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Declaration

I, Siw Helene Hildebrand, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature.....

Date.....

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I would like to thank my supervisor, Professor Pål Vedeld for his endless patience, curiosity, help and support, and not at least good spirits and cool sturdiness in times of panic.

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Finally, a secret thank you goes to Patti and Paul for inspiration and company

“Pollution is a necessary result of the inability of man to reform and transform waste.

...

The transformation of waste is perhaps the oldest pre-occupation of man. Man being the chosen alloy, he must be reconnected—via shit, at all cost. Inherent with(in) us is the dream of the task of the alchemist to create from the clay of man. And to re-create from excretion of man pure and then soft and then solid gold.”

Patti Smith, 25th Floor (& High on Rebellion). Excerpt.

Abstract:

This study is an analysis of current Waste Prevention (WP) policies in Norway, contextualised in a historical backdrop of development of Norwegian waste governance regimes from 1860 to 2010. By analysing how various regimes have responded to waste challenges by institutional change, we can better understand the current policy situation and why it is so difficult to avoid waste. We investigate the current WP policies and initiatives, and look at why they do not have much effect on the overall waste growth. The analysis of both the historical regimes and the current one, is done using a framework for resource regime analysis which based on Classical Institutional Theory. Data collection is mainly done from policy documents, statistics, reports, some second hand sources on waste history. For the final chapter, interviews with relevant professionals are also conducted. The findings suggest that waste governance has historically developed as institutional changes as reactions to waste challenges. Due to this *reactive nature* of waste governance, the *proactive* nature of WP is therefore not leading to any action. There are no political goals for WP, only that the waste growth shall be lower than the GDP growth. This is outside the reach of any waste or environmental authority to change. However, this study suggests a more pragmatic approach and a commodity-based approach to WP is presented. Every commodity has its own waste potential, and WP policy should be about either reducing that potential or removing it completely, depending on the type of commodity. When these potential waste categories are compared with agents and their motivation, we can begin to see the correlation between choice of instrument and where to aim it. This study suggests that it is easier to apply WP principles to agents or products that are under Product Control Act regulation, and that this principle should be taken into concern when articulating future WP policies. The biggest challenge for WP is the lack of crisis, however, with our unsustainable consumption, it is only a question of time before it hits us.

List of Abbreviations

HWP: High Waste Potential

KLIF: (before 2010 SFT) Klima – og Forurensningsdirektoratet – the Norwegian Climate and Pollution Agency

LWP: Low Waste Potential

MoE: Ministry of Environment

MSW: Municipal Solid Waste

NOK: Norsk Emballasjeoptimeringskomitee – the Norwegian Packaging Optimising Committee

REACH: Registration, Evaluation, Authorisation and Restriction of Chemical Substances

PPP: Polluter Pays Principle

SFT: Statens Forurensningstilsyn- the Norwegian Pollution Agency

WHP: Waste with Hazardous Potential

WP: Waste Prevention

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Chapter One: Introduction

Why does Waste Prevention fail?

“This waste of resources is first and foremost caused by the modern welfare societies that go no way to take care of and recycle the waste and bring the materials back into the production cycle. (...) The enormous amounts of substances let into air and water with fumes and drained water from industries means, in reality, a massive waste of resources, not to mention that we by this also are polluting and changing our environment in an undesired way. There is no doubt that we could have limited our time’s damaging encroachment on the world’s resources if we had set our minds to an extensive use of recycling, or regeneration of substances already in circulation.”

NOU 1973:51 on recycling.

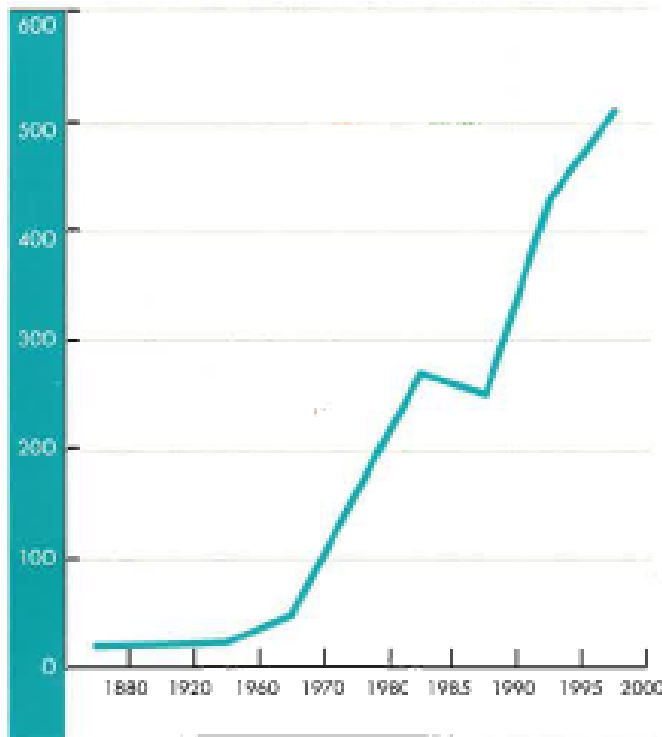
1.0 Introduction

1.1 Background for this study

It is an often shortcoming in environmental governance policy to remove a problem or a conflict from its historical context, and environmental policies are often a reaction to environmental problems or crisis rather than foresight and being pro-active. Choosing policy instruments requires an agreed definition of an environmental problem. As an already agreed upon problem is an effective driving force behind environmental policy implementation, what about when the causes are complex and out of reach of one single governance area? Waste governance has moved into pre-waste stages of consumer politics and producer responsibility, a foreshadowing that something bigger is moving. This study aims to put the current waste policy into a historical context. This serves two purposes; firstly, to see the development of household consumption and waste and the public management of this, and secondly; to show how waste is an indicator on our lives, and that it is high time to focus political attention to waste prevention – or the nature of our consumption.

Waste is seldom a frontline political topic. Public waste management has through history mainly been about controlling the negative outcomes of the system to prevent health or environmental damages, and changes to any current regime have been propelled by threats such as cholera, water contamination or greenhouse gas emissions. Waste prevention is a policy area that suffers from ineffectiveness exactly due to the many reasons why more and more waste is generated.

According to the current Norwegian Climate and Pollution Agency (KLIF) objectives',



Graph 1: Household Waste Generation per capita: 1880 to 2000, kg/year. Source: (Torstenson 2006)

national waste governance is about reducing and preventing the pollution from waste. Its main objectives are: The growth in waste generation should be significantly lower than the GNP growth; more waste should be returned; hazardous waste should be handled properly, and; achieve reduction in the hazardous waste production (Miljøstatus 2012). Most of these objectives are being achieved and pollution from waste is today more controlled than it has ever been in Norwegian history. Especially under the current climate change regime, where monitoring and reducing pollution from waste is easier to measure and regulate due to the quantifiable emissions of greenhouse gasses coming from e.g. waste dumps and energy recovery of waste. KLIF says that 82% of solid waste is being recycled, and total packaging recycling was 95% in 2011, and more than 90% of hazardous waste is collected (Klif 2012). But even though pollution is under control, the main problem in waste governance is not necessarily only that *what* we throw away but *how much* we throw away, and *why*. In Graph 1 we see that household waste generation has increased 25 times from 1880 to 2000, and five times from 1970.

This brings us back to the first policy objective, which, in environmental terms is be the most important one, but in terms of almost all other policy areas is impossible and *unwanted* even; to delink the relationship between growth in GDP and household waste – i.e. alter household consumption in a very radical way. In 2011 Norwegian households generated more waste

than ever before – a staggering 438 kg per capita, a 34% increase since 1995 (Klif 2012). Parts of this is also due to Norway's increasing urban population, with 3 605 500 in 2012, daily municipal solid waste (MSW) generation per capita is 2,8 kg, much higher than the OECD average of 2,15 (Hoorweg 2012).¹ Furthermore, there is no sign that this development is changing; we are moving up Waste Mountain at a ferocious pace, and we can only hold our breath in anticipation of how high we will climb before tilting.

Waste is, and has been for many decades, the proverbial *shadow of our consumption*. Judging from the graph above, the connection between increased BNP and increased waste generation is intertwined. When we talk about waste prevention policies, it soon becomes clear that it is not really about end-of-the-pipe waste policies, but rather “up-pipe”, so to say, aiming at production methods, product design, consumption and consumer habits, and product responsibility- all are issues outside of the waste sector and the traditional waste policy area. The OECD breaks down waste prevention into three components:

Strict avoidance involves the complete prevention of waste generation by virtual elimination of hazardous substances, or by reducing material or energy intensity in production, consumption and distribution.

Reduction at source involves minimising the use of hazardous substances and/or minimising material or energy consumption.

Product re-use involves the multiple use of a product in its original form, for its original or alternative purpose, with or without reconditioning (OECD Working Group on Waste Prevention & Recycling 2002).

As we see, the end-of-pipe measures are at the bottom of the priorities of the waste hierarchy, and this priority order is found in both the EU Waste Frame Directives and Norwegian waste governance. Why then is it the least successful part?

1.2 Purpose, Objectives, Case description and Research Questions of the study

The purpose of this study is to provide an overview over the contemporary WP policies in Norway and account for why it is so difficult to make effective policies that can stagger the waste growth. In order to do so, we need to contextualise it by placing the current situation in

¹ Waste studies reveal that urban dwellers are more known to generate more waste than their rural counterparts. For instance, see Lee, Kai N., “Urban sustainability and the limits of classical environmentalism”, *Environment and Urbanisation* 2006 18:9.

a historical perspective to see the development of waste governance and which factors that influence the “waste regime” at any time. Factors include waste agents, the managing institutions, consumption (or waste itself as the resource). The outcomes of this regime are environmental problems such as pollution, environmental degradation, and resource waste and health threats. However, the waste prevention issue signals that the volume itself is also a warning sign of bigger problems.

The research objectives and questions are:

	Research Objectives	Research Questions
1	Explain the developments in Norwegian waste history since 1860 in a resource regime context.	1 What has been the most important development in Norwegian waste from 1860 to 2010 in terms of composition, volume, agents and governance structures?
2	How has the changes in waste composition and quantity led to institutional change and which policy instruments have been chosen to change the outcome of the current waste regime?	2 To what extent can we see the changes of waste institutions as reactions to the negative outcomes of the regime? 3 In what way did these institutions change to control the outcome?
3	Map existing WP instruments and measures in Norway	4 What are the current waste prevention policies in Norway and how do they work?
4	Analyse current WP instruments and measures to see why they are failing.	5 What are the main reasons for the lack of effect? 6 What can be done to improve WP?

1.2.1 Case: Why are waste prevention policies failing?

The case in this study will be an analysis of contemporary waste prevention policies in Norway. Part one will map the existing instruments and measures, and part two will look at the effect of these. Norwegian waste generation has increased from 25 kg to 438kg per person between 1950 and 2011, and the waste hierarchy was introduced in waste governance in 2001 in a White Paper – but has not yet seen any real political commitment, except for food waste. The question why the environmental policies are unable to reduce the quantitative waste problem will be analysed. The only exception is *food waste* that has entered the political agenda both through EU and other multi-lateral organisations, but also from initiatives from the business itself. Food waste is the only waste stream that has an articulated goal of a 25% waste reduction by 2015. Data collection will be done from policy documents, interviews with government officials and members of waste reduction research programmes like *ForMat*

(Food waste prevention) and *Framtidens Byer* (Cities for the Future – urban sustainable future living programme).

1.3 Justifications, Definitions & Limitations

An official Norwegian Report from a Waste Prevention committee in 2002 discussed waste prevention and it was further backed up by the implementation of the 2008 EU Waste Framework Directive in Norwegian law that states that member states should make room for national waste prevention programmes. Clearly, there is some degree of political awareness around it but we are still waiting to see it take on life. This study aims to study why it is difficult to make effective measures and choosing the right instruments to stagger the waste growth. This is done by mapping waste policy instruments historically up to today to see what the waste management are doing and what they are able to do within its current mandate. Extended industry and business responsibility is also a measure that will be analysed in contemporary waste policies.

1.3.1 Definitions

Household waste as defined in the Pollution Act of 1981, §27:

“**Waste** is understood as discarded chattel objects or substances, and superfluous chattel objects and substances and services, production and treatment facilities etc.”

“**Household waste** is waste from private households, including bulk ware and similar.”

By **municipal waste** we mean household waste and waste from businesses and offices, or waste delivered to municipal waste treatment plants (SSB 1984).

Hazardous waste (or Special waste up until 2003) infers “...waste that cannot be treated with other household waste or business waste due to its size or the danger of inflicting serious pollution or damage on humans or animals” (Law 1981).

WEEE means Waste Electrical or Electronic Equipment.

Resource efficiency is sometimes a term that is inter-changeably used with WP, and *change of consumption habits* is concerning WP aimed at individuals. In this case, however, we will only operate with WP.

1.3.2 Limitations

This study is geographically limited to Norway and for some examples in the historical background, Oslo. At the beginning of our time period, the 1860's, Norway was mainly a rural country, and so using examples from a city is not perhaps the best representation of the current society, but it is however a better indicator of degree and success of policy implementation. Due to the exception that the Second World War and the German Occupation were in terms of Norwegian governance, the years between 1940 and 1945 will not be given special attention.

The case will be on current Norwegian WP policy, and I will bring some special focus on one waste stream, namely *food waste*, as it is acclaimed by many to have the highest environmental benefit by prevention. Much of the writing about waste prevention is about the difficulty of measuring the effects of WP policies, but as this topic is seemingly still only in its infancy implementation wise, the primary concern of this study lies elsewhere. However, as a critical reader to the ForMat project, some remarks on its measurability will be made.

1.4 Current Literature on Waste Prevention (WP) Policies

Waste prevention has not gotten as much academic attention as other waste policy fields such as recycling, even though it has the highest priority in EU and Norwegian waste policies, i.e. decoupling wealth growth and waste generation. Some research has been done in the latter years on waste prevention policy measures, notably in the UK where big WP research projects receive large Government funding prior to the implementation of the 2008 EU Waste Framework Directive implementation by December 2013. Cox et al. (2010) have investigated the evidence of household waste prevention measures undertaken in the UK, pointing to weaknesses in the WP discourse upon dissimilarity of meanings applied to WP, and thus also making it difficult to measure any results. A weakness of comparing different policy measures owes to their indifference in methodologies, behaviours and institutional arrangements. "The need for a 'package' approach, or a 'basket of measures', is linked to and reinforced by the fact that waste prevention is not one behaviour, but many" (Cox 2010:216). In a report commissioned by a OECD working group on WP in 2002, it is articulated followingly: *"Ultimately, whether certain indicators allow "true" waste prevention to be "seen" will largely depend on the choices made concerning the denominators used to index waste prevention, the waste/materials streams assessed, and the base year from which performance will be evaluated"* (OECD Working Group on Waste Prevention & Recycling 2002:15).

One problem with prevention measures is the difficulty of monitoring any actual reduction and even if so, is it possible to attribute it to one particular WP measure. Read, Gregory and Philips (2009) did a study in Dorset, UK where they quantified the impact of household waste prevention strategies on the waste tonnage. The tricky question is not only to find a prevention measure that helps, but also finding a method to analyse which measure or campaign activity that made the household reduce their generated waste amount. They found in their research that the most successful campaign activities were mail preference registration, home composting and doorstepping.

A mapping over existing WP measures in Germany, as a prerequisite for the EU Waste Frame Directive requirements of having established and reported on national WP programmes by the end of 2013, has been carried out by the German Öko-Institute and Wuppertal Institute (Dehoust 2010). Best-practice reviews such as this have been done in other EU waste-prevention projects, too, for instance by the Pre-Waste working group.

There are very few environmental quantitative assessments of WP, maybe due to the complexity of measures and waste streams, but there are a few exceptions. Salhofer et al (2008) did studies a selection of waste streams in Austria and evaluates the potential for waste reduction or WP potential of some measures, but find that only 10% reduction in the relevant waste stream is attainable through the measures. And when we see how little impact the estimated WP has on the overall waste stream, some researchers have assessed the environmental impact of WP. Gentil et al. (2011) look at the environmental benefits of municipal waste prevention based on life-cycle thinking. They conclude that WP is relatively “...more beneficial when land filling is the dominant waste management technology” (Gentil 2011:2378), but that compared to more “high-tech” waste management system, like energy recovery and recycling even without any WP strategy, is less environmentally desirable. Olofsson (2004) calculated the total greenhouse gas emission reduction to be 5-9% if 4% the municipal solid waste (MSW) was prevented in Sweden.

1.5 Outline of thesis

The outline of this study is as follows: Chapter 2 will present the theoretical framework for analysing the data collected. The main theoretical foundation of this thesis is Classical Institutional Theory and we will use the Resource Regime analytical framework to present the historical development of waste managing regimes from 1860 to 2011. Theory regarding

policy instruments and measures is then presented, before *extended producer responsibility* is explained. Part two of this chapter describes the methodology used for data collection and presentation.

Chapter 3 presents four different waste managing resource regimes; 1860-1950, 1950-1970, 1970-1990 and 1990 to present. Each regime is analysed according to the resource regime; with the attributes of the resource, agents and agents' choices, institutions and outcomes. The main drive is to see how the different regimes are trying to control the negative outcome of the regime. The purpose of this chapter is to present the historical development of contemporary Norwegian waste governance, and to see why today's waste policies are ready for prevention approaches.

Chapter 4 is both a presentation of current waste prevention policies in Norway based on the same resource regime model, followed by an analysis on why they are failing. The values of the variables; the attributes of the resource, the agents and their choices and the institutions, are analysed and compared to each other to understand why current policies are failing and what can be done to improve them.

Chapter 5 is summing up and discussing the findings of this research, and pointing ahead to future areas of research.

Chapter 2: Theory and Methods

Theory “provides a framework within which social phenomena can be understood and the research findings can be interpreted” (Bryman 2008:6). Before we go on to answer the research questions we need to understand the theory which we will use to explain our findings and interpretations of the evidence presented through our various sources. Theory helps us interpret and understand the information collected to try to solve the problems in question, however only within the frames of the given theory. In this chapter we will look at the theory and methods used for data collection and presentation in this study.

2.1 Institutions, resources and change

Institutional theory offers a good gateway for analysing environmental governance and resource management problems. We will briefly go through the theory, then go on to look at resource regime analysis, as we will treat waste as a resource, and further policy instruments and finally extended producer responsibility.

2.1.1 Institutional Theory

“Living is choosing. By choosing we make our living, our own future, as we also affect the conditions for others” (Vatn 2005:1).

Why use institutional theory to approach environmental issues? How can an institutional understanding of society and the environment and the interaction between them help us identify what makes some environmental policies work? Briefly put, environmental governance is about reducing the negative environmental impact of people’s everyday *choices* through policies. Consumption, for instance, can be one of those choices, another example can be when a producer chooses to use a more expensive but biodegradable packaging for a product. We “...observe that local, national and international authorities try to change the conditions for individual choices so that what is collectively reasonable also becomes individually so. The way this is done does, however, vary. Some policies seem to work rather well while others are a failure” (Vatn 2005:1-2).

In order to make policies that will make the change policy makers wish to see, we must understand the dynamics of the society and its members and agents; institutions are the rules that organise the relations of this system.

There are various definitions of what institutions *are*, and many explanations go down to the cognitive level – on how we perceive the world and how we communicate it, is the individual free from society, or is it impossible to distinguish people from culture? In order to change motivation and understand the structures of meaning between (and within) individuals, we must assume that “...the motives of the individuals are (not) considered to be independent of the institutional context and the policy itself” (Vatn 2005:13). Neoclassical economic theory focus on stable preferences and rational choice, but classical institutional thinking claims that our preferences and interests are influenced by institutions, and is therefore more dynamic and complex. What then, are institutions? We need a definition before we move on. Arild Vatn defines institutions as follows:

“Institutions are conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularise life, support values and produce and protect interests”(2005:83).

Based on this we see that institutions are the “rules of the game”² in the intersubjective everyday life in society. These institutions are created through a process of *internalisation* of social habits where the individual becomes a part of society. A part of this involves operating with *typifications*, a form of prejudice³ based on Berger and Luckmann describe, in their classical text *The Social Construction of Reality*(1967), the creation of these social structures as “...the sum total of these typifications and of the recurrent patterns of interaction established by means of them” (1967:48). Institutions are thus created by reciprocating these typifications and internalising them. Motivation is formed in these processes, and cannot be separated from the intersubjectivity of the social reality. Bringing it back to environmental policy making, we can see how any policy must be able to motivate people to follow them. If institutions affect our preferences and interests, then any successful policy must be able to change the institutions in a certain way. For instance, during the modernisation period rising up from the rubbles of the Second World War, the old life was being replaced by new stuff,

² Phrasing taken from North (1990) who is a new institutional economist, yet, however does not see institutions as forming the individuals (Vatn 2005).

³ Prejudice in a neutral way, neither positive nor negative, but as a way of mentally organising the reality.

and cars became available for everyone. The capacity of the waste handlers was too low to handle all the waste this transformation generated, so people had to find their own ways of ridding themselves with old furniture and such. Private car ownership meant that people could leave old mattresses in nature at night without anyone seeing it. The fact that this was happening in secret shows that “institutionally” this was not a socially accepted behaviour; however it was hard to prevent it from happening. When littering of the wilderness began to be an obvious problem for no one to avoid, policy makers could more easily get adherence for their intended institutional changes and so also changing the whole regime.

Now that we have seen how institutions are connected to the individual and vice versa, we can now turn to how to change these institutions to reach policy goals.

2.1.2 Resource Regimes: Waste regulation

How do we fit a (natural) resource into the institutional dynamics to motivate change through policy? In this study, we operate with the term ‘resource’ for both waste and goods before they are wasted, so that it fits into institutional theory dealing with resource regimes. However, this is not completely unproblematic, as waste is not a resource in the normal sense, and any resource conflict does not come from the use itself. Rather it is about the environment and people should be protected against the negative outcomes from poor waste handling, such as ground water pollution or, as we have seen in later years, reducing its impact on climate change.

A resource regime analysis framework is useful for us in order to map which entities that are essential for understanding what causes environmental problems. We can clearly distinguish the waste itself from the actors working with it, and also the institutions that articulate the policies to change the terms for agents to make decisions. These institutions are also the motivational structures that are essential to understand to be able to motivate policy compliancy. All these factors come together and make policies happen (*or not*) and here lies our point of interest. This framework (Table 1) draws from the work of Ostrom (1990), Oakeresson (1992) and Ostrom et al. (1994) (Vatn 2005:283-285)

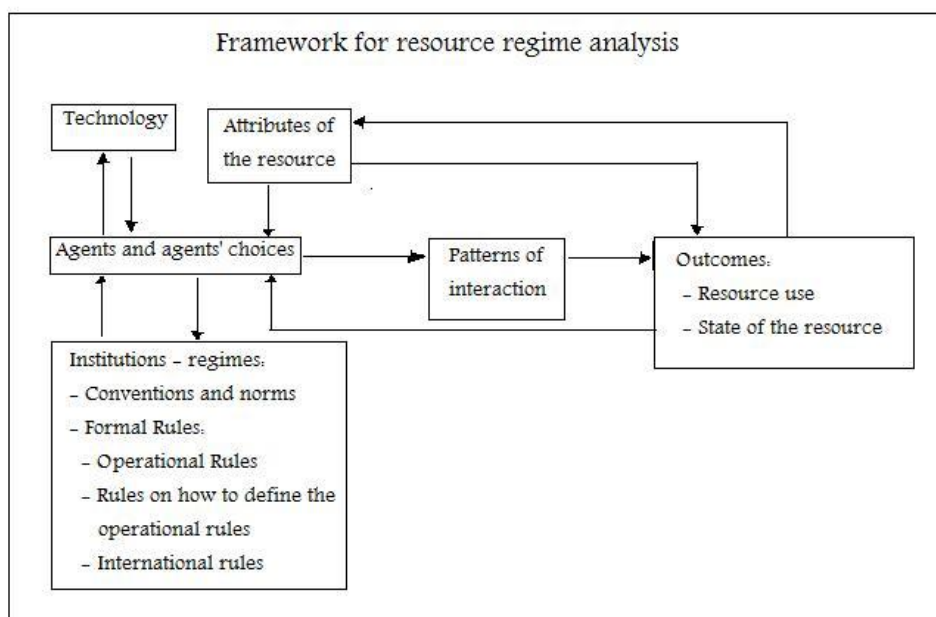


Table 1: Framework for resource regime analysis. Source: (Vatn 2005)

To apply the analysis framework to a resource regime, we can identify the linkages between the attributes of the resource and available technology, agents and agents’ choices, institutions and how they interact together and so make out the structures governing the resource. In our case, the resource is an outcome of other regimes– those governing the product production and consumption. Indeed, this helps to support the argument that traditional waste governing institutions are not “fit” to implement measures to follow up on the waste prevention policies. This regime deals only with the post-consumer life of the product, and waste prevention is about so much more. “Normal” resource regimes are about rights distribution to use a resource and rules governing the results from this use (Vatn 2005).

“If resources are (unintendedly) depleted, the problem is foremost that the regime does not fit well to the characteristics of the resource involved and/or the values of the societies involved” (Vatn 2005:283, original brackets). Waste governance is not about depletion, but pollution, but policy failure can be identified using the same entities.

The role of the state is debated between the various schools of Institutional theorists. The *Neoclassical Welfare Theorists* argue that the market cannot solve all issues because market agents are motivated by their own gain, like our issue here – and the State has to come in wherever there is a “market failure”, especially to protect common goods. The *Public Choice* model claims all agents are egoistic, even politicians and public officers, and believes that there is no need for public policy when there is zero transaction cost – i.e. when the costs of

information gathering, contracting and controlling the contract are zero. The agents will find an optimal solution for all through bargaining. The weakness with this strain of thought, is that there is no one that represents the common goods, like a healthy environment. The last group – the *Classical Institutionalists*, is closer to the neoclassical welfare theorists, but solves the problem of egoistical market agents, by using *roles* to explain different rationalities, e.g. for the individual as a citizen and as a consumer. By distinguishing between the various interests – we can both draw rules for policy making, and for the role of a politician (Vatn 2005).

2.2 Environmental policy instruments and measures

Policy instruments are the tools the governing institutions chose to change individual behaviour in a certain way. Environmental policy objectives are not necessarily always aimed at regulating the state of the resource, regulation can also be aimed at certain activities, the resource or some forms of environmental impacts (Backer 2002). In terms of institutional economy, policy measures are aimed at changing institutions to achieve a policy goal, and the “...issue concerning which particular instruments are relevant to use depends on the regime in place” (Vatn 2005:366). The regime, so to say, creates a context that the policy makers have to take into account. What is more, when studying choice of policy instruments, we have to look at the process around it, too, to understand why the instrument of choice became so. While studying the policy *process* is not something we will do in this study, it is however essential to account for the process itself in order to understand the relation between policy goal formulation, instrument choice and implementation. So a simplified summary is needed before we look at the instruments themselves.

Formulation of a problem is usually the starting point of a policy, and the articulation of the problem depends on the perceived reality of the problem. For any effective action to take place, it is necessary to land on an agreed definition or understanding of the problem, and when this is done, the work can start on formulating the policy objectives. They need to explain the current situation and set clear goals and challenges to achieving these, how to measure fulfilment (Vedeld 2011). Before deciding on an instrument, various options have to be evaluated, based on similar experiences and other best practices. Implementation requires just as much attention as this is in fact perhaps the most crucial point in the policy process, and it requires time, staff and resources to carry out the policies (Vedeld 2011), because if any of these fall short, the implementation will fail.

The categorisation of policy instruments vary between authors and in this study we will use those defined by Vatn (2005): Economic, Legal, Administrative and Informational. *Economic instruments* can take shape in form of taxes, subsidies, tradable quotas or deposit on certain products, and in terms of political economy it aims “to shift the payoffs of different actions and make changed behaviour more desirable for the agent than for the existing behaviour” (Vatn 2005:392). For waste regulation, this could mean that by increasing the costs of some parts of the waste stream to spur innovation that will include the total *real* cost of a product from cradle to the grave(Thommesen 2002). This is in other words referred to as internalising the externalities of a product, and we will look deeper into this in the next chapter under what is called *Extended Producer Responsibility (EPR)*.

Legal instruments can be seen as restrictions on individual behaviour or having the power “...to define what is *right* or *legitimate behaviour*”(Vatn 2005:393). This can be done in multiple ways. Giving *rights* to certain environmental values to the society cannot easily be compromised, however rights as such, e.g. §110b in the Norwegian constitution⁴, is often used as a *principle of Environmental Law* rather than a law to be implemented directly. There are some legal cases where this principle has been applied and so been given significance as a legal source (Anonymous 2007). Legal instruments can also be *restrictions* or *requirements* to products, production or waste handling, which can be seen as a tool for implementing EPR. In Norway there is the Product Control Act, *Produktkontrollloven (11.6.1976 nr 79)*, that has the purpose of controlling products that have or can have detrimental effects on environment or human health, by preventing a product from damaging eco systems, polluting, making waste and so on (Bugge 2011). Acts on consumer rights (*Forbrukerkjøpsloven*) and *Kjøpsloven* may have waste preventing effects as they aim to encourage product repair and prolongment of product life. There is also the Pollution Act (*Forurensningsloven av 13.3.1981 nr6*) that aims to reduce or prevent pollution and waste. Other legal instruments can be *prohibitions*, for instance the Public Road Acts of 1957 and 1965 (*Veiloven*) and the Nature Conservation Act of 1958 (*Naturvernloven*) prohibits littering. A very important prohibition that we will look into later came in 2009 on the deposition of biodegradable waste.

Finally, *Informational or suasive instruments* are used to inform, educate or persuade agents to act a certain way, for instance, informational campaigns aimed at consumers, or product

⁴Change in Constitution of 19.6 1992 number 463; §110b, first paragraph says: “Enhver har Ret til et Milieu som sikrer Sundhed og til en Natur hvis Produktionsævine og Mangfold bevares. Naturens Ressources skulle disponeres ud fra en langsiktig og alsidig Betragtning, der ivaretar denne Ret ogsaa for Efterslegten”.

and packaging labelling (Thommesen 2002). “They may operate through *cognitive* and/or *normative* processes”(Vatn 2005:393). This means that the recipient (of the information) either calculates what is best to do, or by appealing to peoples’ sense of what is right to do. As to what we saw above about the importance of being able to measure results of policy instruments, it is difficult to measure exact effects of informational measures.

2.3 Extended Producer Responsibility

“EPR extends the responsibility of producers across the life cycle of their products and particularly to the post-consumer stage — after products are discarded and become waste. By shifting financial responsibility for managing end-of-life products from government to producers (and thus internalizing its costs), and by specifying recycling targets, EPR provides incentives for producers to 1) make products that generate less waste and 2) develop economically sound recycling systems” (Fishbein 1998:i).

Extended Producer Responsibility (EPR) is a way of shifting the costs that wasted products create onto the producers of the products, and away from the municipalities and/or consumers. OECD defines it as “...an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle”(Walls 2006:1). It can be seen as an extension of the *polluter pays principle*, and the polluter in this context is the producer, and not the consumer⁵. ”In theory, EPR could dramatically alter production practices by internalizing product externalities and providing incentives for environmentally-friendly design” (Sachs 2006:1). Under any regime that uses the waste ‘stage’ as the main environmental regulation point of a product, the manufacturers are easily let off the hook when it comes to paying for the environmental impact of their production processes or products, as it is the end of the product life that is appointed to be the problem, and not how it actually got there. The disposal costs are externalised onto the ‘municipalities and taxpayers’, which is ‘unfair’ so to say, because when we look at the entire life of a product, consumers actually consume very little (Sachs 2006) and it is society that bears the real cost of the products. According to the OECD, “...EPR involves “(1) the shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities, (2) to provide incentives to producers to incorporate environmental considerations in the design of their products.” (Sachs 2006:15).

EPR provides policy tools for waste managers to shift physical and economic responsibility onto the producers. It can also be used as an instrument for reaching waste reduction and

⁵ There are debates about who the polluter is, but it serves no purpose to present this in our context.

waste prevention goals. Manufacturer take-back schemes may both reduce the untreated waste amount created, and also reduce the need for virgin materials, but it is important that these programmes are backed up by mandatory recycling requirements to make sure that collected products are discarded improperly. Equally important, it may give the incentive for producers to avoid environmentally damaging materials into their products as it is now they themselves that is stuck with it in the end. Sachs points out that direct banning of certain toxic or hazardous materials previously used in electronic products, such as mercury and lead, has been more successful in forcing changes into more environmentally sound product design. He also says that EPR programmes need more direct state monitoring than other market-orientated environmental strategies.

There are, however some challenges to an effective EPR system; free riders and high transaction costs. The latter is shown by experience that the practical implementation of EPR return systems requires co-action with other actors such as the municipalities and vendors and especially the municipal renovation services, as they hold the prime responsibility of household waste handling (Sørensen 2011).

2.4 Methodology

The chosen research design in this study is a combination of several methods. Data collection for Chapter 3 is following a cross-sectional design, meaning that we look at several waste regimes at different points in time to identify patterns of association. Data about the same variables from one period is analysed and compared to the same variables from other periods. These three variables are the attributes of the resource (and available technology), agents and agents' choices and institutions in what we refer to as regimes which are models for analysing resource regimes, which is based on Institutional theory that shares the same ontological view as constructivists.

For the case on current Waste Prevention policy, primary data collection is done by qualitative interviews and correspondence with public officers and people connected to ongoing WP research programmes, in addition to analysing policy and government documents, and Positional Papers. A list of informants is found in Appendix 1. In order to answer the research question about why WP fails, I have approached this *inductively* – meaning that hypothesis and theory is based on the empirical findings of the data collection.

2.4.1 Data Collection

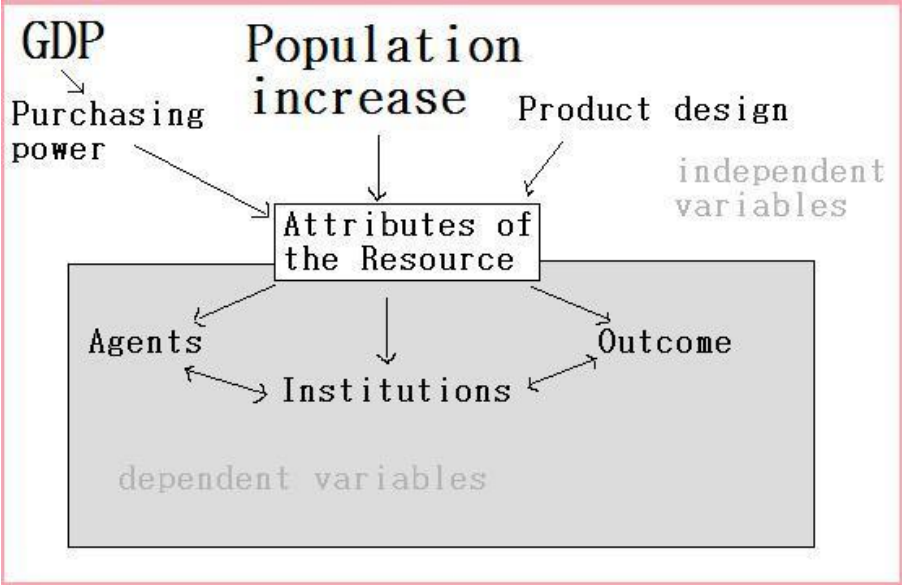


Table 2: Overview over variables' dependency in Chapter 3

The empirical base for Chapter 3 is provided by text analysis of official documents, statistics and some second hand historical sources. Much of Chapter 3.1 and 3.2 is based on a very limited number of secondary sources. This is because there are little official statistics, reports and policy papers on waste in this early period, and also there were little knowledge about the scientific side of the environmental and health problems caused by waste before 1970. The independent variables in Chapter 3 are the attributes of the resource, as we see this is governed by interactions outside the regime we are dealing with.

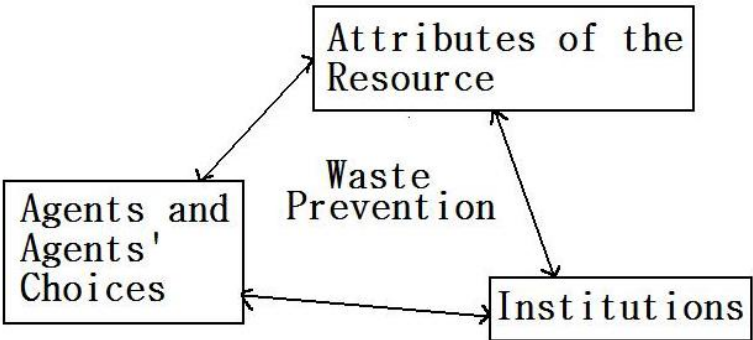


Table 3 Overview over variables' dependency in Chapter 4

In Chapter 4, however, this changes, because here the “resource” itself is what is analysed. To operationalise WP means that we break down the variables of the regime and identify the dependency between them. The dynamics between the three variables changes, because the goal of the institutional change here is to change a value or level of the variable rather than

the total outcome (i.e. interplay) between all the variables. In other word, waste reduction is a value of one of the variables. Are institutions the independent variable here? According to the definition of an institution in Chapter 2.1, it cannot be, due to the interconnectedness with the agents. This means that all variables depend on each other in Chapter 4. There are no other reports or articles over current general WP policies in Norway, to my knowledge, except for Food Waste Prevention.

To gather information for Chapter 4, communication and interviews with informants in three main agents were identified: the Ministry of Environment, which is the Waste Authority, Framtidens Byer (Cities for the Future) and ForMat. In addition, I was in contact with non-public WP initiative, a web flea market portal and a charity organisation, to get a different perspective on WP. In April 2012 I was also invited to join a workshop organised by Avfall Norge (Norwegian Waste Association) to work out recommendations for the (cancelled) White Paper on Waste 2012. I partook more in an observer function and picked up a few ideas on WP measures from the waste sector, which is sort of contradictory as this is a business that needs waste.

Some remarks on my presentation of waste and personal bias: I regard waste as a resource and an unnecessary wasting of materials and energy. This vision is shared by some policy makers throughout history and in present administration, and it is my belief that it can – and should be avoided. I do however acknowledge that not everybody shares this vision, and that many decisions are made on the basis of other conceptions of waste; as a problem, or even an unavoidable effect of development and economic progress. I have tried to present these visions too in the study, however, my bias towards recommendations and possible solutions on the waste prevention issue, is rooted in my idea of waste as avoidable to a large degree, and when not, it is still a resource for some other purpose.

2.4.2 Evaluation of data

One weakness in Chapter 3 is the validity of the first two sub-chapters that are overly dependent on one source, Inge Torstenson's book "Fra Nattmann til Renholdsverk: Avfall og Renovasjon i Oslo gjennom tusen år" (1997). His work is unique in Norwegian waste history writing, and there is, to my knowledge, no parallel reader on the same topic as most articles on the same topic are based on his work. Had this research been a historic reader in waste governance development alone, then cross checking his sources and references would have

been prioritised. However, it makes triangulation difficult and validity weak. Little of the analysis in the rest of Chapters 3 and 4 relies on the findings in Chapter 3.1 and 3.2, so this does not necessarily undermine the main findings of the research. The revolution in waste and environmental reporting and public management from the 1970's up till the present helps provide bountiful information on waste composition, policy movements and institutional development. The two last sub-chapters we have data from a wider data and primary sources such as statistics, White Papers, Official Reports and Position papers. From this, we can see how politics and government attitudes have changed towards waste based on institutions and knowledge, but one must keep in mind that these are political documents, and naturally not unbiased.

The validity and reliability of the statistics used here, most of them are from the Central Bureau of Statistics Norway, have been gathered over many years, through various technical methods, especially when it comes to measuring waste. One remark is on the reporting of municipal waste, which is both household waste and waste from the industry. Sometimes the distribution between the two is not done correctly or uneven. Another weakness is that early reports on recycling rates do not represent the actual recycling, but the amount of waste that was collected for recycling (FIVH 1998).

Much of the data collected from the primary sources and presented here in new context, the conclusions and suggested causalities by me, are sometimes done without the possibility of backing up the theory in other sources. This is not a typical 'hot potato' topic where loads of articles and books are available, and drawing conclusions are difficult, due to the lack of triangulation possibilities. This is the situation for both Chapter 3 and Chapter 4.

The same kind of document also provides the data for Chapter 4, in addition to interviews with public agents and relevant researchers. A major challenge for the case has been the contemporality of the issue, which makes me unable to point to any results and the overall very few reports except those on food waste, and is a major weakness in the case. That is why a more theoretical approach is taken in the final part of Chapter 4. Unable to find any empirical data on successful waste reducing measures in Norway, too, has made the case difficult to conceive. Initially, I wanted to create a hypothetical case where extended producer responsibility (EPR) would be applied on food waste, to see how the success of EPR on packaging could be transferred to preventing food waste by using institutional theory. After communicating with members of the ForMat programme, however, it came to my attention

that such a scheme was already in the making, and implemented in a few agents⁶. Due to this, I had to change my take on this, so instead I look at how WP is reaching to change the motivational structures of agents to produce less waste. The aim of this is not to conclude in exact words why WP is failing, but rather to present hypothesis' and new issues for future studies. Inductive approach is also an open approach, and based on the above, the only way to present this case.

There are no other reports or articles over current general WP policies in Norway, to my knowledge. The shortcoming of these results should be seen against this, because most time was spent mapping and getting an overview over the current policy situation. Again, food waste is the exception to this.

2.4.3 Reflection over representation, validity and generalisations of findings

This study is of the development of Norwegian waste policy and governance, and also an evaluation of current waste prevention policy, based on the framework for resource regime analysis. The waste sector is not a normal environmental governance area with regards to the attributes of the resource. We have seen how problems have driven institutional, especially political changes. This form of reactive governance is found in other parts of environmental governance, such as pollution control, but this research does not try to articulate any universal norm for how environmental policy and governance have or should be developed.

Waste prevention, with the exception of food waste prevention, has received little political commitment. There is a Waste Strategy announced during the spring of 2013, so the findings of this study may be insignificant depending on which goals the Waste Strategy will set for WP (something it is obliged to do according to the EU Waste Directive).

Norway has undergone a large economic transformation the last 150 years, and so have many other European nations. In some degree, Norway has been on the forefront of establishing environmentally sound waste and recycling schemes, and I think that our national experience can be of value to other nations that are in need of establishing waste governance structures.

⁶ See <http://www.stand.no> for producer responsibility schemes for food waste in private sector.

Chapter 3: Historical development of waste management in Norway, 1860-2010

This chapter aims to answer the following research questions:

- 1) What has been the most important development in Norwegian waste resource regime from 1860 to 2010 in terms of composition, volume, agents and governance structures?
- 2) To what extent can we see the changes of waste institutions as reactions to the negative outcomes of the waste resource regime?
- 3) In what way did these institutions change to control the outcome?

To do so we will look into the historical development of waste in Norway in terms of **composition, volume, agents** and **governance structures**, and how problems and the understanding of problems effect the policy process that seeks **to control the negative outcomes of the regime**, by adjusting governing institutions. This form of “reactive politics” is challenged today, as the use of resources and degradation of our environment and threatening our livelihoods challenge us to form policies that are more pro-active and long-term.

“There has been a growing realization in national governments and multilateral institutions that it is impossible to separate economic development issues from environmental issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development. Poverty is a major cause and effect of global environmental problems.” (WCED 1987:3)

This quote is taken from the Brundtland Commission’s report *Our Common Future* (1987). If there is one thing reading the history of waste in Norway from 1860 and up to our time shows us, it is that **increase in wealth** is a *major* cause of environmental problems, too, and its effect – the *waste*, equally so. The time between 1860 and 2010 frames a period of unprecedented economic growth, socio-cultural change, and of increased welfare. It constitutes a transition from a rural subsistence economy into a consumerist society that has had deep impact on our daily life and – more importantly – our environment. The focus of this study, *the household waste* regime, undergoes such dramatic changes that the waste in the early period of this study shares little resemblance with the waste challenges of the new millennium. To put it to the point, the only common denominator is its definition, *wasted resources*.

This chapter will be divided into four phases; 1860-1950, 1950-70, 1970-1990 and 1990-2010, and each one of these phases will be analysed as a separate waste resource regime based on the framework for analysing resource regimes, as presented in chapter 2.1.2. First we will look into the different components; the attributes of the waste, amounts and available technology, the waste agents- both those who are governing the system and those who are generating waste within the system. We will investigate institutional developments and how the outcome of the regime influences the chosen policy style, and, when possible, see to what effect.

3.1 1860-1950: Waste in the time of Cholera, bacteria and rapid urbanisation⁷

From 1860 to 1950, Norway went from being a predominantly rural economy to becoming an industrial economy. Great discoveries in medical science formed new challenges for public health management in addition to industrial developments that lead to a transition into market economy and an increase in consumption. The urban population rates in the period increased substantially from: 17% in 1855, 38% in 1900 and to 45% in 1920 (Grove 2002). The result was that the growing urban areas faced challenges in organising and handling first and foremost an increasing amount of human waste, and later in the period more household waste. With the fear of cholera lurking in the gutter, not to mention the unpleasant flock of flies and rats living in the landfills, waste issues were around the turn of the 20th century a matter of life and death, and health and sanitation, and by far, Norway was unhealthy and smelly.

3.1.1 1860-1950: Attributes of Waste

“If your yard is dirty and foul, heaps of waste in sight, unswept and untended, things scattered, old shoes, pans, and so on, it will immediately give people the impression that here lives people without any sense of order or beauty.

Not only because the ugly offends the eye... but also because it is unhealthy – any such heap can hide foul disease that can bring suffering to the house.”⁸

⁷ This chapter will mainly focus on renovation development in Norway’s urban centres, and Oslo/Kristiania in particular, as this was where most of the new, innovative developments took place.

⁸Landmark, M. (2002 (1900)). Kogebog for Land og By - For Landsbygden. Raad og Veiledning for Hus og Hjem. Bergen, Lunde & COs Forlag.

Page 13, own translation.

The quote above is taken from Marie Landmark's housekeeping and cook book from 1900⁹ where she tries to educate the rural dwellers in simple sanitation and household waste management (alongside cookery). For the modern mind it is difficult to imagine what it must have been like to live in a society where this sort of education was necessary, and by our own reaction we can see how this standard has become a part of us since then.

3.1.1.1 1860-1950: Waste amounts and composition

The waste composition in this period was generally human and animal manure, ash, food scraps or other scraps, paper and rags. In this phase we can see that its increment is very low and almost static around 25 kg waste annually per capita up until ca 1960.

The strongest driving force behind developing renovation and health care reforms from the 1860's, was however the collection, transport and treatment of human waste. Human faeces were appreciated as manure, and commonly regarded as something valuable, a resource not to be wasted. It was, however, a tricky waste in every sense; collection, the amounts itself and storing. Increasing urban population following the industrial development in the latter part of the 19th century, lead to increasing waste amounts, and municipal renovation was slowly catching on. Under the threat of cholera, the accumulation of waste was dangerous and had to be avoided, as human waste was identified to be the source of contamination. Waste management was therefore carried out under the overall aim of disease prevention (Torstenson 2006). When it came to identifying the cause of the diseases like cholera and lethal diarrhea, the "dangerous stinky gases theories of *miasma*" was prevailing until the late 1890's when the groundbreaking bacteriological research by Louis Pasteur and Robert Koch began to have an impact on public sanitation. Waste had to be covered, and it should not be left rotting for weeks or months.

Another significant household waste fraction at that time was ash. Other waste fractions such as paper packaging were burned for heating and cooking. Ash was a nuisance due to the dust clouds that bloomed when stirred, and some technical innovation aimed at "dust free collection" was made, however with the coming of electrical heating after World War two, this problem was solved (Torstenson 2006:56).

Waste composition in this regime is quite static given the longevity of it. Consumption is changing only a little, and the new challenges seem mainly to come from the increasing urban population and the need for increased renovation services to handle the waste it is creating.

⁹ The first edition of this book came in 1892 and was reprinted in 16 editions until 1938.

Technological developments were therefore essential in order for the regime to handle the “renovational” challenges of waste.

3.1.1.2 1860-1950: Renovation Technology

The bacteriological discoveries of Pasteur and Koch, lead to two important technical renovation developments. First - containment of the waste by the households where it was generated in bins and not just by the waste collectors (called the *Nightmen* at that time) for transportation to avoid spill. And secondly – frequent collection, so that it would not be left to be collected a couple times each year, but now at a weekly frequency. Waste historian Inge Torstenson(2006) claims this was the beginning of a renovation reform that spread from the cities to the villages and later to the rural areas. The need for waste containment and increased collection frequency lead to the establishment of renovation as a modern engineer science urging technical developments to meet the new demands of society. Secondly, renovation became important in preventative health work, and this period of time sees hygiene becoming a science – and more importantly – a *practical concern* of its own (Opcit:52-53).

Early urban waste management applied a kind of market solution for the collected manure by selling it to farmers in the rural surroundings of Kristiania¹⁰. The human faeces were collected in the backyard toilets or *privies*. From 1865 in Kristiania this was treated and was sold as manure to farmers outside the city. However, with the threat of cholera and new knowledge about bacteria and contamination, having heaps of faeces stored became problematic in terms of disease prevention and general sanitation. However as Torstenson points out, in “...the struggle to prevent spreading of the contagious diseases, the agricultural interests had to back down on behalf of hygienic concerns” (2006:57, own translation). As problematic as this “dry waste” was, it still took many years before water closets (WC) became common. Some upgrade in the privy system was in the change from bins to buckets, which made the emptying easier. The first WC was built in Kristiania in ca 1860, but WC’s were forbidden from 1879 because there were no suitable treatment facilities for the sewerage, it was only emitted untreated into the city bay. Letting sewerage directly into the bay was banned from 1867, together with the large privy containers. Reports ordered by a WC committee from 1893 and conducted by physician Axel Holst, one of Norway’s first experts on bacteria, concluded that the pollution from the sewer sent into the Oslo harbour areas was severe. On a mission in 1900, divers could report that as far as 150 metres out from the end of the sewer pipes, they were armpit-high in sludge, and this was at a time when WC’s were forbidden. Most of this

¹⁰ Kristiania changed her name back to Oslo in 1925.

was horse waste swept into manholes in the streets (Johansen 2005). Therefore, it became evident that a proper cleaning of the sewer was necessary before households could be connected to the sewerage. This did not come before 1911, when the first sewer treating plant was opened (Folkemuseum 2013). However, bathrooms did not become common in new homes until after World War II, and still by 1973, 27% of Norwegian homes did not have a WC (Folkemuseum 2012), and even in 2003, 50 tonnes of privy waste was collected by Oslo municipality (REN 2008).

The collected household waste, other than the “privy” waste could be burned, land filled or mixed into the manure. Land filling was regarded unsanitary and “a primitive solution” (Torstenson 1997:65) by some. In 1893 in Kristiania, the Renovation Committee opted for mixing it into manure, but the waste generation grew too fast and had to be stored for some time, and the waste became a smelly problem. Burning of household waste next to the separate “poudret system” seemed to be a favourite option, but it would take many years before any incineration plants came about. There were several solutions to where and how to burn the waste - in the tenement buildings or in a larger collective site, how the heat would be exploited and how to store the ash. However, there was no consensus. The first energy recycling plant was built in 1967 in Haraldsrud, Oslo. Other places like Trondheim got its first waste oven, the *Destructor*¹¹ in 1918.

Land filling was an easy, economically low-cost solution for the municipality as compared to e.g. incineration. However, it came with some major disadvantages: the endless masses of flies and rats living and breeding in the dumps, and not to mention the smell of it, made it the least favourite option. Engineers travelling around Europe to learn from different waste management systems, found a good solution in Bradford, England. The “Bradford method” was a method where the natural decomposition of waste combined with the natural heat generation in this process that killed insects and rodents that were great problems in the land fill method, plus that it did not smell. From 1904-1949 two (that became one) islands in the Oslo fjord, *Langøyene*, were used as landfill, received about half of Oslo’s waste (Bymiljøetaten 2003). The rest was divided ca equally between the construction site of the city’s new airport at Fornebu and sent out of town..

¹¹ The *Destructor* oven was first used in Britain in the latter part of the 19th century, engineers and local municipal employees travelled to other countries to learn about renovation, like Britain, Germany and USA (Torstenson 2006).



Picture 1: *Langøyene ca 1937 seen from air. We see how the two islands are connected with the landfill. Oslo Municipality sank old ships to dam the waste. Source: (Widerøes 1937)*

In terms of recycling, we can say that “need-based” recycling was indeed enforced ((LOOP?) for instance, food waste could be separated from other waste, and collected or sold to pig keepers as fodder. In 1942, due to the scarcity enforced by the War, wasting food was illegal, and had to be put aside for animal food. There was also much ‘waste’ that was not collected, but recycled before it became rubbish. Packaging was either burned or re-used, scraps were collected by scrap dealers and sold to for instance bone meal industries, glue producers and similar (LOOP?) . Resource waste was minimal, as it was regarded “uncivilised” and showed poor economic skills. Glomma Papp was the first paper recycling plant in Norway, opening in 1931, and a return system for glass bottles was introduced already in 1902.

3.1.2 1860-1950: Agents of the waste regime

In order to comprehend the dynamics of the waste regime of this period and the forces that pushed forward institutional changes, we use the framework for analysing resource regimes presented in chapter 2.1.2. The agents in a regime are either restricted or encouraged by the institutions, the attributes of the resource and the available technology. The challenge for the institutions, so to say, is to motivate the agents to act in a certain way. “A system may fit the dynamics of the resource well, but may still be undermined if the involved agents are motivated to break the rules and so on”, see Figure 3.2 for illustration(Vatn 2005:285).

3.1.2.1 1860-1950: Waste Governing and Renovation Agents

Waste was, then as now, a resource, either for manure, scraps, land filling or as animal fodder, and we have in this period agents representing all of these different interests. Institutional

developments in terms of the Health Act of 1860 and following resolutions, and newfound knowledge about bacteria, put challenges on the waste agents. Renovation services were "...public services, that is for all and arranged by the municipality, but did not charge much of the municipal budgets" (Myhre 1990, cited in Grove 2002:11).

According to Torstenson, the renovation was divided into three main fractions: *privy renovation* (night renovation), *[household] waste renovation* (day renovation) and *street renovation* ("external" renovation) (1997:61). As we have seen, waste was mainly human faeces and its value as manure was highly regarded. Entrepreneurs sold Kristiania's powdered manure to surrounding farmers, and the *day renovation* could be carried out by "anyone who owned a horse and carriage... And it was up to each household to decide who he wanted to sign a contract with" (Grove 2002:23). However, this was not unproblematic, as the threat of cholera demanded that all households had to get rid of their waste and sewer. The problem was that with many agents on private contracts, the renovation service became random and erratic and not every household was covered, and thus the cholera threat would prevail, in addition to the discomfort of reeking uncollected waste in certain areas of town. Public investigations in the 1890s concluded that the private market was effective, but in terms of quality, the standard was not good enough, especially with stricter Health regulations. The solution was hence to establish a municipal renovation company, *Kristiania Renholdsverk* in 1898 that would be obliged to service the unprofitable houses as well, leading to many years deficit in the companies (Grove 2002). In other cities, like Bergen, the municipality was given the full responsibility of renovation, while in Kristiania, the municipal company operated in competition with other entrepreneurs until 1930 when a general municipal renovation was enforced.

3.1.31860-1950: Outcome of the regime and Institutional Developments

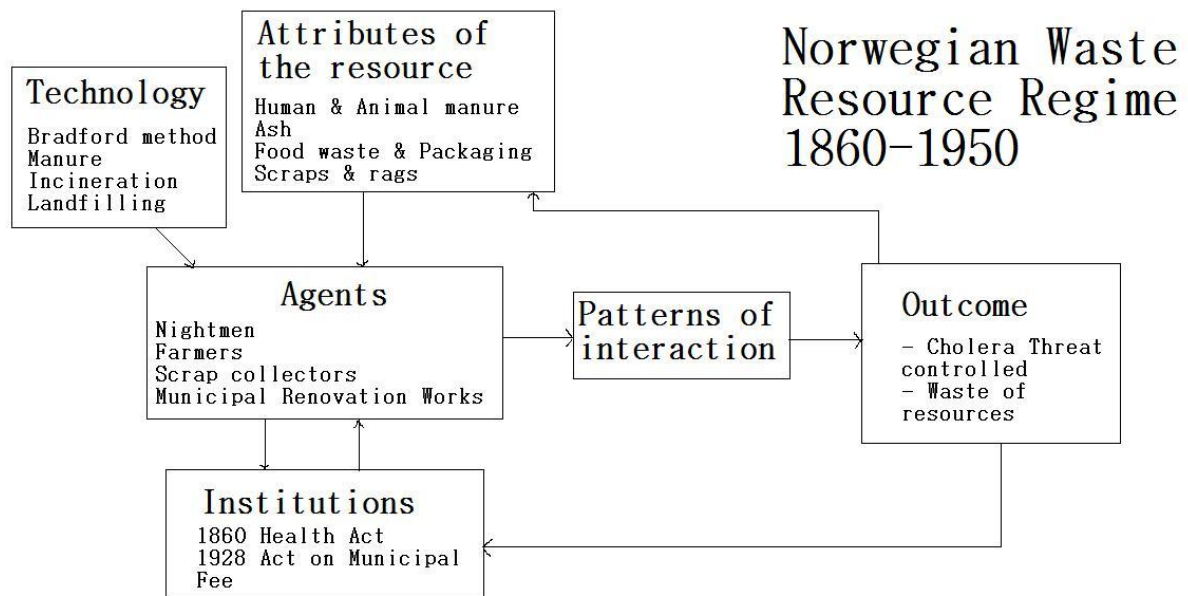


Table 4: 1860-1990 Resource Regime

In order to analyse the institutional developments in this regime, we return to the resource regime analysis in Table 4 and try to explain how the outcome of the regime lead to institutional developments.

The challenges of the regime, as we see in Table 4, were the lurking cholera threat and finding proper waste treatment.

3.1.3.1 1860-1950: Institutional developments as respond to the Cholera threat

The fear of cholera made the governing bodies worry and take measures to try to prevent the fatal disease from claiming more lives. The Health Act of 1860¹² gave each municipality the responsibility of establishing a health care service¹³ and from the beginning, waste and renovation were among the most important issues (Torstenson 1997). As bacteriological research helped locate the contamination source of cholera, more acts following the 1860 Act were passed in order to bring more control over this threat by regulating the storage of manure and sewer handling. The responsibility of waste handling was put under local authority i.e. the municipalities, and they could choose in which manner they would do so, either by its own renovation system, or by letting private entrepreneurs share the ‘waste-market’ between themselves and even operating on the side of a municipal run service. The problem with this

¹² Lov om Sundhedscommissioner og om Foranstaltninger mod epidemiske, endemiske og smitsomme Sygdomme av 16. mai 1860.

¹³ Sunnhetspoliti og sunnhetskommisjoner

system would was that it could not prevent some households to fall outside and potentially be a cholera threat. These households were regarded as ‘unprofitable’ but this came to more or less an end in 1928, when on 8 June 1928 a law on municipal renovation fee was passed, meaning the municipality was given the possibility to demand a fee from the household for renovation services. This fee was not to be greater than the cost of the system itself and it “gave the municipalities the possibility to introduce municipal monopoly on household renovation” (Torstenson 2006:55). This would also be the start of cost sharing of renovation services between municipalities.

3.1.3.2 1860-1950: Institutional Response to the need of improved local organisation of waste treatment

Without many *formalised* recycling and re-use schemes for most of the time in this period (with the exception of the ban on discarding food waste suitable for pig fodder during the War), the waste still held much value, because materials were scarce and labour was cheap. Continuous maintenance of personal possessions was normal, and land filling was considered primitive, incineration was more appealing, but the unexploited heat was agonising decision makers. Food waste was collected by farmers and fed to pigs, until it was beginning to be regarded as unfit for pig food towards the end of this regime. Manure was “gold” and sold to farmers in surrounding districts as long as the *privy* was the king and storing the gold was not regarded unsanitary. But as Norway came out from the rubbles of the Second World War, this would all change.

3.2 1950-1970: Grow and throw, the littering phase.

Our second waste regime, in the period between 1950 and 1970, differs from the other regimes on one essential issue: there were no major waste managing systems developed in the period. Coming out of the economic and material hardships from the Second World War, the economic bloom and welfare development that followed sent the new collective Norwegian mindset on collision course with the old. The old consumption ways met modernity with new low cost commodities. The post-war American development mantra of “the use-and-throw society”, where the throwing away of things was a necessity for stimulating economic growth and employment, was heard in Norway too, however with some more scepticism. Torstenson writes: “In the time after the second world war, Norway was showing a more puritanical productivism compared to the American ideal of mass consumption. The slogan was, after all, ‘growth and welfare’ rather than ‘abundance and mass consumption’ ”(2006:58).

In the air of optimism that is often ascribed to this period, it seems only natural that the transformation of lives and improved living standards, needed to rid itself of the past to start anew, and so, while the population bomb pushed young families into new houses, the space in the old litter bins was getting more and more crowded. The State dictated a planned economy to build the nation, and social policies were aimed at modernising the Norwegian households, but did not, however, follow this encouragement up with renovation capacities.

3.2.1 1950-1970: Attributes of waste



Picture 2: Photo from a refrigerator brochure 1964: Note the individually packed food, cartons, the new, functional kitchen, and the fridge itself. Source: (Elektro 1964)

3.2.1.1. 1950-1970: Waste amounts and composition

The major household waste fraction in this period was paper. In 1966 paper made out 75-80% of the volume of household waste (Torstenson 1997:146). The increase in the paper fraction helps explain the increase of the *volume* of waste between 50-100% between 1956 and 1966, while the population growth was only 7% and the *weight* remained the same more or less (Torstenson 1997:144). Even by 1960, the annual waste generation per capita laid around 25kg, but over this decade it would increase in four folds by 1970.

New product innovations such as disposable milk cartons replacing glass bottles came in use from around 1960. A change in shops from over the counter to more modern type supermarkets, also meant more products were individually packed and so generating more packaging waste. Changes in food products also meant that more was pre-prepared like soups or frozen food, especially when the freezer became a standard part of Norwegian households during the 1960's (Olstad 2011). This development also changed the food waste, in addition to the displacement of food waste generation from households to the factories. The old scraps that had been collected and given to pigs were diminishing as the households were now better

equipped to store food, and the food waste re-use as pig fodder was abandoned due to rising hygiene concerns.

The perhaps biggest waste challenge of this regime was the discarding of old leftovers from the ‘modernisation process’. Old furniture was too big for waste trucks to collect, and owners had to either put them away in storage rooms, or if it was in ok shape – donate to flea markets, but for other undesirables, night dumping in remote areas or rivers became an efficient solution (Torstenson 1997). Even old cars were abandoned during the night, and caused more head ache for the renovation workers¹⁴. The old privy toilets were still in use, and in 1956, there were still 11 000 of these, that needed to be emptied by the renovation workers.¹⁵ There were on the other hand 145 000 WC’s, and the municipality gave interest free loans to house owners that wanted to install WC’s (Torstenson 1997:137).

3.2.1.2. 1950-1970: Renovation Technology

This regime does not develop any new remarkable renovation technology even though parts of the waste composition are getting more complicated and dangerous, even.

A challenge of yet unknown consequences came from wasted products containing chemical or toxic substances, which was a waste stream that was growing during the whole period. There was little knowledge about the real dangers from it and also no knowledge about how to treat these materials. Torstenson (1997) writes that even in the chemical industry there were no answers on how to destroy chemical waste. One example is the use of PCB, which we now know to be one of the most dangerous chemicals in circulation and its detrimental health effects are mapped. This was however, unknown in this period. Chemicals were usually incinerated in controlled form to prevent uncontrolled fires. In Oslo, the municipality gave clearance for companies to burn their own toxic waste. One absurd example was the burning of obsolete trains by the National Railway Company (NSB) in Alnabru in Oslo (Torstenson 1997). Local communities complained about the smoke and unpleasantness from it to the municipality. This made it harder to plan new incineration and waste plants. Polluted run-off water from the landfills was something people were beginning to be alarmed about as the possibility of contaminating drinking water was imminent.

¹⁴ Vehicle scrap deposits (“Vrakpant”) for cars was introduced in 1978.

¹⁵ In 1948 Oslo was brought together with surrounding municipalities in Aker, to form the new greater Oslo, increasing the population from 250 000 to 424 000 (Torstenson 1997:132).

Household waste was still used for providing land mass, especially in urban development, and the Bradford method was still being used (in Oslo). However, as the waste composition changed and increased, it became clear that the Bradford method was not efficient enough because the decomposition went too slow. Landfills were filled to the rim and new ones opened. Incineration was an often opted solution.

Paper was collected by private agents, like the Salvation Army, or school marching bands, and sold to paper recycling industries. In 1954 30 848 tons of paper waste was collected, in 1960 it had risen to 52 338 tons and by 1970 it passed 83 000 tons, and most of this was recycled at all stages (SSB 1976:216).

3.2.2 1950-1970: Agents of the Waste Regime

This period marks the beginning of the time where the most important agent was no longer the waste handlers, but the consumers. Maybe it is incorrect to call them ‘agents’ as little, if any, political effort was made to interfere with their actions. But the role of the household consumer unit is nonetheless the “agent” that has the biggest impact on the outcome of the regime, as the increased consumption and waste generation would turn out to be an enormous source of pollution. The responsibility was, however, still left with the municipalities who were unable to handle this problem due to lack of understanding of the issue, the lack of knowledge and usually without the technical and financial capacity to handle it. Unregulated use of products of complicated composition and unregulated treatment requirements due to lacking knowledge – explains the vacuum of responsible agents in the period.

3.2.2.1 1950-1970: Waste Generating Agents

The housewives were, according to Gro Hagemann, the most important consumer in this regime, and after the War, the home industry became a major industry in Norway, not only for profit, but also to increase the domestic comfort and ease (Sæther 2006). Improved material living standards meant that home improvement became an important part of the market, with home appliances and increased homily comfort, did not only help ease the tiresome work of housewives, it also “made [her] an important market player” (Sæther 2006).

3.2.2.1 1950-1970: Waste Governing Agents

Municipal renovation continued to be enforced nationwide, but by 1955 there were only still 44 out of 445 municipalities that had an organised public renovation service (Torstenson 2006). However, it caught speed, and by the late 1970’s, municipal renovation was found in 343 municipalities.

3.2.3 1950-1970: Outcome of the Regime and Institutional developments

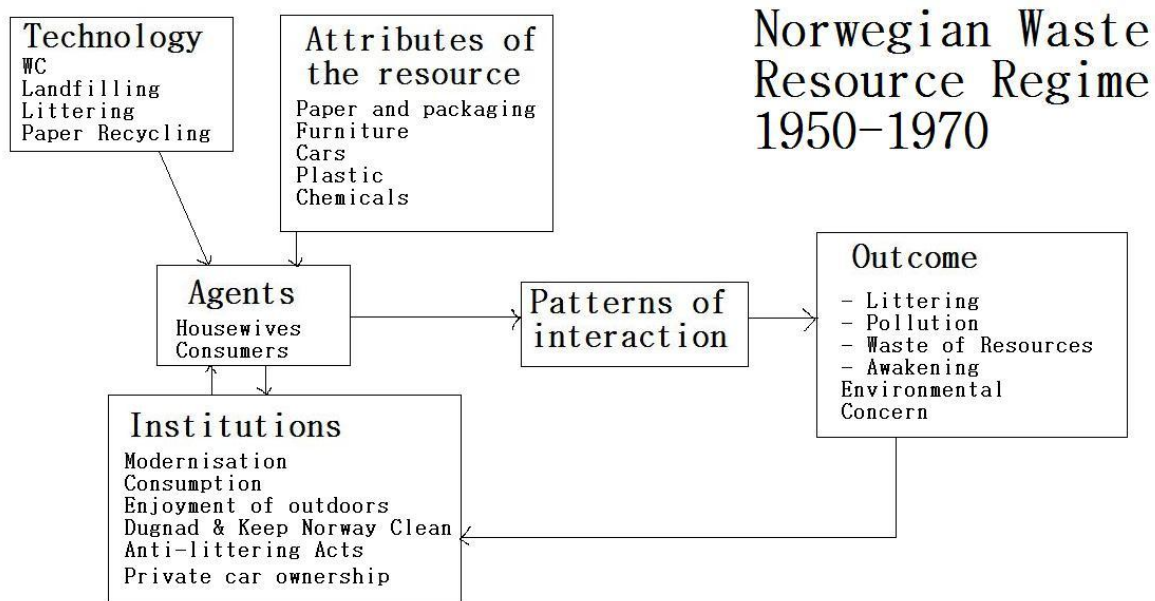


Table 5 1950-1970 Resource Regime

“There is still very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged.”
(Carson 1962:29)

The quote above is taken from Rachel Carson’s book, *Silent Spring*, the corner stone publication of the environmental movement, and is about the uncritical use of pesticides in American agriculture and its devastating ecological and biological effects. Although this issue is different from that of this study, we can trace the same patterns of attitudes in Norway in the 1950’s and 60’s, both in regard to the attitude from scientists and authorities towards pollution, and a sort of “canonisation” of industry as the saviour of economy and development – not to be touched or criticised.

The most serious outcomes of waste regime between 1950 and 1970 were to most people and policy makers yet unknown, and waste regulation was weak in this period. Environmental issues started to gain political momentum together with the dawning of the environmental movement in the last part of the 60’s. Some problems were, however, obvious; the littering of nature and public spheres and the increasing pollution around waste treatment sites, even though there is little action to either gain knowledge about these problems or do something

about it. The main outcome of the regime is therefore the awakening of people and waste governors to the devastating and degrading effect the modernisation has on the environment, and their call for action. This can also be seen as an institutional development, as nature appreciation becomes an enhanced norm in the society that would also bring forward other institutional changes.

3.2.3.1 1950-1970: Institutional Developments as response to littering

There is one main waste policy target in these years and that is the striving to regulate the littering of the public sphere, which was becoming a problem and an obvious one too. A ban on littering is hard to implement, due to the high transaction costs it requires to be enforced. Often littering is done anonymously too, making it even harder to target. If we think back to motivation and policy instruments, choosing economic instruments such as fines on littering is on its own not effective in reducing littering, as it is a sort of anonymous form of pollution. Much of the illegal private waste dumping happened at night and much of it was done with the help of private transportation. Part of the problem was therefore identified with car ownership, and the waste policies at the time came in the form of legal instruments aimed at regulating private transportation: the Public Roads Acts in 1957 and 1963 that banned littering along roads. How effective these acts actually were in reducing littering is unknown. We can, however, *suggest* that littering of wild nature for instance, was more effectively reduced by triggering a moral guilt through legal instruments. Ironically, this new sense of moral commitment towards nature, was helped by one of the very causes of the littering; the car, through the broader public availability of wilderness that it made possible.

Torstenson argues that the car would play both the devil and the revelator as its contribution to the public littering was quite significant due to the mobility and ability of the passengers to access more scattered places. This again opened the eyes to the wide public enjoyment of nature. The bits and pieces of rubbish flying and lying around helped push waste management into the arena environmental politics from the 1970s. To unknown effect, the Nature Conservation Act of 1958 prohibited public littering in nature by law. It is often a problem to measure the effects of policy instruments, but there was a developing institutional dynamic in society, probably spurred by nature conservation issues: keeping our surroundings litter free became a public task. In 1968 a “Keep Norway Clean”¹⁶ campaign was initiated by The Royal Norwegian “Velforening” – to make people aware of the littering, and not at least to clean up.

¹⁶ In Norwegian: “Hold Norge Rent!”

“Dugnad” (a form of voluntary community work) became an annual community wide cleaning of public space action, under the parole of ‘care for nature’ (“Naturvett”).

3.2.3.3 1950-1970: Institutional Developments as response to the Unknown causes and consequences of pollution

However, littering was perhaps the least serious environmental problem. Pollution increased extensively over the 1960’s from the industrialising and modernising Norway. But economic growth was the main agenda and, environmental and nature protection was underplayed in order to promote development. The environmental detriment became so obvious at the end of the 60’s, not only in Norway but all over the Industrialised World, that it finally became a part of the political debate. Nøttestad writes: “It was under this debate that the demand was made: Norway had to establish an effective public management that could gain control over the environmental problems” (2002:14, own translation). In a survey conducted by Norsk Gallup A/S in 1970, 84% of the responds said they agreed that the government should be more active in nature and environmental conservation (Nøttestad 2002). This shows that environmental concern had become an institution in society itself that required management and national political priority. But still, there was little governmental effort made to control the handling of chemical waste in this period. Lack of not only public- but also professional knowledge of the dangers of it, persisted in a vacuum of will to change the ‘outcome’. People would react to incineration sites close to their homes, as the toxic fumes were perceived as unpleasant at best. This would be the only form of regulation for chemical waste treatment in this period—regarding the location of the final handling sites. Unregulated use of chemicals no one had researched the effects of, fell under the curse of lack of authority or responsibility, there was no pollution authority to take responsibility.

However, the regime where environmental protection and nature conservation were left outside of political agenda and public management was over. Water and air pollution were the two first environmental issues to get their own research institutes, *NIVA*¹⁷ and *NILU*¹⁸ respectively in 1958 and 1969. The Neighbour Act of 1887¹⁹ was a legal act created to protect neighbours of factories or any smoke emitting industry against hazardous fumes/air pollution, but it lacked a managing/administrative body until the establishing of a committee to evaluate the national status of the air pollution - *Røykskadekomiteen*²⁰ in 1956, that recommended the

¹⁷ NIVA: Norsk Institutt for Vannforskning – The Norwegian Institute for Water Research

¹⁸ NILU: Norsk Institutt for Luftforskning – The Norwegian Institute for Air Research

¹⁹ Naboloven of 27 May 1887

²⁰ Literal translation: the Smoke Hazard Committee?

establishing of a council to run and coordinate the work to fight the air pollution, and so *Røykskaderådet* came into existence from 1961, under the Ministry of Industry (Nøttestad 2002). In some cases, incineration plants would need concessions from the Neighbour Act, but a report from the Central Bureau of Statistics from 1984 showed that only 36% of these had concessions, and it had in reality little effect on air pollution (SSB 1984). The Ministry of Environment was established in May 1970, and Olav Gjærevoll would be the world's first Minister of Environment and so marking the beginning of a new era in environmental politics.

3.3 1970-1990: Regulation, pollution control and clean up

"I believe the situation can be summarised like this: The continuous improvement of treatment plants puts the municipalities in a new set of challenges, namely what do we do with the sludge? It is no longer acceptable or legal to dump the sludge in water ways, the sea or in the fjords. (...) The extensive research that I refer to shows that many technical, economic, health-related and agricultural issues have to be resolved before we can assign solutions that we know will be successful. I have seen that the perceived best solution among scientists have changed according to new research. This shows the legitimacy of the research and warns us that we have to investigate everything in great detail. On the other side, we see that the municipalities face urgent problems. Owing to this, we need to evaluate our experiences so far, and together with other relevant authorities give them some guidelines on these issues."
Gro Harlem Brundtland, Minister of Environment, speech in Parliament, October 1974.²¹

The quote above is taken from a speech held under the parliamentary proceedings by the Minister of Environment in 1974, Gro Harlem Brundtland. Compared to the previous period, it could seem like environmental protection has finally reached the main political agenda as pollution sailed up the lava stream to become *the* hot topic in both national and international environmental policy discourses. Perhaps the most important development is the acknowledgement that consequences – *and causes* of pollution need to be investigated and understood from several sectors before political decisions are made on structure and management. In other words, the fact that neither politicians nor scientists knew *what* was causing the pollution was no longer an accepted situation in a society where increasing threats to nature and human health became more and more obvious. In terms of our resource regime analysis this translates into that they were no longer un-interested in which characteristics of

²¹ Source, own translation: Brundtland, G. H. (1974). Speech: Vernearbeid innenfor bygg og anlegg. S. d. s. 98-100.

the waste that was causing pollution and neither could the authorities be accountable if they accepted this situation status quo. This regime is also marked by a growing public environmental conscience, where people and professional bodies/interest groups demanded action to be taken.

Alongside this awakening also came new legal instruments and the building of administrative bodies around these. Awareness came with responsibility, and both national and local waste managing institutions were established to both handle and administer these waste challenges.

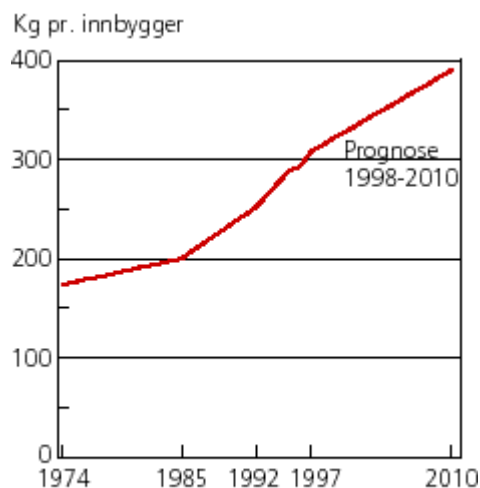
However, on the negative side, the regime is also facing some serious challenges: these new, strict regulations and requirements of waste and sewage handling are given to the municipalities who suffer from lack of finance, technical and environmental understanding of these issues and qualified personnel to ensure environmental protection. This period is a period where problems become quantifiable and measurable, and to some degree also begun solved.

In a little less than 10 years after this speech, Brundtland, then as the Prime minister, became the head of the World Commission on Environment and Development (WCED) under the UN, to examine the link between development and environmental problems. Its report, *Our Common Future*, was released in 1987 and became one of the key documents in directing environmental (and development) policies towards sustainability. The “...environment is where we all live; and ‘development’ is what we all do in attempting to improve our lot within that abode. The two are inseparable...”(WCED 1987:xi) . The rising environmental consciousness of the early 70’s suffered some set back in the first half of the 80’s, but environmental disasters such as the Chernobyl incident, followed by the WCED report, helped reset the political agenda.

3.3.1 1970-1990: Attributes of Waste

The household waste holds three particular features in this period: firstly, its volume increases and becomes more toxic, secondly; the municipal waste treatment systems held poor environmental standard, and thirdly; it is once more regarded as a resource in public managing, however, with little practical effect in this regime.

3.3.1.1 1970-1990: Waste amounts and composition



Kilde: Avfallsstatistikk, SSB og Halmø 1984

Graph 2: Household waste per capita/Kg between 1974 and 1998 (the rest is a prognosis). Source: (SSB 1994)

From Graph 2 above we see how much the household waste increases in this period with ca 70%. Household waste per capita rises from 180 kg in 1972 to ca 240 kg in 1990, and as little as 2% was recycled in 1972 (FIVH 1998). According to research done by SSB in 1978, “typical values” of household waste in 1973-74 were, in terms of weight; Paper 34,1%, Vegetable and Animal matters 37,6%, Plastics 5,7%, Glass 5,5 % and the rest²² 17% (SSB 1978:266). According to NOU 1973:51 – 18% of the paper waste in 1972 was recycled, but recycling as a general waste treatment option was still dormant which it had been since the War. Some recycling schemes did work, however, and remarkably so, too; bottle return schemes organised by the Norwegian brewery Association got a high degree of their bottles in return, due to the high “PANT” on bottles; in 1973 98% of used beer bottles were returned and this high return rate continued through the 70’s. Vinmonopolet had much lower rates – ca 54% in average from 1972-1977, maybe due to the fact that they did not have “PANT” but instead they had a buy-back scheme for bottles that would be re-filled in Norway (SSB 1978).

Another old issue became a problem once again, sewer: Population growth and building of new houses with proper sewage systems, coupled with the new strict regulations dictated by the new law for Protection against Water Pollution of January 1971²³ and an understaffed case handling body (the Water and Sewage Office under the Norwegian Water Resources and Energy Directorate, NVE), made many municipalities cut corners in the wait of sewer emitting permissions. Sewer was in many places let straight out into close streams and rivers without

²² The rest being: textiles 3,3%, Rubber and Leather 1%, other combustible matter 4,5%, Metal 3,6%, other non-combustible matter 1% and small particles 3,7%.

²³ Lov om Vern mot Vannforurensning

being cleansed at all. But by 1983, there was built 617 sewage treatment plants capable of handling sewage from 2 million people (Nøttestad 2002).

Hazardous and toxic substances began to find their ways into household products, and by effect, into the waste streams, too. Before 1977 there was no (legal) control over which products were allowed and not. Lack of government regulation in the other end of the pipe, was also causing pollution, like we saw under the last regime, when toxic waste was incinerated on ground, sometimes close to habitation. And up until the 1980's there was no domestic treatment facility for hazardous waste, it was shipped to plants in usually either Denmark or Sweden, if not "treated" locally. According to Renor, one of the first Norwegian hazardous waste treatment companies, it is written in its 25 years anniversary history book: "There were few people before 1981 who were concerned about [hazardous waste] neither as a problem nor as a business opportunity" (Renor 2006:4). This was however not true – but the State could not find it economically sound to initiate and operate treatment and destruction plants for hazardous waste. In the White Paper from 1975 it was dismissed as uneconomic at the time, and maintained that it was the municipalities' responsibilities to handle this waste stream, either locally or by sending it to other Nordic countries. It encouraged establishing smaller collection sites around the country, within three years – 150 sites were to be opened, however, this never happened- the process was slow. By 1980, budget negotiations opened for the trial of nine such sites (Nøttestad 2002).

There was however, someone who saw a market opportunity for the treatment of municipal hazardous waste. Renor was founded in 1981 in Aurskog, and more or less at the same time, Dentor was founded in Larvik, mainly to handle organic special waste, mainly from industries. During the 80's, Renor's received an annual average between 1000 and 2000 tons (by 2006 it grew to 10 000 tons), while Dentor handled between 2000 and 4000 tons, passing 5000 tons in 1990 (Renor 2006). This waste was among others used for fuel cement furnaces. Many municipalities and inter-municipal companies in Southern and Eastern Norway began to send their hazardous waste to Renor, as there were no municipal plants that were able to treat this waste stream²⁴ (SSB 1984). However, NORSAS²⁵ - The Norwegian Centre for Waste and Recycling - was founded in 1988 in collaboration between the Ministry, Business Norway(NHO) and the Central Municipal Association (KS) to develop and take care of a nationwide collection and treatment of this waste stream (NORSAS 2013).

²⁴ Hazardous waste here means explosive, flammable or health damaging.

²⁵ Norsk Kompetansesenter for avfall og gjenvinning

3.3.1.3 1970-1990: Renovation developments

Household waste treatment options between 1970 and 1990 were mainly landfilling, shredding and incineration. Landfills were either, by definition in this report, “polluting” or unsorted– 80%, 15% and 5% respectively, and was still by far the most used waste treatment option, even in 1992 as much as 76% of all waste was dumped in landfills, while 15% was burned, 1% biologically treated and the rest was recycled. In 1978/79 there were almost 400 waste treatment plants/landfills in Norway – that’s almost one in every municipality and not including the simple landfills and small ones receiving less than 50 tons (SSB 1994:13-14). According to a report conducted by Central Bureau of Statistics ordered by the Ministry of Environment in 1977-78 over municipal landfills, most of the municipalities were without proper environmental waste treatment facilities. Neither was there any central overview over these before the Ministry of Environment started registering them in 1977 in an overall process of improving the standard of these sites (SSB 1984). However, as we move through the 80’s the pollution from these landfills is decreasing thanks to the guidance from SFT to the municipalities. This service was also successful in acquiesce the transition into inter-municipal solutions, which was regarded as a much better environmental solution. Nøttestad (2002) writes that nearly 50% of all municipalities by 1983 were in this kind of cooperation, and more than 100 of the remaining municipalities were considering such a solution.

3.3.2 1970-1990: Agents of the waste regime

The new agents in this regime also reflect the institutional awakening that was happening in this period; the Ministry of Environment and the Norwegian Pollution Agency were established as waste authorities. The municipalities were meeting severe challenges in their local renovation systems, both from household collection and pollution at landfills, to new regulations from above – forcing them to move out of a state of reluctance and towards action.

3.3.2.1 1970-1990: Waste governing agents

The Ministry of Environment was established in 1972. Driven by both public and political concern as a reaction to the increasing obviousness of environmental degradation that took place in the previous decade, environmental conservation was ready to enter as a solo act on the political stage. Tasks were handed over from the Ministry of Municipalities and the Ministry of Industry; nature conservation and “friluftsliv”(outdoor recreation), and pollution, respectively(Julsrud 2012). The severity of the pollution situation demanded a dedicated

administration for such cases, and the Norwegian Pollution Agency (SFT, later KLIF) was established in 1974.

SFT was given the responsibility of waste issues from 1979, and finally there was a dedicated authority to handle pollution and waste issues alone. It became the administrative body of the Protection against water pollution Act of 1971, the Product Control Act of 1977 and the Pollution Act of 1981.

3.3.2.2 1970-1990: Implementing Agents

While waste was being regulated in one end, it was on municipal grounds that the actual collection, transportation and treatment took place. This period's perhaps most important agent, in terms of actual waste management, is therefore the municipality and increasingly the inter-municipal companies under the regulations of the authorities. The municipalities faced two major challenges: 1) the cost and technical skills needed to fulfil the requirements put forward by SFT, and 2) the lack of priority of environmental issues. The latter will be addressed under chapter 3.3.3.2.

As a means of cutting costs of running municipal waste treatment plants, there was a clear tendency of closing single municipal plants and joining together and creating inter-municipal solutions for collecting, transport and treatment. From 1978/79 to 1983 the number of single municipal dump sites was reduced from 340 to 262, while the number of plants used by 4-8 municipalities increased from 13 to 24 (SSB 1984). Meeting the costs of establishing and running these services were accommodated by the State which we will get back to in chapter 3.3.3.2.

3.3.3 1973 -1990: Outcome of the Regime and Institutional Developments

Waste became a political issue in the 1970's and policies were usually passed without much debate through the Parliament. But things changed in the early 80's as the world moved into Thatcherism and right wing politics dominated, pushing the political focus away from environmental policies and toughening the budget negotiations. However, the most important institutional developments of waste governance of the 70's had already established a functioning regime in terms of responsibility and consciousness towards pollution from waste, and this would not be too greatly compromised even though the political landscape shifted right for some time.

As we saw in the beginning of this chapter, the main outcomes of the regime were changes in the management structure, from national policy making to local municipal implementation.

The rising awareness towards the gravity of pollution and waste problems led to the establishment of an authority to deal with these issues alone and administer the pollution acts.

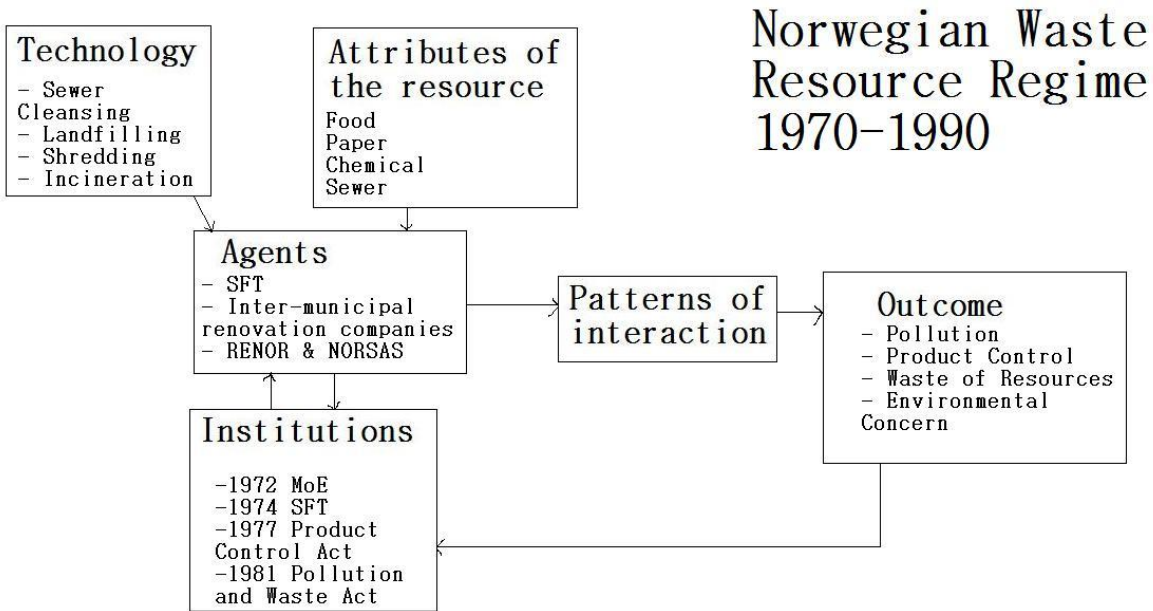


Table 6: 1970-1990 Resource Regime

3.3.3.1 1970-1990: Institutional development as a response to the need for national waste governance

“When the new Ministry of Environment was getting ready to work [on pollutions issues] in 1972, its status was that there was still a lacking foundation of knowledge, both knowledge about the pollution situation and its causes, and about political instruments and measures to achieve environmental improvements. Both administration and research needed improvements, because neither the industries, nor the municipalities, and other agents had any knowledge about the problems they were causing”(Julsrud 2012:104).

As we see from this quote- there was a lot of work to be done for the newly established Ministry. The work on forming a waste policy process started. Before deciding upon measures and instruments, a thorough knowledge and understanding of the cause and nature of the problems was needed. To do so, the Ministry appointed and financed several research programs and committees, for instance a program under the Norwegian Technical and Scientific Research council, the *Committee for Solid Waste*²⁶ helped provide national data on many aspects of waste, such as composition, amount, and renovation costs and so on (Nøttestad 2002). The first White paper came in 1975 (no. 44) *Measures against Pollution*, which started drafting the sketches of the Pollution act (which was implemented in 1981).

²⁶ NTNF (Norges Teknisk og Naturvitenskapelige Forskningsråd) *Utvalg for fast avfall*

While the Product Control aimed at waste prevention of hazardous waste, it was the Pollution Act that would become the main waste legal instrument.

It is important to note that pollution was not the only waste issue to receive increasing political attention. *Recycling* had returned back on the political slab. In 1973 a Recycling Committee was appointed to “to evaluate waste as a resource and elucidate the possibilities to return these resources back into the life cycle” (NOU 1973:9 own translation). It concludes in a report²⁷, among other things that the laws governing waste management were doing little to encourage recycling and stopping the waste of resources, since much of the decisions were prohibitions and “negative” measures. Neither did it encourage waste reduction. It reads in its conclusion that waste generation should be avoided or limited especially when the waste is difficult to treat - this is probably the first time that waste prevention and reduction is mentioned in any official document (NOU 1973:67). The Committee’s second and final report²⁸ was concluded in 1975, and according to Nøttestad (2002) these recommendations would be the starting point of the initiatives set out by SFT later. However, nationwide recycling schemes did not take on life until the 90’s. Most likely due to the fact that municipalities were already struggling to finance the required basic renovation services and still there was no official economic incentive to encourage the municipalities to recycle rather than dump the waste in landfills yet.

Hazardous waste was perhaps the first waste stream where waste prevention principles were applied, as people began to be concerned about the unknown effects of some of these materials that were used in household products and in industry. Nøttestad (2002) argues that one of the strongest drivers behind the development of a national *product control*, was the national labour organisation, *LO*, as they were concerned about the health of workers. It was backed by the powerful Labour Party that entered the suggestion of having an official product control on their Work Program for 1974-77, but already at the end of 1973, the Ministry of Environment had started working on a Law on Product Control. This was enforced from September 1977 and STF was given the responsibility of both case handling and developing a product register.

²⁷ NOU, N. O. R. (1973). NOU 1973:51 - Recycling and Waste Treatment. An overview over current recycling and waste treatment in Norway. Instruments that can encourage increased recycling. Special attention to some waste streams. Preliminary conclusions and recommendations.

²⁸ NOU, N. O. R. (1975). Recycling and Waste Treatment II - The final utredning and recommendations of the Recycling Committee. J. Låg. Oslo, Ministry of Environment.

3.3.3.2 1970-1990: Institutional development as response to the need for local waste governance

While renovation always had been a task that required local management, the new developing national regulations demanded more from local waste management than before. Implementing effective environmental waste management at local level required organisational, economic and legal reforms in order for the municipalities to be capable of meeting the desired standards put forward by the Ministry and STF. The White Paper on Pollution Measures in 1975²⁹ stated that it was the municipalities' responsibility to plan, start and run the renovation schemes, while the Ministry and SFT were to enable them to do so properly. They did so by e.g. making guidelines as to the localisation and running of treatment plants (Nøttestad 2002), and later they would also provide financial help to this process. Nøttestad (2002) writes that the State provided on average 70% of the funds needed as loan and supplement in 1982. A White Paper on Municipal Waste (and measures against water- and air pollution) in 1985 presented the development status of municipal waste treatment; 80% of the population was connected to a renovation service, there was still major pollution challenges in the 400 treatment plants, of which 315 were landfills – but the situation was *finally* improving (Nøttestad 2002).

First, the organisation of the renovation needed to be improved. There were differences in types of municipalities and the type of renovation they chose, urban and more densely populated municipalities were more likely to have a “forced”³⁰ renovation as waste problems were bigger and they would often cooperate with neighbouring municipalities on waste *treatment*. The forced/municipal renovation and inter-municipal renovation cooperation was regarded as an optimal solution for sound waste handling (TØI 1978). These were financially more capable of adopting environmental standards issued by laws and regulations from SFT. The problem was therefore the smaller, non-urban and non-densely populated municipalities that were more prone to have a ‘volunteer’ based renovation service, i.e. the households were themselves responsible of making arrangements with private waste collectors, especially outside urban areas. This form of renovation was the least environmentally friendly option, and the Ministry of Environment and STF were working to enforce “forced” renovation in these municipalities. The problems of doing so were both geographic and economic; in non-urban areas³¹ the costs of collection would run high, and the cost of having full municipal or

²⁹ St.Meld 1975 Om tiltak mot forurensninger.

³⁰ I.e. municipal renovation service (*Tvungen renovasjon* in Norwegian)

³¹ I.e. low densely populated areas (*ikke tettbygde strøk* in Norwegian)

starting inter-municipal renovation services were costly. One of the most important legal institutional changes in the 70's and 80's were therefore the enactment of the Pollution Act in 1981 where the municipalities were obliged to provide for the collection of household waste, and that Pollution Authorities (SFT) could through "regulations or in single cases order the municipalities to introduce systems for source separation" (Law 1981 § 30, 1st paragraph) based on a cost-benefit analysis. The municipalities are also given the right to decide if waste collection is only to be done in densely populated areas, and that some streams are left uncollected by municipal waste collectors, and that some waste streams are collected separately (Law 1981 § 30, 2nd paragraph). In 1978, 6% of the municipalities did not have a collection service in urban areas and 20% did not have it in non-densely populated areas (SSB 1984)³². In 1980, 75% of the population was connected to a renovation scheme, and 95% of this was under "forced" renovation. By 1985 – 80% of all Norwegian households were provided a municipal renovation service (SSB 1994).

The problem of costly environmental requirements for municipal renovation and sewer standards was addressed by implementation of instruments such as the introduction of sewer and water fees³³ and a national finance scheme to support preventative pollution work in the municipalities. Nøttestad writes that this would be crucial for the implementation of municipal measures for billions of NOK over the next 25 years, in addition to the necessary cleansing processes (2002:106). In order for these measures to have any impact on national environmental governance, the gathering of local environmental cleansing activities under a national plan in order to think ahead, had to be developed. This was done in White Paper No. 107 1974(-75) "Regarding the planning of a national plan for the use of water resources"³⁴, which would become one of the most important plans for cleaning up the sewer sector.

The other institutions of renovation also underwent changes, most importantly the waste **treatment** part. By establishing inter-municipal renovation schemes with collaborative waste treatment, the possibilities for improving the environmental standard on the plants increased significantly. "Environmental standards of the treatment plants" mean their effect on humans, animals and vegetation, and is measured based on data from "environmental effects from the plants, distance to buildings, leachate, operations management of the plants", etc. (SSB 1984:21). Environmental effects such as water contamination, flying debris, smell, rodents

³² Based on 78% of the municipalities that answered this query.

³³ *Lov om kommunale vass- og kloakkavgifter av 31. mai 1974*

³⁴ St. Meld 107 1974(-75) "Om arbeidet med en landplan for bruken av vannressursene",

and fumes, were the most common ones. Before the Pollution Act – concessions were authorised by the *Law preventing Water Pollution* and *the Neighbour Act*, to landfills and shredding plants, and incineration plants, respectively. There were however some treatment plants that did not have concessions, which authorised SFT after 1983 to make demands accordingly to address the negative environmental effects and demand action.

Given that the municipalities had so much power to influence the local environmental standard, for an environmental awareness to ‘trickle down’ into improving the standard, the consciousness and motivation of decision makers had to be addressed. For instance, the conclusion of NOU 1973:51 says that there already was sufficient knowledge about the dangers of hazardous waste and that they knew about “the damaging consequences of having an inconsequent waste disposal” (NOU 1973:67). The challenges were thus to take it more serious and, naturally, to find a way to finance it. As we saw above, the financial issues could be solved by establishing inter-municipal renovation, but municipalities were struggling to put environmental conservation onto the priority agenda. What was known as the “MIK reform”³⁵ - *Environmental Conservation in Municipalities* was launched as a test project in 1987 in 91/140³⁶ municipalities, but was soon deemed a success and implemented in all municipalities from 1992 to enhance environmental and sustainability awareness in planning and decision making processes (NIM 1997). Better waste treatment was also a part of this reform.

3.3.3.3 1970-1990: Institutional development as response to the need for a pollution and waste authority

The rules set forth by the national waste governance, needed both administrative and technical backup for case handling and research. This body, the Norwegian Pollution Agency - SFT was made up of *Røykskaderådet* and the State’s Water and Sewer Office³⁷ and was given the responsibility to administer the *Protection against Water Pollution Act*, the *Product Control Act* and the *Pollution Act*, including regulations, especially the regulation on hazardous waste of 1984³⁸. In 1979 when STF was given the responsibility of waste administration– it soon made a plan of action over how to improve the national waste situation. Nøttestad writes that the first thing they did was to start mapping all existing waste treatment (including incineration) plants, and that helped them rank the severity of the cases in the most urgent need of improvement. But the department was understaffed and there was a lack of emphasis

³⁵ MIK: *Miljøvern i Kommunene*

³⁶ Disagreement in sources, Renor 2006 says ca 140 and NIM 1997 claims 91

³⁷ Statens Vann og Avløpskontor.

³⁸ Concerning the operators of hazardous waste collection, storage and treatment to meet SFT’s standards (Nøttestad 2002).

on these issues in higher authorities, which made the work difficult. That also meant that they were unable to do all the controls that were necessary, especially with respect to the hazardous waste treatment. In 1988 SFT was granted the funds to open a department dedicated to hazardous waste alone, and so this issue would get more offensive attention from the authorities now, for instance with the opening of NORSAS.

As we are moving into the 1990's, the new regime is again spurred by environmental consciousness, this time from the launching of *Our Common Future* in 1987. *Sustainable development* becomes a leading principle in environmental discourses, and we see enforcing environmental consciousness at many levels of governance. Although waste amounts keep on growing, the environmental impact is less devastating in and finally there are cries for waste reduction or even prevention being heard. The situation at the *end* of the pipe was to a great extent put under control, and so measures started to aim at activities higher up in the waste life cycle; recycling was seen as a means of waste reduction, and as we move towards the present, we see policies aiming closer and closer at the producer and production of products.

3.4 1990-2010: Environmental concerns, increased waste generation and recycling

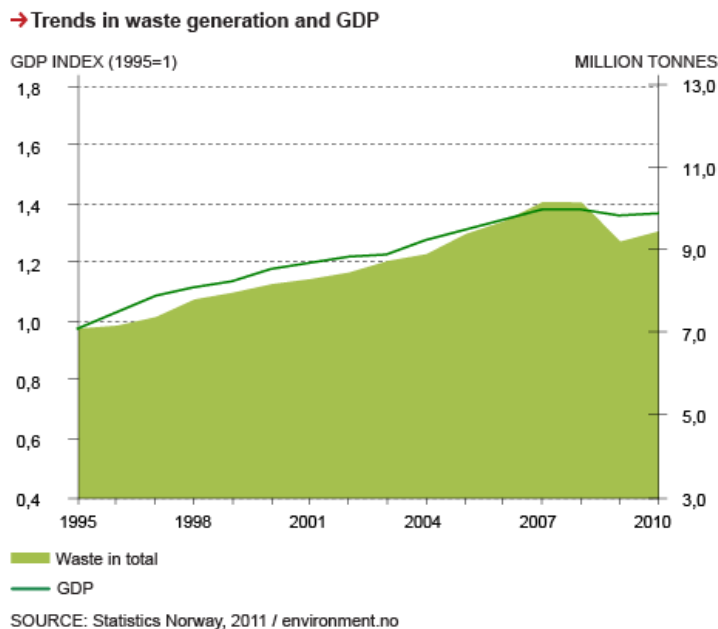
The beginning of our final regime starts with a White Paper (no. 44:1991-92) on measures for waste reduction, increased recycling and responsible waste treatment. A new waste policy is coined: *“The Government’s overall goal for the waste sector is that the waste problems will be solved in such way so that the waste causes the least possible damage and trouble for humans and the natural environment, and at the same time as the waste and the handling of this is done in such a way that requires as little as possible of society’s resources”*(MoE 1991-92:6-7, own translation).

From being in a state of environmental emergency, we can see that the waste discourse in politics has changed to one where the pollution is more under control and the political attention is beginning to look upstream at the producers, businesses and the consumers. The journey towards the present is therefore also a journey up the waste pipe; from regulating polluting leachate to enforcing extended producer responsibility. The challenges of waste in the new decades imply that the problems are now no longer the treatment and transportation itself as much as the *generation* of waste.

One of the main drivers of the change was the new of the Minister of Environment; Thorbjørn Berntsen, who entered his office in 1990 with waste issues on his agenda. He made improvement of the waste sector to be one of the main areas of environmental politics in the 1990's, and for this accomplishment he earned himself the nick name *Waste minister* in some circles.

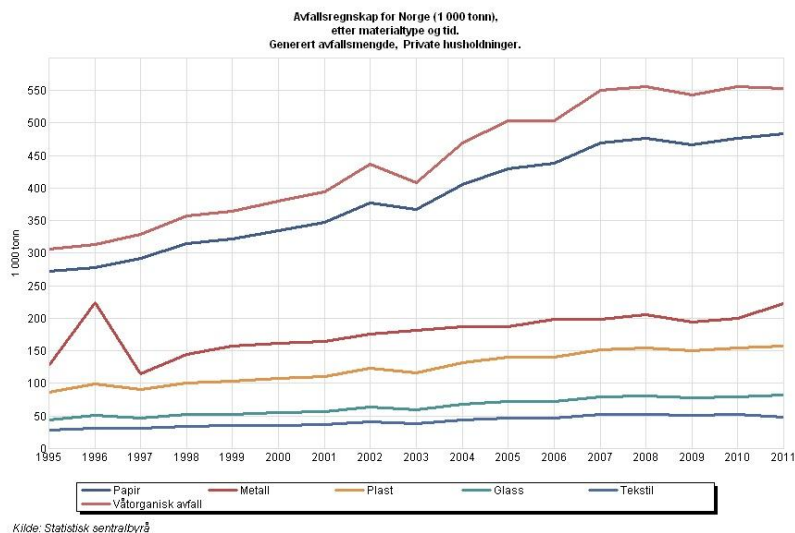
3.4.1. 1990-2010: Attributes of the waste

The household waste amount grew 71% from 1995 to 2007 – a growth rate higher than the household consumption that grew 63%, comparatively(SSB 2008). Graph 3 shows the development of waste /GNP from 1995 to 2010. As we can see, they share the same growth trend – except from 2007 and 2008 when the waste trend was much weaker than the GDP.



Graph 3: Trends in waste generation and GDP Source (SSB 2011).

Graph 4: development of household waste streams (in 1000 ton) from 1995 to 2011: Paper, Metal, Plastic, Glass, Textile and Organic. Source (SSB 2013)



3.4.1.1 1990-2010: Waste composition and amounts

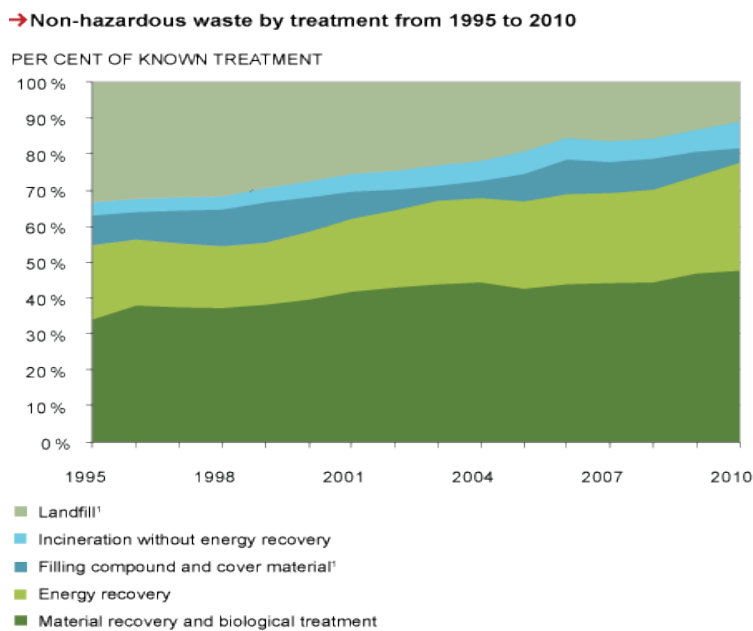
The household waste streams that had the highest increase in this period were Paper and Organic waste, while the other streams seem more or less constant. Graph 4 does not include wasted consumer goods such as e-waste, which is perhaps the most potentially hazardous household waste stream. In 2011, an average person generated 29,9 kg e-waste (environment.no 2012). Not included in Graph 4 is the increase in consumption of consumer goods such as electronics, furniture, clothes and sports equipment. Between 1990 and 2009 – the average Norwegian consumption of clothes (in kg) increased 72% and furniture (in kg) by 220%. Import of sport equipment increased almost five folds (FIVH 2011).

3.4.1.2 1990-2010: Renovation developments

As recycling increased, new systems for collecting of waste were developed. It was up to the municipalities, or more usually the inter-municipal waste companies, to decide on which streams of household waste were to be collected and how this would be organised. The options for the households were either to bring the waste to collection points, or to have their waste, in selected sorted streams, at their homes. Collection of glass and metal was and still is, based on a (voluntary) “bring”-solution- i.e. the consumers are themselves responsible of bringing the selected waste to collection points. These collection pods became a topic of discussion due to the aesthetic dimensions of these and their placement in public space – that by some it got referred to as a visual littering. Even SFT had to produce a user guide to help guide the municipalities about the design and placement of these. “Hopefully will a better and more elegant waste solution also help increase the motivation to use the source separation systems correctly” (SFT 1995:14).

Only 8% of the municipal waste was (materially) recycled in 1992, and the biggest part of this was paper(65,5%) collected at the source(61%), as much as 76% was placed in landfills (SSB 1994). By 1998 this increased to 33% (Bruvoll 2000). By 2005 we passed the goal of a 75% return rate, and in 2011 it was 87%.³⁹ The 2009 ban on dumping of organic waste, reduced the landfilled amount by 32% at least (KLIF 2013).

In 1991 there were 91 collection facilities for hazardous waste. Norway signed the *Basel Convention* in 1991 regarding control of transport of hazardous waste, especially upon exportation. This would eventually mean that a national treatment plant had to be constructed, however not without protests against several suggested locations. The waste that could be incinerated was sent to the NORCEM, in Brevik. The inorganic waste was sent for deposition at Langøya, at the *Norwegian Waste Handling's*(NOAH)⁴⁰ plant, while the rest was sent to



either Sweden or Denmark for treatment (Nøttestad 2002).

Graph 5: Non-hazardous waste by treatment from 1995 to 2010 of all waste streams. Source: (environment.no 2011)

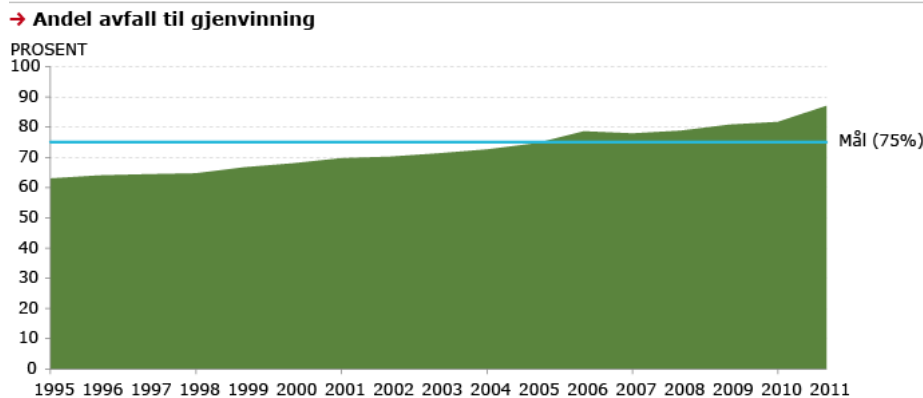
In 1992 there were 340 landfills, 8 incineration plants of which 7 recycled the energy. However, SFT drew up new guidelines in 1994 to continue enhancing the environmental standard at the landfills, from collecting leachate to collecting gas (MoE 1995). By 1995, the

³⁹ Excluding hazardous waste, polluted matter and waste where the treatment is unknown.

⁴⁰ NOAH: Norsk Avfallshåndtering A/S.

number had been reduced to 252⁴¹ (SSB 1996). In 2010 there were around 60 landfills still in operation (environment.no 2012). Methane emission from closed landfills still was a problem, and even though improved techniques of catching methane have been developed, the positive effect is/was lost to the increasing waste amount (OECD 2001).

3.4.1.3 Recycling



Graph 6: Part of waste to recovery 1995-2011, Blue line indicating recycling goal. Source: (environment.no 2013)

Increased recycling efforts throughout this regime by municipalities and the packaging companies (see chapter 3.4.3.1 below), reached the goal of 75% recycling set forward in 2000.

3.4.2 1990-2010: Agents of the Waste Regime

The dynamics of the waste agents in this regime shows the growth in concern and sense of responsibility towards waste in all layers of society. As a symbol of the conclusions of the Brundtland commission's report in 1987, the children's book character *Blekkulf* was voicing the concerns about the problems of waste and littering on behalf of the coming generations.

3.4.2.1 1990-2010: Waste handling agents

Strengthening of the local environmental consciousness in municipalities is a main concern of waste politics in the 1990's. Through the *MIK* reform and later, to some extent the *Local Agenda 21* from the Rio Conference, implemented in Norway by the Fredrikstad convention public officers working with environmental conservation grew in numbers.

From what we see in Graph 6, only 7% of the municipal waste was recycled in 1990, and the favoured municipal waste treatment option was landfilling. Other than environmental concerns, the municipality did not have any incentive to increase the amount that was recycled compared to the part that received final treatment. However, a change in the Pollution Act in 1994 forced the municipalities to set the fee

⁴¹ SSB 1997 claims that in 1995 there were 208.

on renovation services to cover the entire cost of the waste treatment, including operation and capital costs, and from 1995 they were required to have a total cover of waste handling expenses in their budget. A fee was put on the amount of waste that ended up in final treatment. This was introduced to encourage waste minimisation and recycling efforts, and make it economically in-effective to send most of the waste to final treatment. And because of the full cost principle, the change also encouraged differentiated waste treatment fees to encourage households to generate less waste. Another effect of the improved recycling rates was the transition of the waste industry from waste handlers to raw material suppliers.

The municipalities were also obliged to make “waste plans” from 1996 - where the municipal waste streams were mapped and measures for waste reduction and increased recycling had to be planned, too. This obligation was removed some years later.

As we saw in the previous regime, the *MIK-reforms* had set forth to enhance the environmental performance of the municipalities, especially focusing on waste, pollution and industrial emissions (Lafferty 1998). The government would support the municipalities with the financing of a *miljøvernledere* – head of environmental conservation in every municipality until 1997, when the municipalities themselves became in charge of the administration of these positions. By 1997, 78% of municipalities had some form of environmental conservation position in their administration (Lafferty 1998). The *MIK-reforms* were initiated right before the Rio Conference in 1992 and the articulation of what is known as another local environmental governance programme, *Local Agenda 21* – where the involvement of local people in sustainable development would get focus. These reform programmes had overlapping scopes, however, it is not within the grasp of this study to go into detail here.

A new agent from 1990 was the new administrating office for the Product Control Law that SFT transferred to the Ministry for Children, Family and Consumers.

3.4.2.2 1990-2010: Waste Producer agents

For the first time, we see that the industries and producers are brought on stage according to the *extended producer responsibility* (EPR) principle lay down in the post 1991 waste policy. EPR contributed to increase recycling and, collection and sound treatment of several waste streams, and so it has proven to be a successful instrument in waste governance (Sørensen 2011). The Ministry of Environment made agreements with the industries and producers of waste for them to voluntarily come up with waste reduction and return schemes as a positive alternative to forced regulation or fees. The EU Packaging Directive (94/62/EC) was implemented in 1995, and in 1999 it was expanded to include EE-waste, too, through a regulation (backed in an EU directive) that enforces EPR.

The following businesses covering their own waste stream have arrangements with the Ministry:

Table 7: Overview over EPR agreements			
Name (year)	Waste Stream	Return/recycling rate per 2009-2010	Goal ²⁾
Autoretur (2007)	Cars	85%	95% of a car wreck should be recycled
Batteriretur (1995)	Batteries		
Breweries	Reusable bottles	95%	
Elretur (1999)	WEEE		
Grønt Punkt Norge (1997)	Packaging (glass, metal, drinking carton and plastic)	89%	
Norsk dekkretur (1995)	Tires		
Emballasjeretur AS (former Norsk Returkartong and Plastretur AS) (.../1994/1995)	Drinking carton, plastic packaging	Plastic: MR 35% / ER ca 50%	Plastic packaging: MR 30%, ER 50%
Norsk Resirk AS (1995)	Paper and non-reusable bottles and cans	x/80%	
Norsk Resy (1993)	Packaging/brown paper	44/97%	Packaging carton: MR 50%, ER 10% Brown Paper: MR 65%, ER 15%
RENAS	Hazardous waste		
Syklus Glass- og metallgjenvinning (1991/1997/2011)	Glass/metal	Ca85% ^{1*} /68%	Metal: 60%
Sources: (Sørensen 2011) (NVF 2006)			
1: Glass return is not in any agreement and does not therefore have any specific goals.			
2: MR: Material Recycled, ER: Energy Recycled.			

Table 8 shows the nature of the producer responsibility schemes:

Agreements with MoE	Fee	Regulation	Take-back scheme
Brown paper	Drinking carton	WEEE	Beverage packaging
Packaging carton	Plastic beverage packaging	Discarded vehicles	
Metal packaging	Lubricating oil/waste oil	Disposable beverage packaging	
Plastic packaging		Tires	
		Batteries	
		PCB windows	
		Lubricating oil/waste oil	

Table 8: Producer Responsibility Schemes. Source: (KS 2010)

A frame directive that states that 50% of all paper, metal, glass and plastics should be recycled materially – and we have met this target (Sørensen 2011). All these have since 2000 been represented by LOOP.

3.4.3 1990-2010: Outcome of the Regime and Institutional Developments

Waste was again valued for the resources it held, and many of the institutional developments have been driven by the want to not let these resources go to waste. The main challenge was to enter this in the management structures, i.e. the municipalities, through law and politics. However, as recycling efforts improved greatly, so did the amount of waste, so much that itself became an indicator of the overall unsustainable modern life. The need for waste reduction arose, and this will be discussed in Chapter 4. Waste entered the climate change regime, and quantifiable goals were more easily set to reduce GHG emissions, rather than the more qualitative goals set in the other waste politics.

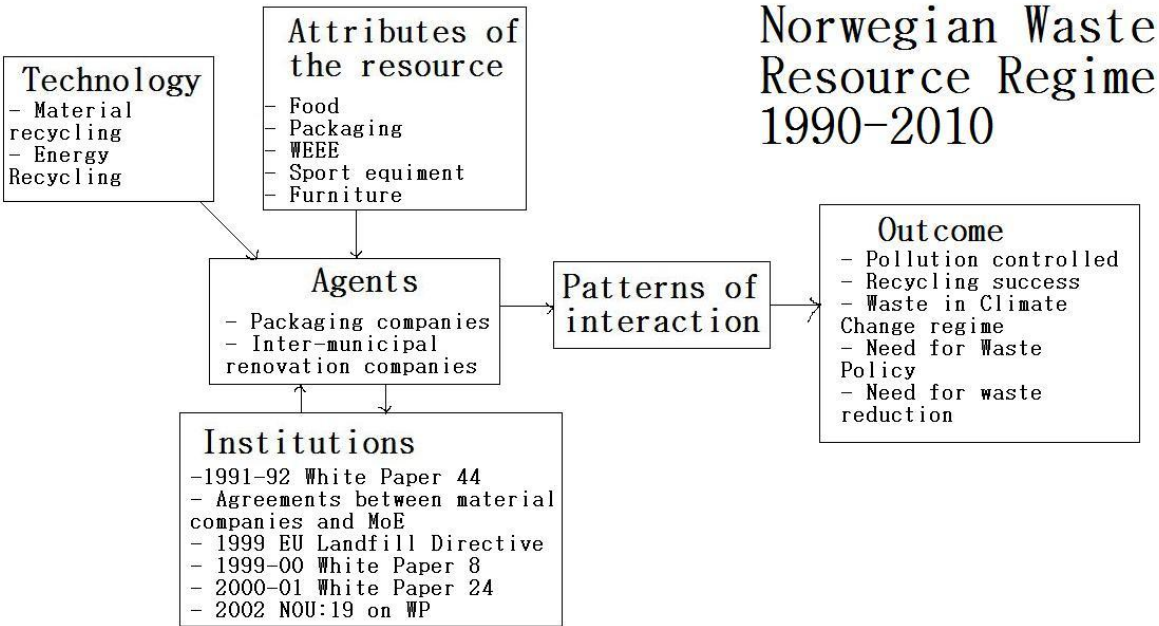


Table 9: 1990-2010 Resource Regime

3.4.3.1 1990-2010: Institutional development as a response to the need of improved national waste governance

Legal and political backing of improved waste handling was perhaps the most important institutional development in the 1990s. With White Paper no 44 (1991-92), the principles were laid for future waste governance:

- *The Polluter Pays-Principle:* In terms of waste this translates into that either the producer or the waste owner shall carry the cost of waste

treatment, and this can be reflected in the price of the product.

- *The Cradle to the Grave-Principle*: When evaluating the environmental impact of a product – the whole life cycle should be taken into account- from the extraction of resources to transport to waste treatment.

- *The Precautionary Principle*: The environment should be given the benefit of doubt when there is potential for doing environmental damage, and measures shall not be postponed due to lack of complete knowledge.

Furthermore, the White Paper states that the waste amounts of today represent both a waste of resources, and a problem in terms of pollution and the local environmental. It lays down three strategies to deal with the waste issue:

1. To prevent waste and reduce the amount of hazardous materials in waste,
2. Promote re-use, material recycling and energy recycling, and,
3. To secure that final waste treatment is done in an environmentally sound manner.

In two later White Papers, no. 8 (1999-2000) and no. 24 (2000-01), specific objectives for waste and recycling are also attached to these strategies:

1. The development of the generated waste amounts should be significantly lower than the economic growth measured in GNP.
2. Based on that the amount of waste which receives final treatment should be reduced to a level that is sound both in terms of socio-economics and environmental care, the amount of waste in final treatment should be reduced to 25% by 2010.
3. All hazardous waste should be dealt with responsibly.

For objective 2 – this means that 75% of all waste should be recycled, both material and energy. Based on the *EPR*-principle, the MoE-industrial agreements set recycling goals for the different waste streams (see Tables 7 and 8 above). A revision of these has been encouraged in the forthcoming National Waste Plan to be announced during the spring of 2013.

White Paper no. 15 (2001-2002) on Climate formulated new measures for the waste policy, amongst others; to ban land filling of biodegradable waste to reduced the emissions of methane from landfills, and; to increase energy recycling to replace the use of fossil fuels. The latter shall not be prioritised over material recycling, however (Alliance 2004). It sets the waste hierarchy to be the following:

1. Prevention
2. Re-use
3. Material Recycling
4. Energy Recovery
5. Disposal

Some actors want this hierarchy written down in law to ensure a larger commitment than what has been shown.

3.4.3.2 1990-2010: Institutional development as a response to the need for waste reduction

As waste treatment improved significantly over the 1990's the new challenge in the new millennia was the amount itself. Even though it was already mentioned in the 70's that to avoid waste is the best way to avoid the problems of it, it was given little political attention. Pressure came from outside Norway, through EU and OCED, however with little effect. However, this issue will be dealt with in Chapter 4.

3.4.3.3 1990-2010: Institutional development as a response to waste in the climate change regime

Waste, as any other environmental issue, entered the climate regime. Landfills make out 2% of the overall GHG emission in Norway. Especially emission of methane from obsolete landfills and food waste were identified as contributors to GHG emissions, even though the methane emissions have gone steadily down since the early 90's due to increased recycling, gas catching and the ban on landfilling organic waste in 2009. According to KLIF, it is expected that these emissions will be reduced by 66% by 2040. The EU Landfill Directive (1999/31/EF) was implemented in the Pollution and Waste Act in 2002. This had three major implications: First, the ban on landfilling of biodegradable waste (enforced from 1 July 2009), secondly, requirements of methane catching at landfills, and thirdly – new, strict standards for municipal landfills (environment.no 2012).

Waste can also mitigate GHG emissions by substitution: that biogas from organic waste can substitute other forms of fuel, energy recovery of waste will substitute fossil fuel use, material recovery of plastic will prevent the outtake of more oil and organic waste can be used instead of fertilizer (KLIF 2010).

3.5 Concluding remarks

The development of waste governance from 1860 to the present shows that the waste generation is a dependent variable consisting of three main values:

1. Increased population.
2. Increased purchasing power/GDP.

3. Increased observable pollution and environmental damage.

Political action will take place when a problem is acknowledged. As we have seen, it is most often solved or addressed politically when the nature of the problem is identical to the third value above, as it was in the case of cholera, pollution, littering, GHG emissions and chemical hazard. This is because it is within the authority of the Pollution and Waste authorities to govern, while the two other values are beyond their control. As we move on to look at WP – these two needs to be addressed, especially the second – as it is the main driver behind the waste generation. Deconstructing this variable is essential for anyone trying to find successful WP instruments and measures.

Chapter 4:

An analysis of current Waste Prevention policies in Norway: Why does it fail?



Picture 3: Minister of Finance Kristin Halvorsen, encouraged citizens to do some extra shopping to keep the economy safe during the 2008-2009 economic recession. source: (Grønland 2008)

What are the lessons learned from Chapter 3; why is it time to focus on waste prevention? The environmental benefits achieved by continuous improvements of waste treatment efforts are falling in the shadows of the waste mountain. And even though we are able to reduce the environmental damage of waste to a minimum, the insatiable appetite for new commodities and capital should be raising alarms. Like we said in the introduction WP is really not about the waste that reaches the landfill. The term is perhaps somewhat misleading, but it is however a term that is being used in politics, and for this reason we will use it here, too.

This chapter aims to analyse why the current waste policies are unable to reduce the waste amount. According to the waste hierarchy implemented in waste governance since 2000 and the waste goal that the growth in GDP and waste shall not be similar – these issues have not been followed up by any political goal or dedicated measure. By comparing the variables of the resource regime in the last chapter, exemplified by the producer responsibility schemes to variables in a WP regime, we will see why the current policies are failing in the light of institutional theory.

In this chapter we will answer the following questions:

- 1) What are the current WP policies in Norway and how do they work?

- 2) What are the main reasons for the lack of effect?
- 3) What can be done to improve WP?

Before we go on, we need to look at the term *Waste Prevention* itself. After that we will present the current policies in Norway and how they work, before we move on to analysing why it is not having much effect. Finally, we will look at what can be done to improve WP.

According to OECD, WP can be broken down into three components:

- A. "Strict avoidance involves the complete prevention of waste generation by virtual elimination of hazardous substances, or by reducing material or energy intensity in production, consumption and distribution.*
- B. Reduction at source involves minimising the use of hazardous substances and/or minimising material or energy consumption.*
- C. Product re-use involves the multiple use of a product in its original form, for its original or alternative purpose, with or without reconditioning."*(source: (OECD Working Group on Waste Prevention & Recycling 2002:12))

WP is thus both reduction of the **amount** and **hazard character** of waste, translating into a *quantitative WP* and a *qualitative WP* distinction, and due to their different nature, they require different measures and policies, aimed at different agents within several sectors and stages in the product life. There is not always a clear divide between the two, as in some cases the amount itself can be causing the threat.

To make a *quantitative WP* policy that staggers waste growth has proved to be difficult due to its close connection to the overall GNP development. *Quantitative WP* must aim at selected waste streams and try to change the social institutions that rule the consumption of goods within this stream. On the other side, enactment of product control laws and authority can obtain success in the *qualitative WP*.

The OECD definition states that the aims of WP are to reduce the "*amount, hazard character or energy content of products or materials before they enter the waste stream. Waste prevention is thus distinct from recycling and other waste management efforts which are applied only when products and materials are recognised as waste*" (OECD Working Group on Waste Prevention & Recycling 2002:12). Following this understanding, by the time any material or product enters the waste regime, it is already considered waste. Thus, WP is aimed

at activities up-stream from regulations on substances, to design, production, packaging, and product placement and information in shops. In other words, we need to move far outside the resource regime we used in Chapter 3, and thus also leaving the traditional waste sector and agents, outcomes and institutions behind.

4.1 The Current WP policies in Norway and how they work

The current situation regarding waste prevention (WP) in Norway is characterised by lack of clearly formulated goals and lack of appointed instruments and measures. While, like we saw in Chapter 3, recycling, waste return and final treatment goals for many waste streams are well defined, this research have not found any official WP goals for any streams, but for one – food waste, where the ForMat project aims at reducing food waste by 25% by 2015. This is however a voluntary initiative taken by the food business sector, and not public. Since the **White Paper 44 (1991-92)** – waste policies have had the aim to decouple the waste generation from the GDP development, by stating that the development of the waste generation should be lower than the economic development. However, the waste amounts have increased 71% from 1995 to 2007. A committee was appointed in 2002 to report on WP in Norway, leading to the publication of a report, *Waste Prevention: A vision about quality of life, consumer consciousness and life cycle thinking (NOU 2002:19)* (Ministry of Environment 2002). This was, however, never followed up in Parliament. WP is a part of the governmental waste politics, but not in law; *the waste hierarchy* is not included in the Pollution and Waste Act. The Ministry of Environment (MoE), who bears the overall responsibility for WP through the administration of this Act, does not have the full legal momentum it could have to give more priority to WP. An EU 2008 Framework directive (2008/98/EG) requests member and EEA countries to promote WP and make programmes that will describe current WP programs, evaluate them and articulate goals for WP (Dehoust 2010). And the MoE are obliging, due to the implementation of the Directive, the MoE has to create a national waste plan and WP programmes,⁴² and it has announced a national waste strategy to be published during the spring 2013. This is replacing the cancelled White Paper that was supposed to be published in December 2012, where the WP issue was said to have been covered.

There are currently two ongoing WP programmes in Norway. The first, **ForMat** is charging at food waste and aims to reduce the food waste by 25% by 2015. It is a voluntary initiative

⁴² Ref. Ragnhild Børke, Advisor, MoE, 22.03.2013.

made by the industry itself, represented by Business Norway (NHO) but it is receiving support from the public. The programme consists of four main areas; research to map the size of the waste; networking across agents to reduce waste within given product series and value chains; communication of findings and ideas, and; implement measures to reduce waste (ForMat 2013). As the programme is still ongoing, not all areas have yet produced reports, most importantly – the proposed recommendations are yet to come. There is also linked research programme at Eastern Norway's Research Institute's (*Østlandsforsk*) *Reducing Food Waste*.

The second programme, *Framtidens Byer* – Cities for the Future, works towards reducing CO₂ emissions from road transport, stationary energy use, and consumption and waste in urban areas and goes on until the end of 2014. It is a collaboration between the State – represented by four ministries⁴³, agents from the Private Sector and 13 cities⁴⁴ in Norway. It is an initiative to help reach the goals of the Parliamentary Climate Agreement (*Klimaforliket*) that sets to cut 15 to 17 million tonnes of CO₂ emissions by 2020 (Cities for the Future 2009). Consumption and Waste receives attention as two main (and inter-linked) issues for reaching the goals, and WP is one of the measures of doing so. This is emphasised through change of consumption patterns, WP, greener public procurement, and green management. The programme does not look at WP directly but through change of consumption habits⁴⁵, for instance by working with GreenNudge. *Nudging* is a manner of designing the conditions for making a choice in a way that makes it easy for the shopper to make a green choice. It is not in their mandate to dictate environmental policy, but rather come with inputs on local policy and environmental governance suggestions, and provide research based knowledge on best practices on WP and change of consumer habits. In way, it can be seen as a modern version of the MIK reforms in the mid 1990's – where local governance is again empowered and put in the centre of attention of environmental consciousness.

Green public procurement, at all levels of government from the Parliament to local municipal governance, has enormous potential in creating a market for green services and products, and also in reducing CO₂ emissions. It is in the current policy that the Public sector makes a good example and procures services and goods of sound environmental and ethical standard.

⁴³ Ministry of Environment, Ministry of Petroleum and Energy, Ministry of Local Government and Regional development and Ministry of Transport and Communications.

⁴⁴ These cities are: Oslo, Bærum, Drammen, Sarpsborg, Fredrikstad, Porsgrunn, Skien, Kristiansand, Sandnes, Stavanger, Bergen, Trondheim og Tromsø

⁴⁵ According to Erik Høines, interview, 20.03.2013.

Annual spending on services and supplies is almost 400 billion NOK and there are guidelines for **public procurement** that are meant to secure that the environmental standards are met. In a guideline for meeting environmental standards in public procurement, it reads that the contractor has to consider life cycle costs and environmental consequences upon acquisition and raise environmental demands for these products or services (Ministry of Trade and Industry 2004). This is, according to several sources, to a large degree an un-exploited potential ((KS Bedrift Avfall 2012) and (Cities for the Future 2012)).

The packaging industry is obliged through their agreements with the MoE, like we saw in Chapter 3, to collect and recycle used packaging, and; to optimise packaging to reduce the environmental burden of the entire packaging process (NOK 2013). The **Norwegian Packaging Optimisation Committee** (NOK) was formed in 1998 by many of the packaging company representatives as a part of the agreements between the MoE and packaging industries. NOK reports annually to KLIF on the status on packaging optimising. However, according to them, this is not the same as packaging minimisation as they do not regard the packaging as “a product that lives its own life independent of the product it is meant to protect” (NOK 2011). However, they report a 7% reduction on packaging used measured in weight and revenues between 2005 and 2011(NOK 2012). Food waste reduction can also be an effect of improved packaging

The Product Control Act is a way of ensuring a *qualitative WP* for hazardous substances by banning use of them, for instance the **Product regulation** or the **REACH regulation**, the latter being the EU’s regulation on chemicals and their safe use.

4.2 Criticism of the Current WP policies: What are the main reasons for the lack of effect?

The picture at the beginning of this chapter shows the Minister of Finance at the time, encouraging citizens to keep on shopping in the threat of being struck by the economic recession that rummaged Europe in 2008. Looking back at Graph 3 we see that this happening has been the most effective waste reducing event so far in newer history. So, when we are trying to explain why the first goal in Norwegian waste policy is failing, i.e. that the growth of waste should be significantly lower than the GDP growth – we have to start by looking at the political deadlock on this issue.

It is clear that a government cannot have an environmental policy that aims at staggering the economic development, at least not in the present age consumption driven societies. In other words: if one is to promote a consumer orientated waste policy, one is up for a real battle. Kuznets' theory about economic development and environmental quality says that environmental degradation is a side effect of economic growth up to a certain point when the society is able and willing to pay for e.g. better eco-system services or taking the cost of reducing pollutants. His theory is presented as the Environmental Kuznets Curve, shaped like an upside-down U, where per capita income leads to pollution up to a certain point, after which it will turn (Dinda 2004). Will we see that the Waste Mountain curve being Kuznetesque?

Learning from Chapter 3 – we saw that the pollution of the waste treatment has gone down significantly, and does, generally speaking, follow this theory. A critique of this model can be that it is based on nations, and does not take the international transfer of goods into account. Because, as soon as we turn to WP – which is consumption and product oriented, and not necessarily pollution orientated, we move outside the borders of the nation. Some of the arguments behind WP, e.g. sustainable natural resource use or extraction, will mean in some cases that the environmental impact of behaviour change will be expressed elsewhere than the point of consumption.

A good indicator of this lacking will of change is by looking at the rhetoric used in environmental and climate policy. Research by the Western Norway research institute (Vestlandsforskning) ((Heiberg 2008) and (Aal 2011)) shows that the terms “consumption” and “change of consumption” are barely mentioned in official environmental policy documents, for instance:

- In the recommendations of the Low Emission Committee (*Lavutslippsutvalget*) (of 2006) it states that a thorough transition of Norwegian consumption is not recommended due to the impossibility of accomplishing any real change, even though it would mean significant cuts in GHG emissions.
- In the Government's Climate Statement (Klimamelding) for 2007, “consumption” is only mentioned once.

Under the chapter of Sustainable development in the National budget for 2011, one can read, according to Hille, that the impact of Norwegian consumption of resources and environment

is not globally sustainable, but no real measures are mentioned to change this course of events (Hille 2011).

In fact, so it seems like the *Cities for the Future's* take on change of consumption is unique of its kind in Norwegian history. Through communication instruments, consumers *can* change habits and preferences, for instance by considering the total life cost of a product, buy second hand goods, and buy eco-labelled products. Also, indirectly, this can be done by for example nudging. This indirect encouraging of (intentional) institutional change from below, by change of consumer habits, is the first step towards a more sustainable future. Translated into Classic Institutional theory, the *institutions influencing the preferences* have to change, and this is best done through communication instruments.

In order to analyse the current regime responsible for WP in Norway, we will return to the resource regime model used in Chapter 3.

4.2.1 Attributes of the resource

Total household waste generation in 2011 was 2 293 000 tons (SSB 2013). From Graph 4 we see that organic matter, paper, metal, and plastic wastes are the largest household waste streams in terms of weight. Not included here are goods that are either re-used by other agents like charities or family and friends, not other streams, like bulky waste as it is not normally included in the ordinary municipal waste collection service. Please note that this graph does not reflect the change in consumption, as shown in Chapter 3.4.1.1 – for instance the clothes' consumption increased 72% and furniture 220% between 1990 and 2009 (FIVH 2011).

The resource itself can be any product that at some point will be wasted – i.e. any object with waste potential, so we can say that WP is about *reducing the waste potential* of an individual's actual stock of goods or planned acquisition of new goods. The **waste potential** is also a temporal factor, as much as a resource and sometimes a hazardous factor, and will naturally vary enormously from product to product based on **characteristics, purpose, quality** (i.e. ability to fulfil its purpose over time) and **interaction with social institutions/re-placeability** (trends) which will need individual strategies adjusted to the characteristics of that very product. Replacability, or trend, is a social construct - an institution, but will be described here as it is an attribute of the specific resource. Goods with *low waste potential* means products that are likely to be used or re-used by others and circulate for a long time before wasted. While, on the other side, *high waste potential* signalises disposable products that are easily replaceable either by design or purpose.

Goods with *low waste potential(LWP)* have a common denominator that their purpose and quality are designed in a way that is meant to be used more than once, *and/or* the strongest propeller behind their wasting lies outside the product, namely the institutions governing their popularity, i.e. replaceability or shifting trends. It can be goods of high costs and value (social institution), technologically durable, and in the wasting consideration, there is a weighing of the want for a product of similar purpose against the cost of it, or the cost of repairing it. Typical goods in this category are furniture, cars, TVs, clothes, books and computers. For most – if not all – of the low waste potential goods, there are already well established trade systems for these as second hand goods, given that they are still usable or can be repaired. Either directly in shops, like used cars shops, charity shops, flea markets and or through online portals – these goods can still have value for a new owner after the original owner no longer want them. Note that goods like this can also have a built-in damage – to speed up the product turnover.

High Waste Potential(HWP) goods signals disposable products that are easily replaceable either by design or purpose. The main streams of the household waste are typically HWP products, see Graph 4. In this category it is the characteristics of the goods rather than the institutions governing it that decides the waste potential. Dominating here is packaging materials, like plastic, paper, metal and glass, and cheap mass produced things, like cheap t-shirts and shoes. HWP products are all purposed to be used once or only a few times before discarded.

Finally, some waste is also hazardous thanks to toxic or chemical substances (*WHP – Waste with Hazardous Potential*), and should be reduced after the qualitative waste prevention principle.

If we take the above one step further, we see how the values of the potential waste have implications for the choice of instruments:

Table 10: Implications of waste values for choice of WP instruments				
Variable:	Value:	WP challenge:	Example of commodities:	Suggested instruments and measures:
Attributes of the resource	LWP: - multiple use - strong social institutional governing use - high value	- Trends and purchasing power are the strongest drivers behind wasting of commodities rather	- smart phones - home decorating commodities - cars - furniture - electrical goods	- remove the VAT on repair services - inform buyers about total life cycle costs of

	<ul style="list-style-type: none"> - good quality - repair possible 	than decreased quality.	- designer clothes	product <ul style="list-style-type: none"> - Change bad consumer habits
	HWP: <ul style="list-style-type: none"> - disposable - low cost - Poor quality 	- Decreased quality rather than trends or cost of commodity.	<ul style="list-style-type: none"> - food and beverage packaging - cheap fashion clothes - excess food 	<ul style="list-style-type: none"> - demand EPR on textiles including higher wages for textile workers and so increasing the total price of product, and possibly reduce wasting. - optimise food packaging to reduce food waste - reduce take-away food packaging problems by remove VAT on service.
	WHP: <ul style="list-style-type: none"> - hazardous character to natural or human health 	- The material content of commodity poses a threat	- textiles with bromated flame retardants	<ul style="list-style-type: none"> - Stronger regulation of border line value products in the REACH list. - ban recycling of products containing toxins to remove them from life cycle.

This resource approach to waste prevention helps to break down the potential waste characteristics, but it does not indicate to whom we should aim the instruments at.

4.2.2 Agents and Agents' Choices

In order for policy measures to be successful, they have to manage to motivate to change the agents' behaviour in the way the policy makers desire them to. The behaviour is, according to Classical Institutional Theory dependent on institutional structures and how to motivate the agents to action.

4.2.2.1 Agents: The Firm

According to the Classical Institutionalists thinkers, the fundamental logic of the firm is to maximise profit. In our analysis, the firms are the importers, vendors or producers of goods that are potential waste, either within their own production system or after having been sold to the consumers. Problems that cannot be self-solving in terms of **maximising profit by minimising waste**, such as reducing food waste, could be approached either positively or negatively, by which we mean encouraging action by positive incentives or prohibition by regulation or such. By positive incentives we mean e.g. the decision to let the industries themselves come up with take-back solutions, rather than enforcing them through regulations.

The *extended producer responsibility* (EPR) is not fully exploited to incorporate WP considerations for instance into product design, where simplified design can make repair and maintenance easier, or reduce the number of different materials used in one product (KS Bedrift Avfall 2012). Some of this knowledge has to be passed back from the recycling and waste treatment agents, too. By extending the *warranty* of a product and on its (spare) parts and so extending the product life, the acquisition of new, same-purpose products is avoided. The high cost of labour, also makes repairing of product less lucrative than buying new products. Neither is the repair industry VAT exempted (Cities for the Future 2012). One interesting act of EPR in the fashion industry is H&M's own initiative *Long Live Fashion* to collect used clothes in selected H&M stores, where customers are rewarded vouchers to use in the stores later. Handed in clothes are either re-sold, re-designed, re-used or recycled, and according to the company's home page, the motivation behind this scheme is to "...reduce the environmental impact of the fashion industry by limiting the amount of waste ending up in landfills" (H&M 2013). As this initiative is only in the start phase (starting February 2013), no reports on results are yet available.

4.2.2.2 Agents: The Governing Authorities

The role of MoE has already been discussed above. Aside from being policy makers and administrators, the public also represents a large actor in the market with an annual spending of 4 billion NOK (4 milliarder). According to Cities for the Future (2012) there is little statistical information about the effects of the green guidelines that exist for public procurement, and to what extent the demands for greener deliverances are used.

Some municipalities, like Stavanger and Oslo, have organised re-use centrals for goods that would otherwise be wasted. Traditional waste agents, for instance municipal waste companies or Avfall Norge, KS Bedrift, are no longer central agents when it comes to WP- as it is

acknowledged by most of the agents in the waste sector that WP policy, with its instruments and measures, lies outside their grasp.

4.2.2.3 Agent: The Individuals; Concerned citizens, consumers, customers and clients.

The individual in this context can have several roles and with overlapping or conflicting interests. As a *citizen* it is concerned about the state of the environment, while the *consumer* wants to maximise its utility (Sagoff (1988), in Vatn 2005). The latter will of course also in many cases be concerned about the environment also when shopping, and the challenge of policy makers must be to address this concern upon the moment of purchase, and so helping them make the “greenest” choice as often as possible. This can be done by institutional change, as preferences are, according to Classical Institutional Theory, influenced by institutional structures (and vice versa). When the Individual enters the market with its available products or services, it is not in the institutional structure of the market to deny consumers any available products. Rather, what can and cannot be purchased has to be decided on before the placing of product in the shelves. The consumer has little power on how the commodities are regarding packaging, toxic materials, shelf life and so on, except to chose to buy or not to buy it. The choices are already made for the consumer.

4.2.4 Agent: Alternative Firms - The re-users and charitable organisations

The agents in the market for used goods are either run by charities or private companies.

In Norway, the most renowned charity is **Fretex**, owned by the Salvation Army and has been selling used clothes since 1905. They collect their clothes from collection pods, around 1400 all together in Norway, and they are the largest actor in the second-hand market for used clothes. They also re-sell other used goods, such as furniture and books, but these are not weighed. According to Gjermundbo – the annual collection of textiles is almost 12 000 tons, where 20% is sold in the Fretex shops in Norway, 60% is sold abroad (Gjermundbo 2013). The second largest agent is **UFF**, which is a part of an international second-hand and aid organisation, HUMANA People to People. They collected 7615 tons used textiles in 2011, while other agents, such as flea markets, received 3385 tones textiles (Laitala 2012). VAT is applied to second hand goods sold in shops.

Another interesting agent, that does not normally receive much credit for being a very successful re-use and WP initiative – is the web portal **Finn.no/torget**. This is a well established a popular web page where anyone can post an ad for something they want to sell,

buy or give away used or new things. In 2012, 1 945 268 private ads were posted⁴⁶, an increase of 200 000 from 2011 – witnessing a trend that says that buying second hand goods have become socially accepted by many people and even trendy for some fractions (finn.no 2013). The internet solution for selling or giving away used things is popular, with pages such as bloppis.no (online flea market) and Facebook groups such as “Oslo: Byttes, Trenger, og Gis bort” (Oslo: Swap, Need and Give away) that redistributes things for free in the geographical scope between members of the group which is open for anyone.

4.2.3 Outcome of the Current WP regime: why is it failing?

By analysing the interaction between the elements above, we look at why we are not able to stagger the waste growth with the means in our reach (i.e. without challenging the GDP and purchasing power). It is some debate about how to measure effects of WP measures, please refer to Chapter 1.4.

Table 11: Variables for Agents and Resource values, motivational implications for WP

Agents Attributes of the Resource	Firms	Environmental Governing authorities	Individuals	Alternative Firms
High Waste Potential	- Profit on disposable commodities	- Reduce littering ⁴⁷ - Reduce waste of resources	- Short lived desire for a commodity - Need of daily commodities - Maximise utility	- Food loss re-distribution
Low Waste Potential	- Profit on expensive quality commodities - Profit and create on trends	- Reduce waste of resources - Reduce waste of energy	- Trend driven acquisition - Need and desire for quality commodities - Maximise utility	- Repair - Second-hand trade
Waste with Potential Hazard	- Profit on environmental degradation	- Regulate and ban certain materials	- Avoid threat based on knowledge	

From Table 11 we see ideal motivation of agents applied to the different potential waste categories. The lack of effect comes from the absence of policies that could have been trying

⁴⁶ This does not, however, mean that that many things were sold.
⁴⁷ Increased littering can also be a side-effect of other instruments. In 2001?/6? a differentiation on VAT levels meant that serving of food has twice as much VAT as the food, made it cheaper to take-away food. According to Cities for the Future, municipalities have noticed a growing littering problem of the take-away packaging Cities for the Future (2012). "Innspill til Avfallsmeldingen."

to motivate agents to make different choices. Boxes marked in bold show where measures are taken, and based on what we have seen so far, is that:

- WPH is the most controlled potential waste category; based on the polluter pays principle (PPP), the Pollution and Waste Act, consumer information and eco-labelling schemes, like *Grønn Hverdag* (*online sustainable consumer information*) and the Swan.
- The Individual is the least ‘governed’ agent. Change of preferences through informational instruments are time consuming and hard to measure any effect.
- The Firm’s profit maximising is regulated only when PPP is evoked.
- The Alternative Firms are not receiving economic support from the Authorities (VAT exemption).

4.3 Food Waste Prevention; the Exception

“It is estimated that 30–50% (or 1.2–2 billion tonnes) of all food produced on the planet is lost before reaching a human stomach.”⁴⁸

Food Waste, or Food *Loss*⁴⁹ – is the only waste stream that has been given significant political attention. Political attention from the outside; EU, OECD, Rio+20 conference, Nordic Council of Ministers, and from the inside through raised voices of concern from politicians, NGO’s and even the business sector itself – has put this issue on the political agenda. It is also expected that the coming Waste Strategy will have a review on food waste reducing measures (Stortinget 2013). A hearing in April 2013 in Parliament on food waste prevention showed that there is a political unity behind the need to reduce the loss, where individuals are at the centre of attention. A ForMat mapping report estimates that households waste as much as a third of all the produced food, or 254 500 tons of edible⁵⁰ food (67,7% of all wasted food), i.e. 51,1 kg per capita; the grocery trade wastes 68 000 tons (18%), and; the food industry 52 000 tons (13,8%). Wholesaler food waste is low at 1800 tons(0,5%) (Hanssen 2010). A food central has been established in Oslo to take in and redistribute food that has passed its shelf

⁴⁸ Source: Institution of Mechanical Engineers (2013). Global Food - Waste not, want not.

⁴⁹ The programme operates with the term Food Loss (matsvinn) instead of Food Waste (matavfall) due to the fact that much of the loss is still considerable as food.

⁵⁰ What is meant by edible food loss (EFL), and what is non-edible food loss (NFL)? EFW covers both edible and potentially edible food waste that due to for instance passed expiration date, broken packaging or malproduction, cannot be sold in a shop. NFW covers peelings, skins and bones(Hanssen, O. J., and Schakenda, V. (2010). Nyttbart matavfall i Norge - Status og Utviklingstrekk 2010. Rapport fra ForMat prosjektet., Østlandsforskning.

life, and cannot be sold, however, that is fully edible still. This is to open in August or September 2013. Food is a typical HWP commodity; relative short lived life, high loss, and low price. The irony, so well pointed out by Parliament member Irene L. Nordahl (SP) in a Parliament hearing in April 2013- the consumer wants to spend as little as possible on food, but at the same time, a family of four throws away food worth 10 000 kr every year (Stortinget 2013).

However, it is the business sector itself that has initiated a Food Loss Prevention programme, *ForMat*. ForMat was initiated by the food industry itself to reduce the waste of usable food by 25% within 2015. The programme consists of four main areas; research to map the size of the waste; networking across agents to reduce waste within given product series and value chains; communication of findings and ideas, and; implement measures to reduce waste (ForMat 2013). As the programme is still ongoing, not all areas have yet produced reports, most importantly – the proposed recommendations are yet to come. However, a voluntary EPR scheme has been drafted for the food industry, and agents are seemingly positive to pay a volunteer compensation fee (3% of the remuneration to packaging schemes) to participate.⁵¹

While ForMat mostly focus on the loss in the producer, industrial and grocery parts of the trade, some measures aimed at the consumers' causes to waste food have also taken place. Their research has shown that one of the main causes of wasting edible food, is due to confusion regarding expiration dates; "Best Before" and "Consume By"⁵². As an effect if this, very little food is marked with "consume by" now, Tine – the largest dairy product producer, has stopped using this marking completely.⁵³

What makes ForMat exceptional and a Best Practice example we should follow for other waste fractions? There are several reasons:

- 1) There is an economic interest in one of the main agent categories to reduce waste. This is motivated by the business' interest to reduce economic loss, in addition to the ethical issue of throwing away edible food.
- 2) Through research, mapping and networking across agents to find real causes for food waste, they have identified areas to focus attention of WP measures.
- 3) A clear goal is set; 25% reduction by 2015.

⁵¹ Ref. Schrøder, A.M, 29.4.2013.

⁵² In Norwegian: Best Før, and, Siste Forbruksdag, respectively.

⁵³ Ref. Schrøder, A.M 29.4.2013.

- 4) There is a good political and official backing of this programme, and food waste is an acknowledged political problem.

How applicable is this example for other forms of commodities and other agents? The firms or producers have, according to Institutional Theory, another form of motivation than Individuals. While the loss minimising efforts corresponds to the motivational structure of the firm, approaching the citizens and their various roles required more complex mapping. It is easier to regulate the private sector rather than individuals, but as long as the major food wasting is taking place in households, similar dedication and ambition are needed to take on the household food waste challenge. Household food waste reduction needs a full political commitment in order to see any action take place.

4.4 What can be done to improve WP?

In Chapter 4.2 we have identified some of the reasons for the shortcomings of WP policies in Norway. The interplay with other legal and political commitments of a ruling regime is complicated and is in many cases out of reach of the MoE to change. However, we have to start one place. To ensure a higher prioritisation of WP, it should be legally anchored by including the waste hierarchy in the Pollution and Waste Act. This may help place the ‘ownership’ of it to national governance. Unlike other waste issues that rose to the political arena because of the sincerity of a (local) environmental problem poor waste handling was causing, one can say that WP, to some degree, comes from outside Norway. *Waste avoidance* was already mentioned in the Official Report from 1973 (NOU 1973), but on the grounds that the waste hierarchy is *not* written in law, and that the EU directive requirements are the only WP requirements in Norwegian law (to our knowledge), our study here suggests that it is a political topic that has come from outside. There are several reasons why an issue becomes a *political* issue, and why a problem gets political attention. Following this line of thought, WP is the result of *globalisation* of environmental politics, compared to other waste problems that historically have arrived on the political stage because of new *knowledge* about the problem, or because of *media* or other *conspiracies* (Sundquist et al., 1991, in Vedeld (2012)). While Norwegian waste politics have always been at the forefront of especially European waste politics, WP may lack momentum due to alienation. By anchoring it in Norwegian law, it may tag along better prioritising.

The lack of ambitions (however this may change in the upcoming Waste Strategy 2013) and goals makes instrument and measures’ assessments pointless. However, we should learn from

our best practises, for instance the outcome of the ForMat project, which is set to be completed in 2015.

Prior to goal formulation, research must be done to map the environmental impact of each stream and goals must be defined only after the stream with the biggest impact has been identified. Following this, must be research about why (especially LWP products) are wasted in the different sectors, from producers to vendors to consumers. Aal (2011) writes about three strategies for a consumption orientated waste policy:

- Efficiency: Reduce the environmental impact per consumption unit.
- Substitution: Change to a less intense consumption behaviour per consumption unit.
- Reduction: Reduce consumption.

Conflicts with other economic interests in society make the choice of strategy complicated, as the alternative wealth generation must be capable of sustaining transition and maintain the same standard of living. The choice of WP instruments has to be evaluated against three criteria; efficiency, effect and legitimacy (Vedeld 2012). Is the **effect** of the instrument the most important criteria – i.e. actual waste reduction? Cost **efficiency** is clearly an issue too, how much wealth generation is lost as a consequence, or how much does the substitution of one substance cost compared to another? And not at least, are the measures **legitimate**; is it in accord with normative and cognitive institutions? Do the measures and instruments manage to use existing social institutions to motivate the desired change of agent behaviour?

One danger in the current climate change regime, where most environmental problems and issues are quantified into CO₂ emissions, is the failure of appreciating the *normative aspect* of the application of instruments. Vedeld (2012) speaks about how it is important for the chosen instrument to be perceived as fair or justifiable by those affected by it. The possible shortcoming of a government to acknowledge the injustice felt when citizens are for instance taxed for CO₂ emitting activities, while at the same time the Government decides to open more oil wells. The normative problems are reflected in the conflicting political interests in different government offices.

The administration of WP is outside the traditional scope of KLIF's work (however, the fusion of KLIF and the Norwegian Directorate for Nature Management to the Norwegian Environmental Directorate on 1 July 2013 may redistribute some tasks, the new organisational structure is unknown to this study at this point), and NOU 2002:19 suggests the establishment

of a dedicated WP authority, based on the same principles as ENOVA (a public enterprise established by the Ministry of Petroleum and Energy to drive forward a transition into more environmentally friendly energy generation and consumption (enova.no 2013)). This “Renova”⁵⁴ can coordinate research and activities, present policy suggestions and so on. More importantly, it can monitor consumption through environmental ‘goggles’ – a job that is to some extent already being done by SIFO (National Institute for Consumer Research) and consumer NGO *Future In Our Hands* (Framtiden i Våre Hender). The advantage by establishing a public agency for waste prevention would be its proximity to decision making bodies and mandate to ensure that waste prevention principles are applied in all consumer -, financial-, energy-, and producer decisions.

Like we have pointed out many times, WP initiatives have to be taken in many different places in the life cycle of the product; from the regulations on the materials used, to product design, product packaging, presentation in the shop, consumer information, warranty, and repair possibilities. Here is a list of the main suggestions for new WP instruments presented by central agents prior to the annulled 2012 White Paper on Waste, and an indication of which waste category is relevant for the instrument:

Table 12: Proposed new WP instruments after type for the 2012 White Paper

Type of instrument	Instrument	Agent	Target for instrument	Most relevant waste category
Economic	VAT exception for repair services and businesses	KS Bedrift, Cities for the Future	Industry	LWP
	Reward the sale of recycled and secondary materials and resources	KS Bedrift	Industry	LWP HWP
	Expand product warranty	Cities for the future	Industry	LWP
	Possible take-back schemes for used mobile phones with economic compensation	Cities for the future	Individuals	LWP
	Change the tax rules that make it cheaper to take away food	Cities for the future	Industry	HWP
	Economic stimulation for greener design	Cities for the future	Product designers	LWP HWP WHP

⁵⁴ Jokingly named so in seminar Avfall Norge 19.04.2012

Legal	Enhance the Product Control Act so that toxins are removed from the product life cycle	KS Bedrift	Waste and Pollution administration	WHP
	Make EPR a legal rule	KS Bedrift	Environmental law authorities	LWP HWP WHP
	Reverse marketing laws so that advertisement will only go to those who actively signed up for it	KS Bedrift, Cities for the Future	Individuals and households	HWP
Organisational	Enhance the green public procurement and map current routines	Cities for the Future	Public management	LWP HWP WHP
	Environmental management and certification of public bodies	Cities for the Future	Public Management	LWP HWP WHP
	Requirements of a waste plan for the construction sector	KS Bedrift	Construction sector	WHP
Informational	Product information for consumers regarding warranty, repairs, life cycle costs, chemicals, etc.	KS Bedrift	Individuals	LWP WHP
	Citizen information about repair and re-use possibilities	Cities for the Future	Individuals	LWP
	Enter WP into school curriculum	KS Bedrift	Individuals and schools	
	Arrange for re-use, loan and repair schemes and promote services rather than products	KS Bedrift	Individuals	LWP

Sources: (KS Bedrift Avfall 2012), (Cities for the Future 2012)

If we return to the Resource Regime model, how can we use this to suggest improvements of WP policies? Or, how can we reduce the waste potential?

In a resource regime model for WP (see below) it is easier to visualise these ideas: WP policies aim at the agents' choices so that less commodities will be wasted. The agents; either producers, sellers, buyers or possessors of the products, will have to be motivated to make choices that are optimal according to WP principles. This concerns everything from optimising packaging, buying a low energy washer or re-using an old jacket. It is the institutions, like the social conventions like trends and fashion, norms (it is wrong to throw away edible food) political (setting clear waste reduction goals), or legal (enforcing regulation

of a new toxin). For the three resource categories, there should be different strategies for the different agents.

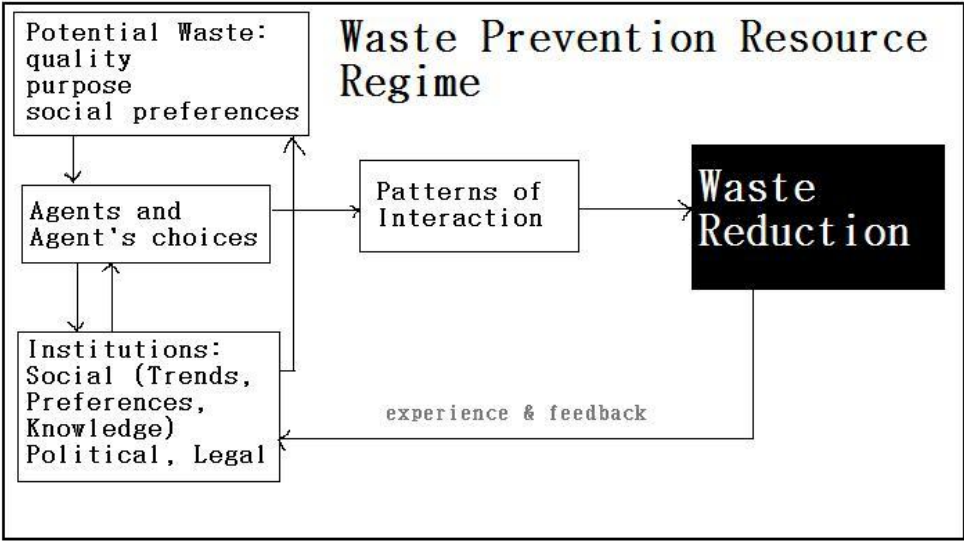


Table 13: Waste Prevention Resource Regime

In terms of HWP commodities: When evaluating a strategy one should evaluate the replacement alternatives for the commodities; to what extent is it strictly necessary (especially when it comes to packaging), what are the less intense options for e.g. product design, and can it be completely replaced with a ‘greener’ alternative? This approach is more suited for producers rather than individual consumers. When it comes to the consumers, they do not really have much choice other than what is already made and available to them at the shop. Food waste is the only type that has a waste potential that changes from the product leaves the shop (when it is low) until it reaches home. For packaging the waste potential is constant given the quality and purpose of the object. For these objective qualities, product regulation is more efficient. But for food, where consumers have to make an evaluation of the possible discarding of a product based on what they know about the quality and consumption potential, information campaigns aimed at increasing the knowledge at this very decision point is necessary.

For LWP, the social institutions play a much larger factor; trends created by advertising are inexorably changing social institutions that rules self perception and definitions of success and happiness (to put it boldly). Commodities in this category are typically costly and of good quality, and repairs and warranty can reduce the wasting of some of commodities. Many instruments can be directed at the industry to enhance technical qualities and possibility for repair and warranty. Like we saw above – producers are most often regulated according to the

PPP. Future waste prevention instruments or measures aimed at producers/firms may be more effective and legitimate if PPP is evoked. Which streams should get focus, should also be done after quantitative and qualitative analysis have identified what is most environmentally beneficiary, taking the whole life cycle in account.

WHP is best regulated through Product Control Law and continuous research and updates of the REACH list.

The base for making any WP policies should be in the **product**, not the agent. It is only after researching where the most environmentally optimal ‘savings’ can be done, that relevant agents are identified, and most importantly; **specific goals for waste reduction in the assigned stream**, then instruments can be articulated after an evaluation of the three criteria of effect, efficiency and legitimacy. Research coordination and administration of regulations and measures should be centralised in an official agency such as Renova.

Chapter 5: Conclusion

This study has been an analysis of historical household waste management regimes from 1860 to present in Norway, and also an analysis of current Waste Prevention (WP) policies. The purpose of contextualising the current regime against a historical backdrop is to see how policy makers and public administration has dealt with waste challenges. Waste governance throughout time has been about dealing with health threats, pollution and waste of resources, usually as a response to a perceived threat or crisis. Waste prevention is not much different, except that as far as crisis goes, it is more pro-active rather than reactive. And for this reason, it is difficult to gather political momentum, or even significant attention to this issue. Unsustainability is not a crisis until resources are too depleted to sustain our lives, and as the cliché goes, by then it will probably be too late. Waste prevention is really not about waste policies at all, it is a mere indicator on consumption, however, it is put under the authority of the Ministry of Environment to overview. Waste prevention goes into many different governance sectors, and without any central agency to monitor efforts, it has fallen between chairs.

All things we surround us with hold some waste potential dependent on the purpose and quality of the commodity, and WP policies are about reducing this potential. The factors driving this are plentiful and entangled with variables also outside the product; agents and institutions. The historical backdrop has shown us how waste governance has developed as responses to environmental problems. The theoretical framework is Classical Institutional Theory and the analytical tool is the Framework for analysing resource regimes.

5.1 Historical development of waste management regimes in Norway from 1860

Chapter 3 aims to answer the following research questions:

- 4) What has been the most important development in Norwegian waste resource regime from 1860 to 2010 in terms of composition, volume, agents and governance structures?
- 5) To what extent can we see the changes of waste institutions as reactions to the negative outcomes of the waste resource regime?
- 6) In what way did these institutions change to control the outcome?

We start our regime in **1860** with the passing of a Health Act that would be important for the household waste renovation services in municipalities. This was due to the threat of cholera and the need to contain possible contamination sources, which were not correctly addressed until the discovery of the bacteria in 1890's by Pasteur and Koch. An Act passed in 1928 made it possible for municipalities to demand that all households should be connected to a renovation service, and that meant that all households, even the unprofitable ones in terms of material 'recycling' (to put it in contemporary terms) – did not fall behind and could be a source of contamination. The principle of *full cost* was introduced; that the renovation fee should not be higher than the actual cost of the service.

The household waste in this first period consisted mainly of human and animal manure, ash, scraps, food scraps and packaging. This was also a period of increasing population growth and massive urbanisation, but the average waste generation was steady on 25 kg per capita up until 1960. Renovation and waste treatment developments were mainly driven by the need of containing cholera disease and to not waste the resources in waste. Human waste was highly appreciated as manure in farming – but at the same time it was dangerous – so continuous improvements in the collection and transport of this is seen throughout the period. WCs were not common until after the Second World War. Food waste was collected by farmers and fed to pigs. Labour was cheap and resources expensive, so maintenance and repairs were important every day activities.

The next period, **1950 to 1970** does not see much institutional development in terms of waste governance, but the *resource* is the variable that changes the most. 'Modernisation' and 'consumerism' are two key terms to describe the change of everyday life. Housewives and car owners are the main agents, as baby boom, home improvement and public car ownership link the strongest waste generating activities: new homes, urbanisation, modernisation of old homes, access to outdoor recreation and littering. Anti-littering acts (Road Acts of 1957 and 1963, and the Nature Conservation Act of 1958) were not sufficient to prevent it, and volunteer measures like the "Keep Norway Clean" campaign and *dugnad* became important social institutions for environmental moral and anti-littering.

Paper was the largest municipal waste fraction, but there were a lot of bulky waste, like furniture and cars, abandoned in remote areas at night. The introduction of the freezer

changed food waste composition, and also meant more processed food at homes; more packaging waste.

However, the hidden hazard was the increased use of chemical substances in products. There was little knowledge about the environmental and health effect of this. And this was true for all agents, from the producers, the authorities and scientists. Rising from the toxic haze of this regime is the environmental movement, originally ascribed to the publishing of Rachel Carson's *Silent Spring* that began to question the uncritical praise of modernity, chemicals and development in the Western World. At the end of this regime, we see how concerns and criticism about this unregulated pollution of unknown causes and effect, and seemingly an unengaged government on these issues, are being raised. Some research agencies were established, and these would later become the National Pollution Agency.

Waste reaches the political agenda in our next regime, from **1970 to 1990**, and consequently issues are addressed, and measures are taken and put into public administration. The Ministry of Environment is established in 1972, and a Pollution Agency (SFT) follows in 1974 that is given the authority of waste management in 1979. Not until 1981 do we see a Pollution and Waste Act, to back up the legal work of these administrative bodies.

Household waste generation increases from 180kg in 1972 to ca 240 kg in 1990. Only 2% was recycled. Paper had a higher recycling rate - 18%, but nothing could compete with bottles, 98% of reusable bottles were returned to breweries. Plastic makes its way into the household for real, and the use of chemical substances increases to grow without any regulation until 1977, when the Product Control Act was implemented. SFT was the administrating body of this act.

The political commitment to increase recycling efforts was low before a Recycling Committee was commissioned in 1973 (and again in 1975) to investigate the possibilities for increased recycling. This resulted in a White Paper in 1975 which was the first of its kind on waste. It criticised the government of lukewarm commitment toward increased recycling and that they did not encourage waste reduction. However, the effect of this White Paper was not seen until the 1990's, but it laid down the foundation for SFT's later work. The postponement of recycling results was due to the fact that the municipalities were already struggling to get a basic, functioning renovation service running, and this had to be in place before recycling plants and such could even be considered.

As various research and mapping efforts had managed to fill the void of knowledge felt in the previous regime, more responsibility was transferred to the municipalities as a response. In a White Paper from 1975, municipalities were given the responsibility to plan, start and run renovation schemes. Under the administration of SFT – stricter restrictions and requirements on landfills put even more pressure on the local waste governors. Improvement of the municipal waste handling, from collection to treatment is also researched. Major issues in this period are therefore the technical, financial and moral commitment to improved waste handling for the municipalities. The government started mapping the number and status of the landfills around the country in 1977, as landfilling was the most opted waste treatment option. This was done as the first step of improving the environmental standard of these. The combination of strict waste treatment requirements and the cost of implementing these also gave birth to inter-municipal cooperation on waste issues, and many inter-municipal waste companies were founded in the 80's. As to the issue of environmental commitment to waste issues, a municipal reform – MIK (*miljøvern i kommunene*) – nature conservation in municipalities – was initiated in 1987 (with 91/104 pilot municipalities) to increase environmental awareness in municipalities, and to make waste managing an environmental issue. This came the same year as the Brundtland Commission and the launching of its report; *Our Common Future*, which would give priority to environmental issues in the coming decades.

Our final regime, from **1990 to 2010** is characterised by environmental concern and pollution control. The regime is initiated by a White Paper and a waste-enthusiastic Minister of Environment, Thorbjørn Berntsen, who made waste handling one of the main focus areas in environmental governance.

Household waste amounts grew massively by 71% from 1995 to 2007. Household consumption of electronics and electrical goods, clothes, sporting equipment and furniture increased dramatically, too. 7% of municipal waste received material recycling in 1990. By 2011 – 87% was recycled, either as material or as energy. Many instruments were used to increase recycling efforts:

- Waste plans for municipalities that included goals for recycling.
- A fee on the amount of waste that receives final treatment.
- A clearly defined goal; 75% (that was also adjusted once reached).

- Agreements with producers based on the *extended producer responsibility* – for treatment of their own products, with goals specified for material or energy recycling.

The White Paper of 1990 defines a waste strategy that lays down waste prevention and reduction of hazardous material in waste as the first priority, thereby followed by promotion re-use and recycling, and finally states that final treatment should be done in an environmentally sound matter. Later White Papers also set waste prevention – to delink the correlation between GDP and waste generation, as the first waste strategy aim. This has however not been successful, and the next chapter goes into this to see why it is failing.

Waste was included in the ‘climate change regime’ – meaning that the environmental impact was quantified into greenhouse (GHG) gas emissions, and goals were adjusted accordingly. Methane emission from old landfills, and especially associated with the deposition of organic waste – lead to the EU ban on dumping organic waste, which was enacted in 2009. As a result, the GHG emission from the waste sector, accounts for about 2% of the total national GHG emissions.

5.2 Current Norwegian Waste Prevention Policies

Chapter 4 is an analysis of current waste prevention (WP) policies in Norway, to see how they work – and more importantly, why they fail and what can be done to improve them? The variables in the analysis are the same as in the previous chapter. The research questions were the following:

- 4) What are the current WP policies in Norway and how do they work?
- 5) What are the main reasons for the lack of effect?
- 6) What can be done to improve WP?

As we have seen, WP is the highest ‘political’ priority in the waste strategies; however, we also see that waste amounts keep on growing. There are several reasons for this, but we have identified the following main reasons for why WP is failing:

- 1) The close correlation between GDP and waste generation is impossible for the Ministry of Environment to change; it is contradictory to the will of the Government to have an environmental policy that aims to stagger economic and consumption growth.

- 2) There are no clear official goals to reduce any waste stream. Food waste has been discussed several times in Parliament, but little action has been taken. (ForMat is a volunteer initiative from the business sector)
- 3) Qualitative WP is easier to enforce due to the backing of the Product Control Act and the REACH list.

WP has both a qualitative and a quantitative meaning; it can be to reduce the amount of hazardous materials used in a product, or it can simply mean to reduce the total quantity of a waste stream, for instance packaging materials.

It is in the definition of WP we begin to grasp the difficulty of making effective policies, because it is about materials *before* they are considered as waste. And that puts it outside the authority sector of traditional waste authorities. It is the Ministry of Environment that has the overall responsibility for WP, but there is no dedicated agency to focus on WP activities, research and policy suggestions. Having such an agency, a “Renova” would help bring focus and discipline to the problem, as it was suggested in a report from the WP Committee of 2002. This report was never followed by a White Paper, perhaps one of the causes why no goals have been set and no official effort has been made. However, we should keep in mind that the announced Waste Strategy (before summer 2013) is committed through the EU Waste Directive to have both engaged and planned prevention instruments and measures included. At least for food waste, it has been said that prevention activities will be announced.

There is an ongoing programme, initiated by the business sector itself to reduce food waste; ForMat. This has an aim of reducing food loss by 25% by 2015, and is mainly aiming at the food industry and grocery trade. However, as households generate almost 70% of the total food waste, the government should not settle with this focus on the private sector alone.

Why is WP failing? In this research we operate with three categories of waste potential; high waste potential (HWP), low waste potential (LWP) and waste with hazardous potential (WHP). WP is about reducing the waste potential. This depends on the attributes of the potential waste: characteristics, purpose, quality (ability to fulfil purpose over time), and interaction with social institutions, like preferences and trends. We analysed them up against the various agents and presented idealised motivational implications for the different waste potential categories, and marked where actual measures have been taken. From this we see that most existing initiatives are based on the polluter pays principle, and that the individual is the agent that is the least governed.

A political backing is, however, the most crucial element. As long as there is no political attention, there is no action taking place. Food waste is the only waste stream that has a universal political support behind it, and it has been said that this will be an issue in the coming Waste Strategy. Political backing is key to any action and (possibly) success, and based on what we have found, we see that when a waste category can evoke the *polluter pays principle (PPP)*, as it is founded in law and as a guiding principle for environmental governance, there is a stronger legitimacy and agents can feel more motivated to change behaviour. To what extent this can be applied to individuals in any effective way, is debatable. However, this is why a legal anchoring of the waste hierarchy with WP at the top should be enacted.

There are three strategies for a consumer orientated waste reduction policy:

- Efficiency: Reduce the environmental impact per consumption unit.
- Substitution: Change to a less intense consumption behaviour per consumption unit.
- Reduction: Reduce consumption.

Each strategy needs to be evaluated across three criteria of; efficiency, effect and legitimacy. How do the measures and instruments manage to use the existing social institutions to motivate the desired action or behaviour? The base for any WP policy should be in the product, not the agent. Only after research can the most appropriate agent be appointed where the highest environmental impact can take place. To ensure full political support and longevity, the selected instruments and measures need to non-conflicting with economic interests in society.

5.3 Concluding Remarks

There are, to my knowledge, no other studies on general waste prevention policies in Norway, and by answering the research question why WP is failing we have seen the shortcomings of the policies to have any real significance. The announced Waste Strategy will set a new political agenda for waste and WP, so the findings of this study may have variable significance, depending on what this strategy will command. There is nevertheless a need for research on especially prevention of household food waste, and how this can be addressed effectively. Another interesting issue is the need for waste created by development of a heating infrastructure based on energy recycling of refuse, and if this will undermine future

WP efforts. It is already dependent of waste imports as our recycling efforts are “too good” so to say, and we are not able to produce enough waste to keep them going (Hickman 2013).

Finally, do we *need* waste prevention? I find the term itself misleading, because, like mentioned above, it is not about waste, but about consumption and resource efficiency. I think the term should be used as an *indicator* on a more sustainable consumption rather than a goal itself. But yes, we do need a change of consumption habits and to slow down the resource drain of our modern lives. Everybody knows this way of life is unsustainable and that the consumption of non-renewable resources and the depletion of land to produce food, out of which as much as 50% is wasted, need to transform into more sustainable production forms. However, the full political recognition of this, with the action it would entail, is far ahead on the horizon. To place our hopes to pro-active resource and environmental politics is perhaps naïve, but until then, all we can do is to wait for the disaster to unfold. The future is nigh.

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Appendix 1: List of Informants

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