

# **Policies for RECP and CP in the Georgian Industry**

Policy Scenario built on an ex-ante policy evaluation of  
the Georgian system for environmental protection

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## **Abstract**

Georgia is facing social and economic challenges and at the same time there are signs that more pressure is put on the environment and natural resources. Georgian industry is energy-intensive and encompassing deregulations have put even more stress on the environment. How to combine economic and social goals with environmental concerns has been a hotbed for disputes in Georgia.

A recognized approach to promote the goals of Sustainable Development, while at the same time utilizing economic savings for both industry and society, is Resource Efficient and Cleaner Production (RECP). This concept suggests using market-based strategies in parallel with informative strategies and administrative instruments in order to promote pollution prevention at source and an efficient use of resources.

This thesis proposes a feasible RECP policy scenario to promote a wider implementation of RECP in the Georgian industry while investigating the conditions for RECP in the current Georgian system for environmental protection. The potential for RECP in the Georgian industry is there, but the conditions to realize it are today low. The condition for RECP in the legal framework and in policymaking is also found low. Extensive capacity-building on a basic level in several areas is needed to improve these conditions.

A feasible policy scenario should today rely on activities promoting awareness and advocacy for RECP in parallel with monitoring and controlling a limited number of substances in order not to force high pollution control costs and to make enforcement manageable. Economic charges should be set high enough to function as a deterrent to pollute. Access to finance for RECP investment is believed to be a key to further unfold the RECP potential in the Georgian industry. Successively, the RECP strategies could become more encompassing when the condition for RECP is improved in industry, the legal framework and in policymaking.

**Keywords:** RECP CP Georgia Scenario Policy

## **Executive Summary**

As a consequence of the breakup of the Soviet Union in 1991 the industrial activities in Georgia stagnated, and since then the economy has slowly but surely recovered. The socio-economic dimension is, however, still under pressure with a significant unemployment rate. The war with Russia in 2008 did also affect the socio-economic situation significantly. As the economy and the industry in Georgia are slowly recovering there are signs that more pressure is put on the environment and natural resources. The Georgian industry is found to use resources inefficiently and its energy intensity is several times higher than that of the industry in the EU.

In addition, industrial waste has been found to be disposed of without environmental requirements. Given the economic and politically turbulent situation dating back from the breakup of the Soviet Union and onwards, economic and social issues have been on top of the political agenda. The capacity and priority for environmental protection has been low the last decade resulting in extensive deregulations in the sphere of environmental protection. However, today the basic functions for environmental protection are currently being reinforced and environmental issues are given a higher priority.

Georgia's ambition and need for economic growth is naturally essential to improve the social and economic dimensions, hence environmental goals need to be formulated in line with this. However, to integrate economic and social goals with environmental objectives is a challenging task, especially in developing countries and countries in transition where resources are scarce. At the same time Georgia is dependent on foreign assistance to drive and finance environmental protection efforts which underlines the need to manage resources in a cost-effective way.

A recognized concept which has proved to be successful in combining goals of development with environmental concern is Resource Efficient and Cleaner Production (RECP), formerly simply called Cleaner Production (CP). RECP has increasingly put its imprint on environmental policies worldwide. RECP strategies are recognized as more effective and less costly from an administrative point of view. From an industrial perspective RECP has a preventive approach to reduce environmental burden opposite to the traditional end-of-pipe approach. The broad goals of RECP are to prevent and reduce, and as far as possible eliminate pollution at the source, and to efficiently manage and use natural resources. For both economic and environmental reasons the RECP approach is frequently seen as superior as it could utilize the positive effects on the environment combined with economic savings both for industry and society.

The purpose of this research was to contribute to increased understanding of how to include RECP within the Georgian environmental policy framework in order to provide a path to Sustainable Development for its industry. In order to guide the research two research questions were formulated:

1. What are the conditions for RECP within the current Georgian system; that is, in practices of the industry, in the legal framework and in policymaking?
2. What policies are most likely to promote a wider implementation of the RECP approach within the Georgian industry?

A method and framework for an ex-ante policy evaluation was developed within which the condition for RECP in the industry, in the legal framework and policymaking was evaluated. A policy Scenario for RECP in the Georgian industry was then constructed. The progress towards Sustainable Development in post-Soviet countries and examples of already implemented RECP strategies among these countries were taken into consideration.

Initially, the environmental, socio-economic and industrial conditions in Georgia were studied in reports and environmental performance reviews. Previous projects within RECP undertaken in Georgia were also reviewed. Literature studies within the field of policymaking and evaluation was undertaken, as well as, within Resource Efficient and Cleaner Production.

A range of stakeholders were approached and interviewed in Georgia in order to confirm and expand the initial findings, and to discuss potentially feasible solutions to environmental issues. The interviewees in Georgia included Georgian Government representatives, environmental NGOs, RECP specialists, as well as, the Georgian beverage industry where a simplified RECP assessment was undertaken. In addition, several RECP specialists across Europe with experience from the region were interviewed. The beverage industry was chosen as a case study as the production processes in this industry are, although specific, not too different from those in other sectors of industry. Hence, to understand what triggers this industry to apply RECP measures could be valuable from a policymaking point of view. The production phase of these companies was assessed with a focus on energy consumption, as well as, water and material and their related waste.

### ***The condition for RECP in industry***

The already indicated potential for RECP in the Georgian industry was confirmed within the research and is particularly related to the presence of out-dated technology. The condition for RECP in the industry, that is, to what degree RECP measures could be expected to be adopted by the industry today should be considered rather low. In discussions with Georgian RECP specialists several issues appeared as potential barriers to the adoption of RECP within the Georgian industry:

- A lack of awareness of how to work systematically with RECP (identified among various industrial sectors in previous projects).
- A lack of financial means for RECP investments (such as more efficient technology and machines) among small and medium sized companies.
- The access to attractive loans for RECP investments is not perceived to be available for small and medium sized companies to a desired degree.
- A generally low level of environmental regulation set and lax enforcement practices (which now supposedly gradually is changing).
- Corrupt enforcement practices have been present for years which may have created a culture of non-compliance in industry.

The condition for RECP within the Georgian beverage industry was found to be slightly different than the findings presented above. RECP was in theory not a familiar concept to the beverage industry; but in practice most of the beverage companies had undertaken far reaching energy efficiency measures in their production processes. This may be explained by that the beverage industry is a large energy consumer which creates a natural incentive to investigate and implement energy efficiency measures. Measures to decrease the use of water and material throughout the process were also undertaken. The savings achieved or which potentially could be reached within the beverage industry were significant and emphasize that waste is a lost resource and therefore should be prevented in the first place.

The perception of prices for energy (electricity and natural gas) was highly varying among the beverage companies from rather low to moderate and relatively high. However, the prices of energy in Georgia are among the highest in the region among other post-Soviet countries. The water prices were perceived to be moderate among all the beverage companies assessed, but two who considered the prices to be very high. In recent years a significant increase of water prices were imposed on companies in the Tbilisi region but from a low level. Both water and energy prices were considered to drive RECP measures at a few of the companies, and some

stated that an increase of these prices would force prices on the final product itself. The high use of these resources in the production and the fact that water is a main part of the product has likely influenced the responses. Based on the limited research it is not reasonable to draw any far reaching conclusions. More research of this issue should be conducted in all sectors of the industry in order to guide policymakers of how to use pricing mechanisms to promote an efficient use of natural resources.

The drivers to adopt RECP in the beverage industry today were mainly found to be made out of:

- The large production volume, the continuous flow and large consumption of particularly energy but also water, as well as, material in production processes.
- Relatively strong internal environmental requirements.
- Most companies had strong finances (and could afford larger RECP investments).
- Less costly RECP opportunities available with significant payback.
- High hygiene and quality standards of products (which is a strong link to RECP).
- High level of technical and efficiency know-how present.

The main barriers to adopt RECP in the Georgian beverage industry today were mainly found to be related to:

- A generally low level of environmental regulation set by authorities and lax enforcement practices.
- Low cost to discharge waste sometime makes it more attractive to pollute than to prevent or treat.
- Taxes imposed on industry are by authorities mainly used as a revenue tool rather than to protect the environment or to promote an efficient use of resources.

### ***The condition for RECP in policymaking and the legal framework***

In order to evaluate the condition to include RECP strategies in the Georgian policymaking a multi-criteria analysis was undertaken. The selected criteria *administrative feasibility, social and political acceptance, incentives for improvement, cost-effectiveness, equity* and *effectiveness* were useful while investigating how a policy scenario would affect various stakeholders and actors involved, and what capacity and resources are available in Georgia. The RECP approach advocates the inclusion of RECP strategies in a whole national policy framework in order to achieve environmental objectives in a more efficient and cost-effective way. The use of market-based instruments in policymaking such as pricing mechanisms is recommended as it could influence the environmental performance significantly. Informative strategies aimed at putting pressure on the industry and to inform is also important, as well as, to exercise a regulatory pressure with the help of administrative instruments. Further, RECP promotes a flexible and decentralized approach when it comes to abatement where the industry is given more freedom due to its current ability to reduce their environmental impact. A closer collaboration between regulators and industrial actors is also preferred to successfully promote RECP in industry.

How feasible is it then to introduce this kind of approach in Georgian policymaking today? Despite the currently strengthened enforcement function which will make better use of the polluter pays principle, the condition for RECP in policymaking was considered rather low for a number of reasons:

- Socio-economic challenges are high on the political agenda which favors growth oriented activities to environmental protection.

- The politically contradicting views in Georgia of how to balance and combine socio-economic goals with environmental concern difficult a more mainstreamed policymaking to benefit RECP.
- To impose environmental costs on industry is a sensitive issue in Georgia as it is considered to hamper industrial growth.
- Taxes targeting the industry in Georgia appear to be used as a revenue tool rather than for environmental protection purposes and to promote an efficient use of resources.
- It is unclear to what degree the industry possesses the capacity, knowledge and the financial means to respond to policy interventions related to RECP.
- To publicly disclose environmental performance is also difficult with no eco-labeling system in place, and the general public environmental awareness may also be limited.
- The limited awareness and advocacy for RECP as a concept in both industry and among decision makers do not facilitate the inclusion of RECP in a policymaking process.
- The indicated present tension between the industry and authorities would need to be improved in order to apply informative RECP strategies which assume a closer collaboration.

The condition for RECP in the legal framework should also be considered low today for a number of reasons, including:

- The legal framework, although currently under reformation, is today made out of gaps and inconsistencies which makes environmental protection difficult to implement and enforce.
- Extensive deregulations in the environmental sphere have been made in recent years (but the outlook to strengthen environmental protection in the legal framework is better).
- A National Sustainable Development Strategy which could make out an important overarching strategic policy document in order to guide policymaking is not in place.
- The formal demands and objectives found in the reviewed policy documents and legal instruments which could be linked and supported by RECP, are not well anchored in reality.

Nonetheless, the stated objectives in the reviewed policy documents and legal instruments provide an opportunity to promote RECP as an approach to achieve these. This is for instance evident within the new Government Program where various specific policies would benefit from a wider implementation of RECP within the Georgian industry. This is especially true for the economic policy. The environmental multi-lateral agreements entered by Georgia would also benefit from RECP, as well as, the National Environmental Action Program in Georgia. A waste management framework law is also currently being created which should prove to be helpful in order include RECP strategies in a Georgian environmental policy framework to a higher degree over time. The existing legal framework could also be used to promote RECP as recommendations of how to work with for instance eco-labeling and soft loans for Sustainable Development activities are available.

### ***Policies most likely to promote a wider implementation of the RECP approach***

The condition for RECP within the legal framework and the policymaking process, as well as, in practices in the industry is as already concluded found to be rather low in Georgia. A RECP policy scenario would have to be adapted to the current conditions and predicted future developments in Georgia. Despite the limited possibility to include RECP strategies in a Georgian environmental policy framework there are still policy interventions which are feasible in order to promote a wider implementation of RECP within industry. Initially, capacity-building for RECP is essential which could improve awareness and advocacy in industry and among decision makers. A RECP policy could in an initial phase include the following:

- RECP demonstration projects and training for industry
- Dissemination of results from RECP demonstration projects to decision makers
- RECP awards for the industry to promote good environmental performance
- Increased collaboration and partnership building with industry
- Environmental standards and regulations – addressing a limited number of substances
- Pollution taxes and fees - addressing a limited number of substances
- Environmental Fund - to strengthen enforcement capacity
- Attractive credit lines for RECP investments for the industry

The presence of international donor RECP projects and capacity-building efforts is a prerequisite to continue with demonstration projects. To disseminate the results of these projects to key stakeholders and persons is crucial in order to create a leverage point. Further, to continuously develop the collaboration and dialogue in-between industry and authorities are also necessary where a joint Sustainable Development strategy could be outlined over time.

The strengthened administrative function enables the enforcement of environmental standards and regulations to a higher degree. However, the monitoring and control should, suggestively, be limited to a number of substances in order not to force the costs for pollution control which previously has been the case in Georgia. Environmental charges should be applied in parallel with the environmental standards and regulations. These should not be too low in order to promote a culture of compliance and act as a deterrent to pollute. An environmental fund may be feasible to introduce in order to financially strengthen the enforcement function. This is already done in Armenia and Azerbaijan where non-compliance fees are collected and re-used for environmental protection purposes.

Successively, the RECP strategies in a Georgian environmental policy framework could be more encompassing and effective when sufficient capacity for RECP has been built in industry, the legal framework and in policymaking. A general development of the socio-economic dimension in Georgia will also facilitate a more stringent environmental protection and advocacy to apply RECP strategies. Suggestively, the RECP policy interventions could at a later stage be enlarged with the following:

- Expanded and more stringent environmental standards and regulations, accompanied with pollution taxes and fees
- Trade restrictions targeting undesired material and products imported to Georgia
- Energy efficiency program
- Increased public disclosure of environmental performance via eco-labeling system
- Voluntary agreements and “grace periods” to comply with regulations
- Pricing mechanisms to address the management and use of natural resources
- A gradual ecological reformation of taxes

To gradually expand the environmental issues to fall under the environmental regulatory standards and to make them more stringent is recommended in order to promote continuous improvements in industry along with economic charges. Sub-law regulations which are planned to be developed in Georgia will provide the possibility to apply trade restrictions on undesired products and material imported to Georgia. This could be a cost-effective policy intervention which does not have to require high administrative resources. Against the backdrop of the energy intense Georgian industry, the introduction of an energy efficiency program which could provide the industry with tax exemptions if energy efficiency measures are undertaken may be plausible in the future.

The Georgian Environmental Protection Law has a provision for eco-labeling developed to promote environmentally friendly production which should be explored in order to put

pressure on industrial environmental performance. It could be introduced as a competitive tool for the industry in order to distinguish itself from other companies. The policy mix should gradually also include more market-based instruments to influence negative behavior and promote positive actions related to RECP. To gradually re-emphasize taxes from only being a way to collect revenues to instead be used to protect the environment and promote an efficient use of resources should be investigated over time.

### ***Improving the conditions for RECP***

A future Georgian environmental policy framework which could include RECP strategies to a higher degree to influence industrial behavior is as mentioned dependent on that several conditions beneficial for RECP are developed over time. The following conditions would need to be considerably improved in Georgia: policy and regulatory incentives to RECP, awareness and advocacy for RECP, access to finance for environmentally sound technologies/RECP Investment, and RECP service delivery.

Basic improvements regarding the content and the way legislation is maintained and implemented in the area of environmental protection are by the EU recommended all of the so called Eastern Partnership countries including Georgia, Armenia, Azerbaijan, Moldova, Ukraine and Belarus. The need to raise awareness about Sustainable Development among all stakeholders in society is also recommended, and to involve the public in decision related to these issues. The policy-mix and the permitting system should also be developed, and a more integrated policy approach to environmental protection introduced, where various policies work towards a more Sustainable Development. These recommendations are a few out of several which should be considered in Georgia while developing and implementing a modern environmental policy where RECP strategies suggestively could be more prevalent.

Specific recommendations found in this thesis' research which could improve the condition for RECP within the Georgian industry include:

- Formulation of a National Sustainable Development Strategy to guide policymaking.
- Creation of a RECP Policy while adjusting legislation and statutes.
- Conduct comprehensive industry research to enable relevant and effective policymaking.
- Improve public access to environmental information in order to improve general environmental awareness and increased public participation.
- Identify key stakeholders for dissemination of RECP demonstration project results.
- Investigate ways to improve access to finance for RECP investments for the industry.
- Establish a RECP Centre offering a full service for the industry.
- Develop eco-labeling system to disclose industrial environmental performance.

### ***Outlook for the future***

The future development and challenges of the socio-economic dimension in Georgia will probably continue to influence the political willingness to prioritize and promote environmental protection. The social and economic dimensions will most likely in a foreseeable future have a continued dominant priority in Georgia. Hence, the dependency of international collaboration and support provided by external donors in the area of environmental protection could be expected to be high also in the future in Georgia. More pressure will increasingly also be put on the environment along with increased economic growth which will drive the costs for environmental protection even more. This emphasizes the need for a cost-effective and efficient environmental policy in Georgia where resources are scarce. A RECP approach stands out as an interesting option in Georgia and should be considered. "Low hanging fruits" in the Georgian industry in the form of a high energy

intensity and out-dated technology provide particular potential to apply RECP and strengthen the industry.

An extrapolation of the RECP potential undertaken in this thesis indicated that a wider implementation of RECP within industry could decrease the energy consumption in Georgia to a great deal which would benefit the industry economically, as well as, the general environmental condition. This kind of findings should be a driver among decision makers, the industry and policymakers to prevent an inefficient management and use of natural resources. It underlines that all kinds of waste is a lost resource. The energy security goals of Georgia would also benefit from a wider implementation of RECP in industry where energy resources are used and managed in a more efficient way.

RECP also supports the compliance of multilateral agreements in the environmental sphere which Georgia has entered. A wider implementation of RECP would, in addition, support the goals related to GHG emission reduction and climate change mitigation stated as long term goals in the Georgian National Environmental Action Program. To include the principles of RECP in policymaking would also support various specific policies in the new Government Program, not least the economic policy which stands out as a back bone in this program. RECP could contribute to build a more resilient economy, and a stronger and more competitive industry.

Considering the obvious benefits for the industry in terms of saving of resources, cost reductions and efficiency, the RECP approach may in the future serve as a vital part of a more elaborated industrial policy in Georgia. The presented usefulness and relevance of the RECP approach for Georgia should prove to qualify RECP as an attractive path towards Sustainable Development for the Georgian industry.

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## **Abbreviations**

CO <sub>2</sub>	Carbon dioxide
CP	Cleaner Production
CSR	Corporate Social Responsibility
EaP	The Eastern Partnership
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EEA	European Environmental Agency
EPR	Extended Producer Responsibility
EUR	Euro
EU	European Union
EST	Environmentally Sound Technologies
IFC	International Finance Corporation
GDP	Growth Domestic Product
GHG	Green House Gases
IEEP	Institute for European Environmental Policy
IIIEE	International Institute for Industrial Environmental Economics
IPPC	Integrated Pollution Prevention and Control
MENRP	Ministry of Environment and Natural Resources Protection
MESD	Ministry of Economy and Sustainable Development
MW	Mega Watt
NCCP	National Centre for Cleaner Production
NEFCO	Nordic Environment Finance Corporation
NGO	Non Governmental Organization
NO <sub>x</sub>	Nitrogen oxide
OECD	Organisation for Economic Co-operation and Development
PET	Polyethylene terephthalate
PFE	Program for Energy Efficiency
REC	Regional Environmental Centre
RECP	Resource Efficient and Cleaner Production
SME	Small and medium sized
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization
USAID	The US Agency for International Development
US EPA	US Environmental Protection Agency
WBCSD	World Business Council for Sustainable Development
WEC	World Environment Center
WHO	World Health Organization



# 1 Introduction

## 1.1 Background and Statement of the Problem

As a consequence of the breakup of the Soviet Union in 1991, the industrial activities in Georgia stagnated (Interview, Dzneladze, 2013) and since then the economy has slowly, but surely, recovered (The World Bank, 2012). According to The World Bank (2012) the economy of Georgia continued to expand in 2012. But despite positive signs of growth the unemployment rate was 15% by the end of 2011, which is lower than previous years but still significant. Growth of the economic base to a large part has been driven by foreign direct investments but also the improved tax collection rate (UNECE, 2010). The increase in foreign investment could to a great deal be contributed to governmental and economic reforms addressing anti-corruption measures and de-regulations while creating a favorable business climate and large-scale privatization in the economy (MENRP, 2011). Given the economic and politically turbulent situation dating back from the breakup of the Soviet Union and onwards, economic and social issues have been on top of the political agenda (UNECE, 2010).

Since Soviet times the environmental impact from the industrial point sources has decreased significantly which is much due to the stagnation and collapse of the heavy industry, but also because the introduction of new technologies in recent years resulting in less air emissions (MENRP, 2011). However, as the economy and the industry in Georgia are slowly recovering The Ministry of Environment and Natural Resources Protection (MENRP) states in their recent State of the Environment report (2011) that there are signs that more pressure is put on the environment and natural resources. In addition, a Waste Inventory conducted by UNDP (2007) in Georgia states that industrial waste often is disposed without environmental requirements. Georgia's ambition and need for economic growth is naturally essential to improve the social and economic dimensions, hence environmental goals needs to be formulated in line with this. However, to combine economic and social goals with environmental efforts is a challenging task (OECD, 2008).

A recognized concept which has proved to be successful for this purpose is Resource Efficient and Cleaner Production (RECP), formerly simply called Cleaner Production (CP) by UNEP and UNIDO (2013). Resource efficiency is considered a key to develop more sustainable industrial systems and a "Green" industry; hence since 2009 the abbreviation RECP is used instead of CP. In addition, these concepts often change due to that wording could make out a difference in terms of acceptability and willingness to adoption among politicians and donors (Interview, Dobes, 2013). This research will refer to the concept as RECP. In short, RECP is "doing more with fewer resources and less pollution" (UNIDO, 2012).

From an industrial perspective RECP has a preventive approach to reduce environmental burden opposite to the traditional end-of-pipe approach by implementing add-on measures to mitigate the environmental impact. For both economic and environmental reasons RECP is frequently seen as superior to end-of-pipe technologies (Frondel, Horbach, & Rennings, 2007). In 1990 United Nations Environmental Programme (UNEP) coined the definition of the cleaner production concept as "a continuous application of an integrated preventive environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and environment". This concept could utilize the positive effects on the environment combined with economic savings both for industry and society (UNEP, 1994).

Georgia is facing challenges related to development of the economic and social dimensions, and in parallel more stress is increasingly put on the environment. An inefficient management of resources has found to be present within the industry (MENRP, 2011) which is estimated to provide a significant potential to apply RECP approaches and at the same time Georgia is dependent on foreign assistance to drive and finance environmental protection efforts (UNECE, 2010). In the light of this, it appears interesting to investigate the feasibility to integrate RECP into an environmental policy which could enable a tangible, resource-efficient and attractive path to Sustainable Development for the Georgian industry.

## 1.2 Aim and Objectives of the Research

This research will contribute to increased understanding of how to include RECP within the Georgian environmental policy framework in order to provide a path to Sustainable Development for its industry.

In order to fulfill the aim it is imperative to confirm the already indicated potential for RECP within the Georgian industry and to understand what triggers the industry to work in this direction. It is chosen to explore these issues by firstly examining the use and management of natural resources and waste within the Georgian beverage industry. Through literature and stakeholder interviews it is also possible to understand the legal structures, the resource pricing system and other policy mechanisms in Georgia which act as drivers and barriers for the promotion of RECP.

Insights from experiences of introducing policies for promoting RECP in other post-Soviet economies similar to Georgia are also a valuable input.

The research questions which guide the investigation and contribute to the understanding of the above stated aim are:

1. What are the conditions for RECP within the current Georgian system; that is in practices of the industry, in the legal framework and in policymaking?
2. What policies are most likely to promote a wider implementation of the RECP approach within the Georgian industry?

## 1.3 Scope of thesis

### *Choice of stakeholder interviewees*

The stakeholders to be interviewed were chosen with the hope to provide useful insights in line with the purpose of the thesis, that is, to contribute to an increased understanding of the feasibility for the inclusion of RECP within the Georgian environmental policy framework. In order to achieve this, the policymaking process, legal structures and other policy mechanisms within the sphere of environmental protection needed to be examined. The interviewees chosen for this purpose were senior ministers within several ministries, RECP specialists, and experts of policy, environmental protection and legislation at several NGOs in Georgia.

The five ministers interviewed were belonging to the Ministry of Environment and Natural Resources Protection, Ministry of Energy, and Ministry of Economy and Sustainable Development. Today there is no particular industrial ministry in Georgia (The Government of Georgia, 2012). These particular Ministries were addressed as they typically could be key actors while integrating RECP into the respective policies (UNIDO, 2002). Interviews were also conducted at three different NGOs working with environmental protection; awareness raising and policymaking in Georgia and the Caucasus region. These interviews were aimed at giving a nuanced picture and a second opinion of the political policymaking process, legal

structures and other policy mechanisms. Two of these NGO representatives had previously been working within the Georgian Government. The interviews at the ministries and the NGOs were crucial in order to confirm my findings from literature concerning the legal and policy framework and the state of the environment, and in order to update myself on the current situation and future predictions in the area.

In order to explore, document and to confirm literature findings regarding RECP potential in the Georgian industry and other post-Soviet countries in the region; simplified RECP assessments were conducted within the Georgian beverage industry. In order to gain the necessary data on a detailed level at the industries, the respondents were production managers, executive directors and plant directors with thorough knowledge of the management and processing of resources and waste.

In addition, six RECP specialists with experience from Georgia and the region were interviewed who gave valuable insights and recommendations prior to the simplified assessment in the beverage industry.

### ***Choice of focus area***

Today there is a wide awareness of the fact that human activity has an impact on the environment and also common acceptance of that it is highly important to mitigate the impacts of production processes and products (Fijal, 2007).

The opportunities to increase energy efficiency and to reduce the environmental impact appear to be significant in Georgia (UNECE, 2010), (MENRP, 2011). At the same time, no RECP program is currently established although Georgia has previous experience from donor projects within RECP. To review and understand these previous RECP efforts and their limitations were consequently interesting. A project within the EU's Eastern Neighbourhood Programme aimed at greening the economies in the region, including Georgia is currently being launched (OECD, 2013). This also entails RECP components. This research aims to contribute with findings which could prove to be useful in this recently launched program.

The concept of RECP offers both industry and society opportunities to follow a path of sustainable growth while reducing costs and mitigating the environmental impact. Not least, RECP could be a possible way of combining environmental goals with economic and social goals. From this background it appeared interesting to investigate the opportunities, as well as, barriers and incentives to apply methods and technologies of RECP within the industry, and the outlook to make imprints of RECP on the national policy framework.

### ***Choice of industry***

The industries investigated more closely produce beverage products such as table water, mineral water, beer, soft drinks and juice. From a Cleaner Production point of view the beverage industry is interesting as it usually involves a continuous use of resources which provides well-known opportunities for improvements (IFC, 2007), (Interview, Dobes, 2013).

The production phase may require high levels of thermal energy in several processes, and the industry is in this phase also a significant user of water resources and large user of packaging material (Dominique, Marcotte, & Arcand, 2006), (Olajire, 2012). Hence, the opportunities to apply the concept of cleaner production are beneficial. This kind of industry is often standardized and not too specialized in terms of processes, waste generation and use of natural resources, as some other industries, meaning that the sector may provide an indication of the general conditions in the industry. Knowledge from this industry may be transferable to

other parts of the industry and findings could be used for policymaking purposes in order to promote RECP (Interview, Lindhqvist, 2013).

The beverage industry which uses own national resources (water of a high quality) for its products and which also is near its market should be of a high priority to Georgia. This kind of nationally established industries with the above characteristics have a possibility to be resilient, create jobs and contribute to internal growth and provide a security aspect. In this sense the beverage industry should be of interest for Georgia and hence also of interest to investigate.

What also reinforces the relevance to investigate the beverage sector in a RECP context is the fact that the food and beverage industry among other industries is a focus industry within the initiative aimed at greening the economies of the Eastern partnership countries within the Eastern Neighbourhood Programme (OECD, 2013).

### ***Choice of phase of RECP and input and output streams to assess***

The concept of RECP addresses processes, products and services in order to increase efficiency and reduce risks to humans and the environment (UNEP, 2013). The whole life cycle is encompassed in the RECP approach. This thesis addresses solely the processes in the initial stage of a product; in particular the production process and the modification of this stage of the production system. However, findings related to the other parts of the production process such as on-site recycling and material substitution will also be presented. The streams of water and energy was chosen as focus of the assessment in the Georgian industry as this is indicated as interesting from a RECP point of view in literature (IFC, 2007) and among RECP experts (Interview, Dobes, 2013). In addition, the material aspect in the production process was also chosen as the beverage industry as known also uses mostly plastic or glass as packaging material for its products.

In developed countries the efforts to combat environmental impact through cleaner production has shifted from the production phase to the use and disposal phase. This is due to the successful reduction of pollution load from a manufacturing point of view in the developed world. The case appears to be different in Georgia where little waste management seems to be undertaken by the industry as a consequence of lax requirements in combination with the lack of an effective function for environmental protection (UNDP, 2007), (UNECE, 2010). It seems plausible to look for improvements in the production phase to begin with. Hence, the other stages of a products life cycle such as extraction of raw material and end-of-life of the products are not considered.

## **1.4 Methodology**

### ***Normative approach***

As concluded RECP is today a recognized approach in order to move industry in a more sustainable direction while integrating environmental concern with goals of development. RECP is promoted by numerous of international organizations such as UNEP, UNIDO and OECD as well as national governments in the developed world, as a cost-effective and feasible approach for developing countries and economies in transition, where the opportunities for great improvements are even larger than in the OECD countries. RECP has also put its imprint on many countries environmental policies which for instance is the case in the EU and China where the preventative approach of RECP is highly integrated. As mentioned, this research does also aim to confirm the indicated potential of RECP to benefit both environmental and economic goals within the Georgian industry. This is conducted

through simplified RECP assessments in the Georgian beverage industry and by interviews with Georgian RECP specialists.

This background should prove to justify the normative approach this research has to RECP when accepting RECP as a useful and desired approach of how to enable the combination of environmental objectives with economic and social goals. A feasible policy scenario based on the goals of RECP is suggested while conducting an ex-ante policy evaluation. An ex-ante policy evaluation method and multi-criteria analysis is by Crabbé and Leroy (2008) stated to play a decisive part in the rational and goal-oriented perspective of a policy while attempting to predict effectiveness and effect of an environmental policy.

### ***Policy evaluation method***

In order to fulfill the purpose of this thesis a policy scenario needs to be outlined based on predictions of what appears to be feasible in Georgia; e.g. a policy should be evaluated in ex-ante, before it has been implemented.

An ex-ante policy evaluation could be said to at once be a method for policy design and policy development (Crabbé & Leroy, 2008). This is in contrast to an ex-post evaluation where a policy is evaluated after its development and implementation. However, in practice a combination of these two methods is often undertaken. According to a guidance document for ex-ante evaluation developed by the European Commission (2013), it is recommended that the process of an ex-ante evaluation begins with an analysis of the current situation and ends with a substantiated proposition and recommendation. The ex-ante evaluation endeavors the challenging task of how to optimize program structure, the sequence of the priorities and concert of the program, and justify proposed decisions (Hungarian National Development Agency, 2013).

The areas which are investigated in this research within the ex-ante policy evaluation will contribute to analyze disparities, inconsistencies and gaps, and possibilities in the current system to promote RECP within an environmental policy. This will facilitate the process of developing a plausible and feasible policy scenario for Georgia and to assess its estimated impact.

### ***Method for data analysis***

In order to suggest a policy scenario targeting the Georgian industry there is a need to identify and compare different alternatives based on a set of targets which in this case are the broad goals of RECP. In addition, relevant criteria of how a policy scenario would affect various stakeholders and actors involved by the policy needs to be identified.

One aid to analyze data and evaluate different options while considering conflicting interests is a multi-criteria evaluation (Munda, 1995). This method is attractive to policymakers as it enables the integration of the social and political dimensions and the presence of interests and opinions of various stakeholders (Gamper & Turcanu, 2007). Multi-criteria analysis is particularly attractive due to that minor administrative resources is needed and useful when data needed for environmental policymaking is lacking which is often the case in developing countries (Beierle, 2002).

Considering the above characteristics of the multi-criteria analysis, it stands out as an interesting method for data analysis and has been chosen as a basis for the policy evaluation framework in this thesis. The Figure 1-2 below presenting this thesis' method and framework for ex-ante policy evaluation displays the set of multi-criteria chosen. The choice of these specific criteria is further justified in Chapter 2.2.

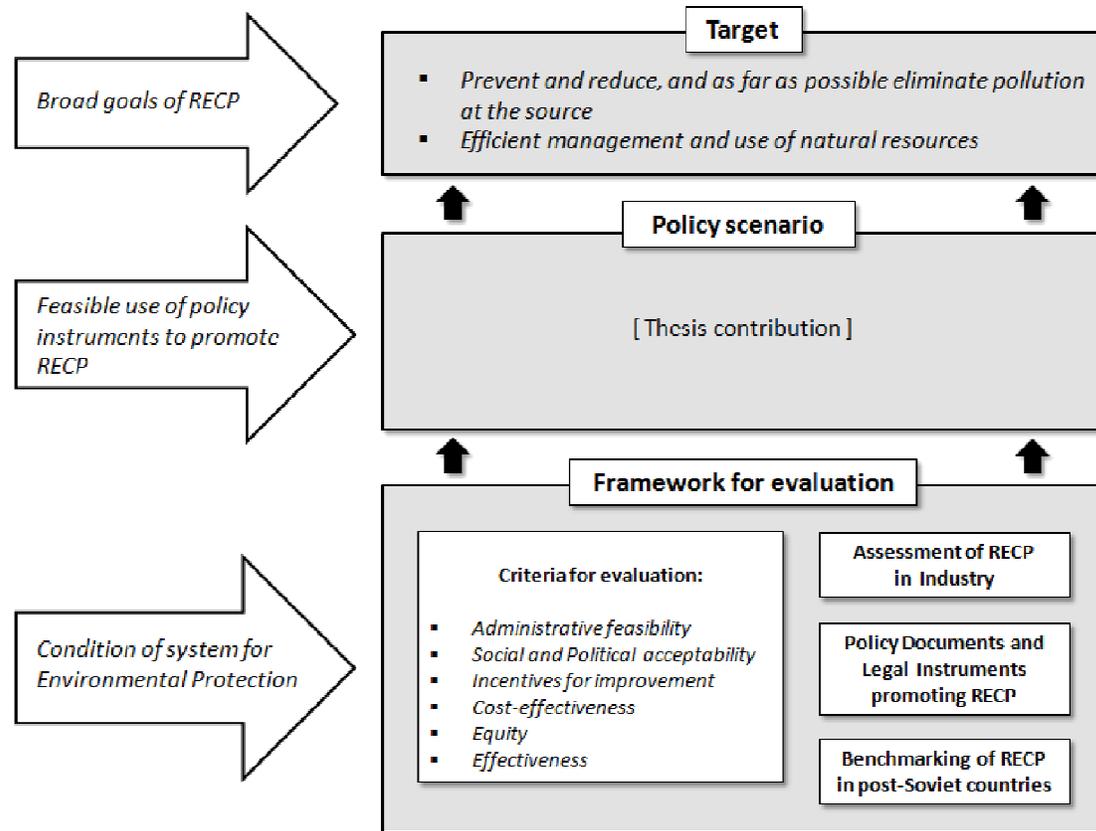


Figure 1-1 Method and framework for ex-ante policy evaluation

The figure gives an overview of how the choices of method and evaluation are integrated in a process aimed at proposing a policy scenario striving towards industrial adoption of the broader goals of RECP. The method and framework model illustrated in Figure 1.2 is put together with inspiration from various sources of literature in the field of policymaking and policy evaluation.

### **Method for data collection**

The research and data collection of the thesis has been carried out in the following sequence:

#### *1. Initial review of conditions in Georgia*

An initial review of the socio-economic situation and state of the environment in Georgia was undertaken. Previously, implemented projects and initiatives within RECP in Georgia and the region were also reviewed in order to get a more elaborated understanding of conditions and challenges the industry is facing regarding the use of natural resources and generation of waste. In addition, a study of already conducted environmental performance and governance reviews made by international institutions including UNECE, UNDP, and OECD was also undertaken to be familiar with structural, legal and institutional challenges in the area of environmental protection.

This initial research gave a sufficient background in order to understand the challenges Georgia is facing within the economic, social and environmental dimensions. The relatively limited data available especially regarding waste levels and macro-economic data provided no opportunity to be selective, but rather to use what was available. The lack of available data within the area of industrial waste should be considered a limitation. However, stakeholder

interviews and the undertaken RECP assessment at the Georgian beverage industry have been a valuable source to complement and provide essential data in this context.

## *2. Literature study*

A literature study within policymaking and evaluation was conducted in order to document what is considered to be good policymaking and what conditions should prevail in order to make it successful. A relevant evaluation criterion frame work was set up based on this research. A study of policy instruments was also undertaken and the most commonly used instruments were listed. The purpose was to give an overview and understanding of policy instruments which are available and acknowledged within policymaking. This overview and knowledge was valuable in the stage where a mix of policy instrument finally were selected for the purpose of promoting RECP. A basic study of RECP and its applicability in environmental policymaking and industry was conducted in order to prepare for the stakeholder interviews which were conducted in Georgia.

## *3. Stakeholder interviews*

The next stage involved empirical data gathering in Georgia among stakeholders in order to confirm the findings in the initial stage, to expand the base of knowledge about the conditions in Georgia and to discuss views on potential solutions to problems. The stakeholder interviews were conducted with governmental representatives in the form of ministers, industrial players, policymakers, NGOs, national and international RECP specialists and donor organizations. The interviews were conducted in a semi-structured manner and it was difficult to avoid a degree of leading questions that may have affected the answers. However, in triangulation with other interviewees and literature and attempts to critically review the interview notes this has likely contributed to remedy this aspect. In addition, the interviews at the ministries most likely have a portion of political correctness and tactics although the respondents appeared quite straightforward. The NGOs on the other hand explicitly contributed with more daring answers. Even though, all of the respondents spoke English well there is most likely a degree of linguistic confusion which may have affected the answers.

The visits at the industries took the form of structured and semi-structured interviews or discussions. An interview script was outlined, as well as, a template for assessing consumption of resources and waste streams. A walk-through inspection was conducted at most of the facilities while the production processes were further explained. Language barriers might have affected the answers to some degree but most respondents spoke English well. In a few cases an interpreter was used to mitigate misunderstandings. It is likely that some data may be considered sensitive in the area of environment as, legal obligations are present to some degree, which may have led to information withhold. However, in most cases the industries were perceived to be outspoken and willing to share as well concerns, and failures, as success. To study this kind of industry which processes is not too different from production processes in other sectors of the industry is as mentioned interesting in order to provide policymakers with information which also could be used while outlining policy interventions for the industry as a whole.

## *4. Policy documents and legal instruments promoting RECP*

A review of policy documents and legal instruments were conducted in order to identify drivers and barriers for the promotion of RECP. The review points out the extent to which the formal demands and how they in reality are applied differs. The limitation is in this context made out of how well I manage to capture these kinds of discrepancies through literature and interviews.

### *5. Analysis and expanded literature study*

An expanded literature study of how to promote and integrate the RECP concept in an environmental policy framework was undertaken with the purpose to investigate the feasibility of its inclusion in the case of Georgia. Hence, RECP principle and strategies made out an essential element while investigating ex-ante the Georgian legal and policy framework through the selected evaluation criteria. Findings from reviewing the policy documents and legal instruments and their suitability to promote RECP were incorporated in the analysis together with the findings from stakeholder interviews and industry RECP assessments.

In addition, as a benchmark to the overall aim of investigating the feasibility to include RECP in a Georgian environmental policy framework, a study of the experience of promoting and introducing Sustainable Development and to promote RECP in other post-Soviet countries in the region was undertaken. The findings were introduced in the discussion chapter while revisiting the RECP concept and what conditions and strategies are preferred in order to promote a wider implementation of RECP in industry.

These various elements incorporated and used in the ex-ante policy evaluation are believed to constitute a solid and necessary basis in order to suggest a policy scenario feasible for Georgia.

The literature on how to promote RECP within a national policy framework was adhered from various academic sources as well as from international organizations with extensive experience of promoting and supporting the implementation of sustainable systems for consumption and production in transition economies such as UNIDO, UNEP and OECD. The combination of academic and more practical sources related to RECP was chosen to give scientific as well as practical basis for the ex-ante policy evaluation and to suggest a policy scenario which could work in practice.

## **1.5 Target Audience**

This research will contribute to increased understanding of how to include RECP within the Georgian environmental policy framework, and hence targets in particular donor organizations interested in promoting RECP and sustainable development in Georgia.

While donor organizations most likely will play an important role in the future development of RECP in Georgia, a target is also Georgian policymakers interested in unfolding the potential of RECP in policymaking and the Georgian industry, while giving examples of how to apply RECP in practice.

The research and its findings also address initiatives undertaken with the purpose to address problems and challenges of a similar nature in other countries in the region and beyond. In addition, academics interested in environmental policymaking and, in particularly, in pollution prevention, as well as other aspects of RECP promotion, is a target group of the research.

## **1.6 Structure of the thesis**

This thesis is made out of seven sections. Chapter 1 is the introduction which describes the background, aim and objective, scope, target audience and methodology. Chapter 2 presents the theoretical framework for policy evaluation and policy instruments, as well as, an approach to RECP assessment in industry. Chapter 3 contains a case study of the Georgian beverage industry and its conditions for RECP. In Chapter 4, policy documents and legal instruments which could make out barriers and drivers to promote RECP are reviewed. In Chapter 5, a multi-criteria analysis is undertaken in order to evaluate the conditions for RECP in the Georgian policymaking process for environmental protection. The concept of RECP and how

it could be adopted within an environmental policy is analysed in this chapter. In Chapter 6, the concept of RECP is revisited and discussed from the Georgian perspective. The experience of introducing and promoting Sustainable Development and RECP in other post-Soviet countries in the region is used as a benchmark. Finally based on the undertaken discussion, a feasible policy scenario for Georgia in order to promote a wider adoption of RECP in its industry is presented. Chapter 7 concludes how the research questions have been answered to fulfill the purpose of this thesis.

## 2 Framework for ex-ante policy evaluation

This chapter presents an overview from literature of what is considered good policymaking and how this could be evaluated through a set of criteria. In addition, common instruments used in order to reach the objectives of a policy is described and listed. The evaluation criteria presented are essential as they will be used in the coming ex-ante policy evaluation, and the policy instruments described will be the basis of selection for a proposed policy scenario. A recognized method of how to assess RECP in industry is finally briefly presented which is used to investigate the condition for RECP among the beverage industries.

### 2.1 Policymaking and environmental protection

From literature one can identify numerous of definitions of what a policy is, and it has been a topic of much debate, but most literature suggests that it is a “set of principles and directives that guide the decisions of an organization” (UNIDO, 2002). The need to take a decision and make a choice out of several alternative actions creates the need for a policy (Caldwell & Bartlett, 1997). Following, if the environment is in the focus of policy, this implies that policymakers are faced with one or several environmental problems which could be addressed by various approaches and courses of actions (Caldwell & Bartlett, 1997).

McCormick (2001) defines an environmental policy as follows: “*Environmental Policy* is taken to mean any course of action deliberately taken, or not taken, to manage human activities with a view to prevent, reduce or mitigate harmful effects on nature and natural resources, and ensuring that man-made changes to the environment do not have harmful effects on humans”. OECD describes the purpose and contribution of environmental policies as follows: “Environmental policies make important contributions to social welfare (e.g. by protecting the natural basis of production, and by improving human health), by causing the targets of those policies to alter their decisions in ways that reflect environmental realities (i.e. “internalizing externalities”).” (OECD, 2008).

Policies could be viewed from different perspectives and in the Handbook of Environmental Policy Evaluation Crabbé and Leroy (2008) distinguishes three different currents and ways of addressing policies:

- Policy as control loop
- Policy as political interaction
- Policy as an institutional phenomenon

*The policy as a control loop* perspective views policy as a rational goal-seeking process strongly influenced by the areas of engineering and economy. Humans are seen as rational and seeking for the best possible solution where the implementation of a policy is seen as a politically neutral process. *Policy as a political interaction* on the other hand emphasize the process of policymaking as an outcome of power relation between different social and political actors with their own, often conflicting interests and varying degree of power capacity. *Policy as an institutional phenomenon* is portraying the influence of institutionalized behavior such as patterns of ingrained and accustomed perceptions of viewing problems and solving those. These institutionalized inter-subjective “truths” influence perceptions and actions of policy-makers, and hence the policy-making process.

In Georgia the existing socio-economic conditions are difficult (The World Bank, 2012), the dependency on external donors in the area of environmental protection is considerable (UNECE, 2010) and there is also disagreements in-between advocates of unconditional growth and a more sustainable growth alternative (Interview, Gogaladze, 2013). The

documented lack of capacity and resources in economic and social dimensions in Georgia reinforces the need to use resources where they make the most impact. This supports the use of addressing a policy as a control loop mentioned above. This kind of approach emphasizes a rational goal-seeking where policymaking is seen as a process aimed at solving a problem where effectiveness and cost-effectiveness are in focus (Maas, Kruitwagen, & Van Gerwen, 2011).

## **2.2 Evaluation criteria**

Policy evaluation will accordingly differ depending on which policy perspective is being applied and naturally also due to which evaluation question is posed within the research. However, influence from all of the perspectives; policy as a control loop, policy as political interaction and policy as an institutional phenomenon in the formulation of evaluation criteria is common (Crabbé & Leroy, 2008). The presence of different basic values and competing interests will also influence the choice of evaluation criteria not least while RECP should be promoted while addressing a wide spectrum of stakeholders and various policies.

How to prioritize which problems to address on a political agenda which tends to be overfull could be a matter of disagreement in policymaking. The objectives of an environmental policy are often in opposition with other policies and sector interests which frequently have more powerful resources (Caldwell & Bartlett, 1997). A typical contentious issue is the agenda-setting, the first step in the popularly called policy cycle (Crabbé & Leroy, 2008), which is a hotbed for disputes are environmental protection versus economic growth due to the presence of contradicting conceptual frames (Boezeman, Leroy, Mass, & Kruitwagen, 2010).

A constraining conceptual frame is focusing on the ecological limits to growth and is more prevalent during times of an economic boom, and the reconciling is more common in times of recession and focuses on win-win opportunities in-between the economics and the environment (Boezeman, Leroy, Mass, & Kruitwagen, 2010). These conceptual differences also tends to influence which criteria are used to evaluate environmental policies where targets and hence also evaluation during an economically prosperous period focus on health, temperature increase, biodiversity and so on (Boezeman, Leroy, Mass, & Kruitwagen, 2010). In contrast, during difficult economic times environmental policies tend to be more goal-oriented from an efficiency improvement perspective where relative aspects and how these are evaluated play a more central role.

As mentioned in the methodology chapter, one useful method for data analysis when conflicting interests are present is a multi-criteria evaluation (Munda, 1995) which also is interesting due to that minor administrative resources are needed and useful when data for environmental decision making is lacking (Beierle, 2002).

Considering the current situation in Georgia, a more goal-oriented and economically rational policy approach has concluded to be fitting and evaluation criteria in line with this appears logic. The socio-economic situation and the varying views among stakeholders of how the economic and social dimensions should be promoted in relation to the environment suggests that the starting point and scope for policymaking in Georgia is to be found on the reconciling side. This fact and the discussion of evaluation criteria common under the different conceptual frames, points to the use of goal oriented evaluation criteria, which, however also should enable some evaluation of the political dimension. The criteria should also be fitting with conducting an ex-ante policy evaluation. Considering the political disagreements of how to balance growth and environmental protection a multi-criteria analysis evaluation method seems plausible.

UNIDO (2002) suggest the criteria *environmental effectiveness, economic efficiency, ease of administration and political acceptability* in order to evaluate RECP policies. Judging from the extensive experience UNIDO has gained throughout the years while implementing and evaluating RECP policies in developing countries all over the world their view on suitable evaluation criteria weigh heavily.

Field (1997) suggests a similar set of multi-criteria for evaluating policy options prior to its implementation (ex-ante): effectiveness, cost efficiency, equity, administrative feasibility, social and political acceptability and incentives for improvement (Field C., 1997). The criteria of Field (1997) are a bit more encompassing and also include equity and incentives for improvement. These additional criteria appear relevant in the context of RECP where incentives for change of behavior in industry are dependent on attractive incentives, and equity which could refer to how the costs for abatement should be distributed is crucial. The social acceptability is in addition also added to the political one which is important as public awareness is an important element in order to successfully promote RECP.

Given the inherent uncertainties related to an ex-ante policy evaluation in contrast to evaluate already implemented policy measures (ex-post), one has to keep in mind that changes may occur and that there is a risk of being too optimistic when it comes to achieving goals (Maas, Kruitwagen, & Van Gerwen, 2011). Political and social acceptability is dependent on public awareness, as well as, economic and political realities, all of which are particularly changing in developing countries. The administrative feasibility is dependent on national resources available at a certain time, and in the case of Georgia feasibility still is dependent on assistance, support and capacity-building provided by external sources (donors). Basically all criteria mentioned have a factor of uncertainty while projections are to be done. The unavailability and limited access to data will unable to reach the full potential of the criteria for evaluation purposes.

In line with Field (1997) and Field and Olewiler (2002) the following criteria will be used to evaluate the policy options ex-ante: effectiveness, cost effectiveness, equity, administrative feasibility, social and political acceptability and incentives for improvement. They have been chosen as they fulfill several important factors related to current conditions in Georgia and in addition seem fitting in order to perform an ex-ante evaluation of the feasibility to introduce RECP in Georgia. The criteria cost-efficiency as introduced by Field (1997) and Field and Olewiler (2002) is excluded as it may be particularly difficult to evaluate and demand an evaluation of both costs and benefits of an intervention, hence both costs and damages must be known. In ex-ante this is likely to be even harder. Cost-efficiency will however be referred in the context of some of the other presented evaluation criteria. The criterion cost-effectiveness as defined by Field and Olewiler (2002) will therefore be included as it only necessitates evaluating the costs for achieving a specific target of a policy. It should, however, be admitted that this is also not an easy task to determine.

### **2.1.1 Administrative feasibility**

“Feasibility and enforceability among other factors are crucial focus points of the economic rationale which mainly focus on policy goal attainment.”(Crabbé & Leroy, 2008). Further, Crabbé and Leroy (2008) simply state that if regulations are not enforced they will not reach their objective. Therefore it is important to pose the question if there is sufficient capacity for compliance monitoring and enforcement at the governmental authorities (OECD, 2008).

Field and Olewiler (2002) stress that resources of people, time and institutions are imperative while imposing regulations and to secure that they are met is crucial. Consequently, in order to have an administration which is feasible of performing its task and have the regulatory impact

intended according to set objectives it should be backed up by a budget and constraints. This is according to Crabbé and Leroy (2008) key when a policy option should be considered, and the responsibilities for public agencies tend to grow and budget constraints are common practically everywhere (Field & Olewiler, 2002). UNIDO (2002) which have extensive experience of policymaking in developing countries, states that in developing countries as a consequence of lack of financial means, the regulatory framework to promote environmental issues is often not sufficient and enforcement practices weak which may lead to a culture of non-compliance within industry.

OECD (2008) highlights two basic duties to fulfill the task of administrative enforcement, monitoring and sanctioning. Another tool which should be considered in interaction with monitoring and sanctioning is awareness and capacity-building (UNIDO, 2002).

### ***Monitoring***

In order to monitor compliance three main channels could be distinguished:

Self-monitoring and reporting conducted by the regulated actors themselves; the authorities conduct announced and unannounced inspections; the monitoring is driven by complaints by the public. In addition monitoring could also be conducted by third party audits and ambient monitoring.

### ***Sanctioning***

Stronger sanctions and a credible feasibility to enforce these in case of non-compliance could have a deterrent function by making them tangible as this could enable the use of "softer" means to reach environmental objectives (OECD, 2008). It is also important that actors in compliance should not suffer economically from their efforts to comply in relation to the sanction costs. The cost of sanctions should be severe enough in order not to breed a culture of non-compliance where it is seen as affordable to break the law. Again, the violation fees at the top of the so called "enforcement pyramid" should function as a warning example for non-compliance (OECD, 2008). In addition UNIDO (2002) states that compliance on a voluntary basis and withdrawal of a violation is the ultimate goal; to punish the polluter should be a purpose which is secondary.

### ***Information and agreements***

Information strategies aiming at awareness and capacity-building among industry could function as administrative facilitators (UNIDO, 2002), as well as, voluntary agreements, especially if combined with some level of monitoring (OECD, 2008). Stavins (2001) also mentions the potential risk imposed on industry in case of exposing environmental performance which could result in a "bad image". This may alter behavior and practice of industry.

## **2.2.2 Social and political acceptability**

Environmental issues commonly have a lower priority on the political agenda where economic and social issues tend to dominate. This is often also reflected in the regulatory framework to promote environmental issues (UNIDO, 2002). The controversies with other policies could even be seen as "a fundamental trait of environmental policies" (Mermet, Billé, & Leroy, 2010).

Environmental policies are often future-oriented. The political unwillingness may stem from that it is seen as politically dangerous to embrace policies which will constrain current ambitions. In order to maximize their political security the actions of politicians are often oriented towards seeking compromise among conflicting interests. Sometimes the value

grounds are so different so that a basis for compromise is almost impossible to find (Caldwell & Bartlett, 1997). Boezeman et al. (2010) explain the rise of conflicts within environmental policy-making while referring to the presence of different conceptual frames. Constraining and reconciling conceptual frames, where the former which is focusing on the ecological limits to growth is more prevalent during times of an economic boom. The latter is more common in times of recession and focuses on win-win opportunities in-between the economics and the environment.

### **2.2.3 Incentives for improvements**

The prevalence of strong incentives for improvements within an environmental policy, to find new innovative ways of mitigating environmental impact is important and is hence a crucial criterion for evaluation. There could be policy instruments which motivate a technology change which could adjust and reduce the cost for abatement. Likewise, incentives for improvements could motivate education and training among staff in order to do things in new ways and hence solve problems more efficiently (Field & Olewiler, 2002).

Policy instruments which support technological enhancement could for instance be direct through public financial support in the form of grants, soft loans or preferential tax treatment; or indirectly by different restrictions related to harmful products or behavior such as regulations or via incentives of an economic nature such as taxes or trading systems. These instruments should be carefully concerted in order to be efficient and motivate desired actions and behavior (OECD, 2008). Research shows that changes in relative prices may also drive particular kinds of integrated innovation, in opposite to end-of-pipe solutions, which integrate both reductions of impact as well as economic gains (OECD, 2008).

### **2.2.4 Equity**

When an environmental policy is designed questions related to equity are raised, not least related to how the benefits and costs of the policy are distributed (Serret, Y; Johnstone, 2006).

The impact of the policy should not be clearly regressive, that is it should not confer to a disproportionate burden on those in society who are least likely to cope with the costs involved (Turner, Pearce, & Bateman, 1994). This is one incentive to why a policy should approach an issue as broadly as possible and give polluters contributing to a specific problem the same beneficial incentives to reduce their impacts (OECD, 2008).

Equity is also a problem of liability and property rights and how the allocation of the costs between polluters and victims classically constructed by Coase (Coase, 1960). The polluter pays principle has been quite influential in the development of the international environmental legislation since 1975. It has strong support among policymakers and the global community, and states that the polluter should for the damage which is caused to the victims of the pollution (Dietz, 2010), (UN, 1992), (Cordato, 2006). The equity of a policy is not only a moral issue, but relates to effectiveness in the sense that a policy may not be politically feasible if it is believed to inequitable (Field & Olewiler, 2002).

To what degree equity and distributional impacts should be emphasized compared to other criteria in the evaluation of an environmental policy is an open question where cost-efficiency is weighed against regressive impacts (Dietz, 2010). The regressive impacts could relate to both the polluter as well as the victim of the pollution and who is aggrieved is partly depending on which conceptual frame and values are used.

## **2.2.5 Cost-effectiveness**

According to Field and Olewiler (2002) "A policy is cost-effective if it produces the maximum environmental improvement possible for the resources being expended or, equivalently, it achieves a given amount of environmental improvement at the least possible cost." This is dependent on to what degree costs related to compliance, administration and transaction could be minimized to meet a given target (Öko-Institut, 2005). According to OECDs Framework for Effective and Efficient Environmental Policies (2008), a policy design and implementation process which uses a more integrated approach, in combination with new technological progress could contribute to mitigate these costs.

What kind of policy approach is used is interesting from an efficiency and cost-effectiveness perspective. In a centralized policy the regulator needs to have the information about this in order to provide efficient policy interventions. On the other hand in a decentralized policy this is left to the actors under influence of the policy interventions to find out, and then take the necessary steps, hence the costs for abatement may be reduced (Field & Olewiler, 2002).

Cost-effectiveness is by Field and Olewiler (2002) described as a key evaluation criteria option for policymakers when it is difficult to measure damages produced by environmental degradation, and therefore difficult to decide the efficient level of environmental quality. In this case policymakers may look for measures which could reach any chosen environmental target at the lowest possible cost, or generate the greatest emission reduction or environmental quality increase for a given abatement cost. Field and Olewiler (2002) state that the importance of cost-efficiency and cost-effectiveness is related to that even though preserving environmental resources is crucial; it is only one of the several things that politicians and policymakers seek. The cost factor in policymaking is found to be even more essential in countries where resources to dedicate to environmental issues are fewer (Field & Olewiler, 2002).

## **2.2.6 Effectiveness**

Environmental effectiveness relates to if and to what degree applied measures have succeeded to reach its intended objectives (OECD, 1997), the effects the policy has had on the level of environmental damage (EEA, 2001). The objectives could be related to outcomes such as changes undertaken by actors or/and impact, the state of the environmental quality. The objectives could be stated in general or specific terms (quantitatively or in terms of economic valuation) (EEA, 2001), (OECD, 1997). The effectiveness of different policy scenarios and measures could vary widely (EEA, 2001).

Due to environmental effectiveness and economic efficiency an environmental policy should approach the problem as broadly as possible and address all polluting sources of the economy contributing to the environmental impact with the same incentives to reduce their impact (OECD, 2008).

## **2.3 Instruments within an environmental policy framework**

In order to provide an overview how policy instruments work in relation to specification of goals and measure Figure 2-1 could be useful. How this balance is outlined is much dependent on the conditions in the country and the relation between actors and authorities (UNIDO, 2002):

	<b>Policy specifies the goal to be achieved</b>	<b>Policy does not specify the goal to be achieved</b>
<b>Policy specifies how the goal should be achieved</b>	<ul style="list-style-type: none"> <li>▪ <i>Some command-and-control instruments</i></li> </ul>	<ul style="list-style-type: none"> <li>▪ <i>Technology-based standards</i></li> </ul>
<b>Policy does not specify how the goal should be achieved</b>	<ul style="list-style-type: none"> <li>▪ <i>Most standard setting</i></li> <li>▪ <i>Most negotiated agreements</i></li> <li>▪ <i>Emission trading scheme</i></li> <li>▪ <i>Some command-and-control instruments</i></li> </ul>	<ul style="list-style-type: none"> <li>▪ <i>Environmental taxes and fees</i></li> <li>▪ <i>Other market based instruments</i></li> <li>▪ <i>Public information</i></li> </ul>

Figure 2-1 Policy instrument and goals overview

Source: UNIDO Manual on the Development of Cleaner Production Policies – Approaches and Instruments, 2002

When a target has been set by society, for instance “an acceptable environmental quality, this decision needs to be turned into reality. This presupposes a change by actors in society. To bring about the needed change a course of action out of several options is singled out which contains a set of policy instruments (Turner, Pearce, & Bateman, 1994).

Norton (1984) specifies several aspects which should be taken into consideration when policy instruments for pollution control should be chosen:

1. What measures for pollution reduction are at hand?
2. What are the aims of the pollution control policy, considering what kind of pollution and to what extent the environment is at risk, the pollution control methods scope and reliability, the social considerations of the pollution control in terms of distributive effects
3. How these objectives could be reached in cost-effective way with a mix of policy instruments

In order to fulfill environmental effectiveness and economic efficiency within an environmental policy, the policy instruments ideally should approach the problem as broadly as possible, meaning that all sources of the pollution irrespective of which part of the economy they make out should be addressed by the policy instruments. These polluters should also be offered the same incentives to abate the environmental problem at hand (OECD, 2008).

Even though a great number of policy instruments are available one can distinguish three main categories (Baltic Environmental Forum, 2003), (UNIDO, 2002):

- Regulatory (also called command-and-control instruments)
- Economic (market-based)
- Information-based

### 2.3.1 Regulatory Instruments

In order to enforce and ensure compliance, governments can undertake a wide variety of actions on its own or in collaboration with other stakeholders. Regulatory instruments which are direct, such as laws and regulations dictating standards of environmental quality or restrictions on emissions, make out a major part of all instruments applied within environmental policy in OECD countries. Given that there are enough resources to monitor

and enforce this kind of direct regulations, the environmental effectiveness is considered to be good (OECD, 2008).

Direct regulations and the setting of standards, also known as the command-and-control approach is throughout the history the most common method to address environmental pollution (UNIDO, 2002). Regulatory instruments could be divided into the following categories (UNIDO, 2002):

- Environmental norms and regulations (general and specific standards and permits)
- Product bans and restrictions
- Raw materials depletion quota (excluded due to lack of relevance in this research)
- Liability assignment

In addition, UNIDO (2002) mentions Extended Producer Responsibility (EPR) as a regulatory instrument. This is however not the original meaning of EPR which by its author Thomas Lindqvist (2000) is a principle of environmental protection. EPR is not important in the context of the purpose of this thesis and will hence therefore be left out.

### ***Environmental standards***

The most common approach historically to address environmental pollution has been through standards. Generally a standard is a predetermined execution level within for instance production which is stated by law (UNIDO, 2002). Faure (2001) distinguishes three different kinds of standards namely target standards, emission standards and product standards.

#### *Target standards*

The target standard set the targets, or desired environmental quality of a specific environmental component or ambient quality standard. An environmental policy commonly has this kind of environmental quality target. This standard poses problems when there is insufficient knowledge and information of what source is guilty decreasing an environmental quality, and the costs of finding this out could be high (Faure, 2001).

#### *Emission standards and permits*

A rate of emission is defined by a standard level of what is allowed legally to emit from a specific pollution source (UNIDO, 2002). Emission standards are also called limit values and regulate the quantity and quality of what is allowed to be emitted to the environment (Faure, 2001). The allowance to emit could be in the form of permits or licenses based on the stated standard or limit value (UNIDO, 2002).

The permits could be in the form of a general permit (use permit) or a specific permit related to a specific aspect (media permit) of the environment. The “facility operation standards/permits” fall under this category and used to be a “permit to operate” and function as a way for authorities to control a specific facility. Increasing environmental awareness led to that emission standards were defined and regulated as well. If for instance current or planned activities are seen as particularly burdensome for the environment due to discharges, emissions or other impact a special permit may be needed. This could then often be preceded by a so called Environmental Impact Assessment. This kind of permitting process tends to be complex as they often involve a large number of actors on a national, regional and local level.

This type of standard leaves less freedom to the polluter than target standards. However, these are closely related as the totally allowed pollution from point sources gives the overall quality of an environmental component (Faure, 2001).

### *Specification or product standards*

This standard goes one step further than target and emission standards in that it regulates ex ante what type of technology or abatement technology is allowed (Faure, 2001). This standard is also called a technology-based standard where an industry is obliged to use a specific technology in its operations (Best Available Technology) (UNIDO, 2002). However, Faure (2001) emphasizes that the economic back draws are related to that technology in these kinds of standards rapidly may become obsolete; also it does not give any incentives for innovation among the regulated actors once the production standard is complied with. In addition, it also presupposes that the regulator has access to more valid information than enterprises when it comes to technology for efficiency and abatement.

### ***Product bans and trade restrictions***

This kind of direct regulation is for instance used to prohibit, limit and phase out unwanted chemicals of hazardous nature posing a threat to humans and the environment (UNIDO, 2002). It could for instance be the gradual phase-out of mercury in products which poses a serious health risk. In some cases there is no good substitute for mercury in an important medical device which may pose a challenge for policymakers in enforcing technology which at least minimize the use of mercury in the product (Swedish Chemicals Agency, 2011).

### ***Liability assignment***

The impact of the liability assignment is made out of for instance “use of the environmental taxation or fees”, fines in case of non-compliance, implementation costs of measures required to operate, costs related to clean-up programs, costs for third party compensation or to employees, potentially arising costs in the future while dealing with for example hazardous waste (UNIDO, 2002).

## **2.3.2 Economic Instruments**

Economic instruments are intended to internalize the costs of pollution and environmental services. This is done with the help of measures which rely on market mechanisms. These policy instruments provide price signals which give incentives to change behavior among economic actors (Böcher, 2012). A price is set on environmental pollution (Faure, 2001). Payments for pollution are balanced versus the costs which occur while mitigating the discharge (Turner, Pearce, & Bateman, 1994). The economic instruments are also facilitators to implement the polluter pays principle; Principle 16 in the Rio declaration (UN, 1992).

Economic instruments are often described as a contrast to command and control instruments but in reality these two types of instruments work in parallel to reach environmental objectives (WHO & UNEP, 2013).

The categorization of economic instruments may differ but in general they make out the same type of instruments in literature (Baltic Environmental Forum, 2003)(Stavins, 2001) (WHO & UNEP, 2013). Economic instruments can be distinguished in the five following categories (Baltic Environmental Forum, 2003):

- Taxes/charges
- Subsidies
- Deposit-refund systems (not relevant in this research and will be excluded)
- Market creation schemes
- Enforcement incentives ( excluded as it is a form of regulatory sanction)

### ***Taxes and Charges***

The purpose of emission charges or taxation is that the pollution should cost as much so that it is beneficial not to pollute but to reduce pollution to the atmosphere, water and soil while undertaking prevention and management activities (Baltic Environmental Forum, 2003). The EU Commission (1997) declares that the payments should be directly linked to the amount of pollution or damage caused. It could for instance be taxes related to water pollution issued by a waste water treatment plant or large combustion plants being charged for emission of NO<sub>x</sub> into the air. Stavins (2001) points out that “Several European countries have moved to implement pollution taxes within the framework of ecological or *green tax reform*, which seeks a systematic shift of the tax burden away from labor and/or capital and toward the use of environmental resources”.

### *Product Charges*

According to the European Commission (1997) product charges are used to raw materials and their related inputs such as for instance pesticides, groundwater as well as on final products of different sort. The energy sector is increasingly seen as an environmental concern in integrated policymaking which could be exemplified by taxes on heating oil and electricity (EU Commission , 1997). These charges address the product itself instead of the emissions with the intention to promote an efficient and economically sound use of natural resources and should also cover the public investments spent on protection and investigation of the natural resources (Baltic Environmental Forum, 2003).

### *User charges*

According to Stavins (2001) user charges is a way to collect money from actors who use environmental services which are provided, opposite to emission or pollution related charges the user charge is not intended to change a behavior. Municipal services and product disposal could be typical examples where a user charge could be applied. It is in that sense more of an administrative charge. User charges are payments for the provision of specific environmental services, such as waste disposal or sewage treatment.

### *Subsidies*

Subsidies could like taxes be used as an incentive to promote a certain behavior which is environmentally friendly (Stavins, 2001) A subsidy is a monetary benefit provided through public sources to a polluter to perform its activities with less impact on the environment and to comply with environmental requirements and it could also take the form of tax exemptions (Baltic Environmental Forum, 2003).

UNEP and WHO (2013) within The Health and Environment Linkages Initiative emphasizes the necessity to reduce environmentally harmful subsidies provided by government which often give incentives to the generation of exploitation of natural resources and high levels of pollution. This is also noted by Stavins (2001) who states that subsidies could provide incentives to approach environmental issues but that in reality subsidies often promote practices which are economically inefficient and environmentally unsound.

### *Market creation schemes*

The economic instrument in the form of tradable permits offers a degree of flexibility to the polluter or user of resources of how they will reach a given environmental target, and by “caps” or the promotion of direct investments of environmentally beneficial outcomes tradable permits stress the achievement of environmental targets (OECD, 2008). This is by OECD (2008) believed to be one of the reasons to the increased use of this instruments; however to increase the environmental effectiveness and economic efficiency several issues

must be considered related to which type of tradable system to be used and how initially allocate allowances, and ways of mitigating transaction costs within the system.

The two main types of tradable permits programs used are credit programs and cap-and-trade systems. The credit programs assign a credit when a pollution sources has reduced emissions below set limit values (Stavins, 2001). These gained credits can then be used by the company in question or another company to reach its control target. In the cap-and-trade permits system, emission permits within an allowable emission level can be freely exchange in-between pollution sources (Stavins, 2001).

### **2.3.3 Information-based Instruments**

OECD (2008) concludes that lack of relevant information is common market failure within the environmental sphere and “better information” could supposedly overcome this failure. Capacity and awareness building within the industry in addition to a regulatory and financial framework could give incentives to desired practices contributing to the achievement of policy objectives (UNIDO, 2002). A positive development of an environmental policy is also found to be reached more effectively when voluntary agreements between government and industry are concluded which also involves some kind of control or follow-up on the agreed issues (possibly by a third party) (OECD, 2008).

Similarly, Stavins (2001) writes that information programs targeting and making consumers and producers well-informed are more likely to contribute to the promotion of market-based solutions to environmental issues. In line with is informative strategies promoted by UNIDO (2002) as for instance public recognition, awards and product labeling in order to promote environmentally good performing industries.

Public education campaigns are also an important tool which could aim at increase a general environmental awareness but also target specific areas such as waste generation reduction and consumption of products with a less harmful environmental impact (UNIDO, 2002). The informative strategies could naturally also include university education on a national level and R & D within national or targeted efforts (UNIDO, 2002).

## **2.4 Assessment of RECP in industry**

While integrating RECP principles in an environmental policy framework, knowledge and insight of resource use and management of waste in industry is essential. This will assist both corporate leaders, regional advocates of cleaner production and policymakers in implementing RECP strategies. For the purpose of this thesis and its limitations only parts of the initial stage normally conducted in a RECP assessment will be described.

A RECP assessment is by UNEP (1996) described as a diagnostic tool and a systematic method to identify “hotspots” of poor management and inefficient use of resources in industry. Several organizations such as US EPA, UNEP and the Dutch Ministry of Economic Affairs with extensive experience of RECP policy development and assessment basically use the same underlying strategy for RECP assessment: Planning - Pre-assessment – Assessment – Evaluation – Implementation (Nilsson, Persson, Rydén, Darozhka, & Zaliauskiene, 2007). This thesis uses the structure presented in UNEPs Cleaner Production - A Training Resource Package (1996) while including other references along the way.

### **2.4.1 Pre-Assessment**

After initial planning where the project is anchored within the organization and a working group is constructed a so called pre-assessment is initiated. The objective of the pre-

assessment is to obtain an overview of the production and environmental aspects of a company. Production processes are best represented by a flow chart showing inputs, outputs and environmental problem areas.

The pre-assessment phase in the UNEP Manual (1996) consists of three stages which will be briefly described:

1. Company Description and Flow Chart
2. Walk-through Inspection
3. Establish a focus

***Company Description and Flow Chart***

The following questions could be a good guide in order to be able to describe the company within a cleaner production pre-assessment:

- What does the company produce?
- What is the history of the company?
- How is the company organized?
- What are the main processes?
- What are the most important inputs and outputs?

In order to answer the above questions several areas need to be reviewed. Activities which must not be forgotten are for instance cleaning; material storage and handling; cooling, steam and compressed air production; equipment repair and maintenance; Output streams such as lubricants and catalysts; By-products etc. A simplified checklist of what to go through could look like this:

*Table 2-1 Checklist – Background information*

Type of information	Content
Process information	Process flow diagram; Material balance data; Energy balance data etc.
Regulatory information	Waste licenses; Environmental monitoring record; Environmental audit reports etc.
Raw material/Production information	Product and raw materials inventories; Production schedules; Material safety data sheets etc.
Accounting information	Waste handling; Water and sewer costs; Product, energy and raw material costs etc.

*Source: NSW Department of State and Regional Development/NSW Environment Protection Authority, 2000*

While looking at the inputs, processes and outputs a simple process illustration like the one below could be helpful:

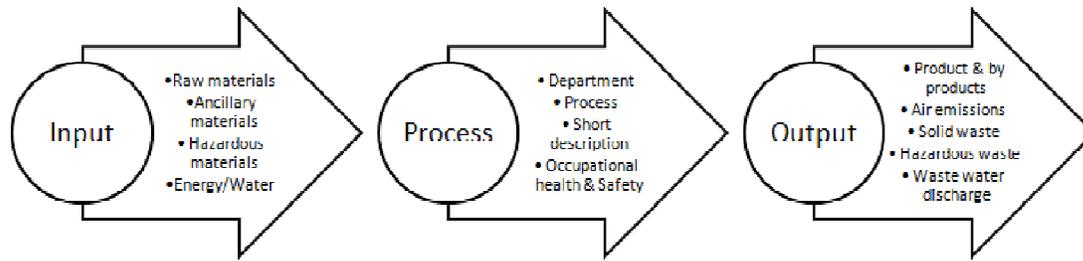


Figure 2-2 Process work sheet of inputs and outputs

Source: NSW Department of State and Regional Development/NSW Environment Protection Authority, 2000

In this stage it is important to do a baseline assessment before a measure has been implemented. This functions as a benchmark to measure the degree of efficiency achievements (REC Caucasus, 2012).

### ***Walk-through Inspection***

A walk-through inspection serves as a good base for complementing background data on inputs, processes and outputs while reviewing how the spots where products, waste and emission are generated. Donald Huisingh (2013), internationally well-acknowledged expert within the field of RECP points out several things to keep in mind while performing a Walk-Through Inspection of a factory which for instance include (Interview, Huisingh, 2013):

- What raw materials are used to produce the product(s)?
- What wastes are produced? (Liquid, gaseous and solid?)
- Where in the manufacturing process are these wastes produced?
- How much is being wasted? What efforts have already been made to quantify the costs of these wastes to the company, per unit of product?
- What can be done to minimize or to eliminate these wastes?
- Are toxic or hazardous raw materials used in making the products that could cause problems?

### ***Establish a Focus***

At this stage a conclusion is made in regard what areas should be focused on in the following assessment. Typically, the areas of interest are the ones which:

- Generate a large quantity of waste and emissions.
- Use or produce hazardous materials.
- Entail a high financial cost.
- Have numerous obvious cleaner production benefits.
- Are considered to be a problem by everyone involved.

### **3 Condition for RECP in Industry**

In order to investigate the feasibility to include RECP in a Georgian environmental policy framework it is interesting to gain an increased understanding of what triggers the industry to apply a resource efficient and cleaner production. Previous studies have already indicated a RECP potential. The case study of the Georgian beverage industry is conducted to confirm what is already indicated and to expand the knowledge on these issues. Based on assumptions built on the assessment in this research and the already indicated potential for RECP in Georgia and the region, a conservative extrapolation is conducted in Section 3.2. The synergies which could be achieved if the Georgian energy intense industry would adopt a wider implementation of RECP are investigated and discussed.

As already concluded there are numerous of benefits which could be gained on both a micro and macro level while applying the principles of RECP which is a preventive approach in opposite to the traditionally used end-of-pipe approach. The advantages generally found for the industry, as a result of applying RECP measures are for instance (REC Moldova; REC Caucasus; Carec, 2005):

- Improve process efficiency
- Reduce raw materials consumption and production cost;
- Improved working conditions;
- Less waste and lower waste management costs;
- Reduce impact on the environment;
- Good house-keeping and improve management

#### **3.1 Assessment of RECP in the Georgian beverage industry**

##### **3.1.1 Method and scope**

Companies within the Georgian beverage industry were approached in order to investigate the prevailing conditions and RECP potential. The assessment method was designed using recommendations and elements of the pre-assessment phase as presented in Section 2.3. The company visits consisted of structured, as well as, semi-structured interviews and walks around the facilities. Only in one case a proper walk-through in the facility was denied most likely because of overall bad conditions.

The focus was on identifying the intense energy and water consumption processes in the production as this appears to offer efficiency opportunities in the beverage industry in general (IFC, 2007). Attention was also given to material use and waste in production processes. The companies were further inquired to identify the top five “hotspots” of their operations in terms of usage and waste and estimate undertaken or potential savings and reductions with resource efficient and cleaner production measures. The industries were also asked if they continuously measure inputs and outputs, and if they use baseline measuring to benchmark their internal development and efforts.

In order to examine drivers and barriers for RECP (UNIDO, 2002) the industries were asked to give their view on the prices of energy and water. This could make out incentives to apply good house-keeping and efficiency measures. In addition, the respondents were inquired to explain their opinion on governmental interventions in the market in terms of fees, enforcement practices, and their own compliance activities relating to this. In addition, the general awareness of resource efficient and cleaner production principles was investigated.

### ***The beverage industry assessed***

The beverage industry manufacturing beer, mineral water, table water and soft drinks is estimated to consist of fourteen companies out of which six could be considered large (medium large by EU standards), three medium size and five smaller companies. Six companies of these were assessed. They are manufacturing beverages such as beer, mineral water, and soft drinks. In addition, a juice manufacturer was assessed. The beverage industry in Georgia is mostly providing the internal and regional market with beverages, but a few which also exports outside the region of Caucasus and beyond post-Soviet countries. An overview of the assessed companies is presented in the Table 3-1 below:

*Table 3-1 Overview of assessed beverage companies*

<b>Aroma Product</b>	Produces natural juices, jams, sauces and dried fruit. Exports its products to twenty countries in five continents (could be considered a food company but this research assessed the juice manufacturing part of the operation).
<b>Borjomi</b>	The biggest producer of mineral water in the former CIS and Baltic States and exports to thirty countries worldwide.
<b>Castel Georgia</b>	Is mainly manufacturing beer but also produces lemonade and soft drinks. Serves the Georgian and regional market but does also export outside the region.
<b>Coca-Cola Bottlers Georgia Ltd.</b>	Certified producer and distributor of Coca Cola in Georgia and the region. The company serves the Georgian market but also Armenia and Azerbaijan in the region with its products.
<b>Pepsi Ltd.</b>	The company is a certified producer and distributor of Pepsi in Georgia and the region.
<b>Natakhtari Beer Brewery</b>	Manufacturer of mainly beer which holds 65% of the Georgian market but does also produce its own lemonade which is exported to twenty countries worldwide.
<b>Healthy Water (Nabeghlawi)</b>	Manufacturing mineral water and is a local market leader in Georgia of mineral water.

*Source: Stakeholder interviews in Georgian beverage industry, 2013*

Many of the visited companies operate lines for both PET and glass bottles and are using advanced technology in their different processes and phases of production. However, a few of the companies were using outdated technology from Soviet-times. A few of the assessed industries were operating their own bottle washing machines.

### **3.1.2 Use and waste of resources and material**

The main inputs among the assessed industries turned out to be, as expected, energy and water, as well as, materials such as plastics and glass for the packaging. In this sense it does not differ from beverage industry in general. The energy is used for activities and processes all throughout the production. The water is used in the production as it is a main part of the product but is also used for cooling and cleaning purposes where waste water is generated at different stages of the manufacturing.

An overview of the most intense spots for energy, water and material found at the production processes at the companies are presented in the table below. As mentioned this research is focused on the production process and the process modifications. It should be noted that savings and reductions made or identified as potential ones were dependent on the current state of the operations and what kind of technology was used. To quantify potentials, the companies were asked to estimate ad-hoc what has been saved while applying RECP measures or to predict what could be saved if RECP measures would be implemented in the production processes. The so called “hotspots” in Table 3-2 are processes within the production process where most energy, water and material are used most intensely.

Table 3-2 Overview of RECP assessment results

ENERGY “HOTSPOTS”	Estimated energy savings from potential or undertaken RECP measures	
PET blowing, Plastic Shrinking, Packaging, Chillers, Brewing process, Bottle washing, Pasteurization, CIP application, cooling of machines and storage	More efficient compressor: <b>10-20%</b> One compressor vs. several: <b>40%</b> More efficient cooling system: <b>5-8%</b> More efficient heaters: <b>5-10%</b> More efficient steam boiler: <b>20-30%</b>	More efficient chiller: <b>50%</b> Brewing house size fit to production: <b>15%</b> Bottle washer size fit to production: <b>35%</b> More efficient pasteurizer: <b>20-30%</b> Additional evaporator using heat from compressor: <b>22-25%</b>
WATER “HOTSPOTS”	Estimated waste water savings from potential or undertaken RECP measures	
Water treatment, Water for cooling purposes, Water at conveyor belt, Cleaning and sanitation	Water reuse equipment: <b>12-30%</b> Floor cross-cutting system: <b>5%</b> (and 90% less caustic soda for sanitation) Dry lubricants: almost <b>100%</b>	
MATERIAL “HOTSPOTS”	Estimated material savings from potential or undertaken RECP measures	
PET blowing, Packaging, Labeling, Bottle design	Modified construction of press cavities at blowing machine: <b>60-70%</b> (spare parts and material) Thinner plastic film for packaging: <b>30%</b> (plastic packaging material)	Trimming of PET blower: <b>7-15%</b> (waste material) More efficient labeling machine: <b>15%</b> (waste material) Shorter bottle neck and thinner bottle: <b>20%</b> (product material)

Source: RECP assessment in the Georgian beverage industry, 2013

One of the beverage companies which were working systematically with efficiency improvement had undertaken several RECP projects in recent years. Table 3-3 gives an overview of these.

Table 3-3 RECP projects in Georgian beverage industry 2010-2013

PROJECT DESCRIPTION	INVESTMENT	SAVINGS
Water recycling equipment installed at two filling processes	EUR 7,500	- 14,000-16,000 cubic m. water/year - Aprx. EUR 28,000 per year
Modification construction of press cavities on blowing machines	EUR 2,500	- 60-70% on spare parts and other material - EUR 7,500-8,500 in one year
Installation of additional CO <sub>2</sub> evaporator for minimization of gas and electric energy	EUR 2,500	- 22-25% of gas and electricity - Aprx. EUR 47,000 per year

Source: RECP assessment in the Georgian beverage industry, 2013

- Table 3-3 above points out that RECP measure can be undertaken at a low or medium low cost with a short payback.
- The assessment results in Table 3-2 communicate that great RECP improvements have been made or could be made within the Georgian beverage industry, especially when it comes to energy savings. Most of the above RECP measures were already undertaken among five out of seven of the assessed companies. This could be explained by that most of the companies had the financial means to invest in more efficient technology.
- Two of the companies could foresee large RECP in production. The technology in these companies were out-dated in many processes and dated back to Soviet-times. A lack of financial means limited RECP measures in these companies, as well as, commitment within the management.
- Most of the companies had highly set internal environmental requirements related to waste and waste water management. A few of the industries had advanced waste water treatment facilities on their premises.
- In one of the industries, too large brewing houses and bottle washing machines were operated which were not adapted to the actual production needs leading to unnecessary high energy consumption. No action was taken due to a lack of financial means and different priorities.
- The fee for waste water is at a low level compared to the energy prices. To treat waste water is therefore not financially justified (UNECE, 2010). There is also no obligation to pre-treat waste water before discharging it into the municipal water system since 2007 (UNECE, 2010).
- Even though many of the companies had undertaken measure to decrease material use and waste in order to chase margins, these measures were not considered as important as the energy efficiency measures monetary-wise. Several of the companies were selling their plastic waste from the production to recycling companies.
- Natural gas was in general used for the hot processes and electricity used for the cold processes in the production.

The focus on energy efficiency measures could be explained by the fact that significant energy use is typical for the beverage industry (IFC, 2007).

### 3.1.3 Perception of price levels for water and energy

The industries were asked to give their perception of prices for electricity, gas and water on a scale ranging from 1 to 5 where 1 was considered low and 5 high. A summary of the answers are compiled in Figure 3-1 below. Water in the figure does not refer to mineral water but to

regular water. Mineral water is taxed higher and the prices of this resource were perceived high among the mineral water companies assessed in the research.

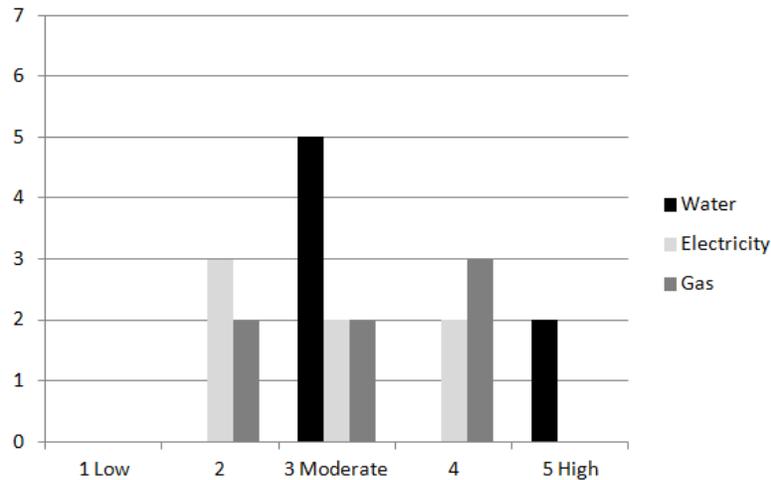


Figure 3-1 Perception of prices for natural resources (y-axis: no. of respondents; x-axis: perceived price level)

Source: RECP assessment in the Georgian beverage industry, 2013

#### Prices of energy

It's hard to judge if the perceived prices of gas and electricity prices ranging from 2 to 4 on the scale should be considered to be a driver for RECP measures; however, the high energy consumption gives a natural incentive to address energy “hotspots”. In the survey one company points out that natural gas prices is not really low in relation to the service which is provided. For instance, there are still cuts in gas provision, sometimes one hour per day which cost the company approximately EUR 450, about the amount that the company would pay for one days energy use to the energy provider. So in the end the company's costs is the double for one days energy use. Half of the respondents stated that an increase in prices of energy would enforce an increase in the price of the product. The other companies did not perceive that an increase would force prices on the end product.

#### Prices of water

The prices for water usage were considered moderate among most respondents, but two of the companies located in Tbilisi considered the price of water to be high. This could be explained by that the prices for water were significantly raised for industrial customers in-between 2005 and 2008 (UNECE, 2010). These companies also stated that an increase in water prices would drive a higher price on the end product. This seems rational as water is a main part of the product at these companies. One of these respondents who perceived the price of municipal water to be high is currently investigating the opportunity to buy water for the product from a local land owner instead as this would decrease the production costs of the products significantly. Among the industries three were not operating in the Tbilisi area and another one in the outskirts.

### 3.1.4 Monitoring and control of waste and emission

The frequency of waste and emission control inspections conducted at the industries varied to a high degree. Some of the companies have had control inspections regarding waste and use of natural resources three to four times a year. One company has not had an inspection in seven to eight years. Another company does not get inspected. Ten years ago the controls were more frequent but then perceived to be corrupt. The controls were removed completely

a couple of years ago with the argument that it did not work effectively. One respondent stated that the lack of controls makes the industry lazy which makes the industry less efficient and competitive and should therefore be strengthened. However, many of the companies were currently reporting on water usage, waste and emission. Energy use is not reported as the providers are private. To report emissions to air such as CO<sub>2</sub> is not required up to date.

### **3.1.5 Awareness of RECP and environmental issues in general**

Most of the companies when asked did not know of the concept or RECP as a conceptual way of internal development. However, in practice many of the companies RECP principles were used to save energy, and waste water and material. This industry has high standards related to hygiene and quality of the product which is a strong link to RECP in itself. The general environmental awareness and the recognition of staff health were high at most of the respondents but only one company did not have a structured CSR policy. While walking through two of the facilities it was noted that insufficient attention was paid to staff safety in processes characterized of high noise and wet slippery floors. The engagement to develop the local area and provide jobs for the local community was especially high at two of the companies which had production facilities out in the regions. These industries even refrained from installing automatic packaging machines in order not to substitute the manual work. One of these companies even had bought forest land around the facility to maintain and improve the health of the surroundings as well as created an ecological farm for the local village.

### **3.1.6 Perception of Governmental interventions**

The Georgian Government recently put an additional fee on each PET bottle produced and the fee is higher for the soft drink producers. The intention is likely either a way to try to make producers switch glass which would decrease the amount of wasted PET bottles in nature and public places or a revenue tax. However, the industries are still producing PET bottles which are a sign that the fee is too low to motivate a switch. Instead this intervention is by the industry seen as a punishment and an unmotivated way of collecting money from the governmental side. In addition, it creates costs for both the industry and the government in terms of implementation and administration (a code system had to be introduced, counting each PET bottle produced). In fact, several of the assessed companies are large PET bottle producers which would like to see a governmental initiative where a recycling system for PET bottles is introduced. This could motivate clean up and reuse of the plastic which is an unrealized resource if not taken care of which also would create jobs. Several industries are also not satisfied with the sudden changes of regulations and interventions which make the industries unable to respond and adapt their operations accordingly. Tax increases on energy and other resources are not communicated long enough in advance. In one case a company's long term license cost for extraction of mineral water was arbitrarily adjusted without notice and explanation.

One of the companies engages in local improvements in the area where it has its production facilities at one occasion bought sixteen hectar forest areas around its facility to benefit the health of the environment in the area where it also is funding ecological farming. After this investment the Georgian Government increased the square meter price of forest land. The interventions from governmental side is mainly seen as money collecting activities preceded by little interaction and communication with the industry. Several of the companies express that they would rather see a "partnership" to be developed in-between the industry and government where the government would help and give incentives to the industry.

### **3.1.7 Summary of findings**

RECP was in theory not a familiar concept to the beverage industry; but in practice most of the beverage companies had undertaken far reaching energy efficiency measures in their production processes. This may be explained by that the beverage industry is a large energy consumer which creates a natural incentive to investigate and implement energy efficiency measures. Most of the assessed companies were also a bit larger and better off financially which had enabled RECP investments. Several of the companies had also undertaken low cost RECP measures resulting in significant energy savings. Measures to decrease the use of water and material throughout the process were also undertaken, but the main emphasis was put on energy efficiency measures where most economic savings were realized.

The savings achieved or which potentially could be reached within the beverage industry were significant and emphasize that waste is a lost resource and therefore should be prevented in the first place. Most of the beverage companies but two had rather high internal environmental requirements where general waste and hazardous waste were properly taken care of. The waste water at four of the seven companies was not treated before being discharged into the municipal water system and this is also not an obligation today. The beverage companies also perceived the waste water fee to be low. However, a few companies were using advanced water treatment facilities built on the premises. This industry has high standards related to hygiene and quality of the product which is a strong link to RECP in itself.

The perception of prices for energy (electricity and natural gas) was highly varying among the beverage companies from rather low to moderate and high. However, the prices of energy in Georgia are among the highest in the region among other post-Soviet countries. The water prices were perceived to be moderate among all the beverage companies assessed, but two. In recent years a significant increase of water prices were imposed on companies in the Tbilisi region but from a low level. Both water and energy prices were considered to drive RECP measures at a few of the companies, and some stated that an increase of these prices would force prices on the final product itself. The high use of these resources in the production and the fact that water is a main part of the product has likely influenced the responses. Based on the limited research it is not reasonable to draw any far reaching conclusions. More research of this issue should be conducted in all sectors of the industry in order to guide policymakers of how to use policy instruments to promote an efficient use of these resources.

The drivers to adopt RECP in the beverage industry today were mainly found to be made out of:

- The large production volume, the continuous flow and large consumption of particularly energy but also water, as well as, material in production processes
- Relatively strong internal environmental requirements
- Most companies had strong finances and could afford RECP investments
- Less costly RECP opportunities available with significant payback
- High hygiene and quality standards of products
- High level of technical and efficiency know-how present

The main barrier to adopt RECP in the Georgian beverage industry today was mainly found to be related to:

- A generally low level of environmental regulation set by authorities and lax enforcement practices

- Low cost to discharge waste which makes it more attractive than to treat
- Taxes imposed on industry are mainly used as a revenue tool rather than to protect the environment or to promote an efficient use of resources
- In addition, the interventions targeting the industry were perceived to appear suddenly without any motivation and with too short notice. (A successful RECP policy necessitates a less strained relation in-between regulators and industry)

### 3.2 Indicated RECP potential in Georgia and the region found in previous studies

In Georgia, despite recent years improvements of technology in industry (MENRP, 2011) there are still facilities using obsolete technologies (Interview, Girgvliani, 2013). This was also the case among a few of the assessed beverage companies. According to Georgian RECP Specialist David Girgvliani (2013), the RECP concept is particularly useful when these kinds of low-hanging fruits should be addressed. In addition small and medium sized companies lack access to finance to realize the RECP potential present, and the general knowledge and know-how about how to work systematically with RECP is low in the Georgian industry (Interview, Shukorova, 2013). The environmental standards and regulations are also perceived to be on a much too low level, and waste has in previous studies been found to be discharged without environmental requirements. In addition, enforcement practices have been corrupted.

IFC (2013) estimates that the energy saving potential for the Georgian industry is 30% (without quantifying this on a sectoral level or by end user level). The opportunities to apply RECP in Georgia is also reinforced by the estimate that the Georgian industry in 2009 was using 2.5 times more energy per nominal unit of production compared to the European Union average (MENRP, 2011). A RECP project undertaken in Moldova, Georgia and Kazakhstan in the period of 2003-2005 resulted in significant economic savings while applying RECP measures (REC Moldova; REC Caucasus; Carec, 2005). The achieved economic savings were different depending on which industry was addressed and level of investment needed. In many cases low and cost measures could reduce consumption of electricity, water, gas and heat significantly.

In summary a set of factors could be perceived to drive a wider implementation in industry based on the above:

- Obsolete technologies present in industry
- An energy intense industry with significant energy saving potential

Likewise, the barriers for a wider implementation of RECP appear to be related to:

- A generally low level of environmental regulation set and lax enforcement practices (which now supposedly gradually is changing).
- Corrupt enforcement practices have been present which may have created a culture of non-compliance in industry.
- A lack of awareness of how to apply RECP identified among various industrial sectors in Georgia.
- A lack of financial means for RECP investments (such as more efficient technology and machines) among small and medium sized companies.
- The access to attractive loans for RECP investments is not perceived to be available for small and medium sized companies to a desired degree.

### 3.3 Extrapolation of RECP adoption in Georgia and its synergies

This section investigates the wider potential of RECP if adopted on a wider scale. The extrapolation is based on the indicated and found RECP potential in previous studies and the conducted assessment in the Georgian beverage industry. In order to feature the magnitude of the RECP potential a conservative estimation for the Georgian industry could be conducted. A starting point to investigate the potential could be to look at the final energy consumption for the Georgian industry. In 2009 the final energy consumption of the Georgian industry sector equaled about 4512 Gigawatt hours as shown in Figure 3-2 below which equals a monetary value of approximately EUR 361 million (VAT 18% included).

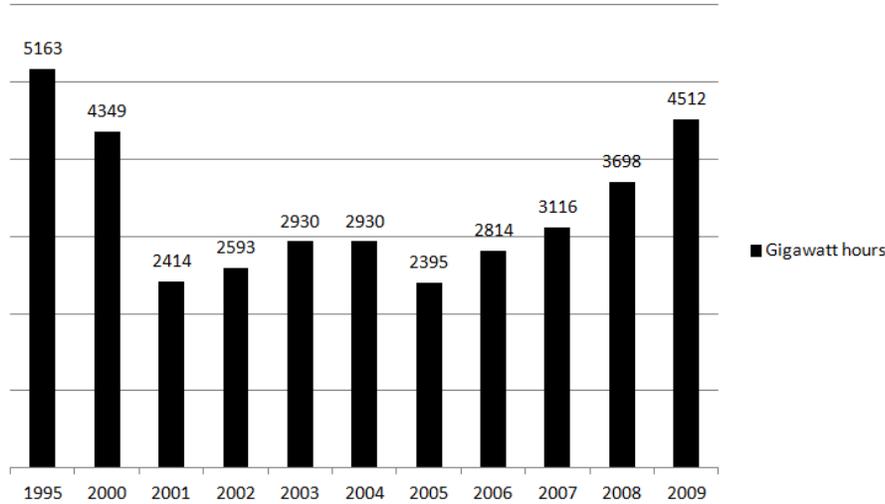


Figure 3-2 Final energy consumption of Georgia's industry sector, Gigawatt hours

Source: IEA statistics, electronic database, 2010

While predicting the estimated impact of RECP measures the energy savings as presented in Table 3-4 could be reached in Georgian industry, given that the cost level of different energy saving levels are like those found in the beverage industry and other projects and studies conducted in Georgia and the region (Interviews, Georgian Beverage Industry, 2013), (Staniskis & Arbaciauskas, 2004), (Martinot, Schipper, & Khrushch, 1995), (REC Moldova; REC Caucasus; Carec, 2005).

Table 3-4 Potential saving in energy and monetary terms at different RECP levels

Cost level of RECP measure	Level of potential saving (%)	Potential saving (Gigawatt hours)	Yearly savings potential (EUR)
No/low cost	5-15	226-677	18 mln – 54 mln
Medium/high cost	15-30	677-1354	54 mln – 108 mln

Source: Stakeholder interviews in Georgian beverage industry, 2013

The monetary saving potential appear significant even when no and low cost measures are undertaken. The figures should naturally be taken with care but nevertheless they are an indication which communicates the potential. No data on final energy consumption for the Georgian industry are unfortunately available after 2009. However, increased energy consumption will offer a higher potential economic saving for Georgia and its industry.

The findings emphasize that overuse and wasted energy actually is a resource which is lost, and this count for all types of waste. In our calculations in Table 3-4 this becomes very evident and should be a driver among decision makers, the industry and policymakers to prevent inefficient management and use of resources.

Apart from what the energy efficiency measures would mean in competitiveness and monetary terms it would also benefit the national energy security. As Georgia’s domestic primary energy production stands for 25% the rest has to be imported, mainly in the form of oil and natural gas (Interview, Valishvili, 2013). Mariam Valishvili, deputy minister of the Ministry of Energy emphasizes that it is crucial to become less dependent of primary energy sources from an energy security perspective. To explore the potential of reducing energy consumption within the industry up to 30% appears interesting from this background.

Table 3-5 Relative final energy consumption Georgian industry sector, %/ energy product

Coal and coal products	Oil products	Electricity	Gas	Heat
12%	7%	29%	47%	5%

Source: IEA statistics, electronic database, 2010

The energy savings while adopting RECP measures in industry would consequently also lead to a reduced environmental impact. Less conversion of coal and coal products into electricity would reduce severe environmental and health effects which also holds true for oil products. Georgia is also a signatory of the Kyoto Protocol (Energy Charter Secretariat, 2012). To realize the RECP potential within the Georgian industry would in turn also support Georgia’s endeavors to mitigate GHG accordingly. Industries identified to be large GHG emitters in Georgia where reduction potential is large are producers of nitrogen, cement; and producers of iron and steel (MENRP, 2011). Georgia is a non-annex 1 Party of the Kyoto Protocol and is therefore only entitled to participate in the Clean Development Mechanism which allows countries in the developed world to achieve a part of their GHG mitigation by introducing cleaner technologies in developing countries, given that it results in reduced emissions (MENRP, 2011).

In the 2<sup>nd</sup> National Environmental Action Programme of Georgia (Government of Georgia, 2012) which spans between 2012 and 2016 it is acknowledged that increased growth in society and industry will create more GHG emissions and drive climate change. It is stated that the long term goals of Georgia is to decrease and combat these issues. The intense rehabilitation of hydroelectric power plants and the construction of wind power are seen as ways of combating GHG emissions. A wider adoption of RECP in industry should also be stressed as an important factor in order to address GHG emissions and climate change.

Numerous of multilateral agreements which have been approved by Georgia and entered into force would also benefit from a wider adoption of RECP in the Georgian industry. These agreements include for instance (Government of Georgia, 2012): The Vienna Convention for the Protection of the Ozone Layer (Montreal Protocol), Stockholm Convention on Persistent Organic Pollutants, and Convention on long-range Transboundary air pollution etc.

## **4 Legal and Institutional RECP Capacity**

The legal and institutional set-up can provide opportunities or barriers to promote conditions for the dissemination of policies to RECP practices in industry (UNIDO, 2002). The purpose is also to use the findings to reflect upon to what degree formal demands are put into real practice. A few legal and policy documents are reviewed in order to investigate the presence or lack of RECP opportunities. The general condition of the legal and institutional set-up and its feasibility to promote RECP is initially discussed. The findings will be analysed in Chapter 5 while applying the chosen evaluation criteria.

In the Environmental Performance Reviews conducted by UNECE (2010) it is concluded that the system for environmental protection is characterized by inconsistencies and gaps which have made implementation and compliance in the environmental area difficult. As a consequence, emission values and standards are in general regulated in theory, meaning that they are stated in law but not really enforced in practice (UNECE, 2010). This has been reinforced by recent years' deregulation in combination with the lack of capacity for enforcement. However, a development to address these issues on different levels is currently ongoing. An environmental policy which promotes RECP is ideally integrated in other national policies of development such as tax policy, energy, agriculture, education, industry etc (UNIDO, 2002). Two policy areas beside the environmental one which are in a particularly favorable position to promote RECP are economy and energy as they are key players in the economic development. The Georgian ministries of Economy and Sustainable Development, Energy, and Environment and Natural Resources Protection in brief have the following functions:

*Ministry of Energy* (ME) is the main developer and implementer within the Georgian Government in terms of the energy sector and is closely linked to the environment, economic development and the social well being of the Georgian citizens (Interview, Valishvili, 2013).

*Ministry of Environment and Natural Resources Protection* (MENRP) has as its overarching goal to support sustainable development of the country in the field of environment (MENRP). MENRP is responsible for the command-and-control part of the environmental protection; monitoring, inspection and enforcement (Interview, Gogaladze, 2013).

*Ministry of Economy and Sustainable Development* (MESD) is in charge of the economic activity and development in Georgia (MESD, 2013). The Ministry is in charge of economic instruments also within environmental protection. The Sustainable Development Department within the Ministry is responsible for developing green business opportunities mainly through the use of hydropower (Interview, Kvernadze, 2013).

### **4.1 Legal and institutional developments**

A Waste Management Framework Law which generally defines waste management responsibilities among different stakeholders is currently being developed within an EU twinning project. Producer responsibilities, the polluter pays principle, landfill management, hazardous/non-hazardous waste streams and a permit regime for waste management actions are all central issues within this framework law. The Association Agreement to be signed between Georgia and the EU is a driver to harmonize the law with EU legislation and practices. Huge efforts are being made to adjust it to Georgian conditions (Interview, Legashvili, 2013). The draft of the waste management framework law has been the topic for public hearings and it has been reviewed and commented by various stakeholders from the business sector and the NGOs. Responsibilities will be put on the private sector in relation to waste, and the necessity to monitor and control the permits to be issued has been a main point

of discussion within the working group. The 2005 Law on Licenses and Permits is to be adjusted in line with the coming waste management framework law (Interview, Legashvili, 2013).

Under the EU twinning Program Georgia is also obliged to prepare a set of sub-law regulations with the purpose to manage different kinds of waste streams such as household waste, landfills, hazardous waste, and waste collection. These sub-laws should for instance also enable to impose a tax on undesired material and products being imported to Georgia which could give incentives to find alternatives.

The Environmental Inspectorate has recently been re-established and 300-400 inspectors will be recruited and new branch offices for the Environmental Inspectorate are being set up. New branch-offices will also be set up for the MENRP in the regions.

Legal international experts have concluded that there are gaps in the legislation of Georgia, Armenia and Azerbaijan which hamper the ability to promote RECP (Interview, Shukorova, 2013). The Regional Environmental Centre in the Caucasus has been given the task by these Governments to suggest adjustments in statutes and legislations needed in order to create a policy for RECP. This will be done in harmonization with EU Directives.

The function of issuing licenses for the use of natural resources has recently been transferred back to MENRP from MESD (Interview, Legashvili, 2013) which potentially provides an opportunity to manage natural resources differently.

## 4.2 Review of strategic policy document

A few policy documents and legal instruments which theoretically could provide opportunities to promote RECP have been selected. The findings of the review also aims to point out to what degree formal demands are set into practice. These selected documents are the Georgian Constitution, the new Government Program, the Law on Electricity and Natural Gas, Main Directions of State Policy in the Power Sector and the Law on Environmental Protection.

### 4.2.1 The Constitution of Georgia

Georgia has a written constitution providing fundamental principles or precedents of how Georgia should be governed; hence to investigate how environmental protection is referred is interesting as it in this document set out basic right for the citizens of Georgia. Paragraph 2-5 in Article 37 of the Georgian Constitution (Parliament of Georgia, 1995) states that:

- 2. The state shall control all institutions of health protection and the production and trade of medicines.*
- 3. Everyone shall have the right to live in healthy environment and enjoy natural and cultural surroundings. Everyone shall be obliged to care for natural and cultural environment.*
- 4. With the view of ensuring safe environment, in accordance with ecological and economic interests of society, with due regard to the interests of the current and future generations the state shall guarantee the protection of environment and the rational use of nature.*
- 5. A person shall have the right to receive complete, objective and timely information as to a state of his/her working and living environment.*

The intergenerational reference in paragraph 4 is in perfect harmony with Brundtland's often quoted definition of Sustainable Development (UN, 1987). These goals are supported by RECP and the closely related concept of Eco-efficiency (WBCSD, 2000) (UNIDO, 2007) (UNIDO, 2012). In fact, Articles 2-4 could all be supported by the RECP approach.

## 4.2.2 Government Program of Georgia

The 2012 Government Program is to start with an important document as it set the scene of what the Georgian Government intends to prioritize and accomplish in different sectors of the economy. Hence, recalling the importance of integrating specific policies within a national policy framework in order to promote the principles of RECP, this document is of interest.

The Governmental program from 2012 (Government of Georgia, 2012) has dedicated a section to *Environmental protection and rational use of natural resources* which could be seen as success in itself. The first paragraph under this section states:

*The sphere of environmental protection will be one of priority directions of the government activities. Environment protection standards and legal-normative base will be developed in compliance with the requirements of EU; Georgia will gradually perform obligations undertaken by bilateral and multilateral environment protection agreements; a modern principle-based system of strategic assessment of environmental impact and environmental monitoring will be set up; the network of air condition observations will be expanded and modernized, sanitary zones will be created/recovered; the quality of fuel, activities of auto park and enterprises will comply with the modern standards of environment protection.*

This statement is without doubt a mark from the Georgian Government that environmental protection will be considered a priority and in line with the requirements within the EU. RECP strategies could undoubtedly contribute to fulfill the objectives stated in this section in a cost-effective way if included in an environmental policy and ideally also within development oriented policies. The text in this particular section indicates nothing which could be interpreted as an integrated policy approach which is a sign that it may be difficult to integrate RECP in a national policy framework. However, RECP could be promoted as an interesting tool to achieve objectives of environmental protection and a rational use of natural resources.

The *Economic Policy* section states in the second sentence of the section that:

*The economic policy will be based on a model of sustainable development ... The Government of Georgia is interested not only in GDP, but in the parameters of welfare of the population.*

The RECP approach is as already stated contributing to a sustainable and resilient economy for the industry which should be of interest in an economic policy with these objectives. In addition, RECP contributes also to welfare of the population in the form of a healthier environment and the preservation of natural resources. Further, it is stated that:

*For the purpose of ensuring global competitiveness of Georgian economy structural modernization of economy will be performed. It will be based on the reasonable application of the comparative advantages of the country. Export will be stimulated and import will be substituted, which is an integral part of structural modernization.*

RECP is contributing to a stronger industry which could create resilient and competitive national industries, and hence more likely to reach an export market. To create an attractive investment climate is stated as one of the most important factors in the economic policy as of below:

*The state will create favorable environment for internal, as well as foreign investments, which implies security of investments, creation of stable and predictable business environment.*

RECP would also benefit this aspect of the economic policy while creating stronger and more solid Georgian industry more attractive for investors.

The *Development of Agriculture* section which is heavily focused on how to make the Agriculture prosper being a main priority, in short states by the end of the section that:

*Food safety, healthy food and maintenance of agro biodiversity will be ensured.*

RECP could also be said to support agricultural development in Georgia with its principles of preventing pollution at source and to use natural resources efficiently. The agriculture sector and adjoining production is stated as a key for Georgian prosperity. This industry could most likely to a large degree benefit from the RECP measures already adopted within the beverage industry.

In the section of *Competition and consumer protection* it is stated that:

*A sustainable economic environment will be established in the country, which will be based on the principle of fairness and protection of consumer rights.*

Again, the RECP concept supports an efficient use of resources and hence also a sustainable economic environment.

#### **4.2.3 Law on Electricity and Natural Gas**

A law on energy efficiency is today not present in Georgia (International Relations Department, 2013). A more general energy policy is however defined within the Law of Electricity and Natural Gas (Parliament of Georgia, 1997) which makes a review interesting from a RECP perspective as it in theory could provide a good platform for promoting RECP. Under the 1st paragraph and 1st Clause of its 1st Article the Law states its objectives and purposes as follows:

*This law shall regulate relations and activities of Individuals and Legal persons in the areas of electricity generation, transmission, dispatch, distribution, import, export and consumption, as well as in the areas of natural gas supply, transportation and distribution and promotes development of the electricity and natural gas sectors in Georgia on the basis of market economy principles.*

From this quote we see that the law has the power to regulate consumption of electricity which is further elaborated on in the following quote:

*Promote growth of efficiency in the areas of electricity generation, transmission, dispatch, distribution, import, export and consumption, as well as in the areas of natural gas supply, transportation, distribution and consumption.*

To promote growth of efficiency in the areas of consumption of electricity and gas is directly linked to RECP and could hence be used for its promotion.

Article 2 is made out of National Energy Policy addressing electricity and natural gas issues. This 3<sup>rd</sup> Clause states among other things that in order to implement and coordinate the National Energy policy the Ministry of Energy should:

*Develop and coordinate implementation of uniform State program on efficiency increase in the areas of electricity generation, transmission, dispatch, distribution, import, export and consumption, as well as in the areas of natural gas supply, transportation and distribution.*

*Promote the environmental the environmental protection of all energy activities, and optimally incorporate environmental protection goals in the formulation and implementation of energy programs.*

Given that this Article is rather limited the space dedicated to promote energy efficiency and environmental protection could be seen as sufficient, and could consequently be used to promote the inclusion of RECP in specific policies.

#### **4.2.4 Main Directions of State Policy in the Power Sector of Georgia**

The focus and main task of this policy document is on securing the provision of energy to industry and domestic demands with a long terms vision to gradually secure the energy provision with own hydro resources based on modern technology (Parliament of Georgia, 2006). RECP could directly support this policy's main goals related to energy security. As stated in the second Chapter of the document concerning policy directions:

*Georgian legislative and executive bodies, power, oil and gas national regulatory commissions through working out legislative and normative acts, through implementation of state programs and state funded projects, participation in international actions, privatization and other actions foreseen by Georgian legislation ensure the support of the following activities:*

- 1. Efficient utilization of power resources*
- 2. Improvement of energy efficiency in industrial and domestic spheres, creating sound legislative basis and institutional framework for improvement of energy efficiency in the country.*
- 3. Study and putting into operation measures necessary for the use of thermal and co-generation systems, also renewable sources of energy.*

The 2<sup>nd</sup> point in this paragraph refers to the improvement of energy efficiency for the industry which could be supported by RECP if adopted in industry. Further down in the second chapter a few other areas are also addressed as a priority which should be supported within the policy; energy security being one these. This reinforces the importance of RECP and the possibility to promote it in this context. The energy security issue should be seen against the background that Georgia today is dependent on imports for 75% of its primary energy need (Valishvili, 2013).

#### **4.2.5 The Law on Environmental Protection**

Environmental protection is obviously the key issue in the Law on Environmental Protection which RECP supports (Parliament of Georgia, 1996). It could however be interesting to look at other aspects which could be useful to build capacity to integrate RECP strategies in the Georgian environmental policy framework. For instance, the law requires, per Article 15 paragraph 3 and 4, that a national Sustainable Development Strategy is established; nonetheless this is still not in place. A national Sustainable Development Strategy could enable a much more integrated approach of the RECP principles in a national policy framework.

## 5 Environmental Protection in Georgia

This chapter lays out the basis for the ex-ante policy evaluation aims at investigating the feasibility for a wider inclusion of RECP principles into a Georgian environmental policy and its policymaking process. The chosen evaluation criteria in Chapter 2 will be used in this purpose while keeping the broader goals of RECP in mind. An environmental policy has the prospect to be more successful if it is not considered a sectoral sub-interest, but concerns the whole policy framework (IEEP, 2010). This becomes even more evident in the strife to incorporate preventative strategies in specific national policies in order to fulfill the objectives of an environmental policy. Despite the economic, social and environmental benefits found with RECP (UNEP, 1994), the conflicts among different stakeholders prevail in attempt to integrate policies if sector interests are at stake (Mermet, Billé, & Leroy, 2010).

However, since UNEP's International Declaration on Cleaner Production in 1998, the integrated concept of RECP has increasingly been an important part of international environmental policymaking (UNEP, 1998). It is acknowledged in many developed countries where it is gaining ground among governments and industry while putting its imprint on environmental policies and waste management laws. This is for instance the case in the EU and China. The EU Directive on Integrated Pollution and Prevention Control (2008) (IPPC Directive) states in Article 2 that the objectives and principles of the Community's environmental policy "consists in particular of preventing, reducing and as far as possible eliminating pollution by giving priority to intervention at source and ensuring prudent management of natural resources, in compliance with the polluter pays principle and the principle of pollution prevention".

### 5.1 Condition for RECP in the Georgian Environmental Policy Framework

In *The Handbook of Environmental Policy Evaluation* Crabbé and Leroy (2008) state that an ex-ante policy evaluation in fact is commonly combined with an ex-post policy evaluation that supports the creation of a policy scenario while taking the temperature of the existing system and do future projections. Hence, in order to be able to predict and suggest a feasible policy scenario, we will look at the current prevailing conditions and structures of the Georgian policymaking process within its environmental policy. Projections of future developments of these conditions are made in order to evaluate the feasibility of how and when principles of RECP could be integrated in a Georgian environmental policy framework and policymaking process.

In order to support the concept of RECP, UNEP (2013) promotes the need to integrate preventative strategies in all facets of the governmental policy framework including for instance fiscal policy and tax regimes, energy policy, industrial and economic development policy etc. A shift from the re-active traditional to a pro-active approach in policymaking is needed. UNEP and UNIDO (2009) use a model to analyze the challenges to adopt RECP within industry in a country. The need for the following conditions to be present is emphasized:

- Awareness and advocacy for RECP,
- Policy and regulatory incentives for RECP
- RECP service capacity,
- Access to finance EST (Environmentally Sound Technologies)/RECP investment.

These aspects will support the discussion in Chapter 6 about what needs to be achieved in Georgia against the background of what is really feasible.

The categories of policy instrument used to promote RECP do not differ from the commonly used instruments within environmental policies (Nilsson, Persson, Rydén, Darozhka, & Zaliauskiene, 2007). However, the emphasis on how these instruments are used differs as the goals of cleaner production aim for preventive rather than end-of-pipe solutions. Karlsson and Rodhe (2002) emphasize that it is crucial to avoid that policy instruments are used in a way that promotes reactive and end-of-pipe solutions. An interaction of different policy instruments falling under the categories of market-based, regulatory and informative instruments are typically used to promote RECP within an environmental policy (UNEP, 2013) (UNIDO, 2002). A broad guideline of a RECP strategy provided by UNIDO (2002) consists of the following elements:

- Base the approach on integrated pollution control, which emphasizes preventing pollution and continuous improvement;
- Require public disclosure of plant and company-wide pollution performance;
- Encourage greater cooperation between polluters, regulators, and the science and technology community;
- Afford greater flexibility to firms to decide how pollution intensity reduction targets should be met;
- Use market-based instruments to meet environmental objectives.

Literature within policymaking of how to promote RECP within a policy framework features, as we see, numerous of instruments and preferred courses of actions. This chapter will evaluate what in reality is feasible to apply within the Georgian environmental policy framework.

### **5.1.1 Administrative feasibility**

Administrative feasibility in the environmental area is made out of the capacity to enforce regulations in order to reach set norms and regulations (Crabbé & Leroy, 2008) through monitoring, control and enforcement (OECD, 2008). In addition efforts of awareness and capacity-building in industry as well as voluntary agreements are by UNIDO (2002) and OECD (2008) mentioned as important facilitators to administrative feasibility. To publicly display bad and good environmental performers may also be effective in this purpose (Stavins, 2001). These measures consequently also demand sufficient resources of people, time and institutions (Field & Olewiler, 2002).

The necessity to enforce regulations in an environmental policy applying RECP is not different, but RECP emphasizes the use of market-based instruments to a higher extent in combination with informative and administrative regulations in order to foster continuous improvements and preventive solutions (UNIDO, 2002). This improves the administrative feasibility as this more decentralized approach to policymaking is less costly. Georgian RECP Specialist David Girgvliani (2013) points out that the regulatory enforcement mechanism should give a first incentive for industries to improve their environmental performance, however, too low sanctioning fees could also undermine the purpose with the monitoring and control functions (OECD, 2008).

Judging from the ability to enforce environmental protection in previous years, the administrative feasibility in Georgia is not high. This could be contributed to the lack of capacity and resources within MENRP in combination with the far reaching deregulations enforced by the previous Georgian Government to attract foreign investment and promote economic growth. Overall, the system for environmental protection has been characterized by inconsistencies and gaps which have made implementation and compliance difficult (UNECE, 2010). In addition, a widespread corruption has apparently also been present (Interviews,

Georgian Beverage Industry, 2013), (Interview, Dzneladze, 2013), (Interview, Gujaraidze, 2013). The scene today is somewhat different. The new Georgian Government has “earmarked” enough money to reconstruct and expand the function of MENRP and to re-establish the Environmental Inspectorate. In addition, the Governmental Program indicates a higher ambition and priority to environmental issues even though a more integrated policy approach not is evident in this strategic document. The construction of a comprehensive Waste Management Framework Law in Georgia in collaboration with the EU under the European Neighbourhood Policy (EC, 2013) is ongoing, and a draft will be presented for and reviewed by the Parliament during autumn 2013 (Interview, Legashvili, 2013).

Despite the positive signs, the contradicting views of the Ministries within Economy and Environment of how to address the economic development in Georgia is naturally posing basic constraints to administer enforcement in a way which could promote RECP.

The administrative feasibility is naturally closely linked to the set ambitions in terms of goals. The polluter pays principle, which is also an essential constituent of RECP, has according to the Minister of Environment (Interview, Gogaladze, 2013) in reality not been in practice in Georgia for many years due to the decreased environmental priorities and a lack of capacity and resources. The hopes to make better use of this principle in practice in Georgia are initially set out as a main ambition with the recently added resources and mandate for MENRP (Interview, Gogaladze, 2013), (Interview, Legashvili, 2013). Environmental standards will be monitored and controlled, and enforced in practice which seems feasible; particularly if the control could be limited to not encompass too many emission standards, permits and licenses. This has before proved to force the administrative costs excessively in Georgia which also made the system difficult to manage (UNECE, 2010). If the sanctions in case of non-compliance will be set high enough to have a desired deterrent effect is in this light is also not obvious judging from the unwillingness to impose environmental costs to the industry.

The administrative feasibility to work towards the broader goals of RECP and to set the polluter pays principle in practice again could possibly be strengthened and supported with inclusion of informative and market-based instruments in addition to the regulatory incentives. What seems to be plausible today in Georgia in order to breed good conditions for administrative feasibility in the form of an improved regulatory and policy framework to the benefit of RECP is to continuously build awareness and capacity among industry and the government as a complement to the ongoing strengthening of administrative functions.

The dissemination of the results in the demonstration projects to the “right” persons which could take it further and to create a leverage point appears as essential which is also believed to have failed in previous RECP projects (Interview, Gujaraidze, 2013). This may contribute to motivate measures by both the industry and the Georgian Government in the right direction and ease administrative feasibility. Voluntary agreements may be possible in the future, but as for today it seems more plausible as a first step to create a culture of compliance while making better use of the polluter pays principle.

### **5.1.2 Social and political acceptability**

As already stated environmental issues are often ranked lower on the political agenda to the benefit of economic and social issues which is reflected in the regulatory framework (UNIDO, 2002) and controversies with other policies are more of a rule than an exemption (Mermet, Billé, & Leroy, 2010). This is also the case in Georgia where difficult times within the socio-economic dimensions have overshadowed the political climate. In order to support the concept of RECP, UNEP (2013) promotes the need to integrate preventative strategies in all

facets of the governmental policy framework including for instance fiscal policy and tax regimes, energy policy, industrial and economic development policy etc.

Hence, a shift from the traditional re-active approach to a more pro-active approach in policymaking, an integrated of policies within Georgian policymaking would be needed. According to the Minister of Environment (Interview, Gogaladze, 2013), the balance between the usage of natural resources and the promotion of environmental protection has for years been an ongoing contentious point in Georgian politics with contrasting views on how to promote economic growth. To protect the environment while imposing environmental taxes and regulations is mainly seen as a barrier to the growth and development of business within The Ministry of Economy and Sustainable Development (MESD) (Interview, Kvernadze, 2013).

Further, also according to Kvernadze (2013), the environmental taxation and licensing applied before in Georgia did not work out well. Instead environmental protection work from MESD now instead is channeled through the promotion of national green business opportunities using hydro power as a main energy. Moreover, if the state of the environment is in such a bad state so that encompassing environmental protection measures are urgent may also be a matter of discussion since the actual environmental impact has been reduced significantly since the break-up of the Soviet Union. Kvernadze (2013) summarizes that the main focus of MESD is to achieve a high employment rate in Georgia, improve the trade deficit and cater for a more equal development in the different regions.

The Ministry of Energy has for the last ten years mostly been focused on the rehabilitation of the distribution infrastructure of energy supply towards the industry mainly by investing in hydropower (Interview, Valishvili, 2013). The demand side of energy that is the way it is used is less addressed. Georgia is now in transition period of development and environmental standards and techniques applied in the EU could not be expected to be applied all at once in the Georgian industry (Interview, Valishvili, 2013). In addition, this would be a barrier to industrial growth and development; instead Georgia is trying to balance this while applying higher norms and standards in prioritized areas. The hydropower sector is one of those areas which should be prioritized and where international standards could be used improve efficiency. Moreover, the aim with a continued focus to develop the great hydropower potential in Georgia is to make Georgia less dependent on imports of the primary energy sources oil and natural gas. At the same time MENRP is skeptical to the fast and widespread utilization of hydropower as it is seen as a threat to the unique biodiversity in Georgia (Interview, Tkhillava, 2013).

The ministries within the spheres of energy, economy and environment could typically be the key actors while integrating RECP into their respective policies (UNIDO, 2002). In the Georgian case, their agendas and view on how to develop are different where MENRP has what Boezeman et al (2010) would call a more constraining view on the economic development and environment. MESD and Ministry of Energy in this aspect have a significant reconciling approach where use of national natural resources should be utilized to a higher degree and where environmental protection sometimes has to be prioritized lower to the benefit of other societal goals. However, judging from the conducted review of the new Government Program (Government of Georgia, 2012), the sphere of environmental protection is claimed to be a prioritized issue for Georgia, where international standards in the area should be considered and the recent significant increase of resources to MENRP does indicate a higher political acceptance to engage in environmental protection. Nonetheless, as mentioned the Government Program does not indicate an integrated approach in specific sectoral policies when it comes to environmental protections and the use of natural resources.

Continued efforts in raising awareness of the potential of RECP as a way of satisfying the objectives in the economic, social and environmental dimensions in parallel could possibly increase the political and social acceptance of a sustainable development which could make its imprint on policy and regulatory frameworks. According to Kety Gujaraidze (2013), Policy Analyst at NGO Green Alternative, it is essential that the dissemination of results of RECP demonstration projects reach the right persons and institutions with the capacity to promote RECP. In previous RECP efforts in Georgia this has not been done and good achievements and results has simply been ignored and plunged into oblivion.

MENRP is today conducting awareness-raising efforts within the ministries while putting forth and promote the learnings from the developed world regarding Sustainable Development where preventive solutions are emphasized to mutually benefit economic and environmental goals (Interview, Gogaladze, 2013). Awareness-creating efforts are also undertaken by the Regional Environmental Centre for the Caucasus (REC) targeting the industry with RECP training and projects which will function as demonstration projects for RECP opportunities. In addition, the Regional Environmental Caucasus Centre is engaged in a regional project on behalf of the Governments of Georgia, Armenia and Azerbaijan to give recommendations of how to adjust statutes and legislation in order to enable a policy for RECP which could be included in national policies and effectively target industry with measures promoting RECP (Interview, Shukorova, 2013). REC was founded in 2002 by the Governments in Georgia, Azerbaijan, Armenia and the European Union and “is an independent, non-for-profit organization, established to assist in solving environmental problems as well as development of the civic society in the countries of the South Caucasus” (REC , 2013).

Similarly, UNIDO is starting up a RECP project targeting several focus sectors of the industry with the aim to prepare a tool kit guideline for RECP in Georgia. The continued presence of external donor projects undertaken within Sustainable Development and RECP will likely also contribute to promote the acceptance of RECP on a high political level. Georgia is also expected to sign an Association Agreement with the EU in a near future (The EU Observer, 2013). This is an opportunity to bring forth environmental concern on a high level since the Association Agreement requires actions in the environmental protection area to eventually be harmonized with those of the EU. A Waste Management Law which will comply with these demands is as mentioned currently under construction.

These endeavors in the form of capacity-building presented above and driven by international collaborations may enhance the general acceptance of RECP and also the possibility to create soft loans and attractive credit lines for SMEs in Georgia which according to Malak Shukorova (2013), Director of REC, do not have the financial ability to invest in technology which could realize the full potential of RECP present. A decision on governmental level is needed to realize these credit lines (Interview, Shukorova, 2013).

A sign of political willingness and acceptance would be the creation of a National Sustainable Development Strategy where the different ministries would gather around long-term Sustainable Development practices and goals. The importance of this is emphasized by The Minister of Environment (Interview, Gogaladze, 2013) as it would provide guidance on sustainable development in sectoral policymaking. A commission has since long formally been created but not until now meetings are being announced with representatives from the current Georgian Government.

### **5.1.3 Incentives for improvements**

Incentives for improvements in the context of RECP should be aimed at preventing, reducing and eliminating pollution at source, and to use and manage natural resources efficiently. “Specified compliance” in the form of precise and specific demands has undoubtedly proved to be an effective way of improving environmental quality in the developed world but too much emphasis on regulatory instruments may promote end-of-pipe solutions (UNEP, 2013). This demands naturally also the sufficient capacity to monitor, control and to enforce.

Information to and agreements with industry is also promoted by UNIDO (2002) as important instrument to be used in parallel with the regulatory instruments which could give incentives to actions contributing to the achievement of policy objectives. Projects demonstrating the benefits resulting from applying RECP could in this perspective be valuable as well as promoting public disclosure of environmental performance and highlighting industries with good environmental performance (UNEP, 2013). Further, UNEP (2013) concludes that market-based instruments also have shown to be more efficient than regulatory standards to achieve pollution reduction at desired levels. Market-based instruments to address so called market failures and give incentives for improvements could be in the form of taxes, charges and fees; liability rules; and subsidies (UNEP, 2013). Among the market-based instruments, the use of pricing mechanisms to drive RECP improvements is emphasized as significantly influential (Reijnders, 2003).

Irrespectively how market-based and informative instruments are integrated with the regulatory; the sanctioning fees should be high enough in combination with monitoring and control in order to motivate a compliant behavior which otherwise might breed a culture of non-compliance (OECD, 2008). Before looking at what informative and market-based instruments that currently is available and discussing which could be feasible to introduce; the success of regulatory instruments and belonging economic charges in Georgia as incentives for good environmental performance is discussed.

The Environmental Performance Reviews by UNECE (2010) estimated that the Georgian industry is re-using only 35% of its waste water. This is thought to be the consequence of that those tariffs for water and waste water are significantly lower than electricity. Hence, an unsustainable use of water is the result, as it would not be economically justifiable to treat water using electricity. To waste the water is more rational from a financial point of view when the fee for waste water is so low. The waste water at the assessed beverage industry in Georgia was most times discharged without any obligation to pre-treat before discharge (Interviews, Georgian Beverage Industry, 2013). The permit issuing system for waste water was abolished in 2007 (UNECE, 2010), and to that the waste water fee was considered low among the assessed beverage companies. In cases where the beverage company’s internal environmental standards required internal waste water treatment plants this was done, mainly within larger industries which were financially better off (Interviews, Georgian Beverage Industry, 2013).

According to the regional RECP policy expert Malak Shukorova (2013) the general limit of emissions is also on a much too low level and should be adjusted to reflect the true environmental costs. The fact is that taxation for pollution has remained on a low level since the 1990s (UNECE, 2010). The already mentioned extensive deregulations and reduced responsibility to pay for environmental impact made during the last decade will successively be addressed with the coming Waste Management Framework Law as well as the ambition to make better use of the polluter pays principle with more extensive monitoring and control of environmental standards in Georgia. However, one could speculate that if the environmental sanction fees in case of non-compliance are not raised in Georgia it is less likely that the industry will comply despite stricter regulations and the increased enforcement capacity which

is being built up. This is, as already mentioned, a sensitive issue and a topic of conflict within the Georgian Government.

RECP aims to give incentives to improve environmental performance by promoting the efficient use and management of natural resources and Reijnders (2003) points out that adjusting the pricing on input of resources such as energy and water have been found to significantly influence environmental performance in industry. If taxes and charges are not set high enough this could result in a waste and overuse of natural resources (UNEP, 2013). Reijnders (2003) notes that, artificially low prices on inputs are in a sense subsidies which do not promote an efficient use of resources, and studies show that subsidies if removed may improve water efficiency by 20-30% and energy efficiency with 10%. Similarly, the Finance Working Group of the EU Water Initiative (2012), states that to increase the price on bulk water to a relatively high level could promote investment in water-saving technologies, leading to resource efficiency and remove water from low value processes.

The Georgian industry is in the latest State of the Environment report (2011) estimated to be 2.5 times more energy intense than in the EU27, the energy prices are however estimated to be among the highest in the region (IFC, 2010). According to an extensive study by the International Finance Corporation (2010), the Georgian industry does not have higher specific energy costs than industries in the other countries in the region (Armenia, Belarus, Ukraine, Azerbaijan, and Russia). The energy prices overall in the region are, however, considered too low to promote good housekeeping (Interview, Shukorova, 2013). However, the energy prices were partly considered to be a driver for RECP measures among the assessed beverage industry but one can as mentioned speculate that the large energy consumption overall within this industry is a more evident driver for RECP measures.

The high energy intensity found in other RECP assessment projects undertaken in Georgia indicates room for improvement, and at the same time it is perceived that particularly the small and medium sized companies assessed lacked the finances to invest in new efficient technology (Interview, Shukorova, 2013). This was also evident among two of the assessed companies within the Georgian beverage industry (Interviews, Georgian Beverage Industry, 2013). The financial resources among these companies to realize significant savings in energy and waste were not present.

The overall prices of water are among the lowest in the region (OECD, 2012). The water tariff for industrial customers in Tbilisi was raised with 180% in-between 2005 and 2008, and is cross-subsidizing the household sector's water consumption where tariffs are significantly lower (UNECE, 2010). Most of the companies assessed in the research, but two, perceived the price of water (excluding mineral water) to be moderate. One of the companies buying municipal water in the Tbilisi region who perceived the price to be on the high end of the scale was considering switching to buy water from a local land owner instead. At this company and another one an increase in prices of energy and water would induce an increase of the price of the final product (Interviews, Georgian Beverage Industry, 2013).

The financially difficult conditions for the industry although it is believed to have improved in recent years (MENRP, 2011) is a consequence of that the Georgian industry still is believed to recover from the stagnation imposed on the industry during the break-up of the Soviet Union in 1991 (Interview, Dzneladze, 2013) as well as from the armed conflict with Russia in 2008. These factors most likely have given little economic room for investment in new technology. One could pose the question if it is feasible to create incentives for energy efficiency improvements while for instance raising prices for energy during these conditions (Interview, Valishvili, 2013). The basic financial condition suggestively needs to be improved for the

industry. As mentioned a government decision is believed to be necessary in order to be able to include the needed RECP financing as part of a successful national RECP policy (Interview, Shukorova, 2013).

It is, however, shown in this paper's assessment of the Georgian beverage industry and other studies in Georgia and the region that RECP efficiency measures could be undertaken at no or low costs in order to reduce the consumption of energy and discharge of waste significantly (Martinot, Schipper, & Khrushch, 1995) (Staniskis & Arbaciauskas, 2004) (IFC, 2013), (Interviews, Georgian Beverage Industry, 2013). This indicates that awareness of the opportunities with of RECP is essential not least when financial resources are scarce.

The awareness of the RECP concept in theory were among the beverage industry low but in practice many of the companies had undertaken extensive RECP measures related to energy. The high energy consumption in this industry gives a natural incentive to address this issue and the assessed companies in the beverage industry were also larger and financially better off and could in most cases afford the RECP investments needed. During more encompassing RECP assessments undertaken in region and Georgia in various industries (REC Moldova; REC Caucasus; Carec, 2005) the awareness about RECP and its methods were low but the potential turned out to be great (Interview, Shukorova, 2013). The idea and belief that natural resources should be free is still prevailing from Soviet time in many industries (Interview, Shukorova, 2013).

To increase awareness about the RECP measures which could be undertaken at no or low cost would likely be an important facilitator and incentive to realize savings and reduce environmental impact. The possibility to launch a RECP award which could function as a good example of to use efficient technology in order to realize cost reductions while at the same time being sustainable (Interview, Gogaladze, 2013).

In Article 19 in the Law on Environmental Protection provides the possibility to promote to promote the production and sale of environmentally friendly products through eco-labeling (UNECE, 2010). Eco-labels could according to this article be issued by an inter-ministerial Commission. This appears as an interesting option which could be explored in order to promote a wider implementation of RECP in the Georgian industry.

In order to create an effect while promoting good environmental performers the public should possess a certain level of environmental awareness and concern which could be achieved through dissemination of environmental conditions and protection in campaigns, media coverage and education. The Environmental NGO Green Alternative is according to its Director (2013) due to a lack of financial resources, mainly targeting the governmental sector and a wider public is not approached. In general NGOs in Georgia are found to be dissatisfied with the poor dissemination of environmental information to the public by authorities resulting in that the Georgian public is not enough informed about acute and important environmental problems (UNECE, 2010).

It should also be noted that the national energy policy is today more focused on the supply of energy in order to address the energy security which has been improved in recent years (UNECE, 2010). Large investments in hydropower facilities are ongoing and a priority for energy security reasons as well as economic (Energy Charter Secretariat, 2012). No law on energy efficiency is today present in Georgia. Article 2 of the Law on Electricity and Natural Gas is made out of a National Energy Policy which emphasizes the need for energy efficiency efforts and to promote environmental protection in all energy activities (Parliament of

Georgia, 1997). The energy efficiency aspect within the industry could not be said to be promoted from governmental side as recommended in this law and policy.

However, in the future, the Deputy Minister of Energy could foresee the introduction of standards for energy efficiency performance based on emission regulations where the industry will have a grace period of 2-4 years to respond and adapt to these regulations (Interview, Valishvili, 2013). In a near future the Ministry of Energy will successively introduce a night and day tariff which will give the industry incentives to use energy at night when the tariff will be lower (Interview, Valishvili, 2013). This kind of incentive program is a way of balancing the peaks of energy use as the energy supply is limited. The incentive to the end users is hence related not to how they should use the energy but when.

Several, energy efficiency projects and programs are undertaken in Georgia mainly based on donor initiatives addressing both supply and demand side of energy (International Relations Department, 2013). On the demand side a few projects related to energy efficient buildings are under operation, however this does not particularly address the industry. The demand side of energy is not yet addressed as a priority at this stage (Interview, Valishvili, 2013) even though it would make sense from a RECP point of view (Interview, Shukorova, 2013). It could also be discussed if the Georgian industry could financially manage a higher energy price (Interview, Valishvili, 2013). Energy efficiency programs as applied in EU countries may be feasible in the future in Georgia under the right conditions.

MENRP are only responsible for the regulatory aspects of the environmental policy, the so called command-and-control part of the environmental protection; while the economic instrumentation and the levels of fees and taxes are supervised by MESD (Interview, Gogaladze, 2013). As mentioned environmental taxation and fees is by MESD considered making out obstacles to business and their development. It is not obvious to foresee a non-compliance fee in Georgia which could be deterrent enough considering the historical unwillingness from governmental side to create actual costs for industry while internalizing environmental externalities. Hence, there may be a risk that the sanction fees in case of non-compliance continuously will be set at a too low level in order to generate a change in behavior and not breed a culture of non-compliance. MENRP asks for more financial incentives to be offered the industry while in compliance or beyond compliance such as reduction from taxes. To decide this is, however, beyond the control of MENRP (Interview, Gogaladze, 2013).

The ambition of MENRP is to create a partnership with industry as they do not want the industry to perceive that they only are punished and a draft of how MENRP want to go green with the industry has been developed as well as meetings with industry representatives (Interview, Gogaladze, 2013). A desire to build a mutual partnership in-between the Georgian Government and the industry was explicitly also expressed by several of the companies which mostly experience unmotivated increases in taxes and with a too short notice which makes it difficult and risky to do investments also in technology. This does however depend on MESD which is entitled to create financial incentives.

The Georgian Government is by the beverage companies in general not considered to understand the situation of the industry in part and whole. An extensive study is desired by the Georgian beverage industry and experts of policy and legislation in order not to make policies blindly without knowing the impact (Interviews, Georgian Beverage Industry, 2013), (Interview, Dzneladze, 2013), (Interview, Gujaraidze, 2013). Recently the beverage industry experienced an intervention which likely was intended to make producers of PET bottles switch to glass in order to address the littering of PET waste. A tax on each bottle produced

was announced, the tax although significant appears to be too low to induce any changes within the industry and instead it is from industry seen as a punishment and an unmotivated way to collect money from the Georgian Government (Interviews, Georgian Beverage Industry, 2013). This is likely not the best way to build a partnership.

#### **5.1.4 Equity**

In the context of an environmental policy equity is referring to how the benefits and costs are distributed and distributional effects are preferred where least costs should be put on those which are less well financially equipped. The public costs in the case of environmental degradation are obvious as they cause health problems. Things are changing in Georgia and there is currently an ambition and opportunity to make polluters pay again which would direct the external costs of degradation towards the industry. The benefits of the business with little or no obligation toward the environmental sphere and citizens are simply less costs and growth. For many years Georgia has been promoting the benefits of the industry on behalf of costs induced on the environment and people living in it. From this point of view it appears “fair” that the polluter should pay. However, does the choice have to fall on either fulfilling objectives of the environment or of those related to economic growth. This research claims with good reasons that RECP could combine these goals.

RECP promotes flexibility towards market when it comes to abatement. The equity aspect lies within that the actors which are more fit reduce more on their part to the benefit of those less able to. The overall environmental targets are still met. This approach also reduces the costs on the administrative side in terms of information gathering of what solutions should be applied to reach the targets etc.

In Georgia, despite the great potential for RECP a lack of awareness how to systematically apply RECP appears to be present in industry as well as financial resources for RECP investments. On what scale the financial resources are lacking is hard to tell but that this burden at some point should be shared by others than the industry seems reasonable. Credit lines for SMEs have been proposed by advocates with good insight into the Georgian industry as one of the most important measures beside awareness and capacity-building in industry and on a political level (Interview, Shukorova, 2013).

The benefits of less environmental degradation while adopting a wider application of RECP industry are favoring the public in terms of a health and social well being as well as the preservation of the environment as cultural heritage. The economic and efficiency benefits will favor the industry from a competitive point of view and the Georgia as a nation providing employment and growth while balancing the trade deficit and more tax revenues. The equity aspects if RECP if fully realized are evident which should be used to promote RECP on a political level in Georgia.

#### **5.1.5 Cost-effectiveness**

A policy is said to be cost-effective when it has reached its target to the lowest costs referring to; compliance costs for the industry, administration and enforcement costs (Field & Olewiler, 2002). Given the limited resources for environmental protection purposes in Georgia and dependency of external donors (UNECE, 2010), cost-effectiveness should be of high interest for both donors and the Georgian administration.

In Georgia, the ambition is now to make better use of the polluter pays principle which has in reality not been in practice for many years; hence the costs for pollution control will rise in Georgia. Before the encompassing deregulations related to environmental protection were

introduced in recent years, the administrative costs for pollution control is believed to have been rather high due to the large number of substances which were taxed (UNECE, 2010). Despite, the newly gained capacity for enforcement purposes it appears costly judging from the encompassing task. Judging from previous experiences the number of substances to be taxed should be limited, and a priority based on prevalence and degree of environmental impact could suggestively be useful. This approach may reduce administrative costs for pollution control. The cost to pollute should accordingly also be high enough in order not to make the enforcement practice ineffective and hence less cost-effective.

A more decentralized policy, less dominated by command-and-control functions, which gives room for more flexibility to the market to find the best solutions for abatement has been found to be less costly from an administrative point of view (Field & Olewiler, 2002). This approach lets the market decide how the abatement should be solved. The polluters which are able to reduce their environmental impact beyond the targets could then sell their permits to pollute to actors currently not able to perform according to targets for various reasons. If there are enough industrial actors which have the ability to take on these abatement costs in Georgia is unknown.

The OECD Framework for Effective and Efficient Environmental (2008) promotes the necessity for an integrated approach to policymaking in order to address the predicted increased environmental impact in a more cost-effective way, where environmental and policies of economic development should be integrated and includes instruments which give stimuli to embrace new technology. UNIDO (2002) name this integrated approach, RECP mainstreaming, where specific national policies beside an environmental policy promote the goals of RECP. Given the limited resources in Georgia, it appears motivated to integrate national development oriented policies while address environmental issues.

Voluntary approaches such as self-regulation and other voluntary approaches could in theory be attractive (Karlsson & Rodhe, 2002) as well as market-based instruments which have with a large empirical evidence base shown to be more efficient than regulatory standards in reaching a desired pollution reduction. Market-based instruments are less costly than the traditional command-and-control approach and could significantly influence the incentives to apply preventive solutions. (UNEP, 2013). The pricing mechanism to influence the prices of input and hence the usage of resources and environmental performance is recommended (Reijnders, 2003). As noted RECP literature presents numerous of measures which could be applied in order to promote and implement a more cost-efficient environmental protection but to what degree does this appear feasible to introduce in Georgia?

The integration of environmental protection issues into other national policies in Georgia has not been a prioritized issue. In addition, the last decade's heavy focus on economic growth on the expense of the environmental sphere has not given any room for the integration of environmental concerns in the development of the economy as a whole (UNECE, 2010). Today the willingness to prioritize environmental issues is as concluded in Section 5.1.2 higher in Georgia. However, if this will enable a more integrated and preventive approach in development oriented policies is not obvious due to political disagreements.

More informative strategies which could enhance RECP awareness among industry stands out as a plausible alternative today which may lower the abatement costs on the administrative side as well as for the industry while initially take on measures which could realize savings at no or low costs. Voluntary agreements and self-regulation is more likely to be introduced in a much later stage as well as more market-based instruments when conditions for RECP in industry and the policymaking process are more favorable.

There is as mentioned a possibility within Georgian Law to create an eco-labeling scheme which may be a cost-effective approach for the future to promote RECP together with other policy interventions. In addition, a cost-effective way of promoting RECP could be to impose a tax on unwanted products and material being imported to Georgia. The planned sub-law regulations would enable this kind of preventive intervention and could be explored in the future.

### **5.1.6 Effectiveness**

An environmental policy is said to be effective when it has reached its intended objectives (EEA, 2001). In this research the effectiveness is related to how effective the Georgian environmental policy framework is to promote a wider implementation of RECP in industry. A prerequisite is to enable the inclusion of RECP in the policymaking process which feasibility has been investigated throughout this chapter.

The administrative feasibility has been rather low but the administrative monitoring and control functions are currently being strengthened. Corruption has also been present according to the industry and former government officials which potentially also today could mitigate the administrative feasibility to some degree. To include more market-based instruments to promote preventive solutions does not seem feasible today due to a lack of political acceptance and mandate to impose incentives of improvement driven by market pricing mechanism. This approach would also make the administration less costly and hence more feasible from an administrative point of view. However, a more decentralized and flexible approach where abatement should be solved by the market does impose most of the abatement costs to the industry.

There are indications that especially the small and medium sized companies do not have the financial capacity to conduct these abatements based on own resources and technological capacity and access to loans is perceived to be limited to these companies. To even out this inequality a suggestion could be to subsidize the industry. Improved access to finance for RECP investments could for instance be enabled through attractive credit lines. The awareness of the economic benefits with RECP among loan institutions would likely also need to be improved in order to increase the willingness to offer loans by national banks.

A more effective environmental policymaking would need a more integrated approach to RECP where it would be integrated into specific policies within the national policy framework. This is not likely today as it has no bearing politically or in legal instruments and policy documents. The legal documents reviewed in this research is not anchored in reality and they rather stands out as sectoral statements with no mandate to be enforced in reality. To build legal capacity for RECP would necessitate changes and adjustments in the statutes and legislation. This could enable the creation of RECP policy which could be promoted in national policies. This kind of investigation and effort is currently being undertaken. To create an overarching national Sustainable Development Strategy would also be an important policy document in this aspect.

The overall ability by the current environmental policymaking system to include RECP strategies to effectively promote a wider implementation of RECP in industry is found to be low. The conditions for RECP within the legal framework and the policymaking process and the industry would need to be improved and developed. The criterion for effectiveness is hence low. Planned donor project within the purpose to promote green growth and RECP in Georgia is important but limited; however these efforts are crucial in order to build awareness and advocacy for RECP over time. Various informative strategies should be further explored

further at this stage in order to build awareness and advocacy, these measures are on their own less effective but it is at least a step forward.

## 6 Preferred Conditions and Strategies of RECP

The discussion in this chapter serves the purpose to function as a basis and support in order to suggest a feasible policy scenario which is likely to promote a wider implementation of the RECP approach within the Georgian industry and to suggest in what ways the conditions for RECP would need to be improved in Georgia.

The discussion section will be guided by what is recognized to be preferred conditions in order to promote a wider implementation of RECP in industry. The current Georgian system's status of these conditions to promote RECP is evaluated against this. In addition, acknowledged and recognized strategies in order to promote a wider implementation of RECP in industry are revisited in order to discuss the feasibility to include these in Georgian environmental policy.

A selection of recommendations of how to move towards Sustainable Development provided for countries in the region and Georgia are considered and integrated into the discussion. In addition, what has been achieved in post-Soviet countries in the region in order to introduce and implement RECP is presented. Findings from the undertaken multi-criteria analysis, the RECP assessment of the Georgian industry, and the review of legal provisions which could make out drivers and barriers to RECP are incorporated into the discussion as well.

### *Necessary conditions to promote RECP in industry*

UNEP and UNIDO (2009) have identified four conditions which should be sufficiently fulfilled in order to be able to promote a wider implementation of RECP in industry: Policy and Regulatory Incentives to RECP, Awareness and Advocacy for RECP, Access to finance for Environmentally Sound Technologies (EST)/RECP Investment, and RECP Service Delivery. Most emphasizes will be put on discussing the aspects of Policy and Regulatory Incentives to RECP and Awareness and Advocacy for RECP as they more clearly fall under the scope of the research. However, the aspect of Access to finance for EST/RECP investment and RECP Service Delivery are important supportive functions and components in order to promote RECP in industry and will also be briefly discussed.

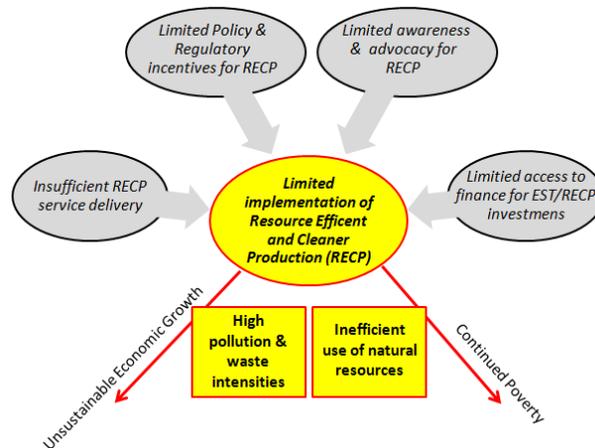


Figure 6-1 Model for RECP Problem Analysis

Source: UNEP and UNIDO, 2009

### ***Broad guidelines of a RECP Strategy***

In order to implement an environmental policy striving to achieve the goals of RECP some policy measures are considered to be particularly useful. The question is how compatible these strategies to incorporate within a Georgian environmental policy framework. Chapter 5 investigated and reflected upon this and these findings will be included in the discussion in this section. The broad guidelines of a RECP strategy as stated UNIDO (2002) consist of the following elements which likewise will guide the discussion:

- Base the approach on integrated pollution control, which emphasizes preventing pollution and continuous improvement;
- Require public disclosure of plant and company-wide pollution performance;
- Encourage greater cooperation between polluters, regulators, and the science and technology community;
- Afford greater flexibility to firms to decide how pollution intensity reduction targets should be met;
- Use market-based instruments to meet environmental objectives.

### ***Recommendations and achievements in the region***

As stated by Brizga et al. (2013) learning from success and mistakes within the region is also a key, and to learn from the Baltic States which give sustainable consumption and production a higher priority within its national policy framework could speed up the progress in the EaP countries towards this direction.

Several encompassing studies have been conducted among The Eastern Partnership Community (The EU, 2013) which is the EU's strategic partnership with its Eastern neighboring countries referred to as EaP, and includes Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. These studies have covered the opportunities and options to promote a Green Economy in the region (Eastern Partnership Civil Society Forum: Green Economy, 2011), as well as, the environmental governance and environmental policy development in the region (Eastern Partnership Civil Society Forum: Environmental Governance, 2011). The studies are linked to EU efforts undertaken in the region to develop the area of environmental protection and Sustainable Development to a level obliged by the Association Agreement which negotiations commenced in 2008 (Eastern Partnership Civil Society Forum: Environmental Governance, 2011). For the sake of clarity the definition of a Green Economy as coined by UNEP (2013) is: "In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive".

The concept of RECP is suitable to promote and support the goals of a Green Economy (Interview, Dobes, 2013), as well as, Sustainable Development. RECP could be viewed as a first step towards a Sustainable Development (UNIDO, 2012). Good environmental governance and environmental policy development which is assessed in the other study referred to is naturally also of interest in order to enable good conditions for the promotion of RECP. Hence, the findings and recommendations in these studies should be considered in the case of Georgia and will hence be integrated into the discussion.

## **6.1 Awareness and Advocacy for RECP**

### ***Regional recommendations***

All EaP countries have been found to be in need of raising awareness in the field of Green Economy amongst all target groups such as state administration, business community, academia, NGOs and the general public (Eastern Partnership Civil Society Forum: Green

Economy, 2011), and the environmental democracy needs to be developed while providing access to essential environmental information as well as the need to involve the public while developing the environmental provisions for the forthcoming Association Agreements (Eastern Partnership Civil Society Forum: Environmental Governance, 2011).

Georgia in particular, is not perceived to ensure public participation in environmental decision making in compliance with the Aarhus Convention and EU Directives (Eastern Partnership Civil Society Forum, 2011). This is partly believed to be a consequence of the defects in the Environmental Impact Assessment system curtailed by the extensive deregulations in recent years.

All of the EaP countries are recommended to arrange seminars with all stakeholders in order to discuss how to collect, organize and manage statistical data to be used in decision making in the environmental area (Eastern Partnership Civil Society Forum: Environmental Governance, 2011).

### ***Awareness and Advocacy for RECP in Georgia***

In order to be able to bring forth “good environmental performers” and make the public more demanding when it comes to environmental issues, an increased awareness is likely needed in Georgia. Several Georgian stakeholders interviewed stress that too little information concerning environmental impact and degradation reach the public through media, government, authorities and NGOs. This is despite the fact that, the right to information about the environment is stated as a right in the Georgian Constitution.

To improve data management the knowledge and access to statistical data within the environmental area could be enhanced in Georgia. It would contribute to provide more accurate data of the State of the environment in Georgia which could be used to justify environmental decision making and to prioritize efforts. This may strengthen the advocacy for environmental protection and RECP among decision makers.

In addition, an environmental performance grading system which could guide consumers and industrial players is not present today in Georgia but is by MENRP considered to be an interesting tool for the future. This could fulfill an informative function for the public as well as putting pressure on the industry. A good environmental performance could become a competitive tool in industry with the support of this kind of system. To introduce a RECP awards in industry in order highlight environmentally good performers could be feasible already today in order to build awareness and advocacy for RECP and should suggestively be launched. To have a continuous dialogue with industry about the possibilities to grow in a sustainable way is also an activity which likely could have an important impact on awareness and advocacy. These informative strategies would be less costly in relation to the resources needed for the enforcement practices.

The awareness of the RECP concept among the assessed beverage industries when asked was limited, but in practice particularly efficiency measures were at many of the companies undertaken. However, a systematic use of RECP principles including baseline measurements was often not present. The high energy consumption in the beverage industry could be considered an important driver to apply RECP measures.

As concluded in the multi-criteria analysis in Chapter 5 an increased awareness of the potential with RECP would most likely create incentives for improvements in the industry. In addition, a general awareness in society and industry could also contribute to an increased

administrative feasibility if combined with regulatory, market-based and informative policy instruments.

The awareness RECP was found to be low in another RECP project undertaken in Georgia within various sectors, as well as, as in the region but the potential to be great. If the awareness was higher one could speculate that, the implementation of no and low cost RECP measures would be more prevalent. However, even if there would be a high awareness but too few monetary or regulatory incentives to apply RECP, the implementation of RECP in industry would possibly maintain low. The access to finance for RECP investments is also a prerequisite to realize the full RECP potential.

The probability to improve the conditions for RECP awareness and advocacy will most likely be greater if the dissemination of the result is utilized in best possible way. A perceived improper dissemination of previous RECP demonstration projects in Georgia is believed to partly have contributed to that their impact have not been fully utilized in order to promote RECP. Demonstration projects have been concluded to be a key by donor organizations and local advocates and experts of RECP in Georgia, and if these results are disseminated to the “right” persons or institutions it may contribute to level the topic of RECP on the political agenda.

The awareness of the RECP approach was found to be rather low among the Georgian ministries but some ministers were familiar with the concept from previous RECP projects in Georgia. The political acceptability to environmental protection and to measures related to RECP was in the multi-criteria analysis overall concluded to be low despite the new Governmental Program which puts a higher priority to environmental issues and an increased budget for environmental protection. The conflicting conceptual frameworks of how to balance growth and environmental issues still appear to persist within the Georgian Government, where ministries with a strong mandate within economic and developmental issues tend to have a much more reconciling approach to economic growth. Hence, the advocacy to promote RECP should still be considered to be low. It should also be kept in mind that difficult socio-economic times is present in Georgia where social and economic issues are high on the political agenda.

Despite the national political disagreements of how to balance growth versus environmental concern, the intensified collaboration with the EU in greening the economy and the forthcoming Association Agreements, and the continued presence of donors and other international actors likely will contribute to increased advocacy for RECP in Georgia.

## **6.2 Access to finance for EST/RECP investment**

Most of the beverage industries assessed were larger (by Georgian standards) and therefore had the financial capacity to realize measures of efficiency. However, two of the Georgian beverage industries were not able to realize their estimated RECP potential due no access to attractive credit lines. Another recent RECP assessment project undertaken in various Georgian industry sectors similarly noted that a lack of financial resources was present among small and medium sized industries in order to realize the full potential of RECP.

Despite that a segment of the industry appears to be financially less good off, the no and low cost measures which could be undertaken to realize a significant savings, is as mentioned less likely to be achieved if the awareness is not high enough and too few incentives are introduced. This emphasizes the importance of being aware of that several conditions which promote RECP needs to be integrated and in interplay to unfold its potential.

A crucial factor believed to strongly contribute to the success of a Lithuanian RECP Centre is the access to RECP financing through a revolving fund provided by NEFCO (Staniskis & Arbaciauskas, 2004). This has proved to be successful in operating credit lines in Lithuania for RECP investments. Up till 2006 this solution provided soft loans for RECP technology investments in 29 companies.

The European Bank for Reconstruction and Development is present in Georgia where it is providing support to the Georgian bank system and infrastructural improvements with a focus on renewable energy and hydro power. Despite the presence of financial support of for instance EBRD (EBRD, 2010) to promote energy efficiency this is not believed to be enough and not always accessible for the small and medium sized companies. The Asian Development Bank is also present in Georgia; however the projects within Sustainable Development are targeting large infrastructural projects (Asian Development Bank, 2013).

The collateral for loans is often as high as 25% which could explain the difficulty to gain access to loans. Also, there is suggestively a tendency among banks in Georgia not to trust collaterals when available (Interview, Lindqvist, 2013).

Attractive credit lines from the national banks is by the Regional Environmental Centre for the Caucasus region considered to be necessary to support the small and medium sized industries to realize the RECP potential. The financial issues are concluded to be one of the main priorities in order to promote a wider implementation of RECP. The possibility to promote environmentally good performers with financial incentives such as tax relief and loans is provided through the Law on Environmental Protection (UNECE, 2010). This is, however, dependent on governmental decision and bearing in mind the rather low advocacy for environmental protection issues, the outlook for intervention could be considered moderate. To build capacity and acceptance of RECP within the Georgian Government and policymakers may strengthen advocacy and promote this kind of decisions long term.

### **6.3 Policy and Regulatory incentives for RECP**

#### ***Regional recommendations and achievements***

There are several rather encompassing recommendations targeting the EaP region considering of how to move towards a Green Economy and Sustainable development within the policy and regulatory area. This should be considered in this research as these elements also would benefit a wider implementation of RECP if improved. If these issues could be addressed today or in the future is discussed in this section. RECP policy strategies have also been introduced in post-Soviet countries in the region which could function as benchmark for Georgia.

In order to make progress towards a Green Economy all EaP countries would need to improve their legal systems and especially their regulatory mix related to permitting system, economic instruments, elimination of harmful subsidies etc (Eastern Partnership Civil Society Forum: Green Economy, 2011). An improvement of the efficiency of economic instruments for both negative and positive stimulation is particularly emphasized as well as to remove harmful subsidies and substitute these with environmentally sound subsidies (Eastern Partnership Civil Society Forum: Green Economy, 2011). The promotion of Sustainable Development in policies is in Georgia estimated to be the lowest in the region (Eastern Partnership Civil Society Forum: Environmental Governance, 2011).

The integration of environmental provisions into sectoral, regional and local policies should be enhanced in the EaP region as it is seen as mandatory for efficient environmental policymaking, and the forthcoming Association Agreements for the EaP countries demand

that environmental policy is integrated through a spectrum of legislative reforms (Eastern Partnership Civil Society Forum: Environmental Governance, 2011).

None of the EaP countries did in 2011 possess any strategic documents on green economy, sustainable production and consumption or cleaner production (Eastern Partnership Civil Society Forum: Green Economy, 2011).

The environmental protection and sustainable development should be improved in terms of legislation, programs and international agreements which demand that legislation needs to be implemented and maintained in the right way (Eastern Partnership Civil Society Forum: Environmental Governance, 2011).

Estonia has been particularly progressive in introducing RECP strategies and implemented a CO<sub>2</sub> tax targeting the heavy industry and energy generating facilities exceeding 20 MW in 2005, as well as, an ecological tax reform which re-emphasizes the use of taxes as a revenue instrument to instead focus on the management of natural resources and pollution of the environment. The ecological tax reform was undertaken to promote economic development and employment and the approach was that the overall tax burden must be balanced to remain the same. A successive increase of environmental charges and fees were also introduced in Estonia with a new Environmental Fees Act in 2006 CO<sub>2</sub> emission, disposal of hazardous waste and for oil shale extraction. In addition, a water abstraction charge was included which will increase with 10% on a yearly basis until 2013.

Armenia and Azerbaijan have successfully introduced an environmental fund based on the collection of non-compliance fees which finance parts of the enforcement function (Interview, Shukorova, 2013). To investigate the possibility to implement a similar fund in Georgia appears interesting and rational as it could contribute to build capacity for the enforcement of regulations.

As mentioned, goals and priorities of sustainable development are in general poorly integrated into other sectoral policies in the region. An exception is Ukraine which in order to create an environmental policy closer to EU practices adopted a National Environmental Strategy for 2020 as well as a National Action Plan for environmental protection for the period 2011 – 2015 (Delegation of the European Union to Ukraine, 2013). It should be noted that the EU has provided financing to support this initiative. The purpose of these efforts is to balance the complex and difficult environmental problems in Ukraine which have been built during a long period of time. Environmental standards with a more stringent to decouple economic growth from environmental degradation is believed to be necessary and collaboration with the EU could be essential to drive environmental reform.

Brizga et al. (2013) states that the recently adopted policy document in Ukraine, containing environmental policy integration may fall short due to that it is only a sectoral document and not anchored in an overarching sustainable development strategy.

### ***Policy and Regulatory incentives for RECP in Georgia***

The integration of RECP in other policies and to impose environmental costs on industry is difficult in Georgia where contradicting views on how to balance economic growth and environmental protection for many years have been a hotbed for disputes. Georgia is still lacking a National Sustainable Development Strategy which as mentioned would be a good starting point in order to guide national policymaking towards a more integrated approach promoting Sustainable Development. However, despite the challenge that this task would encompass in terms of concession and compromise within the Georgian Government,

initiatives to gather around this kind of strategic document have been initiated within the current Georgian Government. To seek support and guidance from the EU in order to create a modern National Sustainable Development Strategy seems plausible. In order to make the national environmental plan in Georgia possible to achieve this should be guided by this kind of strategic document which outlines how sustainable development should be achieved through sectoral policy integration. As mentioned, Ukraine's National Environmental Strategy and national environmental plan may fall short if it is not anchored in a more strategic and overarching sustainable policy.

The incentives to apply RECP in Georgia have been limited for many years. The regulatory incentives have been almost non-existing with low or no obligations to environmental responsibilities due the extensive deregulations made which also has curtailed the Environmental Impact Assessment system. A culture of non-compliance due to a widespread corruption has also been present. This culture has been reinforced by the fact that the economic incentives in terms of sanctioning also have been too low which has not justified a compliant behavior. In addition, the system for environmental protection is characterized by inconsistencies and gaps which have made implementation and compliance in the environmental area difficult.

The administrative feasibility in Georgia is currently strengthened while more resources and capacity is dedicated to environmental protection issues, and the environment is in the new Government Program stated as an area of priority. To make better use of the polluter pays principle seems plausible as a first step to accustom the industry to increased environmental responsibilities and to foster a culture of compliance. However, as concluded in Section 5.1.5, the number of emission standards, permits and licenses to be monitored, controlled and taxed should be limited in order not to make the administrative cost for pollution control too high and make the enforcement task too encompassing. To set non-compliance fees which are deterrent enough are as previously mentioned a prerequisite in order to not promote a culture of non-compliance.

The legal and regulatory system is certainly in need of reform as recommended to all of the EaP countries. The ongoing development of an encompassing Waste Management Framework Law which as far as possible should comply with EU standards and practices is therefore welcome. In parallel, a proposal of how to adjust Georgian legislation and statutes in order to integrate a RECP policy in the national policy framework is also ongoing. This is seen as essential in order to realize and implement the RECP potential within the Georgian industry. The planned development of sub-law regulations which could be used to impose a tax on undesired products and materials being imported to Georgia could be an effective and less costly way of promote RECP in industry.

To introduce and use market-based instruments more efficiently in the policy-mix in Georgia today does not appear feasible. To use economic instruments to enforce a basic set up administrative regulations seem more plausible and a successive increase and expansion of charges could be implemented over time. To impose environmentally related costs on the industry is also perceived to hamper the development and growth by business growth advocates among strong stakeholders within the Georgian Government. The Deputy Minister of Energy does however open up to address the energy intensity in Georgia in the future where regulations could be preceded by "grace periods" provided the industry in order to comply. Energy efficiency programs implemented in the developed world could function as a benchmark.

It could as concluded be more efficient to apply be more flexible and let the market decide how to best find solutions to abatement. It is not likely that this more decentralized policy approach is feasible today in Georgia as the industries themselves would need to take on most of the costs related to the abatement. Instead of addressing the industry broadly with a policy, some sectors may be addressed to start with which are identified as interesting due to pollution level and capacity to abate.

Many of the assessed beverage industries perceive that the Georgian Government often uses taxes only as a source for revenue, sometimes with short notice and in an unmotivated way. The industry perceives this as punishment. To introduce a tax shift similar to the one in Estonia and in other EU countries in order to promote a sound management of natural resources and waste may be applied in Georgia over time. It should be kept in mind that it is very uncommon even in the EU to fully have implemented an ecological tax reform. However, the interventions which stand out as pure tax collection measures in Georgia could suggestively be avoided to a higher degree and taxes aimed at environmental protection could gradually be introduced. The imposed tax on each PET bottle also appears to be a tool for tax collection rather than anything else, which could be shifted to target environmental waste and pollution issues.

To use pricing mechanisms could be an efficient way of significantly influence the use of resources and prevent pollution and waste. To draw any far reaching conclusions on how the industry perceives the prices of energy and water from the limited research in this thesis is not possible. To impose higher energy prices on the industry today does not seem feasible. Although low compared to the EU, the energy prices in Georgia are relatively high compared to countries in the region. The focus should rather be to create awareness among industry of how to address high energy intensity and to provide the industry with the financial means to do so.

The price of energy could partly be seen as driver for RECP measures within the Georgian beverage industry but as already mentioned; the large energy consumption within this industry is likely driving efficiency modifications even more. Water prices were as mentioned considered moderate among all companies, but at two industries located in the Tbilisi region. Lower perceived water prices outside the Tbilisi region may suggestively prevent measures to cut water consumption. In the Tbilisi region the high water tariffs for industrial customers could be considered to cross-subsidize the much lower water tariffs paid by households which would have no incentive to household with water.

The availability of statistical data about the Georgian industry sectors and related data has been quite limited in this research which made an assessment of the Georgian beverage industry essential. Irrespective of how high the level of awareness and advocacy for RECP are among the ministries; the need to gather data and enhance knowledge about the industry in terms of practices and conditions; is by several of the respondents seen as a crucial prerequisite in order to outline a relevant and feasible policy targeting the industry (Interview, Dzneladze, 2013), (Interview, Gujaraidze, 2013).

### ***Incentives for RECP in policy documents and legal instrument***

Several strategic policy documents and legal instruments have been reviewed in order to understand to what degree formal demands are anchored in reality, and if RECP could support the objectives stated in these.

Despite that no Energy Efficiency Law exists in Georgia, as well as, no comprehensive and strategic National Energy Policy, there are a few legal instruments promoting RECP within

the energy area. The Law on Electricity and Natural gas which also contains a rather short and not very elaborated National Energy Policy does promote energy efficiency measures in industry and states that environmental protection should be considered and integrated in all energy activities and goals. The Main Directions of State Policy in the Power Sector of Georgia does likewise promote the efficient use of energy in the industrial sector. These formal demands do not appear to be addressed on the energy consumption side of the industrial sector today. RECP would, however, support and facilitate the achievement of the objectives stated in these policy documents.

The Georgian 1996 Law on Environmental Protection (Parliament of Georgia, 1996) requires, a National Sustainable Development Strategy, nonetheless this is still not in place. A national Sustainable Development Strategy is necessary in order to promote RECP in an integrated way across the sector specific policies in the national policy framework. RECP supports the objectives of the Law on Environmental Protection.

The Government Program (Government of Georgia, 2012) is promising in the sense that it refers to the environment as a prioritized issue by the Georgian Government, where a modern environmental policy will be applied with ambitions set to move towards EU practices and standards (Government of Georgia, 2012). RECP could contribute to fulfill these objectives in an efficient and cost-effective way. The economic policy in the Government Program stands out as a backbone. This would be benefit from a wider implementation of RECP in the Georgian industry.

These policy documents and legal instruments contain guidance, statements and formal demands which, if followed could be supported by the inclusion of RECP strategies in a national policy framework. However, an overall more strategic and cross-sectoral approach to environmental protection and the use of natural resources seems to be needed in order to apply these policy documents and legal instruments in practice.

## 6.4 RECP Service Delivery

### *Regional achievements*

The so called RECP Service Providers are already operational in Moldova (NCCP, 2013) and Ukraine (RECP Centre, 2013). In Lithuania, a RECP centre has through the years had significant success while offering a full service of RECP advice and services (Staniskis & Arbaciauskas, 2004). As a part of the pollution prevention and RECP Program targeting Central and Eastern Europe operated by the World Environment Centre (WEC) and supported by USAID in 1990, a national RECP centre was also created in Lithuania which establishment has been considered successful for various reasons (Staniskis & Arbaciauskas, 2004). In brief the strategy within the program was to do a need assessment of technical issues as well as resources in the region and build up demonstration projects, and establish national RECP centres. To achieve this, three major areas was addressed: Outreach and training, Technical assistance to industry, Institutional capacity-building. The WEC program was complimented in parallel with Norwegian and Danish programs as well as a financing program provided by NEFCO. This RECP centre's success and strength is believed to be made out of:

- *Particular assessment.* RECP methods were efficiently adapted to the needs of the companies which resulted in high reductions and savings for the industries involved.
- *Successful implementation.* Many projects did not require large investments with a payback period within 6 months, and the investments could be made through the company's internal sources. Out of 163 assessed 151 projects were undertaken. The larger projects where more problematic though.

- *RECP financing.* The availability of NEFCO financing offered a revolving fund which successfully operated credit lines in Lithuania. Up till 2006 this solution provided soft loans for RECP technology investments in 29 companies.
- *Sustainability locally.* Sufficient local capacity was developed and it could sustain itself without help from donors
- *Integrate RECP with internal systems.* The RECP concept was integrated into companies' environmental management systems which could sustain the RECP activities
- *Competence and preparation.* The RECP centre's success in its operations is believed be related to that before it was established by WEC, local demonstration projects and training had already been undertaken at APINI operated by IIIEE and a Danish project.
- *A full service.* The various components of the centre contributed to that it could provide a full service, from assessment to financing a project's implementation.
- *Top management training.* In order to avoid that top management was not involved in the RECP process which had been the experience in previous projects in the region, the centre arranged short RECP training sessions for senior managers with the aim to educate in benefits and obstacles, and a better understanding of the concept. This enabled to create more successful teams in the projects undertaken.
- *Training of staff with authority.* Training programs for staff with responsibility turned out to be crucial in order to maintain and realize the full scale of the RECP opportunities.
- *Development of local methodology.* The development of a systematic pollution prevention methodology adapted fully to local conditions is believed to have contributed strongly to the continued success of running RECP projects after donor assistance had ended.

### ***RECP Service Delivery in Georgia***

In Georgia there is today no dedicated RECP Centre which has the capacity to assist and support companies in assessing and realizing the potential of RECP. The RECP project to be initiated by UNIDO and supported by UNEP under the EaP Green program in the region and Georgia has beside the aim to implement RECP demonstration projects in industries also has the purpose to create a capacity for RECP service providers (OECD, 2013). In 1998 the European Union founded the Energy Efficiency Centre (EEC, 2004) in Georgia as a part of the EU TASCIS project which was assessing and implementing RECP in Georgian industry (REC Moldova; REC Caucasus; Carec, 2005). If the Energy Efficiency Centre will take part of the capacity-building within the coming RECP project is unknown.

Considering the success of the RECP Centre in Lithuania, the approach of this centre could be used as benchmark when the RECP Service Delivery capacity is about to be strengthened in the future. To offer a full service, including favorable credit lines appears as quite relevant and a success factor. This would most likely be valuable also in Georgia due to the perceived poor state of the Georgian industry and especially small and medium sized companies which hamper RECP implementation. The seemingly low awareness within the Georgian industry would likely benefit by a fully fledged RECP Service Provider and potentially increase the realization of no and low costs RECP potential within the Georgian industry.

## **6.5 Suggested policy to promote RECP in Georgia**

The proposed RECP policy scenario in Georgia has the purpose to promote a change of culture and behavior in the industry, resulting in a wider adoption of Resource Efficient and Cleaner Production. The policy scenarios illustrated in Figure 6-3 and Figure 6-4 presents a sequence of how and when RECP strategies suggestively could be feasible to include in a Georgian environmental policy framework. Figure 6-3 outlines the interventions which initially appear to be feasible to introduce in order promote a wider implementation of RECP

in industry. Figure 6-4 suggests policy interventions which may be more feasible over time. Both scenarios are dependent on capacity-building in several areas which is presented in Chapter 6.5.3.

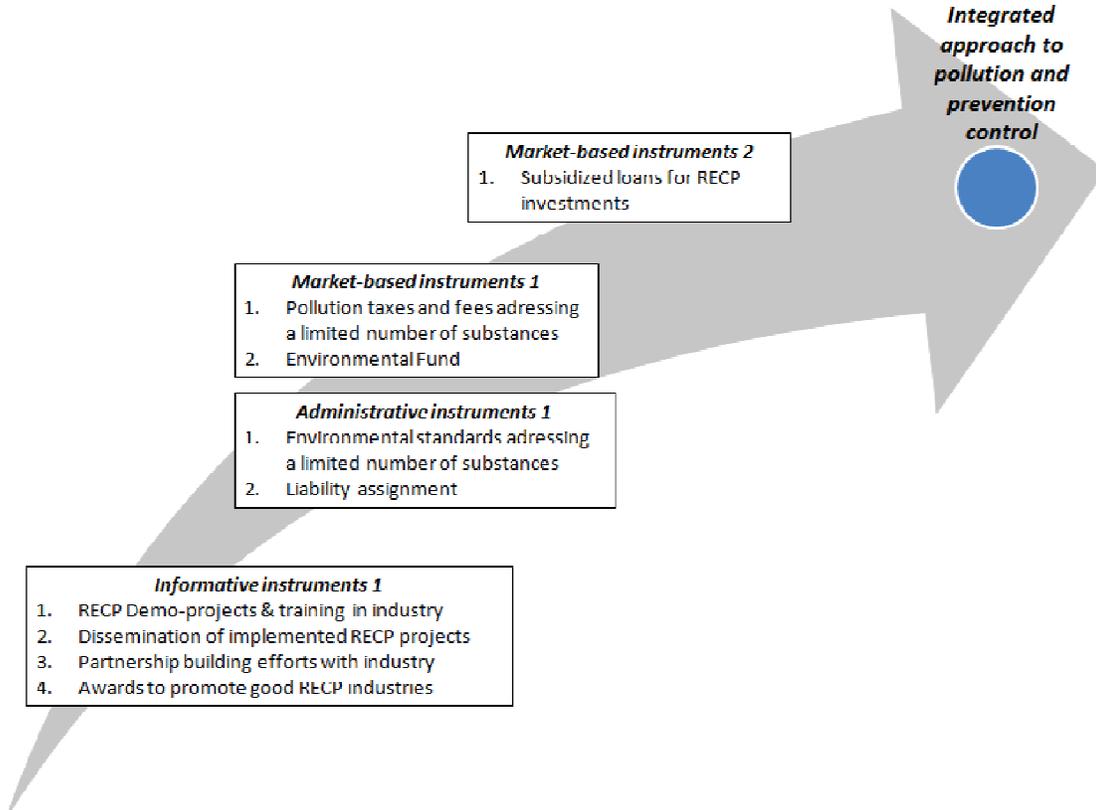


Figure 6-2 Initial RECP Policy interventions in Georgia

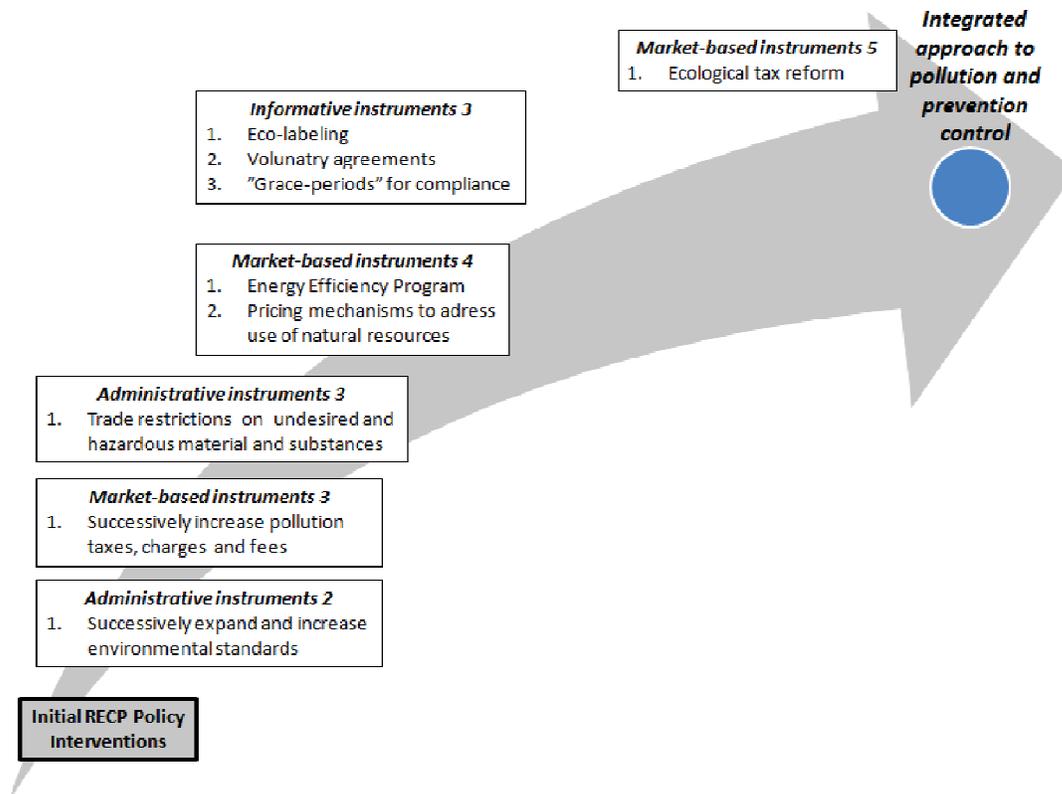


Figure 6-3 Future RECP Policy interventions in Georgia

## 6.5.1 Initial RECP policy interventions

### *Informative instruments 1*

Several of the ministers and Georgian RECP experts (Interview, Shukorova, 2013), (Interview, Girgvliani, 2013), state that capacity-building in the form of RECP demonstration projects and training in the industry is essential. This could build awareness, as well as, advocacy for RECP in Georgia in both the industry and among decision makers. This sequence and order of how to introduce RECP in a country is common and plausible in economies of transition and developing countries according to UNIDO (2002) and international RECP specialist (Interview, Dobes, 2013), (Interview, Lindhqvist, 2013), (Interview, Sop, 2013). The presence of international donor RECP projects and capacity-building efforts are a prerequisite to continue with this informative strategy.

To identify key stakeholders which could use the results from RECP demonstration projects undertaken in order to promote RECP is important and. This is will avoid that these results don't fall into oblivion and that data which could promote RECP creates as much leverage as possible. This is partly believed to have failed in previous RECP projects. Apart from decision makers in the industry, receivers of this data should suggestively be ministries, NGOs, and national and international funding institutions and banks. Meetings in-between the industry and the Georgian Government where a "green" business agenda is outlined as an interesting and beneficial alternative is already initiated by MENRP and to continue these kinds of efforts is likely important to build a mutual understanding and a platform for future collaboration. As

mentioned, to create a RECP award could contribute to increased recognition of RECP within the industry and among other stakeholders.

### ***Administrative instruments 1***

In relation to that the Environmental Inspectorate is being re-established and reinforced as well as MENRP; the monitoring and control function could be improved. This is believed to enable the utilization of liability assignment and the polluter pays principle to a higher degree (Interview, Legashvili, 2013), (Interview, Gogaladze, 2013). Despite this, to take on a too encompassing task while reintroducing the polluter pays principle with increased monitoring and control of environmental standards may force administrative costs as previously was the case in Georgia. To limit these efforts to a manageable scale seems wise and then successively scale up the activities seems more plausible. For instance, only a prioritized selection of emission standards, permits and licenses could be monitored and controlled to start with. Initially, main polluters of certain substances which have some kind of abatement capacity could be addressed. These regulations could be more stringent and encompassing in the future when a compliance culture in industry hopefully is more established and the industry overall has more technological and financial capacity. However, to identify a number of interesting industry sectors to address initially appears realistic. Likewise, a number of industries which are exempted or have lowered obligations should be identified.

### ***Market-based instruments 1***

Belonging economic instruments in the form of charges and fees should work in parallel with the regulatory environmental standards introduced. The non-compliance fee should also not be too low, and the reintroduction of the environmental protection function would not reach its cause and also not promote a more compliant culture in industry. The emission levels are considered to be too according to a Georgian RECP expert and have not been adjusted much since Soviet times. Capacity-building in the form of an environmental fund which is used in both Armenia and Azerbaijan may be feasible in Georgia. This could strengthen the enforcement capacity as the fund is made out of the fees collected during non-compliance cases when limits and standards are breached. The money could then contribute to finance monitoring and enforcement in terms of salaries and operational costs, and managed by the MENRP. To make polluters partly fund monitoring and controlling practices seems fair and a sound way to re-use the fees and should be tried out.

### ***Market-based instruments 2***

Subsidized loans and attractive credit lines are concluded to be an urgent priority in order to enable small and medium sized companies reap the benefits of RECP. To build financial capacity through legislative measures are believed to be necessary in order to realize these subsidized loans. The dissemination of RECP demonstration projects results to key stakeholders will likely speed up the realization of this kind of subsidy. The possibility to promote environmentally good performers with financial incentives such as tax relief and loans is indicated through the Law on Environmental Protection and should be further explored and promoted within the Georgian environmental policymaking.

## **6.5.2 Future RECP Policy Interventions**

### ***Administrative instruments 2***

The ongoing creation of an encompassing Waste Management Framework Law in collaboration with the EU should over time open up for the implementation of more stringent and expanded environmental standards in Georgia. To increase to ambition is important in

order not force a lax behavior in industry but to promote continuous improvements when it comes to pollution and prevention control and the management and use of natural resources.

### ***Market-based instruments 3***

More stringent and expanded environmental standards should in parallel be accompanied with increased charges and fees in order to promote a continuous improvement and function as a deterrent to pollute.

### ***Administrative instruments 3***

To introduce trade restrictions could be a cost-effective way of preventing and mitigating undesired and hazardous substances in industrial production. This has already been discussed within MENRP as an interesting option and should suggestively be explored and promoted within the Georgian Government. Sub-law regulations are to be developed by Georgia as it is demanded by the EU within the ongoing EU twinning project. This will enable policymakers to impose a tax on undesired material and products being imported into Georgia. This could promote environmentally more sound materials and substances to be used in the Georgian industry. Trade restrictions of these kinds are also more cost-effective as it does not demand resources for monitoring, control and enforcement.

### ***Market-based instruments 4***

An energy efficiency program may be feasible to try out to address the energy intense Georgian industry. A variant of the Program for Energy Efficiency (PFE) which addresses energy intense industry in Sweden since 2005 may be an option (Swedish Energy Agency, 2013). Energy prices in Sweden were increased in line with the EU Tax Directive targeting energy intensity in industry but energy intense industries were offered a tax exemption under certain conditions. If the industries volunteered to take part in the PFE they would in return be approved tax exemptions. The program runs during 5 years and the 2 first years the participating enterprise is obliged to introduce and obtain a certification for a standardized energy management system which should be used to review and identify potential energy efficiency measures. A report of a list of measures should be submitted which should be implemented the coming 3 years to improve energy efficiency.

### ***Informative instruments 3***

Voluntary agreements may also be feasible to introduce in the future given that the industry is believed to have the capacity to comply in the future. In addition, “Grace-periods” which could give the industry decent time to adjust operations in compliance with future regulations could be a good way to approach the industry. The interventions conducted today are commonly seen as a punishment by the industry and appears with short notice and without any motive. The desire to build a partnership and trust between industry and the Georgian Government, opposite to the alienated relation which appears to be present today, was expressed by both MENRP and by several of the industries. A continued dialogue and improved relation with industry could lead up the formulation of an attractive Sustainable Development strategy which could both strengthen the industry and reduce environmental impact.

To publicize industrial environmental performance could be a good way to promote RECP in industry. This kind of information does not reach the public today but should be considered along with developing channels to improve the general environmental awareness and the citizens’ participation in these kinds of issues. Today Georgia has no national formal grading system to indentify environmentally good performers in industry. This is important in this context but is likely an endeavor to develop over time. The possibility to issue eco-labels by an



A future Georgian environmental policy framework which could include RECP strategies to a higher degree to influence industrial behavior is as mentioned dependent on that several conditions for RECP over time are developed. The following conditions would need to be considerably improved in Georgia: policy and regulatory incentives to RECP, awareness and advocacy for RECP, access to finance for environmentally sound technologies/RECP Investment, and RECP service delivery.

Basic improvements regarding the content and the way legislation is maintained and implemented in the area of environmental protection are by the EU recommended all of the so called Eastern Partnership countries including Georgia, Armenia, Azerbaijan, Moldova, Ukraine and Belarus. The need to raise awareness about Sustainable Development among all stakeholders in society is also recommended. The policy-mix and the permitting system should also be developed, and a more integrated policy approach to environmental protection introduced, where various policies work towards a more Sustainable Development. These recommendations are a selection and should be considered in Georgia while developing and implementing a modern environmental policy where RECP strategies suggestively could be more prevalent.

Specific recommendations found in this thesis' research which could improve the condition for RECP within the Georgian industry include:

- Formulation of a National Sustainable Development Strategy to guide policymaking.
- Creation of a RECP Policy while adjusting legislation and statutes.
- Conduct comprehensive industry research to enable relevant and effective policymaking.
- Improve public access to environmental information in order to improve general environmental awareness and increased public participation.
- Identify key stakeholders for dissemination of RECP demonstration project results.
- Investigate ways to improve access to finance for RECP investments for the industry.
- Establish a RECP Centre offering a full service for the industry.
- Develop eco-labeling system to disclose industrial environmental performance.

## 7 Conclusions

The purpose of this thesis is contribute to increased understanding of how to include RECP within the Georgian environmental policy framework in order to provide a path to Sustainable Development for its industry. In order to achieve this two research questions were formulated to guide the research:

1. What are the conditions for RECP within the current Georgian system; that is in practices of the industry, in the legal framework and in policymaking?
2. What policies are most likely to promote a wider implementation of the RECP approach within the Georgian industry?

A brief overview of the findings and conclusions related to each subset of the research questions are presented below.

### ***The condition for RECP in practices of the industry***

The already indicated potential for RECP in the Georgian industry was confirmed in the research and is particularly related to the presence of out-dated technology. The condition for RECP in the industry, that is, to what degree RECP measures could be expected to be adopted by the industry today should be considered to be rather low. In discussions with Georgian RECP specialists several issues appeared as potential barriers to RECP within the Georgian industry:

- A lack of awareness of how to work systematically with RECP (identified among various industrial sectors in previous projects).
- A lack of financial means for RECP investments (such as more efficient technology and machines) among small and medium sized companies.
- The access to attractive loans for RECP investments is not perceived to be available for small and medium sized companies to a desired degree.
- A generally low level of environmental regulation set and lax enforcement practices (which now supposedly gradually is changing).
- Corrupt enforcement practices have been present for years which may have created a culture of non-compliance in industry.

The condition for RECP within the Georgian beverage industry was found to be slightly different than the findings presented above. RECP was in theory not a familiar concept to the beverage industry; but in practice most of the beverage companies had undertaken far reaching energy efficiency measures in their production processes. This may be explained by that the beverage industry is a large energy consumer which creates a natural incentive to investigate and implement energy efficiency measures. Measures to decrease the use of water and material throughout the process were also undertaken, but the main emphasis was put on energy efficiency measures where most economic savings were realized. The savings achieved or which potentially could be reached within the beverage industry were significant and emphasize that waste is a lost resource and therefore should be prevented in the first place.

The perception of prices for energy (electricity and natural gas) was highly varying among the beverage companies from rather low to moderate and high. However, the prices of energy in Georgia are among the highest in the region among other post-Soviet countries. The water prices were perceived to be moderate among all the beverage companies assessed, but two. In recent years a significant increase of water prices were imposed on companies in the Tbilisi region but from a low level. Both water and energy prices were considered to drive RECP measures at a few of the companies, and some stated that an increase of these prices would force prices on the final product itself. The high use of these resources in the production and the fact that water is a main part of the product has likely influenced the responses. Based on

the limited research it is not reasonable to draw any far reaching conclusions. More research of this issue should be conducted in all sectors of the industry in order to guide policymakers of how to use policy instruments to promote an efficient use of these resources.

The drivers to adopt RECP in the beverage industry today were mainly found to be made out of:

- The large production volume, the continuous flow and large consumption of particularly energy but also water, as well as, material in production processes
- Relatively strong internal environmental requirements
- Most companies had strong finances and could afford RECP investments
- Less costly RECP opportunities available with significant payback
- High hygiene and quality standards of products
- High level of technical and efficiency know-how present

The main barrier to adopt RECP in the Georgian beverage industry today was mainly found to be related to:

- A generally low level of environmental regulation set by authorities and lax enforcement practices
- Low cost to discharge waste which makes it more attractive to pollute than to prevent or treat
- Taxes imposed on industry are mainly used as a revenue tool rather than to protect the environment or to promote an efficient use of resources
- In addition, the interventions targeting the industry were perceived to appear suddenly without any motivation and with too short notice. (A successful RECP policy necessitates a less strained relation in-between regulators and industry)

### ***The condition for RECP in policymaking and the legal framework***

In order to evaluate the condition to include RECP strategies in the Georgian policymaking a multi-criteria analysis was undertaken. The selected criteria *administrative feasibility, social and political acceptance, incentives for improvement, cost-effectiveness, equity and effectiveness* were useful while investigating how a policy scenario would affect various stakeholders and actors involved, and what capacity and resources are available in Georgia. The RECP approach advocates the inclusion of RECP strategies in a whole national policy framework in order to achieve environmental objectives in a more efficient and cost-effective way. The use of market-based instruments in policymaking such as pricing mechanisms is stressed which significantly could influence environmental performance. Informative strategies aimed at putting pressure and inform the industry is also important, as well as, to exercise a regulatory pressure with the help of administrative instruments. Further, RECP promotes a flexible and decentralized approach when it comes to abatement where the industry is given more freedom due to their current ability to reduce their environmental impact. A closer collaboration between regulators and industrial actors is also recommended to successfully work with RECP in industry.

Despite the currently strengthened enforcement function which will enable a much better use of the polluter pays principle, the condition for RECP in policymaking was considered rather low for a number of reasons:

- The contradicting views in Georgia of how to balance and combine socio-economic goals with environmental concern difficult a more integrated policymaking in specific policies.
- To create incentives for the industry, to improve environmental performance, while imposing environmental costs is a politically sensitive issue in Georgia.

- Taxes targeting the industry in Georgia appear to be used as a revenue tool rather than for environmental protection purposes and to promote an efficient use of resources.
- To use market-pricing mechanisms to address the management and use of resources may also not be feasible for political reasons.
- It is unclear to what degree the industry possesses the capacity, knowledge and the financial means to respond to policy interventions related to RECP.
- To publicly disclose environmental performance is also difficult with no eco-labeling system in place and the general public environmental awareness may also be limited.
- The limited awareness and advocacy for RECP as a concept in both industry and among decision makers do not facilitate the inclusion of RECP in a policymaking process.
- The indicated present tension between the industry and authorities would need to be improved as informative RECP strategies assume a close collaboration.

The condition for RECP in the legal framework should also be considered low today for a number of reasons, including:

- The legal framework, although currently under reformation, is today made out of gaps and inconsistencies which make environmental protection difficult to implement and enforce.
- Extensive deregulations in the environmental sphere have been made in recent years (but today the outlook for a higher environmental protection in the legal framework is better).
- A National Sustainable Development Strategy which could make out an important overarching strategic policy document and guide policymaking is not in place.
- The formal demands and objectives found in the reviewed policy documents and legal instruments which could be linked and supported by RECP, are not well anchored in reality.

Nonetheless, the stated objectives in the reviewed policy documents and legal instruments provide an opportunity to promote RECP as an approach to achieve these. This is for instance evident within the new Government Program where various specific policies would benefit from a wider implementation of RECP within the Georgian industry. The environmental multi-lateral agreements entered by Georgia would also benefit from RECP, as well as the National Environmental Action Program in Georgia. A waste management framework law is also currently being created which should prove to be helpful in order to include RECP strategies in a Georgian environmental policy to a higher degree over time. The existing legal framework could also be used to promote RECP through statements promoting for instance eco-labeling and soft loans for Sustainable Development activities.

### ***What policies are most likely to promote a wider implementation of RECP in the Georgian industry?***

The condition for RECP within the legal framework and the policymaking process, as well as, in practices in the industry are as already concluded found to be rather low in Georgia. A RECP policy scenario would have to be adapted to the current conditions and predicted future developments in Georgia. Despite the limited possibility to include RECP strategies in a Georgian environmental policy framework there are still policy interventions which are feasible in order to promote a wider implementation of RECP in industry. Initially, capacity-building for RECP is essential which could improve awareness and advocacy in industry and among decision makers. A RECP policy could in an initial phase include the following:

- RECP demonstration projects and training for the industry
- Dissemination of results from RECP demonstration projects
- RECP awards for the industry to promote good environmental performance
- Increased collaboration and partnership building with industry

- Environmental standards and regulations – addressing a limited number of substances
- Pollution taxes and fees - addressing a limited number of substances
- Environmental Fund - to strengthen enforcement capacity
- Attractive credit lines for RECP investments for the industry is key

The presence of international donor RECP projects and capacity-building efforts are a prerequisite to continue with demonstration projects. To disseminate the results of these projects to key stakeholders and persons is crucial in order to create a leverage point. Further, to continuously develop the collaboration and dialogue in-between industry and authorities is also necessary where a joint Sustainable Development strategy could be outlined over time. The strengthened administrative function enables the enforcement of environmental standards and regulations to a higher degree. However, the monitoring and control should suggestively be limited to a number of substances in order not to force the costs for pollution control which previously has been the case in Georgia. Environmental charges should be applied in parallel with the environmental standards and regulations. These should not be too low in order to promote a culture of compliance and act as a deterrent to pollute. An environmental fund may be feasible to introduce in order to financially strengthen the enforcement function as is already done in Armenia and Azerbaijan where non-compliance fees are collected and re-used in environmental protection purposes.

Successively, the RECP strategies in an environmental policy could be more encompassing and effective when sufficient capacity for RECP has been built in industry, the legal framework and in policymaking. A general development of the socio-economic dimension in Georgia will also facilitate a more stringent environment protection and advocacy to apply RECP strategies. Suggestively, the RECP policy interventions could at a later stage be enlarged with the following:

- Expanded and more stringent environmental standards and regulations, accompanied with pollution taxes and fees
- Trade restrictions targeting undesired material and products imported to Georgia
- Energy efficiency program
- Increased public disclosure of environmental performance via eco-labeling system
- Voluntary agreements and “grace periods” to comply with regulations
- Pricing mechanisms to address the management and use of natural resources
- A gradual ecological reformation of taxes which could promote environmental protection

To gradually expand the environmental issues to fall under the environmental regulatory standards and to make them more stringent is recommended in order to promote continuous improvements in industry along with economic instruments which should enforce the environmental costs. Sub-law regulations which are planned to be developed in Georgia will provide the possibility to apply trade restrictions on undesired products and material imported to Georgia. This could be a cost-effective policy intervention which does not have to require high administrative resources. Against the backdrop of the energy intense Georgian industry, the introduction of an energy efficiency program which could provide the industry with tax exemptions if energy efficiency measures are undertaken may be plausible in the future.

The Georgian Environmental Protection Law has a provision for eco-labeling developed to promote environmentally friendly production which should be explored in order to put pressure on industrial environmental performance. It could be introduced as a competitive tool for the industry in order to distinguish itself from other companies. The policy mix should gradually also include more market-based instruments to influence negative behavior and promote positive actions related to RECP.

## Bibliography

- Aroma Product. (2013). *About the company*. Retrieved August 17, 2013, from <http://aroma.ge/eng/about>
- Baltic Environmental Forum. (2003). *The use of Economic instruments in Environmental Policy in the Baltic States*. Riga: Baltic Environmental Forum.
- Beierle, T. (2002). The Quality of Stakeholder-based Decisions. *Risk Analysis: an International Journal*, 739-749.
- Boezeman, D., Leroy, P., Mass, R., & Kruitwagen, S. (2010). The (limited) political influence of ecological economic: a case study on Dutch environmental policies. *Ecological Economics*, 1756-1764.
- Borjomi. (2013). *About the company*. Retrieved August 17, 2013, from [http://www.borjomi.com/int\\_en/about/about.php](http://www.borjomi.com/int_en/about/about.php)
- Brizga, J., Mischuk, Z., & Golubovksa, A. (2013). Sustainable consumption and production governance in countries in transition. *Journal of Cleaner Production*, 1-9.
- Buhrs, T., & Bartlett, R. V. (1993). *Environmental Policy in New Zealand. The politics of Clean and Green*. Auckland : Oxford University Press.
- Böcher, M. (2012). A theoretical framework for explaining the choice of instruments in environmental policy. *Forest Policy and Economics*, 14-22.
- Caldwell, L. K., & Bartlett, R. V. (1997). *Environmental Policy: Transnational Issues and National Trends*. Westport: Greenwood Publishing Group.
- Castel Georgia . (2013). *About us* . Retrieved August 17, 2013, from <http://www.castel.ge/?mid=42>
- Coase, C. (1960). The Problem of Social Cost. *Journal of Law and Economics*, 1-44.
- Cordato, R. E. (2006). *The Polluter Pays Principle - A proper guide for environmental policy*. Washington: Institute for Research on the Economics of Taxation.
- Crabbé, A., & Leroy, P. (2008). *The Handbook of Environmental Policy Evaluation*. London-Sterling, UK-US: Earthscan.
- Delegation of the European Union to Ukraine. (2013, February 4). Making environment a priority: Interview.
- Dietz, S. (2010). The equity-efficiency trade-off in environmental policy: evidence from stated preferences . *Land Economics*, 423-443.
- Dominique, M., Marcotte, M., & Arcand, Y. (2006). Development of eco-efficiency indicators for the Canadian food and beverage industry. *Journal of Cleaner Production*, 636-648.
- Eastern Partnership Civil Society Forum. (2011). *Opportunities and Options for promoting a Green Economy in the Eastern Partnership countries*. Brussels : European Commission .

Eastern Partnership Civil Society Forum. (2011). *Towards good environmental governance in the eastern partnership countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine*. Kyiv: stern Partnership Civil Society Forum.

EBRD . (2010). *Strategy for Georgia* . London : EBRD.

EC. (2013). *Country cooperation - Georgia* . Retrieved August 28, 2013, from [http://ec.europa.eu/europeaid/where/neighbourhood/country-cooperation/georgia/georgia\\_en.htm](http://ec.europa.eu/europeaid/where/neighbourhood/country-cooperation/georgia/georgia_en.htm)

EC. (2013). *Guidance on ex-ante evaluation*. Brussels: European Commission.

EEA. (2001). *Reporting on environmental measures: Are we being effective?* Copenhagen : EEA.

EEC. (2004). *The Energy Efficiency Centre*. Retrieved September 10, 2013, from <http://www.eecgeo.org/>

Energy Charter Secretariat. (2012). *In-depth review of Energy Efficiency Policies and Programmes* . Brussels : Energy Charter Secretariat.

Environmental NGO Task Force. (2012). *Annual Report "Citizens' opinion on the implementation of the environmental policy in 2011"*. Kyiv: Environmental NGO Task Force.

ESCO . (2013, May ). Review of the activities of Electricity System Commercial Operator. Tbilisi, Caucasus, Georgia : ESCO.

EU Commission . (1997). *Environmental Taxes and Charges in the Single Market COM(97) 9 final*. Luxembourg : Office for Official Publications of the European Communities .

European Commission. (2010). *Critical raw materials for the EU*. Brussels: European Commission - Enterprise and Industry .

EUWI-FWG. (2012). *Pricing water resources to finance their sustainable management*. Stockholm : EU Water Initiative .

Faure, M. (2001). *Environmental Law and Economics*. Maastricht: The Institute for Transnational Legal Research, Maastricht University.

Field C., B. (1997). *Environmental Economics 2nd Edition*. New York: Irwin McGraw Hill.

Field, B., & Olewiler, N. D. (2002). *Environmental Economics 3rd edition* . New York: Irwin McGraw-Hill.

Fijal, T. (2007). An environmental assessment method for cleaner production technologies. *Journal of Cleaner Production* , 914-919.

Frondel, M., Horbach, J., & Rennings, K. (2007). End-of-Pipe or Cleaner Production? An Empirical Comparison of Environmental Innovation Decisions Across OECD Countries. *Business Strategy and the Environment* , 571-584.

Gamper, C., & Turcanu, C. (2007). On the governmental use of multi-criteria analysis. *Ecological Economics* , 298-307.

- Government of Georgia. (2012). *Government Program*. Tbilisi.
- Hungarian National Development Agency. (2013, August ). *National Development Agency* . Retrieved August 1, 2013, from [http://www.nfu.hu/ex\\_ante\\_evaluation](http://www.nfu.hu/ex_ante_evaluation)
- IEA. (2013). *International Energy Agency* . Retrieved August 19, 2013, from <http://www.iea.org/stats/surveys/archives.asp>
- IEEP. (2010). *Environmental Policy Integration*. Retrieved August 13, 2013, from <http://www.ieep.eu/work-areas/governance/environmental-policy-integration/>
- IFC. (2013). *Energy Efficiency Survey Program*. Retrieved August 14, 2013, from [http://www.ifc.org/wps/wcm/connect/RegProjects\\_Ext\\_Content/IFC\\_External\\_Corporate\\_Site/UEEP\\_Home](http://www.ifc.org/wps/wcm/connect/RegProjects_Ext_Content/IFC_External_Corporate_Site/UEEP_Home)
- IFC. (2010). *Energy Efficiency: A new resource to sustainable growth - researching energy efficiency practices among companies in Armenia, Azerbaijan, Belarus, Georgia, Russia, and Ukraine*. Yerevan : IFC in Armenia.
- IFC. (2007). *Environmental, Health, and Safety Guidelines for the Food and Beverage Industry*. International Finance Cooperation - World Bank Group.
- International Relations Department . (2013). *Energy Strategy and Energy Policy Developments for the Promotion of Clean Power Generation in Georgia*. Tbilisi: International Relations Department .
- Karlsson, M., & Rodhe, H. (2002). *Textbook on Cleaner Production* . Lund: The International Institute for Industrial Environmental Economics.
- Lindhqvist, T. (2000). *Extended Producer Responsibility in Cleaner Production* . Lund: The International Institute for Industrial Environmental Economics.
- Maas, R., Kruitwagen, S., & Van Gerwen, O. (2011). Environmental policy evaluation: Experiences in the Netherlands. *Environmental Development* , 67-78.
- Martinot, E., Schipper, L., & Khrushch, M. (1995). Energy demand and efficiency in Estonia . *Energy Policy* , 217-233.
- McCormick, J. (2001). *Environmental Policy in the European Union - The European Union Series* . Houndmills, Basingstoke, Hampshire; New York: PALGRAVE.
- MENRP. (n.d.). Retrieved July 18, 2013, from Ministry of Environment and Natural Resources Protection of Georgia: [http://moe.gov.ge/index.php?lang\\_id=ENG&sec\\_id=99](http://moe.gov.ge/index.php?lang_id=ENG&sec_id=99)
- MENRP. (2011). *National Report on the State of the Environment of Georgia*. Tbilisi: Ministry of Environment Protection of Georgia.
- Mermet, L., Billé, R., & Leroy, M. (2010 ). Concern-Focused Evaluation for Ambiguous and Conflicting Policies: An approach from the Environmental Field . *American Journal of Evaluation* , 180-198.

MESD. (2013). *Ministry of Economy and Sustainable Development*. Retrieved September 4, 2013, from <http://www.economy.ge/en/home>

Mitchell, C. L. (2006). Beyond barriers: examining root causes behind commonly cited Cleaner Production Barriers in Vietnam. *Journal of Cleaner Production* , 1576-1585.

Mukhtarov, F. (2006). Privatization of Social Policy of Water Supply in the South Caucasus: A Boost to Regional Development or “Stealing Water from the Poor? (pp. 1-21). Budapest: Central European University .

Munda, G. (1995). *Multicriteria Evaluation in a Fuzzy Environment*. Heidelberg: Physica Verlag .

Natakhtari Beer Brewery. (2013). *History* . Retrieved August 17, 2013, from [http://natakhtari.ge/?action=page&page\\_id=32&pageon=32&lang=eng](http://natakhtari.ge/?action=page&page_id=32&pageon=32&lang=eng)

NCCP. (2013). *NCCP* . Retrieved September 10, 2013, from <http://www.ncpp.md/en/index.html>

Nilsson, L., Persson, P. O., Rydén, L., Darozhka, S., & Zaliauskiene, A. (2007). *Cleaner Production - Technologies and Tools for Resource Efficient Production*. Uppsala: The Baltic University Press.

Norton, A. (1984). *Resource Economics*. London : Hodder Arnold .

OECD. (2008). *An OECD Framework for Effective and Efficient Environmental Policies*. Paris: OECD.

OECD. (2013). *Environment in emerging and transition economies - EaP GREEN: Greening economies in the European Union's Eastern Partnership countries*. Retrieved August 21, 2013, from <http://www.oecd.org/env/outreach/eapgreen.htm>

OECD. (1997). *Evaluating Economic Instruments for Environmental Policy*. Paris: OECD.

OECD. (2012). *Green Growth and Environmental Governance in Eastern Europe, Caucasus, and Central Asia* . Paris : OECD.

Olajire, A. A. (2012). The brewing industry and environmental challenges. *Journal of Cleaner Production* , 1-21.

Parliament of Georgia . (2006). *Main Directions of State Policy in the Power Sector of Georgia*. Tbilisi: Parliament of Georgia .

Parliament of Georgia. (1997). *Georgian Law on Electricity and Natural Gas*. Tbilisi: Parliament of Georgia.

Parliament of Georgia. (1996). *The 1996 Law on Environmental Protection*. Tbilisi: Parliament of Georgia.

Parliament of Georgia. (1995). *The Constitution of Georgia*. Tbilisi: The Parliament of Georgia and The Constitutional Commission.

REC . (2013). *The Regional Environmental Centre for the Caucasus region* . Retrieved September 8, 2013, from <http://www.rec-caucasus.org/index.php?lang=en>

REC Caucasus. (2012). *Cleaner PRoduction in Practice*. Tbilisi: The Regional Environmental Centre for the Caucasus.

REC Moldova; REC Caucasus; Carec. (2005). *Tacis Project Cleaner Production in the selected countries of the NIS: Moldova, Georgia and Kazakhstan - Cleaner Production Demo Project case-studies*. Chisinau; Tbilisi; Almaty; EC.

RECP Centre. (2013). *Resource Efficient and Cleaner Production Centre*. Retrieved September 10, 2013, from <http://recpc.kpi.ua/en>

Reijnders, L. (2003). Policies influencing cleaner production: the role of prices and regulation. *Journal of cleaner production* , 333–338.

Robert, C., & Zeckhauser, R. (2011). The Methodology of normative policy analysis. *Journal of Policy Analysis and Management* , 613–643.

Serret, Y; Johnstone;. (2006). *The Distributional Effects of Environmental Policy*. Northampton : Edward Elgar Publishing .

Staniskis, J., & Arbaciauskas, V. (2004). Institutional capacity building for pollution prevention centres in Central and Eastern Europe with special reference in Lithuania. *Journal of Cleaner Production* , 207-214.

Stavins, R. (2001). *Experience with Market-Based Environmental Policy Instruments*. Washington : Resources For the Future.

Streimikiene, D., Ciegis, R., & Pusinaite, R. (2006). Review of climate policies in the Baltic States. *Natural Resources Forum* , 280-293.

Swedish Chemicals Agency. (2011). *The Environmental Economics of a Global Ban on Mercury-added Products*. Sundbyberg; Swedish Chemicals Agency.

The EU. (n.d.). *Eastern Partnership Community* . Retrieved 08 7, 2013, from <http://www.easternpartnership.org/content/eastern-partnership-glance>

The EU Observer . (2013, July 22). *EU and Georgia edge closer to association deal*. Retrieved August 28, 2013, from <http://euobserver.com/enlargement/120935>

The European Parliament and the Council of the European Union. (2008, January 15). DIRECTIVE 2008/1/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning integrated pollution and prevention control. Brussels, Belgium: The European Parliament; The European Council of Ministers;

The Government of Georgia. (2012). *The Government of Georgia*. Retrieved September 9, 2013, from [http://www.government.gov.ge/index.php?lang\\_id=ENG](http://www.government.gov.ge/index.php?lang_id=ENG)

The World Bank. (2012). *Georgia Overview*. Retrieved August 26, 2013, from <http://www.worldbank.org/en/country/georgia/overview>

The World Bank. (2012). *The World Bank Data Bank*.

Turner, K., Pearce, D., & Bateman, I. (1994). *Environmental Economics: An Elementary Introduction*. New York; London; Harvester Wheatsheaf.

Ukrainian Environmental NGO "MAMA-86". (2008). *SCP Policy REview of Western and Southern Caucasus EECCA countries*. Kyiv: Ukrainian Environmental NGO "MAMA-86".

UN. (1992). *Agenda 21 . Agenda 21 - United Nations Conference on Environment & Development*. Rio de Janeiro : United Nations.

UN. (1987). *Report of the World Commission on Environment and Development*. UN.

UNDP. (2007). *Report of Waste Inventory on the Territory of Georgia*. UNDP.

UNECE. (2009). *Energy Efficiency Investment Project Development for Climate Change Mitigation. Final Report*. Geneva: UNECE.

UNECE. (2010). *Environmental Performance Reviews*. New York and Geneva: United Nations.

UNEP . (2013). *Governmental Strategies & Policies For Resource Efficient*. Retrieved August 25, 2013, from <http://www.unep.fr/scp/cp/understanding/policies.htm>

UNEP . (1998). *INTERNATIONAL DECLARATION ON CLEANER PRODUCTION. INTERNATIONAL DECLARATION ON CLEANER PRODUCTION* . Paris , France : UNEP - Divison of Technology, Industry and Economics .

UNEP & UNIDO. (2009). *Joint UNIDO-UNEP Programme on Resource Efficiency and Cleaner Production (RECP)*. Paris & Vienna: UNIDO & UNEP.

UNEP. (1996). *Cleaner Production - A Training Resource Package*. Paris : UN.

UNEP. (1994). *Government Strategies & Policies for Cleaner Production*. UNEP.

UNEP. (n.d). *Green Economy* . Retrieved August 8, 2013, from <http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx>

UNEP. (2013). *RECP Policies*. Retrieved August 28, 2013, from <http://www.unep.org/resourceefficiency/Business/CleanerSaferProduction/ResourceEfficientCleanerProduction/UnderstandingRECP/RECPPolicies/tabid/78841/Default.aspx>

UNEP. (2013). *United Nations Environment Programme - Divions of Technology, Industry and Economics*. Retrieved July 27, 2013, from <http://www.unep.fr/scp/cp/>

UNEP-EEA. (2007). *Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia*. Geneva, Copenhagen : UNEP-EEA.

UNIDO. (2007). *International Handbook for Environmental Technology Management*. UNIDO.

UNIDO. (2002). *Manual on the Development of Cleaner Production Policies - Approaches and Instruments. Guidelines for National Cleaner Production Centres and Programmes*. Vienna: UNIDO.

UNIDO. (2012, April 25). *Resource Efficient and Cleaner Production: doing more with fewer resources and less pollution*. 3. United Nations Industrial Development Organization.

Walls, M. (2011). *Deposit-refund systems in theory and practice*. Washington: Resources for the Future.

WBCSD. (2000). *Eco-efficiency - Creating more value with less impact*. Conches-Geneva : World Business Council for Sustainable Development.

Weiss, P., & Bentlage, J. (2006). *Environmental Management Systems and Certification* . Uppsala: The Baltic University Press .

WHO & UNEP. (2013). *Economic instruments as a lever for policy*. Retrieved August 15, 2013, from <http://www.who.int/heli/economics/econinstruments/en/index.html>

World Experience for Georgia for Winrock International. (2008). *Energy Efficient Potential in Georgia and Policy Options for its utilization* . Tbilisi: USAID Georgia .

Öko-Institut. (2005). *The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural Aspects of Allocation*. Brussels: WWF.

## List of interviewees

### ***National Government representatives of Georgia:***

Ms. Khatuna Gogaladze, Minister of Environment, Ministry of Environment and Natural Resources Protection of Georgia, Tbilisi. (18 June 2013)

Ms. Nino Tkhilava, Head of Department, Department of Environmental Policy and International Relation, Ministry of Environment and Natural Resources Protection of Georgia, Tbilisi. (18 June 2013)

Ms. Nino Kvernadze, Head of Sustainable Development Department, Ministry of Economy and Sustainable Development, Tbilisi. (18 June 2013)

Ms. Mariam Valishvili, Deputy Minister, Ministry of Energy of Georgia, Tbilisi. (21 June 2013)

Mr. Irakli Legashvili, Waste Management Expert, Ministry of Environment and Natural Resources Protection of Georgia, Tbilisi. (25 July 2013)

### ***RECP Specialists:***

Mr. Thomas Lindhqvist, Professor, IIIEE (International Institute for Industrial Environmental Economics, Lund. (4 June 2013)

Mr. Vladimir Dobes, Director, EMPRESS – UNEP/GEF Project (Energy Management and Performance Related Savings Scheme). (13 June 2013)

Mr. Donald Huisingsh, Professor of Sustainable Development, University of Tennessee. (17 June 2013)

Mr. David Girgvliani, Director and RECP Specialist, DG Consulting, Tbilisi. (19 June 2013)

Ms. Malak Shukorova, Vice Director, The Regional Environmental Centre for the Caucasus, Tbilisi. (21 June 2013)

Ms. Lucia Sop, Programme Director National Cleaner Production Programme - Moldova, (20 August 2013)

### ***NGOs:***

Mr. Malkhaz Dzneladze, Regional Coordinator, WWF Caucasus, Tbilisi. (18 June 2013)

Ms. Kety Gujaraidze, Policy Analyst and Director, Green Alternative Association, Tbilisi. (27 June 2013)

### ***Georgian beverage industries and respondents:***

Mr. Vakhtang Lagidze, Coca-Cola Bottlers Georgia Ltd, Tbilisi. (19 June 2013)

Mr. Gocha Gorgidze, Plant Director, Pepsi Ltd., Tbilisi. (20 June 2013)

Mr. Gia Shatirishvili, Production Director, Borjomi, Borjomi. (24 June 2013)

Mr. Mika Phirtskhalava, Production Manager, Natakhtari Beer Brewery, Natakhtari. (23 June 2013)

Mr. Vladimer Gugushvili, CEO, Aroma Product, Tbilisi. (25 June 2013)

Mr. Frank Lange, Castel Georgia, Plant Production Manager, Tbilisi. (25 June 2013)

Mr. Gia Gogaladze, Director, Healthy Water (Nabeghlawi), Tbilisi. (26 June 2013)