upscaling

The last upscaling is the ***hierarchical*** one. It is based on the same principles as the vertical upscaling but on legally binding rules. 'Laggards' will have to comply with the minimum standards which are set by the regions and the states. It is different from the horizontal and vertical upscaling as this type of upscaling requires strong states with the ability to set binding requirements. It is a hierarchical form of governance where goals and targets have to be reached. (Kern 2019)

In this MLG, three types of cities are identified based on their stance in the fight against climate change:

- The leaders, which are cities that stand out, such as Copenhagen, which have to keep their position
- The followers, who have to develop their resources and their strategies to catch up with the leaders
- The laggards, which have to meet the regulatory standards set by regions and the State

(Fuhr et al. 2018)

With the embedded upscaling (which corresponds to the challenges of the three types of upscaling identified), the gap between leaders, followers, and laggards aims at being closed.

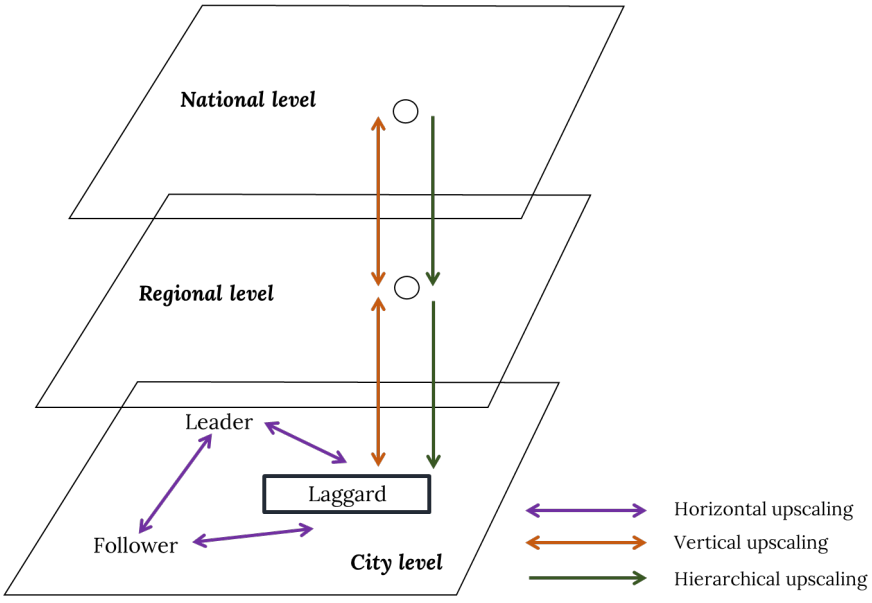

Figure 8 - Embedded upscaling

Embedded upscaling with the three forms presented before has an impact on the form of city networks. Different forms of cooperation and networking are being developed alongside this embedded upscaling. These different forms are translated by new practices and new actors. (Kern 2019). Some new practices identified by Kern are the following:

- New meta-networks emerge like the Covent of Mayors, with other networks and cities being part of the meta-network. It means networks also have to work together with one voice.

- Territorial networking: networking initiated by local authorities, regional authorities or driven by actors at the national or EU levels
- Networks of planners also emerged
- With MLG, networks are becoming more intense, denser, and with a growing number of actors.

(Kern 2019)

The takeaway from the embedded upscaling theory:

In this thesis, part of the analysis of the different cases will aim at understanding how the networks of public actors can have an impact on the plans' production and the implementation of the initiative. Multi-level governance and the different levels of upscaling will provide a framework to understand the knowledge and skills transfer processes at the local scale. They will help to shed light on the public actors' networks.

2. Adding on the external aspect of multi-level climate governance: private actors and citizens inclusion through co-creation

In the fight against climate change, cities can resort to co-creation. The idea behind co-creation is to mobilize resources and ideas in the creation of public solutions coming from a plurality of public and private actors. It aims at replacing the public service monopoly and the traditional public-private competition with collaboration. (Torfing et al. 2019)

In co-creation processes, the "actors attempt to solve a shared problem through a constructive exchange of different kinds of knowledge, resources, competences, and ideas that enhance the production of public value in terms of visions, plans, policies, strategies, regulatory frameworks, or services." (Torfing et al. 2019)

Not only does co-creation allow private actors to be involved, but it also invites citizens to the table. Co-creation transforms the way of thinking about citizen participation. It can easily be applied to climate abatement at the local level. Climate consultations are often made with citizens when drafting climate plans. In the ladder of participation, this action would be at the "consultations" level. Nevertheless, this ladder of participation could be supplemented by a ladder of co-creation, that adds different levels, which is the following:

"

- 1°*Public agency aims to empower citizens to increase their capacity to master their own lives and encourage them to co-create the services they are offered*
- 2°*Not only co-producing but creating value for other citizens (voluntary work)*
- 3°*Providing input into the design of new tasks and solutions (crowdsourcing, focus-group interviews, consultations, public hearings)*
- 4°*Public & Private actors engage in mutual dialogue at ad hoc meeting aimed at designing new and better solutions and coordinating their implementations*
- 5°*Relevant and affected actors from the P&P sector participate in institutional arenas that facilitate collaborative innovation based on joint agenda-setting and problem definition, joint design and testing of new and untried solutions, and coordinated implementation drawing on public and private solutions.*

"

(Torfing et al. 2019)

Co-creation processes at the local level, and more specifically in the context of the fight against climate change, pose some risks. Indeed, co-creation may result in a form of biased participation favouring the most advantaged fringe of the population. Those who have time, resources, energy to join and influence the participatory process will be the ones who will be the most represented. Implementing co-creation initiatives is also very costly in terms of resources to mobilize. Involving lots of actors also means taking into consideration lots of different expectations. Commitments can be hard to bridge and can lead to conflicts between actors. (Torfing et al. 2019)

Co-creation remains valuable as it enhances democratic participation and can strengthen social cohesion within a community. It enhances trust in the democratic process while fostering more efficient solutions that become more adapted to the local preoccupations, more holistic, and more synergistic. (Torfing et al. 2019)

The literature also suggests barriers that can be faced when trying to use co-creation. Sometimes, political conflicts can prevent collaboration and mutual learning. However, the most common barrier identified is the difficulty for the public and private actors to identify their role. They all have to develop a perception of their own role. Nevertheless, this shift in sharing powers and responsibilities can still remain painful for some actors.

Municipalities can be driven to resort to co-creation for different reasons. Political actors can desire to strengthen their leadership with dialogue with different stakeholders. The public servants also realize that they do not have the resources, experiences, or knowledge to do everything on their own. Citizens can also seek purpose and wish to have more influence in decisions that affect their lives.

The literature also suggests how to advance co-creation at the municipal level. Implementing co-creation means going away from a focus on control and measurement of performance to a trust-based approach, where resources are shared, where vertical and horizontal accountability is present and where there are trust-based steering processes implemented. Implementing co-creation processes also means accepting risks and experimentations. Therefore, the professional culture of urban planners also has to be changed (Torfing et al. 2019).

The takeaway from co-creation theory:

In this thesis, part of the analysis of the different cases will aim at understanding how the collaboration between public actors, private stakeholders, and citizens can have an impact on the production of the plans and the implementation of the initiatives. The ladder of co-creation, the risks, benefits, and ways forwards identified will provide a framework of analysis for the collaboration processes between public and private actors as well as the citizens.

3. Between city planning departments

High stakes are also identified inside the planning authorities when it comes to planning for climate change abatement. As climate change is a multidimensional issue, departments often have to work together to produce a coherent and holistic plan of action.

The example of the city of Copenhagen can be used to illustrate the importance of coordination inside a municipality. In 2010, Engberg and Larsen conducted a case analysis of a large-scale experiment on organizational change conducted in collaboration between two separate departments of the city of Copenhagen. Those two departments were not directly

linked to climate planning, but this case is compelling because it provides possible explanations and solutions to inefficient cross-sector coordination. (Engberg and Larsen, 2010)

To sum it up, the authors mapped up the following coordination problems between the two departments:

- The size of a city administration can prevent coordination between two departments. It can be challenging to keep track of the different projects with a large-scale organization.
- Budget issues can also be a reason explaining the coordination problems: more resources are often needed when cross-departmental projects are implemented.
- Involvement from city planners can be lacking.
- City planners can have a difficult time identifying their role in the procedures.
- Knowledge can be neglected, and projects can go in different directions.
- The projects and coordination procedures are sometimes not evaluated, and the effects are not measured.
- The steering of actors might be inadequate as there are too many actors with no or little coordination.
- Lack of synergy can be identified inside a municipality with a lack of communication and no integration at the horizontal and vertical levels.

Engberg and Larsen then came up with some "horizontal-pillar" proposals which aim at improving the coordination between different departments.

- First of all, they recommended mapping and exchanging knowledge between departments.
- A joint agreement between departments could also be drafted.
- The governance structure should be unified so that initiatives can be appropriately developed.
- Both negotiation procedures between departments and evaluation procedures should also be implemented.

(Engberg and Larsen, 2010)

The takeaway from interdepartmental planning theory:

In this thesis, part of the analysis of the different cases will aim at understanding how the coordination and collaboration inside the municipalities have an impact on the production of the plans and the implementation of the initiatives. The mapping of issues and solutions presented before will help analyze the identified successes and difficulties in the selected EPCIs.

D. The role of the urban planner in the climate challenge

When looking into the city planning administration, the urban planner also has a significant role to play. The role of urban planners changed in the last decade. At the beginning of the '70s, new working conditions appeared. Before, the urban planner position used to be considered as an expert hat knew the truth. This approach led, what was called comprehensive planning, to fail. The planning initiatives took place in fragmented policy and governance systems that did not allow for practical actions. Voices in the '70s started to argue that expert knowledge was not a way to the truth and that new planning conditions had to be considered with citizens having to be a more critical part of planning. (Molina 2010)

Different kinds of knowledge had to be integrated into those new planning conditions. First of all, collaboration with other professionals and laypeople like citizens, politicians, and other actors had to be considered. New values such as democracy and effectiveness and new forms of management were included. A cross-sectional approach of planning with the inclusion of several actors started to develop as silo-thinking was useful for stability. However, it did not allow to solve problems in our societies. New relationships emerged between actors, being sometimes conflicting because of the stakeholders' different roles, knowledge, or even points of view. (Molina 2012a)

With this new context, the urban planner has to navigate between different roles. In 2009, Sehested explained that planners had to move from the role of the rational planner, with an autonomous planning role, to a more hybrid role that challenges the idea of a rational planner. These planners have a role that can vary depending on their values and orientations. (Sehested, 2009)

The following table taken from Sehested paper summarizes the different variations in the role of the planner today.

	Orientation towards:	Result:	Collaboration with:	Knowledge:
Professional Manager	Professionalism and policy	The best professional product	Professional, administrative and political actors	Planning and communication
Administrative Manager	Policy and efficient implementation	The politically appropriate product	Political and administrative actors Private investors	Urban/regional development Public policy and administration Negotiations Communication
Market planner	Market and competition	The financially feasible product	Private investors and firms Political and administrative actors	Urban/regional development Economics Communication
Process planner	Communities and consensus	The right democratic process	Citizens, Organisations, Businesses, Political and administrative actors	Urban/regional development Process and organization knowledge

Table 7 - Variations in the role of the planner (Sehested 2009)

Nowadays, the planners have to reflect, combine, and balance these roles. When they face a specific task, they have to identify what roles they have to take on to solve the issues. Specific values and knowledge are needed, such as technical, economic, and political knowledge with ease with communication and teamwork. These planners need to have the ability to create an open and inclusive network of actors, to solve issues, and to be able to have an essential role of management in this network. The evolution of these roles is also mentioned in the French urban planning

literature. Yves Chalas, especially, focused on how urban planning practices have evolved when facing the new and multifaceted territorial realities. (Chalas 2000, Chalas et al. 2004)

The takeaway from the roles of the urban planner theory:

In this thesis, part of the analysis of the different cases will aim at understanding how the role of the urban planners in charge of climate change abatement can have an impact on the production of the plans and the implementation of the initiatives. The different variations of the role of the urban planner will provide a framework for the analysis of the responsibilities that French climate planners have.

The next three sections aim at presenting some international knowledge about the emergence of climate initiatives at the local level.

E. The emergence of climate policies at the local level in Europe

The 2015 Paris Agreement had an essential role in raising awareness about the climate change issue. However, the fight against climate change at the local level in Europe is not something new. Indeed, mitigation policies have been implemented at the local scale at the end of the 1980s. It is the emergence of climate policies at the international level that is pretty new with the implementation of some networks of actors, for instance (C40). (Fuhr et al. 2018)

The Swedish example of local climate planning can be used to illustrate the evolution at the local level. In most European countries, mitigation rather than adaptation, has been the preeminent answer. This observation also applied in France. (Richard and Molina 2014) Still today, various cities in different countries focus on mitigation and do not include the adaptation component of the fight against climate change. The majority of the mitigation measures have initially been taken in the energy sector with a progressive inclusion of other sectors. Since the beginning of local climate planning, the difficulty for the municipalities to accurately know the definitions of the roles they had to have appeared. While not knowing exactly what they had to do, European municipalities mainly undertook analyses of the effects of climate change, but adaptation measures were rare in the planning documents. In Sweden, there was no regulatory framework that made it compulsory for municipalities to draft climate plans. Some municipalities stood out as proactive as others were more passive towards climate planning. In the Sweden context, state subsidies were created (LIP and KLIMP) to stimulate and support the municipalities in their environmental work. (Langlais 2009)

F. Regulatory frameworks enforcing climate change action at the local level in Europe

The regulatory framework has an impact on the initiatives that are taking place at the local level. With the Swedish example, for instance, municipalities were not obliged to do anything except writing an energy plan for the supply, distribution, and use of energy. There were only vague national guidelines on climate change response, which made it difficult for local authorities to understand their responsibilities. Sixteen environmental objectives were drafted by the Environmental protection Agency, but no local guidelines were given regarding a more comprehensive climate strategy at the local level. A robust regulatory framework enforcing the implementation of climate change at the local level, such as the one existing in France or the United Kingdom, facilitates and encourages climate change action. (Langlais 2009)

Even without a regulatory obligation to produce climate plans, some municipalities across Europe started to understand that starting to draw up an initiative for climate abatement would bring benefits to the entire community. Indeed, scholars identified reasons that would push cities to adopt local climate strategies. Acting against climate change and air pollution allows the cities to control energy bills, save money, and reduce vulnerability to climate change. Local resources (jobs, natural resources) and new areas of growth in terms of employment can be developed. Current jobs could be improved, and the region could become more attractive through an improvement in the quality of life. (ADEME 2016a)

G. Key drivers for the development of local climate policies

Scholars started to identify the reasons for the development of local climate policies in cities, regulatory reasons excluded. First of all, it seems that cities with urging issues that are plagued by numerous natural disasters and that have high capacities of dealing with the issue are more capable and willing to deal with the climate issue. Four more drivers were identified:

- An existing democratic background at the local level
- A large number of legal competencies and resources for the municipalities
- An environmentally-concerned civil society and green industries
- Strong local leadership in favour of climate action with a professional administration

(ADEME 2016b)

Climate change abatement became quite a popular agenda in some cities while also being a lucrative business for some companies (Molina 2012b). There are several fields of action that make cities a critical player in the fight against climate change. For instance, they can cut emissions, implement new energy standards, create alternative transportation systems and infrastructure, switch to carbon-neutral mobility, improve waste management. Cities can effectively act and are rewarded by an improved environment of life and an improved liveability. This reward can be seen as a driver for the development of local climate policies. (Fuhr et al. 2018)

Regarding the Swedish example, it seems that engagement was facilitated in some places where energy plans were already in place and then revised into more holistic climate plans. In those places, new motivations and drivers for sustainable development appeared. It has to be noted that municipalities are not equally preoccupied with those issues or are not preoccupied with those issues for the same reasons. Indeed, some have more pressing urgencies (and focus on a specific sector such as transit, for example), and some are more aware of climate change challenges because of their geographical location (next to a body of water, for instance).

The Sweden case also highlighted the importance of some key individuals for the implementation of climate policies. When they leave a municipality, the strategy can collapse, and cities can become less engaged than before. The engagement in climate change abatement can take a variety of forms. Some municipalities just want to comply with the legal requirements while others take into consideration climate issues in every work they do. There can also be a lack of political will in some municipalities that translate into poor climate actions. Regarding some small municipalities, two perspectives can be identified. Some municipalities argue that they do not have the necessary resources to tackle climate change, while others explain that it is an opportunity. Indeed, because they are small, they have the opportunity to develop initiatives that are not affected by large cities' bureaucracy processes. (Langlais 2009)

The next table summarizes the main key drivers for the development of local climate policies across Europe found in the literature.

Key drivers of climate policies at the local level	Key elements that prevent local climate policies
A regulation that enforces the production of climate plans Pressing issues (natural disasters …) High capacities (material, human) An existing democratic background An environmentally concerned civil society Green industries: lucrative business Strong and climate-conscious local leadership Understanding of the environmental and human benefits climate planning brings Existing energy plans in place Key individuals with knowledge and conviction Small municipalities with less work to accomplish	No regulation No political will Lack of resources and funding Lack of civil engagement

Table 8 - Drivers and brakes to the development of local climate policies

The takeaway from the key drivers:

In this thesis, part of the analysis of the different cases will aim at understanding how climate policies did emerge at the local level. Based on the previously identified drivers at the international level, what are/were the key drivers identified by the EPCIs that made the initiatives successful or not? The human and material resources and the leadership drivers of the EPCIs will be used as a framework for the analysis.

H. Takeaways from the theories

Concepts	What will they be used for in the thesis?
General theoretical framework: Actor-network theory	By analyzing the networks of actants in the French local climate planning world, this study will also describe the relevant points of passage necessary for the networks to keep developing and existing. The notions of actants, translators, and actor-world will provide the theoretical framework to analyze the difficulties expressed by the French local governments.
Additional theoretical elements	
Multi-level governance and the different levels of upscaling in climate change planning	It will help in drawing the networks of public actors and understanding how the networks of public actors can have an impact on the production of the plans and the implementation of the initiatives.
The ladder of co-creation, the risks of this concept, its benefits and ways forwards	It will help in understanding how the collaboration between public actors, private stakeholders, and citizens can have an impact on the production of the plans and the implementation of the initiatives.
Coordination issues and solutions inside a municipality	It will help in understanding how the coordination and collaboration inside the municipalities have an impact on the production of the plans and the implementation of the initiatives. The mapping of issues and solutions presented before will help to define a framework to analyze the identified successes and difficulties in the selected EPCISs.
The role of the planner	The variations of the roles of the planner will provide a framework to analyze the responsibilities and actions carried out by French urban planners.
Additional state-of-the-art knowledge	
Previously identified drivers at the international level regarding climate change abatement	Human and material resources, capacities, responsibilities, leadership drivers of the EPCIs will be used as a framework to analyze the drivers of the selected cases.

Table 9 - Takeaways from the theories

Analysis

A. Introduction to the different cases

This section of the analysis is intended to set up the context of the different cases of study. A preamble on the French administrative structure is proposed for the reader to understand the French specificities regarding local urban planning more easily. Then the 8 cases are introduced through the prism of climate actions. A portrait of the territories, the genesis of the climate initiatives in these territories, a brief introduction of the current PCAET, and a structural presentation of the local authorities are offered as a way to introduce the cases.

It has to be noted that the typology every EPCIs falls into – pioneer, leader, follower, laggard - depends on both:

- When the EPCI started implementing climate-related initiatives at the local level, and how this starting date compares to most of the EPCIs of the same size
- Their current status in the production of climate plans (i.e., is there still an active, approved, and running PCAET on the territory ?)

1. Preamble: the French "millefeuille' and the intermunicipal cooperation

As of 1 March 2019, France had 34,968 municipalities, a figure that is decreasing due to the recent regrouping of local authorities. Besides, the country has 8,661 public establishments for inter-municipal cooperation (abbreviated as EPCI) for a total of 11,576 inter-municipalities, 104 departments as well as 13 regions. Between the different types of authorities, there are many cross competences, particularly regarding housing, town planning, and schools. (Vie Publique 2015)

Therefore, public establishments for inter-municipal cooperation (EPCI) are French administrative structures grouping together several municipalities to exercise some of their competences jointly. According to the law, on the French territorial "millefeuille," the EPCIs are responsible for carrying out the PCAET on the territory. The EPCI is the coordinator of the energy transition and is responsible for leading and coordinating the PCAET's actions on the territory. (Vie Publique 2015)

There are two types of EPCI. On the one hand, EPCIs with their own tax system, which can be either a metropolis, an urban community, an agglomeration community, or a community of municipalities exercise necessary competences laid down by law and optional competencies entrusted by the municipalities, within the framework of a "territorial project." On the other hand, EPCIs without their own tax system generally called "inter-municipal syndicates," are explicitly created to exercise certain powers. They are not concerned with the need to elaborate a PCAET. Only EPCIs with their own taw system have this obligation. (Vie Publique 2015)

The next table summarizes the number of EPCIs with their own tax system of each type on the French territory:

Metropolises	Urban communities	Agglomeration communities	Communities of municipalities
14	15	219	1018

Table 10 - Different types of EPCIs – Taken from Vie Publique website

The type of EPCI depends on the number of inhabitants in the urban area. A metropolis has more than 400,000 inhabitants, an urban community more than 250,000 inhabitants, an agglomeration

community, more than 50,000 inhabitants, and communities of municipalities have no population condition. Depending on the type, the EPCIs do not share the same responsibilities. There are indeed compulsory, optional, and elective competencies for every type of EPCI. Nevertheless, the responsibility of implementing a climate policy on the territory is the same for every type of EPCI. (Vie Publique 2015)

In the remaining of the thesis, distinctions between the EPCIs will be made when it will be necessary to put a focus on the different organizational strategies.

2. A metropolis: Bordeaux Métropole

FOLLOWER/LEADER

Bordeaux Métropole is an EPCI that brings together 28 municipalities in the Bordeaux conurbation, that spread over both banks of the Garonne River. It replaced the Bordeaux Urban Community (CUB) on 1 January 2015. The climate of the EPCI is of the Aquitaine oceanic type. (Bordeaux Métropole n.d.)

Figure 9 - Bordeaux Métropole location

Bordeaux Métropole has the ambition to be one of the first positive energy metropolis by the year 2050 in France. The first climate plan on this territory was published in 2011. At this time, the local authority was the Bordeaux Urban Community (CUB). The most recent plan from Bordeaux Metropole was published in 2017. The climate plan is entitled "Action plan for a sustainable territory with a high quality of life." This plan is not yet recognized by the State services. Regulatory requirements having evolved during the drafting of the plan, the metropolis had to review its copy to comply with the regulatory requirements. Nevertheless, the plan being three years old, it is in the process of being evaluated with a revision in sight. The 2017 plan is composed of a programming framework for the period 2017-2050, which provides a medium-term vision, and of a second part presenting a detailed action plan for the period 2017-2022. (Bordeaux Métropole 2017)

Figure 10 - Evolution of Bordeaux Métropole climate policies

Three strategic orientations are defined in the plan and declined into 12 goals. The three themes are the following:

- Accelerate the region's energy transition to make Bordeaux Metropole one of the first positive energy metropolises in 2050 (4 goals)
- Preserve and enhance 50% of natural, agricultural and forest areas (4 goals)
- Support all stakeholders towards the energy and ecological transition (4 goals)

(Bordeaux Métropole 2017)

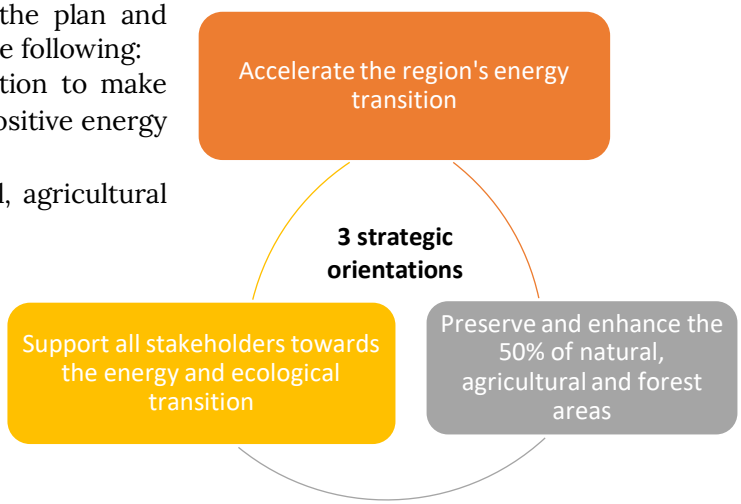

Figure 11 - Bordeaux Métropole's PCAET strategic orientations

Since 1 January 2016, Bordeaux Métropole has been organized into seven main directorates, the result of pooling with several departments of the city's municipalities. Four directorates are directly linked to the issues of energy and climate:

- Mobility ("Direction Générale Mobilités")
- High Quality of Life (« Direction Générale Haute Qualité de Vie »)
- Development of the territory ("Direction Générale Valorisation du Territoire »)
- Planning and development

Climate planning is the responsibility of the « Direction énergie, écologie et développement durable » department – inside the High Quality of Life Directorate. (Bordeaux Métropole n.d.)

3. A metropolis: Grand Lyon

GRANDLYON la métropole

LEADER

Located in the Auvergne-Rhône-Alpes region and north of the Rhône valley, the Metropolis of Lyon is made up of 59 municipalities with nearly 1.3 million inhabitants over 538 km². The territory is crossed by the Rhône river. Although it is mainly urban, the territory of the metropolis has 40% of natural and agricultural areas. (Grand Lyon n.d.)

Figure 12 - Grand Lyon location

In the future climate, an increase in the frequency and intensity of extreme events, particularly extreme heat, is expected in this area. The urban heat island effect linked to the minerality of the city multiplies the impact on the health of its inhabitants. Other vulnerabilities, such as atmospheric pollution, flooding, and water scarcity, are the main identified issues at the territorial level. (Grand Lyon 2019)

Grand Lyon's commitment to the Climate and Energy theme was first asserted through its Agenda 21, as early as 2005, focusing on the fight against the greenhouse effect. In 2007, Grand Lyon initiated the implementation of a first Climate and Energy Plan for its territory. Today, the metropolis is recognized at the national level for its partnership approach in the development and monitoring of its Climate and Energy Plan. (Grand Lyon 2019)

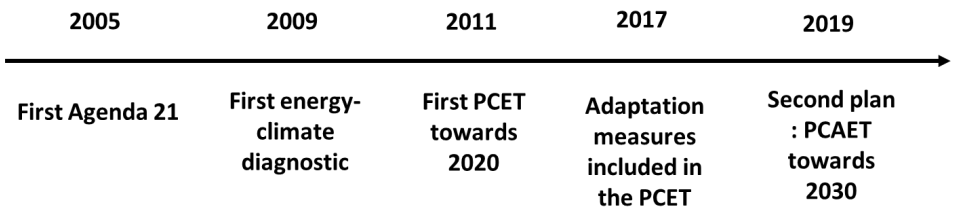

Figure 13 - Evolution of the Grand Lyon climate policies

The general objective of the last plan (2019) is to define a territorial strategy for 2030 and 2050 aimed at reducing the impact of the territory's activities in terms of greenhouse gas (GHG) emissions and atmospheric pollution while preparing it for the consequences of current and future climate change. To achieve this, the Metropolis and its partners are implementing an agenda of cross-cutting actions to control energy and develop local renewable energy sources to reduce the region's dependence on fossil fuels. The actions program of the last PCAET is structured in 5 strategic axes made up of 23 framework actions, which are themselves broken down into 238 actions concerning both the heritage and competencies of the Metropolis but also territorial actions that are engaging the entirety the territory actors. (Grand Lyon 2019)

The five strategic orientations are the following ones:

- All ordinary heroes (3 framework actions)
- An economy integrating the challenges of climate change (4 framework actions)
- A sustainability-based development (5 framework actions)
- A low-carbon mobility system (6 framework actions)
- A territory in connection with its resources (5 framework actions)

(Grand Lyon 2019)

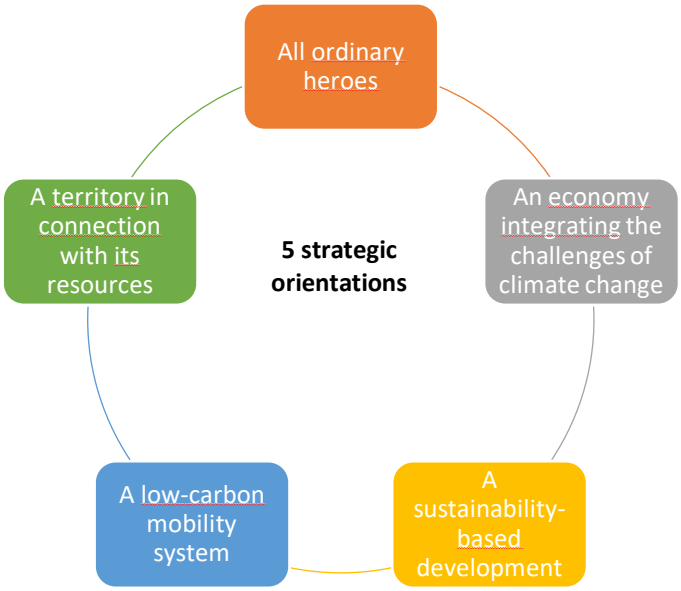

Figure 14 - Grand Lyon's PCAET strategic orientations

In terms of organization, the metropolitan administration is divided into five directorates, with one focusing on “Urban development and quality of life.” This directorate is divided into several departments which are: Resources; Land and real estate; Territorial strategies and urban policies; Urban project management; Urban management; Water and waste; Roads, nature, cleaning, and Territories Urban Services. These are the central departments that are dedicated to the issues relating to climate change. (Grand Lyon n.d.)

4. A metropolis: Grenoble-Alpes Métropolis

PIONEER

Grenoble-Alpes Métropole is a French metropolis, located in the department of Isère and organized around the city of Grenoble. With its 49 municipalities, the Grenoble metropolis is the second most populated inter-communal area in the Auvergne-Rhône-Alpes region. It is the largest European metropolis located in the heart of the Alpine massif. At the crossroads of France, Switzerland, and Italy, it represents a privileged location at the heart of the Rhône-Alpes region by having an exceptional mountain environment. (Grenoble-Alpes Métropole n.d.)

Figure 15 - Grenoble-Alpes Métropole location

Because of its geographical location, at the heart of three major mountain ranges, the Grenoble area is particularly sensitive to climate change. The impacts of climate change are now clearly perceptible, both in urban areas (heat islands, heat waves, natural hazards, etc.) and in mountainous areas (rising temperatures in spring and summer, increasing scarcity of snow at mid-altitude, increasing water deficits). Besides, as in many densely populated French and European cities, and because of its singular geographical configuration, the population of Grenoble is particularly exposed to air pollution. (Grenoble-Alpes Métropole 2019)

Regarding climate planning, in 2005, Grenoble-Alpes Métropole was the first city in France to adopt a Climate Plan. This decision demonstrated the EPCI awareness of climate risk and its pioneering willingness to act. A Climate Plan Observatory was also created in 2005 to monitor changes in energy consumption, greenhouse gas emissions, and the production of renewable energy in the territory. (Grenoble-Alpes Métropole 2019)

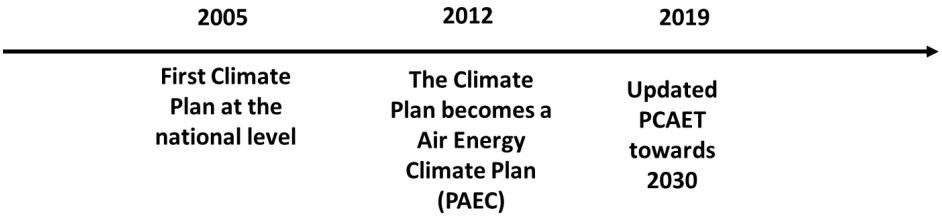

Figure 16 - Evolution of Grenoble-Alpes Métropole climate policies

Since then, the Metropolis continuously updated its climate plans and became involved in several initiatives aiming at including the ecological preoccupations in the EPCI roadmap. The strategic vision defined in this new plan presents a trajectory towards 2030, with a crossing point in 2026, which will be the year the plan's evaluation.

Today, the new Metropolitan Climate Air Energy Plan (PCAEM) adopted in 2019 is the territory's 2020-2030 roadmap. Between 2020-2030, Grenoble-Alpes Métropole is committed to mobilizing itself and the local players around an action plan structured around five orientations:

- Adapting the territory to climate change (4 goals)
- Tackling air pollution and reducing greenhouse gas emissions (7 goals)
- Developing our resources to reduce our carbon footprint and store CO2 (8 goals)
- The need for collective mobilization (7 goals)
- An exemplary metropolis (2 goals)

(Grenoble-Alpes Métropole 2019)

Grenoble-Alpes Métropole is organized into seven main directorates. Several directorates are directly linked to the issues of energy and climate, such as the Mobility and public space and the urban planning directorate. Nonetheless, the directorate in charge of the elaboration and monitoring of the plan is the Territorial Coherence one. Inside this directorate, the Environmental Air Climate Service is the service responsible for the plan. (Grenoble-Alpes Métropole n.d.)

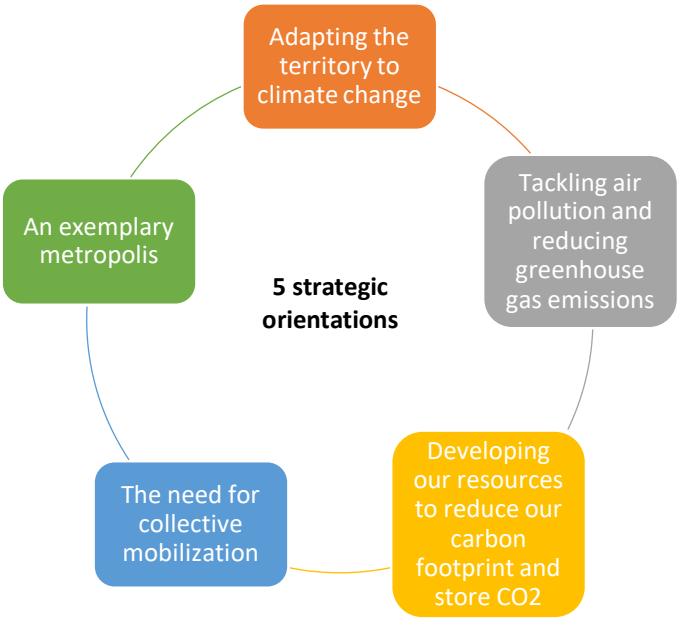

Figure 17 - Grenoble Alpes Métropole's PCAET strategic orientations

5. A community of municipalities: Ile de Noirmoutier

FOLLOWER

The "Communauté de Communes de l'Ile de Noirmoutier" is made up of four municipalities, from south to north: Barbâtre, La Guérinière, L'Epine and Noirmoutier-en-Île. The total population of the community of municipalities is of 9380 people and the EPCI covers an area of 48 km². The EPCI is located on an island in the department of Vendée and the Pays de la Loire Region.

Figure 18 - Ile de Noirmoutier location

Although it does not fall within the scope of the legal obligation of elaborating a PCAET, the island of Noirmoutier has volunteered to carry out this action in response to the expectations expressed. The project of elaborating a new climate plan aims at defining the environmental course of the island of Noirmoutier for the next 30 years and at proposing actions to reach it. The plan has been validated by the community council at the end of 2019. (Ile de Noirmoutier 2019)

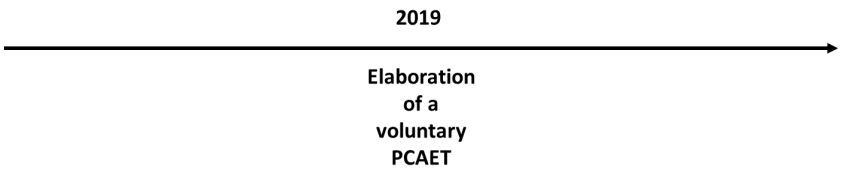

Figure 19 - Evolution of Ile de Noirmoutier climate policies

In this plan, 16 actions are presented through 8 strategic orientations:

- An island that favours soft mobility
- An island that encourages the adaptation of buildings
  An island that takes climate change into account in its development
- An island that develops a healthy and local diet
- An island adapting its local economy
- An island where water is a precious resource
- An island producing renewable energy
- An island mobilized

(Ile de Noirmoutier 2019)

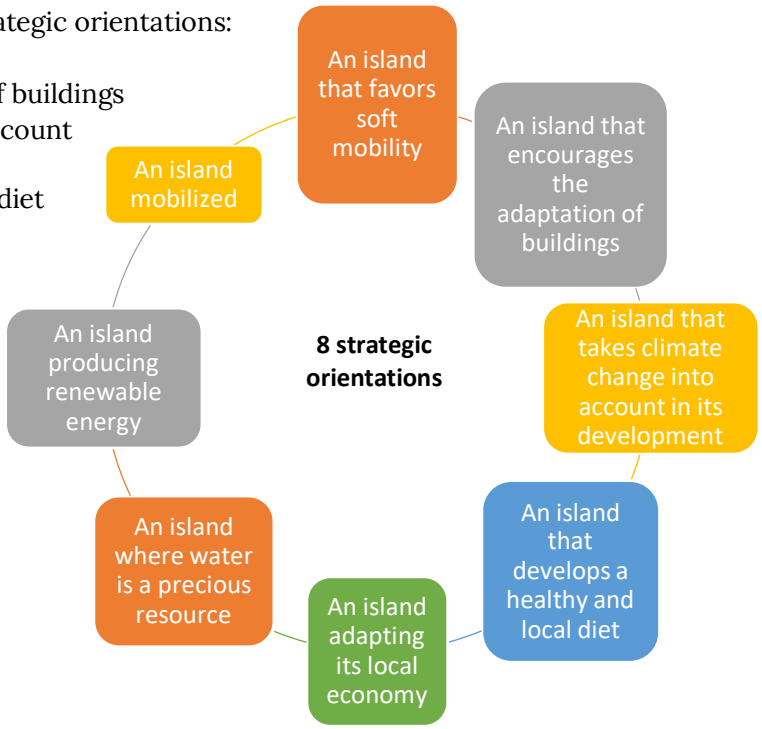

Figure 20 - Ile de Noirmoutier's PCAET strategic orientations

When looking at the EPCI's organization, there is a specific directorate that looks into the issues of energy and climate: the Environment and urban planning Directorate. Inside this directorate, there are three departments: the Territorial Environment department, the Urban planning and territorial projects department, and the Living Environment department. (Ile de Noirmoutier 2019)

6. A gathering of 3 communities of municipalities: Pays Midi Quercy

PAYS MIDI-QUERCY LEADER

The territory of the Midi Quercy region includes 49 municipalities grouped into three inter-municipalities, two of which are subject to the obligation to carry out a PCAET. The last local authority is not legally required to draw up a PCAET.

The vast territory of the Midi Quercy extends over 1,223 km² to the east of the Tarn-et-Garonne department, with one commune (Montrosier) located in the Tarn department. It is a very contrasted territory: the western sector is experiencing urbanization pressure, especially in the green Quercy Aveyron. While the eastern part, with a rich natural environment, is less anthropized. (Pays Midi-Quercy n.d.)

Figure 21 - Pays Midi-Quercy location

In the future climate, an increase in the frequency and intensity of extreme events, particularly intense rainfall, is expected. This climate change has consequences on the vulnerability of the territory by making water resources and biodiversity more fragile, increasing health risks, accentuating natural risks linked to flooding in particular, and the vulnerability of the agricultural

economy, which occupies 80% of the territory. The three communities of communes have entrusted the PCAET competence to the territorial and rural balance centre (PETR) Pays Midi Quercy at the territorial scale of the territorial coherence scheme (SCoT). (Pays Midi-Quercy 2019)

For the Pays Midi Quercy, the energy issue has become, since 2004, an essential part of their concerns. This concern has been materialized through the development and implementation between 2006 and 2009 of an energy plan and then, from January 2010, of a territorial climate and energy plan. Today, The Pays Midi Quercy aims at becoming a positive energy territory (TEPOS) and at producing more energy than it will consume (107%) in 2050, which implies very significant reductions in energy consumption, and to cover all needs through the production of renewable energy (RE). The entirety of the last PCAET fits into this strategy of becoming a TEPOS. Therefore, in the 2019 plan, the reduction in energy consumption, pollutant and GHG emissions, and renewable production are thus defined to follow a trajectory that makes it possible for the territory to reach the TEPOS objective in 2030 and 2050. (Pays Midi-Quercy 2019)

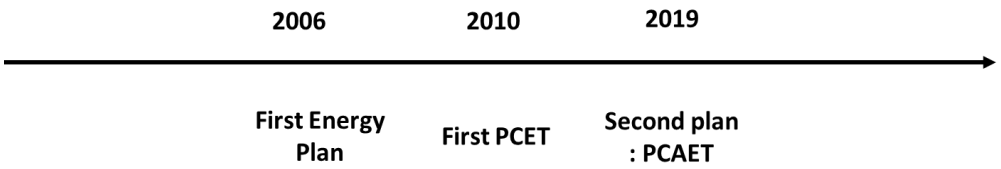

Figure 22 - Evolution of the Pays Midi-Quercy climate policies

Seven strategic orientations are defined in the plan and declined into 45 actions. The seven themes are the following:

- Coordination of the energy transition (8 actions)
- Reducing consumption and GHG emissions in the building sector (6 actions)
- A more sustainable mobility (10 actions)
- Locally beneficial investments in renewable energies (9 actions)
- A more sustainable agriculture and food model (6 actions)
- The need to boost forest management (3 actions)
- The fight against the production of waste and the improvement of waste collection and recycling (3 actions)

(Pays Midi-Quercy 2019)

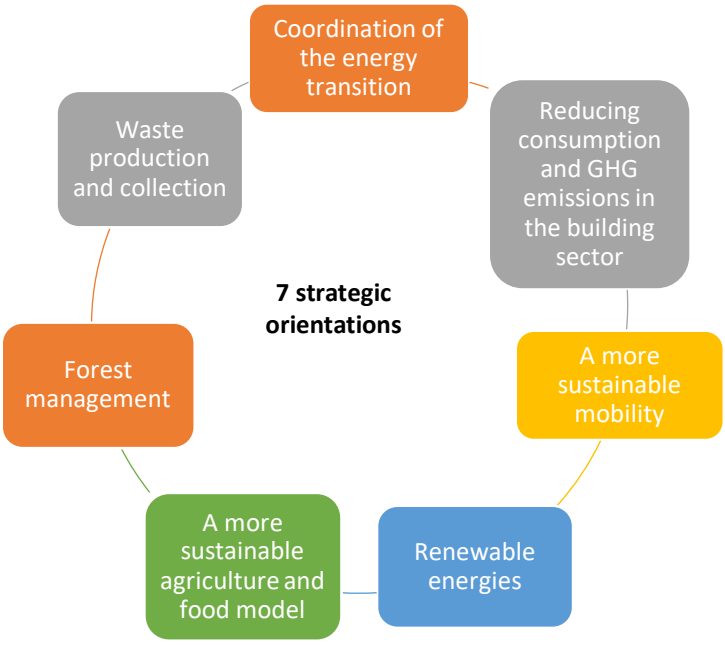

Figure 23 - Pays Midi-Quercy's PCAET strategic orientations

In terms of organization, a team of 19 people works for the Pays. It develops actions in various fields that are structured around specific missions: energy transition, culture, heritage, tourism, habitat - living environment, employment, agriculture, and communication. Regarding climate change, there is a specific officer in charge of the climate plan. (Pays Midi-Quercy n.d.)

7. An urban community: Grand Poitiers

FOLLOWER

Grand Poitiers is a French urban community, located in the Vienne department in the New Aquitaine region. Located in the centre of the Vienne department, the urban community of Grand Poitiers groups together 40 municipalities and covers an area of 1,064.7 km² with a population of 191 791. (Grand Poitiers n.d.)

Figure 24 - Grand Poitiers location

In 2010, Poitiers city decided to launch a new local Agenda 21, incorporating the regulatory obligation stemming from the Grenelle Environment to draw up a Territorial Climate and Energy Plan (PCET). This first draft of a Climate Plan was then included in the Agenda 21 action plan, which was published in 2013. In 2015, this climate plan was improved with a new version, and a proper standalone plan was drafted. Finally, in 2017, to follow the new regulations, the last PCAET from Grand Poitiers was elaborated jointly with an energy master plan for the territory. This plan was adopted in December 2019. (Honoré 2020)

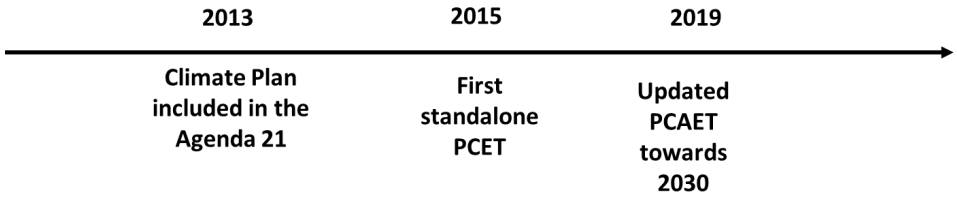

Figure 25 - Evolution of the Grand Poitiers climate policies

The Grand Poitiers PCAET includes the following main objectives for 2030: a 25% reduction in energy consumption (which translates into a 34% reduction in GHG emissions linked to this consumption) and a 260% increase in renewable energy produced. Eight strategic orientations are defined in the plan and declined into 126 actions. The seven themes are the following:

- Deploy and promote public transportation and soft modes (53 actions)
- Build an energy and space-efficient territory (8 actions)
- Reduce and recover waste (15 actions)
- Develop renewable energies (8 actions)
- Adapt the territory to the consequences of climate change (13 actions)
- Raise awareness and support local stakeholders (13 actions)
- Seek the exemplarity of the EPCI (11 actions)
- Manage the energy transition (5 actions)

(Grand Poitiers 2019)

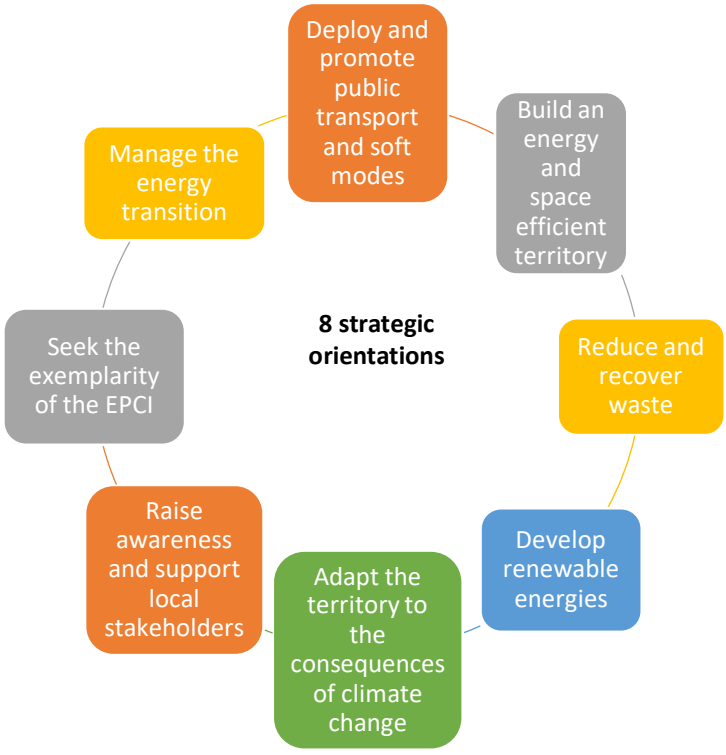

Figure 26 - Grand Poitiers' PCAET strategic orientations

Regarding the urban community's organization, the main directorate in charge of the energy and climate-related issues is the Energy Transition directorate. Inside this directorate, the "Energy – climate" service is the service in charge of the climate plan elaboration. Other directorates such as the Public space – Quality of Life and the Urban Project ones are also concerned by the issues mentioned in the climate plans. (Honoré 2020)

8. A metropolis: Tours Métropole Val de Loire

LAGGARD

Situated in the center of the Indre-et-Loire department, the Tours Métropole Val de Loire EPCI groups together 22 municipalities and covers an area of 389.2 km with a population of 299 177 inhabitants. (Tours Métropole Val de Loire n.d.)

Figure 27 - Tours Métropole location

Regarding climate initiatives, the Metropolis, named Tour(s) Plus at the time, had already implemented a climate plan for the period 2011-2014 to reduce CO2 emissions by 20% by 2020 compared to 2008. Between 2011 and 2014, 56 concrete actions had been defined to help reduce greenhouse gas emissions in the territory. A mid-term review was carried out in November 2012. This plan ended in 2015 without any evaluation of the actions implemented. (Tours Métropole Val de Loire n.d.)

Today, the Metropolis currently has no roadmap for implementing a climate plan, which is a regulatory obligation for the EPCI since 2016.

In the EPCI, several directorates are directly linked to climate and energy issues such as the Quality of Life Directorate and the Land-use Planning Directorate. There is even a Sustainable Development Department inside the Quality of Life Directorate. (Tours Métropole Val de Loire n.d.)

9. A community of municipalities: Vienne et Gartempe

FOLLOWER/LAGGARD

The Vienne et Gartempe EPCI covers just over a quarter (28%) of the surface area of the Vienne department over 1988.3 km² between Poitiers and Limoges. This rural EPCI welcomes a stagnating and ageing population of 41,031 inhabitants heterogeneously dispersed over 55 municipalities. This area is characterized by the predominance of the agricultural sector (goat breeding and cereal production). It has a strong tourist potential (green tourism) due to its rich landscape and heritage. (Vienne et Gartempe n.d.)

Figure 28 - Vienne et Gartempe location

In the future, the territory will mainly face increasing temperatures, heatwave, and water scarcity that will lead to a decrease in crop yields and higher mortality rates during the summer seasons. (Vienne et Gartempe 2019)

The EPCI just acquired in 2018 the responsibility of elaborating a PCAET for its territory. On the 9 January 2019, the Community of municipalities officially launched the development of its Territorial Climate Air Energy Plan. The diagnostic was made during the first months of 2019, while the strategy and the actions have been defined until September 2019. Finally, in the last months of 2019, the plan has been validated by the community council. (Vienne et Gartempe n.d.)

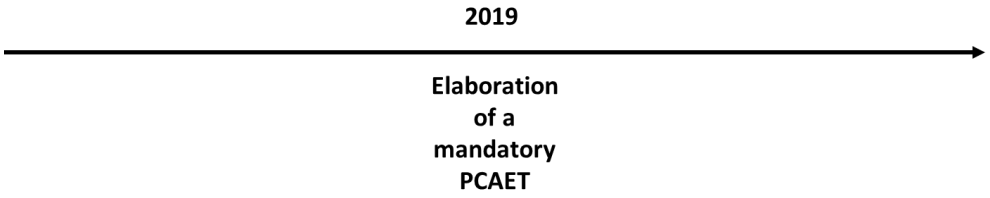

Figure 29 - Evolution of Vienne et Gartempe climate policies

In the PCAET, five strategic orientations are defined and declined into 40 actions:

- Animation, governance, and communication (3 actions)
- Living and working in healthy and economical buildings (9 actions)
- Using our resources to produce and consume energy locally (7 actions)
- Moving around more soberly on our territory (7 actions)
- Sustainable management of the natural resources on our territory (14 actions)

(Vienne et Gartempe 2019)

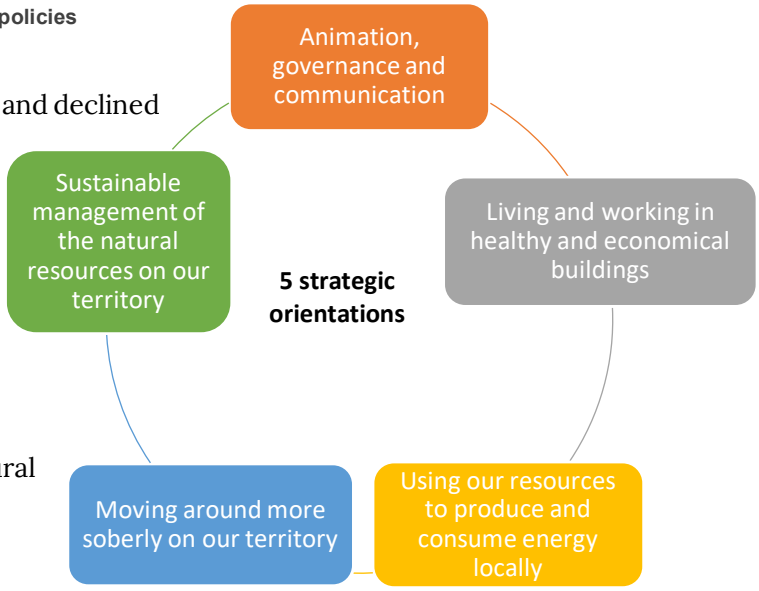

Figure 30 - Vienne et Gartempe's PCAET strategic orientations

Regarding the EPCI's organization, the Land Planning Department is in charge of all the environmental issues, especially the implementation and monitoring of the PCAET. (Vienne et Gartempe n.d.)

10. Summary

The paragraphs above presented the 8 cases that will be analyzed in the thesis. The following figure synthesizes the state of advancement of the different EPCIs studied.

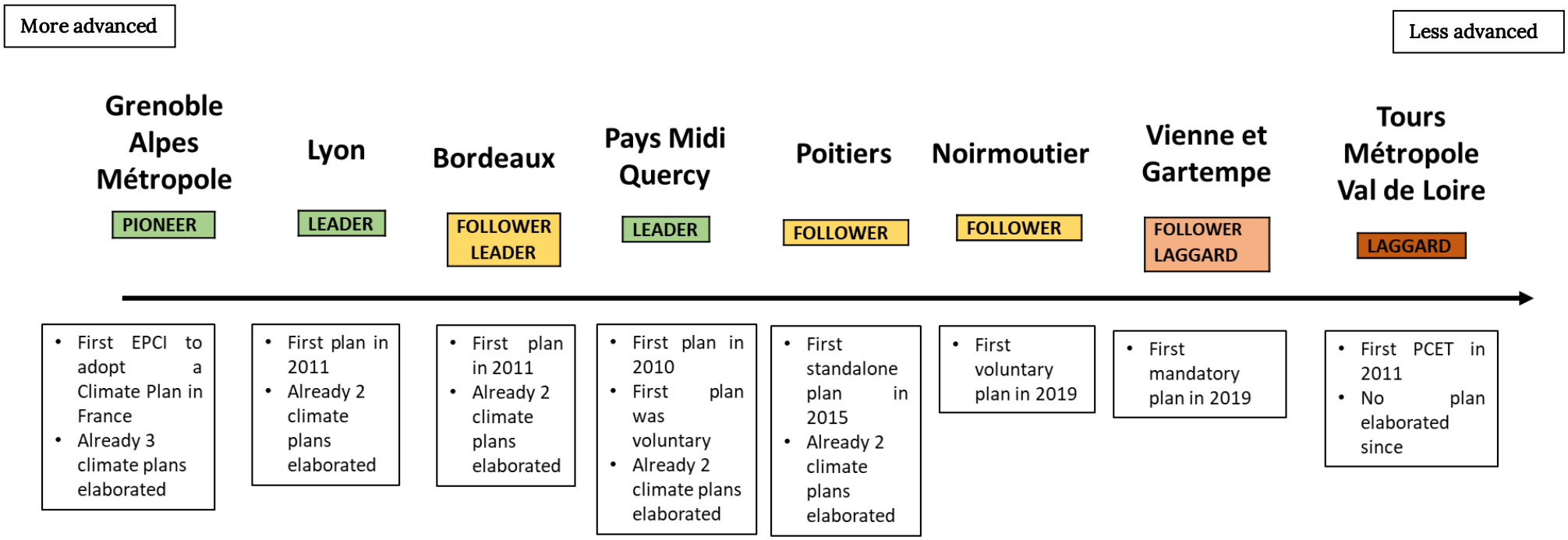

Figure 31 - Cases summary

B. General overview of the systems of actants

The analysis will take a look at the relationships between the different actants, which are all motivated by the same objectives: elaborating a PCAET, implementing the initiatives, and monitoring the actions carried out. In the analysis, SWOT diagrams will allow for an understanding of the dynamics taking place between the different actants.

The actor-network theory will provide the framework for this analysis, as mentioned in the Theory and Methodology chapters. The analysis will describe the different systems of actants. However, it will also break down the chain of translations in the processes mentioned before to identify successes, barriers, and levers in each of the sequences of the translation processes. The analysis of the different PCAETs and interviews with climate planners have made possible the identification of several sub-systems of actors that are all involved in the elaboration, implementation, and monitoring of a PCAET. These different sub-systems will be elaborated on in the next sections.

The next figures aim at simply summarizing the different actants, found in the planning documents, that will be studied in the remaining of the thesis. The PCAET will be considered, in the analysis, as the central actant of the main network, all actors working towards its success.

Public actors, private interests, and the citizens are the three main human actants in the identified system of actors. Other actants, such as financial resources or specific climate projects, for example, are also actants that are involved in the process of climate planning. Those "not-actors" actants are not represented in the figure below, but they will be included in the dedicated analysis sections.

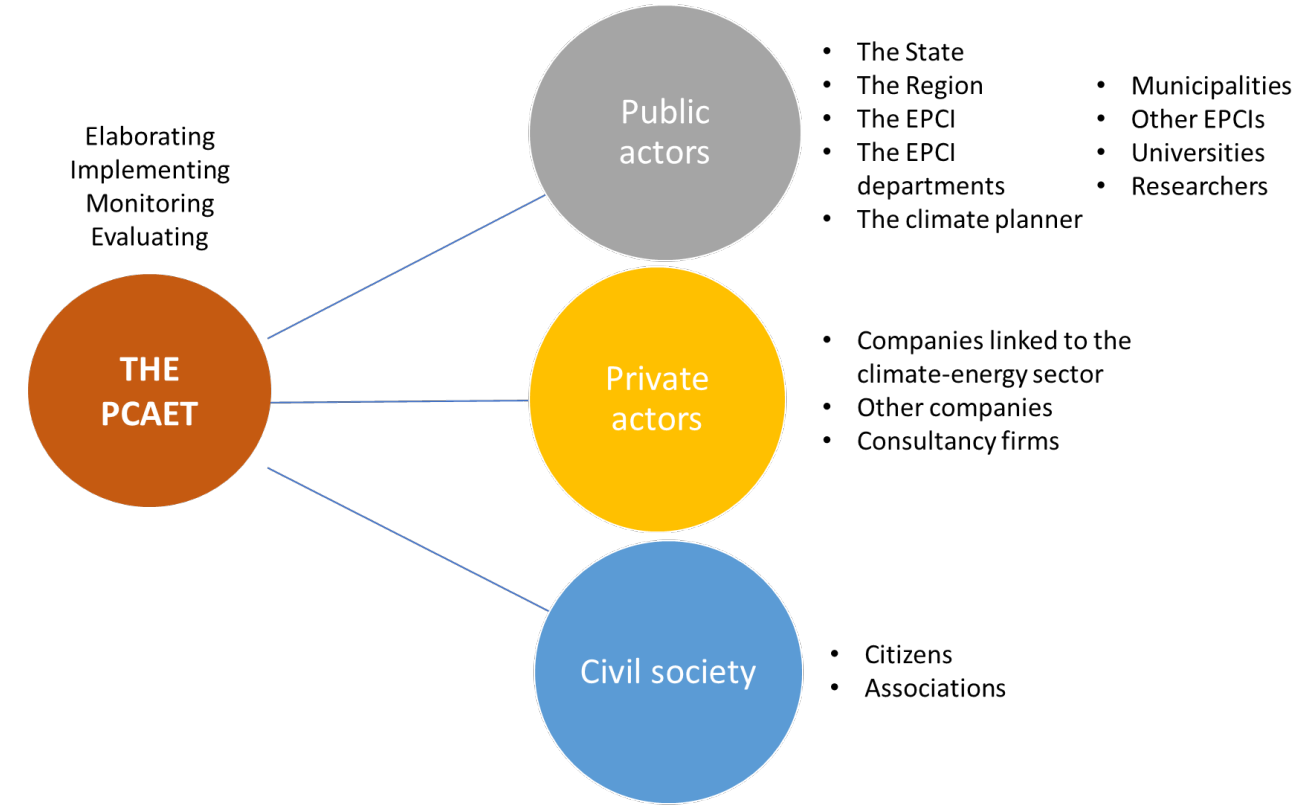

Figure 32 - General map of the PCAET actors

C. Public actors in planning for the PCAET

1. Mapping of the actors

Public actors are essential actants identified in the different processes involving the PCAET. When investigating the eight different cases, the public actors appear to be of different types: the State, the Region, the EPCI (including the climate planner him/herself, the different departments working towards climate abatement, and the elected officials) and the municipalities (elected officials included).

These are the actants that are direct members of the hierarchical governance structure instituted since the decentralization happened in France. Even if not equally involved in the different processes, every EPCI (having a PCAET at the time this thesis is written) had those actors included in the different phases. Other essential actors are also identified, but not included in the processes for every EPCI. For example, actors such as universities, researchers, other EPCIs, public associations, and the ADEME are also involved in some EPCIs.

Actors involved in every EPCI	Actors not involved in every EPCI
State	Universities, researchers
Region	ADEME
EPCI (departments and climate planner)	Other EPCIs
Municipalities	

Table 11 - Public actors involved

2. Dynamics between the actants

Between the state and the EPCI: a regulatory "contract" based on hierarchical upscaling

The climate plan constitutes a 'procedural' public action mechanism. Indeed, the state formulates requirements, written in the law, imposing a rigid framework for the EPCI. What the PCAET should contain is imposed by the law. Nevertheless, there are no predefined goals to reach imposed by the State. The EPCI can choose itself the strategy that the territory will follow in the years to come. They are free to elaborate the actions of their choice, but the perimeter and the structure of the plan are imposed. For instance, the content of the diagnosis and the themes of the strategic objectives are mentioned in the legal texts. There are nevertheless no specific tools or specific methods that are imposed by the government.

This regulatory contract between the state and the EPCI goes back to 2016. Several steps, made by the State, intended to frame the elaboration of the plans progressively. Indeed, the Decree No. 2016-849 of 28 June 2016 on the territorial climate-air-energy plan specified what the PCAET must contain and how it has to be developed and publicized (French Parliament 2016a). Then, the order from the 4 August specified the sectors of activity which must be taken into account in the plan and the list of data to be uploaded to the plan resource centre and how to submit them (French Parliament 2016b). Later in 2016, new decrees specified that the PCAET should be subject to an environmental evaluation. The latter has to be built iteratively as the climate plan is progressively developed.

The stance of the State evolved, as time went by, regarding the PCAET. Before 2016, EPCIs were left without any guidelines regarding how the plan should be elaborated and evaluated. Pioneers and followers EPCIs that created their first plans before 2016 all already had different strategies regarding how the plan had to be created. Therefore, those starting early had to adapt the way

they operated to the new "regulatory' contract that the state enforced on the EPCI. This is an example of what Kern calls *hierarchical upscaling* (Kern 2019). Laggards now have to comply with the minimum standards which are set by the state. As mentioned in the theory chapter, this type of upscaling is valuable because it gives the opportunity of differentiated approaches for the late EPCIs.

Interviews with the different EPCIs emphasize this distinction between the "latecomers" and the others.

For large EPCIs being experienced with climate plans, this framework imposed by the state can quickly become a burden. Indeed, some EPCIs already put in place a functioning strategy of elaborating the plan before the different decrees were adopted. While recognizing that a common framework for all EPCIs helped to structure the different steps of the processes, large pioneers and followers EPCIs pointed out the constraining aspect of these regulations. Some of these EPCIs also question the utility of some of the regulatory obligations imposed by the state. The environmental evaluation is, for instance, a moot point, often mentioned as useless by some EPCIs. They also mention that adding more and more layers of reglementary constraints, with a fixed amount of resources, makes it difficult for the EPCI to provide good quality action plans in a minimal amount of time. Dedicating more and more time to the elaboration of the plan also gives less time for the implementation phases.

For instance, Bordeaux Metropole, found itself restricted by the evolution of the regulatory requirements. As of today, their climate plan is still not recognized by the state services because they started to draft the plan before two main elements - that are the environmental evaluation and the public consultation - were added to the legal texts. Therefore, Bordeaux Metropole adopted their plan at the level of their community council but had to revise it shortly after because of the evolution of the law. As a consequence, the plan is still under instruction by the State services. This example points out the difficulties that already large and advanced EPCIs faced these last few years. They had to consistently adapt the form and the content of their plan to match the fast-evolving requirements from the State. (Mejri 2020; Ponsard 2020; Fouvet 2020)

The small latecomers EPCIs interviewed, that must draft a climate plan since 2018, are unanimous towards this regulatory contract from the State. Because they have no experience in drafting such plans, the relatively detailed decrees helped them very much in structuring their strategic and action plan sections (Colin 2020). This contract acts as a passage point, as ANT theorists would call it. It has become an institutional tool that turned out to be essential for an extended rollout of climate plans across the French territories. Some of the EPCIs even pointed out that these decrees could have been even more precise in terms of content and methodology. For the State, the law is a way to enrol and mobilize the main local public actor. Indeed, ANT authors explain that actors build their role in a sort of division of tasks, which makes it possible to consolidate the relationships and to root the mobilization of the actors. This is how this regulatory contract works, binding the EPCI to work towards a specific goal with predefined content. (Theories A.)

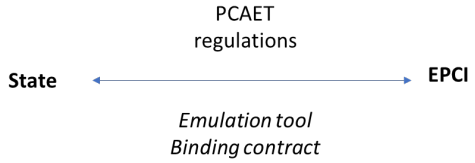

Figure 33 - Relationships between the State and the EPCI

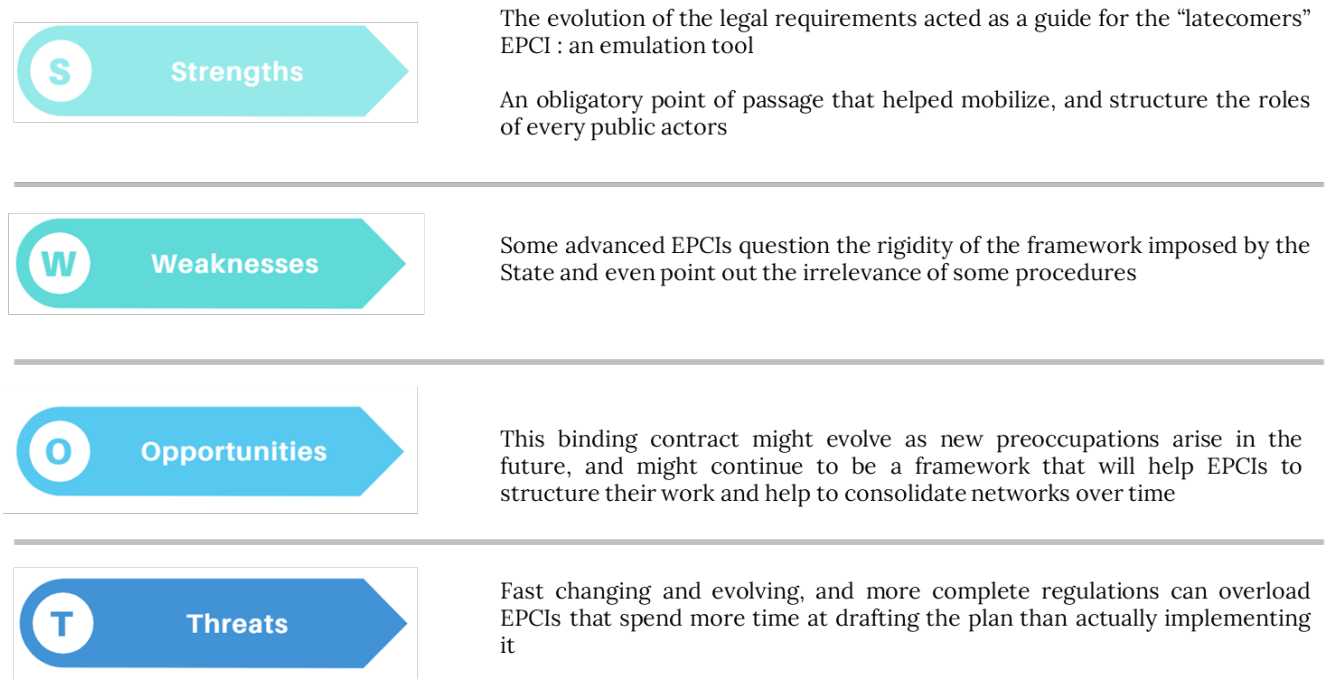

Figure 34 - Between the State and the EPCI / SWOT Diagram

The ADEME: pushing the EPCI towards improved climate action through the CIT'ERGIE initiative and calls for projects

The French Environment and Energy Management Agency is better known by its acronym "ADEME." Since its creation in 1991, it has been in charge of the implementation of environmental protection, sustainable development, and energy policies in France. Its scope of action covers a wide range of areas such as waste management, soil pollution, transport, or air quality. This organization is not a classic administrative authority since it is considered to be a public establishment of an industrial and commercial nature. This institution is therefore placed under the supervision of three distinct French ministries: the Ecology, Energy, and Research Ministries. (ADEME, n.d.)

Regarding the implementation of climate plans, the ADEME brings methodological support to the EPCI that are constructing their plans. Through a voluntary engagement, EPCI can become involved in the "Cit'ergie process." This process is a governance tool that can help structure the EPCI's energy and climate strategies. It enables them to get ready to take up new challenges, in particular the ones of moving from experimentation to the massification of actions in order to reduce energy consumption significantly. (Cit'ergie n.d.)

Concretely, the ADEME accredits a Cit'ergie advisor who will support the EPCI and will guide them towards a project mode organization. The advisor will provide guidance and identify strengths and margins for progress. He or she will help the EPCI develop its policy program but will also help them evaluate the implementation of its policies. An EPCI engaged in the Cit'ergie initiative will have to follow iterative steps every four years:

1) Organization in project mode with an elected referee, a project manager, a transversal working group and a steering committee
2) Diagnosis of the territory
3) Definition of the energy-climate policy
4) Implementation and Monitoring of the results
5) Labelling earned for four years

After the 4-year circle, a Cit'ergie auditor controls and reports back to the National Label Commission. These steps match the steps enforced by the regulation regarding PCAET. The EPCI can then get three different levels of labels depending on the score they get. (Cit'ergie n.d.)

This intervention in the ADEME would constitute a mutual engagement based on a contract. On the one side, the EPCI commits to implement the management and monitoring measures for climate-air-energy policies and the Cit'ergie label within its EPCI, by deliberating and recruiting a Cit'ergie advisor. On the other side, the ADEME undertakes to provide financial assistance for the support of a Cit'ergie adviser whose role will be to develop the program's tools inside the EPCI. This contract works the same way as the one between the EPCI and the State, the difference being that this engagement is voluntary.

In the eight selected cases, not every EPCI is involved in the Cit'ergie process. While some of them have been active for several years in the process, a few either do not know this initiative or are not interested in getting involved at the moment. Most of the large leaders and some followers are labelled at the higher levels, and it becomes a way for them to get credit for their actions towards climate abatement. (Bordeaux Métropole 2017; Grand Lyon 2019; Grenoble-Alpes Métropole 2019) The EPCIs involved in the Cit'ergie process agree that the available advisor was a significant asset when they started the process of elaborating climate plans. The advisor gave them specific methods, and organizational advice to start their plans. By instituting an elected referee, a project manager, a working group, and a steering committee, it helped to shape the organizational structure of the EPCIs. (Mejri 2020; Ponsard 2020; Fouvet 2020; Honoré 2020)

Aside from the help of a Cit'ergie advisor, the ADEME also proposed different initiatives that help to start the work for some EPCIs. The Midi Quercy Pays started their climate initiatives by signing a climate objectives contract with the ADEME. This binding contract provided financial aid to impulse the first climate objectives of the territory. Ever since, the EPCI has signed territorial contracts with the ADEME, still following the same path. Through this system of renewed contracts, small EPCIs can effectively launch a PCAET. In those cases, it appears that the ADEME acted out as a necessary catalyst. (Pays Midi-Quercy 2019; Berthelot 2020)

All the EPCIs interviews, at some point, responded to specific calls for projects that were financed partly from the ADEME. The Region and the State sometimes abound these amounts on specific projects. More specifically, the ADEME is recognized by some EPCIs as a project initiator. (Mejri 2020; Ponsard 2020; Fouvet 2020; Honoré 2020; Berthelot 2020) By providing specific knowledge about cutting edge innovations and strategies, they are a resource for the EPCI, as well in terms of finance than in terms of knowledge.

As financiers of actions, public actors such as the State or the ADEME can, therefore, accompany both technically and financially some projects related to climate, air, and energy. They act as both developers of strategies and coaches of initiatives by launching Calls for Projects on specific themes.

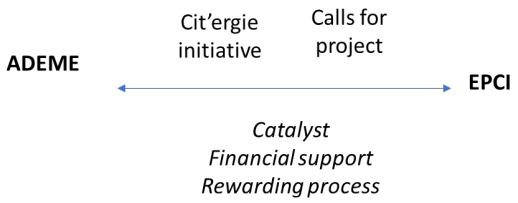

Figure 35 - Relationships between the ADEME and the EPCI

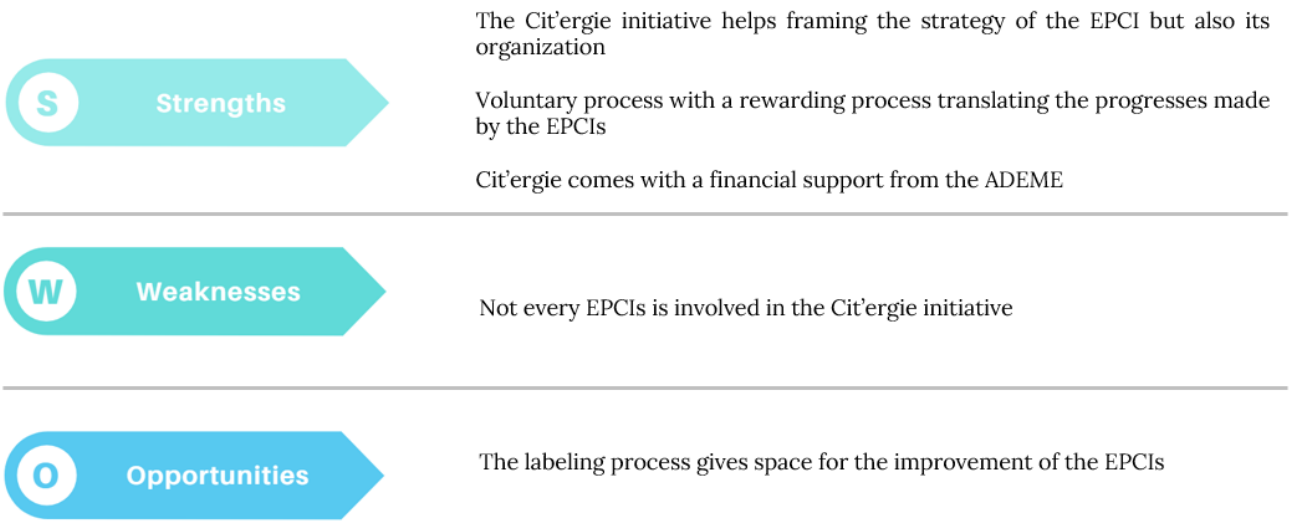

Figure 36 - The ADEME / SWOT Diagram

The articulation between the PCAET and the other planning documents

Actants in an actant-world can sometimes be non-human elements (Theories A.). In the French planning organizations, the PCAET must be correctly positioned with the different planning documents at the local, regional, and national levels. These planning documents can either be planning documents linked to air quality, linked to climate-air-energy planning or more general urban planning documents. They are established at different levels of the French organizational structure.

The interactions between these different planning documents can be of different types. First, the PCAET must sometimes just be *compatible*, in order words, not in contradiction with the options set up with other planning documents. Secondly, the PCAET sometimes has to *take into account* other planning documents. It means that it must not ignore or stray away from the fundamental objectives and orientations of these documents. For example, the PCAET must be compatible with the PPA (Atmosphere protection plan) at the EPCI level or the SRADDET (Regional Plan for Town and Country Planning, Sustainable Development and Territorial Equality) at the regional level. It also has to take into account the objectives of the SCoT (Territorial Coherence Scheme) at the EPCI level and Low-Carbon strategy at the national level. Globally, the PCAET is in direct or indirect relationships with nine other planning documents. The following figure summarizes this tangled web of planning documents.

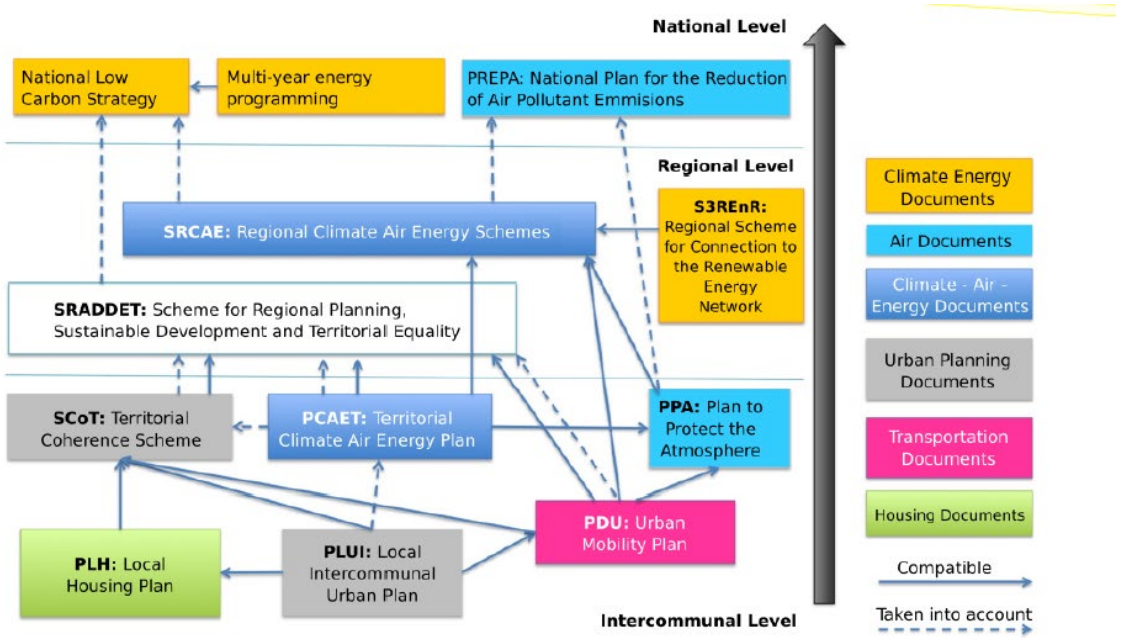

Figure 37 - The tangled web of French planning documents (Molina et al. 2018

This large amount of planning documents linked to each other provides *additional difficulties* in the elaboration of the plans as a lot of specific elements have to match each other at the EPCI level but also in coordination with the planning documents at the national and regional level. (Mejri 2020; Ponsard 2020; Honoré 2020; Fouvet 2020) This tangle of different strategies is a case of what Kern would call vertical upscaling (Theories C.1.). The local strategies depend on national and regional strategies with regulatory objectives that must sometimes match. Actions carried out at the national and regional levels help define strategies at the local level. While the multiplication of planning documents covering different themes at different levels can be challenging, it also provides incentives and a specific framework that can help frame the strategies at the EPCI level. These plans at the different levels act for some EPCIs as catalysts and facilitators in designing the path that the EPCI will follow in the years to come. (Mejri 2020; Ponsard 2020; Fouvet 2020; Honoré 2020; Berthelot 2020)

A specific initiative has been mentioned by some EPCIs during the interviews: *the SDE* (energy master plan). To optimize their energy mix and reduce greenhouse gas emissions from their territory, local authorities are now looking to act in a coordinated manner concerning energy production, distribution, and consumption. (Ponsard 2020; Fouvet 2020; Honoré 2020; Grand Lyon 2019; Grand Poitiers 2019; Grenoble-Alpes Métropole 2019) To do this, since 2015, an increasing number of territories have chosen to design an energy master plan (SDE). This is a voluntary approach that makes it possible to question in detail the local organization of the energy consumption and production system. Like the PCAET, the SDE contains a diagnostic, a strategy, and an action plan. (Grand Lyon 2019; Grand Poitiers 2019; Grenoble-Alpes Métropole 2019)

For instance, in the Grand Lyon, the last PCAET was built based on the energy master plan. This approach includes both the energy model of the territory, which has made it possible to make the scenario for 2030 and the strategy published in 2019 at the same time as the PCAET. The energy strategy is organized along three axes: demand management, energy production, and recovery, organization of the networks of renewable and distribution. It details 125 actions that are included in the PCAET. (Grand Lyon 2019)

The EPCIs interviewed mention that the SDE and the PCAET are complementary: the SDE can be used to supply the energy-climate component of a PCAET, while many PCAETs identify the implementation of an SDE in their action plan. Implementing an SDE before the elaboration of the

PCAET or during its elaboration allows for realizing a more in-depth and spatialized diagnosis than the PCAET and goes into a more well-argued strategy. The result is the definition of quantified objectives that are consistent with the technical and financial capacities of the actors. This work allows each person to identify his or her contribution to the effective implementation of an energy transition for the territory. It can serve as a baseline for identifying the major actors that need to be included in the different discussions. It will be easier to elaborate the PCAET after because organizational strategies will have already been identified to carry out the SDE.

Rydin puts words on this process. He explains the importance of material artefacts in network creation. He insists on the fact that policy documents are essential to bringing actors to work together. When the roles are not initially clearly defined, these material artefacts might be a way to define the relationships between actors accurately. More detailed policy documents might help to understand the changing roles of every actor. (Rydin 2013) This is what the SDE provided to those EPCIs.

To put it in a nutshell, the implementation of a SDE is a real exercise in detailed scenario writing and territorial energy forecasting that can help the elaboration of the PCAET by going more into details about the energy issues. Interviewed EPCIs agree that the added value sought for the SDE is both in the ability to structure projects with several actors and in the created strategy itself. (Grand Lyon 2019; Grenoble-Alpes Métropole 2019; Grand Poitiers 2019)

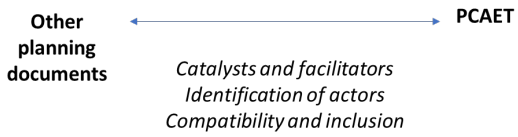

Figure 38 - Relationships between the PCAET and other planning documents

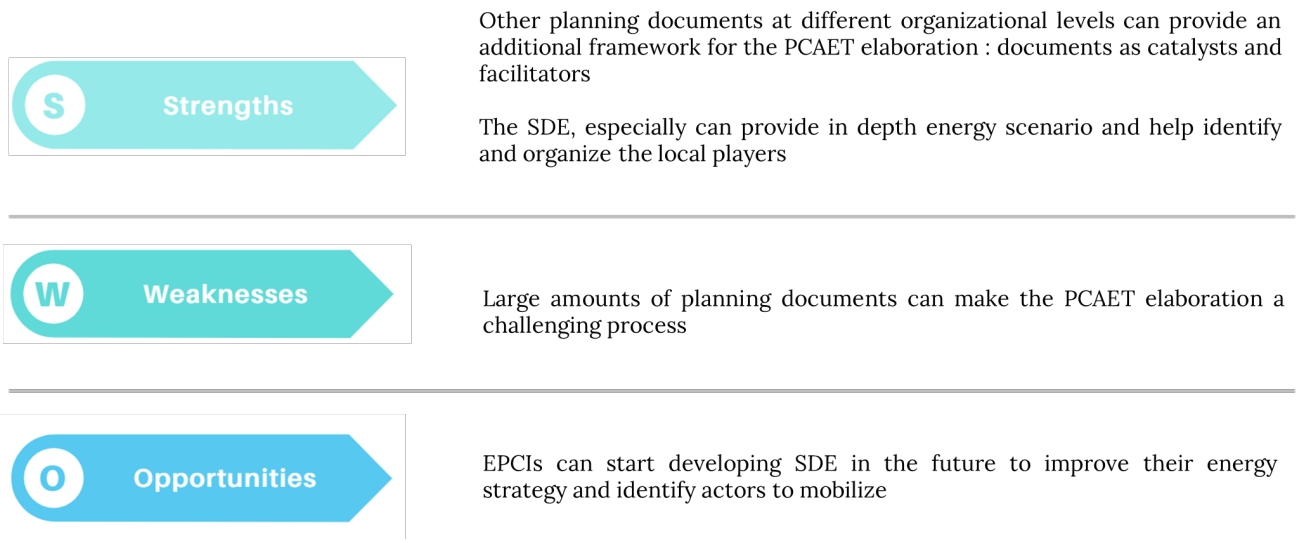

Figure 39 - Other planning documents / SWOT Diagram

The articulation between the PCAET and other initiatives of sustainable development

The PCAET can also be elaborated in parallel with other initiatives of sustainable development that provide insights for this process. This section is a selection of two initiatives that were either mentioned in some PCAET or during interviews.

The *Agenda 21* is an EPCI project that aims at taking into account the sustainable development in policies and programs of the EPCI. If an Agenda 21 already exists at the EPCI level, the PCAET allows making its "climate-air-energy" part more operational. For some EPCIs, the Agenda 21 was indeed the precursor of the PCAET and the first planning documents dealing with the issues of sustainable development at the local level. For EPCIs without a pre-existing Agenda 21, the PCAET can also be the first operational part of a future Agenda 21. (Mejri 2020; Honoré 2020; Grand Poitiers 2019; Bordeaux Métropole 2017)

Another initiative of sustainable development is the call for projects TEPCV. TEPCV stands for positive energy territory for green growth. In this initiative, the EPCI commits to reducing the energy needs of its inhabitants, buildings, economic activities, transport, and leisure activities. It proposes a global program for a new development model which is soberer and more economical. This is a voluntary initiative with a specific grant awarded. There again, this initiative can help to frame the strategy of the PCAET and be a catalyst towards developing the climate plan. Moreover, The TEPCV grant can be used for the implementation of the PCAET's actions. (Berthelot 2020; Pays Midi-Quercy 2019)

Other sustainable development initiatives can, therefore, act as a catalyst towards the realization of a climate plan, either by providing insights for the development of the strategy or by providing financial support. These other sustainable initiatives are more and more significant, and EPCI can more largely benefit from these, especially on specific issues that the EPCI needs to work on.

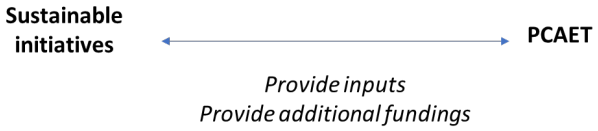

Figure 40 - Relationships between the PCAET and other sustainable initiatives

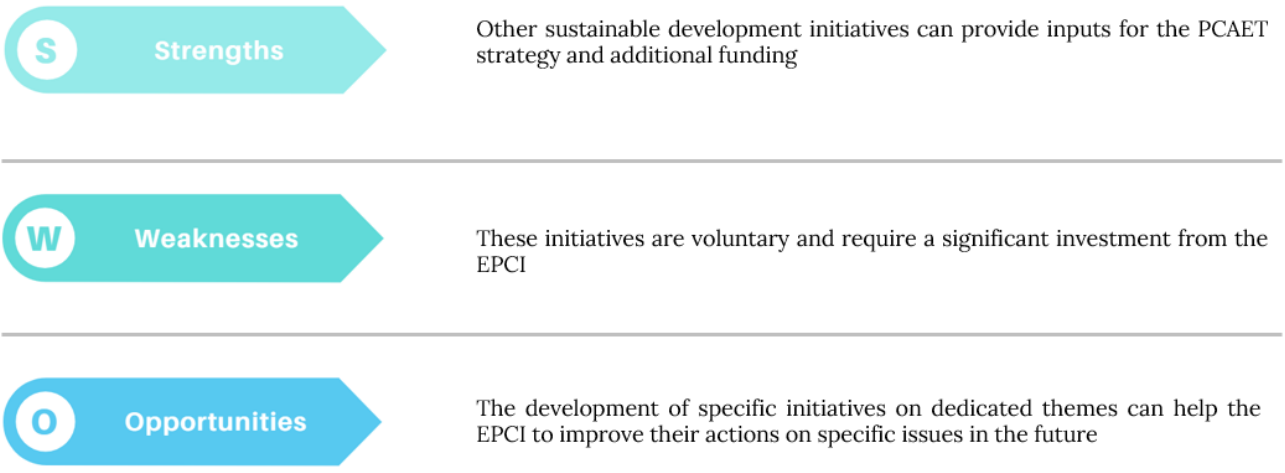

Figure 41 - Other sustainable initiatives / SWOT Diagram

Interdepartmental coordination

The sections above focused on non-human actants of the "PCAET actor-world." While these elements are essential and can frame the different steps of the life of a PCAET, human actors are also vital to the success of a climate plan. This section delves into the work that is done inside the EPCI to give birth to the PCAET.

According to the law, being the local authority, the EPCI bears responsibility for the elaboration, implementation, and monitoring of the PCAET. These new responsibilities have called for new organizational strategies at the internal level.

The way PCAET works called for specific management methods and new working practices. Large frontrunners EPCIs started very early to work in "project mode" with the different departments of the EPCIs. (Mejri 2020; Ponsard 2020; Fouvet 2020; Honoré 2020) As shown in Analysis A., in large EPCIs, many departments inside an EPCI are working with issues related to climate abatement. While there is a specific department dedicated to the elaboration of the PCAET, this process requires the investment of a lot of departments and the planners that work in them.

For the pioneers, the leaders, and some followers EPCIs studied, there is a culture of the energy transition that is anchored in the different departments. Climate planners argue that it is easy to work crosswise.

"There is no need to go and convince - people are already convinced – my colleagues are all aligned and convinced of the need to work together towards the same goals" (Mejri 2020) [2]

Still, some EPCIs point out that the silo-based vision is still important in large structures. As pointed out in the Theories (Theories C.), involvement from city planners can be lacking. It can require large amounts of work for the climate planner in charge of the PCAET to mobilize every agent. While sometimes the size of a city administration can prevent coordination between two departments, planners mention that if adequate cross-sectors structures are put in place, it can be easier to keep track of the different projects with a large-scale organization. (Mejri 2020; Ponsard 2020; Fouvet 2020; Honoré 2020)

Therefore, in the large leading EPCIs, there has been the creation of new bodies of internal actors, such as a steering committee or multidisciplinary working groups, which are *the formal modalities of exchanges*. These groups or committees are made up of agents of the different departments that can easily share information about the evolution of the different projects included in the plan. These committees are useful both in the elaboration phase (concertation with the different services on the strategy and the actions to carry out) and in the monitoring phase (the responsible agent shares information on the progress of the actions carried out). (Bordeaux Métropole 2017; Grand Lyon 2019; Grenoble-Alpes Métropole 2019; Grand Poitiers 2019) These groups of agents allow to raise awareness about the role of every department and to make sure that these issues are all taken into account in the different projects and policies. This is the example of the "unified" governance structure mentioned in the Theories Chapter (Theories C.) This internal governance structure, made up of several agents, allows for discussion, negotiation, monitoring, exchanges, and evaluation between the departments. When necessary, there are also informal exchanges between agents across departments.

It has to be noted that the creation of a structure that allows for exchanges between planners do not necessarily lead to a joint approach between the different teams. Planners have to work on subjects that are not necessarily their own as a group and it can sometimes lead to opposition between planners that do not have the same interests. The lack of knowledge and competences of some agents can make the process more difficult. (Fouvet 2020; Mejri 2020) As the Grenoble climate planner explains, "some climate planners still face walls in some departments." These working groups, nevertheless, allow for a discussion between those agents, which can make them more aware, competent, and able to work in a project mode.

[2] Originally in French: "Il n'y a plus besoin d'aller convaincre les collègues; ils sont déjà convaincus. Mes collègues sont tous alignés et convaincus de la nécessité de travailler en tant que groupe pour atteindre les mêmes objectifs."

In smaller EPCIs, there are fewer internal actors to include in the processes. In Midi-Quercy Pays, the planner argues that it is easy to work with her colleagues because of the size of the structure. Because she knows the way her other colleagues work well, they can benefit from the strengths of every agent. (Berthelot 2020)

Therefore, while large structures have the resources to create efficient working bodies inside the local authority, and have a long history of transversal work, the smallest EPCIs that are involved in the PCAET process-making benefit from the reduced size of their structure.

There is a specific element that can improve the stimulation of the agents in the EPCI. The Cit'ergie initiative, as mentioned earlier, imposes a regular assessment of the EPCI's performance. Therefore, it encourages the different departments to make progress on the initiatives under the PCAET. With the Cit'ergie initiative, the nominated agents for each department of the EPCI must meet regularly to address cross-cutting issues, evaluate their actions, and review action plans. The Cit'ergie initiative has therefore structured a lot EPCIs in terms of internal organization:

"With the Cit'ergie initiative, there are 26 referring agents that follow 180 indicators. They have the energy-climate issues in their DNA now" (Ponsard 2020)[3]

"The 80 referring agents are mobilized, the Cit'ergie auditor comes every year and goes meet every agent" (Mejri 2020)[4]

"While there is a specific climate planner, there is an ecosystem of agents that is mobilized thanks to the Cit'ergie initiative. This initiative encourages the organization to create committees, stresses the weak points. It is an additional external driving force, which allows for leverage on specific projects." (Fouvet 2020)[5]

A department, not explicitly linked to climate-energy issues, has also proven, through the interviews to be of decisive importance: the communication one. This communication department intervenes at different times, with the communication of the PCAET when it is over, for example. Bordeaux stresses that the layout is fundamental to make people adhere and read the plan. (Bordeaux Métropole 2017) Communication is also needed in the concertation phase. Coordination with this department is fundamental, and not always up to the challenge is some EPCIs. The importance of communication concerning citizen participation will be elaborated on later in the dedicated section.

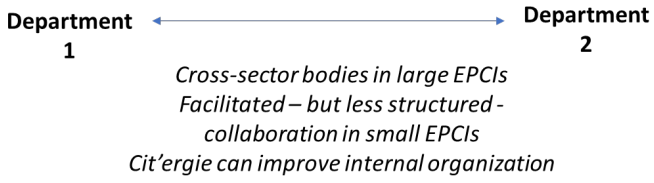

Figure 42 - Relationships between different departments

[3] Originally in French : "Avec l'initiative Cit'ergie, il y a 26 agents référents qui suivent 180 indicateurs. Désormais, ils ont les questions énergie-climat dans leur ADN. "

[4] Originally in French : "Les 80 agents référents sont mobilisés, l'auditeur de la Cit'ergie vient chaque année et va à la rencontre de chaque agent."

[5] Originally in French : "Même s'il y a bien un chargé de mission climat spécifique, il existe tout un écosystème d'agents qui est mobilisé grâce à l'initiative Cit'ergie. Cette initiative encourage l'EPCI à créer des comités et souligne les points faibles. C'est une force motrice externe supplémentaire, qui permet d'exercer un effet de levier sur des projets spécifiques."

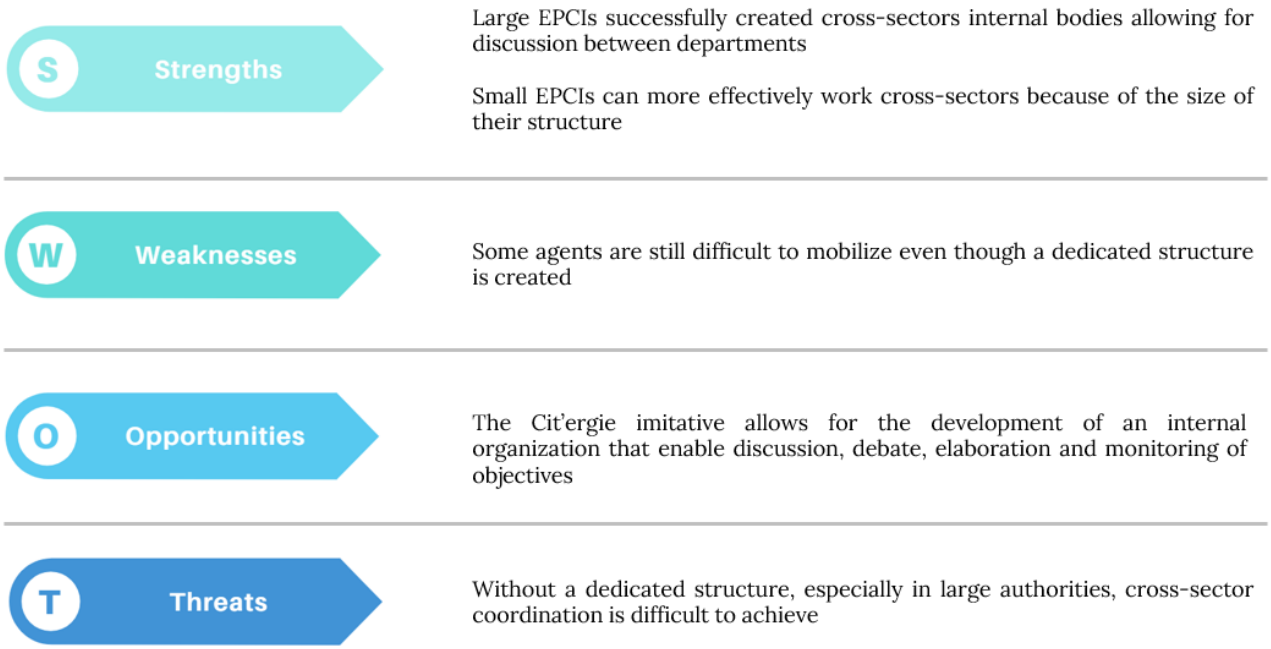

Figure 43 - Interdepartmental coordination / SWOT Diagram

The role of the climate planner

When looking into EPCI work processes, the climate planner in itself also has a significant role to play. To elaborate the PCAET, the EPCI often created a job position for a climate agent whose role would be to work on the PCAET. Their title is often "Climate officer," "PCAET officer." In this section, we will see that the planning conditions under which the climate planner operates are not the same in every EPCI.

When interviewing climate planners, it was clear that the assumption on the evolution of the roles of the planner, which was made in the theoretical chapter, is something the planners agree on. This section aims at presenting how climate planners aim at becoming hybrid planners in these new planning conditions.

First of all, it is interesting to look at the profiles of the climate planner interviewed. It shows a broad range of professional and educational backgrounds. While some climate planners working in EPCIs have a strong engineering background, some have been trained in geography, urban planning, or even law.

1. Diversity of educational background

Engineers argue that their formation helped them working on their ability to tackle many issues, understand technical subjects. They are not afraid of complexity and enjoy their ability to talk to specialists in each subject and researcher. Their formation also provided them with a useful communication asset and some structuring of thought. Nevertheless, they mention that it has been difficult, in the process of elaborating the plan, to dialogue with people coming from non-engineer backgrounds such as lawyers, geographers, or pure urban planners. They also mention that their weak initial knowledge of the public sector -they did not know a lot about the functioning of local governments - initially posed some difficulties. (Ponsard 2020; Honoré 2020)

The lawyers interviewed are specialized in public affairs. While not having an engineering background, the knowledge about local authorities and their formation allowed them to mobilize actors within the cross-cutting nature of environmental issues. During her formation, one jurist mentioned that she also educated herself with the ADEME through publications to gain knowledge on environmental issues. Lawyers mention that for big EPCIs, specific engineers are available and work for the local authority when necessary. The role of the climate planner is to coordinate the actions of these other agents; this is why an engineering background is not fundamental. (Mejri 2020)

Geographers and urban planners interviewed have spatial planning training. Their training in France was focused on local territorial project studies and helped them develop skills related to the implementation of project planning and impact studies. (Berthelot 2020; Fouvet 2020)

2. Diversity of professional trajectories

The planners interviewed often have been working inside an EPCI or another local structure before being climate planner in charge of elaborating the PCAET.

Some planners benefit from being in charge of elaborating climate plans for a long time. In Bordeaux Metropole, the current climate planner has known three generations of climate plans in several structures and has therefore gained experience in the processes. She is now responsible for the department in charge of the elaboration of the climate plan. (Mejri 2020)

Others have been working in the private sector before, and it helped them understand the way companies that can be involved in the PCAET processes operate. (Ponsard 2020)

Finally, other planners have already been working in EPCI but had more specific tasks than overall climate planning. Some planners have, for example, been working on mobility or green energy, and it gave them specific knowledge on issues that are covered by the PCAET. (Berthelot 2020)

Those three trajectories allowed for developments of specific and complementary knowledge and know-how.

3. Identification of roles and qualities

Climate planners are a central element in the climate planning process. The following paragraphs present the roles and qualities identified by the planners interviewed. The description given by the interviewed planners can be looked through the eyes of the theoretical optic of the hybrid planner. In the theory chapter, Sehested invited to look at the roles of the planner through the outlook of the professional manager, administrative manager, market planner, and process planner (Theories D). These categories call for specific values and knowledge, such as technical, economic, and political knowledge. The following paragraphs use the information gathered during the interviews as a point of departure and then match the roles identified with the framework elaborated by Sehested.

COORDINATING AND MONITORING

Climate planners are the main translator in the network of actors. In the ANT, the *spokesman* has to define and engage the actants in the actor-world is what makes the networks successful or not. (Theories A.) Therefore, the spokesman has the responsibility to make the actants participate in the actor world. This is how climate planners see their work. As a "conductor," they have to coordinate the actions of the different stakeholders: from the actions between the departments to the discussion with external partners. They have to draw the path and keep all the actions carried out to align toward the same goals. This responsibility calls for a cross-disciplinary vision with an enduring vision of the play of actors. The planners need to have the ability to create an

open and inclusive network of actors, to solve issues and to assume an essential role of management in this network. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020)

In the interviews, all climate planners mentioned coordination and monitoring as their primary task in their everyday life. Coordination appeared to be more difficult in large EPCIs without a history of environmental preoccupations.

Coordinating and monitoring are elements from the process planner and the professional manager roles. It mobilizes collaboration with political and public actors, businesses and uses knowledge about public policy, urban development, collaboration, and negotiation.

ANIMATING

Both between departments and with external partners, the climate planner has to bring to life the networks of actors and keep them animated. This is a permanent job that is demanding and fundamental to keep the networks that are developed alive. Animating means adapting the discourses to the audience (companies, citizens, politicians) and understanding the needs of each of these actors.

Animating and discussing are also elements from the process planner and the professional manager roles. It mobilizes collaboration with political and public actors, businesses and also uses knowledge about public policy, urban development, collaboration, and negotiation.

In the interviews, all climate planners insisted on the aspects of animation and discussion. They point out that the need for animation grandly varies depending on the size of the networks created. Smaller EPCIs have to spend less time in animating the networks of actors. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020; Colin 2020)

MIND OPENNESS AND RESOURCE-SEEKER: THE NEED FOR ACCULTURATION AND FINANCIAL RESOURCES

Because planners have various professional and educational backgrounds, they are not experts in every aspect covered by a PCAET. A climate planner needs to know how to look for information and to keep an open mind. In science, as

"*Yesterday's truth is no longer today's truth.*" (Mejri 2020)[6]

The planners always need to be one step ahead of the game and be informed of the latest developments to reflect these changes in the planning documents. This acculturation can take place through personal readings (ADEME papers, books, articles), personal investment (associations…) These planners also have to look for financial resources through calls for projects, for instance. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020; Colin 2020)

These roles are elements from the market planner and the professional manager roles. It mobilizes collaboration with political and public actors, businesses, and political, economic, and scientific knowledge.

NAVIGATION BETWEEN SEVERAL TASKS

Planners have different conditions of work, depending on the size of the EPCI they work for. In large EPCIs, because the elaboration and implementation of a PCAET is such a mammoth task, climate planners are often solely dedicated to working on this plan. In other EPCIs, less staffed, the climate planners have to navigate daily between several tasks. Therefore, they can have less time to devote to the climate plan per se because of their involvement in other planning activities.

[6] Originally in French : "La vérité d'hier n'est plus celle d'aujourd'hui."

It makes the job both more intense and more diverse. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020; Colin 2020)

These elements summarize what is expected from a hybrid planner. It mobilizes the perpetual navigation between the different professional, administrative, market, and process planner roles.

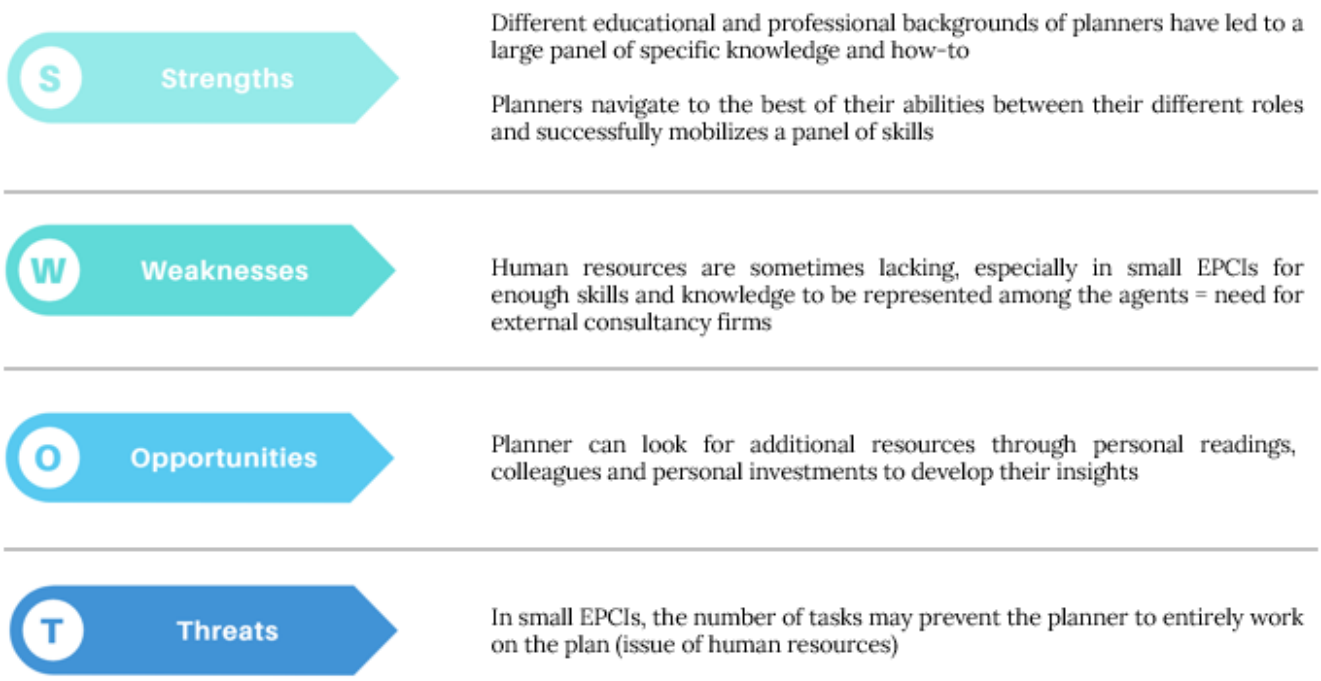

Figure 44 - The role of the climate planner / SWOT Diagram

Local officials and municipalities inside the EPCI – the importance of political support

As identified in the Theories chapter, the existence of strong political support at different levels is a fundamental driver of success for the elaboration and implementation of the PCAET. (Theories G.)

There is a need, expressed by the climate planners, to include as much as possible the political players of the municipalities inside the EPCI. To do so, EPCIs have included the elected officials of the EPCI in the piloting committees. (Grand Lyon 2019; Grand Poitiers 2019; Grenoble-Alpes Métropole 2019; Vienne et Gartempe 2019; Bordeaux Métropole 2017) It is imperative to include these officials because municipalities represent a strong link of proximity for the inhabitants. Because the municipalities are owners of municipal buildings (nurseries, schools, sports, and cultural facilities, etc.), they can manage and improve the energy performance of these buildings. They also have expertise in the management of public lighting and the management of green spaces. The mayor has certain policing powers, such as parking and a ban on burning green waste, which are essential to the achievement of air quality objectives.

Climate planners insist that it is necessary to make the mayors appropriate themselves the objectives of the PCAET. The EPCI has some responsibilities, but the municipalities have to assume the burden of their own responsibilities; otherwise, the plan will not be effective. (Ponsard 2020; Fouvet 2020; Colin 2020; Berthelot 2020) Some EPCIs (like Grenoble) accompany the municipalities and follow-up on their actions.

Political support **has not been at the same level** for all the EPCIs studied.

In Poitiers Métropole, the political support was paramount since the local authority started working on climate plans; the political majority in the EPCI was ecologist, and this majority greatly supported the establishment of climate plans. In the Midi Quercy, they also had significant political support. In their particular situation, with three inter-municipal structures reunited in ones, they managed to mobilize the elected officials of the three structures. It was a political decision to delegate the responsibility to create the PCAET to the Pays structure. (Honoré 2020; Berthelot 2020; Pays Midi-Quercy 2019)

In Tours Métropole, no PCAET has been established since 2014. 2014 coincides with the political alternation. The absence of a plan is due to a lack of political will, so as the absence of the evaluation of the first plan from 2011. (La Nouvelle République 2019) In Noirmoutiers, where a voluntary plan was drafted in 2019, the mayor of one of the municipalities deplored the fact that this plan was drawn up without a proper consultation of the municipality. (Ouest France 2020)

Even in large EPCIs, such as Lyon or Bordeaux, there have been difficulties in mobilizing several elected officials in charge of specific topics effectively. It has been difficult for them to "cut the silos" and work with a cross-sector approach. Debates arose because different interests were represented among elected officials. There is a need, like what is happening inside the EPCIs, for the elected officials to work more effectively as a group and spend time as creating collective solutions.

As seen, the political involvement has a pretty decisive impact on how the PCAET will be developed. Nevertheless, at the level of the municipality, the "chief service officer" also has a vital role to play: he is responsible for the different services of the municipality. These people can be challenging to reach and mobilize in the long run, according to some EPCIs.

EPCIs climate planners also warn about the demobilization of the political players when the plan is wrapped up. There is a need for them to stay invested in the process as they have a major in implementing the actions at the municipal level. Several EPCIs confirm that throughout time, elected officials are less and less present at the different meetings. They also need to assume their role in decision-making at the EPCI level when choices have to be made. (Ponsard 2020; Mejri 2020)

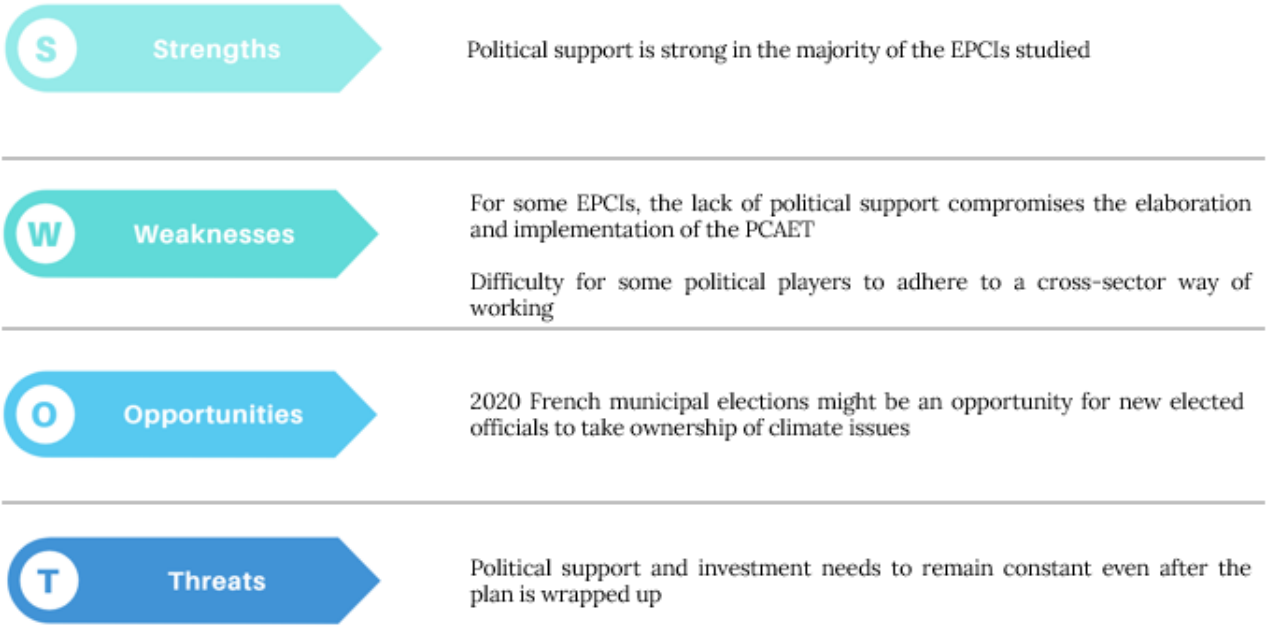

Figure 45 - Local officials and municipalities / SWOT Diagram

Networks between different EPCIs

The logic of transmission of knowledge inside the different departments of the EPCI around the PCAET is also declined at other levels. EPCIs are indeed sometimes working side by side and, by doing so, form specific networks.

National formal networks are identified in the plans and through the interviews. These networks are often animated by an external actor, such as the ADEME. Therefore, networks animated by the ADEME or State services acted as places of sharing for the climate planners. At the regional levels, other networks of climate planners from EPCIs are also identified and complete this networking strategy. There are both generalist networks and thematic ones.

These formal national networks, such as the one implemented through the Cit'ergie initiative, are mainly recognized as useful by the climate planners interviewed. This "transmission and sharing logic" between EPCI has allowed EPCIs to help each other at the different levels of the elaboration, implementation, and monitoring. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020)

When elaborating the plan and implementing it, EPCIs were helping each other by providing insights into each other strategies and action plans. The more large and advanced EPCIs were able to stimulate the reflections of the small latecomers on both their organizational structure and the content of their climate strategy. The more advanced EPCIs were also able to feed one another on these subjects. During the elaboration phase, EPCIs were also able to help each other when specific questions arose about the respect of the regulatory constraints. The interpretation of the decrees published by the state was facilitated by these networks of actors. Therefore in the elaboration phase, there have been both exchanges between EPCIs of the same typology (leader to leader, laggard to laggard) and exchanges between EPCIs of different typologies (laggard to leader). These exchanges are not of the same nature but happened in the same networks. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020)

This is a critic formulated by some of the climate planners interviewed. Some planners, especially the ones from large advanced EPCIs, complain about this vast disparity in the networks between EPCIs. In the same formal networks, some EPCIs just launched their PCAET process for the first time, and there are large experienced EPCIs with sizeable budgets. These EPCIs do not have the same needs as they are not at the same stage of the process. (Mejri 2020)

These laggard-to-leader or small-to-large upscaling seems to only be profitable to the laggards that can effectively benefit from the exchanges of experiences and the transfers of knowledge. As for the leaders and followers, they seem to gain from the discussions between EPCIs of their typology because they share the same preoccupations, budgets, and responsibilities. As stated it the Theories chapter, this horizontal upscaling is therefore profitable to leading cities who can learn between each other. (Theories C.1.) As warned in the theoretical chapter, leaving the laggards out of the discussions with the leaders could widen the gap between leaders and laggards because laggards do not have the capacities, without their help, to follow the leaders.

Other national networks are also identified but are this time, *informal*. They mainly consist of city-to-city discussions and aim at bypassing the constraints imposed by formal networks. Cities can more freely choose whom they learn from and therefore gain profit on their most pressing issues at the moment. These exchanges are often about operational and thematic subjects. Feedbacks are exchanged between leading cities but also between laggards and leaders in those informal networks. For instance, Bordeaux Métropole was solicited by three small EPCIs of the very touristic Bassin d'Arcachon region for feedbacks on their strategy about tourism and climate. (Mejri 2020)

Regional formal and informal networks (newsletter, meetings, city-to-city discussion) are also identified and provide for more local knowledge sharing as EPCIs in the same Region might face similar issues.

Because the PCAET is a French planning document, few EPCIs mentioned the importance of European networks of cities in their work. While they often look at what strategies are implemented at the European level, through benchmarking, to gain knowledge on specific themes, they do not engage in specific collaboration with European cities. The European Energy Transition conference, which recently took place in France, was nevertheless the opportunity for the leading EPCIs interviewed to learn from what is done in other European territories. (Ponsard 2020; Honoré 2020; Mejri 2020; Fouvet 2020; Berthelot 2020)

In conclusion, *the following characteristics* of the existing networks between EPCIs have been identified :

- There are mostly national and regional networks of climate planners.
- There are generalist networks but also thematic networks.
- They allow for knowledge-sharing on the regulations of the PCAET, the content of the plan, the implementation of the actions and the monitoring of the plan – they both help design new strategies and overcome identified difficulties.
- Informal networks allow for more open discussions between leading cities and also contribute to the laggard to leader upscaling.
- Formal networks take place through meetings, newsletter, conferences and signed conventions.
- Informal networks take place through specific city-to-city discussions.

Through the interviews, climate planners advocate for :

- The diversification of the thematic networks of EPCIs: mobility, housing, heat networks…
- The reinforcement of the regional networks that are fundamental to exchange on local issues
- The creation of a dedicated national network about PCAET on the animation and partnership aspects of a PCAET

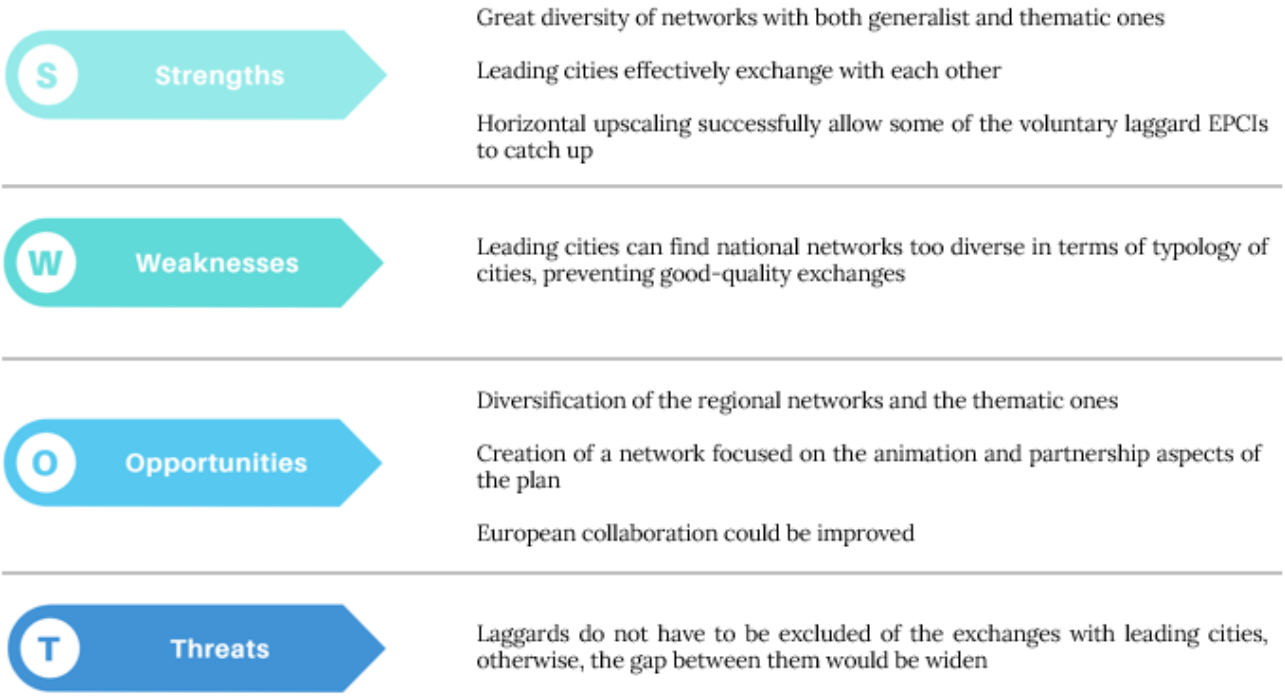

Figure 46 - Networks between different EPCIs / SWOT Diagram

Universities and researchers

Other public actors were also included in the PCAET elaboration and implementation processes: universities and researchers. Nevertheless, not every EPCI has included universities and researchers in their planning process. For the ones who did, the climate planners advocate that research organizations helped advance innovation and the creation of viable solutions for the fight against the effects of and adaptation to climate change. By including them in the elaboration process of the plan, they provided knowledge that was needed for the strategy to be elaborated. A wide variety of researchers has been included in some EPCIs: geographers, sociologists, thermal engineers… (Grand Lyon 2019; Grand Poitiers 2019; Bordeaux Métropole 2017; Grenoble-Alpes Métropole 2019; Mejri 2020; Fouvet 2020; Ponsard 2020; Honoré 2020)

Some EPCIs chose to include the researchers when help about specific issues was needed. In the Grand Lyon, there has been much collaboration on the UHI effect, and research actors demonstrated a willingness to set up a network of researchers who wanted to work in this field. There has been a collaboration with several laboratories (prefiguration of a climate observatory with geographers (about participatory measurement), telecoms (mobile temperature sensor, pollution), sociology researchers (climate perception), thermal laboratories. Every year, in the Grand Lyon, in link to the PCAET, 15 people with a research perspective gather to take stock of the situation in the different projects. It gives the EPCI an updated basis of knowledge that they use for the elaboration and implementation of their actions. (Ponsard 2020)

In Grand Poitiers, scientific actors did not have any role in the elaboration of scenarios and actions. The scientific and technical material came from the consultancy firms that were commissioned. Grand Poitiers think that this is one of the aspects of the organizational structure that will evolve in the future with more and more public research actors involved. They already have trainees from the university in the climate department who are doing their Master's degree in behavioural psychology. They are looking at the levers and brakes of citizen involvement and the social acceptability of energy initiatives. (Honoré 2020)

In Bordeaux Métropole, another approach has been taken. A multidisciplinary scientific council was established during the elaboration of the plan. They intervened at different levels. They had to work on exposing their strategy for the territory, on elaborating actions. These scientists had many difficulties in working with each other. They provided answers only through the spectres of their educational background and did not reach collective agreements. These scientists nevertheless were involved later on more specific issues. It then worked better to mobilize the researchers like it was done in Grand Lyon, on specific projects. (Mejri 2020, Bordeaux Métropole 2017)

In small EPCIs, no collaboration with universities and researchers were identified. Because of a lack of research structures, they cannot rely on them for knowledge and often need to have recourse to external consultancy firms. (Berthelot 2020; Colin 2020)

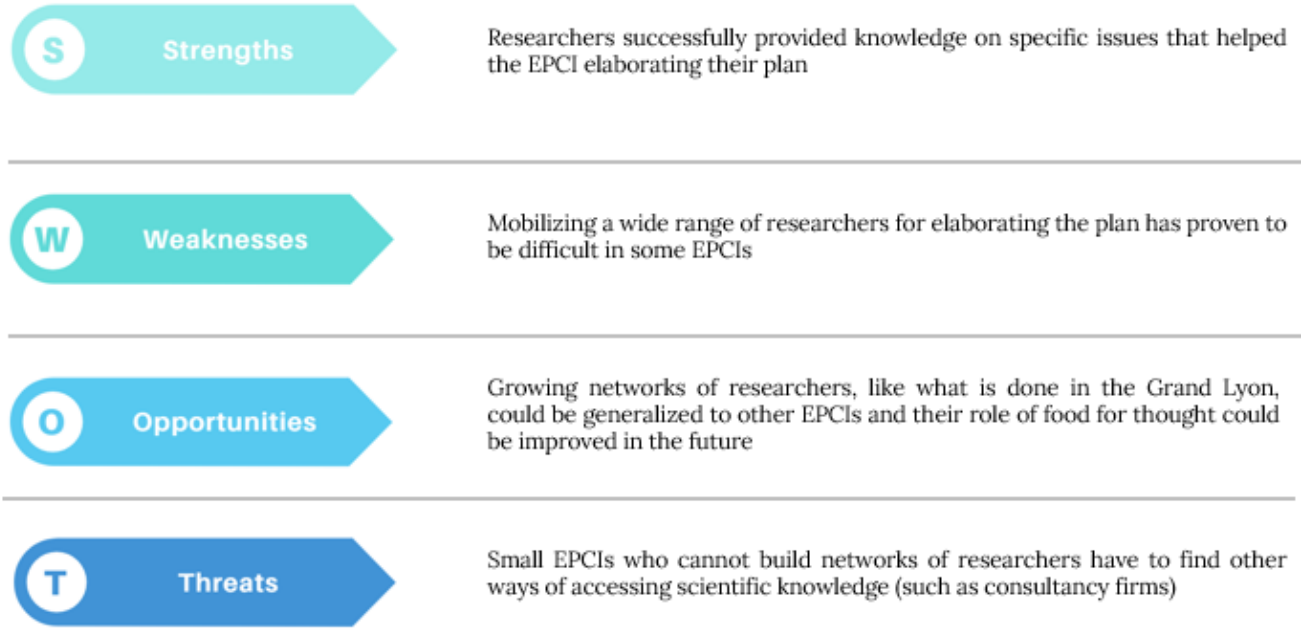

Figure 47 - Universities and researchers / SWOT Diagram

D. Private actors in planning for the PCAET

1. Mapping of the actors

Private actors are the second typology of actors identified in the different processes involving the PCAET. When investigating the eight different cases, private actors appear to be different. There are private actors linked to the climate-energy sector, businesses not linked to those issues, and consultancy firms.

Actors involved in every EPCI	Actors not involved in every EPCI
Business linked to the climate-energy sector - Energy distributors - Energy suppliers - Mobility actors	Consultancy firms
	Businesses not directly linked to the climate-energy sector

Table 12 - Private actors involved

Looking at the different PCAETs, private actors are involved in two main different ways across the PCAET:

- They can work in the processes of elaboration and monitoring of the plan, together with the EPCI, by providing specific knowledge
- They can also be actors of the implementation of the actions elaborated in the PCAET

The following paragraphs aim at presenting the main professional actors identified in the several plans and the roles they had to play. (Grand Lyon 2019; Bordeaux Métropole 2017; Fouvet 2020; Grand Poitiers 2019; Pays Midi-Quercy 2019; Vienne et Gartempe 2019)

PRIVATE ACTORS LINKED TO THE CLIMATE ENERGY SECTOR: knowledge providers and sources of actions

Energy distributors

Some EPCIs own the gas, electricity, and district heating networks. System operators can, therefore, participate in the actions of the Climate Plan in several ways. They are guarantors of the quality of service and make the investments required to ensure to maintain, modernize, and develop the networks. As the actors responsible for metering consumption, they can provide the EPCI and users with the information necessary for better planning and centralized access to information for the consumers. They can conduct experiments and research projects with the EPCI and universities. They can also support the development of gas and electric mobility by providing information on the capacity of the distribution network to meet these new needs.

Energy suppliers

These actors can provide electricity or gas from renewable sources, make consumers aware of their consumption of energy (e.g., by providing comparisons between housing of the same size). They can directly be guarantors of renewable energy supply of significant installations and equipment in the EPCI. Internally, they are sometimes working on optimizing energy production and use. Besides, they can help to raise awareness of the territory's inhabitants to the energy transition in particular by communicating about the actions taken.

Mobility actors

These mobility players are often freight carriers and their federations, companies providing passenger transport, or managers of vehicle parking lots. Their actual actions could be in optimizing logistics contributes to a better organization of tours, optimization of the modes of delivery is based on cleaner vehicles, or even active modes. In some EPCIs, vehicle fleets are evolving in terms of motorization (switch from diesel and petrol to electric power or CNG) or fashion (electric cargo bikes replacing the vans). Some of these mobility players regularly engage in experimentation or research projects to make practices and uses evolve.

These actors are having a role to play both in the elaboration process of the plan (by providing elements of diagnosis, for instance) but also by taking specific measures that can be implemented at the business' level to accelerate the green transition of the territories. In most of the EPCIs studied (both large and small EPCIs), these actors were included in the elaboration of the plan, because they are essential parts of emissions of the territories.

BUSINESS NOT DIRECTLY LINKED TO THE CLIMATE ENERGY SECTOR: sources of actions

Other industries and companies not directly linked to the climate-energy sector are sometimes represented via their federations or associations. As managers of industrial processes, some companies use the heat produced to reduce the energy consumption of their buildings. Similarly, they can use energy from renewable sources for all or part of the supply of their buildings, use fewer consuming appliances (operation, lighting, heating), while others might focus their action on the envelope of their buildings. In day-to-day operations, the dematerialization of working documents makes it possible to reduce printing, which also goes hand in hand with an improvement in waste sorting and the systematic use of recycling. Companies are also helping their employees to use less carbon-intensive modes of transport and encouraging the use of public transport and active modes for commuting. In some cases, even teleworking can reduce these trips. More and more companies also have vehicles that emit less CO2 among their fleet (electric and hydrogen experiments).

In the EPCIs studied, there have been different levels of inclusion of these actors. For the metropolises and large EPCIs more generally, the inclusion of these actors is something somewhat familiar both in the elaboration and implementation processes. The forms of inclusion

nevertheless change depending on the EPCI, as we will see later. For small EPCIs, these industries are both less represented in the actors organizing to elaborate the plan, and the actors mobilized to implement the identified actions.

In large EPCIs, it has been identified that the federations, professional associations, and competitiveness clusters bring together various companies in the region, enabling them to play a role as network leaders and intermediary players for the implementation of actions relating to the energy transition. Professional federations also support and accompany new technological and innovative projects on work practices and industrial processes that are less costly and more efficient. In the plans, it has also been identified that these federations work on training and support for professionals by pooling energy and environmental procedures.

CONSULTANCY FIRMS: knowledge providers

Some EPCIs have called for the help of external consultancy firms to help them in the process of elaboration of the PCAET. Some EPCIs have punctually been helped by public consultancy firms on specific elements such as the air or energy diagnosis. This is the case in most of the large EPCIs that have been helped by their Local Energy Agency or the regional ATMO organizations during the diagnosis phase.

Other EPCIs, the smaller ones, have had the help of some consultancy firms through the entirety of the process of elaboration of the PCAET (not only the diagnosis phase). It has been a way for the small EPCIs to delegate some of the work to do, especially when the workforces of the public authority have been low. They have been able to use the knowledge from these consultancy firms – both on the content of the PCAET and on the organizational procedures that had to be implemented. For instance, some EPCIs trusted external consultancy firms to organize the different meetings including the stakeholders and the concertation phases with the citizens. In Midi-Quercy, these consultancy firms have "supported the EPCI from start to finish" on the entire process of developing the PCAET. According to these EPCIs, the external consultancy firms were assets in the sense that they were able to add external value to the PCAET project by providing additional knowledge and how-to. (Berthelot 2020; Colin 2020; Pays Midi-Quercy 2019; Vienne et Gartempe 2019)

2. Different strategies to include the actors

Companies formally included

Large EPCIs have developed over the years networks of private actors that are successfully mobilized over the PCAET. In this section, the formal engagement between private actors and the EPCI will be elaborated on.

- **The Grand Lyon partnership approach: an action-based engagement**

The Grand Lyon launched in 2009, the first partnership based climate plan in France. It was based on the report that 25% of the GHG emissions of the territory came from professional activities. This partnership approach has been a focal point in the strategy developed by the Grand Lyon. It is based on the following principles. Any organization wishing to join the partnership has to send an official request in which he adheres to the vision of the EPCI and indicates the actions it will implement to actively contribute to the objectives reflected in the action plan of the PCAET. There is a partners' charter that has been created that allows each partner to identify the actions that it can implement within its structure. Every two years, each partner declares the results of its actions, which are integrated into the "milestone" and shared at an energy-climate conference.

This is a formal cooperation between the EPCI and the organization. On one side, the organization commits to report every two years the actions carried out and the correspondence with the 23 framework actions of the climate plan of The Grand Lyon. They also have to participate in the biannual conference and to identify ten actions that are the most relevant for the structure that will be highlighted in the years to come. This list will constitute the plan of actions of the structure, which will position itself in parallel to the plan of the Grand Lyon. On the other side, the EPCI commit to valorize the actions of every organization through their own means of communication. (Ponsard 2020; Grand Lyon 2019)

- **The Grenoble-Alpes Metropole partnership approach: a range of engagements**

In Grenoble-Alpes Métropole, a Partner Commitment Charter revised periodically since its creation in 2005, has formalized the objectives and action plans of each partner, in line with the objectives of the PCAET. Initially created for the municipalities, this charter was also intended to integrate all the public partners and economic players in the territory. In the same manner as the Grand Lyon EPCI, there is a Partners Forum for the PCAET. The purpose of this event is to present to partners the progress of projects, to exchange on good practices, and to promote a collective reflection on the actions that need to be implemented.

The difference with the Lyon partnership approach is that, in the commitment period 2015-2020, all organization's entry into the process, regardless of their level of involvement, was based on three "levels of engagement" and not only one:

- The first level commitment "I adhere" allowed signatories to join the partners' network, and to be informed of local news on climate and air quality.
- At the second level, "I act", each partner had to develop an action plan based on the different thematic axes of the climate plan.
- Finally, the third level corresponded to a full commitment with quantified targets.
(Fouvet 2020; Grenoble-Alpes Métropole 2019)

It has to be noted that in the Grand Lyon and Grenoble-Alpes Métropole cases, this contract of engagement was not only dedicated to private actors but also to municipalities who are also encouraged to adhere to the action plan elaborated by the Metropolises.

If we take a look at these examples of companies involvement through the ladder of co-creation (Torfing et al. 2019), such participations could be qualified as

> "4°*Public & Private actors engage in mutual dialogue at ad hoc meetings aimed at designing new and better solutions and coordinating their implementations.*"

Feedbacks from those EPCIs have shown the growing participation of private actors in the plans elaboration and implementation over the years. For the Grand Lyon, 100 organizations were adherents of the plan in 2015; they are 145 today. What has been appreciated by the actors is that their involvement is not hugely time-consuming. Indeed, they need to elaborate a plan of action and realize an assessment every two years on the actions taken.

From the companies' point of view, their involvement in the PCAET process is a way to give more meaning to their employees and to more easily recruit young generations who are more aware of these environmental issues. (Ponsard 2020; Mejri 2020) Today, being able to show that a company's actions are part of a territorial climate plan is a discourse that can make sense. Across the years, actors are taking a little more ownership of the climate messages. From being a specific subject between insiders to mobilizing more diverse actors from various backgrounds, these large EPCIs have successfully achieved mobilization through those "formal cooperation". The theory

identified several barriers in implementing co-creation with the professional actors, including the difficulty for the public and private actors to identify their role. Through this "formal cooperation" and "material artefact", they can more easily develop a perception of their role, by adhering and making commitments that will guide their actions in the years to come.

Nevertheless, the last level of co-creation which is

> *"Relevant and affected actors from the P&P sector participate in institutional arenas that facilitate collaborative innovation based on joint agenda-setting and problem definition, joint design and testing of new and untried solutions, and coordinated implementation drawing on public and private solutions."* (Torfing et al. 2019)

does not seem to be reached even in those advanced EPCIs. Indeed, even though private actors are invited to design their own plan of action, these are still based on the EPCI baseline. While these companies are often involved in the different decision committees, they are often just presented the territorial plan more than being fully active actors of their elaborations. (Ponsard 2020; Mejri 2020; Honoré 2020; Grand Lyon 2019; Bordeaux Métropole 2017; Grand Poitiers 2019)

Companies informally included

In Bordeaux Metropole, the approach chosen by the EPCI is different from the ones of the Grand Lyon and Grenoble.

There is no charter of engagements for private actors. One of the reasons for this choice is that according to the climate planner, it is "a rigid framework that can frighten some companies." The justification is that while these types of contracts can effectively attract big companies that have specific time available, smaller companies can be left out. The Grand Lyon recognizes that they do not accept every company as a partner, depending on their size. While some small companies can be represented in these plans through their federations, some are still left out and can be hesitant to commit to the EPCIs' plans of action strictly. (Mejri 2020)

The choices made by Bordeaux Metropole are based upon this reflection. They created several groups of private actors, depending on their economic sector. Not one body brings together all economic actors of the territory like in Lyon or Grenoble, but there are several bodies. They advocate for the necessity to bring in companies that are just starting and that can feel that they are not doing anything for the climate yet. Small sector-based bodies of actors can favour facilitated exchanges between smaller actors. There is no charter of engagement, which is overly formal, according to the climate planner in charge. According to her, EPCIs have to dedicate time to bring smaller actors to the table. (Mejri 2020)

Other large EPCIs like Bordeaux Metropole made this choice not to create a charter of engagements. However, they organized large or thematic professional committees that allowed for the inclusion of the professionals' preoccupations in the PCAET and awareness-raising on these communities. This form of involvement could be qualified as "informal" as the framework of inclusion is more flexible. While allowing for a more extensive inclusion of actors, these EPCIs did not yet achieve to completely federate all economic actors in the elaboration and implementation processes of the PCAET.

If we take a look at the type of involvement in those EPCs, through the ladder of co-creation, such participations could be qualified as

> "3°*Providing input into the design of new tasks and solutions* (*crowdsourcing, focus-group interviews, consultations, public hearings*)"

The fourth level of co-creation does not seem to be reached by those EPCIs as they do not collaborate permanently throughout the entirety of the PCAET processes.

Companies scarcely included

In some smaller EPCIs, the involvement of professional actors has not been an essential element in the elaboration of the plan, mainly because the economic structures on the territories are scarcely present. No charters have been elaborated on those territories because of a lack of big companies that can dedicate time to the elaboration and implementation of actions. Sometimes, some strategic meetings have been organized with local companies on the territories, but they were not continuously invested in the processes. In other EPCIs, which are lacking political support, companies have not been included at all in the PCAET reflections. (Berthelot 2020; Colin 2020; Pays Midi-Quercy 2019; Vienne et Gartempe 2019)

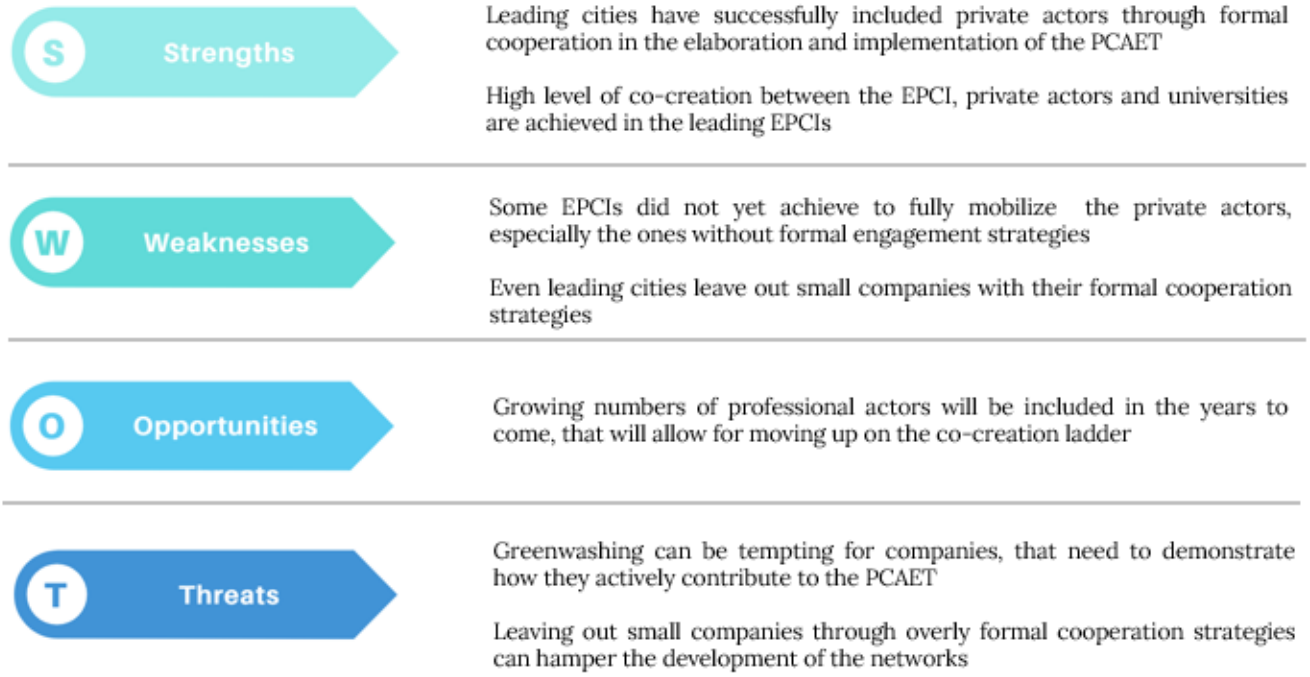

Figure 48 - Inclusion of private actors / SWOT Diagram

E. Citizen participation in planning for the PCAET

Citizens are the last actors identified in the different processes involving the PCAET. This section identifies the strategies implemented by the EPCIs to include the civil society.

1. Different strategies to include the actors

Minimum formal concertation: workshops and online processes

According to the law, a consultation phase has to be carried out in the process of the PCAET creation. This consultation can be carried out during the diagnosis phase as well as during the process of building the action plan. The concertation is intended to give the main orientations of the project as well as to define more precisely a given action. The consultation must contribute to a collective awareness of the potential for savings and financial gains, the health, and quality of life challenges of a climate-air-energy approach. This concertation phase with the citizens took different forms depending on the EPCIs.

During the elaboration phase, lots of EPCIs decided to use the *online tool* as a way to include citizens in the PCAET elaboration. In Grenoble Alpes Métropole, for instance, an online space was opened from 10 January 2019 to 31 March 2019, to gather the public's opinions and proposals. A consultation workbook presented the necessary elements for informing the public: objectives and main characteristics of the PCAET, territorial diagnosis and an overview of the potential impacts of the PCAET on the environment. This online consultation, "Engaging for Climate," attracted 502 contributions, nearly 3000 votes, and 378 participants. (Grenoble-Alpes Métropole 2019)

Citizens or associations of citizens were also often associated during dedicated workshops. Across the eight studied cases, different types of workshops can be identified:

- Presentation of the strategy and the action plan workshop – no active involvement of the citizens (1)

- Reaction and amendment of strategy and action plans – citizens were presented advanced versions of the strategy and the action plans and were able to react and to propose changes (2)

- Preparatory work before the elaboration of the strategy and the action plan – citizens had to work on designing a strategy and/or specific actions before any proposition was made by the EPCI (3)

(3) was the strategy adopted by Grenoble-Alpes Métropole, for instance. Four hundred proposals resulting from this prior consultation have been forwarded to the EPCI departments and elected officials. These proposals have been classified into three categories: 1) the proposals referring to actions already implemented by the Metropolis (60% of the proposals), 2) the refused proposals – approximately 20% of proposals – as they did not fall within the framework of the PCAET and finally 3) the selected proposals that were considered when elaborating the PCAET (20% of the propositions). (Fouvet 2020; Grenoble-Alpes Métropole 2019)

It was also the strategy chosen by the Grand Lyon. Before the elaboration of the last plan, there has been a consultation with a citizens' forum. Citizens were able to ask questions, and they were able to feed into the construction of the plan from the outset. It was easier to get the lines moving. Few recommendations, not already identified by the EPCI, came out, but a not already identified focus on food was underlined during the workshops. It was then integrated into the plan.

Workshops have also been organized: through a broad consultation between March and September 2019, 500 participants were able to identify new ideas for concrete action. The booklet of "100 Climate Proposals" was the fruit of this work and a synthesis of each workshop were integrated into the PCAET. (Ponsard 2020; Grand Lyon 2019)

(2) was the strategy adopted by the Grand Poitiers. Citizens were not actively involved in designing the plan. They were mainly represented by associations of citizens in the dedicated meetings. Once the project of PCAET was wrapped up, the citizens were consulted before the vote. Public gatherings and thematic meetings across the territories were organized to present the project and to gather amendments. In addition to these contributions, like Grenoble Alpes Métropole, an online platform was implemented and citizens were able to vote and react to specific actions. Afterwards, the EPCI departments took into account these amendments. 82% of the contributions have integrated the PCAET (some proposals were already included). There were 116 actions in the project, and due to the public consultation, 25 have evolved and nine new actions were added. (Grand Poitiers 2019; Honoré 2020)

(1) was the strategy adopted by Bordeaux Metropole. During the elaboration in their first plan in 2011, the EPCI, 27 public meetings were organized but only two people were present at the first two meetings. Public consultation then stopped and there has not been public meeting for the last plan elaborated in 2017. Thematic meetings have been organized later but not in direct link with the PCAET. Regarding the last PCAET, an online questionnaire has been created that aimed at asking what citizens are willing to do for the energy transition. Unlike other consultation processes, Bordeaux Métropole did not ask their citizens to comment or react on the plan because they thought many answers would have been either banalities or elements already included in the plan. More than making citizens acculturated on the PCAET, the metropolis wanted to evaluate the citizens in their ability to be active. Therefore, there has been no direct involvement from the citizens in elaborating the plan. This consultation instead allowed for an identification of the levers the EPCI could activate regarding citizens. (Mejri 2020; Bordeaux Métropole 2017)

The small EPCIs studied, which started drafting their plan recently, also adopted the strategy with little to no involvement of citizens mainly because of a lack of experiences on these issues and the difficulty of mobilizing a population which is not sensitized to these issues. (Colin 2020; Vienne et Gartempe 2019)

No matter the strategy of formal concertation chosen by the EPCI, some difficulties emerged concerning the participation of the citizens in these physical workshops or online consultations.

First of all, all the EPCIs interviewed which carried out public meetings faced difficulty in *mobilizing a large number of citizens*. In Grand Poitiers, 50 citizens were mobilized for a meeting in the biggest city of the EPCI while in more rural areas, no more than ten citizens went to those public meetings. In even smaller EPCIs, reaching the public audience was more difficult. Larger EPCIs have seen more significant numbers of participants but those citizens were still not wholly representative of the population of the territories. For the online consultations, increased numbers of participants have been observed in all EPCIs that implemented this solution. For instance, in Grand Poitiers, 350 citizens participated, and 1000 written contributions were gathered. While being more important than physical participation, those online contributions still represent a small amount of the total population of the territory.

This leads to the second issue identified by the EPCIs: *social representativity*. While in terms of age, participations were rather homogeneous, climate leaders identified that the citizens participating in public meetings were already engaged in either environmental associations, political organizations, or at least already sensitized to environmental issues. In Grenoble, the climate planner acknowledges that

"Let us not fool ourselves; it is always the same categories of people that we meet or who participate in the different types of exchanges." (Fouvet 2020)[7]

Finally, the last issue identified in those forms of citizens' involvement was formulated by some of the large EPCIs interviewed. EPCIs and climate planners have struggled to show citizens, after their participation, that they were listened to. Indeed, lots of propositions made by citizens were already identified by the EPCI since the beginning of the PCAET process. To overcome these issues, some EPCIs like Grand Lyon, either produced booklets of all the propositions made by the citizens and/or integrated the detailed results from the public concertation directly in the PCAET.

To conclude this section, we showed that public inclusion in the PCAET processes mainly happened through dedicated workshops (with different levels of participation) and was complemented by an online consultation. If we look at this situation through the lens of cocreation, this level of inclusion would, at best, correspond to:

> "3°*Providing input into the design of new tasks and solutions (crowdsourcing, focus-group interviews, consultations, public hearings)" (Torfing et al. 2019)*

This level is nevertheless not reached for the EPCIs who simply presented the plan to their citizens and that did not directly include them in the elaboration process of the plan.

As seen before, the formal approaches have not been enough to include every citizen. What were the other strategies put forward by EPCIs to achieve a more inclusive approach?

Expanded concertation: complementary actions

Some small EPCIs that started to work on their PCAET very recently came up with a complementary approach to the inclusion of citizens. To reach a larger amount of citizens, they chose an "out of the box concertation."

Pays Midi-Quercy decided to implement a more exhaustive plan to reach citizens. They organized cultural events targeted to the entirety of the population, in association with cultural partners (artists, theatres, cinemas). Cultural events linked to the theme of energy transitions happened in the three communities of the EPCI. There were two primary goals for these events :

- First reach a larger audience, that in a first place would participate in those cultural events and would then also participate in the more formal instances of exchanges about the PCAET
- Secondly, acculturate the citizens on climate change, so they can more effectively be actors of the energy transition in their daily life.

(Berthelot 2020; Pays Midi-Quercy 2019)

They also reached citizen associations. Those actors allow for an extension of the networks of citizens reached. Through these associations, the EPCI identified actions that could be implemented. (Berthelot 2020; Pays Midi-Quercy 2019)

Those cultural events, while reaching a large number of citizens (around 100 citizens per event), did not allow for a complete redirection of the citizens to the formal workshops (around 20 citizens). The climate planner estimates that these events nevertheless allowed for a necessary wake up call for the citizens, who could then be more invested during the implementation phase. (Berthelot 2020; Pays Midi-Quercy 2019)

[7] Originally in French : "Ne nous leurrons pas ; ce sont toujours les mêmes catégories de personnes que nous rencontrons ou qui participent aux différents types d'échanges."

This form of citizen participation, especially for the first generation of climate policies, aims at materializing and making everyone aware of the issues at stake. This is why the activities of awareness-raising and popularization naturally occupy an essential place in the first actions undertaken in those small EPCIs. These expanded forms of concertation are, therefore, for beginners EPCIs, both a necessity and an opportunity to extend the networks of citizens. (Berthelot 2020; Pays Midi-Quercy 2019)

This complementary approach has nevertheless also been chosen by some large EPCIs that organized cultural events throughout the years. These events were either dedicated to the elaboration of the PCAET or were not directly related. Mobilizing associations and companies, EPCIs organized special events aiming at connecting the different types of actors mobilized around the energy transition. (Grand Lyon 2019; Bordeaux Métropole 2017; Grenoble-Alpes Métropole 2019) To keep people aware of climate issues, one climate planner argues that

"There is a need for more than the exchange times of the classic climate plan" (Mejri, 2020)[8]

"Organizing fun events around the climate challenges aim at proving that climate change is not only a burden but mainly an opportunity for all the actors" (Mejri, 2020)[9]

The importance of communication for both formal and extended citizen inclusion

All climate planners interviewed, mentioned the decisive part that communication activities play in the elaboration process of a climate plan. All large EPCIs engaged in a variety of communication forms for the concertation phases: social networks, EPCI's website, newspapers. Through these means of communication, EPCIs incited citizens to participate in the elaboration of the PCAET.

Nevertheless, communication was also fundamental for the leading EPCIs to raise awareness about climate issues. By building strong relationships with their communication departments, EPCIs aimed to attract citizens by providing easy-to-read informative documents (such as the PCAET). While some communication departments might have been reluctant to communicate a lot about these issues in the past decade because it has not been a priority, the last few years have marked a change in some local authorities. Communicating around climate change issues has become an essential aspect of the activities carried out by these communication departments. For small EPCIs, it has proven to be more difficult to communicate on these issues outside of the dedicated time of the PCAET. (Ponsard 2020; Mejri 2020; Fouvet 2020; Honoré 2020; Berthelot 2020; Colin 2020)

The citizens are also actors of the implementation and monitoring of the plan

As identified before, citizen mobilization often is in itself a strategic orientation or a dedicated action in the PCAET. More than just being involved in the elaboration of the plan, citizens have a role to play in transitioning the territory. Large EPCIs, mostly, through their actions plan, intend to make citizens actors of the energy transition both in the implementing and monitoring phases. (Grand Lyon 2019; Bordeaux Métropole 2017; Grenoble-Alpes Métropole 2019; Grand Poitiers 2019; Pays Midi-Quercy 2019)

One example illustrates this idea of citizen participation in everyday life. In Grenoble, a call for citizen projects has been organized with strong financial envelopes put at the service of the inhabitants' projects. Citizens communicate on specific projects and city services then select the

[8] Originally in French : "Il faut plus que les temps d'échange du plan climat classique."
[9] Originally in French : "L'organisation d'événements amusants autour des défis climatiques vise à prouver que le changement climatique n'est pas seulement un fardeau mais surtout une opportunité pour tous les acteurs."

realistic ones. Citizens can, therefore, receive help from the city to implement the projects. These citizen projects help to address the air - climate-energy issues. Experimentation of white roof painting, commissioning of new fountains are examples of the citizens' participation in Grenoble. (Fouvet 2020)

In the co-creation theory, the focus is now put on the contribution of the citizens. Assuming that they are actors of the PCAET elaboration and implementation, is assuming that they have much local knowledge that can be used. EPCIs, in the examples presented, helped the citizens to realize this and to accept this shift in their role.

Moving up the ladder: a necessary change in the governance framework

The first level of the cocreation ladders consists of encouraging citizens to co-create the services they use. The second one consists in creating value for others, and the three last levels incorporate the provision of inputs for new solutions design and the dialogue between actors in different proportions (Torfing et al., 2019). Larger EPCIs, like Grenoble and its calls for citizen projects, aimed at moving up the ladder by providing a dedicated governance framework.

The governance changes related to citizen participation, which are partly implemented in those large succeeding EPCIs are mainly trust-based steering of bottom-up procedures. The citizen call for projects is a vivid example of those procedures. The acceptance of experimentation, negotiation, risk, and innovation from the EPCIs is also identified in the leading structures. The analysis has shown that small local authorities are not yet at this level of the co-creation ladder.

S Strengths	Formal concertation (workshops and online participation) have been done in all the EPCIs studied Extended concertation has allowed for a necessary acculturation of the citizens – especially in beginning EPCIs
W Weaknesses	Formal concertation has not been sufficient to largely mobilize citizens, even when supplemented with cultural events
O Opportunities	Change in governance (bottom up procedures) settings that start to be implemented in a few EPCIs will allow for a larger participation of citizens Increased communication actions will allow for a larger audience to be reached and for making citizens accept the shift in their role
T Threats	Keeping the existing rigid governance settings (top down procedures) in some EPCIs will prevent an inclusive participation of the citizens

Figure 49 - Citizen participation / SWOT Diagram

F. Public, private and citizen participation: forms, evolution, and resources

This chapter aims at expanding on several aspects of the PCAET network of actants which are cross-actors: the working modalities of actors, the evolution of the networks of actors, and finally, the human and financial resources.

1. Forms of inclusion and working modalities of the actors

Two main strategies have been adopted by the EPCIs when making the networks functioning: separated entities and cross-actors entities.

First, some EPCIs have created dedicated bodies of actors in the forms of separated entities. One type of actors was represented on these bodies. For instance, these bodies could be :

(1) Scientific committees with researchers
(2) Technical committees with agents from the EPCIs
(3) Workshops with citizens

Secondly, some EPCIs created specific governance organization composed of members of both the public, private sectors, and the civil society.

(1) Piloting committees, for instance, mostly met at critical stages of the process to inform the partners of the progress of the work undertaken and to gather their opinions.
(2) Partners conferences, as organized in Lyon and Grenoble, gather all the actors either every year or every two years to present to the public the progress made

(Grand Lyon 2019; Bordeaux Métropole 2017; Grenoble-Alpes Métropole 2019; Grand Poitiers 2019; Pays Midi-Quercy 2019; Vienne et Gartempe 2019)

EPCIs often mix these two types of bodies in their governance structures. The bigger EPCIs are the ones having the more advanced – in terms of numbers of actors and numbers of bodies – meta governance structures. They decline the climate governance in several strata with both separated bodies and unified governance organization. Those large EPCIs also multiplied the forms on which these networks of public-private and civil actors are mobilized.

Smaller EPCIs, in contrast, have fewer bodies of exchanges between the actors. They often have a restricted committee in charge of piloting the PCAET, but they do not multiply the types of actors included in those committees. Citizens, associations, and researchers are often left out of the governance structures of the small EPCIs studied.

2. Evolution of the networks

Three trends have been identified across the eight cases concerning the networks of specific types of actors.

An increasing amount of professional in large EPCIs

Across the years, there has been an increased amount of professional actors included in the processes of elaboration and implementation of the PCAET. A change of mindset has been identified by climate leaders. In the beginning, businesses might have been looking to be associated with the PCAETs because of publicity. Today, some businesses are voluntarily engaging

in the PCAET processes. Actions carried out by EPCIs, aiming at attracting businesses such as the establishment of partner charters have allowed for a broader inclusion of this type of actor. To keep these networks growing, the attention of the EPCI is now mobilized towards smaller companies, which are, for now, left out of the formal inclusion processes. (Ponsard 2020; Mejri 2020; Fouvet 2020; Grand Poitiers 2019; Grand Lyon 2019; Bordeaux Métropole 2017; Grenoble-Alpes Métropole 2019; Grand Poitiers 2019)

Increasing awareness across the population which does not necessarily translate into the PCAET involvement

Through formal and extended concertation, EPCIs achieved to reach a more significant number of citizens in the last few years. While citizens are more aware of the issues related to climate-air-energy challenges, this citizen awareness did not translate in the PCAET participations. Some EPCIs are nevertheless in the process of implementing bottom-up procedures to more easily include citizens in the implementation phase of the PCAET.

Decreasing mobilization of actors once the PCAET is wrapped up

The EPCIs interviewed agreed on saying that elected officials and other actors have sometimes been less mobilized when the PCAET was wrapped up. It has been both difficult to mobilize over the long term, and challenging for elected officials to make decisions during the implementation phase based on transversal governance. Once the plan was wrapped up and the last piloting meeting over the elected officials and participants had the idea that the climate plan is finished. However, the plan is only just starting to be implemented in the field, and it still needs the support of the networks of actors. It has been challenging to make all partners understand this, especially the elected officials:

"*Regarding the elected officials, especially, it has been challenging to make each elected actor feel part of a whole.*" (Ponsard 2020)[10]

"*The climate plan is a meta-policy - you need one elected official who agrees to be the coordinator (which is not a classic policy stance) and to keep the entirety of the public actors mobilized continually*" (Ponsard 2020)[11]

3. Resources

Financial resources

Financial resources remain of the main difficulties that EPCIs face when elaborating and implementing the plan. Without the financial support of external actors (the ADEME, companies) that can happen through the involvement in some initiatives (Citergie, for instance) or responses to specific calls for projects, there is often, in small EPCIS, no specific funding planned for the systematic support of PCAETs. This is why both large and small EPCIs are encouraged to exploit the different types of funding that exist at the different levels: the regional, national, and European levels and some specific financing procedures (energy performance certificates, partnership contracts, etc.). (Mejri 2020; Ponsard 2020; Bordeaux Métropole 2017; Grand Lyon 2019)

Financing the elaboration of the climate plan, demands the activation of the networks of both public and private actors. It also makes sense that those actors support a part of the cost of the PCAET, especially the implementation phase. The EPCI, acting as a coordinator, does not have all

[10] Originally in French : "En ce qui concerne les élus, en particulier, il a été difficile de faire en sorte que chaque acteur élu se sente faire partie intégrante d'un tout".

[11] Originally in French "Le plan climat est une méta-politique - il faut un élu qui accepte d'être le coordinateur (ce qui n'est pas une position politique classique) et de maintenir l'ensemble des acteurs publics mobilisés en permanence"

the initiatives on their shoulders. Some mechanisms allow the burden of investment to be borne by a third party involved in a specific action. (Mejri 2020; Ponsard 2020)

Today, EPCIs can launch their PCAET, no matter their size, because of the support from several actors, especially the ADEME.

Nevertheless, when looking at the implementation phase, there are significant inequalities between EPCIs.

Large EPCIs have huge budgets dedicated to the implementation phases. There often are dedicated financial resources dedicated to the PCAET, but as the actions often mobilized other specific departments, the budget is also shared with those departments' budgets. Bordeaux Metropole, has, for instance, 122 Million euros dedicated to the implementation of climate initiatives, which represent 10% of the metropolis budget. The climate planners interviewed, mention the importance of looking for every possible source of funding, by mobilizing private and public partners, but also the importance of arguing (with sound arguments and forecasted budgets) with the direction instances to get more financial resources. Political support is fundamental to get funding more easily. (Mejri 2020; Ponsard 2020; Bordeaux Métropole 2017; Grand Lyon 2019)

Small EPCIs, like communities of municipalities, often do not have any funding allocated to the implementation of the action plan. In Midi-Quercy, there is no financing at all on all the actions. This is why the EPCIs focused on its PCAET on some actions that do not necessarily need financing, but only cooperation. The EPCI then had to prioritize some actions which were possible thanks to mutualization or partnerships. The result of this lack of funding is a plodding progress in the implementation phase. The lack of funding for the small EPCIs therefore threatens the outcome of the PCAET because of two reasons. First, because EPCIs know they will not have funding to implement actions, they bridle their ambitions and it results in a less ambitious plan. Secondly, the success of the plan is based exclusively upon the financial capacities and will of external actors. Small EPCIs have then to engage in strong networks with external actors to make sure some of the actions elaborated will successfully be implemented. (Berthelot 2020; Colin 2020)

> "*When we do not have any funding, the plan will just stay on paper, so there is no interest whatsoever.*" (Berthelot 2020)[12]

Human resources

The dichotomy identified for financial resources is still relevant to human resources.

Large EPCIs now have strong teams of agents working on elaborating and implementing the actions of the PCAET. There are often one or two people that are dedicated to the PCAET in a full-time position and an ecosystem of around 20 FTE (full-time equivalent) that punctually work on the PCAET. (Ponsard 2020; Mejri 2020; Fouvet 2020; Honoré 2020)

Small EPCIs often have a team of one or two persons that are dedicated to the PCAET, but this is not their only role. These EPCIs mention that the human resources mobilized are not enough for such a program of actions, especially when their missions are extended to other planning activities. This is mainly the reason why those small EPCIs have a more frequent need for external consultancy firms, who can support them with human resources, throughout the elaboration process of the plan. (Berthelot 2020; Colin 2020)

[12] Originally in French : "Quand nous n'avons pas de financement, le plan reste sur le papier et il n'y a donc aucun intérêt".

Discussion

This chapter will aim at synthesizing the main elements found during the analysis and provide additional recommendations for the EPCIs regarding the most pressing issues previously identified.

A. Organizational strategies identified across the studied cases

The analysis has shown that the organizational strategies adopted by large and small EPCIS are different: they are not on the same level in terms of mobilization of the networks of actors, in terms of governance organizations and in terms of relationships between actors. This discussion chapter will, therefore, provide a summary of the strategies and organizational structures identified in both large EPCIs (most of them being either pioneers, leaders, or followers) and small EPCIs (most of them being either followers or laggards).

The next two figures intend to synthesize the results found during the analysis. These results depict the situation in the 8 EPCIs studied in this thesis. Additional coloured dots will allow for identifying the most urgent issues and themes that need to be addressed in the future. A green dot means that, overall, no fundamental issues have been identified during the analysis concerning this specific theme. An orange dot means that while problems have been identified, they are not the most prominent. A red dot means that significant difficulties, issues, or threats, that need to be addressed soon have been identified. The colour of the dot is not necessarily linked to the number of issues, but it is instead linked to the significance of these issues.

This categorization allows for distinguishing the priority of the actions to be carried out, depending on the EPCI.

The analysis has shown that for **large EPCIs**, the main focus needs to be on improving co-creation with the professional actors and the civil society. Making sure the networks created during the elaboration phase of the PCAET persist and are renewed over time is also one of the priorities of those EPCIs. Other issues linked to the sharing-networks with other EPCIs, the lack of political support, the lack of financial resources, and the rigidity of the legal framework imposed by the state appeared during the analysis. However, these issues are less intensively experienced by every large EPCI studied.

Regarding **small EPCIs**, the main focus needs to be on improving co-creation with the civil society. Making sure the networks created during the elaboration phase of the PCAET persist over time, is, as it also is for large EPCIS, one of the top priorities of those EPCIs. Finally, financial and human resources were also identified as fundamentally problematic for those small-scale structures. Other issues linked to the sharing-networks with other EPCIs, the lack of political support, the lack of collaboration with local companies and universities, appeared during the analysis. However, these issues are less intensively experienced by every small EPCI studied.

IDENTIFIED ORGANIZATIONAL STRATEGIES IN LARGE EPCIs
(>50 000 inhabitants)

THE STATE

+ Obligatory point of passage that helped mobilize, and structure the roles of every public actors

- Issues with the rigidity of the legal framework

THE ADEME

+ Help framing the strategy of the EPCI but also its organization

+ Cit'ergie comes with a financial support from the ADEME

PLANNING DOCUMENTS

+ Other documents as catalysts and facilitators

+ The SDE, especially, can provide in depth energy scenario

SUSTAINABLE INITIATIVES

+ Provide inputs for the PCAET strategy and additional funding

- Voluntary initiatives that require a significant investment from the EPCI

INTERNAL COORDINATION

+ Large EPCIs successfully created cross-sectors internal bodies allowing for discussion between departments

- Without a dedicated structure, cross-sector coordination is difficult to achieve

- Some agents still difficult to mobilize

THE PLANNER

+ Different educational and professional background of planners have led to specific knowledge and how-to

POLITICS

+ /- Generally increasing political support that widely varies and can sometimes hamper the elaboration and implementation of the plan

OTHER EPCIs

+ Great diversity of networks with both generalist and thematic ones

+ Leading cities effectively exchange with each other

- Leading cities can find national networks too diverse in terms of typology of cities, preventing good-quality exchanges

UNIVERSITIES /RESEARCH

+ Knowledge providers either on specific issues or the elaboration of the plan

RESSOURCES

+ Large budgets involved but need to exploit funding opportunities

+ Strong teams of agents mobilized

COMPANIES

+ High level of inclusion and co-creation achieved in some EPCIs

- Still a difficulty to engage a complete range of actors from small businesses to big cities

Several strategies : formal and informal inclusion

CITIZENS

- Several degrees of involvement going from no to little participation to designing strategy and action plans

+ Extended concertation helped acculturating citizens

- Insufficient citizen participation

EVOLUTION OF THE NETWORKS

+ Increasing amount of professionals

+ / - Increasing awareness across population which does not necessarily translate into the PCAET involvement

- Decreasing mobilization of actors once the PCAET is wrapped up

PLACES OF GOVERNANCE

+ Specific governance organization with several separated thematic bodies and cross-sector united bodies

- Large numbers of dedicated bodies and places of exchanges

Figure 50 - Identified organizational strategies in large EPCIs

IDENTIFIED ORGANIZATIONAL STRATEGIES IN SMALL EPCIs
(<50 000 inhabitants)

THE STATE

+ Obligatory point of passage that helped mobilize, and structure the roles of every public actors

+ The legal framework acts as a guide for beginning EPCIs

THE ADEME

+ Help framing the strategy of the EPCI but also its organization

+ Cit'ergie comes with a financial support from the ADEME

PLANNING DOCUMENTS

+ Other documents as catalysts and facilitators

- Large amounts in planning documents can make the PCAET elaboration a challenging process

SUSTAINABLE INITIATIVES

+ Provide inputs for the PCAET strategy and additional funding

- Voluntary initiatives that require a significant investment from the EPCI

INTERNAL COORDINATION

+ The Cit'ergie initiative can kickstart the development of an internal organization

+ Small EPCIs can more effectively work cross-sectors because of the size of their structure

THE PLANNER

+ Different educational and professional background of planners have led to specific knowledge and how-to

POLITICS

+/ - Generally increasing political support that widely varies and can sometimes hamper the elaboration and implementation of the plan

OTHER EPCIs

+ Great diversity of networks with both generalist and thematic ones

+/ - Horizontal upscaling successfully allow some of the voluntary laggard EPCIs to catch up - need to keep including the laggards in the networks

UNIVERSITIES /RESEARCH

- Not included in the small EPCIs' networks : need for alternatives

RESSOURCES

- Restricted financial resources to implement to plan: need for external funding

- Limited human resources: need for external expertise

COMPANIES

- Small amounts of companies are included in the processes : companies scarcely included

+ Consultancy firms have a large role to play in small EPCIs by providing additional help

CITIZENS

+/- Several degrees of involvements going from no to little participation to designing strategy and action plans

+ Extended concertation helped acculturating citizens

- Insufficient citizen participation

EVOLUTION OF THE NETWORKS

+/ - Increasing awareness across population which does not necessarily translate into the PCAET involvement

- Decreasing mobilization of actors once the PCAET is wrapped up

PLACES OF GOVERNANCE

+/ - Few bodies of exchanges between actors : piloting committees and some specific committees

- Citizens, associations and researchers often left out of those places

Figure 51 - Identified organizational strategies in small EPCIs

B. Back to the theoretical background

Looking back at the Theories chapter, one may note that not all the theoretical elements can be found equally in the case studies and the conclusions that result from their analysis.

Theoretical elements were both used as a framework for the analysis (such as the ANT) and as state-of-the-art regarding the relationships between the actants of the climate planning network. The structuring elements, such as the ANT, were able to frame the study of the different cases effectively. The state of the art elements regarding co-creation, inter-municipal coordination, the roles of the planner, and the drivers for action were mainly taken from the international literature and were used to analyze the French local cases.

Therefore, some elements, such as inter-municipal coordination and the drivers for climate action, which have been identified as problematic in the international literature, are not as challenging for the French local authorities. For these themes, in the French context, *the analysis has partially qualified the theoretical elements*.

Nevertheless, as identified in the literature, co-creation processes, and the barriers for their implementation remain substantial challenges for French local authorities. Likewise, the resource aspect of climate planning that was also identified in the Theories chapter is fundamentally challenging in French climate planning. The identified planning roles in the analysis also match the different elements highlighted by the planning theory. Finally, the principles of embedded upscaling identified in the same chapter were also recognizable in the French local governance settings with, however, a noticeable lack of participation in formal networks at the international level. For these themes, there has mainly been *concordance between the theoretical elements and the results of the analysis*.

Other elements, not directly identified in the Theories chapter, appeared during the interviews and the document study. For instance, the links between the PCAET, other planning documents, and sustainable initiatives or the involvement of researchers have proven to be important. Even if they are not significant sources of concern for the EPCIs, they have been valuable sources of knowledge. For these themes, *the analysis has supplemented the theoretical elements*.

C. Finding-based recommendations

From the findings of Discussion A., specific recommendations from both large and small EPCIs can be formulated. Based on the identified organizational strategies and the topics prioritization, organizational recommendations will be drawn up upon those four selected themes:

- Improving co-creation with professional actors
- Improving co-creation with the civil society
- Keeping the networks alive
- Make the best of limited human and financial resources

As stated before, these recommendations are not exhaustive. This section only aims at addressing the most pressing issues identified in the analysis chapter.

Recommendations linked to other themes can also be identified throughout the thesis, especially in the “Opportunities” section at the end of every thematic section.

1. Improving co-creation with the professional actors

The analysis has shown an uneven inclusion of the private actors in the elaboration and implementation processes of the PCAET. Therefore, based on the theoretical framework and the theory, the following recommendations can be made:

- Formalizing a **partnership approach** on the different territories with a formal inclusion of the large companies which can be translated by a commitment charter with several levels of participation, is a possibility. This visibility will make it possible to identify more clearly the actions already carried out by some companies and those to be initiated. It will act as a catalyst for the companies that will be able to make commitments that will guide their actions in the years to come at their level.

- To include **smaller companies**, **thematic climate clubs** could be created across the territories. It would allow for not yet mobilized companies in a territory to exchange on the energy transition. This could lead to the emergence of projects to reduce GHG emissions or other collective operations.

- Make sure that both large and small companies consider the energy transition as a **lever for the development and resilience of their economic activity**. While achieving energy savings, companies can contribute to the principles of the CSR (corporate social responsibility) and benefit from a more sustainable image.

- Professional actors need to be mobilized across **all the PCAET phases**. For now, the analysis has shown that companies are mostly mobilized in the elaboration and implementation phases. The evaluation and monitoring aspects also need to be covered by this professional inclusion.

- The challenge being to climb the ladder of co-creation, companies will, therefore, have to be working side by side with the EPCIs to define joint agenda-setting, joint solution designing, and joint implantation procedures regarding climate issues. The intervention of the companies has to be considered as **permanent** and not punctual as it mostly is today.

- Implementing higher levels of co-creation levels mean **changing the culture of the EPCI**. A trust-based approach, with resources being shared, and with vertical and horizontal collaboration has to be implemented in the EPCIs. Improved professional inclusion will only be developed if the governance structure of the EPCI is willing to adapt itself by accepting risks and experimentations with external actors.

2. Improving co-creation with the civil society

The analysis has shown different and complementary strategies to include the citizens with a similar conclusion: few citizens attend public consultation meetings. Therefore, based on the theoretical framework and the theory, the following recommendations can be made:

- The strategy identified in the analysis that allows for the most substantial inclusion of the citizens in the elaboration of the PCAET is based upon the participation in both early phases (design of the strategy and the action plans) and through the entire process.

- To attract more citizens to the formal concertation, EPCIs need to **diversify** their strategies to reach citizens. To attract a larger audience, meetings in more interactive

formats need to be organized. For instance, some "ciné-débats" could be organized with the projection of a film followed by a debate. Meetings in forms of games or theatre play can even be created.

- EPCI should give priority to **small thematic meetings** rather than an-only PCAET consultation meeting. Because of the formalism of the PCAET, citizens might need to be presented the air-climate-energy issues with a non-PCAET angle. For instance, to tackle the issues of mobility, energy, waste, the communication should focus on the citizens' daily life and their vision of the territory by 2030/2050.

- **Going out to meet the citizens** can make the audience grow. For instance, workshops in middle and high schools on the meridian break, interventions in shopping centres or market places, association gatherings, etc. can attract more citizens. It also allows for a wider **representativity of the population** by making sure there are no socio-professional categories left out.

- EPCIs should show citizens, after their participation, that they **were listened to** by producing booklets including all if their propositions and/or integrating the detailed results from the public concertation directly in the PCAET.

- **Communication activities** are also fundamental to **raise awareness** about climate issues. By building strong relationships with their communication departments, EPCIs can aim at attracting citizens by providing easy-to-read informative documents.

- EPCIs should make citizens **actors of the energy transition**, not only in the elaboration phase but also in the implementing and monitoring phases. EPCIs have to create dedicated places for the citizens to innovate, such as civil calls-for-project, for instance. They need to facilitate their involvement by both adapting the governance structure and identifying key actions for citizens.

- As for the inclusion of professional actors, implementing higher levels of co-creation with the citizens' levels means **changing the culture of the EPCI**. Trust-based steering of bottom-up procedures and the acceptance of experimentation, negotiation, risk, and innovation from the EPCIs part are fundamental elements to more easily include the citizens.

3. Keeping the networks alive

As stated in the analysis, three general trends have been identified across the eight cases concerning the evolution of the networks of actors across the different cases. One of these trends, being the progressive decrease in the mobilization of actors once the PCAET is wrapped up, some recommendations based on the theory and the analysis can be formulated.

- First, the climate planner needs to convince and then mobilize all the actors involved **over the long run** that is to say in every phase of the PCAET. To do so, climate planners need to precisely identify the roles of each actor in every phase, so that their enrolment is facilitated. By providing roles definitions, and specific tools and places of expression, the planner will more easily keep the networks alive.

- As shown in the analysis, the elected officials have a significant role to play in every phase of the PCAET. The challenge here is to make **elected officials become the driving force**. It is possible to raise politicians' awareness with the help of other elected representatives which are already sensitized and experienced. One fundamental challenge is also to manage to cross political divides. The election of new leaders with

different priorities over time also has to be considered when implementing climate-related policies.

- To keep the networks alive, EPCIs will have to **keep those networks growing** with both private and civil actors as recommended in the two sections before.

4. Making the best of limited human and financial resources

Financial and human resources remain one of the main difficulties that EPCIs face when elaborating and implementing the plan, as shown in the analysis. Small EPCIs, especially, are heavily confronted with this lack of resources. Some recommendations can be formulated:

- **Developing joint initiatives with other departments** in the EPCIs is a solution. As climate-related projects often cross departments, the climate planner can rely on other departments to share the financial and human burden of the actions that need to be carried out. Sharing budgets and knowledge across departments can be a way to bypass the lack of resources in the climate department.

- In the same vein, **collaborating with private actors** in implementing specific actions constitutes additional help. Private companies can be a source of both knowledge and funding for climate actions.

- **Responding to calls for projects** is also a way to gather funding for implementing specific actions that are included in the climate agenda set up by the PCAET. The ADEME, the region, and the state can, therefore, provide additional financial resources to the voluntary EPCIs that are responding to those initiatives.

- Finally, additional help can be found through **external consultancy firms.** They allow for more knowledge and human resources to go in the general process of elaboration and implementation of the PCAET, or specific climate-related issues

Conclusion

This chapter is the conclusion of the thesis and aims at answering the following research question: "*What organizational strategies can French city planning institutions deploy to respond to climate issues*?"

The analysis has shown an uneven advancement of local climate planning across French territories. Regarding the organizational dynamics, the majority of the large EPCIs studied have often shown an advanced structure of governance with serious attempts of including the majority of the actors concerned (public, private, and citizens). Smaller EPCIs, have seen different forms of mobilization of the territorial actors, with new roles emerging as new responsibilities appeared over time. The different themes elaborated on in the analysis, such as the political backing or the collaboration aspect, have been experienced differently by every EPCI but have still strongly shaped the organizational strategy for climate change abatement for every local authority.

From the analysis, general organizational trends for large and small EPCIs have been identified across different themes. While every EPCI has faced its own challenges, mainly depending on its advancement, all EPCIs also shared some of the same organizational strengths, weaknesses, opportunities, and threats. The analysis has both confirmed elements from the already existing literature and provided additional perspectives in specific areas in the French climate planning context. In the future, some organizational improvements could be implemented in regards to three specific issues that were identified as the most problematic for now, in the analysis.

Improving co-creation with professional actors and with the civil society is one of the critical points on the future climate planning initiatives in every EPCI. Including these external actors, with a broad diversity of forms of inclusion (charter of engagements, formal meetings, interactive formats) in both the PCAET phases and outside those dedicated times, is fundamental. Reaching a wide range of the actors (from very small to large companies and from the ordinary citizen to the already committed one) and shifting the culture of the EPCI with renewed forms of opened governance will be necessary steps to ensure a more massive inclusion of those non-public actors across the French territories.

Keeping the already existing networks alive and extending those networks are other challenges that EPCIs will face shortly. To do so, the engagement of the private and civil actors is fundamental, but so is the one of the climate planners and the elected officials. Climate planners need to elaborate specific animation strategies to keep the networks animated during all the PCAET phases but also outside of those specific legally-related moments. Elected officials, for their part, are the driving forces of the initiatives carried out and must fully assume this role of both support and decision-making. The continuity of actions and strategies has to be achieved when the political authority of the EPCIs is often discontinuous over time.

Making the best of limited human and financial resources is the final recommendation that came out of this thesis. Those existing limited resources force EPCIs to find roundabout ways to accomplish their missions. Collaboration is the keyword; indeed, collaboration with other departments for joint initiatives, collaboration with external actors (private companies, consultancy firms, and researchers) or specific calls for projects, will allow for facilitated resource-sharing.

This thesis has helped to establish the current map of the organizational structures implemented in the French EPCIs and has provided elements for future improvements. As a lot has positively changed since the implementation of the first climate plans, it is desirable to believe that EPCIs will successfully adapt their structure and working modalities towards more flexible models of actors' inclusion.

Bibliography

ADEME. 2016a. “Elus, l’Essentiel à Connaître Sur Les PCAET.” https://www.ademe.fr/elus-lessentiel-a-connaitre-pcaet.

———. 2016b. “PCAET : Comprendre, Construire et Mettre En Oeuvre.” https://www.ademe.fr/pcaet-comprendre-construire-mettre-oeuvre.

———. n.d. “Territories and Climate.” Territories and Climate. https://www.territoires-climat.ademe.fr/.

Akrich, Madeleine, Michel Callon, and Bruno Latour. 2006. *Sociologie de la traduction, textes fondateurs.* Presses de l’Ecole des Mines. https://hal-mines-paristech.archives-ouvertes.fr/hal-00397086.

Berg, Bruce L. 2001. *Qualitative Research Methods for the Social Sciences*. Ed. Allyn & Bacon.

Berthelot, Gaëlle. 2020. Pays Midi Quercy interview.

Bordeaux Métropole. 2017. “Bordeaux Métropole PCAET.” https://www.bordeaux-metropole.fr/var/bdxmetro/storage/original/application/33522d60eda3067200703292d9eb86cc.pdf.

———. n.d. “Métropole - Bordeaux Métropole.” Bordeaux Métropole. https://www.bordeaux-metropole.fr/Metropole.

Callon, Michel, Arie Rip, and John Law, eds. 1986. *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World*. Palgrave Macmillan UK. https://doi.org/10.1007/978-1-349-07408-2.

Chalas, Yves. 2000. *L’invention de la ville.* Anthropos.

Chalas, Yves, Jean-Paul Blais, Alain Avitabile, Gilles Novarina, and Collectif. 2004. *L’imaginaire aménageur en mutation : Cadres et référents nouveaux de la pensée et de l’action urbanistiques*. Paris: Editions L’Harmattan.

Cit’ergie. n.d. “Présentation de Cit’ergie.” Citergie. https://citergie.ademe.fr/presentation-de-citergie/.

Colin, Olivier. 2020. Vienne et Gartempe interview.

Ecology and Sustainable Development Ministry. 2004. “Plan Climat 2004.” http://www.comite21.org/docs/economie/axes-de-travail/alimentation-dechets-energie-transports/plan-climat.pdf.

Engberg, Lars A., and Jacob Norvig Larsen. 2010. “Context-Orientated Meta-Governance in Danish Urban Regeneration.” *Planning Theory & Practice* 11 (4): 549–71. https://doi.org/10.1080/14649357.2010.525379.

Fouvet, Anne-Cécile. 2020. Grenoble interview.

French Parliament. 2010. *Grenelle 2*.

———. 2015. *Law of 17 August 2015 on the Energy Transition for Green Growth*. https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000031044385&dateTexte=&categorieLien=id.

———. 2016a. *Décret N° 2016-849 Du 28 Juin 2016 Relatif Au Plan Climat-Air-Énergie Territorial*. *2016-849*.

———. 2016b. *Arrêté Du 4 Août 2016 Relatif Au Plan Climat-Air-Énergie Territorial*.

Fuhr, Harald, Thomas Hickmann, and Kristine Kern. 2018. “The Role of Cities in Multi-Level Climate Governance: Local Climate Policies and the 1.5°C Target.” *Current Opinion in Environmental Sustainability*, 1.5°C Climate change and urban areas, 30 (February): 1–6. https://doi.org/10.1016/j.cosust.2017.10.006.

Grand Lyon. 2019. “Grand Lyon PCAET.” https://blogs.grandlyon.com/plan-climat/wp-content/blogs.dir/8/files/dlm_uploads/2019/12/01-PCAET_MetropoleDeLyon_2019-20301.pdf.

———. n.d. “Bienvenue à La Métropole de Lyon - La Métropole de Lyon.” https://www.grandlyon.com/metropole/bienvenue-a-la-metropole.html.
Grand Poitiers. 2019. “Grand Poitiers PCAET.” https://jeparticipe-grandpoitiers.fr/project/consultation-pcaet/presentation/presentation.
———. n.d. “Le territoire.” grandpoitiers.fr : Site Internet. https://www.grandpoitiers.fr/grand-poitiers/le-territoire.
Grenoble-Alpes Métropole. 2019. “Grenoble-Alpes Métropole PCAET.” https://www.grenoblealpesmetropole.fr/463-plan-air-energie-climat.htm.
———. n.d. “La Métropole.” https://www.grenoblealpesmetropole.fr/2-la-metropole.htm.
Honoré, Thomas. 2020. Grand Poitiers interview.
Ile de Noirmoutier. 2019. “Programme d’actions.” Communauté de Communes de l’Île de Noirmoutier. May 2, 2019. https://www.cdc-iledenoirmoutier.com/programme-d-actions.
IPCC. 2014. “AR5 Synthesis Report: Climate Change 2014 — IPCC.” https://www.ipcc.ch/report/ar5/syr/.
———. 2018. “Global Warming of 1.5 ºC.” https://www.ipcc.ch/sr15/.
Kern, Kristine. 2019. “Cities as Leaders in EU Multilevel Climate Governance: Embedded Upscaling of Local Experiments in Europe.” *Environmental Politics* 28 (1): 125–45. https://doi.org/10.1080/09644016.2019.1521979.
Kvale, Steinar, and Svend Brinkmann. 2009. *InterViews: Learning the Craft of Qualitative Research Interviewing, 2nd Ed*. InterViews: Learning the Craft of Qualitative Research Interviewing, 2nd Ed. Thousand Oaks, CA, US: Sage Publications, Inc.
La Nouvelle République. 2019. “‘ A quand un plan climat pour Tours ? .’” *lanouvellerepublique.fr*, April 2019. https://www.lanouvellerepublique.fr/tours/a-quand-un-plan-climat-pour-tours.
Langlais, Richard. 2009. “A Climate of Planning: Swedish Municipal Response to Climate Change.” *Planning for Climate Change: Strategies for Mitigation and Adaptation for Spatial Planners*. https://portal.research.lu.se/ws/files/5430760/2426485.pdf.
Martinson, Karin, and Carolyn O’Brien. 2015. “Conducting Case Studies.” In *Handbook of Practical Program Evaluation*, 177–96. John Wiley & Sons, Ltd. https://doi.org/10.1002/9781119171386.ch8.
Mejri, Virginie. 2020. Bordeaux Métropole interview.
Molina, Géraldine. 2010. “Les Faiseurs de La Ville et La Littérature : Lumière Sur Un Star-System Contemporain et Ses Discours Publics : Des Usages de La Littérature Au Service de l’action Des Grands Architectes-Urbanistes.” These de doctorat, Toulouse 2. http://www.theses.fr/2010TOU20031.
———. 2012a. “Aménager Les Espaces En Ménageant Le Climat : De Nouvelles Interfaces à Construire Entre La Climatologie Urbaine et Les Praticiens », Synthèse Des Contributions.” In .
———. 2012b. “Lutte contre le changement climatique : les acteurs de l’aménagement entre coopération, reconversion et concurrence.” *Métropolitiques*, November 12, 2012. https://www.metropolitiques.eu/Lutte-contre-le-changement.html.
Molina, Géraldine, Marjorie Musy, and Margot Lefranc. 2018. *Les professionnels du bâtiment face aux défis énergétiques et environnementaux: Compétences et pratiques en transition*. ISTE Group.
Ouest France. 2020. “Noirmoutier-en-l’Île. Clim’actions : Noël Faucher répond aux élus de L’Épine.” *Ouest-France.fr*, January 21, 2020, sec. L’Épine. https://www.ouest-france.fr/pays-de-la-loire/lepine-85740/noirmoutier-en-l-ile-clim-actions-noel-faucher-repond-aux-elus-de-l-epine-6699703.
Pays Midi-Quercy. 2019. “Pays Midi-Quercy PCAET.” https://cloud.paysmidiquercy.fr/s/DYbPX4r9LG8JFWo.

———. n.d. “Le pays - Pays Midi-Quercy.” https://paysmidiquercy.fr/. https://paysmidiquercy.fr/le-pays/.
Ponsard, Luce. 2020. Grand Lyon interview.
Reckien, Diana, Monica Salvia, Oliver Heidrich, Jon Marco Church, Filomena Pietrapertosa, Sonia De Gregorio-Hurtado, Valentina D’Alonzo, et al. 2018. “How Are Cities Planning to Respond to Climate Change? Assessment of Local Climate Plans from 885 Cities in the EU-28.” *Journal of Cleaner Production* 191 (August): 207–19. https://doi.org/10.1016/j.jclepro.2018.03.220.
Richard, Elsa, and Géraldine Molina. 2014. “Le Plan Climat de La Communauté Urbaine de Toulouse Métropole : Une Démarche Territoriale « ordinaire » d’adaptation Aux Changements Climatiques.” *Sud-Ouest Européen, N°37*, 2014.
Rydin, Yvonne. 2013. “Using Actor–Network Theory to Understand Planning Practice: Exploring Relationships between Actants in Regulating Low-Carbon Commercial Development.” *Planning Theory* 12 (1): 23–45. https://doi.org/10.1177/1473095212455494.
Sehested, Karina. 2009. “Urban Planners as Network Managers and Metagovernors.” *Planning Theory & Practice* 10 (2): 245–63. https://doi.org/10.1080/14649350902884516.
Torfing, Jacob, Eva Sørensen, and Asbjørn Røiseland. 2019. “Transforming the Public Sector Into an Arena for Co-Creation: Barriers, Drivers, Benefits, and Ways Forward.” *Administration & Society* 51 (5): 795–825. https://doi.org/10.1177/0095399716680057.
Tours Métropole Val de Loire. n.d. “Les chiffres clés de la Métropole.” Tours Métropole Val de Loire. https://tours-metropole.fr/les-chiffres-cles-de-la-metropole.
Vie Publique. 2015. “L’intercommunalité | Vie Publique.Fr.” 2015. https://www.vie-publique.fr/fiches/lintercommunalite-0.
———. 2016. “Projet d’arrêté Relatif Aux Plans Climat-Air-Énergie Territoriaux (PCAET).” Vie Publique. 2016. https://www.vie-publique.fr/consultations/21562-projet-darrete-relatif-aux-plans-climat-air-energie-territoriaux-pcaet.
Vienne et Gartempe. 2019. “Vienne et Gartempe PCAET.”
———. n.d. “Présentation.” *CC Vienne et Gartempe* (blog). https://www.vienneetgartempe.fr/la-ccgv/presentation/.
Yalçın, Melike, and Benoit Lefèvre. 2012. “Local Climate Action Plans in France: Emergence, Limitations and Conditions for Success.” *Environmental Policy and Governance* 22 (2): 104–15. https://doi.org/10.1002/eet.1575.
Yin, Robert K. 2009. *Case Study Research, Design and Methods*. Ed. London: Sage Publications.

Appendixes

1. Interview Guide

Attached as audio files when submitting the thesis:

2. Pays Midi Quercy Interview – BERTHELOT Gaëlle / Energy-Climate Officer (25/03)

3. Ville de Grenoble Interview – FOUVET Anne-Cécile / Air-Climate Project Director (25/03)

4. Bordeaux Métropole Interview – MEJRI Virginie / Climate Plan Project Manager (26/03)

5. Grand Lyon Interview – PONSAR Luce / Ex-Climate Plan Project Manager (26/03)

6. Grand Poitiers Interview – HONORE Thomas / Head of the Prospective-Climate Unit (31/03)

7. Vienne et Gartempe Interview – COLIN Olivier / Head of the Spatial Planning Unit (21/04)

APPENDIX 1. INTERVIEW GUIDE

PRESENTATION:

1. Before we begin, if there is anything that is not clear in what I am saying, please let me know.
2. As part of my thesis, I am seeking to study the interplay of actors that takes place during the creation and implementation of PCAETs to identify brakes and levers. So what I would like to do today is to hear about your experience in writing this plan and your daily work. What interests me, in particular, is to identify and characterize the networks of actors that were created during this work, but also to portray the perception you have of your own role within these networks.

Themes	Sub-topics, reminders	What we want to know (hypotheses)
1. Local context and history of action plans	**Understand the historicity/genesis of the establishment of the first climate plans (when, how and why?).** . *Date of implementation of the first plans* . *Genesis (Agenda 21, specific plan for energy, PCET...)* . *Actors involved in this initial work* **Identify the specific characteristics of the study area that are related to the process of creating climate plans and that may have led the local authority to set up a climate plan:** . *The geography of the territory (topography)* . *Demographics, economic and social profiles* . *Climate vulnerabilities* . *The commitment of elected officials* . *Material and financial capacities* . *Key individuals* . *A civil society concerned about climate issues, citizens' waiting horizon* **Understanding how the community works** . *Structure of the different services (especially those related to climate planning) .*	*Identify the initial stakeholder networks and represent the **genesis of the PCAETs** - how climate policies emerged from environmental policies* *Assessing **community support** on climate issues* *Identifying the **driving forces behind the implementation of the** first climate plans* *Clarify the **role of elected officials** in the process of creating the PCAETs.* *Roughing up the general functioning of the community (how many services? cooperation between services?*
2. Inspirations and models	**Identify the strategies that shaped/ served as a model for the construction of the PCAET** . *What are the possible **models**: the **devices**, **people**, **projects** or **achievements that** have inspired you or served as examples (devices, people, projects, achievements, etc.)* *? What were the roles of individuals or entities: other communities in general, individuals in particular (researcher, climate planner, etc.)?* . *On what aspects? Why?* . *How have you adapted these models to your territory? Have any of the strategies failed?* . *Do you serve as a model for other communities?*	*To identify the **processes of knowledge and experience transfer that** have led to an increase in competence and acculturation of climate planners (key individuals, communities, networks).* *Identify **leaders, followers and laggards,** understanding the **role of "best practices" and "references"**: systems, actors, projects, achievements, models, etc.* *Understand the success or failure of the **transposition of local strategies** (generalization of local practices) and the **modalities of circulation of the models.***
3. Networks of actors	**Identify all the actors mobilized for the production of the plan and the conditions of cooperation:** *. Which actors were mobilized for the production of the plan?* *. What was the directive, the general direction, the instruction, the command? By whom was it defined?*	*Identify the **key actors mobilized** for the realization of the plan and the **modalities of their participation as well as** their respective roles* *Identifying the **relationships between actors** and the nature of these relationships: competition, complementarity, support ("buoys"), divergent interests, conflicts, tensions, hierarchies, etc.*

	. *Detail institutional actors, private actors, research actors* . *Specify the roles of each of them. When and for what reason did they intervene?* . *Inclusion of actors: which actors were excluded from the process? For what reasons?* . *What was the proportion in terms of active participation of the different actors?* <u>Identify how the climate planner perceives his or her own role</u> . ***What are the knowledge and resources*** *mobilized ("scientific", "secular", "do-it-yourself" knowledge, drawn from intuition and personal experience) when creating the plans?* . *How do you articulate your different tasks?* . *What is your academic and professional background? How does this affect the relationship you have had with your mission to carry out the climate plan?* . *What are the values that are important to you in your profession? What do you consider to be your comfort and discomfort zones?* . *Do you see yourself as the central actor in the task of creating the PCAET? Why ?* <u>Identify knowledge and skills transfer processes</u> **. Between the national, regional and local levels:** . *Did you receive regional or national support to create the plan? In what form? Are there resources available to you? What was the role of ADEME?* . *How does your work fit in and relate to national and regional planning documents? In relation to other local planning documents (PLUM...)?* . *What has been the impact of the changes in the PCAET legislation on your work?* **. Between the different services in the local authority:** . *What services were mobilized in the production of the plan?* . *What were their roles?* . *What obstacles did you encounter? How did you overcome them?* **. Between different local authorities:** . *Are you members of national or international city networks? Why are you a member?* . *What benefits do/have you derived from this participation?* **. Between the public authority and private / research / parapublic actors:** . *How do you take advantage of the knowledge/skills of private actors / research actors / parapublic actors?* . *How do private actors benefit from their contribution? Why do they participate?* . *Do you think their participation is a way to stimulate innovation and entrepreneurship in your territory?* . *What is the role of innovation in the PCAET creation process?* <u>Modalities of exchanges between the actors :</u> . *For each type of actor, what are the modalities of exchange? How often? (Seminars, trips, meetings, workshops, newsletters...)* . *What other steps were needed to mobilize actors and organize networks? How to make the network of actors "survive"?*	*Understand the* ***working modalities of the climate planner*** *who navigates between the different roles he or she has to play.* ***Identifying the roles*** *around the values, skills and knowledge of the "professional manager", "administrative manager", "market planner", "process planner".* *Identifying the role of the climate planner within the networks of actors* *Identify the* ***characteristics of the pioneers*** *(adherence to ecological values, the role of reading, geographical mobility, etc.).* *Distinguish between the* ***notions of "horizontal upscaling", "vertical upscaling" and "hierarchical upscaling"*** *on the territory and the dynamics at each level:* *Qualify the different* ***transfers of knowledge, skills and benefits/obstacles*** *encountered at each of the scales.* *Placing the actions carried out on the* ***scale of co-creation for private actors*** *Understand the* ***dynamics of these public-private partnerships*** *(modalities, obstacles, etc.).* *Identify the* ***crossing points, spokespersons, intermediaries, recruitment strategies, and extensions from the*** *actor-network theory.*

	<u>Evolution of networks of actors</u> . *Do networks of actors grow over time? Why do they grow? How do they grow?* <u>Understanding Citizen Participation</u> . *Did citizens participate in the creation of the climate plan? In what ways? At what level?* *Examples of elements retained in the plans* . *Was this citizen participation included in the final plan?* . *Were these participations representative of the population of your territory?* . *Which socio-professional categories were mainly represented during these mobilizations?*	*Place the actions carried out on the* ***scale of co-creation for citizens*** *Characterize the* ***representativeness of*** *the participating audiences* *Identifying whether or not citizen participation is* ***considered in*** *planning documents*
4. Resources	. *What resources (material, financial and human) do you have at your disposal? What is the allocated budget?* . *Do other actors allow you to bring in resources that you do not have?* . *What other resources would you need?* . *How did you collect the data for the diagnosis of your territory? Who then manipulated and analyzed them?* . *Did you use ADEME guides to carry out the plan? How did it help you?*	
5. Synthesis	. ***Generally speaking, in your opinion, what have been the most critical successes? Progress? To what are they due?*** . ***What were the most considerable difficulties encountered? Brakes, blind spots and locks?*** . ***What levers can you identify to improve the different processes ? Under what conditions can these levers be activated?***	*Identify :* - *Success, progress* - *Difficulties (brakes, locks, blind spots)* - *Levers*