

Master's Thesis in Strategic Leadership towards
Sustainability (SL2403)

A Facilitating Platform for Energy & Climate Change Programs – a Case within Municipalities in Southeast Sweden

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Abstract: Focus on municipal level planning has increased in the recent years. Municipal governments are primarily responsible for such planning and they do have the biggest responsibility of driving the entire municipality towards sustainability. In this research project we provide a study on some of the gaps and challenges in the current procedures faced by a few municipalities within Southeast Sweden with respect to Energy and climate change planning and implementation. It was observed that the current engagement practices, communication, and alignment of goals could potentially hinder the municipality from achieving the overall goals of sustainability. Furthermore, a complementing facilitating platform was suggested that would give municipal governments an opportunity to intervene and address some of these gaps and challenges to establish structure and control on activities, towards a sustainable municipality.

Keywords: municipality, energy, climate change, policy, gaps, challenges, strategy

Statement of Contribution

This thesis was the result of our interests and emergent opportunities, the topic emerged from the research team's strong shared interest in discovering newer approaches for municipalities working on Energy and climate change issues. Each member of the team played a key role in the investigation and discussion during the research design phase. Research methods were then carried out in the forms of literature review, interviews, and feedback sessions.

Rajeev initiated the relationship with Karlskrona Municipality's Energy planning department, and the team organized meetings over the course of four months, focusing on capturing the current planning and implementation processes and challenges at Karlskrona municipality's. Yuan focussed on the literature review, data capture and consolidation. Evelyne focused on literature review, coordinating interviews with stakeholders and feedback collection.

All members participated in preparation of the written report and presentations. Rajeev played the facilitating role on the written report by distributing tasks and compiling the results to help professionalize the flow of the completed document. Yuan helped the work of reviewing, modifying paper and arranging references.

Karlskrona, June 15, 2011

Rajeev Akireddy

Yuan Zhi

Evelyne Lyatuu

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Karlskrona, June 15, 2011

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Executive Summary

Introduction

Access to energy is central to sustainable development. In the present world, finite sources of energy are used to produce electricity and are also used for transportation purposes. In the process emit greenhouse gases, causing air and water pollution, producing waste and raising risks like storage of radioactive waste, global warming, rise in sea levels, widespread flooding, droughts and the spread of tropical diseases which are already having a devastating impact. These effects are leading to increase in the costs for resources, higher taxes and tougher legislation. The predicted outlook until 2035 depends primarily on various government policies and actions that are taken now in terms of reduction in energy consumption, consumer behavior, promotion of renewable energy options and promotion of public transportation making policy as a means to achieve sustainability.

Local authorities like municipalities play an important role in the achievements of the EU's energy and climate change goals as climate impacts are manifested locally and local governments as "neighborhood authorities" for people, companies and organizations are better positioned to address them. Since challenges presented in municipalities are complex, a generic five level strategic planning framework can be used to simplify, categorize and build a mental model. When this framework is applied for Strategic Sustainable Development it is referred as the Framework for Strategic Sustainable Development (FSSD). Planning and transitioning towards a sustainable society requires significant efforts and success can be defined in terms of basic principles which are necessary, sufficient, concrete and scientifically agreed upon, they are:

In a sustainable society, nature is not subject to systematically increasing ...:

1. ...concentrations of substances extracted from the Earth's crust;
2. ...concentrations of substances produced by society;
3. ...degradation by physical means;
and, in that society...
4. ...people are not subject to conditions that systematically undermine their capacity to meet their needs.

FSSD based planning for energy and climate change programs in municipalities:

1. The *Systems* level identifies the systems being studied for planning. In this case it is the local government and its policies and actions that are a primary contributor to the way the energy demands will be addressed in the future. It is very important for municipalities to foresee the implications of its actions and hence take an integrated (socio-ecological and economic) view towards energy and climate change program involving all its stakeholders.
2. The *Success* level identifies the overall goals that need to be achieved in order for the planning process to be successful within the constraints of the four sustainability principles.
3. At the *Strategic* level, backcasting from the vision of success is applied to enable municipality's decision-makers in a step-by step approach to reach success, and then the strategic guidelines are used to choose concrete actions.
4. High level *actions* are identified for stakeholders who are the primary implementers.
5. *Tools* are used to monitor and report actions.

The municipality is responsible for creating the local Policy¹, the responsibility for implementation of policy measures lies with the local stakeholders². There have been some gaps and challenges in the current implementation and this thesis explored some of them in a few municipalities within Southeast Sweden and proposed strategies that could possibly fulfil them.

Research Questions

1. *What are the current planning and implementation procedures at Karlskrona municipality that aids in realizing its energy and climate change program goals?*
2. *From a Strategic Sustainable Development perspective, what are some gaps and challenges in Karlskrona municipality's current planning and implementation procedures that are preventing them from reaching their energy and climate change program goals?*
3. *What are some possible strategies to address the above gaps and challenges in current procedures?*

¹ Policy is a high-level plan with general goals and acceptable procedures especially of a governmental body

² Stakeholder is defined as one who is involved in or affected by a course of action

Methods

Literature review, interviews and content analysis are the research methods used in this thesis. The research was divided in six stages, which consisted of Initiation, Identification, Analysis, Concept Development, Validate and Recommendation.

- In the *Initiation* stage, information was gathered from the journals, articles of the EU Commission Energy department, Swedish municipalities, EU Policies, Guidebooks, Case studies and from other theses works.
- In the *Identification* stage, interviewed the energy and climate change coordinator at Karlskrona municipality on their current energy and climate change planning and implementation process and created a process map. A few Target and Other Group companies were also interviewed for identification of gaps and challenges.
- In the *Analysis* stage, the current reality was summarized, and analyzed for common threads in the interview responses and to draw up a list of requirements to close the gaps and challenges.
- In the *Concept Development* stage, the authors explored literature to identify a few strategies which could be used to fulfill the above requirements.
- In the *Validation stage*, the authors sought feedback on the requirements and possible strengths, limitations and improvements on the strategies. The thesis group also visited a few other municipalities in Southeast Sweden to seek their current energy and climate change planning, implementation procedures, their feedback on similarities in the gaps, challenges and the requirements to close the gaps, the possible strengths, limitations and possible improvements that can made to the strategies.
- *A recommendation is made* with the final set of requirements to close the gaps along with some identified strategies that could fulfil the above requirements.

Results:

An ABCD based process map was created out of Karlskrona municipality's strategic planning process and some of the key findings were that Target Group companies owned the responsibility for implementation in the current process while the Other Group of companies were not involved. Other findings that were in common to all the stakeholders were:

- lack of access to information and awareness on sustainability challenges within the municipality,
- lack of information exchange between the municipality and its stakeholders,
- lack of consideration for stakeholders' preferences in the Policy planning and implementation,
- lack of cooperation amongst stakeholders and, finally
- A weak enforcement of the policy on the municipality's behalf.

Analysis was carried out along with the Karlskrona municipality and the above results were validated within a few municipalities in Southeast Sweden and similarities in the process, gaps and challenges were drawn and strengths, weaknesses of the strategies were identified. It was observed that most of the municipalities lacked the internal capability to support and manage the level of engagement in the post-planning and implementation phases of the energy and climate change policy, hence a complementing platform was proposed to bridge the gaps with appropriate strategies.

Conclusion

Municipalities as the "neighbourhood authorities" for people, companies and organisations play an important role in implementing sustainable development (UNCSD 2011). The thesis provides an understanding of the current procedures at Karlskrona municipality and led to the creation of a process map of energy and climate change program in a municipality along with the current situation of the energy and climate change program along with gaps and challenges that were preventing them from reaching their energy and climate change goals.

The gaps and challenges were validated from a stakeholder's perspective and also similarities were found in other municipalities as well. Some strategies were identified to fulfil the above requirements by the inclusion of stakeholders from the Other Group:

- closing the gaps in communication and feedback, creating an alignment with stakeholder's interests and motivation with the municipality's goals;
- monitoring the progress and deviations using the "Lens of Sustainability";
- Providing an opportunity for all stakeholders groups to collaborate and cooperate within the municipality to share resources, knowledge and expertise.

The platform possibly bridges the gaps in the current procedures thus decreasing the overall complexity and delays caused in moving towards sustainability. It also provides an opportunity to re-prioritize actions and learning's for the future planning and implementation.

Glossary

Adaptation is concerned with the impacts of a changing climate on society, the economy and the environment, and promotes activities to reduce vulnerability to extreme weather events and other longer term changes in our climate (West Sussex County Council 2006).

Backcasting: Making plan from “success vision” by starting with the desired outcome in mind and determining the steps required to achieve the outcome.

Carbon Capture and Storage (CCS): An approach to mitigate global warming by capturing carbon dioxide from large point sources such as fossil fuel plants and storing it instead of releasing it into the atmosphere

Challenge: A stimulating task or problem (Merriam-Webster 2011)

EU Covenant of Mayors: It is the mainstream European movement involving local and regional authorities, voluntarily committing to increase energy efficiency and use of renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO₂ reduction objective by 2020 (European Commission 2008).

“Freedom of information”: That is, the freedom to procure and receive information and otherwise acquaint oneself with the utterances of others (Sveriges Riksdag 2010) mandates access to information.

Gap: An incomplete or deficient area (Merriam-Webster 2011).

Greenhouse gases (GHG): Gasses in the atmosphere which reduce the loss of heat into space and are believed to be the key problems for current global temperature increases. Carbon dioxide (CO₂) methane (CH₄) and nitrous oxide (N₂O) are major GHGs.

Greenhouse Gas Effect: It is a process by which radiative energy leaving the Earth's surface is absorbed by some atmospheric gases (E.g. CO₂, CH₄ etc.) called greenhouse gases. They transfer this energy to other components of the atmosphere, and it is re-radiated in all directions, including back down towards to the surface, increasing the temperature than it would be if direct heating by solar radiation were the only warming mechanism (Solomon et al. 2007, 5).

Local Governments for Sustainability (ICLEI): An international association of local governments and national and regional local government organizations that have made a commitment to sustainable development. It provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level using Local Agenda 21 as a framework for good governance and advancing sustainable development.

Local Agenda 21: A local-government-led, community-wide, and participatory effort to establish a comprehensive action strategy for environmental protection, economic prosperity and community well-being in the local jurisdiction or area. It requires the integration of planning and action across economic, social and environmental spheres. Key elements are full community participation, assessment of current conditions, target setting for achieving specific goals, monitoring and reporting.

Mitigation is concerned with the causes of global warming and calls for the reduction of greenhouse gas emissions (West Sussex County Council 2006).

Platform: A declaration of principles upon which a person or a party proposed to stand (Merriam-Webster 2011).

Policy: a high-level plan with general goals and acceptable procedures especially of a governmental body (Merriam-Webster 2011).

Renewable energy: Energy generated from perpetual sources

Stakeholder: Defined as one who is involved in or affected by a course of action (Merriam-Webster 2011).

Sustainable Energy Action Plan (SEAP): These plans will validate European energy policies and add value to the many individual local demonstration projects in these cities. The plans focus on the long term transformation of the energy systems within these cities, including measurable targets on energy use and the share of energy from renewable resources.

The municipalities of Sweden: The local government entities of Sweden. The municipal governments are responsible for large portion of local services like schools, emergency services and city planning.

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1 Introduction

1.1 Energy & Climate Change

Access to energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development social, economic and environmental including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues (United Nations Development Programme 2009).

Energy sources are classified as either finite or perpetual resources. Finite resources are fossil fuels like coal, crude oil, oil shale, natural bitumen & extra-heavy oil, natural gas and metallic elements like uranium, thorium. Peat to some extent is intermediate in nature, with both finite and perpetual elements in its make-up. Resources like solar energy, wind power, bio energy, geothermal heat, tidal energy, wave power and ocean thermal energy conversion are perpetual resources which are much cleaner, available everywhere and do not run out. In the present world, the finite sources of energy are used to produce electricity and heat; used for transportation purposes. In the process emits Greenhouse Gases (GHGs), produce waste (such as radioactive waste) and cause air/water pollution (World Energy Council 2011).

It is observed globally that energy from finite resources is a major contributor to GHG emissions (about 61% of the total GHG emissions), of which 40% is from electricity and heat generation, another 20% from transportation and the remaining from buildings and Industry. Other sources of GHG emissions are from, land-use change (includes deforestation, reforestation (replanting in existing forested areas) and afforestation (creating new forested areas) (World Energy Council 2011). The increasing concentration of GHG emissions in the atmosphere causes “greenhouse gas effect”, which results in some of the devastating effects like: rise in average global temperatures at the Earth’s surface also known as “global warming” wherein the global average temperatures increased by 0.76 degrees Celsius since the 1850-1899 period (which marks the beginning of instrumental temperature records); rise in sea levels by 3.8mm/year approximately per year from 1993 – 2003 (Solomon et al.

2007, 5); widespread flooding and droughts in few places and the spread of tropical diseases (Friends of the Earth 2008).

Advancements in technology like CCS (Carbon Capture & Storage) show a good prospect of reducing some risks of GHGs but increasing risks from storage of radioactive waste, climate change and loss in biodiversity are causing changes beyond the threshold limits of our biosphere. In the recent years there has been a high growth in the use of renewable energy sources but it will take a lot of time before renewable can meet our increased energy demands. Hence, for future energy needs, the focus should be on improving efficiencies (International Energy Agency 2011).

“Fossil fuels currently account for about 80% of primary energy demand and this figure is expected to remain largely the same through to 2030” (World Energy Council 2011). Despite the global economic crisis and effects of higher oil prices over the past years, world primary energy demand has been growing and it is expected to continue its growth for decades to come. The World Energy Outlook estimates that the primary energy demand will see an increase by 36% during the period 2008 - 2035 which is 12,300 Million Tonnes of Oil Equivalent (Mtoe) to over 16,700 Mtoe. The increase in demand is estimated to be slow in EU/OECD ((Organization for Economic Co-operation & Development) countries while Non-OECD countries will account for 93% of the projected growth (mainly China and India will account for 22% and 18% respectively). Total energy capacity additions will be about 5900 Giga Watts over the period 2009-2035 and more than 40% of this capacity is expected to be added by 2020 (International Energy Agency 2011).

About 40% of global energy and 90% of transport fuel needs are met with Oil which is on a course of decline within about a decade beginning from the year 2010. The constraints in supply will tend to curb demand in various ways and one possible outcome will be rise in prices ending the historic pattern of economic growth leading to recessions, international tensions, and growing conflicts for access to critical oil supplies. Those countries that do plan and prepare will clearly have great advantage over those that simply react to the crisis when it hits them (Campbell 2002).

“The environmental implications of the continued global energy system’s dependence on fossil fuels call for urgent action across the world. Climate change is a global concern and should be treated as such” (World Energy

Council 2011). “It is the poorest of the people, living in countries that are least responsible for GHG emissions are set to suffer the most. Future generations may well puzzle why we knew about the problem but still didn’t take steps to tackle it” (Friend of the Earth 2008).

There is no general shortage of energy resources when all the sources are considered, for decades to come but it is how we are using these resources that have to change to ensure sustainable energy future (World Energy Council 2011). Reduction in the usage of the finite resources and increase in the usage of perpetual resources are important, hence energy policies promoting the above measures have significant implications on the climate change and are a means to achieve sustainability. A step towards this vision is undertaken in the UN conference on Climate Change held in Dec 2009, Copenhagen on Sustainable Energy Systems where major developed and developing countries had set a non-binding objective of limiting the increase in Global temperature to 2 Degrees Celsius above the pre-industrial levels and cutting the global emissions by at least 50% by 2050 (International Energy Agency 2011).

1.2 Illustrating the Risks and Sustainable development

In our current un-sustainable society, people are gradually deprived of their ability to meet their own needs and the overall resources base is on a decline. The Brundtland Commission defines sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. The field of sustainable development can be conceptually broken into three constituent parts: environmental sustainability, economic sustainability and social sustainability (Brundtland Commission 1987, 43).

Extraction and use of fossil fuels for energy, GHG emissions and risks with nuclear waste storage are causing a serious threat to the climate and as such can be considered systematic design flaws in our society. Using a Funnel metaphor, we can visualise ourselves as moving into a funnel (through time) where the inevitable consequences of climate change and other

sustainability problems as a result of the degradation of the socio-ecological system and the declining capacity to support human civilization is depicted by the closing walls of the funnel. The effects of increase in the costs for resources, rise in taxes, tougher legislations are depicted by the “hitting the walls of the funnel” thus making it more difficult in reaching sustainability (Robèrt 2000).

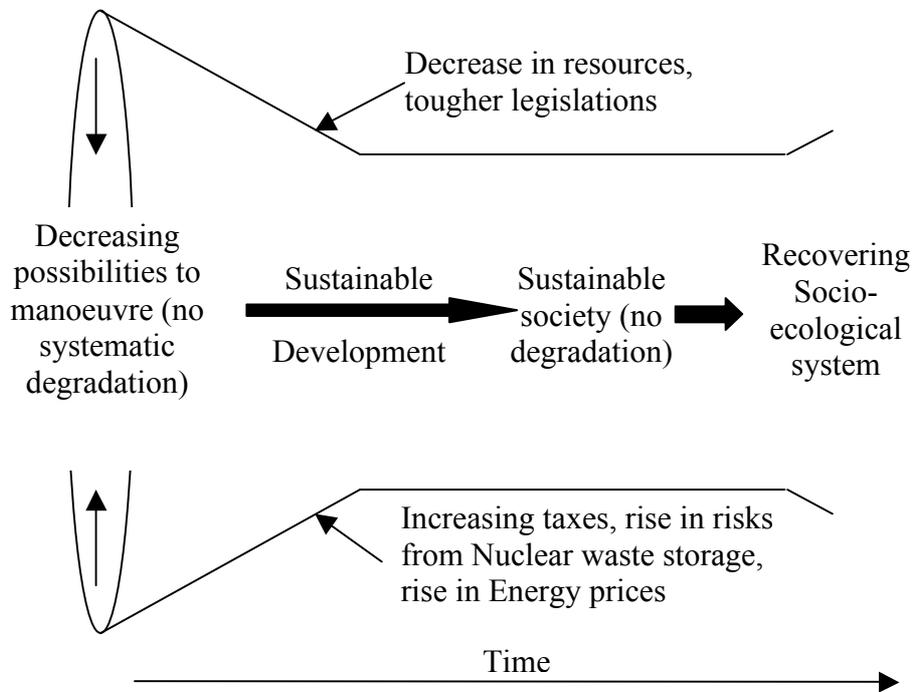


Figure 1.1 Sustainable development illustration with the funnel metaphor

Source: adapted from (Robèrt 2000).

1.3 Policy as a means to achieve sustainability

To avoid impacts of the closing walls of the “funnel” as illustrated above, a strong commitment to implement change is needed and policies are the means to achieve that at a government level. The world energy outlook to 2035 depends critically on government policy action, and how that action affects technology, the price of energy services and end-user behaviour. The actions primarily affect programs that involve (International Energy Agency 2011):

- Innovations in technology and improvement in the energy efficiencies in the energy value chain (i.e. Generation-Transmission- Distribution- Consumer) which include:
 - Decrease in the power rating of electrical appliances
 - Decrease in transportation involved in the generation of electricity
 - Improvements in buildings and urban living standards
 - Micro grids helping decentralization of power production
 - Transmission technology – high voltage grids
- Promotion of carbon capture & sequestration (CCS)
For example, “IPCC found that CCS could contribute up to 55% of the cumulative mitigation effort by 2100 while reducing the costs of stabilisation to society by 30% or more” (World Energy Council 2011).
- Promotion of renewable energy options
- Promotion of electric vehicles and fleet electrification infrastructure
- Pricing of energy services, because the price consumers are currently paying are for the most expensive KWh of electricity generated and the removal of subsidies on fossil-fuel based energy consumption
- The consumer's behaviour/consumption patterns and human needs satisfaction

The European Union (EU) is leading the global fight against climate change, and has made it its top priority. The EU adopted an integrated energy and climate change policy in December 2008, including targets set to below 1990 levels by the year 2020, known as the "20-20-20" targets and has created a first action plan for a period of 6 years (i.e. 2007-2012) (European Commission 2011). The EU hopes to cut greenhouse gases by 20% (30% if international agreement is reached); reduce energy

consumption by 20% through increased energy efficiency; Meet 20% of energy needs from renewable sources (European Commission 2007).

Phases of a Policy

An ideal policy cycle comprises of the following phases:

Formulation → Implementation → Monitoring & Evaluation

- Strategic planning takes place in the formulation phase and the outcome of this process is a Policy document with list of instruments/measures
- In the implementation phase, the identified measures are implemented under various programs, timelines, implementing authority are identified and budget is allocated
- Post implementation, every policy instrument or programme is monitored and evaluated, leading to reformulation or even an abolishment of the instrument (ECOFYS 2006).

1.4 Local governments' importance in Policy making

Local authorities like municipalities play a key role in the achievement of the EU's energy and climate objectives (European Commission 2010), further research has identified that it is important to focus on municipal-level planning amidst a changing climate for three reasons: "firstly climate change impacts are manifested locally, affecting all systems (socio, ecological and economic systems); secondly, vulnerability to the affects of climate change and capacities to adapt to changing climate are determined by the local conditions; and lastly, effects of adaptation activities are observed at the local level and it is also easy to tailor actions accordingly"(Gellera et al. 2006).

Global warming presents great challenges to local planners, particularly the need to integrate the responses on climate across all planning domains. One way is for planners and decision-makers to perceive climate change as an additional source of stress on both socio-ecological systems while others sources of stress being poverty, public health, economic and infrastructural development, population growth and housing (Roy, 2009).

1.5 Context for Municipalities in Sweden

Sweden is divided into 290 municipalities (local authorities) within 18 counties and two regions. Sustainable development was adopted as an overall objective for public affairs and included in the Swedish constitution in the year 2003; it required that all political decisions consider long term economic, social and environmental effects (UNCSD 2011).

As per Swedish legislation all municipalities and county councils are obliged to carry out activities decided by central government through special regulations and these regulated activities consumed most of their resources” (Knutsson et al. 2008). However, autonomy has been given to the local government (i.e. municipality) as specified in the Municipal Act (Kommunallagen) where in the municipalities and county councils has a large degree of freedom to organise themselves and their activities (Knutsson et al. 2008).

Municipalities can pursue independent initiatives like:

- Expanding renewable and efficient energy production,
- Promoting energy efficiency and conservation,
- Orienting spatial planning and urban development to climate change mitigation and adaption,
- Stipulating clear energy, environmental and climate requirements in public procurement,
- Focusing on a dialogue with citizens and greater civic participation.

A SALAR (*Swedish Association of Local Authorities and Regions*) survey of Sweden’s municipalities, county councils and regions in 2007 showed that multi-sector action plans for reducing emissions were in place in 52% of municipalities and in the pipeline in another 28%. 98% of Mayors and Presidents/ Chairpersons of the County Council and Regional Executive Boards were prepared to increase efforts and initiatives (SALAR 2006). Some benefits for municipalities working on Energy and climate change programs are:

- Contribution to the global fight against climate change, global decrease of greenhouse gases will also protect the people living in the municipality against climate change;

- Demonstration of a commitment to protect environment and the efficient management of resources
- Transition to a sustainable energy system that provides a low negative impact on health, environment and climate
- Participation of civil society, improvement of local democracy and improvement in the municipality's image as an attractive destination for people and business
- Security of future financial resources through energy savings and local energy production and security of energy supplies
- Improvement in the municipality's position to implement national and/or EU Policies and legislation (European Commission 2010).

The overall sustainability challenge presented above needs a focused, strategic transition towards a sustainable society and without a strategic planning process municipalities can run into problems. A municipality that uses a shared planning process based on the right techniques and basic principles of success is bound to be successful in moving towards sustainability.

1.6 Introduction to Framework for Strategic Sustainable Development

A scientific consensus process has led to the formulation of criteria for success principles for strategic sustainability planning (Holmberg and Robert 2000, Ny et al., 2006). These criteria say that planning for sustainability requires basic principles that are:

- based on a scientifically agreed-upon view of the world;
- necessary to achieve sustainability;
- sufficient to achieve sustainability;
- concrete enough to guide actions and serve as directional aids in problem-solving; and
- Non overlapping or mutually-exclusive to enable comprehension and analysis.

Four Sustainability Principles were derived that fulfilled the above criteria (Holmberg and Robert, 2000; Ny et al., 2006) in order to preserve the socio-ecological system. They are:

In a sustainable society, nature is not subject to systematically increasing ...:

1. ...concentrations of substances extracted from the Earth's crust;
2. ...concentrations of substances produced by society;
3. ...degradation by physical means;
and, in that society...
4. ...people are not subject to conditions that systematically undermine their capacity to meet their needs.

When planning for sustainability, a conceptual framework known as the Five Level Framework can be used to simplify and categorize a complex issue and build a mental model of the overall picture.

The Five Level Framework focuses on:

1. the **system** that the planning takes place in;
2. the definition of **success** identifying the goals that need to be achieved if the planning process has to be successful;
3. The **strategic** guidelines that will be used to choose concrete actions as part of an overall strategic plan to accomplish the above set goals. The concept of backcasting can be used as a strategic planning technique for Sustainability challenges (Holmberg and Robèrt, 2000, 294). When Backcasting, planners start by building a vision of success in the future and then ask, "What do we need to do today to reach this vision?"(Dreborg 1996, 813). This provided them with a sense of direction while taking into account the current trends and helps avoid dead ends.
4. **Actions** are identified to reach success in line with the strategic guidelines
5. **Tools** are strategically chosen to plan, monitor, and report the actions taken.

1.6.1 The ABCD tool

The ABCD tool was developed to guide and implement the strategic planning process derived from the FSSD (Ny et al. 2006, 65). It is composed of the following four steps.

The A step: Awareness, provides an understanding of the system; its vision, constraints, its working and the need for sustainability.

The B step: Baseline includes conducting a baseline assessment of the current reality through the lens of the four sustainability principles. From a Sustainability perspective, all the current flows within the system along with the strengths and weaknesses are analyzed and gaps identified.

The C step: Brainstorming Actions, involves brainstorming a list of possible actions that'll help close the gap and more towards the vision.

The D step: Prioritization, The lists of actions identified in the C step is prioritised using the three prioritization questions:

- Does this action lead in the right direction?
- Does the action serve as a flexible platform for further improvements?
- Does this action provide sufficient return on investment?

1.6.2 FSSD based Energy and climate change planning in municipalities

Planning and transitioning towards a sustainability society requires significant efforts that will lead to reductions in the energy consumption, and increased clean and safe energy sources (primarily from renewable sources).

A previous MSLS thesis entitled “Enhancing Planning for local energy systems with the strategic sustainable development framework” was written to analyze global, EU and Swedish Energy objectives, as well as the results of a survey of beacon European cities to form strategic planning guidelines for authorities moving towards sustainable local energy systems. In the thesis a local energy system is referred to the supply, distribution and use of energy within a municipality and sustainability is defined as full compliance with the four sustainability principles. The authors advocated using a Strategic Sustainable Development framework (i.e. FSSD) that is based on backcasting from principles of sustainability and had concluded that the FSSD structure informs strategic and critical decision points for planning of local energy systems within a municipality.

(Cassidy et al. 2007)

Basing on the above study, FSSD can be applied for a municipality working on its energy and climate change policy in the following way so as to build an overall mental model for Strategic Sustainable Development:

Systems

At the systems level, gaining an understanding of the energy and climate change aspects at a municipality level is needed to inform the overall goal. The biosphere’s limits are acknowledged and considered while framing the policy measures. Interrelationship in the energy sector such as electricity from fossil fuels, oil for transportation and purposes are considered (Cassidy et al. 2007). Integrated view (socio-ecological and economic) aids thinking upstream that’ll help address the local and global challenges from a System’s perspective (Whistler 2004). An overview of the sustainability challenges within the municipality, values, vision and interactions with society and biosphere are identified.

Since local government policies and actions are a primary contributor to the way the energy demands will be addressed in the future, it is very important for a municipality to foresee the implications of its actions and hence involve all possible stakeholders in the municipality's visioning process.

The following governance structure and the hierarchy of energy and climate change policy targets are to be respected at the municipality's level, while they are free to add more targets or goals at the municipality's vision level (Knutsson et al. 2008).

EU Targets

→ Swedish National Targets

→ Regional Targets

→ Overall Targets and Objectives for Municipality

Success

Success is the overall goal that needs to be achieved in order for the planning process to be successful. In the context of sustainability, success is stopping the unsustainable actions that are currently threatening the social-ecological system. The current EU and Swedish National Energy and climate policies (with set targets and objectives) lack a full sustainability perspective, while the focus is on incremental, optimisation goals which may lead to the exclusion of gaining more ambitious and long term measures (Cassidy, et al. 2007). For example, targets set for a sectoral issue like achievement of reduction in 50% GHGs by year 2015 are not indicative of a sustainable society while it can be taken up as a small step towards the long term vision of sustainability.

For a municipality moving towards sustainability, the success criteria can be defined as:

- No contributions to the violations of sustainability principles
- Energy and climate change targets achievements for the municipality as an organization & geographical area

Some examples showcasing implications of sustainability principles on Energy and climate change Policy is presented below. The municipality;

- Contributes to violations of SP1, if the policy promotes electricity generation from Non-renewable sources

- Contributes to violations of SP2, if the policy promotes an activity which leads to the emission of GHGs, storage of Nuclear Waste etc.
- Contributes to violations of SP3, if the policy promotes clearing forests for fuel etc.
- Contributes to violations of SP4 if the municipality,
 - does not provide access to information to the stakeholders (public) during the formulation, post formulation and implementation phases (refer to section 1.3)
 - does not involve stakeholders in the decision making process during the formulation and implementation phases
 - does not consider the preferences of the stakeholders (public) during the formulation and implementation phases

Strategic

Backcasting from the vision within the constraints of four sustainability principles can be applied using the ABCD tool to enable municipality's decisions-makers in a step-by-step plan to reach success.

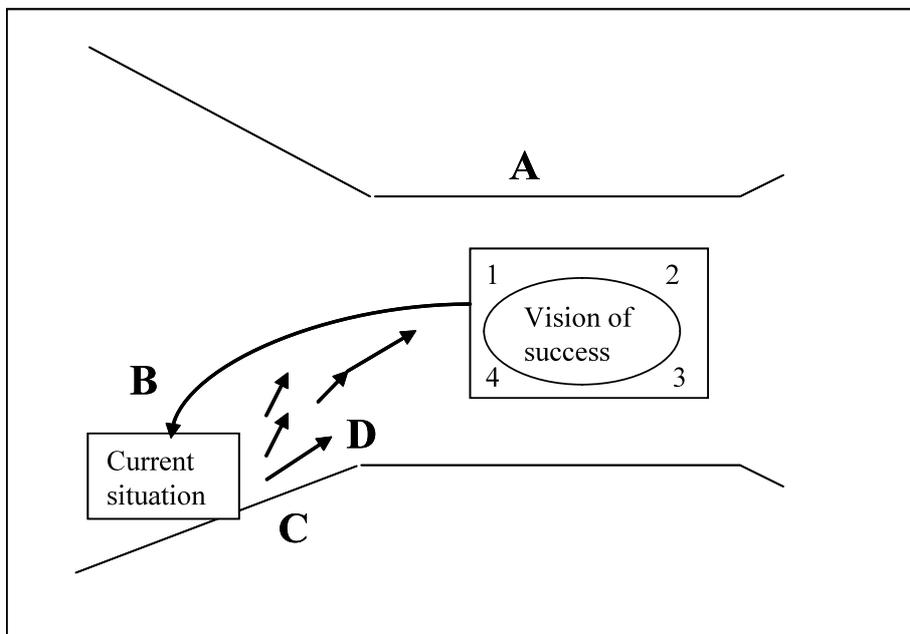


Figure 1.2 The ABCD backcasting methodology
Source: adapted from (Ny et al. 2006, 65)

In the A step, municipality's energy and climate change vision is established within the constraints of the four sustainability principles along with specific goals like investment in renewable energy sources, energy efficiency and expansion of district heating system are established. Core values within the vision such as transparency, honesty, and participation are created.

In the B step, applying the backcasting technique, a baseline assessment of the municipality's current energy and climate change risks is carried on through the lens of the four sustainability principles. From a sustainability perspective, the current flows within the system along with the strengths, weaknesses, opportunities and threats are analyzed.

In the C step, a list of possible actions are identified that'll help eliminate contributions to the un-sustainability and move towards the vision.

In the D step, the following strategic guidelines are used to choose concrete actions from the above list of actions to accomplish the overall municipality's goals:

- Does this action lead in the right direction (i.e. towards sustainability)?
- Does this action serve as a flexible platform for further improvements?
- Does this action provide sufficient return on investment?

At the **Actions level**, an implementation plan is created with the identified actions along with the responsibility, timelines and indicators.

At the **Tools level**, progress monitoring tools are strategically chosen to plan, monitor, and report the actions taken and ensure that the municipality is moving towards sustainability. For example, tools like ecoBUDGET can be used to plan, monitor and report the consumption of natural resources within the municipal territory to the public (ICLEI 2007) showcasing the efforts put in by the municipality.

1.7 Research scope

The EU has taken a leadership role in the global fight against climate change and energy security, they adopted an integrated Energy and climate change policy. The results were observed (from the first action plan period 2007 -2012) and reported to be discouraging. “For European energy policy to be effective, it is not sufficient that a legislative framework is in place; it must also be implemented. The current state of implementation of European energy legislation is overall poor” (European Commission 2011).

Literature from the United Nations Conference on Sustainable Development (UNCSD) synthesis report demonstrates that possible barriers like lack of data, weak enforcement and inadequate public awareness or engagement are some reasons for the slow progress in implementation of sustainable development programs. Many different steps were suggested to bridge the gaps increasing the efforts towards political will and commitment, improving coordination at all levels, increasing awareness, communication with the public and providing information (UNCSD 2011).

However, clarity was missing if those barriers were relevant at a municipality level and with the current procedures in energy and climate change programs. Municipalities as the “neighbourhood authorities” for people, companies and organisations play an important role in implementing sustainable development (UNCSD 2011). This thesis explored some of the possible barriers in the current procedures in a few municipalities within Southeast Sweden and proposed strategies that can fulfil some of the identified barriers thus helping them move towards sustainability. Southeast Sweden was chosen as it is one of the most densely populated counties with 51 inhabitants per square kilometre and has a unique position as being closest to many countries within Europe. (About Blekinge 2010) Southeast Sweden also has the Europe’s greenest city i.e. Växjö and Sweden’s fifth largest city i.e. Linköping and provides a mix of several municipalities with varying size, population, priorities (refer appendix A) thus allowing us to validate this thesis and arrive at a generic set of recommendations that are useful for more than one municipality.

The above-mentioned thesis (Cassidy, et al. 2007) provided guidelines to integrate principles of Strategic Sustainable Development into Karlskrona municipality’s existing strategy for a sustainable local energy system. The

guidelines do not provide a step-by-step detail on how the ABCD tool can be used in energy and climate change policy formulation and further on the implementation procedures. Also it does not provide details on how the ABCD tool can be used for building community participation and municipality's role in leading the energy and climate change program towards success. This thesis began with the study of the current procedures employed by Karlskrona municipality³ and then identifies some gaps⁴ and challenges⁵ in their planning and implementing procedures which are preventing them from reaching their energy and climate change program goals. This was done with the aim to propose a generic set of strategies that could possibly offer to close the gaps and challenges.

Karlskrona municipality was chosen as a first step to study current planning and implementation procedures because they have an FSSD based strategic planning process, the authors of this thesis are based in the city of Karlskrona and access to the municipality's personnel becomes easy.

1.8 Research Questions

1. What are the current planning and implementation procedures at Karlskrona municipality that aids in realizing its energy and climate change program goals?
2. From a Strategic Sustainable Development perspective, what are some gaps and challenges in Karlskrona municipality's current planning and implementation procedures that are preventing them from reaching their energy and climate change program goals?
3. What are some possible strategies to address the above gaps and challenges in current procedures?

³ Municipality from here on refers to the administration department that is responsible for the whole Karlskrona municipality as a geographic area

⁴ Gap is an incomplete or deficient area in the current procedures of the municipality

⁵ Challenge is a stimulating task or problem for the municipality

2 Methods

2.1 Chosen Approach

The overall research that was needed for this thesis was designed in the following way (as explained in figure 2.1) against each of the above research questions.

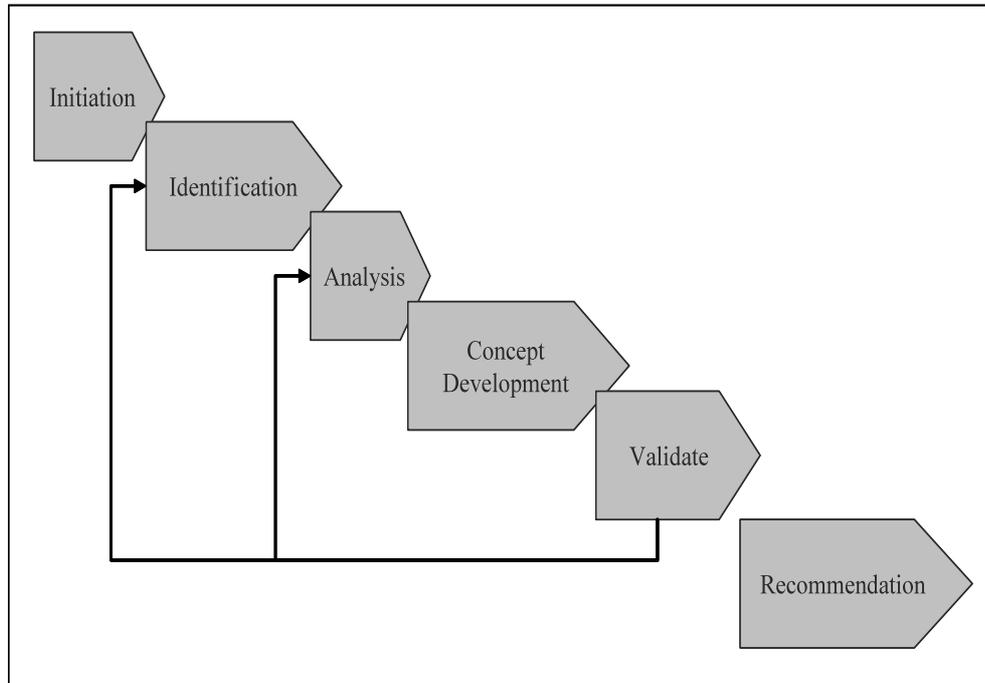


Figure 2.1 Illustrating the research design for this thesis work

Our research methods included literature review, interviews and content analysis:

Literature review

We reviewed literature from the journals, articles online from the EU Commission Energy department, Swedish municipalities, EU Policies, Guidebooks, Case studies and other thesis works.

Interviews

Our interviews were semi-structured where in we began with a set of open ended questions and asked more questions based on the answers we received. We also made presentations wherever necessary showcasing our findings with other municipalities, stakeholders along with FSSD based concepts to clarify and seek further inputs.

Content analysis

From the interview notes we gathered, we had a two stage analysis:

- In the first stage an in depth analysis was carried on looking for key information for example, on the answers provided to the FSSD based control questions, relevance to energy and climate change, policy formulation, implementation, monitoring and evaluation, current stakeholder engagement practices, Industry,, barriers, municipality's role.
- In the second stage a summary of the analysis was prepared highlighting the key points noted that are relevant to our thesis scope.

2.2 Research Design

The below table 2.1 explains further the research design phases, the research methods that were used in each of those phases, research activities that were carried out to address each of the above research questions and the expected result in each phase:

Table 2.1 Illustrating the research design

Research Phases	Identification	Analysis	Concept Development	Validate	Recommendation
Related Research Question	Research Question 1 & 2	Research Question 2	Research Question 3		
Research Methods	Literature review, Interviews, Content analysis	Content analysis	Literature review	Interviews, Content analysis	
Research Activities	Exercise 1: Current planning and implementation procedures at Karlskrona municipality				
	Exercise 1.1: Gaps and challenges at Karlskrona municipality			Exercise 4: Validation with Other municipalities	
	Exercise 2: Current Stakeholder engagement (Target Group)				
	Exercise 3: Current Stakeholder engagement (Other Group)				
Expected Outcome	Process Map, List of gaps and challenges	Requirements to close gaps	Details on the Strategies	Details on the strengths, weakness and areas of improvement	List of requirements for a platform

2.3 Research Phases

2.3.1 Initiation

Literature review was carried out to gain an understanding on the Vision 2020 of the European Union (EU); Energy and climate change targets from EU to a municipality level in Europe; on the current structure of governance in Sweden and the role of municipalities; and on the current planning and implementing procedures at municipalities and the challenges they faced.

We also looked at reports, articles and publications on communication, feedback management and engagement within municipalities in climate change projects; statistics and case studies from Swedish Association of Local Authorities and Regions (SALAR) on Sweden's municipalities; and EU Policy framing and evaluation mechanism and planning and implementation guidebooks like Sustainable Energy Action Plan (SEAP) provided by the European Union Covenant of Mayors and other frameworks; and approaches provided by the International Council for Local Environmental Initiatives (ICLEI).

2.3.2 Identification

Research Question 1: *What are the current planning and implementation procedures at Karlskrona municipality that aids in realizing its energy and climate change program goals?*

Exercise 1: Current planning and implementation procedures at Karlskrona municipality

The previous thesis that we referred to in the research scope (Cassidy et al 2007) did not provide broad details on how the ABCD tool can be used in planning at Karlskrona municipality. To gain a complete understanding on how the ABCD process was used in energy and climate change planning, we undertook the exercise of creating a process map of the entire ABCD process and highlight the current stakeholder engagement, role of the municipality. Process mapping is a simple technique by which the existing

processes are examined and documented, it helps identify tasks (what), when (phases), who (roles) within a process and are used to develop a better understanding of a process (Anderson 2009).

The thesis group began with interviewing the energy and climate change coordinator at Karlskrona municipality (Questionnaire in Appendix C). Basing our questions on the FSSD concepts we asked them to explain from a systems level perspective, how the planning for energy and climate change policy begins, the relevance of previous policy achievements, stages of the policy, the actors involved and the outcome.

The above interview process was followed by consolidation, documentation and presentation to Karlskrona municipality. Feedback was sought on the process map.

Research Question 2: *From a Strategic Sustainable Development perspective, what are some gaps and challenges in Karlskrona municipality's current planning and implementation procedures that are preventing them from reaching their energy and climate change program goals?*

Exercise 1.1: Gaps and challenges at Karlskrona municipality

In the second round of interviews with the Karlskrona municipality, we enquired about the status of the current energy and climate change program, what were some of the success criteria, identified focus areas, strategies, achievements so far and if there were any gaps and challenges (when compared to an ideal case, refer to section 1.6.2) that are preventing them from reaching their sustainability goals and what efforts Karlskrona municipality was putting in to overcome the above challenges.

From the results of the above exercise, the thesis group identified several references to the gaps in the current stakeholder engagement process, challenges with information exchange and feedback which made us explore further from the stakeholder's perspective on what they thought about the current engagement process in exercises 2 and 3.

Exercise 2: Current Stakeholder engagement (Target Group)

Scope of this research was limited to companies, businesses and not individuals. In order to gain an understanding of the current situation and feedback from stakeholders, the thesis group choose a few stakeholders from the Target group in Karlskrona (refer to Appendix B) and interviewed them. Other Target Group companies were not interviewed because they worked with elderly care, rescue services, waste, water etc. which had little relevance to energy and climate change program.

Since most of them did not have any knowledge on the FSSD framework, the thesis group briefed them on the sustainability principles, backcasting, FSSD and ABCD tool concepts and then interviewed them with questions (refer Appendix D) relating to their current level of engagement with Karlskrona municipality, energy and climate change program at the municipality, sustainability actions that they were involved with, issues with the engagement and about being engaged in a complementing platform.

Exercise 3: Current Stakeholder engagement (Other Group)

A different set of stakeholders from the Other Group companies (refer to Appendix B) in Karlskrona were identified from across industry/business sectors and interviewed. Since most of them did not have any knowledge on the FSSD framework, the thesis group briefed them on the sustainability principles, backcasting, FSSD and ABCD tool concepts and then interviewed them with questions (refer Appendix D) relating to their current level of engagement with Karlskrona municipality, energy and climate change program at the municipality, sustainability actions that they were involved with, issues with the engagement and about being engaged in a complementing platform.

2.3.3 Analysis

Research Question 2: *From a Strategic Sustainable Development perspective, what are some gaps and challenges in Karlskrona municipality's current planning and implementation procedures that are preventing them from reaching their energy and climate change program goals?*

From the above exercises 1.1, the thesis group analyzed and summarized the current reality. Basing on Karlskrona municipality's inputs, identified some of the gaps and challenges which were posing as barriers to them from achieving their energy and climate change goals.

The thesis group also analyzed if they were common threads in the results of interview exercises 1.1, 2 & 3 on the current level of engagement between the municipality and its stakeholders and drew a list of requirements that the municipality can fulfill to close the gaps.

2.3.4 Concept Development

Research Question 3: *What are some possible strategies to address the above gaps and challenges in current procedures?*

The thesis group explored literature on the SEAP guide book provided by the EU, ICLEI, other strategies in use by a few municipalities and the EU Covenant of mayors for any best practices. Depending on the above literature, the thesis group identified few strategies which could be used to fulfill the above requirements.

2.3.5 Validation

After conceptualizing few strategies, the thesis group sought feedback from the energy and climate change coordinators at Karlskrona municipality on the requirements to close the gaps, identified strategies to close the gaps in an iterative cycle until an agreement was reached.

Feedback was also sought on the possible strengths, limitations and improvements that can be made on the strategies.

Exercise 4: Validation with Other municipalities

Using the process map that was created in the exercise 1, the thesis group visited a few other municipalities in Southeast Sweden to gain an understanding of their current energy and climate change planning and implementation procedures. A brief presentation on the current process along with the gaps and challenges (refer Appendix E) was made, FSSD based control questions (refer Appendix F) were asked to check for similarity in their current processes (refer to section 1.6.2) within the principles of Strategic Sustainable Development.

As a next step, the thesis group explained their current findings at Karlskrona municipality on the gaps, challenges, requirements to close the gaps and the strategies that were identified to close the gaps in the planning and implementation procedures. Sought their feedback on similarities in the gaps, challenges and the requirements to close the gaps and finally on the possible strengths, limitations and possible improvements that can be made to the strategies.

2.3.6 Recommendation

A recommendation is made with the final set of requirements to close the gaps along with some identified strategies that could fulfil the above requirements.

3 Results

3.1 Results for exercise 1

Current planning and implementation procedures at Karlskrona municipality:

Karlskrona municipality is a part of the Ekokommuner network in Sweden and has envisioned becoming a “Fossil Fuel Free” municipality by the year 2020. Karlskrona’s previous energy and climate change plan was adopted in the year 2006 and covered most of the national and regional targets as well. The highlights were:

- Security of Energy supplies
- Transition to a sustainable energy system that provides a low negative impact on health, environment and climate
- High safety and promotion of a good economic environment and climate.

(Karlskrona Kommun 2006)

In the formulation phase, Karlskrona municipality used an FSSD based approach (refer to section 1.6) for a general overview on the Systems, Success, Strategic, Actions and Tools level) and uses the ABCD tool in their strategic planning process. The four sustainability principles were always in site. Planning is done for both,

- municipality as an organization representing the various departments working within the municipality (refer to section 1.5)
- municipality as a geographic area

However, there are differences in the participants, targets and implementation guidelines. A process map for the municipality as a geographic area is provided below along with the ABCD tool orientation:

Table 3.1 Illustrating an AS-IS process map

Phases/ Goals	Vision within Sustainability Constraints	Current Reality Assessment	Compelling Measures & Prioritization
ABCD Tool outline	A	B	C & D
Activity	- Vision definition - Focus Areas Identification - Identification of Strategies under each Focus area	- Sub Strategies definition - Objectives identification for each Sub-strategy	- Brainstorm list of key measures ⁶ for each of the objectives mentioned - Prioritize the list of key measures that can be taken up within the municipality - Identify key Indicators for each measure
Stakeholder groups	Steering Committee	Working group	Target Group Working Group Reference group,

From the above table 3.1, in the B step the municipality creates a baseline inventory, quantifying the amount of Carbon dioxide emitted in the past due to energy consumption within the municipality and analyzes other statistics on focus areas like energy efficiency achieved, usage of Renewable sources of energy, transportation trends. Based on the data, sub-strategies and objectives are defined and in the C step measures are identified against each of the sub-strategies.

The below table 3.2 provides details on the audiences for each of the stakeholder group engaged in the planning process.

⁶ Policy Instrument/Measure is a high level action when translated into FSSD/ABCD terms

Table 3.2 Audiences for stakeholder groups in the Formulation phase

Stakeholder Group	Audience	Additional information
Steering committee	<ul style="list-style-type: none"> - Politicians - Energy company - Housing company - Spatial Planning department - Technical department - Roads & Buildings department - Energy and Climate Coordinators 	<p>Politicians are elected members of the municipality and they are responsible for setting the vision.</p> <p>The Energy, housing companies are owned by the municipality.</p>
Working group	<ul style="list-style-type: none"> - Other Personnel from municipal departments/ administration 	Different set of audiences are identified for different Focus areas (for example Renewable Energy, Transport), Strategies, Sub-strategies and objectives
Target Groups	<ul style="list-style-type: none"> - Personnel from municipality owned companies (i.e. Energy company, Housing company) 	Different set of audiences are identified for different Focus areas (for example Renewable Energy, Transport), Strategies, Sub-strategies and objectives.
Reference groups	Youth, Elderly group within the community and Non Governmental Organizations (working in the Energy and climate change work)	They are the review groups identified to review the overall policy objectives, measures identified and provide feedback.

The following general criteria are adopted by municipalities for stakeholder identification and it summarizes an overall engagement process of the stakeholders by the municipality across various phases of the policy. The below table 3.3 summarizes responses from the interviews, it provides details of the stakeholder groups as per the criteria they satisfy against various phases of the energy and climate change policy.

Table 3.3 Criteria adopted for stakeholder identification and engagement

Stakeholders are those:	Formulation	Implementation	Monitoring & Evaluation
Whose interests are affected by the Energy and climate change policy (European Commission 2010)	Working groups Target groups	Target groups	Target groups
Whose activities contribute to the Sustainability challenges/risks within the municipality. (European Commission 2010)	Target groups Reference groups	Target groups	Target groups
Who have the information, resources and expertise needed for strategy planning and implementation (European Commission 2010)	Target groups	Target groups	
Whose participation is needed for successful implementation, monitoring and evaluation (European Commission 2010)		Target groups	Target groups
Who has played a similar role in the past or with similar experience.	Reference groups		

The outcome of the above planning process is an “Energy and climate change program”, which is a policy document with the following details such as focus area orientation (for example moving onto 100%, Renewable Energy Sources), references to Regional, National and European Union levels, Sub Strategies and Objectives to be achieved for the municipality along with a list of possible measures that can be taken to reach the goals. Post the planning process, the information on the Energy and Climate change program is shared on the municipality’s webpage and brochures are circulated to all interested members of the society as per the Swedish law “Freedom of information”.

(Lilja and Walitalo 2011)

In the implementation phase, an overarching implementation plan is prepared for all the identified measures to achieve the stated objectives. For example, an identified measure is to reduce the usage of Oil for heating houses in a specific area, the local Energy Company takes the responsibility to expand District Heating to that area. Similarly, other measures are taken up by various target group companies as the municipality itself cannot take up any measures for implementation. Once a Target Group Company takes up a measure, it is responsible for its own implementation planning which includes identifying detailed list of actions, prioritization of actions, timelines, progress indicators and allocating budget. If necessary, the municipality, Regional and National governments arrange funds for the Target Group companies.

Target Group companies evaluate the progress by measuring the impact generated by the actions they had taken and appropriately make decisions on continuation or abolishment of the action. An Energy and climate change Policy goes through four or five years of implementation before the municipality feels a need for another one keeping in view the outcome it has generated, current reality and changing National or EU laws.

3.1.1 Results for exercise 1.1

Gaps and challenges at Karlskrona municipality:

The aim of this exercise was to enquire on the status of the current energy and climate change program at the municipality, and if there were any gaps and challenges that are preventing them from reaching their sustainability goals.

Summary of our findings are:

- Karlskrona municipality does not always receive updates on the implementation activities and status on the actions taken by the Target Group companies. The municipality policy makers are therefore unable to measure the success of their current energy and climate change program goals. They still make efforts to engage with stakeholders and monitor the status but not up to a satisfactory level
- Karlskrona municipality believes that a Program level view that establishes structure and control over all the actions taken up by the Target Group companies is missing
- Current procedures enable them to share information only once after the policy is formulated
- They do not receive any feedback on the policy and believe that it is important post the formulation phase as it provides additional inputs and newer statistics
- A few reasons like lack of time, resources to support and manage are limiting them to focus only internally while they believe that they have a responsibility to drive the program on the whole municipality level. This is explained below:

In the implementation phase, the focus of Karlskrona municipality is more or less pointing internally i.e. I) municipality as an organization II) A few Target Group companies which they own and not externally i.e. other companies within the municipality. It appears as though the municipality as an organization and Target Group companies are the only ones taking the energy and climate policy forward.

3.2 Results for exercise 2

Current Stakeholder engagement (Target Group):

The aim of this exercise was to gain an understanding of the current situation from the stakeholders of the Target Group companies.

Summary of the findings are presented below:

- 2 out of 4 of the Target group companies we interviewed participated in the planning and implementation process of the municipality's energy and climate change program. The rest of them cited lack of time as the primary reason for not participating in the planning and implementation
- Almost all them are involved in energy and climate change related projects in their own way and have established their own goals. They are not necessarily a subset of the municipality's goals
- Almost all of them are aware of the current energy and climate change policy at the municipality and a few of them were not sure if they understood all the details
- 3 out of 4 of the Target group companies we interviewed said that there is less or minimal communication from the municipality after the planning process is complete
- 1 out of 4 said that they need help (with funds) and advice in taking up sustainability related actions
- Almost all the Target Group companies responded that they would like to provide feedback and believe that their feedback will be effective for municipality's energy and climate change program but found the feedback mechanism missing
- All the Target Group companies agreed that energy and climate change program can contribute to the local innovativeness and improvements in local business opportunities

3.3 Results for exercise 3

Current Stakeholder engagement (Other Group):

The aim of this exercise was to gain an understanding of the current situation from the stakeholders of the Other Group companies.

We explored if other companies are making efforts towards Sustainability and their current level of engagement with the municipality. Summary of the findings are presented below:

- Most of them agreed in general that sustainability risks are real, acknowledge the fact that efforts are needed at the earliest,
 - 3 out of 9 responded that they are not taking up any sustainability related actions as of now
 - Another 2 out of 9 responded to have been involved with limited set of activities in their own way and needed knowledge, resources and skills to take up additional sustainability related actions
 - Remaining 5 out of 9 responded that they were actively involved in sustainability related actions in their companies and would comply with the municipality's goals
- 7 out of 9 responded they are happy to be part of Other Group while 2 out of 9 responded that they would like to part of the Target Group to improved their current engagement level with the municipality
- 5 out of 9 responded minimal or no communication from the municipality on the energy and climate change program while they were willing to contribute, 3 out of 9 responded they received communication in some way, were aware and willing to contribute while the remaining 1 out of 9 said they did not receive any communication and were not interested to contribute towards sustainability.
- Almost all of them cited that they would like to provide feedback and believe that feedback will be very effective in the municipality's future planning activities
- None of them shared any knowledge and skills on the sustainability related actions and are not cooperating in any way with other companies/business within the municipality.

3.4 Summary of the gaps and challenges

The above identified gaps and challenges from exercises 1.1, 2 and 3 are summarized into the following categories:

- There is a lack of access to information and awareness on sustainability challenges within the municipality
- There is in general a lack of information exchange and feedback between the municipality and its stakeholders
- Not all stakeholders are involved in the planning of the energy and climate change program because of which not all stakeholders preferences are being considered in the policy
- There are instances of non-cooperation amongst stakeholders, municipality in terms of knowledge, skills and resources
- Overall it shows a weak enforcement by the municipality on the energy and climate change goals.

3.5 Analysis for requirements to close the gaps and challenges

Inclusion of the Other Group

The municipality currently does not involve the Other Group companies because they lack internal capability to support and manage this level of engagement due to limited resources (in terms of personnel, infrastructure) and time. However they recognize the need to engage the Other Group as well because they also satisfy the below stakeholder engagement criteria (refer table 3.3);

- their activities also contribute to the sustainability challenges within the municipality;
- their interests are affected by the Energy and climate change Policy as well, hence it becomes necessary for their preferences also to be included;
- they can also provide alternate sources of information, risk assessment and expertise;
- They also undertake some actions towards Energy and climate change in various focus areas leading to an increase in the overall efforts towards making the municipality sustainable.

Our literature review showed that stakeholder participation, can enhance the motivation levels of others and leads to strengthened accountability (Toth 2010) and can serve as a platform for stimulating behavioural change that can complement the actions during implementation (European Commission 2010). A basis for success in moving towards sustainability is that, stakeholders should be considered not as passive recipients of newer policies but as intellectual partners in overall discussions (Robèrt et al. 2002). The “Other Group” provides a new perspective with an alternative source of knowledge; this could lead to repetition of the ABCD process as shown in the above figure 1.2.

“Finding a path towards sustainable development will require the pooling of diverse perspectives, knowledge and resources. No single individual, organisation, nor even a single segment of global society is likely to by themselves identify and implement the solutions to the big challenges humanity is facing today” (Krick et al. 2005, 4).

“The primary reason why we want to constantly engage with all possible stakeholders groups is to communicate the direction they need to take in the implementation and validate it” (Lilja 2011).

Information exchange and feedback

The municipality currently communicates (sends out announcements, posting on the web) only once, post the policy formulation process. A more proactive approach of raising awareness and facilitating constant information exchange between the municipality and its stakeholders could resolve some of the above identified gaps. Communication is essential for a good level of engagement and it can align interests, efforts towards one goal of success (Tendring District Council 2010).

Another approach could be to constantly monitor the progress indicators of the energy and climate change program and seek feedback post planning and also from various stakeholder groups involved in the implementation phase. Feedback could play a number of roles, such as predicting and correcting inconsistencies, enabling cooperation, decreasing complexity and reducing delay (Cover 1988). Without an appropriate feedback mechanism, it is not possible to receive and incorporate important comments, inputs and address critical questions (Agarwal 1995). Feedback

could provide an alternate view or knowledge from other sources, enabling identification of further risks and impact assessment.

Environment of cooperation

The municipality could consider providing an environment of participation and cooperation amongst all its stakeholder groups which will; help identify and resolve any potential barriers in taking up sustainability related actions; provide an opportunity to collectively analyze and exchange information on how their respective work is contributing to the overall goals. This would also enable better distribution of the municipality targets amongst stakeholder groups allowing them to find creative ways to address some of the challenges and leading to an overall qualitative implementation of the program.

Enforcement by the municipality

Municipality as a regulatory authority can exercise control over the sustainability goals on stakeholders and has the overall responsibility to steer the energy and climate change program towards the vision. The program could fail if leadership is ignored.

“We at the municipality cannot set goals for companies but can exercise some level of authority and control over their actions” (Oredsson 2011).

“Municipalities with a strategy content of being proactive and innovation seeking performed better than municipalities with a reactive stance focused on formal inspections and complaints” (Andrews et al. 2006).

“Although we have a good policy in place, it is not guaranteed that it’ll lead us closer towards Sustainability. We need the stakeholders to maintain focus and implement actions as per the expectation and within the timelines, we cannot risk inaction and we are here to provide any kind of help” (Lilja 2011).

The municipality has to fulfil all the above requirements by, providing access to information; involving all possible stakeholder groups in the decision making process; enabling the inclusion of public preferences in the policy making process; building cooperation amongst stakeholder groups. All the above actions establishes more trust in the municipality, which is one of the main factors when discussing measures, action plans and rules (Fukuyama 2002). High trust levels can help stakeholder groups cooperate with each other better thus strengthening the society in its ability to respond to sustainability challenges.

3.6 Strategies to close the gaps and challenges

The following strategies are identified to bridge some of the gaps and challenges:

Inclusion of stakeholders from the Other Group

The Other Group audience can be included by the municipality in the energy and climate change program beginning from the post-planning phase and later in the implementation and monitoring & evaluation phases. They may be included in two of the several levels that are available: at the lowest level, the stakeholders may be targeted with enhanced information (e.g., about risks). At other levels stakeholder's views may be actively solicited through mechanisms such as consultation exercises, focus groups, and questionnaires. (Rowe and Frewer 2000)

“Informing mode”, is the lowest level, involves communication being sent to the stakeholders (e.g., about the vision, risk assessment, measures identified etc.) typically a top-down communication and a one-way flow of information (Rowe and Frewer 2000) from the municipality.

“Informing and feedback mode”, is the next level, which seeks some degree of stakeholder involvement characterized by dialogue and two-way information exchange (Rowe and Frewer 2000) between the municipality and the stakeholders. “Consensus conference” can be a good delivery mechanism for seeking feedback in the post-planning phase of the energy and climate change program, an initial characterisation (brief description on the planning process, policy details are given) and a draft version of the

policy are made available for the stakeholder. This is followed by, interviews with individual stakeholders to review the program information, indicators, success and failure factors (Rowe and Frewer 2000). The mechanism provides greater accessibility to the audience, also allowing for high independence of the participants, allows task definition and easy decision making. It is a better choice for early involvement of stakeholders in a process and it promotes a high degree of transparency and can be very cost effective (Rowe and Frewer 2000).

The below Table 3.4 provides a sample inclusion plan for the Other Group audiences (refer Appendix B) in the energy and climate change program based on the responses we received from our interviews (refer to section 3.3).

Table 3.4 Illustrating sample inclusion plan for Other Group

Stakeholder	When to involve in the energy and climate change program?	What level of inclusion?
Public representatives from housing societies, apartment owners other than the ones owned by the municipality	Post-planning phase and during implementation on the activities taken up and the benefits, issues they are facing in their neighbourhood because of the actions.	Informing and Feedback mode
Transportation company	Post-planning, implementation, monitoring and evaluation phases	Informing and Feedback mode
Financial partners like Banks, financial institutions	In the Post-planning phase to provide innovative investment options for local Industry, businesses before the implementation phase beings. In the monitoring and evaluation phase to learn and check the possibility of financing.	Informing and feedback mode

Table 3.4 (Continued)

Stakeholder	When to involve in the energy and climate change program?	What level of inclusion?
Post office	In the Post-planning and implementation phase as they are interested to know how they can align their efforts in implementing actions.	Informing and feedback mode
Schools	In the Post-planning phase as they interested to know how they can align their efforts, for example: training programs to children. Also in the implementation, monitoring & evaluation phases as they are part of actions taken up in the municipality.	Informing and feedback mode
Local Businesses like retails stores, hotels, restaurants, shops etc.	In the Post-planning phase and also for any important updates.	Informing mode
Industry (which are into discrete Manufacturing, services etc.)	In the Post-planning phase and implementation phase as they are interested to know how they can align their efforts in implementing actions.	Informing and feedback mode
Media houses (News papers, TV, Radio)	In the Post-planning phase and also for any important updates.	Informing mode
Hospitals	In the Post-planning phase and also for any important updates.	Informing mode
Visitors (that includes prospective residents)	In the Post-planning phase and also for any important updates.	Informing mode

Communication Strategy

A communication strategy plays an effective role, as it maximizes information sharing and minimizes misinterpretations. (Chess and Hance 1994). “A communication strategy is the why, what, who, when, where, and how of relaying information, details the message, audience, potential vehicles, resources required, and feedback mechanism” (Chess and Hance 1994).

A goal can be established based on what the communication is about, like information sharing, increasing awareness, encouraging action, changing behaviour, promoting community participation as providing information alone is not enough, it should raise awareness and stimulate change in the behaviour as they understand a bigger picture and are able to relate better with actions. Seeking constant feedback also allows companies to relate to the big picture of municipality’s goals (West Sussex County Council 2006). A sample of the message template for information sharing is provided in the Appendix (refer to section 6.7).

A feedback guide (on what to look for in a Policy) could also be provided to the stakeholder groups to guide them to provide necessary feedback on the Energy and climate change Policy in the post-planning phase. A sample of the guide is provided in the Appendix (refer to section 6.7)

Program management strategy

The municipality could establish a program level access and control by having a Program management strategy. The strategy will enable Energy and climate change coordinators at the municipality to:

- Create an alignment with stakeholder’s interests and motivation. The alignment process can begin in the post-planning phase with an induction program/from participation in the consensus conference (refer to Table 3.4) for the Other Group stakeholders and a few Target Group companies as well with orientation on municipality’s goals and objectives. This could be followed by making some of municipality’s sustainability goals as a subset of the goals that the stakeholder’s company set in its visioning process. This tends to incorporate a sense of pride and responsibility amongst the

stakeholders that their efforts are not only contributing their organization but also towards making the entire municipality sustainable. “If people are given responsibility, encouragement, resources and are motivated, things will happen” (European Union 2010). The alignment could continue into the implementation, monitoring & evaluation phases of the policy with a follow through on actions and results.

- Monitor the progress indicators, overall plan; actions undertaken by the stakeholders, deviations from the planned list of actions using the “Lens of Sustainability” (refer to section 6.8). In the process, the municipality can help address any barriers that the stakeholders may encounter, like: Technical barriers, technical Options that may not be available or not sufficiently proven to adopt them; Limitation in knowledge / information thus leading them to a lack of strategy; Economic barriers due to lack of funds for investments or investments not meeting their profitability criteria; Requirements for funds, subsidies, Institutional barriers posed by Banks or Investment firms for investments; Lack of interest or motivation leading to no efforts (ECOFYS 2006).
- Provide an opportunity for all stakeholders groups (Target and Other Group companies) to collaborate within the municipality to share goals, action plans, resources, knowledge, expertise and best practices, this could possibly lead to saving costs especially for smaller companies that lack the resources or expertise in implementing actions. It could also serve as a platform for conflict resolution for actions that are shared between stakeholders

3.7 Results for exercise 4

Validation with Other municipalities

This exercise with the Other Municipalities (refer to section 6.1) was undertaken to validate the above findings. From the interview responses we received, it was observed that 3 out of 5 of them had Local Agenda 21 as a framework for planning process and remaining had their own internal process. Several similarities were observed with the FSSD based approach that Karlskrona municipality had.

A summary of the findings are:

- All municipalities agreed that they consider the biosphere's limits while planning for their energy and climate change policy
- While agreeing to the current structure of the Targets from EU-Sweden-County-Municipality, most of them seem to be ahead of the current EU/Sweden's "20-20-20" Target.
- All of them agreed that an integrated approach considering Socio-ecological and economic aspects should be looked into for sustainability planning
- All of them agreed that interrelationships exists within the energy sector i.e. energy is not just electricity but Oil, Natural gas and Transportation
- All of them agreed to the stakeholder engagement criteria we defined in the Table 3.3
- All of them had a long term vision but none of them had defined it in terms of the four sustainability principles
- All have them had identified strategies, focus areas within energy and climate change like Energy Efficiency, Renewable Energy Sources, Community Heating system, Sustainable consumption but most of the targets lacked a full sustainability view within the constraints of sustainability principles and were short term incremental targets for examples 65% reduction in fossil fuels by year 2020
- Most of them agreed that sustainability related actions could pave way for local innovativeness and help improve business opportunities locally
- Many municipalities that we visited used forecasting technique where likely future is predicted based on the current trends
- Most of them performed a current reality assessment, created SWOT (Strengths, Weakness, Opportunities and Threats) analysis
- Most of them had developed strategic guidelines that helped them prioritize different measures
- Most of them identified indicators to measure the progress of several strategies identified
- In 2 out of 5 of the municipalities, companies owned by the municipality undertook the implementation activities. Lack of resources and time were primary reasons for not engaging all

stakeholders. While in other 2 out of 5 of the municipalities Other Group companies were also involved in implementation activities

- Access to information is provided in a few municipalities in various ways and awareness campaigns are taken up proactively. In a specific instance in one municipality about 3000 people are learning about sustainability and development as pre-step to planning.
- All the municipalities responded that feedback is very important post the planning phase to make any corrections in the strategies and measures. The current feedback response was very poor. A few of them responded that feedback is good during implementation phases for activities that are incremental in nature so as to learn from the past experiences and plan better for the future
- Most of the municipalities responded that they do not provide any subsidies or capital investments to the Other Group companies and hence cannot offer much help to the companies
- 1 out of 5 of the municipalities highlighted that they had engagement strategies already in place for example "Lammhult Direct" is a direct meeting strategy with citizens two times a year
- 2 out of 5 of the municipalities agreed with exercising authority on companies forcing them to take up actions while the rest felt that they cannot do it
- All municipalities agreed that they have the overall responsibility to steer the local energy and climate change policy towards success.

3.8 Recommendation

Since the municipality had limitations with the capability to support and manage the extra resources needed to bridge the above gaps in the post-planning and implementation phases, a complementing platform was proposed as part of this research to manage the overall energy and climate change program as shown in the below figure 3.1. Interview responses to exercises 2 & 3 further strengthen the need and acceptability for a complementing platform from stakeholder groups:

- 2 out 4 of the Target Group companies agreed to be part of the complementing platform
- 6 out 9 of the Other Group companies responded they would like to engaged as part of the complementing platform

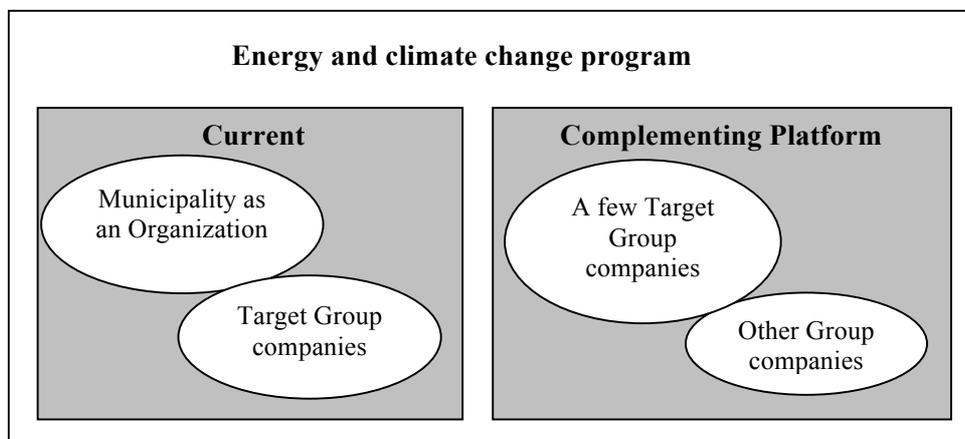


Figure 3.1 Illustrating the Complementing platform

Considering the initial feedback on the gaps, challenges and the strategies identified, a final summary of the platform is detailed below in figure 3.2 the platform has a goal in every phase of the energy and climate change program addressing the gaps, challenges that were identified.

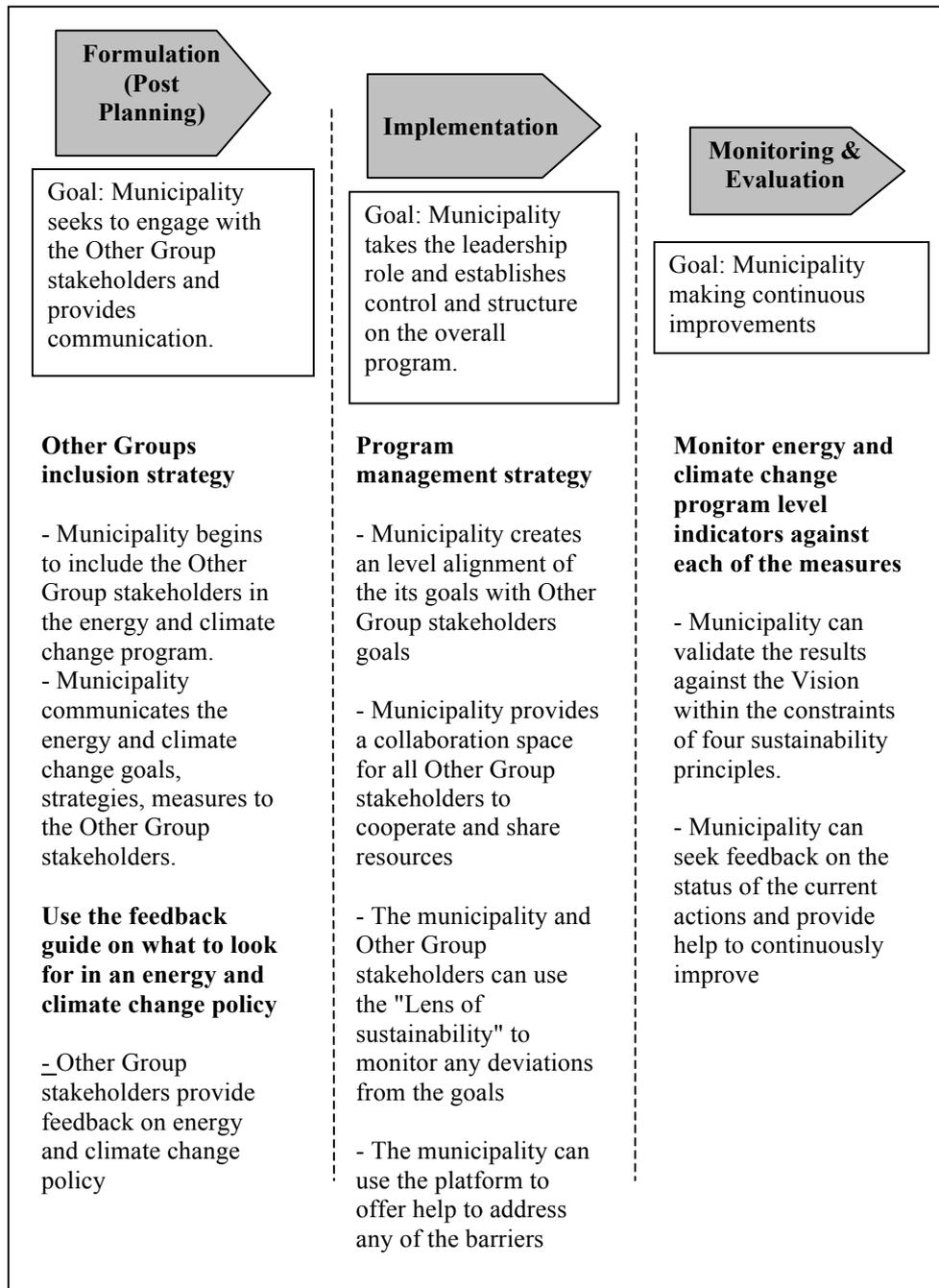


Figure 3.2 Illustrating the Complementing platform details

Some success factors for the platform can be studied in relation to the achievements of the municipality as a geographical area, some possible indicators are:

- The total sustainability focus and alignment towards the municipality's targets that it could bring into the overall efforts when compared to a situation without the platform.
- Mutual learning that has taken place between stakeholders and the municipality and between stakeholders themselves.

Some strategies can be used with the Target Group companies as well; as there were similar gaps identified (refer to section 3.4). The platform bridges gaps in the Strategic Sustainable Development process and serves to offer the following benefits for the municipality as an organization as well as to all the stakeholder groups:

- Increases awareness and motivation
- Encourages action and responsibility
- Promotes innovation and cooperation locally
- Aids in the identification and development of alternatives (knowledge, skills and solutions)
- Promotes Trust between the stakeholders and the Municipality
- Creates a positive image (improves reputation) for the municipality and could build respect for their actions at the County and National levels.

4 Concluding Discussion

4.1 Meeting the success criteria

The goal of this study was to leverage the current thesis work done on planning for local energy systems i.e. a municipality, identify gaps and challenges in post planning and implementation phases of the energy and climate change program and come up with a set of strategies to fulfil them. The success criteria were to first identify and seek feedback on the various strategies that were listed as part of this thesis work, although they satisfy to a certain extent, limitations exist which can be taken up in future research and development.

4.2 Research validity

4.2.1 General validity issues

The research was carried out with an iterative approach, including the study of current procedures, identification of gaps, challenges and development of strategies in one municipality first and then validation of the findings and strategies with other municipalities. The final results are derived from a combination of the interviews, literature review and internal understanding and analysis of the thesis team. The iterative approach allowed the team to incorporate the best set of the findings and resulted in an improved set of strategies in the end. This thesis work was reviewed against other municipalities' work on the topic but it was not tested in full scale in any of those municipalities and it was not validated against similar set of platforms available to fulfil similar gaps and challenges.

4.2.2 Strengths of this study

Some of the strengths of this research are that although most of the strategies exist independently and a lot of literature is available but what makes it unique is the way they are tied into the energy and climate change

program phases. Inclusion of the Other Group audience, allows for inputs of different kinds and the result is a better plan for everybody that participates (Johansson 2011). Having a communication strategy controls the exchange of information between the municipality and its stakeholders, “it could give another level of getting feedback on the different plans on how to perform a certain activity” (Johansson 2011). “Lens of sustainability” could be a useful tool for municipalities not employing the FSSD based approach, as it provides a strategic focus not only in the planning phase but also in the implementation phase for municipalities and stakeholders as well.

4.2.3 Limitations of this study

Some limitations are with the requirements to close the gaps and the details of the strategies identified, they are on a higher level, further research needs to be carried on to improve the requirements and strategies. A program level alignment might not be applicable if a company’s sustainability goals are higher than the municipality’s goals. There is an overlap of the role of the County administration, Swedish Environmental Protection Agency with the municipality’s role in driving energy and climate change goals for companies and it is not very clear if municipality is in a better position to control and achieve results because only 2 out of 5 of the municipalities agreed in our interviews that they can exercise authority on companies forcing them to take up actions and steer the local energy and climate change goals towards success. In our stakeholder interviews, our focus was limited to city limits and not other cities/towns within the municipality because we assumed that a vast majority of the population in EU lives and works in cities, consuming 80% of energy within the EU. (European Commission 2008) however this study can be further expanded to other cities as well in the future work.

4.3 Conclusion

The first research question “What are the current planning and implementation procedures at Karlskrona municipality that aids in realizing its energy and climate change program goals?” provided an understanding of the current procedures at Karlskrona municipality and led to the creation of a process map of energy and climate change program in a municipality in ABCD terms.

The second research question, “from a Strategic Sustainable Development perspective, what are some gaps and challenges in Karlskrona municipality’s current planning and implementation procedures that are preventing them from reaching their Energy and climate change program goals?” presented the current situation of the energy and climate change program within Karlskrona municipality and identified the following gaps and challenges that were preventing them from reaching their energy and climate change goals:

- lack of access to information and awareness on sustainability challenges within the municipality;
- lack of information exchange and feedback between the municipality and its stakeholders;
- non involvement of stakeholders preferences;
- Non-cooperation of stakeholders for mutual benefit and weak enforcement by the municipality on the energy and climate change goals.

The gaps and challenges were validated from a stakeholder’s perspective and also similarities were found in other municipalities as well. Municipalities as the “neighbourhood authorities” for people, companies and organisations play an important role in implementing sustainable development (UNCSD 2011). Literature from the United Nations Conference on Sustainable Development (UNCSD) synthesis report demonstrated that possible barriers existed that are slowing the progress in implementation of sustainable development programs. However, clarity was missing if those barriers were relevant at a municipality level and with the current procedures in energy and climate change programs.

The third research question, “what are some possible strategies to address the above gaps and challenges in current procedures?” provided details on some strategies on possible inclusion of stakeholders from the Other Group, closing the gaps in communication and feedback, creating an alignment with stakeholder’s interests and motivation with the municipality’s goals, monitor the progress and deviations using the “Lens of Sustainability” and provide an opportunity for all stakeholders groups to collaborate and cooperate within the municipality to share resources, knowledge and expertise. Based on the findings of this study, the platform is expected to bridge the gaps in the current procedures thus decreasing the overall complexity and delays caused in moving towards sustainability. It also provides an opportunity to re-prioritize actions and learning’s for the future planning and implementation.

4.3.1 Further work

Further research can explore how the platform can possibly be used to close similar gaps at a county level (that includes many municipalities) and also explore the possibility of implementing the strategies identified using information & communication technologies.

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6 Appendices

6.1 Appendix A: Municipalities visited

Table 6.1 Details of the municipalities visited

Name	Size (Km ²)	Population	Notes
Karlskrona	3,348	64,000	The primary industry is composed of successful companies with products in time, and many smaller companies that form an important part as subcontractors.
Ronneby	1,247	28,500	Ronneby Soft Center is especially known, including Blekinge Institute of Technology and about 60 companies, most of them specialised in ICT.
Olofström	415	13,100	The car industry, dominated by Volvo Cars and other companies connected to this industry, is the largest employer in Olofström.
Karlshamn	491	31,143	It's a port city that serves as transportation hub to major European countries with industries in food, biomass fibre, Energy.
Växjö	1,924	83,000	City of Växjö has got two international awards in 2007 and international media says Växjö is the Greenest City in Europe. Major international companies collaborate with smaller entrepreneurs, include Alstom and Aerotech Telub .
Linköping	1575	146000	Sweden's 5 th largest municipality with industry in aerospace (SAAB). The city also has a strong presence in information technology based industries as well.

6.2 Appendix B: Interviews

Municipalities

Name	Organization
Johnny Lilja	Karlskrona Kommun
Lisa Walitalo	Karlskrona Kommun
Henrik Johansson	Växjö Kommun
Eva Johansson	Olofstrom Kommun
Monica Oredsson	Ronneby Kommun
Liv Balkmar	Linköping Kommun
Thomas Svanbeg	Karlshamn Kommun

Target Group companies

Ulf Klint	Karlskronahem
Sven Hult and Beenny Gustafsson	Blekingetrafiken
Anders Karmehed	Affarsverken
Johan Melin	School

Other group companies

Lennart Tyrberg	The Energy Agency for Southeast Sweden
Annika Chriotensson	Blekinge Hospital
Häkan Lemark	Nordea Bank
Thomas Larsson	A Hotel
Gunnar Suewsson	BLT News Paper
Äsa K Holsf	Swedish Radio
Hans Matfisson	Posta Office
Johnny Gylling	Telenor
Häkan Breda	Roxtec
Trung Tran	Royal Thai Restaurant

6.3 Appendix C: Questionnaire for Karlskrona Municipality

- 1 What efforts are you making on energy and climate change program? What are your success criteria? Why are they sustainable in the long run?
- 2 How do you set targets for achievement? Do you think targets are different to “municipality” as a geographical area (external) and “municipality” as an organization (internal)?
- 3 What are the main processes of your energy and climate change program?
- 4 How do you use the ABCD tool in your current strategic planning process?
- 5 What are the principles, criteria to identify stakeholders in the planning phase of the energy and climate change policy?
- 6 After your strategic planning process is complete, how do you seek feedback on the energy and climate change program/Action plan? From whom do you seek feedback (list all the stakeholders)?
- 7 Do you believe feedback from stakeholders is important after the strategic planning process and before the implementation begins? Why?
- 8 What is the effectiveness of feedback post strategic planning process and during implementation of the energy and climate change program?
- 9 Do you have a formal Feedback seeking mechanism/process in place as of now?

6.4 Appendix D: Questionnaire for Target Group & Other Groups

1. Are you making contributions to the current energy and climate change program with the municipality? If yes, can you explain the details?
2. How effective do you think your feedback will be for the municipality with respect to the success of energy and climate change program?
3. Where do you think you belong to in the current municipality’s planning and implementation process i.e., Target Groups or Other Groups?
4. Do you understand the targets defined with the municipality’s Energy and climate policy? How about the context of targets at Swedish Government and EU level?

5. What are your thoughts on “the energy and climate change program paves way for improvements in local innovativeness and local business opportunities”?
- 5.1. Do you think Companies locally crave for it? How is your Organization looking at this?
6. Do you think that a communication platform will facilitate necessary communication possible?

6.5 Appendix E: Questionnaire for the other municipalities

1. What are your efforts towards the current energy and climate change program of the municipality? What are your success criteria? Are they sustainable in the long run?
2. How do you define sustainability targets currently? Do you think targets are different to municipality as a geographical area (external) and municipality as an organization (internal)?
3. What kind of strategic guidelines does the municipality use for planning and implementation purposes towards success?
4. Who gets involved in your energy and climate change program?
5. Do you involve these "Other groups"? Choose possible members: Energy companies (private), building companies (private), local businesses within different sectors etc.
6. Do you think their involvement is good for the policy? Do you agree them being part of “Other groups”? Have you ever involved them?
7. What kind of process do you currently have to involve your stakeholders and communicate with them?
8. What are the criteria to identify stakeholders? Currently, when and at what phases of the energy and climate change policy do you involve your stakeholders? How?
9. Which step during the energy and climate change program do you think feedback (inputs) from stakeholders is important?
10. Do you revisit your planning process based on the above feedback? (In case something substantial has been reported and you need to re-visit strategies) What are some communication, feedback requirements in the implementation, & evaluation phase? What is the periodicity?
11. After your strategic planning process is complete, do you seek feedback on the energy and climate change program/action plan? Who do you

- seek feedback from, list all the stakeholders? Do you have a formal Feedback seeking mechanism/ process in place as of now?
12. Do you agree communication as a first step is key element for engagement?
 13. What other steps are possible for "Inter-relationship" between municipality and Stakeholders?
 14. Do you agree that a complementing platform can create that structure & control for communication (existing as well as new ways)? Do you know of any other models like this platform?
 15. What are your comments on the success factors of the complementing platform?
 16. Do you think this platform is effective to your municipality? What do you think are some of the strengths? What do you think are some of the limitations?
 17. What do you think are the improvements that can be made to make this platform more effective, widely acceptable, and usable?

6.6 Appendix F: FSSD based control questions

Control questions for other municipalities not employing FSSD based planning approach:

Systems Level:

1. How does the municipality describe procedures in relation to the socio-ecological sustainability, stakeholder involvement?

Success Level:

2. How does the municipality define success in terms of sustainability? How are Swedish national and EU goals integrated into the municipality's long-term success definition?

Strategic level:

3. What kind of strategic guidelines does the municipality use for planning and implementation purposes towards success (municipality as an organization and municipality as a geographic area)?

Actions level:

4. How to ensure if actions/measures have a sustainability focus as defined in the success criteria or not?

Tools Level:

5 Are there any monitoring, reporting tools, concepts used for ensuring sustainability focus for the above actions/measures?

6.7 Appendix G: Communication template and feedback guide

The following is a sample message template that could be used to communicate about the Energy and climate change program.

Table 6.2 Sample message template

Energy and Climate Change Plan: Vision – Focus areas	<ul style="list-style-type: none"> • Describe the identified Strategies and Sub-strategies • Provide a big picture on how this Vision will fit into in the long term Sustainability perspective
Summary of the Current Situation	<ul style="list-style-type: none"> • Provide details on the current Energy supply: <ul style="list-style-type: none"> ○ Security of supplies ○ Source, current resources base ○ Estimated local demand ○ Local and Global Challenges
Local Sustainability Risk Profile	<ul style="list-style-type: none"> • Sustainability Risk potential • Risk Prioritization (Long term/ Short term risk)
Planned Measures	<ul style="list-style-type: none"> • Classification as Mitigation/Adaptation measure • Alternate measures • Prioritization criteria used • Tradeoffs criteria considered • Expected timelines • Proposed budgetary estimates • Progress Indicators

Feedback guide to the Stakeholder's (on what to look for in a Policy) for providing feedback on the Energy and climate change Program in the post-planning phase:

- Is there an explicit mention on how the municipality believes the policy measures are going to work or such a description is lacking?

- How close it is to the expectations of the resident people, industry, business and others stakeholders?
- How was the political support built for the policy instruments?
It is widely accepted that stakeholders are interested to extend relationship with power (i.e. with local government) for business opportunities either directly or by indirectly representing the industry (Toth 2010)
- Check for dependency on other measures which are either simple to achieve or requires less budget, this could be different if it is a single measure?
- Identify the cause-impact relationships for each of the measures and the outcome that it has generated, compare it with a scenario if the outcome was possible in the case cause-impact relation did not exist
- Qualitative Analysis:
 - If the success and failure factors of policy measures are clearly identified
 - Validity of assumptions made about the functioning of the measure as wrong assumptions can hamper the effectiveness
 - Clarity in the measure undertaken, validate if a clear description of the goals and functioning of the measure is mentioned or if ambiguities exist
 - Technical complexity of identified measure, whether it is easy to understand or contains complex details
 - Technical inputs/ data source used for current reality assessment, if that is latest and from a reliable source
 - Stakeholder understanding and acceptance of the measure: if stakeholders have properly understood the functioning of the measure, and accept it, since they affect the implementation and effectiveness of the measure
 - Participation of stakeholders in the planning and implementation of the policy as Participation of stakeholders can have a relation to their understanding and acceptance of the measure
 - Role of implementing agency: The competence, willingness and authority of the implementing agency are important factors for an effective implementation
(West Sussex County Council 2006)
- Has the Policy measures been packaged in the right way? policy measures are packaged to increase the combined efficiency and effectiveness and overcome all market barriers

- Has there been clear identification on disincentives, incentives for all actors within the Municipality?
- Interaction with, other energy/ environmental policy measures (e.g. mining, forest development, recycling, shipping etc.) within the Municipality/region/National/EU levels
- Have past lessons, best practices (both national and in other countries), past experiences been looked into and taken advantage of in creating similar policy instruments.
- Does it have the SMART targets for the measures:
 - Specified: be as concrete as possible, what is it aimed for, who is it targeted at, does it seem to be the most appropriate measure to achieve maximum impact
 - Measurable: objectives should be measurable to determine whether results and effects have been achieved at a later stage
 - Ambitious: targets should go beyond business as usual
 - Realistic but acceptable: with respect to desired effect, available budget, the timeframe
 - Time framed: it should be clear when the results and effects are to be achieved
- For all the identified measures, is an ‘upstream’ approach taken or downstream approach taken? Upstream planning anticipates and avoids problems before they occur, as opposed to a ‘downstream’ approach, where resources are used to deal with the results of the problems.
- Does it promote new ways of thinking (innovativeness)? For example, linking wider climate issues and local/ individual action, linking policy with communication
- Does it reinforce a feeling that their actions (i.e. the stakeholder’s) are meaningful (Translating motivation into actions)?
(West Sussex County Council 2006)
- Evaluate the proposed process (implementation) plan for the identified measure
 - Evaluate if the following quantitative indicators are stated clearly:
 - Effectiveness (the extent to which a policy measure is expected to achieve its stated targets)
 - Net impact (Impact realized when compared to the situation without the measure)

- cost-effectiveness (proposed budget to achieve this Net impact)

(Broerse et al. 2009)

- Progress indicators for evaluation at important phases to check the course of action and possibilities for adjustment (re-design), improvement in its effectiveness and cost-efficiency
- Monitoring and Evaluation opportunity: Have monitoring and evaluation activities been considered in policy measure and have procedures been defined as to how data will be collected during the implementation of the instrument
- How are Tradeoffs handled?
 - Tradeoffs' occur when a step towards one aspect of success and sustainability means a lack of progress toward, or even a short-term step away from another element of success and sustainability
- Does the identified measure suggest and encourage sharing of resources and suggest best possible usage? (Broerse et al. 2009)

6.8 Appendix H: “Lens of Sustainability”

“Lens of sustainability” can provide the audit criteria that be used by the municipality or the stakeholders. It provides the strategic focus of sustainability for every measure and actions that are planned and undertaken. This can also be used if the strategic planning is not based on FSSD.

- If the planned action move the municipality (as an organization and geographic area) /company in the right direction when all the aspects of the vision are considered? (Vision, Four Sustainability Principles, Focus areas, Strategies, Objectives etc.)
- Can the planned action serve as a platform, benchmark for further actions towards the vision?
 - Can subsequent planning, future actions build upon the planned actions
- Does the planned action provide returns in terms of reduced levels of risk (ecological, social or economic)?