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Energy Policy Development in a Non-OECD Context

- early experiences of energy efficiency policy for residential buildings in Argentina

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Abstract

The reliability of energy supply is crucial for the well-being of individuals and the prosperity of countries. At the same time, energy production is closely connected to CO_2 emissions, which is believed to have an important impact on human-induced global warming. In light of resultant, partly counteracting challenges, energy efficiency has gained increasing attention as a means of ensuring energy supply, fostering a country's competitiveness and cost-effectively mitigating CO_2 emissions. Yet, evaluations of energy efficiency policies are often lacking or insufficient. Moreover, researchers have tended to largely overlook energy efficiency policies in non-OECD countries, although many developing countries are about to introduce energy efficiency policies.

In order to shed particular light on the processes of early-stage implementation (including the design of specific policy instruments) in non-OECD countries, this research turns to a qualitative research agenda, mainly relying on interviews with key actors within policy making, business and academia. The specific object of study is constituted by PRONUREE – an umbrella policy for energy efficiency introduced in Argentina in 2007, and more specifically on the programme's sections for the existing residential building stock. A theoretical process model of this umbrella policy is developed based on which the output of the policy is both identified and evaluated. The analysis is complemented by the further assessment of transparency, administrative burden in the design process and the generation of business opportunities.

This study highlights that the output of PRONUREE has so far been rather limited. This is partly attributed to the lack of transparency. In addition, a heavy burden of negotiation put on the public authorities, which too impedes implementation, is revealed. By drawing on so-called policy network theory, it is argued that particularly the lack of interaction between private, public and academic actors has hampered the proceeding of the programme. Furthermore, the study highlights the importance of (managing) expectations when assessing policy implementation.

Executive Summary

Background

Energy plays a critical role for mankind. As a consequence of an increasingly scarce energy supply, much attention has lately been given to the role of public policy to provide the right incentives and foster energy systems compatible with economic, social and environmental goals. Countries' development and citizens' living standards are tightly interwoven with and dependent on the reliability of an affordable energy supply. Historically, energy consumption was often believed to be merely positively related to the economic development of countries. However, during the last decades, many OECD countries have witnessed a decoupling of energy usage and economic growth (Proop 1988 referred to in Arbex and Perobelli, 2010). In addition to climate change concerns, this has reinforced a focus on strong energy efficiency policy as a potential means of both ensuring a reliable energy supply and reducing energy demand sustainably.

Within this context, high energy efficiency saving potentials and climate change concerns have fuelled an ever growing attention towards effective energy efficiency policy. As known, energy production and consumption are closely linked to the emission of one of the most prominent greenhouse gases (GHG), carbon dioxide (CO_2). Tapping these potentials represent a cost-effective way to reduce GHG emissions. In particular, the building sector offers great potential for policy interventions due to extensive potentials for improved energy efficiency and resulting emission reductions (IPCC, 2007). According to Rogner et al. (2007), 30% of the GHG emissions in the building sector could, in fact, be avoided through measures implying net economic benefits for the society. The Intergovernmental Panel on Climate Change (IPCC) highlights the importance of addressing CO_2 abatement policies in non-OECD countries, as these countries are estimated to stand for more than two thirds of the CO_2 emissions worldwide (Rogner et al., 2007). However, the prevalence of numerous market and institutional barriers to improve energy efficiency in the building sector suggests that policy instruments are necessary for these potentials to be materialised.

Despite the importance of energy efficiency policy in the building sector, research activity in this particular area has been sparse, in particular within the context of policy evaluation in non-OECD countries (Rogner et al. (2007). In addition to this, a considerable knowledge gap in GHG mitigation options in non-OECD countries (Rogner et al., 2007) and a lack of knowledge concerning the evaluation of energy efficiency policies in OECD as well as non-OECD countries (Mundaca, 2008) has been already identified. Moreover, knowledge and understanding on the (effective) implementation of policy measures in non-OECD countries seem to be highly limited (Koeppel and Ürge-Vorsatz, 2007).

Argentina, which is chosen as the specific case study of the thesis, captures to a large extent the above mentioned justifications for this research. First, only limited attention has been given to CO_2 abatement in the country. Second, a systematic evaluation of public policies for energy efficiency has hardly ever occurred and the specific phase of early stage implementation has been even less attended. In addition, recent gas and electricity supply shortages have pointed to the particular need for the initiation of long-term solutions for energy security. With Argentine building stock being characterised by inefficient systems for

heating and cooling (Juanicó and González, 2008b), as well as poor thermal quality of the building envelope (González et al., 2007), the potential for improved energy efficiency is considerable. In fact, 35 to 40% of all primary energy resources used in the country are used for environmental conditioning of the built habitat (heating and cooling), 53% of which can be allocated to the residential sector alone (OLADE, 2006).

Objective and research methods

This Master's thesis seeks to address the aforementioned research gap within energy efficiency policy evaluation in developing countries. Driven by this shortcoming, the specific objective of the thesis is to provide an understanding of the early implementation stages of energy efficiency policies targeting the existing residential buildings in Argentina. The propositions investigated form part of a broader umbrella policy for energy efficiency by name PRONUREE. Four proposed policy instruments were investigated: 1) "Develop a system of incentives for the decrease of the consumption of energy which includes, for example, preferential financing for measures aiming at reducing the consumption." 2) "Design a strategy for the massive implementation of systems of water heating based on solar energy, in particular in peripheral populations."3) Implement a national programme for the insulation for housing including roofs, building envelopes and openings" and 4) a separate proposition concerning the introduction of a light bulb exchange programme are assessed in order to highlight the particularities of the different propositions. As a consequence of the umbrella nature of the policy assessed, the concept of policy implementation has in this thesis come to include also early stages of policy development, such as design of the particular policy instruments.

To address the objective, the following research questions have guided the research:

1. What has been the output of the investigated policy propositions?

2. How have public and private interests been pulled together within the investigated policy propositions?

3. How has the availability of human and financial resources within public administration affected the implementation of the investigated policy propositions?

4. Given the actual performance of the investigated policy propositions, what kind of business opportunities can be discerned for the construction sector?

5. What can policy-makers learn for future policy design and implementation within energy efficiency for residential buildings in Argentina?

Different methods for data collection and data analysis were used. The main part of the research has been carried out during three months' fieldwork in Argentina including in-depth interviews with a broad range of relevant actors. In addition, documentary study of legal documents and consultation of academic and other literature sources have been turned to. For analysing the data, theory-based policy evaluation is first applied. As a result, a model of the policy development process is derived The development of the model guides large parts of

this study because of its capacity to facilitate the identification of crucial stages and processes within which policy implementation might have come to a halt. As a consequence of the current stage of development of the investigated policies, the public authority within Secretaría de Energía (the Secretary of Energy) designing and formulating PRONUREE has become an important target of enquiry within this research project. To further assess PRONUREE, the research focused on four evaluation criteria: a) output b) generation of business opportunities within the construction industry c) transparency, and d) administrative burden of implementation.

The thesis seeks to reach a broader academic audience within environmental policy evaluation in both developing and developed country contexts. Policy makers also represent an important target group. In addition, the thesis aims to provide valuable information to industrial actors within the Argentine construction sector.

Results

The result of the process model analysed are presented, based on this model, the four research criteria are then further explored, with references made to policy network theory. From applying the theory-based policy evaluation approach and testing the process model of the policy theory, it can be concluded that the propositions addressing the environmental conditioning of the built residential habitat have not been implemented in accordance with PRONUREE's prescriptions. Instead, the measures have come to halt within the Secretaría de Energía (the Secretary of Energy) which is the public authority responsible for the first implementation stages including inter alia the specification of policy measures and the development of indicators to monitor progress. The PRONUREE light bulb programme, on the contrary, has resulted in the distribution of 18 million low energy light bulbs and the collection of 23 million incandescent light bulbs which is in line with the targets set through the programme.

Based on the analysis of the process model above, the findings strongly suggest that the output regarding the investigated proposed instruments is very limited. The only concrete step in the direction towards further implementation is the initiation of the development of a labelling standard for the thermal envelope of buildings. The standard was formulated and then published earlier this year. Regarding the light bulb exchange programme on the other hand, the output in form of developed plans and passed resolutions is in accordance with the targets set up.

None of the investigated proposed policy instruments seem to have led to the creation of noticeable business opportunities within the construction industry. This is unsurprising given their limited or non-implementation. In addition, results highlight the importance of long-term policy objectives as key prerequisites for the creation of business opportunities within the construction industry. In fact, parts of PRONUREE call for a focus on continuity — a concern which is also upheld by actors within the group at Secretaría de Energía in charge of the programme. Nonetheless, business actors do not seem to experience an increase in predictability and continuity, which might be a result of a lack of transparency and confidence in emerging policy instruments that characterise the entire programme.

Until today, very little is known by relevant stakeholders about the proposed policy instruments. In turn, this has created an environment in which expectations regarding the implementation of policy instruments are low. In particular, the lack of transparency characterising the three proposed policy instruments addressing the environmental conditioning of the built habitat seems to have hampered these very measures' implementation. This is mainly due to the fact that this lack of transparency has impeded a) the identification/communication of potential business opportunities, b) the pooling of financial/human resources, c) the formation of consensus and d) the materialisation of public pressures for implementation to be carried out. These aspects appear to have formed a particularly unfavourable ground for the successful implementation of PRONUREE as a whole.

The research work at hand also sheds light on the heavy burden that is put on public authorities in charge of implementing PRONUREE. This burden comes mainly in the form of negotiation, due to a) limited jurisdiction on a national level which cedes substantial legal powers to provinces with regard to buildings, b) the politicisation of policy measures and c) the polarisation of the Argentine society.

The analysis indicates that external funding has played an important role. For instance, funding from the Global Environment Facility (GEF) has been critical for the Secretaría de Energía's efforts to proceed with PRONUREE. To further increase and stimulate implementation, this thesis sets, however, even out to argue for the potential introduction of a public funding system in which savings stemming from energy efficiency measures (partly) come to drive public policy implementation regarding energy efficiency is discussed.

Conclusions

Contributions of the thesis are on a methodological and theoretical level as well as on an empirical level. Regarding methodological conclusions, the research further underlines the importance of systematic assessment of all phases of public policies in order for the development of successful energy efficiency policy measures in non-OECD countries to advance. In particular, the investigation highlights the importance of investigation of the early stages of policy development (e.g. design and formulation). Furthermore, a qualitative understanding of the administrative burdens carried by implementing public authorities comes out as crucial when understanding the constraints for policy implementation. On a theoretical level, the thesis emphasises the importance of including expectations of policy implementation held by relevant stakeholders as a central parameter when studying policy implementation.

On the empirical level, several conclusions can be made. First, the findings indicate that the output, of the investigated parts of PRONUREE, with exception for the light bulb exchange programme, has been very limited. Moreover, lack of transparency appears to have constrained the ability of PRONUREE to pull together the necessary resources of private and public actors in order to implement the programme. The administrative burden of the programme turns out to be considerable, and an important component coming out of the analysis is the burden of negotiation. The limited resources available within the Secretaría de Energía, therefore, seems to have impeded the implementation of the programme. In addition

to the lack of implementation, important constraints to public policies' ability to generate business opportunities include the lack of long-term policy objectives and continuity of policies.

Drawing on concepts of network theory, the need for private and public actors to work together in order to pool resources necessary for implementation is further highlighted. One can argue that strengthening the network of actors with a strong interest in an ambitious energy efficiency policy is more likely to lead to actual implementation. Furthermore, strengthening the network of actors with an interest in ambitious energy efficiency policy targets can also contribute to a set of policies characterised by continuity and predictability. This is found to be important with regard to the stimulation of a market and related capacity building for construction measures for energy efficiency. One way of strengthening such a network, could be through the creation of a formal institution, such as an energy efficiency agency bringing together public and private actors.

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Abbreviations

ARS – Argentine Peso

EUR – Euro

DNP – Dirección Nacional de Promoción

DNPEE – The Energy Efficiency unit within Dirección Nacional de Promoción

GHG – Green house gas

IRAM – Instituto Argentino de Normalización y Certificación – The Argentine Institute for Standardisation and Certification (Thesis author translation)

IPCC – Intergovernmental Panel on Climate change

USD – US Dollar

Currency exchange rates

ARS 1 = EUR 0.1977 rate of www.xe.com, 2010-08-12

USD 1 = EUR 0.7799 rate of www.xe.com, 2010-08-15

ARS 1 = USD 0.2539 rate of www.xe.com, 2010-08-20

Glossary

As no official English names for all government agencies have been found, the Spanish names have been used. Below these are presented with an English translation by the thesis author. Quoted sections from the relevant legislation are translated by the thesis author

El Ministerio de Planificación Federal, Inversión Pública y Servicios – The Ministry of Federal Planning, Public Investment and Services

Jefatura de la Gabinete de Ministros – Head of the Cabinet of Ministers

Secretaría de Comercio Interior – Secretary of Domestic Trade

Secretaría de Energía – Secretary of Energy

Secretaría de Industria y Comercio – Secretary of Industry and Commerce

Secretaría de Obras Públicas – Secretary of Public Works

Subsecretaría de Coordinación y Control de Gestión – Subsecretary of Coordination and Management Control

1 Introduction

1.1 Background

Energy plays a key role for all economies. As low-cost sources of energy are increasingly scarce with associated price increases, the issue of energy supply in relation to a growing demand of energy services and energy security is a concern for the majority of countries. Shortage of energy can include sharply increased poverty as consumer prices rise, a drastic raise in government expenditure for energy (-subsidies) as well as political unrest. Shortage of energy can also have serious effects on a country's industrial sectors when these are dependent on cheap energy. Historically, energy consumption was often believed to be merely positively related to the economic development of countries. However, during the last decades, many OECD countries have witnessed a decoupling of energy usage and economic growth (Proop 1988 referred to in Arbex and Perobelli, 2010), which seemingly points to a reinforced focus on energy efficiency as a potential means of both ensuring efficient energy supply and of developing the economy of the respective country.

Energy production from fossil fuels is one of the most important sources of CO_2 and other greenhouse gas (GHG) emissions. A large share of the climate research currently firmly believe in an anthropogenically driven greenhouse effect that will have major economic, environmental and social impacts on our planet (e.g. Rogner et al., 2007). Consequently, drastic measures in order to alter our way of living and consuming energy will be needed for minimising such climate change and its negative effects. The per capita emissions of CO_2 in non-OECD countries are about a third of those in OECD countries. However, non-OECD countries are projected to stand for two thirds to three quarters of the CO_2 emissions worldwide (Rogner et al., 2007). Thus, the efforts of these countries to reduce CO_2 emissions are crucial for an effective climate policy on a global scale.

Energy end-use efficiency concerns the efficiency with which energy is used, excluding energy transmission and production. It is seen by many as the most important tool for energy security and CO_2 emission mitigation. Its advantages include cost-effectiveness as well as improved productivity and living standards (Jochem, 2000 and Geller, 2003).

According to World Business Council for Sustainable Development (WBCSD, 2008) buildings stand for 40% of global energy consumption and this share is expected to increase. Factors driving the energy consumption in buildings include increased areas of the building stock as well as a change towards lifestyles characterised by higher energy consumption (WBCSD, 2008). However, many of the inefficiencies in buildings can be addressed with an economic gain as consequence. Compared to many other sectors, the presence of self-financing measures is especially significant within the building sector with alternatives such as increased building insulation, improved lighting and air conditioning topping the list of cost-efficient CO_2-abatement measures (Enkvist, Nauclér and Rosander, 2007). According to Rogner et al. (2007) 30% of the GHG emissions of the building sector, the majority representing CO_2, can be avoided with net economic benefits.

The underlying reasons to the large cost-effective potentials for saving energy and cutting CO_2 emissions through energy efficiency within the building sector can be explained by a number of market failures including lack of information, incorrect pricing due to externalities, as well as misplaced initiatives (principal-agent problems) (Levine et al., 1995). Another market failure is constituted by market distortions such as subsidised electricity prices, both directly and indirectly through, for example preferential treatment of energy producing companies, contributing to the inefficient use of energy. Finally, market barriers stemming from characteristics of individuals and organisations such as myopic behaviour and lock-in effects as well as the high cost of capital for energy efficiency investments help explaining the existence of major energy saving potentials. The magnitude of the barriers and market failures impeding energy efficiency is higher in non-OECD countries than in OECD countries (Rogner et al., 2007).

The many barriers for energy efficiency improvements within buildings imply that prevailing market mechanisms alone are not sufficient for materialising the investments needed, but justify the development of policies in the area. However, it has proven difficult to develop effective and efficient policy instruments. Furthermore, energy markets are highly regulated in many countries with prices characterised by substantial subsidies, and increasing consumer prices for energy is met with fierce political opposition in many places. This complicates the issue of policy design and implementation further.

Argentina is not an exception in the case of high energy inefficiency in housing. Between 35 and 40% of all the primary energy resources used in the country are used for environmental conditioning of the building stock (heating and cooling). 53% of this can be allocated to the residential sector (OLADE, 2006). The Argentine building stock is characterised by inefficient systems for heating (Juanicó and González, 2008b).

Argentina has traditionally been an energy abundant country, particularly rich in natural gas (IEA, 2010a). However, during recent periods of economic prosperity, the country has been experiencing the effects of an increasing energy scarcity, in particular during periods of heat as well as cold waves. Many argue that the country's history of energy abundance has lead to an energy policy and discourse very oriented towards energy supply, but omitting the aspect of demand management.

1.2 Problem definition and justification

This research is justified by the lack of evaluation of energy efficiency policy in non-OECD countries, the significance of market failures and barriers for energy efficiency in buildings as well as a large potential for energy efficiency in buildings in the residential sector in these countries.

Several researchers stress the need for more evaluation of energy efficiency policy. Mundaca (2008), identifies a lack of knowledge when it comes to the evaluation of energy efficiency policies in OECD and non-OECD countries. The IPCC report specifically highlights the critical lack of research concerning GHG mitigation options in non-OECD countries, energy efficiency being one of the most important sources of mitigation (Rogner et al., 2007). One of the major obstacles for successful policies in non-OECD countries is the effective

implementation of policy measures and also here, there is a significant gap in the research until now. Research within this area becomes particularly important as many non-OECD countries are just about to implement energy efficiency policies (Koeppel and Ürge-Vorsatz, 2007).

A number of characteristics of non-OECD countries amplify the market barriers and failures impeding energy efficiency. These include *inter alia* lack of access to capital, highly regulated energy prices, non-payment of energy as well as lack of social capital (Rogner et al., 2007).

As a consequence of the barriers mentioned, the energy efficiency in many non-OECD countries is still poor, and consequently public policies addressing these barriers can play an important role. The remarkable potential for cutting greenhouse gas emissions in buildings is illustrated in figure 1-1.

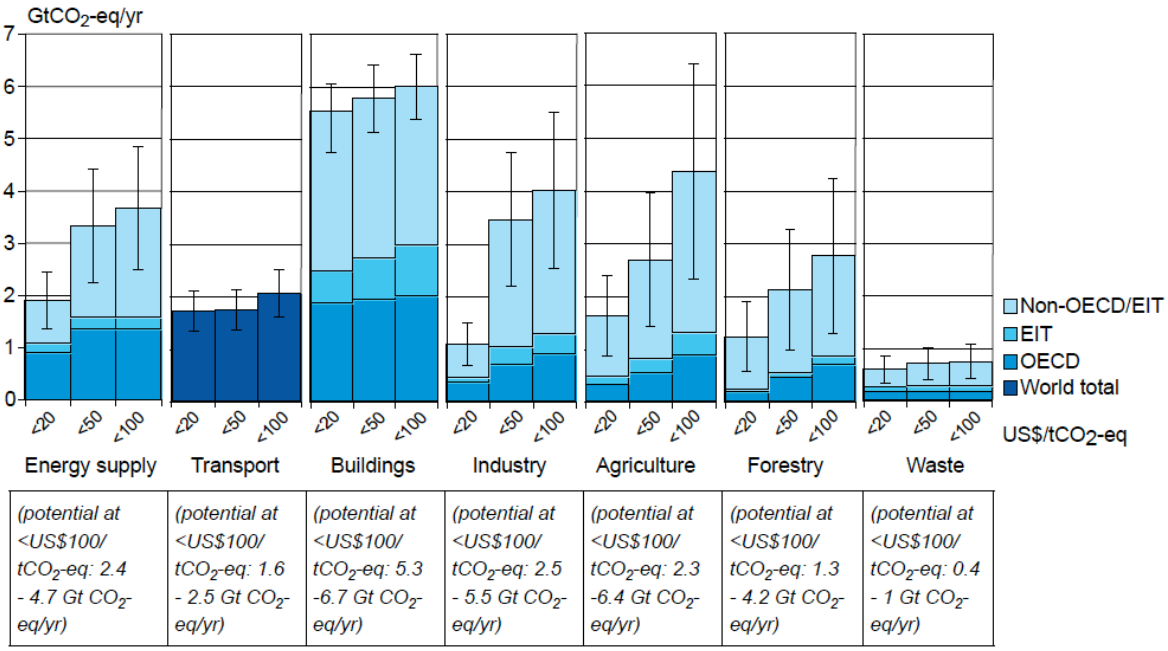

Figure 1-1 Estimated sectoral economic potential for global mitigation for different regions as a function of carbon price in 2030 from bottom-up studies, compared to the respective baselines assumed in the sector assessments

Source: IPCC, 2007
Note: EIT= Economies in transition

Within the chosen case for this research–Argentina, the basis for justification referred to, namely, lack of energy efficiency policy evaluation, large barriers for energy efficiency and large economic potential for energy efficiency improvement in the existing building stock, is particularly significant. As seen in section 2.6.1 below, little systematic evaluations of the outcomes of energy efficiency policy in Argentina have been made and even less is known about the specific mechanisms within the policy design and implementation leading to the outcome of the policies. The lack of assessment contributes to the difficulty of developing

policy tools which are likely to be successful within the Argentine context. Furthermore, a lack of evaluation can lead to that policies are poorly coordinated and thereby inefficient. Risuelo (2009) emphasises the need for looking at the institutions within which policies are implemented in order to gain knowledge to develop more successful policies. The high potential for energy efficiency in buildings as shown in figure 1-1 appears to be even higher in Argentina due to the countries cold climate in comparison to other non-OECD countries. Moreover, being a comparatively wealthy non-OECD country, the use of energy-consuming air-conditioning can be expected to be more prevalent here than in other countries within this group. Regarding the barriers for energy efficiency in buildings, these are also encountered in the Argentine context, with malfunctioning capital markets, energy subsidies and non-payment of energy being particularly prominent (World Bank, 2008a).

The need for research on Argentina is exacerbated by the increasingly precarious energy situation in the country. During hot summer months and cold periods in the winter, the heating or cooling of the building stock has contributed to temporary power cuts for the industry, in order to ensure the energy supply to private households. In addition, expensive energy imports and the temporary rise of energy tariffs indicate an increasing need for improved measures for ensuring the energy security of the country. The potential for increased energy efficiency within the environmental conditioning of the residential building stock in Argentina is considerable and could potentially provide cost-effective opportunities for lowering the energy demand of the country, at the same time as comfort is increased (González, 2009). The Argentine government's diverse attempts to foster energy efficiency through different policy measures indicate some recognition of the various problems connected to low energy efficiency, including considerable amounts of state expenses on subsidies vis-à-vis the electricity and energy prices, vulnerability of private households and businesses in case of rising energy prices, low indoor comfort and emissions of CO_2. However, the programmes seem to have had little effect and Argentine housing stock remains inefficient in these aspects (World Bank, 2008a).

Despite policy implementation being a highly context specific phenomenon, several of the barriers to policy implementation are shared by other non-OECD countries, such as lack of access to capital and insufficient implementation (Koeppel and Ürge-Vorsatz, 2007). Therefore, the results of the research are also valuable for the understanding of energy efficiency policy implementation in a broader range of countries.

1.3 Objective and research questions

This thesis is driven by the need to contribute to a better understanding of energy policy implementation in a non-OECD context. The objective of the thesis is to provide an understanding of the implementation of a set of energy efficiency policies that target the environmental conditioning of the existing residential buildings in Argentina. This is done through the assessment of a specific umbrella policy programme introduced in 2007, Programa Nacional de Uso Racional y Eficiencia de la Energía (PRONUREE, National Programme for Rational Use of Energy and Energy Efficiency) and some of its particular sections related to energy efficiency in buildings. Due to the umbrella character of this policy programme, the assessment of its *implementation* is also including policy development stages of

design of specific policy instruments as well as *policy formulation*. This conceptualisation is further discussed in section 3.5.

In order to reach the research objective, a process model of the PRONUREE is developed. In addition, four evaluation criteria have been guiding the assessment. The criteria representing the dependent variable is output. Independent variables explored include transparency, administrative burden of implementation as well as business opportunities. The choice of evaluation criteria is based on their importance for the creation of a strong network of relevant actors for the implementation of energy efficiency policy. The criteria are further described in the conceptual framework (chapter 3). Through the evaluation, the thesis seeks to shed light upon the constraints and solutions for a successful energy efficiency policy implementation.

In this context, the following research questions are posed:

1. What has been the output of the investigated policy propositions?

2. How have public and private interests been pulled together within the investigated policy propositions?

3. How has the availability of resources within public administration affected the implementation of the investigated policy propositions?

4. Given the actual performance of the investigated policy propositions, what kind of business opportunities can be discerned for the construction sector?

5. What can policy-makers learn for future policy design and implementation within energy efficiency for residential buildings in Argentina?

1.4 Research methods

1.4.1 Scientific positioning

The scientific positioning of this thesis can best be described as a moderate social constructionist stance (c.f. Berger and Luckmann). Consequently, the existence of an external reality, independent of individual interpretation is denied. Instead, the relevant area of study is the social construction of reality. Yet, in order not to fall into the fallacy of relativism, within which no interpretation of reality can be said to be more valid and appropriate than any other, this study project adheres to a moderate stance, acknowledging "reality" of an internal, socially constructed world (Kvale, 1989 and Bryman and Bell, 2003).

In this thesis, no claims of complete value neutrality are being made. First, the very choice to investigate how public policies for energy efficiency function, expresses the implicit value that energy efficiency as well as the government's role in this are important concerns. Secondly, the application of qualitative research methods such as the ones in this thesis, are inevitably coloured by the values and norms of the thesis author. Thirdly, the thesis author herself does not stand outside the socially constructed world acknowledged. However, the author's wish to

produce knowledge that to some degree is generalisable, still reflects the recognition of the existence of general knowledge to develop, consequently, positivist stances are not fully rejected. This is achieved through methodological choices as well as through an openness regarding the value inherited in the methodological and other research choices being made. See section 5.5 for a discussion of the validity of the findings provided by this research project.

1.4.2 Methods for data collection

The main method for data collection has been in-depth interviews with actors professionally involved in aspects of energy efficiency in residential housing carried out during three months' field work in Argentina. Interviews served as a means for understanding personal perceptions of the challenges in the implementation of energy efficiency policy and the connected structures. Furthermore, many of the aspects studied, such as the specific work of the group in Secretaría de Energía implementing the policy programme, is not available through other sources than interviews. The interviewees were accessed mainly through the contact with some key actors and thereafter contacts of these actors.

Several other sources of data complemented the interviews performed. One of these was constituted by relevant legal documents. Furthermore, academic literature – theoretical as well as empirical and "grey" literature such as reports from international organisations have been used in the work. In the application of the latter, the organisation behind the report is indicated in the text. Finally, a review of newspaper articles is carried out. The vast majority of newspapers in Argentina are critical towards the government. In the review, two oppositional and one government friendly newspaper is investigated. In order to spot highly skewed reporting coloured by political standing, the articles were classifies into positive, negative or neutral. However, the majority of the reporting of PRONUREE appears to be rather positive, even from the oppositional newspapers.

1.4.3 Methods for data analysis

Several concepts were applied in order to analyse and interpret the data. In order to understand the case-specific process of policy implementation, the data is firstly analysed through theory-based policy evaluation. The method requires that a theoretical model of the various steps of the policy programme, indicators of the outcomes and key success factors are developed and tested against the real outcome according to various data sources. This model is hereafter referred to as process model. Within this thesis, the construction and testing of a process model has four purposes. First, the initial sketching of a process model that is undertaken is important in order to spot the critical area of interest and narrow down the research scope. Second, the development of the process model functions here as an analytical tool in order to understand the mechanisms within the policy implementation better. This can contribute to increasing the validity of the study (Palumbo and Olivier, 1989). Third, the verification of the model provides data for the assessment of output. Fourth, the model is applied as a pedagogical tool when communicating the results of the research.

In a second step output, transparency, administrative burden and business opportunities generated will be evaluated separately. The evaluation criteria are chosen because they are considered to have a potentially important effect on the implementation of the policy – in particular they are believed to have an important impact on the creation of policy networks (see section 3.5).

In the subsequent discussion, the results of the evaluation will be elaborated. Network theory will be introduced to further interpret the data acquired. Based on initial findings, where interviewees highlighted the lack of continuity in – and the lack of implementation resources for – public policies for energy efficiency, network theory was believed to have considerable explanatory power

No full transcription is made of the interviews performed within the research. Transcription requires a lot of time resources at the same time as it increases the distance to the initial source, as no transcription can fully capture all aspects of a conversation. Instead, a spread sheet is developed, where key outcomes and quotes from the interviewees together with their time position on the recording are presented, organised after topic. This enables the researcher to systematically compare the data as well easily return to the recording.

Regarding the review of newspaper articles carried out, all articles found when searching the article archive of three influential Argentine newspapers for the term "PRONUREE" are classified as neutral, positive or negative. In addition, the articles are scanned according to which aspects and components they bring up regarding the policy programme, to obtain statistics on the frequency of different aspects reported.

1.4.4 Unit of analysis

This thesis takes the form of a case study. The case comprises national Argentine policy for increasing the energy efficiency of the environmental conditioning of residential buildings in Argentina. The specific policy programme studied is PRONUREE (Decree 140/2007, Annex I), more specifically its proposition[1] 2.9 with the sub heading *Existing residential building stock* and a separate proposition prescribing the introduction of a programme for exchange of incandescent light bulbs to low energy light bulbs.

There are several reasons to focus on the specific case of Argentina. In addition to the lack of policy evaluation within the Argentine context. The increasing severity of energy shortages makes the study of energy efficiency highly relevant. The large potentials for energy efficiency improvements in the environmental conditioning of the current residential building stock justify the choice of this sector. Finally, the lack of implementation, despite the existence of policies on paper in combination with the lack of previous research of the same motivates the choice to study this part of the policy process. The thesis author's access to key actors within the country context also contributed to the choice of case study. The case of Argentina also has significance on an inter-case level. Firstly, Argentina is a big country, whose energy consumption has a considerable effect on the regional level and also on the global level. Furthermore, the shared characteristics with many other non-OECD countries make

[1] The word proposition is here used in order to denote the paragraphs within the Annex constitutin PRONUREE, in which the measures to be taken are specified

conclusion valuable also as a contribution to the general understanding of energy efficiency policy implementation in these countries, especially countries characterised by federalism and a history of energy abundance.

The choice of studying the specific public policy programme of PRONUREE, was driven by the programme's significance. The programme is supposed to function as an umbrella policy guiding the country's efforts within national energy efficiency policy and it is repeatedly encountered in documents describing the energy efficiency policy of Argentina. It can be argued that the limited implementation of PRONUREE makes it unsuitable as a focus of the study, yet, in order to understand energy efficiency policy within Argentina, study of this programme appears crucial, in particular when seeking to build on previous Argentine experiences.

By signing the Decree 140/2007, the president instructed the Secretaría de Energía to implement the PRONUREE which formed part of the same decree as Annex I. The programme covers energy efficiency in a broad range of areas and functions as an umbrella for energy efficiency policies.

In the recitals of the programme, reference is made the country's signatory of the Kyoto protocol. In addition, the importance of actors from public and private sectors as well as the general public for the development of energy efficiency are acknowledged. The recitals also include a definition of energy efficiency, "Energy efficiency is understood as the adequacy of systems for production, transport, distribution, storage and energy consumption, with the purpose of reaching a more sustainable development with the available technical means, minimising the environmental impact, optimising the energy conservation and cost reduction".

The first article of the decree declares the "national interest in and priority of the rational use of energy". In the second article, the president approves with the general guidelines of PRONUREE. Furthermore, the decree assigns Secretaría de Energía as executing unit of the programme (Art. 3). In addition, the decree creates the Commission of support, follow-up and control. The members of this commission report to the Ministerio de Planificación Federal, Inversión Pública y Servicios which is to dictate and develop necessary measures and legislation for the development of the programme (Art. 8).

The programme is divided into two parts, the former describes measures to be carried out in the short run, which is specified as within 30 days, including among other things, the light bulb exchange programme studied in this thesis. The proposition for the light bulb exchange is expressed as follows:

- "Initiate the necessary management for massive exchange of incandescent light bulbs for low energy light bulbs in every home in the country"

The second part constitutes of measures to be carried out in the medium to long term, i.e. they shall be implemented within a period of 90 days. The measures to be carried out in the medium to long term concern areas such as industry, education, cogeneration as well as residential building stock. The paragraph for residential building stock is in turn divided into

two sections: *New buildings* and *Existing residential building stock*, of which the latter form the focus of this thesis.

The three suggestions under this heading are:

- "Develop a system of incentives for the decrease of the consumption of energy which includes, for example, preferential financing for measures aiming at reducing the consumption.

- Design a strategy for the massive implementation of systems of water heating based on solar energy, in particular in peripheral populations.

- Implement a national programme for the insulation for housing including roofs, building envelopes and openings"

It is not clear from the specific wording in the propositions that the part only relates to measures regarding the environmental conditioning of the buildings. However, the structure of the decree, presentations from the Secretaría de Energía (Baragatti, 2009) and the choice to put the section under the heading *Construction* in the general framework which further formulates the implementation of the decree (Resolution MPFIPyS 24/2008) indicate that the measures under this heading are aimed to concern mainly construction solutions regarding the environmental conditioning of buildings.

The study's main focus is on the implementation stage of public policy programmes. The concept of implementation here applied includes also relatively early stages of the policy process. For an elaboration of the concept, see section 3.5. The organisations and societal structures constitute the primary unit of analysis. But also individuals' perspectives and driving forces are explored.

1.5 Scope and limitations

The study will focus on construction measures for increasing the energy efficiency of the environmental conditioning of residential buildings. Residential buildings have been target to energy subsidies in a higher degree than commercial buildings, therefore, we can expect the potentials of energy efficiency measures to be larger within this sector. The political resistance to some policy instruments, such as increased tariffs, can be expected to be stronger in the residential sector, as it will affect a large number of potential voters. Even though the share of new construction in Argentina is relatively high, the existing building stock represents the vast majority of the energy consumption of the residential building stock. Furthermore, from a resource conservation perspective, it is preferable to look at this part of the building stock and see how it can be more competitive, compared to focussing new construction. Retrofit measures that are likely to be relevant for the study include: insulation of walls, roofs and floors, exchange of windows and additional insulation of windows.

The geographical scope of the investigation is the same as for the policy programme being examined, the whole of Argentina. As the assessment is an ex-post assessment, the time frame

is from the introduction of the policy programme, until the time of the data collection, i.e. June 2010.

The choice of data sources imply some limitations of the results. The snowballing approach used when collecting interview material can naturally cause a distortion in the data obtained. For example, a majority of the interviewees were active in the national standardisation and certification body, IRAM. Access to IRAM is free to anyone with an interest in the standard being developed, therefore this should not significantly distort the results. However, many of the IRAM groups within the area of thermal envelopes of buildings are very technical, possibly restricting these actors to people with considerable technical knowledge.

Another source of potential bias in the data collected is the fact that the majority of interviewees were working in the context of the capital, therefore, the contextual factors affecting only other parts of the country might less well represented. By actively contacting actors in other parts of the country, this distortion has been somehow altered. However, even though the conditions of greater Buenos Aires differs from the rest of the country in many aspects, for example dense population and the accumulation of wealth in this region, it is important to keep in mind that this area represents a big share of the population – 13 million of approximately 40 million inhabitants (INDEC, 2010b).

Concerning potential interviewees' willingness to participate in the research, a broad range of actors were willing take part in interviews and to share important information. The most challenging task in this regard was to contact high rank actors appointed to the Commission of Support, Follow-up and Control of PRONUREE. Unfortunately no interview with members from this commission could be carried out. Still, the overall willingness to participate and the many interviews carried is an important feature of this research, adding to the thesis' validity.

Several of the interviews were carried out in Spanish. Since the thesis author is not fluent in Spanish and did not have access to translation, this somewhat limited the possibilities for communication. However, the quality of the interviews is considered sufficient. In this context, the possibility to go back to the interview recordings provided an important resource for facilitating understanding.

Political sensitivity of the topic constituted another limitation to the work. Topics regarding the (non)implementation of policy measures is seen as rather controversial in Argentina. In this light, interviewees were at a few occasions unwilling to have sensitive information published in the report.

1.6 Target audience

This thesis spans the final semester of – and constitutes basis for examination within – the MSc education of Environmental Management and Policy at the International Institute for Industrial Environmental Economics at Lund University. Consequently, it first and foremost serves as a base for academic discussion and assessment for the immediate academic audience within the context of this education. However, the thesis also seeks to reach a broader academic audience within environmental policy evaluation in non-OECD country contexts.

Another target group is policy-makers within energy policy in non-OECD countries, in particular in Argentina. It is the hope of the thesis' author that the document can add to the understanding of policy design and implementation for this group of readers.

Last, but not least, the thesis can provide valuable information to industrial actors within the relevant industries, mainly construction, where this information hopefully can contribute to the development of business policy formulation, agenda setting and capacity building.

1.7 Disposition

Following this introductory chapter, including a description of methodology for and background of the research, chapter two sets out to describe the context of the case investigated, including *inter alia* basics of the Argentine legal system as well as particularities regarding Argentina's energy supply. The third chapter aims at illuminating important methodological concepts used within the thesis, such as theory-based policy evaluation, criteria evaluation and the very concept of implementation. In chapter four, the details are presented in a data analysis. The chapter begins with elaborating on the derived process model of the policy, i.e. the policy theory. Thereafter, the four research criteria are separately assessed. Based on the analysis, chapter five provides a discussion on the important topics of the analysis as well as certain pertinent methodological aspects. In the concluding chapter, chapter six, the initially posed research questions are revisited and explicitly addressed. Furthermore, the chapter elaborates on the contributions of the research.

2 Case context

2.1 Argentine economy and political and life in brief

Argentina has a history of prosperity and was at the beginning of the 20th decade richer than both Germany and France (della Paolera and Taylor, 2003). However, during the last century, the economy has been characterised by large fluctuations due to, among other things, hyperinflation and state deficit, resulting in a highly unstable economic climate that discourages long term investment (della Paolera and Taylor, 2003). The most severe crisis of the Argentine economy was in 2001-2002. Fiscal deficit and the subsequent pressure on the one-to-one convertibility system between the Argentine peso and the US dollar contributed to what has been described as "one of the most severe losses of income and downturns in living standards on record" (World Bank, 2009). However, a domestic demand and a factor accumulation especially among labour facilitated a pro-poor recovery relatively well. And in 2007 the country's economic policies shifted focus from recovery to economic sustainability (World Bank, 2009). Naturally, Argentina was also hit by the latest global financial crisis that struck the world in the end of 2008 (EIU, 2009).

The official inflation rate in 2009 was 6.8% whereas private estimates suggest an inflation rate of 10-15% in 2009 (EIU, 2009). Money market interest rate in Argentina peaked at 15% in December 2008. By the end of 2009, it went down to 11%, getting nearer to the pre-crisis levels fluctuating around 8.5% since 2007 (EIU, 2009).

The president, Cristina Fernandez de Kirschner represents the Frente para la Victoria, which is a fraction of the labour class oriented Peronist party (EIU, 2009). The other fraction in Argentine politics is dominated by Unión Cívica Radical, which has a stronger support in the urban middle class. Argentine political life is highly polemic with the majority of public authorities and organisations being affiliated to one of the two blocks. This characteristic has major implications in policy implementation.

2.2 Argentina's legal system

Argentina is a federal country, with 23 independent provinces. Each province has its own constitution and independently decides how to organise the municipalities within the province (Kozameh et al., 2001). The autonomous city of Buenos Aires, legally established in 1994, constitutes an exception with the same autonomy as the provinces but, for example, without a fully functioning independent judicial system (De Giovanni, 2008). The Autonomous City of Buenos Aires is not to be confused with the Province of Buenos Aires, which constitutes the area surrounding the autonomous city.

The constitution, which was originally sanctioned in 1853, establishes that the provinces shall be independent with exception for the areas delegated to federal level in article 121 of the constitution (Spiller and Tommassi, 2007). The area of environment was added to the constitution as late as in 1994. According to Article 41 of the constitution, minimum levels for environmental quality shall be established at a national level, while the provinces can choose to

apply more strict regulation. Furthermore, the provinces are autonomous when it comes to the exploitation of natural resources. This markedly constrains the possibilities of federal environmental regulation (Rosenfeld, personal communication, 2010-07-14).

Energy resources are regulated separately from other natural resources. Energy prices are regulated in two steps. Firstly, the national state establishes prices for the energy being sold to the provinces. Thereafter, the provinces set a price on the distribution, leading to a differentiation in prices between the provinces.

Building standards are regulated at provincial or municipal level. Still, the federal state has jurisdiction over social housing. Furthermore, the federal state has the possibility to introduce market based instruments such as a subsidy connected to energy efficiency investments (personal communication, Baragatti, 2010-07-16).

The hierarchy of legal documents in the national Argentine legal systems is illustrated in figure 2-1. Laws (*leyes*) are passed by the Parliament. Decrees (*decretos*) can be passed by the Parliament or by the executive power – which can be the President, the Vice president, the Chief of the Government or the Ministers. Decrees can either be autonomous or require a resolution for their implementation. In the case of Decree 140/2007, some of the articles, such as the creation of the Commission for Support, Follow-up and Control, are enforced by the very same decree, whereas others, such as the implementation of the PRONUREE, requires resolutions by the Secretaría de Energía for the further implementation (Mouchet and Zorraquin Becu, 1987). Resolutions (*resoluciones*) are created by Ministries, secretaries or sub-secretaries (Cassagne 2004).

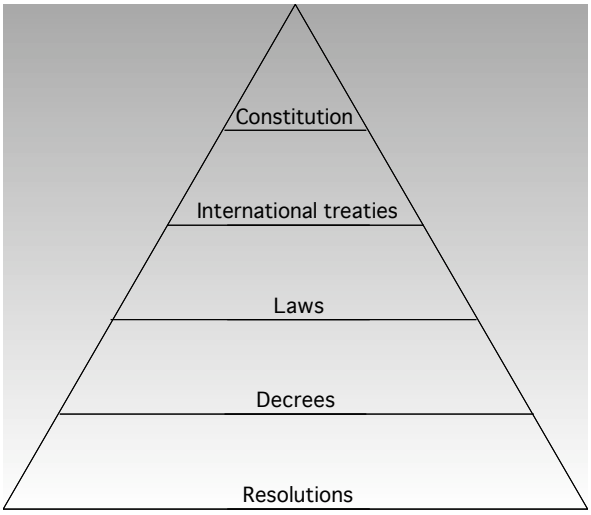

Figure 2-1 Legislative hierarchy in Argentina

Source: Mouchet and Zorraquin Becu (1987) and Cassagne (2004)

The World Bank has been studying the implementation of policies in Argentina. In 2006, an Institutional and Governance Review of Argentina was published in which hinders for policy reform implementations from the early 1990s to the beginning of 2004 are studied (World

Bank, 2006). The focus of the study is on major reform programmes on national and provincial level within the administrative areas of financial administration, control, procurement, human resources and transparency. Here, the results from the provincial reforms will be briefly presented. A too strong belief in the power of formal and structural alterations and the insufficient understanding of the underlying behavioural reasons for the problems targeted were among the reasons for limited implementation. For understanding the implementation, external interests outside the immediate policy environment need to be understood. In a concluding remark, the authors acknowledge that, as the reforms are highly political processes, the necessary prerequisites for implementation is that the people supporting them have real power and a clear vision of what they can achieve over the short run.

2.3 Energy policy in Argentina

Traditionally being an energy abundant country, with major resources of fossil fuel, the country has lately been experiencing the effects of an increased scarcity of energy, including temporary power cuts for industrial sites (see for example Falbo, 2010) as well as attempts to raise the consumer prices for residential consumers (González, 2009). These attempts have faced fierce opposition among the public. Due to these protests, the attempts have been turned into only temporary price rises ("Bajan subsidios y desde el domingo suben la luz y el gas de 23% a 93%", 2010).

The two main domestic energy resources are natural gas and oil. In 2007 approximately 90% of these fuels were extracted within the country (IEA, 2010a). The oil supply peaked in 1998 and the current extraction levels are low, partly due to uncertain investment conditions. Furthermore, import of energy is unattractive due to price regulations within the country (EIU, 2006). Natural gas extraction is also declining and without further investment in generation, the resources are projected to be depleted in 2018 (Caratori, 2010). There are also significant coal resources within the country but they have not yet been extracted because of the low degree of economic competitiveness (Pew Center on Global Climate Change, 2000). However, increasing energy shortage might alter this assessment.

The energy shortages became evident during the fieldwork of this research, as one of the coldest winters for many decades struck Argentina during this period. Newspapers repeatedly reported on expensive gas imports ("Por el frío polar, Argentina está importando cantidades récord de energía", 2010), energy cuts for the industry ("Los cortes de gas llegaron a las estaciones de servicio de GNC", 2010), record levels of electricity consumption ("La demanda eléctrica alcanzó un nuevo récord", 2010) and the temporary decrease of energy subsidies ("Bajan subsidios y desde el domingo suben la luz y el gas de 23% a 93%", 2010). Furthermore, an oppositional newspaper estimated and reported on the public cost of the energy subsidies from 2004 to date being ARS 53 744 million (≈ EUR 1 136 million) (Cabot, 2010-08-07). Government estimates of the costs of the energy subsidies amount to ARS 500 million, yearly since 2008 (EUR 99 million) ("Bajan subsidios y desde el domingo suben la luz y el gas de 23% a 93%", 2010).

A very important aspect of residential energy consumption in Argentina is the subsidies of the consumer tariffs of energy. Natural gas purchased from the grid is by far the most

subsidised form of energy and also the most common energy source for residential heating. For the same amount of money an argentine person can buy 5-15 times more energy from natural gas than from other energy resources (Filippiín and Flores Larsen, 2009. Furthermore, the Argentine prices of natural gas are 9-26 times below international residential price levels (Gonzalez, 2009). The subsidies have been justified by the need to also provide the very poor with energy. However, 40% of the population does not have access to the natural gas grid, but has to turn to unsubsidised forms of energy such as LPG, kerosene or charcoal. Many of these include low or middle income groups in the northern parts of Argentina, leading to a regressive system where the rich people are being subsidised by the poor (González, 2009). In addition to encouraging energy consumption in favour of other consumption, such as energy efficiency solutions, the heterogeneity of subsidies between the energy carriers further contribute to inefficient household energy solutions. Electricity prices are in par with the prices in other countries, but still subsidised (González, 2009). As described earlier in this section, there has lately been some attempts to raise the energy prices for large consumers.

2.4 Energy efficiency in Argentine residential building stock

Some key characteristics of Argentine building stock are described in table 2-1

Table 2-1 Argentine residential building stock

Characteristic	Lowest income quintile	Highest income quintile	Average
Share of owned houses, %	55	71	66
Number of rooms	0.5	3.3	3
Size, m^2			60
Share of dwellings in multifamily housing, %			85
Share of households with access to natural gas grid, %			60

Source: INDEC 2010a, the numbers are for 2006, based on the census of 2001, INTI, 2009 and González, 2009

A number of researchers have been investigating the thermal efficiency of buildings in Argentina. In a study by González et al. (2007), the energy usage of one family houses in the city of Bariloche in southern Argentina and Stockholm, Sweden – two cities with a similar climate – are compared. It is concluded that the dwellings in Bariloche consume about twice as much energy. If comparing energy per square meter, the difference becomes even more striking, with the consumption in Bariloche almost reaching three times the energy use in Stockholm. The low thermal efficiency is attributed to low efficiency of heating devices as well as construction characteristics of the buildings. Table 2-2 illustrates the energy consumption of Argentine building stock put it in relation to Swedish conditions.

Table 2-2 Energy use for heating in Argentina and Sweden

	La Plata	Bariloche	Río Grande	Stockholm
Latitude	34ºS	41ºS	54ºS	59ºN
Annual medium temperature (°C)	15.5	8	5.5	7
Heating degree days (°C, baseline 18 °C)	1 170	3 620	4 560	4 070
Energy for heating (MJ/year)	50 000	144 000	210 000	53 000
Specific heating energy per unit of climate heating degree-day (MJ/year, ºC degree-day)	42	40	46	13

Source: González (2009)

González (2009) concludes that the main construction characteristics contributing to the low thermal efficiency of Argentine housing stock are: floors of heavy concrete with no insulation to the ground, metal and wooden roofs with minimum or none insulation, reinforced concrete structures exposed by thermal bridges, bricks of large heat transmittance, ceramic tiles without insulation on walls and floors, single glass windows, infiltration in doors, windows, roofs and parts of structures and designs that do not consider climate zones and solar power (González, 2009).

The potential energy savings within the heating and cooling for existing building stock in Argentina is significant. The saving potential for heating has been estimated to 43% by increasing the insulation of walls and roofs up to the standards of the voluntary IRAM standard 11.604. If, in addition, double glazed hermetic windows are installed, the energy savings can amount to 50%. If the complete residential buildings stock was retrofitted in this way, the daily savings only in gas would be 15.4 million m^3 during winter days (approx. 15% of total gas consumption), and up to 20.7 million m^3 during cold waves (Volantino et al., 2007). Another study, made by the Cámara Argentina de la Construccón (the industry organisation of the Argentine construction industry) estimates energy savings of heating and cooling to 35% from improved insulation of walls and roofs, and 40% when considering the installation of hermetic double glazed windows as well. Furthermore, the payback of the measures using monomic prices is calculated, being 7 years for the insulation of walls and roofs, and 15 years if, in addition, windows are exchanged. Monomic prices are prices in which aspects of diminishing reserves, gas utilisation and marginal costs of fuels alternative to gas are included (Cavedo and Galilea, 2009). Furthermore, the investment in the improved building stock would lead to decreased need for heating and cooling devices, which implies additional savings. The investments are a way of shifting spending from energy to investments increasing the value of the building stock. With increasing world prices of energy, a rise is likely in Argentina as well. If these expected price rises are considered, the pay-back time on energy efficiency measures becomes considerably shorter. Several interviewees do however express that price rises are seen as so uncertain that they seldom are included in investment decisions.

Public policies could increase the investments in measures to improve the energy efficiency of the environmental conditioning of buildings. In addition to the direct costs of energy, the

state can gain in terms of increased political support and increased energy- as well as political security. The fact that a large share of the gains will be made by the state, further justifies the important role of state action in the development of energy efficiency for buildings. In addition, investment in construction represents 80% of public investment (Coremburg, 2008)

In light of the significant saving opportunities available, there seems to be a major unexploited market in terms of energy efficiency improvements of thermal efficiency of houses, where money - today spent on energy - would instead be spent on the building stock. Interviews and publications show that the building industry has been active in the promotion of increased energy efficiency of buildings. However, in Argentina, as in the majority of the world, the building industry is characterised by a conservative culture. Furthermore, there might be a fear that regulatory measures can increase the costs of building, thereby reducing the demand. The use of positive market-based instruments do not run the same risk. However, there is still a lack of broad capacity within the industry (Heredia, personal communication, 2010-06-23). Public policies can play an important role in the development of this capacity, by preparing the market for sudden energy price increases. The need for capacity building has to be taken into account when formulating and implementing public policy measures. Being an industry very sensitive to the business cycles, the Argentine construction industry has been forced to adapt to an extremely fluctuating market. This might have contributed to an even more precautionary attitude within the Argentine industry than within other construction industry.

2.5 Barriers to energy efficiency

IPCC identifies seven major barriers to energy efficient building design. The barriers are specifically prominent in the non-OECD context (Levine et al., 2007):

- **Limitation of the traditional building design process and fragmented market structures**. A building process is complex involving a number of different actors, including, architects, real estate developers as well as engineers and the lack of integration between the activities can lead to e.g. underinvestment in energy efficiency.

- **Misplaced incentives**. This is also known as the principle-agent problem, resulting from that the agents that make the investment decisions many times are different from those that can benefit from energy-saving investments.

- **Energy subsidies, non-payment and theft**. As energy is often seen as one of the basic needs, many governments choose to subsidise energy in order to ensure that everyone has access to it, something which distorts individuals' incentives to make investment in energy efficiency. Furthermore, in many countries, illegal extraction of energy from the energy grid is common. This has often come as a consequence of the reduction of energy subsidies and the subsequent price rises.

- **Regulatory barriers**. A number of barriers have been shown to stand in the way for energy efficiency, and in particular building level generation techniques such as solar panels. Furthermore, the regulation of markets for rented housing can impede the investment in energy efficiency measures.

- **Small project size, transaction costs and perceived risk.** Due to limited experience with energy efficiency projects, transactions costs and perceived risks can be high and the profitability of other projects appear higher. Furthermore, moneylender's little knowledge of energy efficiency projects make funding expensive.

- **Imperfect information.** Often, it is difficult for potential investors to acquire sufficient knowledge about costs and, in particular benefits with energy efficiency measures. For example, future energy prices can be difficult to predict and infrequent reading of electricity metres can delay feedback to consumers.

- **Culture, behaviour, life style and the rebound effect**. Lifestyle and tradition can have a major effect on how houses are used and the connected energy consumption. Furthermore, culture has a big impact on which building materials and techniques that are chosen. Finally, the so called rebound effect, i.e. the fact that the savings from increased energy efficiency are used for more energy consumption, constitutes a challenge for policy makers to tackle.

All the barriers above are relevant, also for the Argentine context. The culture of building with materials with high thermal transmittance comes out as an important aspect in Argentina. Furthermore the energy abundant history has created a discourse focussing on energy supply but often forgetting about the importance of demand management. Transaction costs such as costs for financing are also very much relevant for the Argentine case. After the economic crisis of 2001-2002 banks have been very restrictive in their lending policies and energy efficiency projects are perceived as high risk projects (World Bank, 2008a). As earlier mentioned, energy subsidies as well as theft from the energy market also constitute important barriers to energy efficiency in Argentina. Regarding information, World Bank (2008a) identified a lack of information and experience exchange between industrial actors as well as a lack of market for energy efficiency services, such as energy auditing.. The regulatory framework for buildings is often obsolete. For example, in the Autonomous City of Buenos Aires, the building codes are from 1947 (Gaspes, personal communication, 2010-07-02)

2.6 Energy Efficiency regulation in Argentina

There has been some policy initiatives for energy efficiency in the residential buildings in Argentina, see table 2-3. The results have, however, been poor (World Bank 2008b). In addition to the specific policy programmes put in place, the energy subsidies can potentially have a big effect on choices to invest in energy efficiency.

Table 2-3 Policy programmes for energy efficiency in residential buildings

Programme	Year	Status	Implementing Agency	Comment
Legal proposal for energy efficiency	Late 1990s	Never entered into force	-	The economic crisis of 2001-2002 came in the way for legislation
Efficient Lighting initiative (ELI)	1999	Continued by PRONUREE	Secretaría de Energía, Edenor, EPEC (electricity distributors)	Light bulb exchange
Development of a model for energy saving in buildings and determination of limit values for thermal quality	2000	Finalised	Instituto de Estudios del Hábitat - Facultad de Arquitectura y Urbanismo - Universidad Nacional de La Plata	
Programa de Ahorro y Eficiencia Energética (Programme for energy saving and -efficiency) PAEE	2003	-	Secretaría de Energía	Strategic guidelines including institutional and legal mechanisms for e.g. education, economic incentives and investigation
Pilot programme for LFCs	2004	Continued by PRONUREE	Secretaría de Energía	Light bulb exchange
Programa Uso Racional de Energía Eléctrica (Programme for rational use f electric energy), PUREE	2004	In force	Secretaría de Energía and electric energy distributors	System of fines and bonifications for energy use in relation to earlier consumption
Programa Uso Racional de Energía (programme for rational use of energy) (gas) PURE	2004, 2005	In force	Secretaría de Energía and ENERGAS (gas distributors	System of fines and bonifications for energy use in relation to earlier consumption
Programa de calidad de Artefactos energéticos (Programme for quality of energy consuming appliances) PROCAE	2005	In force	Secretaría de Energía	Electrical appliances and labelling
Proyecto de eficiencia energética en Argentina (Project for energy effciency in Argentina) - GEF	2009	In force	Secretaría de Energía	Projects within domestic lighting, industry and capacity building financed by the GEF

Source: Based on UDES (2008) Risuelo, (2009), World Bank (2008a)

There is also law proposal, suggesting the creation of an national agency for energy efficiency (Agencia Nacional de Eficiencia Energética, ANEE), which is supposed to function as an independent unit, working with energy efficiency under the framework of PRONUREE (Prieto, 2010).

2.6.1 Energy efficiency research

Within the specific context of Argentina, there is a well established body of research about available energy efficiency measures and their energy-saving effect. Part of this is briefly presented below. However, little research has been carried out within the area of energy efficiency policy evaluation, in particular when it comes to ex-post and implementation studies. De Schiller and Compagnoni (2000) investigate the legal framework for environmental impact assessment and, more specifically, building and planning code within the Metropolitan area of Buenos Aires. The article concludes that in the implementation of the codes, the environmental goals for urban and peri-urban areas are left without specification. In the case studies of environmental impact assessment, the authors found that indicators of urban and building aspects often are lacking, despite being required by the law. However, the scope of the article does not allow any analysis of the reasons for this lack of implementation.

Rosenfeld et al. (2003) follow-up the programmes for rational use of energy that was carried out in the metropolitan area of Buenos Aires during the 1990s. In the article, the differences in sales of various energy consuming artefacts for the home are studied. It is concluded that the limited energy savings made by, for example, a small increase in the sales of low energy light bulbs is outbalanced by the overall increase in purchase of energy consuming equipment such as TV sets and air conditioners. Furthermore, it is concluded that the room for diminished energy use through energy efficiency improvements during this period was relatively limited as safety and comfort aspects had a higher priority. Other aspects that have contributed to the increase in the consumption of electric energy as well as natural gas during the decade investigated include deregulation of the electricity market, the altering of the tariff scheme, which encouraged operators to maximise sales, as well as weak regulatory capacity of the state. All these aspects have contributed to the weakening of energy efficiency.

In a study by Tanides (2004) the application and positive experiences of energy efficiency labelling and minimum efficiency standards in several countries are presented. The incipient efforts of introducing labelling and minimum efficiency standards for electric appliances in Argentina are described and acknowledged as an important part of a future energy policy for electric energy in Argentina.

Raspall Galli and Evans (2003) model the economically optimal degree of insulation (economic thickness) of various insulation solutions in the period of 1998 to 2003, in order to assess the effects of the major economic crisis in 2001-2002. The study shows the vulnerability of the market, due to fluctuations in energy prices, material prices and interest rates. Based on the results, the authors push for public policy that diminishes the risk of investments in improved insulation.

Finally, González (2009) analyses the heavy energy subsidies in Argentina and their impact on the thermal efficiency of the residential building stock. González argues that the redistributive

purpose of the energy subsidies is reversed by the fact that many low income consumers do not have access to the natural gas grid, which is the energy form enjoying by far the highest subsidies. Furthermore, González presents a policy strategy for improving the energy efficiency of the Argentine residential building stock. The set of policies include a price increase of 100% for energy in middle and high income sectors. This is argued to be politically feasible if it is preceded by campaigns to increase awareness and educate about energy efficiency, especially as a price increase of 100% still is quite small in absolute terms, compared to other household consumption. Furthermore, the policy programme should include subsides for low and middle-income families to carry out energy efficiency measures. Other components of the programme include the support to solar based solutions as well as the efforts to implement cheap energy efficiency improvements of the commonly used heating equipment. Finally González suggests the establishment of educational groups and technical offices at a local level to disseminate the knowledge about available energy efficiency measures.

In this context, it should be emphasised that the thesis author has not been able to find any research carried out by social scientists, incorporating a deeper analysis of the political, organisational and microeconomic aspects within the relevant area. However, when turning to a broader sources of literature than only the strictly academic, a report published by ECLAC, OLADE, the German Federal Ministry for Economic Cooperation and Development and the German Technical Cooperation Agency assessing the energy efficiency in Latin America and the Caribbean provides an overlook and brief assessment of the energy efficiency policies in Argentina (ECLAC et al., 2010). The report brings up organisational aspects, the lack of funding and the large dependence on international funding, the discontinuity of energy efficiency policies as well as the lack of technical expertise as important factors contributing to the weak results of energy efficiency policy so far. PRONUREE is mentioned as a small but important step in the direction towards more continuity and higher prioritisation of energy efficiency. Also the reports by the World Bank have made important contributions in this area (World Bank 2006, 2009)

2.7 Summary

As shown above, there are many drivers to invest in energy efficiency in Argentina, but also many barriers to overcome and this is where policy measures become important. A number of actors are involved in the materialisation of energy efficiency measures for the existing building stock. First, policy-makers need to acknowledge the need for and priority of energy efficiency measures and identify relevant and feasible solutions. Second, bureaucrats must be given the administrative and organisational resources as well as the necessary education to implement the measures. Third, the construction industry needs to develop the knowledge necessary to provide those business solutions that a policy would support. Fourth, homeowners, landlords and tenants need to understand and cherish the advantages of carrying out the energy efficiency measures. Fifth and finally, financiers need to understand the nature and the magnitude of the risk of energy efficiency investments.

3 Conceptual framework

A schematic presentation of the conceptual framework applied is presented in figure 3-1. The framework will be elaborated below, following the structure of the figure.

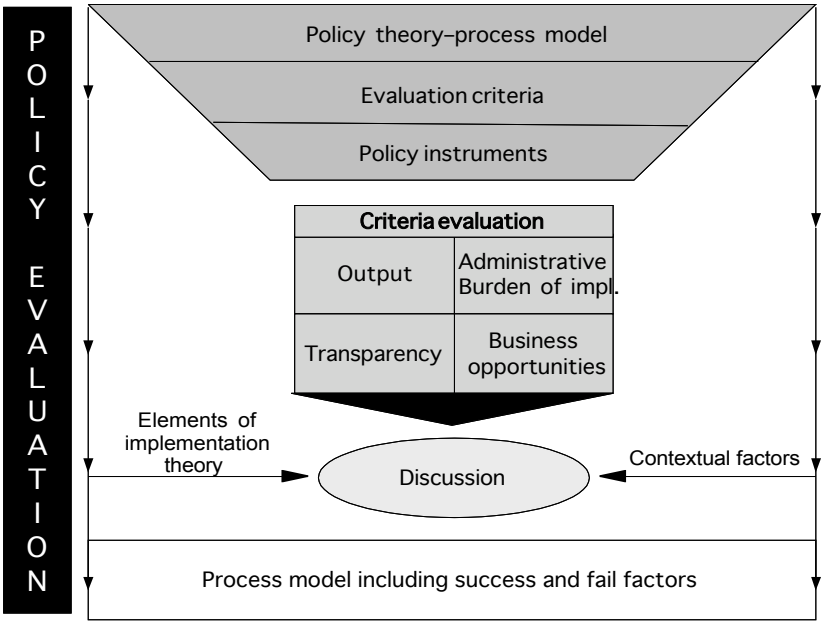

Figure 3-1 Conceptual framework

3.1 Policy analysis and policy evaluation

There is no commonly accepted definition of public policy (Fischer, 2006). A very broad definition is given by Dye (1976) as "whatever governments chose to do or not to do". Fischer (2006) offers the following, less generous definition, "political agreement on a course of action (or inaction) designed to resolve or mitigate problems on the political agenda – economic, social, environmental, and so on. Whether public policies are arrived at through political deliberation or formal vote, they involve a specification of the ends (or goals) to be pursued and the means (or instruments) for achieving them". Mundaca (2008) defines the concept as "the governmental actions and decisions designed and implemented to solve social, economic and/or environmental problems." In contrast to the definition by Fischer, it excludes the choice of inaction. Although, inaction might very well be important and constitute an active political choice, the latter definition is considered more suitable for the current research as the area of study is active public policies to achieve energy efficiency.

The word policy can also refer more generally to "A principle or course of action adopted or proposed as desirable, advantageous, or expedient" (OED, 2010). Within this thesis, policies

by governments are referred to as *public policies* or simply *policies*, whereas policies by businesses are referred to as *business policies*.

Fischer (2006) equalises policy evaluation with policy analysis, but distinguishes this from evaluation research, which he describes as a narrower concept. However, the conceptualisation given by Fischer guides the work in this thesis, which consequently equates policy evaluation with the main goal of policy analysis. This concept of policy evaluation will be elaborated below.

Vedung (1997) defines policy evaluation as "careful assessment of the merit, worth and value of the administration, output and outcome of environmental policies" Through this definition, the ex-ante dimension of policies is excluded, an exclusion which should be seen as controversial (Mickwitz, 2006). Building on Vedung's definition, Mickwitz (2006) defines policy evaluation as "careful assessment of the merit, worth and value of administration, output and outcome of environmental policies, which is intended to play a role in future, practical solutions", in order to even include the ex-ante dimension. This is a relatively broad definition, including evaluation at all stages of the policy process. In addition, by the use of the term *careful assessment*, the definitions include some less research oriented forms of assessments, such as peer review. Bemelmans-Videc (1998) offers a narrower definition of the term policy evaluation as "the systematic application of social research procedures for assessing the conceptualization, design implementation, and utility of social intervention programs", including evaluations at all stages of the policy process, but excluding non-research assessment. In order to capture the different stages of policy evaluation, yet emphasising the research orientation of the study the definition by Bemelmans-Videc is here adopted.

According to Mickwitz (2006) the carrying out of policy evaluation is justified by the need to develop knowledge on how to design the best possible policies within the areas where citizens consider such policies necessary. Furthermore policy evaluation is essential as a way of keeping policy makers and implementers accountable for their work. Rossi (2004), on the other hand, identifies four different purposes of policy evaluation: programme improvement, knowledge generation, accountability and hidden agendas.

The purely applied nature of policy evaluation is something that distinguishes it from many other sciences, such as, economics. There are several approaches to policy evaluation; Nagel (1991) presents the following alternatives:

- Mathematical optimization which focuses on decisions and management research
- Econometric approach which applies statistical regression analysis
- Quasi-experimental approach which tries to isolate the impact of the policy through pre-tests, post-tests etc.
- Behavioural approach focuses on formation and implementation

- Multi-criteria approach seeking to apply several criteria to determine a preferred policy option.

Many descriptions of policy evaluation emphasise the multitude of methods applied as characteristic for this research area (see for example Fischer, 2006). It has, however, been argued that such an interdisciplinary approach has failed, leading to a fragmented field of research without theoretical integration (Garson, 1986).

For a long period, the technical approaches to policy evaluation such as risk analysis or cost-benefit analysis dominated (Stirling, 1997). The author of this thesis argues that such evaluation techniques have had a very important impact on our understanding of political policies and their functioning. However, these positivist forms of policy evaluations have often claimed to provide value-free answers to what constitutes the best policy option, alternatively a neutral answer which can then be applied together with the values of politicians in the policy making process. A risk in such an analysis is that scientists attribute their own values on the decision makers. When these evaluations are used for political purposes, the image of an ideological tool disguised to science emerges (Stirling, 1997). In line with the realist scientific positioning of this thesis, no claims of value neutrality regarding its results are being made. This is elaborated in section the research positioning in section 1.4.1.

Drawing on a similar source of distinction between the approaches, Birkland (2005) distinguishes between the rationalist view within policy evaluation on the one hand, and the policy process focus on the other hand. According to him, the researcher with a policy process approach see rational, often quantitative, policy evaluation as arguments used by various actors in the policy making process when advocating for their preferred policy. Consequently, the values and beliefs of political actors and the application of rationalist results such as economic evaluations are all included in the policy analysis. Within this thesis, a process oriented approach is adopted. The simple explanation to this is that, according to the thesis author, the investigation of implementation requires careful analysis of actors and organisations in order to be meaningful. Furthermore, the current stage of implementation of policy measures here investigated make quantitative evaluation of the outcomes of limited interest for the reader.

3.2 Theory based policy evaluation

As a response to critique of policy evaluation not sufficiently considering the very mechanisms creating the policy outcome, the so called theory-based policy evaluation was developed (Chen, 1990). The methodological approach implies the development of a model of the policy process' various steps–a policy theory. Other terms that have been used for referring to the concept of policy theory include programme theory, logic model, programme model, outcome line, cause map and action theory (Chen 1990). In order to facilitate for non-technical reader, the model is here referred to as a *process model*. The development of a process model can potentially provide a deeper understanding of the policy and its functioning, thereby improving the validity of the research (Palumbo and Olivier, 1989). A parallel can be drawn to medical sciences where the researcher does not only want to assure the outcome of a certain medicine, but completely understand the physical, chemical and biological processes leading to the outcome. Such an understanding is essential for applying the medication in a

successful manner on a broad range of patients and for the development of new medicines. In the same manner, policy theory can increase the generalisability and trustworthiness of a policy programme (Chen and Rossi, 1987).

Despite having been applied for several decades, theory-based policy evaluation within the field of energy policy is relatively new. One of the early applications is Blumstein et al.s' (2000) assessments of energy efficiency market transformation programmes in California (Harmelink et al., 2005).

The accuracy of strictly causative relationships acknowledged within theory-driven research has been questioned by, among others, Palumbo and Olivier (1989) who argue that policy implementation can sometimes better be understood through system theory. According to the authors, such a theoretical approach does, for example, describe organisations as living organisms driven by the competition for resources in a dangerous environment. Whereas, in the theory-driven policy evaluation, organisations are only seen as passive actors, carrying out the decisions. Within this thesis, it is argued that a theory-driven approach does not have to exclude a deeper understanding of the organisations and individual actors within the policy implementation, but can provide an ideal structure, within which these behaviours are studied.

In the theory development process suggested by ECOFYS (2006), the first step is to identify all the cause-impact relationships in the policy cycle, from initiation by the government to the action of the target group as a consequence of the measure, e.g. the carrying out of energy efficiency measures to reach the final energy savings. Thereafter, indices for identifying whether the step actually took place are developed. For each policy step the critical factors for success or failure are determined. Finally, the interaction with other policy instruments, which might enhance or impede its implementation is investigated. Through empirical information, the process model is verified and adjusted. The process model then forms the basis for an evaluation according to the chosen criteria.

3.3 Evaluation criteria

There is a multitude of criteria applied for evaluating public policy measures. Mickwitz (2006, p. 29) argues for the use of multiple criteria in policy evaluation as this allows for a more comprehensive debate about the policy instrument. Also the IPCC applies this method of evaluation (Gupta, et al. 2007). Some of the commonly applied criteria are presented in table 3-1.

Table 3-1 Commonly applied policy evaluation criteria

Criterion	Related questions
Impact	Is it possible to identify impacts (anticipated or not, inside the target area or not) that are clearly due to the policy and its implementation?
Effectiveness	To what degree do the achieved outcomes correspond to the intended goals of the policy?
Efficiency	Is the difference between total social benefits and costs maximised (in favour of the benefits)?
Cost-effectiveness	Do the measure minimise compliance costs for meeting a given policy target?
Relevance	Do the goals of the instrument cover key problems of policy?
Transparency	To what extent are the outputs and outcomes of the policies, as well as the processes used in their implementation, observable for outsiders?
Equity	How are the outcomes and costs of the environmental policy instrument distributed?
Transaction costs	What are the costs, other than price, faced by market actors to initiate and complete contracts?
Political feasibility	Are there any political resources, distributional considerations, procedural obstacles, or other limiting factors of a similar character, that prevent the realisation of the proposed course of action
Administrative burden	What financial and human resources are required by the authorities implementing, monitoring and enforcing the public policy programme?
Legitimacy	To what degree do individuals and organizations, such as non-governmental organizations (NGOs), interest organizations and firms accept the environmental policy instrument?

Source: Based on Micknitz (2006, Table 2), Mundaca (2008, p. 64f) and Majone (1975)

Within this thesis, the selection of research criteria has been driven by aim to understand forces driving or impeding the implementation process. Factors within the specific case context as well as aspects of the theories applied have guided the choices which are further motivated under each criterion. Being part of the iterative research process, the final choice of criteria came as a consequence of the initial findings of the research.

This thesis will draw on a vocabulary typical for quantitative research using the terms *dependent* as well as *independent variable* for describing the relationship between the evaluation criteria. The dependent variable then defines the extent to which the policy has been implemented, whereas the independent variables rather address the processes of implementation (Hill and Hupe, 2002). Despite borrowing from quantitative vocabulary, this research adheres to a social constructionist research positioning which is further justified in section 1.4.1.

Several measures are available in order to measure what has actually been produced by the policy, i.e. what is often seen as the dependent variable of the policy evaluation. Common criteria include cost-effectiveness and effectiveness (c.f. table 3-1). The assessment of effectiveness requires a measuring stick in terms of objectives. Therefore, evaluation of effectiveness can be difficult when, as in the case of this thesis, objectives are disputed. Furthermore, the main focus of this thesis is on the early implementation stages, not on the full policy process. In order to capture those stages alone and to handle the lack of consensus regarding the objectives, the criterion **output** as applied by Vedung (1997) is chosen. Output is sometimes used interchangeably with, for example outcome or effectiveness. Vedung (1997), however, distinguishes between output and outcome in the following way:

"By *output* is meant phenomena that come out of government bodies in the form of, for example, prohibitions, enabling procedures, grants, subsidies, taxes, exhortation, jawboning, moral suasion, services and goods. […] *Outcomes* are what happens on the addressee (client, recipient) side […]"

This definition of output is also adopted here. The concept is illustrated schematically in Vedung's model of the government intervention process (see 3-2).

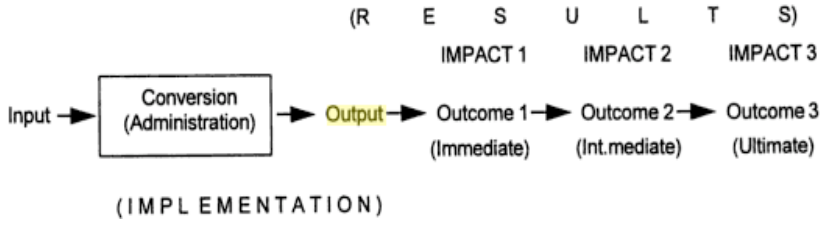

Figure 3-2 Vedung's systems model adapted to government intervention programmes

Source: Vedung (1997), figure 1.2

In order to guide the output assessment a guiding research question is posed:

- What has been the output of efforts within the public authorities with regard to the implementation of the investigated policy measures?

The second evaluation criteria, **generation of business opportunities**, is closely connected to effectiveness. None of the presentations of research criteria consulted (Mickwitz, 2006; Guglyuvatyy, 2010; Mundaca, 2008) highlight this as a commonly applied alternative. Within the context of this thesis, the possibility of policies to generate business opportunities is, however, seen as a crucial driver for active participation in the policy implementation from the private sector's side, motivating the inclusion of this parameter. Moreover, within the concept of policy networks applied in this thesis and further discussed in section 3.5, resource interdependency is seen as the driving force for the creation of policy networks. Consequently the perception of business opportunities becomes crucial for the understanding of the creation of such a network. Finally, the perceived generation of business opportunities is important in order to foster capacity building and relevant market supply within the construction industry, which is a prerequisite for the success of policy measures. The focus within this research is delimited to business opportunities within the construction sector.

The criterion of business opportunities is here defined as possibilities to expand the market in terms of value of products and services provided within the relevant area of the policy. The guiding research questions for operationalising this evaluation criterion are:

- To what extent have the industry stakeholders experienced any effects of the investigated policy measures?

- Which drivers for market development do the stakeholders perceive today?

Consequently, the generation of business opportunities is here understood as a dependent variable that is an outcome of the public policy, but also as an independent variable connected to the output of the policy measures investigated. Moreover, the focus is on the individual's perception of generated business opportunities. Therefore, the connection to the third research criterion, transparency, becomes important.

Transparency is the third criterion investigated in this thesis and refers to the visibility of public policies. Transparency is rated among the most important evaluation criteria in the study by Guglyuvatyy (2010). If policies are not transparent, the public pressure to implement them can be impaired. A higher degree of transparency can also facilitate the gathering of resources and know-how necessary for developing the best possible policy measures. In addition to potentially impacting on the effectiveness of policies, transparency has a value in itself by addressing democratic concerns (Mickwitz, 2006). Transparency can also play a vital role in the development of a strong network of actors for the implementation of policies (Compston, 2009). During the initial research for this thesis, transparency repeatedly occurred as an important aspect for the policy programme investigated.

In this thesis, transparency is defined as the extent which the policy itself, outputs and outcomes of the policies, as well as the processes used in the implementation, observable for and communicated to stakeholders. The definition implies that some kind of active outreach is necessary in order for the policy to be considered transparent. The term *stakeholders* has in this thesis been limited to actors with a professional interest in energy efficiency in buildings, including individuals from private, public, non-governmental organisations and academia. The reason for this is that the here investigated umbrella policy is not assumed to be considered sufficiently relevant by the general public, even though it might have far-reaching consequences for this group. Transparency is often associated with good governance and related aspects such as corruption. However, within this thesis is rather to be understood as a criterion investigating the degree of communication from the public authorities.

Four questions are here turned to in order to guide the assessment of transparency of the policy investigated:

- Is the policy known by relevant stakeholders?

- Do these stakeholders know about the outputs of the policy?

- What aspects of the policy programme are highlighted in the public discussion?

- Is there any comprehensive source of information that is easily accessible in order to acquire information about the outcomes and outputs of the policy?

The fourth evaluation criterion applied is **administrative burden of implementation**. Administrative burden of implementation is here defined as the financial, political and human resources required by the authorities implementing the public policy programme. This definition is chiefly based on Mundaca's (2008) definition of administrative burden, although political resources have here been added and the policy stages of monitoring and enforcement of the actual policy instrument have been omitted. Still, the monitoring of the policy implementation *per se* is still included in the assessment. Given the case investigated, political considerations have been found to be of certain significance, particularly in the implementation process, which necessitates this re-conceptualisation. Several reasons motivate the inclusion of the political dimension of the implementation process. For instance, this policy's umbrella character leaves considerable room for implementers when formulating the resolutions that are to materialise the programme. Moreover, many legal documents in Argentina somewhat appear to have the role of expressions of will rather then of binding acts. In order to facilitate legal enactment, goals are vaguely designed, with difficult political trade-offs being left for later phases of the implementation process.

The assessment of administrative burden is here centred on the early stages of implementation, including *inter alia* the further design of policy measures and production of legal documents within the executing unit, Secretaría de Energía. The here applied concept of implementation is further elaborated in section 3.5.

A disproportionally big administrative burden of implementation can weaken the effect of a policy, as initial ideas behind it might be compromised. In addition, it might have an adverse impact on the legitimacy of the measure.

Administrative burden is often analysed in quantitative terms, such as monetary costs or hours of work input. Considering the aims and the scope of this thesis, a qualitative investigation is seen as more appropriate and feasible in order to capture aspects of human capacity and political considerations. Data collection and analysis regarding this criterion seek then to shed light on the character and significance of the administrative burden. Two questions are formulated in order to guide the research:

- What are the major types of administrative burden connected to the policy implementation?

- How do these compare to the administrative resources available for the policy implementation?

3.4 Energy efficiency policy instruments

As described above, a broad range of policy instruments to address energy efficiency in buildings exists, ranging from energy labelling of buildings and products to energy price regulations. Several ways of classifying the policy instruments are offered. Vedung (1998) presents a commonly used three-part division based on the authoritative force or degree of constraint related to the measure, resulting in regulatory, economic and informative policy instruments.. Another way of classifying policy instruments is on a continuum scale, ranging

from non-intervention or freedom to control (Vedung, 1998). When investigating the implementation of a policy programme already in place, Vedung's division is seen as more suitable than the continuum approach. The approach is further described below.

Regulatory instruments constitute instruments through which a person or a group is obliged to act in a certain way and controlled (Vedung, 1998). Within the topic of this thesis, regulatory instruments would, for example, correspond to regulated minimum standards of the thermal transmittance of the building envelope. Regulatory instruments can be very effective, but sometimes on the cost of efficiency.

Policy instrument which give or take material resources in order to encourage a certain behaviour, yet do not oblige the parties to carry out the action, are labelled as **economic instruments** (Vedung, 1998). The raising of energy prices is one economic instrument relevant for this thesis. Others include the subsidy of energy efficiency investments or preferential financing of the same. One idea behind economic instruments is to correct for external effects from economic transactions, i.e. welfare effects on a third party not participating in the specific transaction. Economists label these instruments as market-based instruments since they rely on market mechanisms. By including the external effects in the transaction, a result that is closer to the solution that maximises societal welfare is expected. According to economic theory, the optimal is to target the source of the externality. For example, in the case of the current thesis, the use of energy appears to be cheaper than the actual cost for society of using energy which, for example, should include the costs of decreased energy security, power cuts for the industry, high public expenditure for fossil fuel imports and adverse effects from the emissions of greenhouse gas emissions. By including these costs in the consumer price for energy, the rational energy consumer would find the cheapest way of saving energy in order to maximise their own, and thereby the society's, welfare. An important aspect to keep in mind when discussing economic instruments is that an optimal economic instrument does not ensure the perfect distribution of welfare. Therefore, economic instruments might need complements such as income transfers to poor groups being adversely hit by the instrument. In theory, it is important that these transfers are pure income transfers and not connected to any particular consumption, as this would distort consumption decisions away from those decisions which maximise welfare. There might, however, be many political reasons to diverge from this principle in practice.

Informative instruments are those which seek to change the behaviour of people through transfer of knowledge, argumentation and persuasion (Vedung, 1998). This can, for example, include information campaigns and voluntary labelling schemes. Informative instruments try to correct the information deficit or asymmetries, for example, regarding the current energy efficiency of buildings and the potential effect of energy efficiency measures on the grounds that information deficit can constitute one of the barriers to energy efficiency investments. Information deficit can, in this example, also be the consequence of the fragmentation of the construction industry, and subsequent lack of communication between the actors within the industry.

3.5 Policy implementation

Important foundations for the prevailing, contemporary conceptual framework of policy implementation assessment were laid during the 1970s (McLaughlin, 1987), with one of the comparatively influential works of this period defining policy implementation as "those actions by public and private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions" (Van Meter and Van Horn, 1975). When referring to "actions [...] directed at the achievement", this definition comprises both one-time efforts and continuous endeavours to achieve objectives set forth in policies. Markedly, this definition excludes the ongoing process of (re-)formulating and specifying policy objectives as well as designing the actual instruments, which is a central feature of the implementation of umbrella laws, such as of the PRONUREE programme considered in this Master's thesis. Moreover, even the many instances and processes surrounding and shaping objective formulation, all of which can be expected to heavily impact and precondition the achievement of policy objectives, are then unduly excluded from the concept of policy implementation.

Alternatively, DeLeon (1999), paraphrasing Fehrman (1990), has attempted to re-define policy implementation as "what happens between policy expectations and (perceived) policy results". Evidently, this rather inclusive definition seems to leave considerable room for interpretations and speculations regarding the actual starting point or conceptual breadth of policy implementation, which may even comprise the above-mentioned ongoing processes of objective formulation and policy design commonly characterizing umbrella laws' implementation. However, this specific concept's operationalisation appears to be too cumbersome to be readily carried out

Therefore, another serviceable, but more specific definition of policy implementation is here turned to as an inspirational scaffolding: Mazmanian and Sabatier's (1983) definition of policy implementation is widely recognized, referring to " the carrying out of basic policy decisions [including umbrella laws], usually incorporated in a statute, […] which can also take the form of important executive orders or court decisions". Not only does Mazmanian and Sabatier's definition, more readily apply to PRONUREE, it even highlights that the implementation "process […] [inter alia] runs through a number of stages beginning with passage of the basic statute, followed by the policy outputs (decisions) of the implementing agencies and important revisions (or attempted revisions) in the basic statute".

The Decree 140/2007, establishing the policy programme of PRONUREE, constitutes here the basic policy decision, which Mazmanian and Sabatier (1983) have, as outlined above, identified as a starting point for definition of policy implementation. Evidently, some consecutive implementation stages, such as the actual delivery of the policy measure following the output of the policy, receive here rather limited attention due to the confined implementation of PRONUREE. Consequently, this thesis focuses mainly on the earlier implementation stages, including even considerable elements of policy design. Many policy evaluation scholars would investigate these early stages under the rubrics of policy design and formulation (see for example Mundaca's, 2008 outline of the policy development process). However, Hill and Hupe (2002) advocate a specific (re-)conceptualisation of the term policy implementation, which a) to some extent ties in with Mazmanian and Sabatier's definition and b) seems capable of capturing the peculiarities of the underlying case. Basically, Hill and Hupe

(2002) argue that policy decisions and policy implementation should be considered as partly overlapping as policy decisions commonly include specifications on how policy implementation is to be carried out. Similarly, Vedung's (1997) concept of policy implementation, which comprises not only specific administrative outputs, such as subsidies, prohibitions and enabling procedures, but firmly includes governmental administration, which can be perceived to include the ongoing processes of objective formulation of umbrella laws, justify the approach taken here (see 3-2). This approach is considered fruitful as many of the concepts used within policy implementation theory have a high potential in contributing to the understanding of the processes investigated here. These concepts are elaborated below.

In the study of policy implementation, Hill and Hupe (2002) highlights the importance of contextualisation of implementation since implementation is always a consequence of a specific policy which deals with a specific problem. For example, implementation in a federal system, like the one in Argentina, provides specific challenges. Hill and Hupe (2002) applies the term layers for denominating the various levels of political authorities in such a system. Under federal circumstances, the implementation might need to embrace the co-formation of policies. In this context Goggins et al. (1990) speak about the role of policy as federal messages to provinces.

The focus of implementation studies has shifted during the years. The development of theories describing implementation commenced by what was later termed as the top-down approach. The top-down approach's focus lies on how to achieve the goals and objectives set forth in policies (Hill and Hupe, 2002) and important scholars include, Van Meter and Van Horn (1975). The top-down approach was later challenged by the bottom-up approach in which focus is on the work of the implementing organisations instead of on the goals defined by policies. One of the important scholars of the bottom-up approach, Lipsky (1980) describes how, what he calls, *street-level bureaucrats* act as creators of their own set of principles and systems, as a way of coping with the various pressures they face. Further attempts from the top to steer the activities of the bureaucrats will only increase this process, as pressure increases. Consequently, it becomes very difficult to implement policies that are not in line with these systems. Focus should then instead be on the work of the implementing agencies.

Sprung from the polemic between top-bottom and bottom-up approaches, Hill and Hupe (2002) describe a group of scholars with a synthesising approach. Within this school, the so called network theory has gathered a lot of attention. The policy network is a network of actors from private as well as public organisations. The network is held together by resource interdependence within a specific area and, therefore, the actors have a common interest in developing and implementing policies within this area (Smith 1993). In other words, the network occurs by the need to pool resources for policy implementation. In previous works, policy networks was seen as something negative, impeding transparency and control. Within this new approach, on the other hand, strong policy networks are seen as potentially forceful environments for implementation (Hill and Hupe, 2002).

The functioning and development of networks have been described with references to so called game theory in which the strategic choices and their consequences are studied (Stoker, 1991). However, no complete formal model has been developed to study policy networks.

This is partly due to differing epistemological positioning within the research field (Smith and Marsh, 2001).

A common way of classifying policy networks is through a continuum, where the well working policy network is characterised by consensus and membership is stable with a lot of interaction between the members. The group share a common definition of problem and policy options, leading to problems and solutions being seen as technical, rather than political. Private network members have information, implementation resources and legitimacy. Within the network, these resources are exchanged with influence over policy outcomes. Furthermore, the network shall consist of one single government agency. Consequently, less well functioning policy networks are characterised by lack of consensus, little interaction and involvement of many different government agencies. In these networks, the private members possess few resources attractive to the policy makers (Compston, 2009).

All three main perspectives of policy implementation assessment presented above can provide important understanding for the case studied. In particular, the theory of network policies will be applied. Scharpf (1978) argues that policy implementation always is a consequence of the interaction of a diversity of actors. Consequently, an understanding of the network of involved actors is necessary in order to understand policy formulation. The arguments become even stronger in the Argentine context, where the involvement of a multitude of actors appears crucial in order to give stability to policy measures in an environment of rapidly changing political conditions.

3.6 Summary

This chapter has described how and why a model of the policy process is developed to guide the evaluation of output, transparency, administrative burden of implementation and business opportunities generated. Furthermore, the concept of policy networks has been introduced. In the subsequent chapter, the data will be presented according to the structured presented in the conceptual framework.

4 Analysis

This chapter sets out to introduce this study project's readers to the chosen analysis of the field work data gathered within this Master's thesis. After providing vital general information on the policy process, this chapter turns to outlining the model of the process for implementing PRONUREE, which has been derived by means of the previously described theory-based policy evaluation approach. Supplemented with specific indicators presented in section 4.1.1, this model serves ultimately as a tool for the identification of factors that seem to impede PRONUREE's implementation. Moreover, four evaluation criteria are turned to in order to facilitate a more detailed inquiry into these causes of the policies (lack of) progress.

4.1 Policy process

In order to adequately appreciate the scope of specific policy stages within the PRONUREE propositions here investigated as well as these stages' implementation, a so-called process model illuminating the policy implementation is presented. Basically, this process model of causal relationships has been derived by means of examination of relevant initial policy documents and is, as indicated, supplemented by vital stage-specific indicators, which lend themselves to assessing whether the specific step in question has taken place. These indicators spring, too, from analysis of relevant policy documents, but partly also of interview data gathered. As mentioned, the resultant process model forms the first part of the analysis provided, being employed to spot stages at which PRONUREE's implementation comes to a halt. Regarding the specific propositions under paragraph *2.9 – Existing residential building stock*, a potential design of an incentive scheme for improved insulation will here be taken as an analytical point of departure as these propositions' ultimate design remains still to be agreed upon. In addition, the light bulb exchange programme will be described in more detail, serving as point of reference with regard to the three mentioned propositions. However, before presenting the process model, some general aspects of the policy are presented below.

The **objective** of the umbrella programme PRONUREE and of its specific propositions, are somewhat obscure. According to the Decree 140/2007 and its Annex I, which constitutes PRONUREE, the overarching goal of this programme is to "contribute to and improve the energy efficiency of the various energy consuming sectors, which as Annex 1 form part of this decree" (Decree 140/2007, Art. 2). Consequently, the residential building stock being at the analytical core of this study, becomes closely linked to the goal of contributing to and improving the energy efficiency. Moreover, Annex I, paragraph 2, specifies that the measures in part 2 of the annex, i.e. including *2.9 – Existing residential building stock*, shall be implemented within 90 days of the publication of the decree. When looking closer at section *2.9 – Existing residential building stock,* the following objectives of this programme can be identified.

"*Develop* a system of incentives for the decrease of the consumption of energy which includes, for example, preferential financing for measures aiming at reducing the consumption."

"*Design* a strategy for the massive implementation of systems of water heating based on solar energy, in particular in peripheral populations."

"*Implement* a national programme for the insulation for housing including roofs, building envelopes and openings [author's emphasis]."

Contrary to these propositions' seeming forcefulness, interviewees in the implementation group at Secretaría de Energía (DNPEE) have stressed PRONUREE's function as a mere guideline, acknowledging the unrealistic nature of the objectives prescribed by the Decree 140/2007 (Furfaro, personal communication, 2010-07-23).

Concerning the light bulb exchange, the corresponding proposition specifies that the necessary management of the massive replacement of incandescent light bulbs for low energy light bulbs in all the homes in the country shall be initiated, within 30 days.

The **target** group for the measures under *2.9 – Existing residential building stock* has not yet been defined. Potential target groups include, however, private households, real estate developers, landlords and Secretaría de Obras Públicas, in their role as vital stakeholders in primarily charge of the current residential building stock. Regarding the light bulb exchange programme, the target group consist of private households.

The **authority** responsible for the execution of PRONUREE is Secretaría de Energía (under the Ministerio de Planificación Federal, Inversión Pública y Servicios) and more specifically its "Dirección Nacional de Promoción" (DNP), which is responsible for promoting both energy efficiency and renewable energies. Approximately half of the DNP's personnel work with energy efficiency and is as such the unit chiefly involved with implementing PRONUREE. This DNP subgroup is hereinafter referred to as DNPEE.

The 2010 **budget** for the work with energy efficiency within the Secretaría de Energía amounts to approximately ARS 35 million (EUR 7 million, corresponding to 0.03‰ of GDP) (Law No 26 546).

The PRONUREE was published as Annex 1 to Decree 140/2007 and a *General Framework* further specifying its implementation was published as Annex 2 to Resolution MPFIPyS 24/2008

4.1.1 Process model

The process model depicting various policy stages as specified in PRONUREE is presented in figure 4-1. Under the heading *Cause-impact relationships*, each sequential step of the policy process is described, listing the first stages at the top, with consecutive stages following below, respectively. To the left, the rubric *Monitoring and follow-up mechanisms* describes functions for monitoring that are meant to accompany implementation. The column labelled *Indicators* to the right describes the indicators applied when assessing the realisation of specific stages in question.

The process model shown takes the signatory of the president of the Decree 140/2007 as its starting point (step 1 in figure 4-1). The decree regulates that the Ministerio de Planificación Federal, Inversión Pública y Servicios further clarifies the how to reach the objectives of the decree and takes the necessary measures for the realisation of the programme (Art. 8) (step

2). Furthermore, the decree identifies Jefatura de la Gabinete de Ministros as the authority in charge of carrying out the necessary budget reallocations for the implementation of the decree (Art. 5) (step 3). The Secretaría de Energía shall adopt the regulation necessary for the implementation (Art. 3) (step 4). Parallel to this, programmes and plans for implementing section 2.9 in the PRONUREE shall be developed by the Secretaría de Energía (step 5). In addition, the Secretaría de Energía shall offer technical support Secretaría de Obras Públicas in case this authority wishes to implement measures in line with the programme propositions under heading *2.9 – Existing residential building stock* (Resolution 24/2008, Annex II, paragraph 12)(step 5). Thereafter, one or several organisations are assigned to carry out the actual measure, such as public utility companies, different public authorities or private actors. Moreover, the target group shall bring about the actual measure which finally produces energy efficiency. When using this theoretical process model for assessing and identifying actual implementation, the steps are further elaborated upon.

The programme also includes a control mechanism, described by Decree 140/2007 and Resolution MPFIPyS 24/2008 (see figure1-2). The Secretary of energy shall produce reports that are presented to the Ministerio de Planificación Federal, Inversión Pública y Servicios and to organisms for external and internal control (MPFIPyS 24/2008, annex II, §15). In addition, the Commission of Support, Follow-up and Control shall meet weekly, its members report to the president (the Minister of Planificación Federal, Inversión Pública y Servicios) on the progress made, and take action for ensuring for improvement of the programme (MPFIPyS 24/2008, Art. 2).

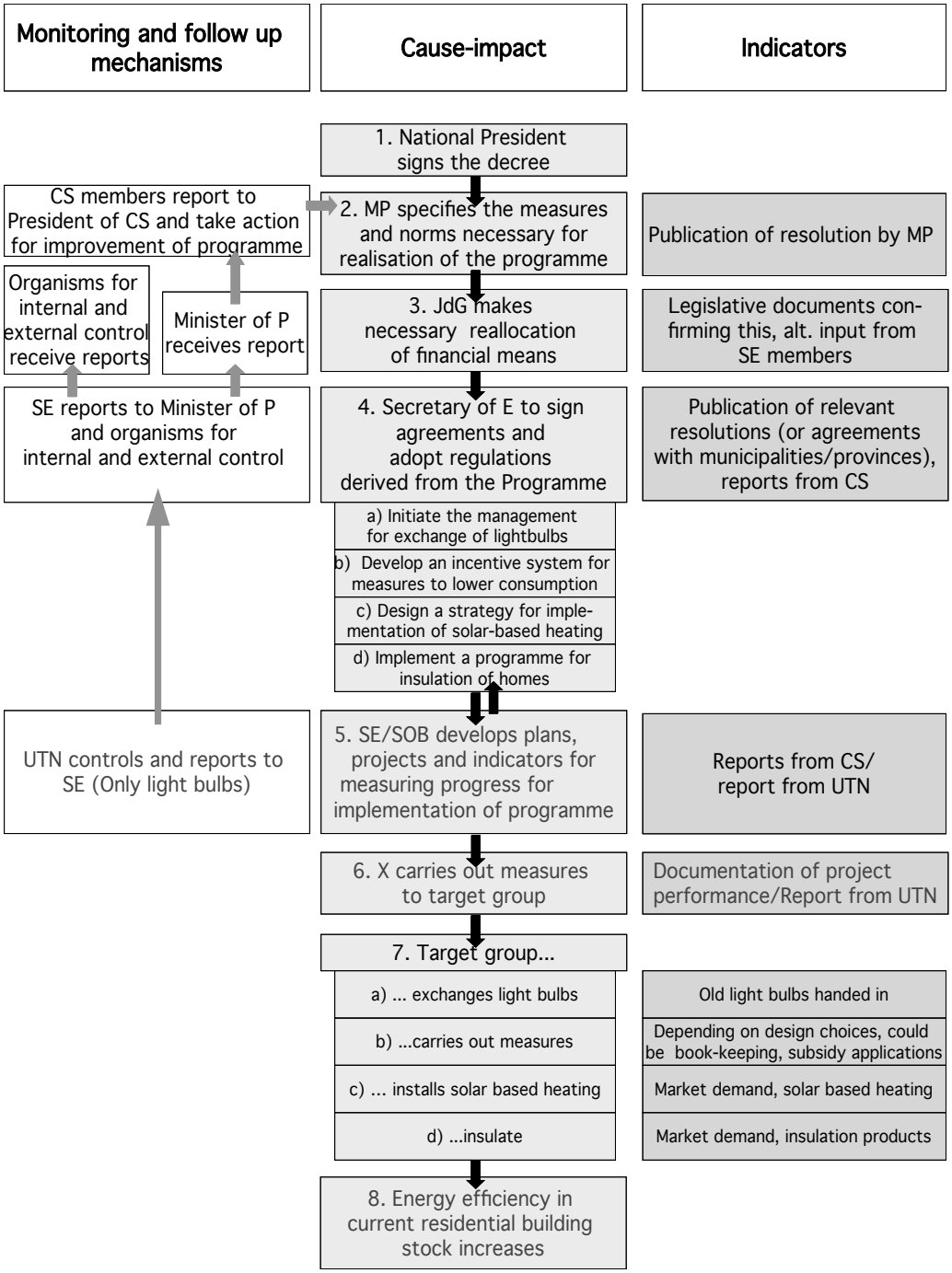

Figure 1-2 Process model: Cause-impact relationships

Source: Smedby based on Decree 140/2007 and Resolution MPFIPyS 24/2008
Note: Abbreviations: JdG, Jefatura de Gabinete de Ministros, MP - Ministerio de Planificación Federal, Inversión Pública y Servicios, Minister of P - Minister of Planificación Federal, Inversión Pública y Servicios, SE – Secretaría de Energía, Secretary of E – Secretario de Energía, SC - Commission of Support, Follow-up and Control, SOB – Secretaría de Obras Públicas, UTN – Universidad Technoclógica Nacional

4.1.2 Process model – actual implementation

Within this section, the previously introduced steps of the process model are tested against actual outcomes. In short, the light bulb exchange programme has been found to have been carried out in a process similar to the one described by the theoretical policy process derived from relevant legal documents; whereas the propositions under *2.9 – Existing residential building stock* have, up to until now, come to halt early in the implementation process.

The **first step** of the policy – the signatory of the Decree – took place on the 21st of December 2007 and this act is a necessary prerequisite for the choice of case study for this thesis.

Resolution MPFIPyS 24/2008 confirms that the **second step** of the model of the policy process has partly been carried out. The Resolution includes certain specifications on responsibilities for the various steps in PRONUREE. Under the subheading of *General guidelines*, it is specified that the Secretaría de Energía shall offer support to Secretaría de Obras Públicas by means of required collaboration and technical assistance in order to develop plans and projects for the implementation of point *2.9 – Existing residential building stock* in PRONUREE. However, Secretaría de Obras Pública's responsibilities concern mainly public housing, and the Secretaría de Energía is still the executing unit of the programme. Therefore, it can be concluded that, despite the fact that the resolution has been published, the forms of implementation for the measures in *2.9 – Existing residential building stock* remain exceedingly open, with the second step having only partly taken place. The only investigated measure for which further implementation is specified in detail is the light bulb exchange programme (Resolution 24/2008, 7/2008 and 8/2008).

Resolution MPFIPyS 24/2008 is also concerned with the **third step** of implementation, fund allocation. In the recitals, it is stated that the execution of the programme shall not receive any additional funding from the state. This wording does significantly facilitate the passing of the legislation (Schvartzman, personal communication 2010-07-07) However, for the section *2.9 - Existing residential building stock*, the Secretaría de Energía is prescribed to assist with collaboration and technical support (Annex 2, point 12). *Collaboration and technical* support is not further specified, but according to interviews with actors in DNPEE, this does not include financial support (Furfaro, personal communication, 2010-07-23). Regarding the light bulb exchange, the Secretaría de Energía – through third parties or through entities of the Ministerio de Planificación Federal, Inversión Pública y Servicios – shall foot the expenses (Annex 2, point 6). This stands in some contrast to the wordings in the recitals.

However, albeit not specifically mentioned in either PRONUREE or the general framework of PRONUREE, external funding through international organisations also appears to play a significant role for the implementation of the specific measures. In this context, it is important to highlight Decree 1253/2009, in which funds from the GEF, which amount to US$ 15 155 000, are allocated to energy efficiency measures through the International Bank for Reconstruction and Development within three energy efficiency areas. These include the actual development of an energy efficiency fund, the development of a utility energy programme and, finally, capacity building and project management. Despite being published in 2009 only, Decree 1253/2009 can be assumed to have had considerable effect on PRONUREE's implementation even before this date. This is due to its legal prehistory, which

may even be thought of as having partly paved the way and having stimulated PRONUREE's implementation. For example, a project brief from the World Bank preceding Decree 1253/2009 was published in 2005 (GEF, 2005), and the final *Project appraisal* of the same was published in 2008 (World Bank, 2008b).

As mentioned, the first component of Decree 1253/2009 aims at establishing an energy efficiency fund. This fund is, however, only designated for small and medium sized companies (World Bank, 2008b), and its objective is "to demonstrate the commercial viability of investment in energy efficiency by reducing the risk perception that currently impedes such investments" (World Bank, 2008b). Moreover, it should be stressed that this project does not cover the residential sector (World Bank, 2008b)

The second component of Decree 1253/2009, the energy efficiency programme, stipulates support to the light bulb exchange, the phase out of incandescent light bulbs and the provision of technical assistance for discovering new delivery mechanisms of EE services through utilities. The funds for the project stem from the following sources (World Bank, 2008b):

- GEF: US$ 9.2 million
- Government of Argentina: US$ 41.3 million
- Energy Utilities: US$ 40.0 million

Basically, Decree 1253/2009 is an Argentine offshoot of the global "Ban the Bulb" initiative administered by the GEF (World Bank, 2008b). According to staff of DNPEE, the funding for the light bulb project had to be expanded, which was done by financial reallocations from component one, concerning the establishment of an energy efficiency fund, to component two, the energy efficiency programme. As a result, component one had instead to be financed by a loan (Furfaro, personal communication, 2010-07-23).

The third component of the GEF programme concerns capacity building and project management. One of its subcomponents includes the identification of barriers to energy efficiency and the improvement of the regulatory and institutional framework in order to promote energy efficiency (World Bank, 2008b). This could potentially be used for developing the investigated propositions for the building stock in use, although this has not been done so far (Furfaro, personal communication, 2010-07-23). The corresponding resources stem from the following sources (World Bank, 2008b):

- GEF: US$ 0.25 million
- Government of Argentina: US$ 0.05 million

Within the GEF project, specific key indicators for progress assessment are set up and defined; these are (World Bank, 2008b):

- "GHG emissions reduced;

- number of bankable EE project proposals developed;
- number of EE standards and labels issued;
- number of CFLs used by residential customers; and
- enhanced awareness and knowledge of EE among energy consumers. "

It is worth noting that the aforementioned subheading of component three, regarding the regulatory framework, which could potentially be used for the propositions under heading *2.9 – Existing residential building stock*, is not accounted for or reflected by the above indicators.

With regard to the **fourth and fifth steps** in the process model, no legal documents or reports could be found to confirm that these have actually taken place for the measures specified in *2.9 – Existing residential building stock*. An interview with DNPEE, confirmed that these sections have still not been attended to (Baragatti, personal communication, 2010-07-23). The reasons for this are elaborated in the assessment of administrative burden of implementation below.

Despite the above, initial measures with regard to the propositions under *2.9–Existing residential building stock* have been taken, mainly in the form of the development of building standards. The national standardisation and certification body – IRAM, which functions as an NGO chiefly financed through certification activities, has developed several labelling standards for the thermal efficiency of the building envelope and continues even to do so (Zucal, personal communication, 2010-07-06). For one of these labelling standards, IRAM 11.900, which was published in May 2010, actors in DNPEE have directly initiated the work with the standard. The initiation and work with labelling standards turn out to be the single concrete output from Secretaría de Energía concerning section *2.9–Existing residential building stock*.

However, the effectiveness of building standards is highly dependent on whether the standards are mandatory or not. Until recently the labelling standards concerning the thermal envelope of buildings have only been voluntary, and consequently the standards have only been marginally applied (Kusner, personal communication, 2010-07-01 and Furfaro, personal communication, 2010-07-23). In fact, the Secretaría de Energía does not have the jurisdiction to make building standards mandatory, as jurisdiction is exerted on a provincial or municipal level. Therefore, the activities of the Secretaría de Energía are largely limited to internal discussions with actors at these levels (Baragatti, 2010). These discussions appear to be rather dormant at the moment. Still, on the 2nd of July, 2010, the first decree demanding the mandatory application of labelling standards for energy efficiency of the building envelope was signed in the Province of Rio de La Plata. The decree shall apply to existing buildings to the degree that these are retrofitted (Decree DI 1.030).

The Secretaría de Energía has not yet initiated collaboration with Secretaría de Obras Públicas in order to implement measures under *2.9 – Existing residential building stock* as suggested by the General framework of PRONUREE (Resolution MPFIPyS 24/2008).

In contrast to the measures regarding the environmental conditioning of the building stock, the light bulb programme has reached the fourth step in the process model presented above. This is due to Resolution SE 7/2008 and Resolution SE 8/2008, specifying that in the following two years, between 15 and 20 million light bulbs shall be exchanged, thereby altering the initial objective of light bulb exchange in every Argentine dwelling[2]. The actors carrying out this measure include electric utility companies and municipalities (Resolution SE 8/2008, Anexo). In addition, a control unit, based at Universidad Tecnológica Nacional (UTN), is responsible for auditing and monitoring. This group reports in turn to the Secretaría de Energía (Resolution 24/2008, anexo).

The **sixth step**, in which the actual measure is carried out in order to reach the target group, has not been carried out for the measures subsumed under *2.9–Existing residential building stock*. Regarding the light bulbs, the number of low energy light bulbs delivered to the agents carrying out the exchange is, as mentioned, 18 million. Furthermore, this exchange has included the collection of 24 million incandescent light bulbs (Secretaría de Energía, 2010). Consequently, the reformulated objective of the exchange of 15 to 20 million light bulbs has been achieved.

In the **seventh** step, the target group is supposed to carry out the measures which are meant to bring about increased energy efficiency. It may be possible that the publication of building standards for the energy efficiency for building envelopes has had some effect on the target group. However, according to interviewees from IRAM, NGOs as well as Secretaría de Energía, the impact of voluntary standards are to be considered as highly limited. Options for implementing the measures include then future legislation on provincial and municipal levels making labelling mandatory and potentially establishing minimum standards as well as legislation providing incentives for the application of the standard through market-based instruments.

With regard to the light bulb exchange programme, the indication of that the target group actually has carried out the exchange is the collection of incandescent light bulbs. Nevertheless, there is a small risk of already discarded incandescent light bulbs having been used in the exchanged.

The **eighth** step of the process model concerns the materialisation of expected energy efficiency improvements. This aspect is not investigated within the scope of this thesis.

The causal relationships described above are complemented by a set of **monitoring functions.** The work with energy efficiency is relatively informal, which is partly why no formal reports have been published (Baragatti, personal communication, 2010-07-17). DNPEE reports to the head of the Cooperación y Asistencia Financiera, which reports the Secretary of Energía (Furfaro, personal communication, 2010-07-23). None of the interviewees within the Secretaría de Energía has been able to confirm that the meetings of the Commission of Support, Follow-up and Control have taken place, but describe the work of the commission as "unorthodox": "They talk among each other about things that need to be resolved, political things etcetera", "They are very busy people". Several interviewees

[2] With a population of approximately 40 million, 15-20 million light bulbs does not deviate significantly from the initially stated ambition of exchanging light bulbs in every Argentine household.

outside the Secretaría de Energía express that they have a hard time believing that the meetings are, in fact, taking place.

The monitoring function for the light bulb exchange programme appears to function well. Monthly statistics are being sent to the Secretaría de Energía, which in turn publishes this on the web site of the Secretaría de Energía. More qualitative information regarding the progress of the programme is passed on orally according to interviewees in the control unit (Filgueira, personal communication, 2010-08-04).

4.2 Criteria evaluation

Having outlined the comparative theoretical-actual analysis of the propositions in question, this section turns now, as outlined (see section 4.1), to further inquiring into to potential causes that seem to bring PRONUREE's implementation to a halt. In order to arrive at a better understanding of these reasons, four research criteria are here drawn upon. These are a) output, b) generation of business opportunities for the construction industry, c) transparency and d) administrative burden of implementation.

4.2.1 Output

The assessment under the criterion of output revolved chiefly around the following question:

- What has been the output of efforts within the public authorities with regard to the implementation of the investigated policy measures?

Flowing from the analysis provided in the previous sections of this chapter, the initiation of labelling standards constitutes the only step taken on a federal level that aims at implementing the measures under *2.9 – Existing residential building stock*. Within this context, the implementing group at Secretaría de Energía, DNPEE, has come to collaborate with contracted programmers in order to develop a software tool which is to facilitate classification according to the standards defined.

In addition to guiding the implementation stages that have taken place on a national level, PRONUREE can also contribute to the implementation of policies at a provincial or municipal level. An actor within the environmental administration in the Autonomous City of Buenos Aires, highlights, in this regard, the importance of PRONUREE as a facilitator for local initiatives: "PRONUREE is a very important point of reference for motivating and justifying local policies for energy efficiency" (Gaspes, personal communication, 2010-07-02). A local decree making energy efficiency labelling mandatory in La Provincia de Buenos Aires is an example of this. In fact, the law, preceding this local decree, partly builds on and makes reference to the Decree 140/2007. Similarly, within the Autonomous City of Buenos Aires, a law has been passed, stipulating a subsidy of 50% of the additional cost of installation of energy saving systems in existing buildings to potential investors (Law 2972, CABA, Decree CABA No 543/009). Bearing in mind that these measures have not come to operate as yet, the role of PRONUREE as a policy facilitator on provincial and municipal levels seems to have been largely limited.

Regarding the exchange of light bulbs, the number of light bulbs delivered between 1st of January 2008 and 1st of August 2010, amounts to 18 million, while the number of incandescent light bulbs collected amounted to 23 million, which appears to be in line with the set objective of 15-20 million light bulbs within two years (Secretaría de Energía, 2010). The design, the production of a number relevant policy documents and the establishment of monitoring functions was carried out by Secretaría de Energía.

4.2.2 Generation of business opportunities

When assessing the generation of business opportunities in the construction industry, the research questions guiding this analysis have been as follows:

- To what extent have construction industry stakeholders experienced effects of the investigated policy measures?

- Which drivers for market development do the stakeholders within the construction industry perceive today?

Based on the output evaluation, the policies do not appear to have generated any business opportunities, as yet. This is confirmed by all industry actors interviewed, of which none claims to have experienced any specific outcome of PRONUREE affecting their business.

Even if policy measures have not been implemented, the anticipation of implementation has potentially an effect on investment decisions. This can go in two directions. On the one hand, if price rises concerning energy are expected, investment in energy efficiency measures might be spurred. On the other hand, if a subsidy on an energy efficiency measure is expected, this can cause individuals to postpone their investments. However, what comes out as striking in the underlying case is that industry actors have extremely low expectations with regard to the implementation of PRONUREE, with many of them not even knowing the content of the specific propositions contained.

Actors within the building industry stress that efforts concerning improved energy efficiency and green building do seldom pay off. The main drivers affecting business activities within this construction sector are, instead, accumulation of additional benefits through a) differentiation, b) expression of status, c) certain environmental concerns, which commonly show little connection to energy efficiency improvement of the existing building stock and green building and d) anticipated benefits from increasing internationalisation of business operations (Heredia, personal communication, 2010-06-23, Sueiro, personal communication, 2010 07-06 and Rosenfeld, personal communication, 2010-06-23).

According to several interviewees an important constraint hampering better and further alignment of the construction industry's business activity with policies on energy efficiency as expressed in PRONURREE relates to the lack of continuity characterising these policies and their implementation (Heredia, personal communication, 2010-06-23, Sueiro, personal communication, 2010 07-06). In fact, one of the prime aims of PRONUREE was to bring continuity to the policies. Formulations in the recitals of the Decree 140/2007, such as "promoting energy efficiency is not a cyclical activity but of permanent character in the

medium and long term" indicate that the programme aims at giving continuity to energy efficiency policy. Actors within DNPEE also argue that a clearer line within energy efficiency policies has become discernible since PRONUREE's introduction (Furfaro, 2010-07-23). Such views have, however, not been surfaced in interviews with private actors. For example, the recently adopted resolution in the Province of Buenos Aires appears to have come as a sudden initiative for actors within the private sector. Therefore, continuity becomes particularly important, especially in light of the lack of capacity prevailing in the industry. Sudden policy initiatives, such as the one described above, will most likely not be matched by an equally immediate supply. Moreover, it will take time before the industry can take advantage of these business opportunities and frequent, inconclusive see-saw changes my undermine business actors' trust and confidence in such programmes, which may further forestall necessary investment activity.

4.2.3 Transparency

When addressing transparency, the following questions guided the assessment provided:

- Is the policy known by relevant stakeholders?
- Do these stakeholders know about the outputs of the policy?
- Is there any comprehensive source of information that is easily accessible in order to acquire information about the outcomes and outputs of the policy?
- What aspects of the policy programme are highlighted in the public discussion?

About half of the people interviewed during the field work knew the programme by name - PRONUREE or Decree 140/2007. However, within the group acquainted with the programme, the majority only knew about the implemented measures, mainly the programme for exchange of light bulbs and the sister programme for energy efficiency in public buildings. In general, the programme for light bulbs is very well known, and many of the interviewees highlight this as an important educational measure, which stimulated a debate on energy efficiency: "This is a very good thing, near the people!" (Schwarz, personal communication, 2010-06-09)

Knowledge about the programme as a whole as well as about measures that have still not been implemented is very limited. The only group among the interviewees with a deeper knowledge of the content that has still not been implemented is the actors working within the political administration (Furfaro, personal communication, 2010-07-23, Baragatti, Servant, and Elizondo, personal communication, 2010-07-16 and Gaspes, personal communication, 2010-7-02). Some interviewees emphasised their knowledge about the programme's nature as an umbrella policy. In connection with this, low expectations of implementation were, however, normally expressed: "This is just a project, nothing has happened" (Tanides, personal communication, 2010-07-01). Repeatedly encountered reactions of interviewees, when introduced to the research topic, were laughter and partly cynical remarks such as, "Well, yes that I would like to know too", indicating that the implementation process is highly opaque.

When actors were asked about where they would turn to for more information about the programme and its outcomes, answers were either "Through internet" or "By asking key decision makers" (Rosenfeld, personal communication, 2010-07-14). The web page of Secretaría de Energía contains, however, only information about the measures actually carried out. Moreover, it includes statistics on energy consumption, energy efficiency advice as well as presentation of the actions within the light bulb exchange, technical standards for energy efficiency, the introduction of summer time as well as the energy efficiency programme for public buildings. However, the decree establishing PRONUREE is not available there, nor is the name of the decree mentioned. The second way of acquiring more information, through key persons, is likely to require the appropriate contacts within the field and may not necessarily constitute an adequate large-scale information channel for timely information sharing.

Parallel to the implementation of PRONUREE, a general dialogue on energy efficiency between private and public stakeholders has come into being. The work groups of the labelling organisation IRAM constitute here an important nexus where various stakeholders can interact (Tanides, personal communication, 2010-07-01). Other examples of stakeholder interaction include talks on energy efficiency organised by the environmental protection agency of the Autonomous City of Buenos Aires (Gaspes, personal communication, 2010-07-02). However, the involvement of actors from academia appears here to be limited, with academic actors being frustrated about the fact that their knowledge is not applied in policy decisions, while private and public actors often take the view that academia is too far away from reality (Gonzalez, personal communication, 2010-06-17 and Rosenfeld, personal communication, 2010-06-23).

No publicly available information regarding the monitoring of the general implementation of the programme is available. According to Baragatti (personal communication, 2010-07-16) at Secretaría de Energía, the work and follow-up is carried out in relatively informal ways, and public reports are not produced. Also regarding the activities of the Commission of Support, Follow-up and Control, the information appear to be non-existent, as elaborated in the previous section.

In addition to the above, media plays an important role within the context of policy implementation, particularly in the spread of information of – and creation of a public debate around – policy programmes. One interviewee brought up the political nature of media as an obstacle for communication from the government, arguing that, as most media supports the political opposition, only negative aspects of government policies are brought up in the majority of media (anon.).

An investigation of newspaper coverage was carried out in order to capture the reporting about PRONUREE, including articles from two oppositional and one government friendly newspaper. The two main measures that are reported in the media are the change to summer time, which is mentioned in 71% of the articles, as well as the exchange of light bulbs, which is mentioned in 54% of the articles. Very little attention is here given to parts of the programme that still have not been implemented. However, some articles describe the long-term aims of the programme, highlighting quotes from the programme such as "the efficient

use of energy is of national interest and priority" and that the programme has a "permanent character".

4.2.4 Administrative burden of implementation

Drawing on the presented policy model, which takes the signing of the Decree 140/2007, i.e. the establishing act of PRONUREE, as a point of departure and focuses particularly on the earlier stages of implementation within Secretaría de Energía, the following questions have guided the assessment of administrative burden for these policy stages of the programme:

- What are the major types of administrative burden for the public authorities when implementing the investigated measures of PRONUREE?

- How do these types of administrative burden compare to the administrative resources available for the policy implementation?

The work within the public authorities concerned with implementing PRONUREE can be serviceably analysed by means of reference to four different categories of burden, namely a) burden of design, which relate to the specification of the mechanism to encourage energy efficiency in the building envelope, b) burden of monitoring and follow-up, which relates to the monitoring and follow-up of the progress in the implementation of the programme, c) practical burden, including issues such as public purchasing and d) burden of negotiation, which relate to the communication with stakeholder in order to necessary for the implementation.

The implementation stages of PRONUREE investigated here are mainly carried out through the Secretaría de Energía and the DNPEE. The DNPEE constitutes of 10 members of staff, of which the majority are engineers. Their tasks include further specification of the design of policy measures, the identification of possible actors to implement the policy instruments, the management of the financial resources allocated and the establishment and development of contacts with international donors. This group is responsible for all national energy efficiency policies. The DNPEE not only works with the current design of implementation of the measures, but also designed PRONUREE as published with the Decree of 140/2007 (Furfaro, personal communication, 2010-07-23). The DNPEE has been in place since 1994. Due PRONUREE's umbrella policy character, their responsibility includes all kinds of energy efficiency policies, ranging from measures on an industry level to educational campaigns in schools and the light bulb exchange. The budget for the work with energy efficiency in 2010 was approximately ARS 35 million (EUR 6.92 million, corresponding to 0.03‰ of GDP) (Law 26. 546). This budget is, however, meant to cover costs other than those of purely administrative character, such as the purchase of the light bulbs.

When being asked about the work with **design**ing the specific measures for the existing residential building stock, interviewees in DNPEE replied in the following ways:

"We are not there yet" (Baragatti, personal communication, 2010-07-16)

"We are doing a lot of other things" (Baragatti, personal communication, 2010-07-16)

"We have only worked with energy efficiency for seven years. And the actual execution and implementation of energy efficiency policies... we have only done it for a very short time" (Baragatti, personal communication, 2010-07-16)

"It is within the Decree that this shall go from bottom to top. We are working on this. Once the decision is taken by the president it is easy!" (Baragatti, personal communication, 2010-07-16)

Regarding the access to resources, the DNPEE has some possibilities to purchase consulting services from other actors, for example, in the case of the mentioned development of a software tool for calculating the thermal transmittance of building envelopes. There appear also to be certain unexploited possibilities in terms of the work force expansion.

The legal documents regulating the forms of implementation of PRONUREE indicate a heavy **administrative burden of control**. The Commission for Support, Follow-up and Control, consists of members on the very top of Argentine political and bureaucratic life, for example, the Minister of Planificación Federal, Inversión Pública y Servicios, the Secretary of Energía, the Subsecretary de Coordinación y Control de Gestión as well as heads for major labour unions and electricity providers (Resolution MPFIPyS 24/2008, art. 2). This commission is supposed to meet once a week, and its members shall present the progress of the programme. Based on this information the commission shall "make the necessary recommendations for optimisation of the objectives of the PRONUREE". As described in section 4.1.2, no indications of that these meetings have been taking place have been found.

Also the work of the DNPEE is described as informal, with no formal reports being produced. The group reports to the Ministry of Energía. The impression gained when gathering the empirical material underpinning this study, is, however, that the group works relatively independently from the rest of the Secretaría de Energía.

Asked about the potential workforce needed for implementing a project, an interviewee I DNPEE pointed to another important administrative burden, namely, the **burden of negotiation**:

"It is not a matter about *how many*, but about *who* should do it!" (Baragatti, personal communication, 2010-07-16)

In so doing, the interviewee highlighted the challenges of finding the right actors to take on the various tasks connected to further implementation. Part of this stems from a lack of jurisdiction, which is a consequence of the federal system of the country. As buildings are chiefly regulated at the provincial and municipal level, the DNPEE can only work indirectly, through negotiation with the provinces to advance mandatory building standards and labelling. In a country with 23 provinces and 2 164 municipalities, this undertaking becomes an extensive and challenging task.

In order to better understand the burden of negotiation, experiences from other implementation processes taken care of by the same implementation group may here prove to be highly valuable. In fact, many of the impediments that the burden of negotiation may

produce became evident within the context of PROCAEH, a programme aiming at setting standards and introducing mandatory labelling and tax incentives to promote energy efficient electrical appliances. Basically, experiences gained from PROCAEH's implementation highlight organisational difficulties between different government authorities and the malfunctioning coordination of these authorities. In an assessment by the World Bank (2008b), the Secretaría de Energía attributed the difficulties encountered with PROCAEH's implementation to:

- Excessive amounts of time for developing the standards due to lack of competence of the participants in the Energy Efficiency subcommittee of IRAM

- Difficulties in the development and publication of relevant legal documents, due to a lack of human and financial resources provided by the Secretaría de Comercio Interior, a lack of personnel with sufficient technical expertise and a lack of knowledge about the corresponding market

- Insufficient capacity of testing laboratories

- Insufficient knowledge within the Secretaría de Comercio about energy efficiency for taxation and control

- Lack of end-user awareness

The highlighted aspect of malfunctioning coordination between these authorities becomes further complicated by the polarisation of the Argentine society, which even more complicates the work with finding suitable actors to carry out the implementation of specific instruments. The problem is illustrated by a quote in a newspaper article where the difficulties of implementation of the light bulb programme were described. According to the quote, a mayor's unwillingness to adhere to the light bulb exchange programme had to do with the fact that participating in the programme would have meant being photographed together with the head of the government, which this mayor eagerly sought to avoid ("El recambio de lamparitas sólo avanza en el conurbano", 2010).

Practical administrative burdens within the DNPEE include aspects such as the mentioned designing of a software for labelling the energy efficiency of buildings. As indicated, the actual work is mainly carried out by contracted programmers, but the process of designing the software programme appears to take up a lot of resources even within the DNPEE as mentioned by interviewees.

When it comes to more down-stream activities, it is interesting to study how the various types of administrative burden have been handled in the light bulb exchange programme. Within the programme, an agreement was reached in which the electricity distributors agreed to carry out the exchange without any financial compensation. The exchange itself constitutes a heavy, practical administrative burden. Furthermore, the distributors have an interest in maximising the energy sales, which opposes the actual purpose of the light bulb exchange programme. On the other hand, the distributors are obliged to ensure the sufficiency of electric energy supply. This, in combination with the opportunity of gaining popularity by distributing the light bulbs

come out as important factors for the programme's success in terms of effectiveness. Evidently, not all distributors have found this arrangement satisfactory, and there is a current shift towards letting municipalities be in charge of the implementation rather than electricity distributors. Basically, it appears to have been relatively easy to convince the different actors involved to take on the heavy burden of distribution. Possibly, the handing-out of "free gifts" and the related positive image of the gift-giver have played an important part here.

The auditing and the control of the light bulb exchange programme have been performed by the Universidad Tecnológica Nacional (UTN). One of the advantages of UTN, in this aspect, relates to its decentralised structure including branches spread all over the country. UTN was contracted by the Secretaría de Energía for carrying out this control, and approximately 150 full-time workers were involved in the task. In the beginning of the programme, the Argentine association for distributors of electric energy, ADEERA (Asociación de Distribuidores de Energía Eléctrica de la República Argentina) was also involved in the monitoring, but its involvement was eventually phased out.

In order to foster effective and continuous implementation of energy policies, several countries have turned to cooperation forms for private and public actors in different types of energy agencies. In Germany, *dena* (Deutsches Energie-Agentur, German Energy Agency) has played an important role in the successful implementation of energy efficiency policies (see Text box: Germany case, p. 49), with soft loan programmes for residential buildings having been pointed to by the European Union as a particularly good example (EC, 2009). Another example is Chile, which seems to exhibit a strong culture of involving private actors in the energy efficiency policy implementation (IEA, 2009). As a response to energy shortages in 2004 and 2007-2008, the country has made a significant move towards the prioritisation of energy efficiency measures (IEA, 2009). The country has, contrary to Argentina, *inter alia,* managed to introduce mandatory minimum standards for roofs and envelopes as well as insulation retrofit programme for existing homes. Moreover, Chile inquires now into ways to turn its short-term response to energy crisis into a long-term strategy for energy efficiency. In this context, the country intends to introduce an energy efficiency agency pulling together public and private actors for the further implementation of their long-term energy efficiency plan (see Text box: Chile case, p. 56).

4.3 Summary

In this section, the data collected has been analysed from a number of angles. The derived process model provided important input for the further elaboration of the specific research criteria. In the next section, the author sets out to discuss some of the pertinent topics presented here.

Text box: Germany case

Germany's work with energy efficiency is an essential part of its climate policy (IEA, 2007); and in 2005 a coalition agreement for energy efficiency was formed (IEA, 2007, p.53). The country's political work to support energy efficiency is described by the National Energy Efficiency Action Plan (NEEAP) (EC, 2009). In the EU evaluation of the NEEAP (EC, 2009) the programme is commended for its emphasis of coherence, complementarity and continuity. Buildings constitute an important part with estimated 40% of the projected energy savings in this sector. The efforts for buildings include a soft loan programme - KfW CO_2 Building Rehabilitation Programme. The programme has been highly prioritised with funding rising from approximately EUR 360 million in 2006 to EUR 1 000 million in 2009 (0.38‰ of GDP). The amount is sufficient for supporting loan applications up to EUR 17 million IEA, 2007). The programme is managed by a non-profit public banking group and the goal of the programme is to address the upfront costs of energy efficiency refurbishment. In addition to interest loans below market level, non-repayable grants are available. Since the beginning of the programme til 2009, 628 000 homes where renovated with loans totalling to EUR 12 050 million (IEA, 2010b).

An important actor in the implementation and formulation of energy efficiency policies is the German Energy Agency (Deutsches Energie-Agentur, dena). The agency functions as a limited company with the following goals:

- Improvement in the rational use of energy
- Development of renewable energy sources
- Increase in innovative technologies for the rational conversion of energy
- Creation of energy efficiency markets

The shareholders are the Federal Republic of Germany, KfW Bankengruppe, Allianz SE, Deutsche Bank AG and DZ BANK AG. The projects are mainly financed through public-private partnerships. The agency has, among other things, been contracted by German state institutions for implementing various energy efficiency policy projects, worked with international cooperation on energy efficiency and organised conferences on the topic (dena, 2010a). Within the existing residential building stock, projects include energy performance certification, which is the documentation of and suggestions for improvements in a building's energy performance and a number of case studies in which the possibilities to increase the energy efficiency of homes are demonstrated. It is also one of the shareholders of dena, KfW Bankengruppe, that administers the soft loans for energy efficiency refurbishments (dena, 2010b).

5 Discussion

In this section, main outcomes of the analysis are discussed in order to further explore impediments, but also drivers for policy implementation.

5.1 Policy process, rational but unrealistic

The theoretical policy process concerning PRONUREE as derived and presented in figure 4-1, appears to be comparatively linear and straightforward. In fact, the decree introducing PRONUREE, Decree 140/2007, identifies the authorities in charge of the implementation and also specifies mechanisms for monitoring as well as channels for continuous learning throughout the policy implementation process, i.e. through the sharing of experiences in the Commission of Support, Follow-up and Control. In addition, there is a timeframe for the realisation of the goals set up by PRONUREE. The goals *per se* appear, however, to be rather non-committal, with only one of this programme's goals within the section for current residential building stock postulating implementation. The remaining propositions are confined to initiating or developing the specific measures.

However, the seemingly rational structure of the policy appears less and less so as the implementation process is investigated further. In fact, the above analysis suggests that the design of the policy has left many key problems unresolved, which constitutes a considerable challenge for the actors within public administration who are to implement the policy. First, it becomes evident that the time horizons set for the programme are impossible to comply with, which was also acknowledged by PRONUREE's public implementers and designers, DNPEE. Part of this situation may be due to this programme's extensive scope, reaching far beyond the building sector alone. Basically, the number of propositions to be carried out in the short run, i.e. within 30 days, is six, whereas the number of measures to be carried in the long run, i.e. 90 days, is 41. Due to the broadly acknowledged impossibility to comply with the time limitations established, which both the field work carried out and the ensuing analysis have pointed to, the monitoring bodies are disinclined to demand compliance with these, and no time limitations exist in practice. The result is a lack of structured, rational prioritisation of measures and limited pressures to implement. Partly, these propositions' wording, using verbs such as *develop*, *investigate* or *initiate* more frequently than more pungent verbs such as *implement*, is a way of myopically facilitating the fulfilment of the goals. The obvious risk with such a design is that the multitude of commenced propositions is not followed by the final implementation of policy measures. In the underlying study this problem has, however, not arisen, due to the fact that not even investigation and initiation have occurred. Basically, the actors within the DNPEE appear to have tackled the unrealistic scope of the goals by redefining them according to their own prioritisation, based on *inter alia*, political feasibility and accessibility to external financing, in a process similar to the one of the *street-level bureaucrats* described by Lipsky (see section 3.5).

Another aspect regarding the theory underpinning the policy as derived in the process model, is that it appears to insufficiently address the jurisdictional limitations and challenges faced by implementers within a federal system. In fact, the Argentine federalism involves important obstacles for policy implementation at the national level for residential buildings in terms of,

for instance, mandatory building standards. The Decree 140/2007 does not touch upon these challenges more than by encouraging municipal and provincial actors to adhere to the same (Art. 9). The measures that the DNPEE has chosen to emphasise, such as the development of mandatory – and potentially minimal – standards for the building envelope can only be regulated at provincial or municipal levels, which implies a high administrative burden in terms of negotiation with or persuasion of these actors.[3]

Furthermore, in contrast to the light bulb exchange programme, further specifications on how the measures under *2.9 – Existing residential building stock* are to be carried out remain truncated. The general framework (Resolution MPFIPyS 24/2008) states that Secretaría de Energía shall offer technical support to Secretaría de Obras Públicas for implementation of measures under *2.9 – Existing residential building stock*. However, the resolution does not alter the fact that Secretaría de Energía is ultimately responsible for the implementation. Still, nothing more is said about what the specific measures shall look like, how they are to be implemented or what the more specific objectives of these propositions shall be. The explanation for the insufficient specification can probably be partly attributed to the lack of political support for further specification, which is strongly supported by the interview data introduced and analysed above.

The aspects of the policy process described above render the policies difficult to implement with a heavy burden put on the implementers. At the same time, mechanisms for monitoring of their progress and subsequent enforcement are insufficient and prioritisation of measures that are actually carried out seemingly unsystematic. In such a situation, the capacity and resources of the implementers become crucial. One way of increasing the capacity of the implementer is through the development of a strong policy network.

Based on the discussion in this chapter, a modified model of the policy process that identifies key success factors is presented as figure 5-1. The figure sheds light on a number of important aspects that have turned out to restrain the implementation of PRONUREE in general, and the investigated propositions in particular.

First, it is clear that no strong mechanism for monitoring and follow up is in place in the case investigated. In order for the Commission of Support, Follow-up and Control to function, it is necessary to make sure that its members have the possibility to set aside the time required. Still, the members need to be of sufficient prominence in order to be able to represent the relevant stakeholder groups. However, the data also points to the importance of that a political support for energy efficiency is in place, in order to keep the activities of the group high on the agenda (step 2 in figure 5-1).

Moreover, sufficient financial allocations are necessary for the implementation (step 3 in figure 5-1). Naturally, the contradicting messages regarding financing (see section 4.1) do not facilitate the allocations. Ways of ensuring that financial resources are on par with the costs are discussed in section 5.2.

[3] This thesis does not argue for energy efficiency regulation at any particular jurisdictional level. However, the PRONUREE is a national programme; and with this prerequisite, the possibility of the executive body, which is a national secretary (secretaría), to actually exert the influence necessary for implementation is utmost important when evaluating the programme.

Political prioritisation is naturally of great significance in order for the necessary policy decisions to be taken by the Secretaría of Energía, such as the signing of agreements and the adoption of regulations (step 4 in figure 5-1). However, the political support shall not be seen as given, but can be actively nourished. For instance, as elaborated in section 5.3, the analysis suggests that support can be enforced through increased stakeholder pressure for ambitious energy efficiency policy and the perception of feasible design solutions, which in turn potentially can be promoted by increased transparency. Moreover, sufficient monitoring and follow-up appears to be a crucial aspect in order to push the implementation in this stage.

In order for Secretaría de Energía to develop plans for the implementation (step 5 in figure 5-1), something which is done in a process parallel with the Secretary of Energía's signing of agreements and adoption of regulations, sufficient resources and clear prioritisation seem to be crucial according to the fieldwork. The resources are not limited to financial, but even include jurisdictional and political resources.

In the next step (step 6 in figure 5-1), an actor is supposed to carry out the actual practical implementation of the policy measure. In order for this step to be carried out, the analysis clearly exemplifies the importance of commitment and a sufficient reward for the down-stream implementer. An important reward appears to be public popularity. The results from the analysis also suggest that, if measures are rather seen as technical, than political, the finding of actors willing to participate becomes significantly easier.

Finally, when target groups are supposed to carry out the actual measures (step 7 in figure 5-1), the analysis indicate that an available market supply is often crucial for success. In order to prepare the market for the introduction of the policy measure, it is important with transparency and predictability, as elaborated in the next section.

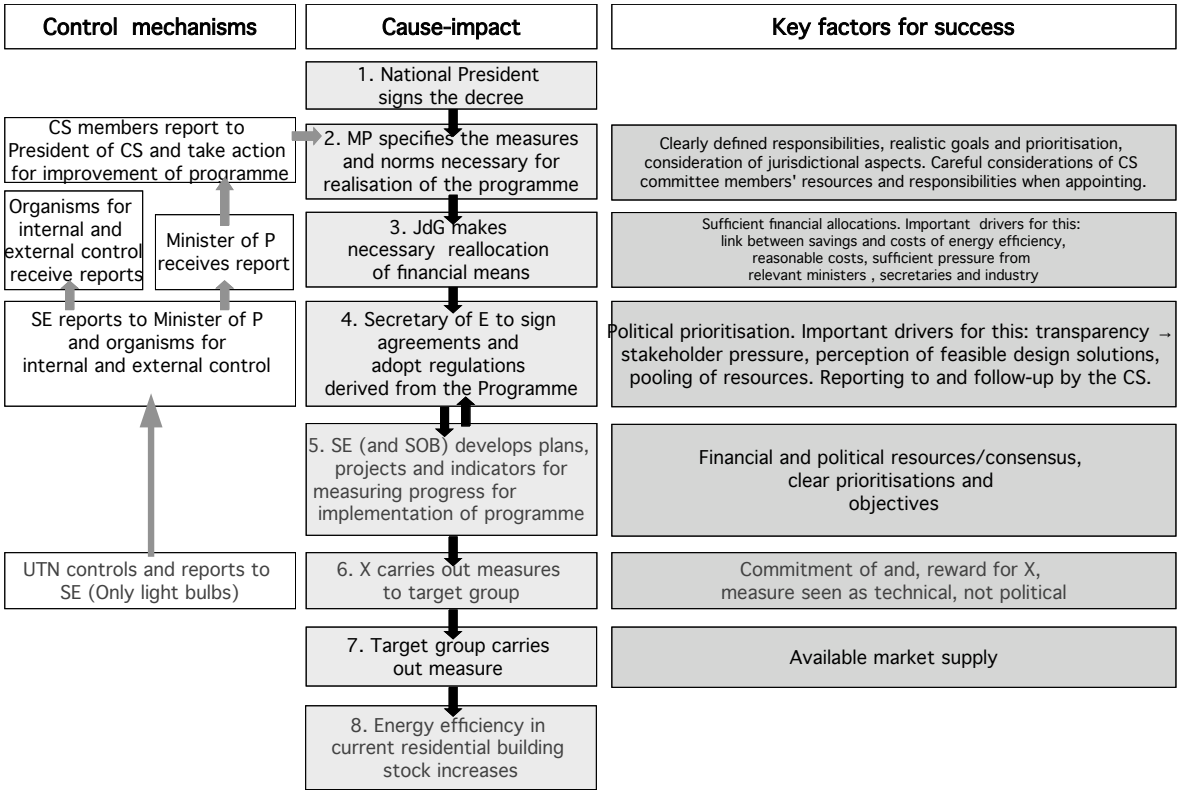

Figure 5-1 Process model: Key factors for success

Note: Abbreviations: JdG, Jefatura de Gabinete de Ministros, MP - Ministerio de Planificación Federal, Inversión Pública y Servicios, Minister of P - Minister of Planificación Federal, Inversión Pública y Servicios, SE – Secretaría de Energía, Secretary of E – Secretario de Enegía, SC - Commission of Support, Follow-up and Control, SOB – Secretaría de Obras Públicas, UTN – Universidad Technoclógica Nacional

5.2 Ways towards increased resources for policy implementation

Due to the limited availability of public authorities' resources for implementing PRONUREE's extensive range of propositions, additional financial funding is a prerequisite for a more effective implementation. There are, however, certain obstacles to this. First, it is difficult to justify increased resource allocation when control mechanisms concerning the implementation progress within the public authorities are not fully functioning, especially in combination with the absence of clear objectives and time frames for the policy programme. Second, as a consequence of the federal administration's limited financial resources (Spiller and Tommassi, 2007) and the malfunctioning capital market, in particular with regard to investments in energy efficiency (World Bank, 2008a), it is difficult for the state to step into the breach, financing energy efficiency measures with large initial costs.

Even though not clearly expressed in policy documents, implementation of PRONUREE has largely been developed in accordance with the availability of external funding – mainly through the cooperation with the GEF (Global Environment Facility), with very few measures carried out without financing from this unit. For example, the light bulb exchange occurred

with support from GEF and was part of the facility's *Ban the Bulb* programme. Recalling the evaluation criteria for the project of the GEF:

- "GHG emissions reduced;
- number of bankable EE project proposals developed;
- number of EE standards and labels issued;
- number of CFLs used by residential customers; and
- enhanced awareness and knowledge of EE among energy consumers,

these appear to have considerably impacted on the implementation focus of PRONUREE. The main achievements highlighted by the DNPEE up to this point have been connected to low energy light bulbs, information campaigns and development of energy efficiency labelling standards. The analysis above does not reveal the degree to which the GEF sets the agenda for energy efficiency measures.

Is then external funding necessary for energy efficiency policy implementation? Many energy efficiency measures mean economic savings even without considering environmental externalities (see chapter 2). This constitutes a possibility for different kinds of internal financing mechanisms. Consequently external financing should not be necessary, especially as the costs of low energy efficiency today to a large extent are borne by the state, e.g. through energy subsidies and energy imports. If these state-borne costs for energy inefficiency can be reduced through energy efficiency measures, the resulting savings could be used to increase the financing of those public authorities implementing energy efficiency measures. This could provide a strong driver for the authorities in the implementation of energy efficiency measures. This financial mechanism has actually been initiated on a small scale for the energy efficiency programme for public buildings by name PROUREE, which was also established through Decree 140/2007 (Annex II). A public organisation receiving money for an energy efficiency investments in public buildings through PROUREE must invest the money saved by the measure in new energy efficiency equipment. The scheme is, however, still in its infancy (Contarino, personal communication, 2010-08-04). By carrying out measures that quickly pay off and reinvesting these savings in new energy efficiency projects with more long-term investment plans, a powerful mechanism for driving the energy efficiency policy could be provided. In the case of public buildings, the main expenditure is not the specific administrative costs for implementing the measures but the specific direct economic input for the investment *per se*. However, it seems reasonable to allocate some of the gains from the measures to the public administration responsible for the implementation as this could be considered as a part of the investment cost. The method of ear-marking money in this way can be questioned on the grounds of economic efficiency, i.e. investments should be made where profits are the largest and money should not be reserved for special areas. However, ear-marking is often necessary for ensuring funds for specific areas, especially within non-OECD countries such as Argentina. Furthermore, ear-marking can be justified as it might generate savings that would not take place otherwise. It is, however, important to bear in mind that this mechanism *per se* is not sufficient for incentivising energy efficiency measures, since

research shows that many potentially profitable projects are not carried out due to a number of other barriers, such as behavioural and informational impediments (Rogner et al., 2007).

Regardless of whether the financing takes place through an ear-marking mechanism or not, high interest rates provide a general hinder for investment in energy efficiency for the state as well as for private actors. The average money market interest rate in Argentina was 11% at the end of 2009 (EIU, 2009). In addition, energy efficiency measures are considered with skepsis in the financial market, producing even higher financing costs for these investments (World Bank, 2008a) which impede, not only implementation, but also the actual investment in energy efficiency measures. An increased knowledge within the financial sector regarding energy efficiency could partly improve this situation. This holds also for other actors such as the construction industry. In light of the limitations of the Argentine financial market, it is important to acknowledge the hinder that high initial costs and long payback periods constitute in order for some energy efficiency measures to be carried out. Here, external funders, such as the GEF, might still have a very important role to play.

Text box: Chile case

Just as Argentina, Chile, in recent years, has suffered from severe energy shortages, partly due to the cut of natural gas imports from Argentina. For a long time, Chile's energy efficiency policy fully relied on the "correct" pricing of energy. This would encourage cost-effective energy efficiency investments and maximise total welfare. However, since 2005, Chile has developed a more active energy efficiency policy with the following four key components:

1. Establishment of an institutional framework for energy efficiency policy
2. The building of a relevant knowledge base
3. The promotion of energy efficiency across all sectors
4. Provision of incentives for energy efficiency, especially in the electricity market

The National Energy Efficiency Programme (Programa País de Eficiencia Energética − PPEE) which was created by a decree in late 2005 is the main tool for government energy efficiency policies. The efforts were further strengthened since 2008, which is mirrored by increasing budget allocations. From 2005 to 2009, the annual budget allocation for PPEE was increased from USD 1 million (EUR 0.78 million) to USD 34 million (EUR 26.52 million, 0.21‰ of GDP). According to IEA, the strong political support for energy efficiency has been one of the factors enabling the new institution for energy efficiency. One of the key features of the PPEE is the involvement of private actors. The committee governing the work includes local actors, civil society and relevant state institutions (IEA, 2009). An example of the involvement of private actors is the development of economic instruments for the retrofit of residential buildings. In the initial phase, relevant public authorities such as the Ministerio de Vivienda and the Cámara Chilena de la Construcción take part in round table talks. Thereafter, these actors signs performance agreements based on the results of the talks. Finally, the project is further designed and implemented (Villena, Donoso and Kaschel, 2008).

The policy programme had residential energy use as one of its key components and in 2009 and, in addition to a light bulb exchange programme and other measures targeting the consumption of electric appliances, the programme has led to the establishment of minimum standards for roofs and for new homes, an insulation retrofit programme for existing residential building stock and an energy certification programme for residential buildings (IEA, 2009).

In its review of Chilean energy policies IEA (2009) stresses the need to develop institutions further to make energy policy even more effective. In addition to the introduction of a ministry of energy, Chile is planning the introduction of an energy efficiency agency (Agencía Chilena de Eficiencia Energética - ACHEE) (IEA, 2009) responsible for energy efficiency programme delivery and implementation. Responsibility for regulation, objective definition and policy design would belong to the ministry of energy (IEA, 2009). The agency will provide a platform where private and state actors meet to share knowledge and develop energy efficiency tools, inspired by public-private participation models in e.g. Germany and the U.K. (see Text box, Germany) With a majority of the board constituting of private actors, ensuring transparency and continuity (ECLAC et al., 2010).

Since the publication of the assessments reviewed above, Chile has created a ministry of energy but the agency for energy efficiency is still to be created (Ministerio de Energía 2010)

The next step for Chile is to develop a ten year action plan for energy efficiency, including prioritisations, objectives, programmes and funding mechanisms.

5.3 Evaluation results and the need for a strengthened policy network

The lack of a) control within public administration, b) a regulatory framework and c) administrative resources described above suggest that energy efficiency enjoys little priority at higher levels within Secretaría de Energía. An alternative explanation might be that barriers hinder this ambition to turn into political action. The empirical material underlying this thesis points to several reasons for political inactivity. For example, energy efficiency issues are not seen as urgent in comparison to many of the other needs of the country. Furthermore, the aforementioned history of energy abundance seems to have created a discourse within which solutions to energy insufficiency are mainly sought within energy supply. Moreover, when political driving forces are lacking, the need for a strong network including both private and political actors becomes important for the progression of policy measures.

One crucial aspect for developing such networks for policy implementation is transparency. Data gathered through the field work indicates that information to relevant stakeholders regarding those policy measures still on a planning stage is lacking. With improved transparency regarding these measures, the relevant stakeholders, including various private actors, potential financiers as well as various entities within political administration, both vertically, in terms of provinces and municipalities and horizontally, in terms of different ministries and secretaries, would have a chance to prepare and build capacity for policies to be implemented. For example, a measure such as the introduction of the minimum building standards recently introduced in the Province of Buenos Aires, will need a considerable amount of know-how within the construction industry in order to be effective. Moreover, increased transparency and communication of policies at a planning stage could potentially increase both consensus regarding goals and suitable policy design among the actors. In addition, the possibility of pooling resources could increase with increased transparency, since the actors in the policy network would gain more knowledge of implementation barriers. For example, it seems likely that actors within the construction industry could identify and administer parts of a subsidy scheme for energy efficiency investments. Another vital aspect of transparency relates to potentially increased implementation pressure owing to the fact that both potential business opportunities for private actors and welfare gains for households would become more visible. To sum up, increased transparency might strengthen the policy network, which in turn could diminish the administrative burden by fostering of consensus as well facilitating the pooling of resources for implementation. Moreover, the increased possibility to fine-tune, develop and improve policy measures could be counted among the potential benefits of increased transparency. In addition, the policy network itself can improve the communication and transparency of energy efficiency policy, in a positive feedback loop.

As energy efficiency policy is commonly reported to have high numbers of winners and few losers, (Geller and Attali, 2005) the conditions for strong policy networks can be perceived as being favourable in the investigated case, in particular when a medium- to long-term perspective is adopted. The construction industry, politicians, private actors and financiers all have a lot to gain from successfully implemented policy instruments for energy efficiency (see section 2.7). Potential losers may include actors within the field of energy supply. On the other hand, it should be highlighted that that, due to the underinvestment in energy infrastructure in Argentina, actors within the energy sector with an obligation to provide energy can also have an interest in increased energy efficiency. It is also possible that a few actors within the

construction industry, producing material with poor thermal qualities may initially experience a loss of market shares. Yet, the bulk of financial reallocation caused by investments in energy efficiency is likely to be in the direction from energy to construction. Therefore, actors' respective sales decreases within the construction industry are likely to be limited. All those actors likely to gain from improved policies for energy efficiency in buildings' environmental conditioning have, with sufficient information, an incentive to facilitate the implementation of such policies.

With respect to administrative burden of the policy design, private actors from the construction industry might have a good understanding of, and constructive ideas about, measures actually working in practice. It is also possible that financial institutions hold valuable knowledge regarding the investment behaviour of individuals in this aspect, even though the data collected suggests that this knowledge is not yet sufficient. Finally, provinces and municipalities have the key resource of jurisdiction, within many areas concerning the building sector.

In the case of the administrative burden of negotiation, a strong policy network with a high level of transparency can potentially lead to more consensus through gainful discussion and potential readjustment surrounding the advantages of increased energy efficiency as well as the suitable design of policy measures. Such a consensus can facilitate the negotiations in the policy implementation. For example, Compston (2009) describes how changes of perceived problems and solutions lead to changes in the range of preferred solutions. Transparency and open discussion regarding policy measures to be implemented may lead to a conversion of these perceptions and preferred solutions resulting in increased consensus. Furthermore, Hill and Hupe (2002) highlight the potential of interaction in policy networks to contribute to depoliticisation and reduction of conflicts. In particular, the depoliticisation appears to be of considerable importance in the Argentine case.

Nevertheless, the development of a policy network does also involve certain risks regarding the burden of negotiation. The increased involvement of various actors does not necessarily lead to more consensus. First, if consensus remains absent despite the development of a policy network, the administrative burden of negotiation can come to increase with the involvement of more actors. This supports the advice of policy network researchers to keep the number of participants of the network limited (see for example Compston, 2009). Second, considering the conservative nature of the construction industry, an increased degree of involvement by these actors may lead to weak policy measures which do not considerably alter the development from the business-as-usual scenario. Consequently, it is important that the members of the policy network have a sincere interest in the strengthening of public policies.

In addition to the administrative burdens of early stage implementation, such as policy design and formulation, which is part of the main focus of this thesis, the introduction of policy measures also lead to administrative burdens of more practical nature connected to later stages of implementation. Concerning these specific burdens, actors within the policy networks have, through their resource interdependency, an incentive to facilitate or assist the implementation of measures in order to breathe life into the markets of energy efficiency. However, in a network with many actors gaining from the same measures to be taken there is

also a risk for free-riding behaviour. This risk can be minimised through network stability and long term-orientation so that trust can be built up and exchanges made over a long time period. Improved communication which strengthens the policy network might also facilitate the burden of control, as these networks tend to be more transparent than political organisations. But a strong policy network also means that a range of actors are involved and financial flows may occur. This does provide additional challenges in terms of control.

The high involvement of non-political actors characterising strong policy networks, is an important way of strengthening the continuity of policies, something that was stressed in the field work by a number of actors as the missing link for the market for energy efficiency investments in the residential building stock to take off.

5.4 The role of policy expectations

Recalling DeLeon's (1999) previously mentioned definition of policy implementation, "[all that] happens between policy expectations and (perceived) policy results", attention is drawn to a relevant conceptual point of discussion. Although the definition above is not adopted in this thesis, it can be argued that the low degree of expectations of policy implementation renders PRONUREE unsuitable as object for a study. For instance, Hill and Hupe (2002) cautions scholars of implementation research to assess the implementation of policies which nobody seriously expected to be implemented. More specifically, the authors argue that such research should rather be labelled as policy rhetoric research than policy implementation research. Is this stance then a valid critique with regard this thesis' methodological and theoretical choices? Indeed, as presented in section 4.2.3, the comments from several interviewees indicate that expectations on policy implementation among private and NGO actors are very low.

Why is then implementation study still the chosen form of approach? The line of reasoning for justifying the approach chosen is as follows: certain expectations on the implementation of the thesis do actually prevail. The general lack of expectations on implementation is not specific for PRONUREE, but valid for a large share of the policies in Argentina. Yet, it is necessary to try to understand these policies, what they actually have achieved and why, in order for policy implementation to advance. Finally, the fact that objectives are not achieved, does not necessarily mean that implementation has failed. For example, with a bottom-up perspective on implementation, objective achievement is of less interest, whereas the functioning and outputs of the implementing organisation is still of interest. Consequently, expectations on policy implementation is an important variable when understanding policy implementation. The variable can function both as a condition and as a consequence of implementation. The arguments are elaborated below.

It is clear that some expectations of implementation of PRONUREE do prevail. The DNPEE are proceeding in their work with energy efficiency within the framework of the Decree 140/2007. Consequently, within this group, expectations of implementation do prevail. The expectations on implementation are considerably increased with the involvement of the GEF.

Still, the general expectations on policy implementation in Argentina are low. A frequently encountered comment about Argentine politics clearly mirroring the general lack of confidence in implementation is that "Argentina has great laws on paper, it is just that they are never implemented". However, it is possible that the lack of confidence in the implementation of the policies arises from the unawareness of the actual content of the policy programmes. As this thesis' analysis suggests, government policies are commonly seen as unpredictable, not even worth the effort of trying to understand and predict them, which is particularly evident in the case of PRONUREE. This may partly turn into a self-fulfilling prophecy, as phenomena which individuals may not have sufficiently engaged with, might easily appear unforecastable and obscure to these persons. Furthermore, low expectations regarding implementation creates a culture within which the pressure for implementation is low, which may be a result of the socio-political culture of Argentina. Therefore, it can be important not to let these low expectations hinder the closer investigation of the policy and its implementation as well as to include expectations on implementation as a relevant parameter for understanding policy implementation.

As mentioned, low expectations concerning PRONUREE's implementation are only partly supported by the empirical material gathered. Progress has actually been made, for example, concerning the light bulb programme, reflecting the public implementers' ambition to proceed with the programme. The possibility to contrast the parts of the programme that have, in fact, been carried out, to the parts of the programme that have not been implemented, provides good opportunities for understanding the drivers and barriers of implementation.

5.5 Validity

Having discussed central themes that spring from the empirical material underpinning this study, the following section sets out to discuss and elaborate important concerns surrounding the validity and prepositions of the arguments put forward here. Validity can be discussed in terms of internal and external validity, with internal validity denoting the extent to which the conclusions drawn about causal relationships reflect actual conditions. External validity, on the other hand, concerns the extent to which the results are generalisable beyond the specific research context (Bryman and Bell, 2003). Being most closely connected with quantitative research, the application of validity as a criterion of qualitative research has been highly disputed. The adoption of validity within qualitative research can be questioned on the grounds that this form of research often adopts an epistemology denying the existence of an objective reality. With such a research positioning, the investigation of the results proximity to reality becomes irrelevant. However, within the moderate social constructivist stance taken within this thesis, operating within the internal socially constructed world, it still seems appropriate to discuss the findings' validity within this very sphere (see Flick, 2006 for an alternative approach).

Regarding concerns of internal validity, some key aspects of the chosen methodology are turned to in order to address this. First, as argued in section 3.2, the development of a process model strengthens the validity as it reveals the causal linkages through which the results are delivered. For example, by spotting the relevant group of people working with the implementation and interviewing them about this work, it is possible to get a deeper, more well-grounded understanding of in which stage the implementation is. For instance concerns

about problems within the target group as the prime source of non-effectiveness can be excluded as the problem currently seems to appear in the early implementation stage.

Moreover, by turning to a number of data sources in order to investigate the same phenomenon, so called triangulation, a more representative picture of different interpretations of the research topic could be gained. A relevant example is the revealing of the functioning of the Commission of Support, Follow-up and Control. By a) understanding its role and composition, and thereafter b) fruitlessly trying to contact the various actors in the commission, as well as c) interviewing relevant non-members about the members and the functioning of the commission, it becomes clear that the impression of that this group does not function in practice is rather representative.

Turning to the second aspect here discussed, external validity, the research does not claim the same degree of validity. As highlighted by Hill and Hupe (2002), implementation research is a highly context dependent enterprise. Based on this characteristic of policy implementation, the study chose to focus on one sole case. Albeit justified, such a choice further limits the external validity of the research. Despite the previous, the thesis is believed to provide important value by contributing to the general panorama over challenges of policy implementation as well as by providing input to the potential areas of interest in similar studies. The elaboration of the case context provided in chapter 2, further contributes to the external value of the research. Basically, by illuminating the prerequisites against which the policy implementation takes place, the study provides a framework for interpretation of the results, similar to the one provided through the development of a process model.

External validity can here either concern the generalisation to other policy areas within the same geopolitical context (Argentina), or generalisation to other geopolitical contexts. With regard to the generalisation between policy areas, the specificities of the various implementing public authorities constitute an obstacle for generalisation of results. Still, the deeper understanding of the peculiarities of Argentine policy implementation presented here are believed to provide valuable guidance for research in other policy areas within the same country by contributing to the general understanding of the country context as well as providing inspiration of potential areas of interest in future research. If, on the contrary, considering the generalisability to other geopolitical contexts, the conditions can be expected to be even more case-specific. However, also here, the research can contribute to the general understanding of policy implementation through its contribution to the panorama of global understanding of policy implementation. In light of the pressing lack of research within the research topic investigated here, in particular within a non-OECD context, the contribution of the results within this regard seems even more important.

5.6 Summary

To sum up, the unrealistic nature of the model for policy implementation has led to that no goals for the policy implementation actually exist in practice, with the further policy implementation running the risk of coming to a halt. By introducing particular models for financing the work of implementing agencies, a potentially forceful mechanism for driving long-term energy efficiency policy can be created. Furthermore, the strengthening of the network of actors with a strong interest in ambitious energy efficiency policies, can potentially

facilitate and drive the policy implementation further. Within this context, the importance of expectations on policy implementation is highlighted in this chapter.

In a discussion of the validity of the findings, it is argued that the internal validity is strengthened by triangulation and the application of theory-based policy evaluation. However, due to the context specific nature of policy implementation, the environment in which the policy is to function needs to be considered carefully when translating the results to other examples.

6 Conclusions

This section returns to the objective of this research and address the research questions that were initially posed, including the elaboration of advice for the stakeholders within Argentine energy efficiency policy for buildings. Furthermore, implications for future policy evaluation within a non-OECD context are identified and avenues for future research suggested.

This thesis has been driven by the need to further the understanding of energy policy implementation in non-OECD countries. The objective of the research has been to evaluate the implementation of energy efficiency policies that target the environmental conditioning of the existing residential buildings in Argentina by assessing of relevant parts of the policy programme PRONUREE.

Through fieldwork, mainly in the form of in-depth interviews with a range of relevant actors within public administration, NGOs and private sector, in combination with investigation of a variety of literature sources, this research has shed light on several of the complexities of policy implementation in non-OECD countries in general and in Argentina in particular. The research revealed an energy security discourse in which solutions through energy supply constitute the main focus, whereas solutions through energy efficiency and demand management were overlooked. It turned out that a heavy burden of administration is put on the public authorities implementing the investigated policy programme of PRONUREE. For example, politically sensitive decisions have been left for the public authorities implementing the policy and jurisdictional limitations posed by e.g. the federal system are not sufficiently considered in the policy design. This has resulted in an implementation driven by the public implementers and characterised by limited structured long-term prioritisation, follow-up and enforcement. Furthermore, the discussion provided highlighted that the specific policy is not sufficiently transparent and therefore little known even by relevant stakeholders. Resulting in a perception of that policies for energy efficiency are not sufficiently predictable and continuous in order to develop a market for energy efficiency solutions for the building envelope. It was then argued that a higher degree of transparency can facilitate the pooling of resources and the consensus formation by enforcing the network of stakeholders involved in the policy implementation, thereby facilitate the implementation. Within this context, the discussion elaborated on the possibilities as well as risks connected with actively trying to develop strong policy networks. Moreover, the role of funding for energy efficiency policy implementation was investigated, revealing an important function played by external funding so far. The introduction of an internal financing mechanism was then put forward as a way of providing an impetus for, and ensuring financing of further development of energy efficiency policies. The findings will be further elaborated through the addressing of the initially posed research questions below.

What has been the output of the investigated policy propositions? It can be concluded that the output of the policy is rather limited. The implementation group within Secretaría de Energía, DNPEE, has not addressed any of the propositions under *2.9 – Existing residential building stock* explicitly. However, initiatives have been taken that could potentially support the implementation of the propositions, the most prominent being the initiation of a labelling scheme for the energy efficiency of the building envelope. This scheme could, for example, form a basis for soft

loans; alternatively it could be made mandatory through provincial and municipal regulation. Work currently in progress includes the development of a software tool to classify buildings according to this scheme. Next steps to be taken according to DNPEE include discussions with provincial actors regarding the possibilities to include mandatory labelling schemes. The PRONUREE has also been working indirectly through provincial adherence to the programme. For example, a subsidy scheme for investments in sustainable retrofitting in the Autonomous City of Buenos Aires that was approved referred to the provincial adherence of the programme. The programme is, however, not yet implemented due to uncertainties regarding the specific design. Consequently, none of the propositions within the investigated parts of the policy in 2.9 – Existing residential building stock has been delivered to the target audience. This stands in stark contrast to the light bulb exchange programme within PRONUREE which has resulted in the distribution of approximately 18 million low energy light bulbs, and the collection of 24 million incandescent bulbs (Secretaría se Energía, 2010).

How have public and private interests been pulled together within PRONUREE? The lack of transparency in the implementation process of PRONUREE appears to have limited the involvement of various actors in the programme. There are some initiatives to a dialogue regarding sustainable buildings, which can have important effects on future policies. But regarding the specific case of PRONUREE, the knowledge regarding its components that still are to be implemented appears to be very little. This seems to have contributed to the limited involvement of relevant stakeholders in the development of the policy tools, which potentially can contribute to waste of resources as well as limited possibilities for private actors to prepare for a market demand following a policy. In addition, the lack of expectations appears to have further impeded the policy implementation.

How has the availability of human and financial resources within public administration affected the implementation of PRONUREE? One of the major conclusions in this regard is that the character of Argentine policies in general and PRONUREE in particular lead to that public authorities meant to implement the policy are left with a very large administrative burden for which their resources are insufficient. A large part of this burden is of rather political nature and concerns the effort spent on negotiation, including, for example, finding actors willing to administer the measure or coordinate different levels of government. This form of administrative burden increases considerably in a federal system if not sufficient consideration is taken to the aspect of jurisdiction in the policy design. In this context, a well-functioning network of relevant actors characterised by trust and long-term cooperation can be important. According to Compston (2009) such networks tend to contribute to a depoliticisation of the policy area and a focus on effective solutions (Smith, 1993). This is particularly important in societies, like the Argentine, characterised by political polarisation that often impedes the effective implementation of policies.

Given the actual performance of the programme, what kind of business opportunities can be discerned for the construction sector? The research could not find any market opportunities created by the policy programme investigated so far. In addition, the research points to the importance of continuity and predictability of policy for the creation of market opportunities and the possibility to build up necessary capacity. So far, it appears as if market actors have not experienced this increase in continuity.

What can policy makers learn for future policy design and implementation within energy efficiency for residential buildings in Argentina?

The impediments for policy implementation were discussed in terms of a lacking policy network. It was argued that the sufficient pooling of resources and a consensus regarding the goals and means for energy efficiency were deficient due to the absence of a strong policy network with relevant stakeholders.

How can then the development of a strong policy network be supported? Many of the characteristics of the Argentine society do, indeed, provide obstacles for the establishment of strong policy networks. These aspects include the violent turns in the country's economy, the political nature of public authorities described above, the lack of integration between industry, academy and policy makers as well as the low degree of interpersonal trust within the Argentine society at large.

In a society where strong policy networks do not appear naturally, one way to facilitate the establishment of a such a network is through the creation of a formal organisation in which the relevant actors meet. The German energy agency and the proposed Chilean agency for energy efficiency constitute examples of such a formalised policy network, gathering private and public actors to facilitate implementation. In addition, a proposal of a similar agency exists as a law project in Argentina. This thesis argues that such an agency, gathering academic, various private actors and public administration at different levels and areas could potentially improve the chances of successful implementation. The idea of an energy efficiency agency was also brought up by one of the members of the DNPEE as a way of increasing jurisdiction and possibilities for implementation of the relevant measures.

Academia can also potentially play an important role in the strengthening of policy networks in Argentina through action research, with researchers working as bumblebees cross-fertilising different units within the network, catalyse the development and eventually help to build up and encourage self-standing mechanisms for policy development.

There are, however, also risks with the strong involvement of private actors. Several of these are brought up in the discussion above. The heavy influence of private actors might lead to that policies implemented do not divert considerably from business as usual market development that would have taken place without the policy. The crucial point then, for a policy network to be progressive and lead to actual change, is that there is a strong conviction on the advantages provided by the implementation of policy instruments implying a significant deviation from the business as usual scenario. Furthermore, the involvement of too many actors can lead to excessive time spent on negotiation and potentially paralyse organisations. This is supported by research on policy networks (Compston, 2009).

Game theoretical approaches have contributed a lot to the understanding of policy networks. According to this theoretical approach to studying interaction between actors, the policy network needs to gather a range of participants with a strong interest in the topic, and these need to interact frequently and with a long-term perspective to build trust and competence in order for the network to become strong. This too, is emphasised by empirical research on policy networks (Compston, 2009).

Other characteristics of successful policy networks according to Compston (2009) include the inclusion of one single government agency. The inclusion of a single government agency can *inter alia* facilitate accountability. Regarding the case currently investigated, it can however be argued that the inclusion of various government agencies, both vertically on different levels within the federal system and horizontally between various ministries and secretaries, should be included in order to increase the strength of the network. This would be important in order to address challenges posed by the federal system as well as to incorporate the various policy areas connected with energy efficiency, such as environment, trade and energy. Still, it is important to have one government agency ultimately responsible for the policy areas in order to address concerns of accountability and effectiveness.

The challenge with an agency as the one proposed here, is to ensure its long term functioning, despite changing political powers. For this to be happen, it is important that the private sector stands for a significant part of the representation in the agency. Within the Chilean agency described in a text box above, it is for example suggested that private sector shall stand for a majority of the members of the board. The agency could also involve academia to ensure that the valuable knowledge about energy efficiency that exists within the country is used in the policy making. Interviewees from academia expressed a frustration over that this was not happening today. Just as its German predecessor, an agency for energy efficiency could be involved in international cooperation. As this would increase the possible business opportunities, it could increase the attractiveness of cooperation for private actors.

The chosen form of financing of policy development also plays an important role for the progression of energy efficiency policies. A self-financing mechanism such as the one described in section 5.2 could provide a strong impetus for the development of energy efficiency policies, being either in the form of an agency or a continuation of the current administration.

When moving focus from the specific investigation to energy efficiency policy implementation in non-OECD countries in general, the research points to the importance of exploring the type of administrative burden faced by the public authorities implementing the the policy measures. The political aspects and connected burden of negotiation that was found to be prominent in Argentina is expected to be frequently encountered also in other non-OECD countries. In addition, the result of the thesis highlights the need of private and public actors to act together on a long-term basis in order to pool resources and create consensus and thereby contribute to the implementation of a set of policies characterised by continuity and predictability which is necessary to foster the market supply and demand that leads to improved energy efficiency. The thesis also argues for the application of financing mechanisms that can provide a driving force for further policy implementation.

Regarding the methodological contributions of the research performed, the thesis alleged the need for expanding the object of implementation studies also to those policies which have limited expectations of implementation. This theoretical advance underscores the importance of taking in expectations as a central parameter of policy implementation rendering expectations management as a central tool in policy implementation. In connection to this, the research highlights the need of taking business actors and their drivers into consideration when assessing public policies. The business actors' resources and expertise are crucial

throughout the policy development and their involvement becomes particularly important as a means of giving continuity to policies in a politically disruptive environment.

The research has also revealed several avenues for future research. The limited interest within social scientists to investigate topics related to policy for energy and sustainable construction in Argentina early became evident and a general development of this research area, shedding light on, *inter alia,* market actors and conditions, the viability of policy options and the cultural aspects connected to energy efficiency is needed. More specifically, the further investigation of inter-organisational relationships within the governmental authorities working with energy efficiency in non-OECD countries can provide important insights into the challenges of energy efficiency policy implementation. Concerning challenges posed by cultural aspects, such as the sole focus on supply as solutions to energy scarcity, these could beneficially be addressed drawing on the concept of expectation management put forward above. Finally, the development of action research as a way of understanding, but also driving energy efficiency policy development in country specific contexts could provide important new insights regarding the functioning of the various stakeholders within energy efficiency.

With the above, I hope to have provided valuable stimuli for the audiences of this thesis as well as inspiration for future research.

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