

Prevention of food waste in restaurants, hotels, canteens and catering





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Introduction

Background and aim of study

Environmental challenge

Wasting of avoidable food leads to environmental, economic and moral challenges. Many countries, organizations and individuals have therefore put avoidable food waste prevention on the agenda:

- Greenhouse gas emissions
- Water consumption
- Energy consumption
- Forest devastation
- Loss of biological diversity

Waste prevention programmes

Waste prevention is the highest priority in the waste hierarchy according to the revised EU Waste Framework Directive. According to the directive member states must develop waste prevention programmes to be issued no later than December 2013.

Food waste prevention can also be linked to the new EU plans for a resource-efficient Europe – a Flagship initiative under the Europe 2020 Strategy.¹ According to the communication from the Commission to the European Parliament some concrete ambitions for 2020 were proposed:²

- 20% reduction in the food chain's resource input
- Disposal of edible food waste should have been halved
- This work on resource efficiency is again linked to the process of Sustainable production and consumption within EU³

¹ http://ec.europa.eu/resource-efficient-europe/pdf/resource_efficient_europe_en.pdf

² COM/2011/0571 final

³ http://ec.europa.eu/environment/eussd/escp_en.htm

EU has declared 2014 as a “European Year against Food Waste” and future objectives for avoidable food waste reductions are under discussion. A target of 50% reduction in food waste from “farm to fork” within 2025 is proposed.

Lack of data and knowledge

Reports on the topic food waste and avoidable food waste lack data and knowledge on organic waste and no specific data on avoidable food waste. On the other hand workshops show a high interest amongst the actors in dealing with waste prevention.

Good examples, but a need for more action

School kitchens appeared so far to be an area with good examples for initiatives on food waste prevention.⁴ A Nordic project on prevention of food waste from wholesale and retail trade has been published.⁵ Another Nordic project in 2011 has focused on possible campaigns on avoidable food waste from households.⁶ Industry has also taken initiatives on how to reduce food waste from the food industry, retail sector and consumers. In Denmark a number of enterprises and organisations have signed a charter on less food waste, while several organisations join forces in Sweden to develop and coordinate strategies within this field.

Even though some initiatives have been taken, less research has been made within the hospitality sector on avoidable food waste prevention. The Nordic subgroup on waste prevention under the Nordic Waste Group has thus asked for a project proposal “How to increase prevention of food waste in restaurants, hotels, canteens and catering”, e.g. this report.

⁴ Skolmatens Vänner, Kartläggning av Sveriges kommuner gällande de måltider som i dag serveras på landets grundskolor och förskolor, 2011.

⁵ Nordic Council of Ministers – Initiatives on prevention of food waste in the retail and wholesale trades – A. Stenmark/IVL, O.J. Hanssen/Østfoldforskning, K. Silvennoinen, J-M. Katajajurri/MTT Agrifood research, M. Werge – PlanMiljø – 2011.

⁶ Nordic Council of Ministers – Nordic information campaign on food loss prevention – Prestudy – P. Sundt, J. Marthinsen, F. Syversen/Mepex Consult, O.Kaysen/Econet and K. Kirkevaag/Klar Kommunikasjon- 2011.

Nordic benefit

The project will give a Nordic benefit related to the preparation of national prevention plans based on EU requirements in the Waste Framework directive.

The project will show how member states in the EU could develop the area of waste prevention, which is required according to the revised Waste Framework Directive.

Objective, scope and expected outcome.

The overall objective of this study is to concentrate the attention on food waste in the hospitality sector comprising restaurants, hotels, canteens and catering and to point out possible initiatives to reduce food waste.

The objective of the project is to deliver a brief report on possibilities of new initiatives in order to reduce the generation of food waste from restaurants, hotels, canteens and catering. Focus in this report shall be given to avoidable food, e.g. avoidable food waste.

The project will furthermore deliver a guide on prevention of avoidable food waste in this sector.

Target group of report and guide

The target group of this report and the guide covers restaurants, hotels, canteens and catering, business associations of this sector, and national and local authorities.

Methods and content of report

Information has first been obtained directly from organizations and major players within the hospitality sector in Denmark, Finland, Norway and Sweden. Secondly meetings and interviews were organized.

Based on the personal interviews a questionnaire was developed and tested out also in cooperation with the organizations and the leading companies within the hospitality sector. These organizations took part in the survey themselves and distributed the questionnaire to their members in the four countries as well.

The survey was undertaken in January 2012 in all four countries. In total 289 questionnaires were answered. However not all of the forms were complete, probably because the respondents did not have data

needed to answer some of the questions, e.g. data on food waste and avoidable food waste.

The information gathered from the interviews and the survey has been supported by public statistics, available reports and also information obtained in direct contact with different actors.

General information about the hospitality sector in the four Nordic countries is summarized in chapter 2.1., while a more detailed analysis is made per country in the following chapters 2.2 – 2.5. The country presentations follow the same main structure, but differ both due to national differences and information available.

All statistics related to waste and avoidable food waste is analysed and presented in chapter 3.

Instruments and initiatives are described in chapter 4; first the instruments used by Governments, then different initiatives and practice within the hospitality sector. The results from the survey are also integrated in this presentation. Due to the fact that just a limited survey is made, the results are presented for all four countries and segments in the market.

The results from the survey are summarized in chapter 5, also listing initiatives and actions taken and planned by the hospitality sector itself.

Proposals and ideas for further actions are described in chapter 6, while chapter 7 give some background information for the guide. Literature and a list of personal contacts are attached the report.

Definitions and scope of study

Definition of avoidable food waste

Food waste can be defined as organic waste which has its origin in food or inputs in food production. We can divide between avoidable and unavoidable food waste. Avoidable food waste was edible at some point prior to disposal (e.g. slice of bread, plate residues etc.) The avoidable food waste from hospitality sector could be divided in waste from the kitchen (e.g. preparation of meals) and waste from the guests (plate residue). Unavoidable food waste is not-edible food waste from preparation and consumption (e.g. bones, egg shell, coffee grounds etc.) In this project we use the terms of avoidable food waste and edible food waste as synonyms.

Definition of hospitality sector

In this study we will use the expression «hospitality» sector. This expression is in accordance with the English names of the trade organizations:

- NHO Hospitality Association, Norway
- Finnish Hospitality Association MaRa

The hospitality sector is according to WRAP⁷ split into two sectors:

- The profit sector
- The cost sector (not working for profit)

The hospitality sector is often called “storhusholdning” in Scandinavian languages. Hospitality operations is in this report regarded as a “sector” in society, but sometimes it might be more correct to call preparing and serving food a “function”, e.g. a function often taking place within other sectors in the economy, e.g. canteens in every company and catering within hospitals and for elderly people at home etc.

The profit sector

The profit sector consists of:

- Horeca, e.g. hotels, guesthouses, restaurants and cafés
- Horeca; hotels, restaurants and cafés
- Canteens
- Catering (NB: often part of the activities of others; e.g. canteens, restaurants and even supermarket/ food stores)

Horeca is used to describe this industry too, according to Wikipedia; “Horeca is a business term which refers to a sector of the food service industry, to establishments which prepare and serve food and beverages. The term is a syllabic abbreviation of the words Hotel/Restaurant/Café.” This means that horeca covers just part of the hospitality sector. Quick service restaurants (QRS)/ fast food outlets, pubs and bars are in this report also included in horeca.

⁷ WRAP – The Composition of Waste Disposed of by UK Hospitality Industry – 2011.

The expression “horeca” is well known in all countries. In Sweden “horeca” is also known but not used. The expression “Besöksnäringen” is more common.⁸ In Sweden the expression “Storhusholdning” is mostly related to public operations of schools and hospitals etc. In this report we regard “storhusholdning” wider, e.g. as a Nordic expression for “hospitality sector”.

Each group, for example the hotels and guesthouses are split into subgroups, e.g. hotels with and without a restaurant.

National statistics are made in accordance with the list above for the profit sector, see chapter 2.⁹

Most of the hotels, guesthouses, restaurants, cafés and partly catering and canteen services, are organized in national hospitality associations; Horesta in Denmark, MaRa in Finland, NHO Hospitality Association in Norway and SHR in Sweden. There might be other trade organizations as well, like Virke in Norway. Catering and canteen services in Denmark and in Norway are organized within Dansk Industri and NHO Services. See chapter 2.

The cost sector

The cost sector, comprises, according to WRAP businesses where providing hospitality services is not the main function of the organization and where the aim is not to maximize profit (e.g. catering and accommodation services within the premises of schools, universities, hospitals, nursing homes, prisons, military facilities and self-operated canteens within companies etc.).

This report will focus the most on the profit sector within the hospitality industry, e.g. horeca, canteens and catering. The professional canteen and catering companies deliver their services to both private and public sector. Private and public operators compete in the market. Both within the private and public sector canteen services are outsourced to professional operators.

Part of the cost sector is also described in this study, but not school kitchens. However there are poor statistics for these activities, the “turnover” and the costs. The same applies to food waste statistics from these specific food activities as the waste figures are included in the overall statistics for the whole sector/operation.

⁸ www.hsr.se

⁹ Statistisk Sentralbyrå (SSB).

It is important to have in mind that the available studies and statistics cover different parts of the hospitality sector. Furthermore it is important to stress that other businesses, not belonging to the hospitality sector, often compete with the hospitality sector. For example fuel stations and service trade are important competitors to restaurants.

Hospitality sector vs other sectors

In this report we do not include:

- Fuel stations, even these operations often sell more food, incl. fast food prepared at the station than fuel and they compete with restaurants along the highways
- Service trade, even though these shops prepare and sell fast food in competition with restaurants, cafés and canteens
- Retail chains, even though also the supermarkets also prepare and sell prepared dishes in competition with restaurants, cafés, canteens and other catering operators
- Retailers serving food as part of their operation, like the café at IKEA, is in this report part of the private “cost-sector”

In Norway fuel stations and kiosks bought 2.9% of the meat distributed in the country, mostly hot-dogs and hamburgers for preparation for the “take-away” market. These operations are not part of the described “hospitality sector” in this report.¹⁰

Summing up we will in this report split the hospitality sector into three segments:

- Horeca; hotels, restaurants and cafés
- Canteens and catering
- The public and private cost sector

¹⁰ <http://www.flesland-markedsinfo.no/>

Summary

The hospitality sector

The title of this study is prevention of food waste in restaurants, hotels, canteens and catering. In this study we have decided to use the expression “hospitality sector” to cover operations such as preparing and serving food outside homes. However several other terms are used by this sector itself and in literature. It might be argued that preparing and serving food is not a sector within the economy but rather a function within different other sectors.

The aim of this project is to describe possible further initiatives and instruments in order to reduce the amount of avoidable food waste within the hospitality sector in the Denmark, Finland, Norway and Sweden. The project results consist of a report and a guide. The guide includes practical advices for the operators within the hospitality sector. The report and the guide are partly based on information gathered from interviews and a survey undertaken in the four countries in January 2012.

Due to the fact that the hospitality sector is complex and comprises various kinds of activities and organisations, the report contains a thorough description of this sector in each of the four countries. This basis knowledge might help understanding the sector in general and why available literature and statistics report quite different results on food waste and avoidable food waste from this sector. The information about the hospitality sector is also linked to the description of the large number of initiatives undertaken and planned in order to reduce avoidable food waste.

Background for report

Prevention of avoidable food waste is an important environmental issue. Each country will be affected of new EU ambitions on avoidable food waste reduction. Further, every member state has to develop waste prevention plans for 2013. New EU strategies on resource efficiency will probably also comprise the issue of avoidable food waste.

So far literature and reports have been focusing on avoidable food waste within households and the retailers. Less focus has been given to the hospitality sector representing about one third of food consumption (Denmark).

Methods

The report is partly based on literature, partly on interviews and a survey among organisations and operators within the hospitality sector in the four countries; Denmark, Finland, Norway and Sweden.

The survey was undertaken in all four countries in January 2012. The questionnaire asked for information about the operators, their environmental and waste policies and routines, waste and avoidable food waste, an evaluation of the most important initiatives undertaken today and for the future, comments on potential instruments and finally needs regarding the guide.

Definitions

The first key definition is related to avoidable food waste, avoidable food waste comprise the edible part of food waste. Some reports use the expression food loss as an alternative.

The other key definition is related the “hospitality” sector. This sector is split into the profit sector and the cost sector. The profit sector consists of:

- Horcea; hotels, restaurants and cafés
- Canteens
- Catering

The costs sector comprises the non-profit food services within the public sector and the self-operated canteens within the private sector.

Facts about the hospitality sector

In general the information available for the profit segment gives a reasonable overview of the activities and the operators. For the cost segment, including all self-operated canteens, not for profit, the available data is limited.

The profit sector in the four countries comprises: (2009)

- 64,200 companies
- 369,810 employees
- Ca. € 30 billion in turnover

The profit sector includes a number of international hotel- and restaurant chains and also international canteen operators. These canteen (food service) companies are expanding into new segments. However in all counties there are keen discussion on the question of outsourcing of canteen and catering services.

Based on Finnish statistics 55% of the meals in the hospitality sector are served within the cost sector. The cost sector comprises food services for hospitals, canteens in the schools and several public food services including nursing homes, catering for elderly etc. In addition private self-operated canteens belong to the cost sector.

Food consumption and avoidable food waste

According to Danish and Finnish statistics it might be concluded that one third of all food is served within the hospitality sector.

Available literature gives different results on food waste and avoidable food waste. There is thus a need for both better methodology and definitions in order to improve statistics on food waste and avoidable food waste.

Based on different methods the amounts of food waste and avoidable food waste are calculated in order to illustrate the situation of avoidable food waste within the hospitality sector in general and for different segments. The analyses conclude with a best estimate for total avoidable food waste in the four countries of 456,000 tons, e.g. about 18kg/ inhabitant. The differences between the reports underline a need for better statistics, including better definitions and reporting systems.

Instruments and initiatives

Key EU initiatives include a 50% target on avoidable food waste prevention within 2025 and a declaration on 2014 as the European Year against Food Waste. EU commissioned a preparatory study on food waste across EU27 in 2009. The report describes about 100 initiatives within avoidable food waste prevention in EU. The study also gave recommendations on further policies in order to reduce avoidable food waste. Introducing targets, reporting requirements and improved statistics are among the proposals.

Denmark, Finland, Norway and Sweden have already implemented some economic, regulative and communicative instruments. These include financial support to different initiatives, a proposed national prevention target in Sweden and a voluntary charter in Denmark. Relevant legislation is however mostly related to food safety. These rules might have an impact on avoidable food waste, often in harmony, but also in conflict with avoidable food waste prevention ambitions.

A large number of initiatives of the hospitality sector are described. Different initiatives are also linked to the result of the survey.

The survey

In the survey undertaken in January 2012 key personnel in different segments of the hospitality sector provide important information and views on the sector:

- A high degree of certification/eco-labelling within the hospitality sector
- A high focus on waste sorting in general
- A prioritized list of actions undertaken today to reduce avoidable food waste
- A prioritized list of actions planned for the future to reduce avoidable food waste
- A low interest for Governmental instruments beyond supporting campaigns and initiatives taken by the hospitality sector itself

According to the survey, these are the most important actions for the future in order to reduce avoidable food waste from the hospitality sector:

- Fix targets for avoidable food waste reduction
- Routines for right portions
- Internal education/training on costs (cost of food/total costs)
- General awareness campaigns on avoidable food waste prevention
- Menu planning

Needs for further initiatives and instruments

The conclusion on further actions is that new instruments are needed in order to meet overall avoidable food waste targets, to reduce environmental negative impacts and obtain benefits for society. Instruments are also required in order to bridge the ambitions and rules related to food safety and avoidable food waste prevention. Different economic, regulative and communicative instruments are listed without any conclusion given on which instrument or package of instruments should be chosen. National instruments might be reinforced and coordinated on a Nordic level.

The guide

The guide includes practical advices on avoidable food waste reduction actions to operators within the hospitality sector. To keep it simple and focused the avoidable food waste issue in the guide is related to efficiency of the operations. Avoidable food waste prevention leads to lower costs both for business and also for the environment. The list of advices is for the most given and prioritized by the organisations responding on the survey and presented in the guide back to the hospitality sector. As

the hospitality sector comprises global companies as well as small organisations, hotel chains as well as small canteens and bars, the advices are general and meant as an inspiration. It is the intention that the operators can download the guide from internet and use the guide or part of the guide as an inspiration in their own internal avoidable food waste reduction programs.

1. An overview of the hospitality sector in Denmark, Finland, Norway and Sweden

1.1 Structure and overview of the hospitality sector

The hospitality sector in general

In this report we split between these three segments:

- Horeca, hotels, restaurants and cafés
- Canteens and catering
- The public and private cost sector

The horeca sector is mostly private and it is possible to get an overview of these operations from public statistics and the trade organizations. For any comparisons between hotels it is important to stress that some hotels just offer breakfast (garni hotels) others serve all meals.

The relationship between the canteen/ catering segment and the cost sector might however be more difficult to understand. The table below illustrates the relationship between the operators and the type of canteens in order to explain the differences.

Table 1: Canteen and catering sector vs. the cost sector

Sector Operator:	Canteens in private sector	Canteens in public sector
Private professional	Outsourced service to private operator	Outsourced service to private operator
Public professional	Outsourced service to a public operator	Outsourced service to other public operator
Self-operated canteens	Private self-operated canteens, not for profit	Operated by staff, integrated activity

- The first line: Private professional operators sell their services to both private and public sector. The professional operators, often international companies, are increasing their activities also within the public sector, e.g. schools, hospitals and other social services, military services and other public organizations. Whoever owns the premises, private or public, these activities belongs to the “canteen and catering” sector in this report
- The second line covers public professional operators selling their services to both the private (probably not many cases) and public sector. In this case the public operator might compete with private operators. Such public owned operators are part of the “canteen and catering”-sector, not the “cost-sector”
- The third line comprises private companies and public organizations operating their own canteens, with their own staff (sometimes also with part time hired staff). These activities are integrated in the overall operations. These canteens are not operated for profit, thus these activities are included in the “cost sector”. As the cost sector comprises a huge number of organizations and kitchens and the fact that the canteens are well integrated, it is difficult to obtain statistics from these canteens

The simplifications made in the table above might differ from practice and public statistics. Probably public operators, line 2, often are regarded as part of the cost-sector even though some could be regarded as market operators.

The professional canteen market is growing in all the four countries due to more outsourcing of these activities. Often the food services are integrated in larger facility management agreement offered by international companies like (alphabetic order);

- Compass Group/ Eurest
- Fazer
- ISS
- Sodexo

According to these companies there are some differences regarding the canteen market:

- In Finland the lunch is the main meal, with warm food. The Norwegians still enjoy their “matpakke”, but slowly Norwegians also eat more hot dishes for lunch

- Norwegians enjoy their “matpakke” also at schools, while Finnish and Swedish pupils normally are served hot meals at the school canteens
- In Sweden it is normal to have a lunch out of office based on a meal ticket system. A meal ticket system is also normal in Finland
- In Norway food is often sold by item in canteens, in Denmark buffets are more common

As the canteen operations are different, also the waste generation differs. Some canteens purchase more prepared food, which push the waste generation upwards in the value chain.

Unlike USA doggy bags are not common in the four Nordic countries and guests seldom ask for such bags. In USA doggy bags are part of a concept whereby big portions are served (1.75 of normal portion is served!)

According to the Norwegian Pollution law waste and Danish legislation waste from the hospitality sector, normally is regarded as industrial waste (free market), not as municipal solid waste, MSW, anymore. In other countries the waste is normally regarded as MSW, whereby the municipalities have the obligation to collect and treat the waste/ some part of the waste from the hospitality sector. The different legislation has an impact on the waste management systems, costs and results.

1.1.1 Hospitality sector statistics

According to the model of national statistics for the profit sector in Norway (SSB), the table below illustrates the whole hospitality sector. According to the studies of each country, the segmentation might differ between the countries. The charts must therefore just be used as an indication. The table includes the cost sector. However within the framework of this report it has not been possible to complete the chart for the cost sector.

Number of companies

The following table shows the structure of the hospitality sector in the four countries, with number of companies, 2009.

Table 2: Number of companies, 2009. Sources: Denmark: Horesta, Finland MaRa Norway: SSB, Sweden SCB/ SHR

	DK	Finland	Norway	Sweden
1. Profit sector	14,311	11,126	12,153	26,610
1.1 Accommodation	935	1,660	3,087	4,110
1.1.1 Hotels	935	664	1,485	1,993
1.2 Food services	13,376	9,466	9,066	22,500
1.2.1 Restaurants	8,896	7,030	6,693	
1.2.2 Catering and canteens (independent)	2,140	1,268	1,805	
1.2.3 Pubs and bars	2,340		568	
2. Private Cost sector				
3. Public Cost sector				
Total				

Number of employees

The following table shows the structure of the hospitality sector in the four countries, with number of employees, 2009

Table 3: Number of employees, 2009. Sources: Denmark: Horesta, Finland MaRa Norway: SSB, Sweden SCB/ SHR

	DK	Finland	Norway	Sweden
1. Profit sector	84,560	79,300	89,915	116,035
1.1 Accommodation	20,133	23,800	26,989	33,535
1.1.1 Hotels	20,133	20,900	23,688	30,900
1.2 Food services	64,427	55,500	62,926	82,500
1.2.1 Restaurants		43,500	47,623	
1.2.2 Catering and canteens (independent)		12,000	11,098	
1.2.3 Pubs and bars			4,205	
2. Private Cost sector				
3. Public Cost sector				
Total				

Turnover in national currencies

The following table shows the structure of the hospitality sector in the four countries, with turnover in national currencies for 2009.

Table 4: Turnover within hospitality sector in national currencies for 2009. Sources: Denmark: Horesta, Finland MaRa Norway: SSB, Sweden SCB/ SHR

	DK DKK	Finland €	Norway NOK	Sweden SEK
1. Profit sector	40,445	5,262	57,304	88,400
1.1 Accommodation	11,502	1,300	21,181	17,900
1.1.1 Hotels	8,390	1,118	18,964	15,400
1.2 Food services	28,943	3,962	36,123	70,500
1.2.1 Restaurants	18,838	2,790	26,014	
1.2.2 Catering and canteens (independent)	5,599	905	8,192	9,588
1.2.3 Pubs and bars	4,506	269€	1,917	8,460
2. Private Cost sector				
3. Public Cost sector				
Total				

Hotel chains

The same hotel chains are operating in several Nordic countries; Nordic Choice hotels has about 170 hotels, mostly in Norway and Sweden, while Scandic hotels operates 129 hotels in all four countries. Best Western, First hotels, Radisson and Rica are among other chains operating in more than one Nordic country.

1.2 Hospitality sector in Denmark

1.2.1 Overview of the hospitality sector in Denmark

According to the Danish Veterinary and Food Administration (Fødevarestyrelsen)¹¹ the total amount of food served within the hospitality sector was 1.1 million tons in 2009. This includes the profit sector and the public part of the cost sector. Self-operated canteens within the private sector are not included.

According to the same source the total consumption of food in Denmark was 3.5 million tons (636 kg/ inhabitant, or 1.7 kg/ inhabitant/day). This means that the hospitality sector represents one third of the consumption of food in Denmark. Including all the self-operated canteens within the private sector the share would have been even higher.

By turnover, most of the hotels and restaurants are organized in Horesta, while some canteens and catering companies are organized within the Confederation of Danish Industries (Dansk Industri). However, by numbers most operators in these markets are not organized.

Horesta is the national trade association for the hotel, restaurant and tourism industry in Denmark with more than 2,100 members. The members represent approximately 85% of the hotel capacity in Denmark and about 50% of the revenues from restaurants. Furthermore the members employ around 75% of the 85,000 people working in the hotel and restaurant sector – a sector with an annual turnover of DKK 28 billion.

¹¹ Branchestatistik, Kantine og Catering, DI Service 2011.

1.2.2 Horeca in Denmark

Accommodation

Key facts and figures of the accommodation sector in Denmark (2009)¹²

- 935 hotels (inclusive conference centres, hostels, vacation centres, camping) in operation, with a turnover of DKK 11 bn
- 42.2 million accommodations (of which 32% in hotels)
- 20.133 employees
- The food turnover is calculated to DKK 2,500 mill which corresponds to 22 % of the total turnover

Table5: Accommodations in Denmark 2009, Horesta

	Total turnover DKK mill	Food (turnover) DKK mill	Number	Number accom- modations Mill	Number employees
Hotels	9,950	2,298	935	13.6	
Hostels	656	210		1.1	
Camping	891			12.8	
Summer				14.7	
Total	11,502			42.2	20,133

Restaurants/ food service market

The table below illustrates the structure within the restaurant/food service market. This table includes also catering and canteens illustrating the fact that statistics often split activities and segments differently.

Table 6: Restaurants (incl. catering and canteens) in Denmark, 2009

	Total turnover DKK mill	Food turnover DKK mill	Number	Guests (mill)	Number employees
Restaurants	12,536	8,950	4,415		
Fast Food (incl. pizzerias)	6,302	4,096	4,481		
Event catering	1,794		859		
Other restaurants	3,805		1,281		
Cafes, bars, disco	4,506		2,340		
Total	28,943		13,376	234	64,427

The number of guests at restaurants etc. is estimated to 234 million, e.g. 42 meals/ inhabitant/ year, exclusive meals in canteens and by catering.

¹² <http://horesta.dk/Oekonomi-Statistik/Tal-Statistik>

1.2.3 Canteens and catering in Denmark

Key figures for the canteens and catering market

- Ca. 3,000 canteens, of which 700 canteens operated by professional companies, the rest, 2,300 canteens are self-operated (Cost-sector)
- Total turnover of DKK 5.3 bn. (2010), incl. public central kitchens
- Servings; ca. 600,000 meals/day.^{13, 14}
- About 100,000 employees, of which 75% within canteens

The turnover within this sector has increased by 30% from 2002 to 2010. Operators in the market expect an annual growth of 5–10%. The further growth is due to more outsourcing of canteen services in the market, even from hospitals in the future.

The customers of the canteen and catering operators (among members of DI) are:

- Industry, 37%
- Public sector, 25%
- Trade and finance, 20%
- Service, 16%

The Confederation (DI) of Danish Industries represents and attends to the members' political and business interests both on regional and national levels. The federation offers member services such as consultancy, counselling, representation, network, conferences and workshops.

As an integral part of the DI, DI Service represents the operational service sector. The 650 members include some of DI's major member companies. The members represent a wide range of activities within the service sector, such as:

- Facility services
- Temporary employee and recruitment services
- Laundry and textile services
- Guarding and security services
- Canteen and catering services

¹³ Kantiner og catering, Branchestatistik 2011, DI Service.

¹⁴ The Danish Diet & Nutrition Association says one million meals pr. day in the cost sector.

Canteen services are operated at the customers, often as part of a total service package (facility management). The major operators are Compass Group (Eurest), ISS, Fazer, SSP, Forenede Service, Sodexo and Meyers Køkken.

Catering service is partly undertaken by specialized companies. The average canteen operated by professionals has 101–250 guests/ day. The canteen survey 2011 shows the split of number of canteens:¹⁵

- 1–100 persons, 8%
- 101–250 persons, 62%
- 251–500 persons, 20% (majority within public sector)
- 501–and more, 10% (majority within public sector)

ISS and Eurest

In order to illustrate the canteen and catering market some key information about two of the leading companies are summarized below. The information underlines that the operators have the topic of avoidable food waste reduction on the agenda, but the operators might have chosen different strategies. None of the two companies are so far active within hospitals (See 3.3.4). Examples of their avoidable food waste prevention initiatives are included in chapter 4.2.

Eurest¹⁶

- Operates 250 canteens with ca. 90,000 guests/day, a typical canteen has 200 guest/day
- Customers in both the private and public sector, but so far not hospitals (see 3.3.4)
- Catering for municipal institutions for elderly etc.; e.g. preparing and distributing food in competition with municipal central kitchens
- Proactive and visible regarding the avoidable food waste issue based on an expected increased awareness of the issue of avoidable food waste in society and among guests
- Eurest has developed targets on avoidable food waste reductions and an internal reporting system
- Trim Trax is the name of the system to register avoidable food waste, see 4.2

¹⁵ Se Kantine og Catering, Branchestatistik 2011, DI Service side 7.

¹⁶ Eurest, meeting.

ISS¹⁷

- Operates 165 canteens with ca. 35,000 guests/day, a typical canteen has 280–150 guest/day, e.g. 1 ½ day employment/day
- Customers both within private and public sector, but so far not hospitals (se 3.3.4)
- ISS has no specific avoidable food waste prevention target. However prevention of avoidable food waste is regarded as part of a general optimization of the operation. It is also up to the customer to take responsibility dependent on contract
- ISS does leave the information work towards the canteen guests related to avoidable food waste to their customers

1.2.4 Cost sector in Denmark

Within the public sector it is not normal to outsource food services based on public tenders.

The Danish hospitals, operated by the regions, have so far organized the food services themselves; public central kitchens deliver food to the hospitals. These central kitchens do also operate the canteens for hospital staff.

Also the municipalities operate their own central kitchens serving food to nursing homes, day care institutions, cradle wards and day care institutions for children etc. However, in some cases, also private operators are now delivering food services, such as canteen services and catering.

The Danish Diet & Nutrition Association, (Kost- og ernæringsforbundet) has an important role within the cost sector. This organization has 7,700 members of which 85% work within the public sector.

The Danish Diet & Nutrition Association is a specialist organization for administrative dietitians, kitchen managers and chefs, bachelor in nutrition and health in general and bachelor in nutrition and health – specialized in catering management, AP degree in process technology – specialized in food technology, and health and clinical dieticians. The members working with food services every day have thus also a key role as regards avoidable food waste prevention.

The members of Danish Diet & Nutrition Association serve 1 million meals every day within the following sectors.

¹⁷ ISS meeting.

- Hospitals, operated by the regions
- Food services; canteens and catering for nursing homes, day care institutions, cradle wards, day care institutions for children, schools, town hall canteens, prisons etc. operated by the municipalities

The food is normally prepared in central kitchens and distributed all the way to the patient in the hospitals and others. Leftovers from the patients are transported the same way back to the central kitchen.

According to Danish Diet & Nutrition Association the avoidable food waste problem is reduced due to the following reasons:

- Efficiency measures during the last years, resulting in better procurement and better use of all food purchased
- Food service is now more customized to the individual needs of each patient, inclusive more á la Carte rather than buffet/self-servings. Better food services have resulted in better nutrition and also less avoidable food waste

Avoidable food waste has been focused and good results are partly based on better communication between patient needs, the hospitals and the central kitchens. Staff education is also an important tool, see chapter 4.2.

The above mentioned examples from the Danish hospitals, according to the Danish Diet & Nutrition Association, are also valid for the rest of the public sector. Several initiatives are taken, e.g. projects covering nutrition, quality and food preparation, and thus also covering the avoidable food waste issue as part of the projects.

1.2.5 Initiatives and plans in Denmark

Initiatives taken by the hospitality sector are all summarized and described in chapter 4.2 for all the four countries. Special Danish initiatives are:

- The commitment to the charter for reduced avoidable food waste
- Green Key
- Participating in EWWR

1.3 Hospitality sector in Finland

1.3.1 Overview of hospitality sector in Finland

According to MaRa a total 850 million meals were served outside home in Finland in 2009.

Every third meal consumed was enjoyed outside home. These figures are the same as reported from Denmark, see chapter 2.2.

The number of meals served per person from the hospitality sector varies from 130 to 180 meals per year.

It was 21,369 kitchens within the hospitality sector in Finland in 2009, of which:

- 4,928 kitchens just distributing the meals, e.g. did not cook themselves
- 2,180 did not serve warm meals

Petrol stations (about 920) also serving food is also included in statistics as “restaurants”. Cafés include fast food establishments. In these statistics all canteens are included – also self-operated private and public canteens (cost-sector).

The meals were split on the different segments in 2008:

- 38% restaurants, hotels, cafés, bars
- 7% canteens, independent
- 2% canteens, self-operated private
- 53% public canteens/ food services

This split indicates that 47% of the meals are served within the profit segment of the hospitality sector, while 53% of the meals are served within in the cost sector in Finland.

The kitchens within the hospitality sector are also split by ownership:

Table 7: Ownership of the kitchens and the share of kitchens and the number of meals served

Owner/ Share	Share of kitchens	Share of meals served
State	2%	4%
Municipal	21%	41%
Cooperative	3%	5%
Private	62%	43%
Foundations/ not for profit	7%	5%
Other	5%	2%

According to MaRa the travel and restaurant sector: (the for profit segment)

- Accounts for 3.4% of Finland's GDP
- The sector employs 130,000 people, e.g. 5% of the workforce

The VAT rules in Finland were changed in 2010 as the same VAT rate was introduced for all food, e.g. 13% either sold in a restaurant or a shop.

1.3.2 *Horeca, catering and canteens in Finland*

The cafés accounted for 37% of the kitchens within the hospitality sector and 24% of the meals served within in the hospitality sector in Finland. The restaurants accounted for 27% of the kitchens within the hospitality sector and 17% of the meals served within in the hospitality sector in Finland.

The catering and canteens accounted for 8% of the kitchens within the hospitality sector and 7% of the meals served within in the hospitality sector in Finland.

The different vacation establishments accounted for 10% of the kitchens within the hospitality sector and 7% of the meals served within in the hospitality sector in Finland.

The biggest companies within the for profit segment of the hospitality sectors are:

- Fazer Foodservice
- SOK, SOKOS hotels and several restaurant chains and traffic stores
- Sodexo
- Restel hotels
- Scandic hotels

The Finnish Hospitality Association (MaRa) represents 2,400 members with 6,000 outlets and 60,000 employees with a total turnover of € 5.5 bn., e.g. MaRa represents 80–90% of the total turnover in the hospitality sector. MaRa is member of Confederation of Finnish Industries (EK).

1.3.3 *The cost sector in Finland*

As mentioned about 53% of the meals served within the hospitality sector are served within in the cost sector in Finland. So far hospitals and schools have operated their own canteens and food services, but the market is opening up for some outsourcing.

The hospitals accounts for 1% of the kitchens within the hospitality sector and 9% of the meals served.

The municipalities organize the canteens within schools. The schools account for 10% of the kitchens within the hospitality sector and 19% of the meals served. The cost per portion is low and varies between € 0.87 to € 3.50/meal. The average cost is about € 1.67 in Finland according to MaRa.

Homes for elderly account for 7% of the kitchens within the hospitality sector and 10% of the meals served.

Kindergartens account for 6% of the kitchens within the hospitality sector and 4% of the meals served.

Like in the other Nordic countries the organization “Kost och ernæring” plays an important role within the public cost sector and Finland has the same debates on the topic outsourcing.

1.3.4 Initiatives and plans in Finland

Initiatives taken by the hospitality sector are all summarized and described in chapter 4.2 for all the four countries. Special Finnish initiatives are:

- Self-regulation guide for the hospitality industry (MaRa/ Evira)
- Avoidable food waste project, also including food service institutions, a study to be finalized March 2012

1.4 Hospitality sector in Norway

1.4.1 Overview of hospitality sector in Norway

Structure of the for profit sector

Statistics Norway (SSB) organizes its statistics on the profit sector according to the following system also used as basis for this report. See chapter 2.2:

1. Accommodation
 - a. hotels
 - b. hostels etc.
 - c. camping, tourist cabins
 - d. other accommodation

2. Food and beverage operations
 - a. restaurants
 - b. restaurants and cafes
 - c. fast food/ quick service restaurants
 - d. catering and canteens operated as independent businesses
 - e. bars

As can be seen, 2d includes independent businesses, while self-operated catering and canteens (the cost sector) are not counted in these statistics.

Volumes of food and beverages

According to a market research service company, the hospitality sector bought food and beverages for NOK 18.9bn. in 2010. The food is distributed partly directly from producers (57%) partly through wholesale (43%).¹⁸

VAT rules in Norway

In Norway the VAT rate on food (incl. on take-away) is 15%, while the rate is 25% when the food is served. This split stimulates sales disfavour the operations of the hospitality sector. Sales of take-away food and beverages are stimulated, e.g. sales from the service trade. In Finland and Sweden is this split repealed.

The VAT rule related to caterings vs. canteen services vs. self-operated canteens are regarded as complicated and also sometimes as discriminating for professional canteen operators (outsourcing).

1.4.2 Horeca in Norway

Tourism accounts for 3.3% of GDP, 6.3% of the employment according to national statistics, SSB 2009. In total 13,999 companies worked within the tourism industry, comprising more than just accommodation and restaurants. The turnover of these companies was NOK 89 bn.

Key figures on accommodation in 2009, according to Statistics Norway¹⁹

Accommodation companies	3,087
Number of stays, millions	28.5 (2010)
Employment	26,989
Turnover, NOK Mill	21,181

¹⁸ <http://www.flesland-markedsinfo.no/>

¹⁹ Statistics Norway, SSB, Overnattings-og serveringsvirksomhet, 2009.

The accommodation companies comprise 1,485 hotels with an employment of 23,688 and a total turnover of NOK 19 bn. The turnover related to accommodation was about NOK 11 bn. The rest comprises food and beverages, NOK 8 bn.

The number of hotel rooms was 76,000 in 2010,²⁰ of which 63% belonged to 10 hotel chains. The number of beds increased by 15,000 during the years 2009 and 2010 indicating that the horeca business is growing rapidly.

Key figures on "Food and beverage operations" in 2009, according to Statistics Norway

Companies	9,066
Employment	62,926
Turnover, NOK Mill	36,122

The restaurants comprised 6,693 companies, e.g. 72% of the turnover and 76% of the employment with food services.

The Norwegian Hospitality Association (NHO Reiseliv) is an organization of hotels and other accommodations, restaurants, catering and other food service businesses:²¹ "Members also include campsites, family amusement parks, alpine facilities and other attractions.

The Norwegian Hospitality Association has 2,400 member businesses with a total of 55,000 employees and annual turnover of NOK 30 billion in 2011. The organization is one of the three largest national associations in the Confederation of Norwegian Enterprise (NHO).

Some hotels and other organizations within horeca and tourism are members of Virke – The Enterprise Federation of Norway.²²

1.4.3 Canteens and catering in Norway

Catering and canteens (independent) employed 11,098 persons in 2009, while the turnover amounted to NOK 8.2 bn., the number of companies was 1.805 (SSB).

According to NHO Service the turnover is estimated too high as some of the major canteen and catering operators are active in other services as well. Some key figures for the canteen market only, according to NHO Service (2010):

²⁰ Norsk Hotellnæring, Horwath Consulting/ Aftenposten 17.10.11.

²¹ <http://www.nhoreiseliv.no/English/>

²² http://www.virke.no/eway/default.aspx?pid=302&trg=TabList_8885&Main_8836=8969:0:10,4198&TabList_8885=8887:0:10,4307:1:0:0:::0:0

- The total canteen market amounts to NOK 5.8 bn., of which NOK 2.6 bn. is the calculated turnover of self-operated canteens
- The independent canteen market (outsourced) amounts to NOK 3.2 bn. and comprises 1,800 canteens, with an average number of 325,000 guests every day
- The average canteen serves 200 guests/ day and the turnover is about NOK 2 million/year

Even though this sector used to be local with a majority of small and medium sized enterprises, the food and beverage operations in Norway are more and more characterized by a keen competition between larger companies and chains, especially in the big cities and at airports. Most of them are offering several services in addition to catering/ canteen services.

Most of the professional companies are organized in NHO Services. The organization NHO Service comprises several industries, inclusive canteens. NHO Service has 201 members within canteen and catering businesses with a total turnover of NOK 3.1 bn. in 2010, 95% of the independent market, e.g. the market opened for competition.

According to NHO Service ca. 0.8 million people, ca. 33% of the total number of employees in Norway are served meals in a canteen. In addition about 140,000 students have access to a canteen. The members of NHO Service serve about 600,000 meals daily in both private and public organizations.

Canteen services might comprise different kind of services to the customer; operation of canteen, staff, goods etc. This means that the operations are split in different ways between the canteen operator and the customer/ hosting company.

The market is growing due to the fact that companies want to outsource such activities and also because Norwegians increasingly want to eat food prepared at work rather than bringing their own food ("matpakke"). At one of the biggest canteens in Oslo (Postgiro), 30–40% of the guests eat hot meals for lunch. The trend is that the guests buy more salad, but less bread and "pålegg". It is also a trend that the food is getting better and that more food, incl. bread, is prepared in the canteens. In some companies staff can get food for free, meaning more servings, while others have to pay full or part of the costs.

The Norwegian market for food services is illustrated by the following leading companies in the following table:

Table 8: Leading canteen operators in Norway, 2010

Company	Main activity	Turnover Norway NOK Bn	Canteens Norway	Persons served/ day	Other Coun- tries, total turnover
Eurest	Canteens + services	0.8	300	100,000	Compass group, global £13 bn.
ISS	Canteens + services	0.8	400	>100,000	Global, Danish Group, DKK 78 bn.
Sodexo	Canteens + services	0.55	110	n.a	Global, €16bn.
Fazer	Canteens + services	0.2	43	25,000	Nordic, Finnish group, € 1.5bn.

Some of the private operators are based on former public owned kitchens. There are few public owned organizations competing in this market, Drammen Kjøkken KF is one of them, delivering food services partly to municipalities partly to the private market.²³

NHO Service characterizes the catering industry in Norway as rather limited and the catering service is often integrated as an extra service of other enterprises, e.g. restaurants, shops etc.

1.4.4 The cost sector in Norway

The information about the structure and the activities within the cost sector is limited.

As mentioned the total canteen market amounts to NOK 5.8 bn. in Norway, of which NOK 2.6 bn. is the calculated turnover of self-operated canteens, partly within the private and partly within the public cost sectors.

According to NHO Service the self-operated food services of the hospitals and nursing homes consist of:

- 13,000 beds at Norwegian hospitals (inclusive day patients) and the total food cost is calculated to NOK 285 million
- 41,000 nursing home placements (inclusive day patients) and the total food cost is calculated to NOK 898 million

²³ <http://www.drammen.kommune.no/no/Om-kommunen/Virksomheter/kf/Drammen-kjokken/>

The public cost sector is a topic for political discussions in Norway:

- Private operators are delivering some services to hospitals, but according to NHO Service, Norway lags behind Denmark and Sweden on outsourcing of food services within the public sector. This is partly due to the VAT rules in Norway according to NHO Service
- Like in Denmark (and also Finland and Sweden) employees are organized in the National Diet & Nutrition Association (Kost- og ernæringsforbundet), an organization also connected to HCI (Healthcare Caterers International).²⁴ According to the strategies of the Norwegian organization “public key activities are not suited for and must be protected from outsourcing/ competition”²⁵

According to the Diet & Nutrition Association the food service concepts within hospitals in Norway are changing and new concepts are discussed and tested out, e.g. central vs. local food preparation. This is also the case within the military and municipal social services.

As an example food is prepared at a central kitchen in the Vestfold county for distribution in the Buskerud County, sending prepared food all the way, even with bus to the hospital in Ål, ca 250 km.

The Diet & Nutrition Association has 1,500 members and is a part of Delta and the national organization for employees YS.

1.4.5 Initiatives and plans in Norway

Initiatives taken by the hospitality sector are all summarized and described in chapter 4.2 for all the four countries. Special Norwegian initiatives are:

- The initiative of industry and trade in Norway, ForMat, with an ambition to reduce the amount of avoidable food waste in Norway by 20% within 2015, intends also to focus on the hospitality sector
- Project Food bank and practical experiences

²⁴ <http://www.matomsorg.no/id/1.0>

²⁵ <http://www.matomsorg.no/id/149>

1.5 Hospitality sector in Sweden

1.5.1 *Overview of hospitality sector*

A fifth of all food consumed in Sweden, e.g. 1.4 bn. portions, is consumed within the hospitality sector. The amount is expected to increase according to a report from 2004.²⁶

This expected increase is underlined by more recent statistics:

- The private part of the hospitality sector contributes with 1.5% to the BNP and 3.4% to the Swedish employment (SCB). The employment within this sector increased by 27% during the period 2003 to 2010, while the employment in general in Sweden rose by 4% only
- The employment in restaurants is expected to increase further as the VAT was reduced from 25% to 12% as of 1st January 2012. In this way all food will have the same VAT either a food is served at a fuel station or at a restaurant

1.5.2 *Horeca, canteens and catering*

The private professional hospitality sector in Sweden is organized in SHR (Sveriges Hotell & Restaurangföretagere). This organization calls its industry "Besöksnäringen" including also amusement parks and ski lift plants.

SHR has 4,200 members with 5,800 units, covering 75% of the turnover of the hotels and restaurants in Sweden.

Key figures 2010: (SCB/ SHR):

- 2,042 hotels, 30,100 employed, SEK 16.7 bn. turnover on accommodation, 77% are Swedish guests
- 22,500 restaurants, 85,100 employed, SEK 74.5bn turnover
- The turnover of "restaurants" is split into different kinds of operations
- 5.7% canteens (Excl. public sector)
- 5% cafés
- 7.9% catering/ fairs and traffic related operations
- 13.1% fast food
- 13.4% hotel restaurants

²⁶ Naturvårdsverket – Nyttan av att minska livsmedelssvinnet i hela kedjan – Rapport 6454, 2011

- 12.0% pubs, bars etc.
- 42.9% lunch and dinner restaurants

The following list of the biggest companies within the private hospitality sector in Sweden in 2010 gives an impression of the structure within the hospitality sector. Here are the 10 biggest of a total list of 100 companies.²⁷

Table 9: The profit segment of the hospitality sector according to Restauratören 28/ 2011

Company	Turnover 2010, SEK million
McDonalds	4,487
Scandic Hotels	3,926
Nordic Choice Hotels	2,704
Riksorganisationen Folkets Hus och Parker	1,810
Sodexo	1,550
Fazer Food Services	1,499
Elite Hotels	1,402
Max	1,253
Skistar	1,133
Compass Group (Eurest)	933

1.5.3 The cost sector

The private self-operated “cost” sector

Several companies have their own canteen, e.g. operated on a non-profit basis.

No statistics have been found illustrating these activities and the avoidable food waste from this sector.

The public hospitality sector

Every day about 3 million meals are served within the public hospitality sector, of which 1.4 million portions at schools.

The public hospitality sector comprises:

- Municipal responsibility:
 - a) Pre-school/kindergarten, 1–6 years
 - b) Schools; 1–9 class
 - c) Houses for elderly
- Regional responsibility:
 - a) Hospitals
 - b) Health centres

²⁷ Restauratören, 28/2011

- National:
 - a) Prisons
 - b) Military

The food service might be undertaken by the public itself or outsourced based on a public tender. Based on legislation inhabitants might choose themselves between public and private suppliers of services.

The public hospitality sector is also split according to the activity within the kitchen:

- Food preparation kitchen/ central kitchen
- Kitchen receiving the prepared food for heating and serving
- Kitchen with mixed operation

The waste generation differs between the different kinds of operations. A key issue along this value chain is the ordering routines between the local receiving kitchen and the central kitchen.

The public hospitality sector is partly operated by the public itself, and partly outsourced to private operators. Like in other Nordic countries there are discussions on this “outsourcing” of activities from the public sector.

Within the cost sector the Swedish Rural Economy and Agricultural Societies (Hushållningssällskapet) plays an important role in order to reduce avoidable food waste. The Rural Economy and Agricultural Societies are independent members organizations dedicated to enhancing an enterprising spirit in rural areas and promoting good rural and urban living environments. There are 18 local Rural Economy and Agricultural Societies today, represented in every county in Sweden.²⁸

The organization has 20 experts working all over Sweden organizing staff training and projects related the most to municipal operated kitchens. Projects comprises also avoidable food waste reduction project with workshops.

²⁸ <http://www.hushallningssallskapet.se/?p=12286&m=4090>

1.5.4 *Activities and plans within the Swedish hospitality sector*

Initiatives taken by the hospitality sector are all summarized and described in chapter 4.2 for all the four countries. Special Swedish initiatives are:

- National target on food wastes comprises also the hospitality sector
- Hospitality sector joins forces with other stakeholders in “SaMMA”
- Participation in survey initiated by the “Konsumentföreningen” on avoidable food waste and also the attitudes related to the use of doggy bags within restaurants in Sweden
- EWWR participation and sharing of experiences within the hospitality sector
- Projects on avoidable food waste reduction, “Mindre Matsvinn”, with web page, newsletters and training of staff within municipal operated kitchens
- Several surveys and projects within schools

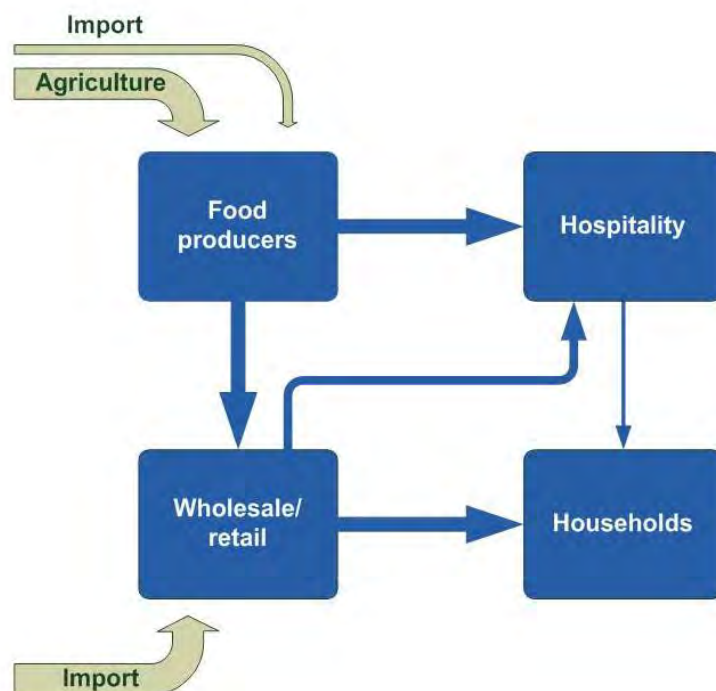
2. Available existing data on avoidable food waste from the hospitality sector

2.1 The food value chain

The value chain for food includes several actors from production to consumption. Figure 1 below shows a simplified presentation of the value chain for food with a focus on the 4 major links in the chain; the food producers, the hospitality sector, the wholesale and retail sector and the households.

As can be seen from the figure below both food producers and the wholesale/ retailers are suppliers of food and beverages to the hospitality sector. According to Norwegian reports the producers deliver 57% of the food and the wholesalers 43% to the hospitality sector, see chapter 1.4.1.

Figure 1: The value chain for food



The figure illustrates the fact that the hospitality sector has an important role within the value chain for food. The hospitality sector represents one third of the consumption of food in Denmark, see chapter 1.2.1.

The simplified figure does not give information on all streams of food and food waste. As a basis for statistics it is important to take into consideration:

- The supply consists of both food and beverages. Only a few studies include loss from beverages
- Some food and beverages from the hospitality sector are probably sent back to the suppliers for various reasons, even for destruction, similar to what happens between retailers and producers
- Some food today, probably more in the future, will be redistributed to food banks for human consumption
- In the preparation of food, often water is added in the process, for example cooking of pasta. Some water evaporates during cooking. These facts are important when comparing food purchased vs. food wasted
- As can be seen from the figure some food from the hospitality sector is sent to households, for example catering to elderly people at home. In addition it is important to stress that canteens are operated at the premises of other companies. Catering includes also deliveries outside the hospitality sector. In the same way “take- away food” includes also a “take away” of possible waste from the guest who consumes the food in a public area or somewhere else
- The food waste from the hospitality sector is not limited to food sorted in the bin for organic waste. More or less food is wasted in the bin for residual waste. In addition some food is flushed into the sewage when plates and pots etc. are washed in the kitchen. Waste from liquids and beverages are probably also flushed down the drain. Furthermore waste from deep-fat and fat normally are sorted out, but just partly included in reports of food waste and avoidable food waste. Some food waste are probably used as pet food as well, this edible food is anyway regarded as an avoidable food waste

2.2 Data on food waste

The hospitality sector is no doubt, a significant producer of food waste, but there is a significant lack of reliable statistics on their food waste and their avoidable food waste. As can be seen from chapter 3.1.3 new studies are under way.

There are some studies on food waste and avoidable food waste in each of the four countries, but the reports are often covering different parts of the hospitality sector.

The following statistics and studies are relevant:

- Statistics Norway (SSB) publishes yearly statistics from the service sector which also covers part of the hospitality sector
- EU BIOIS study also covers the hospitality sector for the EU 27 with calculated figures for each country
- WRAP has developed a thorough study for the hospitality sector in the UK which primarily includes the profit sector

Data for the profit sector, see chapter 1.1.1, gives an indication of the industry's size. For the 4 Nordic countries together the industry comprise

- More than 60,000 single companies
- Nearly 370,000 employees and
- A turnover of over € 28 billion per year (2009)

The cost sector figures come in addition and can be of the same order of magnitude. According to chapter 1.3.1 the cost sector represents 53% of all meals served within the hospitality sector in Finland).

The data on food waste from the hospitality sector is taken from present official statistics and literature. There are also some key figures from the survey performed in this project used as a supplement to data from other sources.

The present data on food waste from the hospitality sector focus on the total amount of food waste from the entire sector or edible food waste from parts of the sector (e.g. school kitchen). Some reports only focus on food waste that is source separated and ignore thus the fact that food waste also is disposed together with residual waste even though recycling has been introduced. Another factor is that the total amount in most cases only includes solid waste. Waste (liquids and residuals from plates etc.) that is poured into the drain is to varying degrees included in the figures. A large proportion of food waste from restaurants and fast food is fat from separators and deep fat. It is often difficult to see from the statistics if this waste is included.

2.2.1 Denmark

Data from Miljøstyrelsen²⁹

Miljøstyrelsens data on food waste from the hospitality sector in Denmark are based on rather old studies.³⁰ It is uncertain how representative these studies are today and whether they represent the total amount of food waste. The studies carried out in this area in Denmark are summarized by Miljøstyrelsen in 2010³¹ and in a note prepared by the Aarhus University in 2011.³²

Data is based on the system with separate collection of food waste from restaurants and canteens to animal feed. Due to new EU – regulations this system no longer exists (withdrawn in 2003). The newest data is therefore from 2001 when it was collected 21,000 tons of food waste.

It is pointed out in several reports that this estimate is too low. The system of separate collection of food waste included commercial kitchens that generated more than 100 kg / week. Smaller kitchens and kitchens in cost sector were not covered by the collection scheme. In addition, there are reasons to question whether all businesses in the profit sector with more than 100 kg per week actually took part in the system and to what degree sorting was achieved.

The Miljøstyrelsen report from 2004 points out that approx. half a million meals daily are served by public kitchens. Each serving was assumed to generate in average 125 g of food waste.³³ On annual basis this equals 22,800 tons of food waste. It is assumed in the report that the same number of meals are served in the profit sector. This gives a total amount of approx. 46,000 tons food waste per year. However recent studies have come to other results based on the fact that the number of servings in the cost sector is at least twice as many, e.g. more than one million servings per day.

Data from EU

Based on data from EUROSTAT 2006, the BIOIS report uses an average of 27.32 kg per capita of food waste from “food service and catering” in

²⁹ Environmental Protection Agency in Denmark.

³⁰ Miljøstyrelsen – Forundersøgelse af madspild i Danmark – B. Kjær, M. Werge/Copenhagen Ressource Senter – 2010.

³¹ B. Kjær, M. Werge, Forundersøgelse af madspild i Danmark (2010).

³² L. Mogensen et al, Madspild i fødevareproduktionen – fra primærproduktion til detailed (2011).

³³ L. Kroman et al (Niras)- Madaffald fra storkøkkener (Miljøstyrelsen 2004).

EU15³⁴, ³⁵. This gives a total of 148,000 tons food waste from the hospitality sector in Denmark.

Data collected in this study

Statistics on turnover and number of meals served per year for different segments of the Danish hospitality sector are summarized in chapter 1.2. If we combine these data with the key figure from Miljøstyrelsen of food waste per meal, e.g. 125 g, this gives a rough estimate of the amount of food waste.

Table 10: Meals served per year in the hospitality industry in Denmark

Sector	Meals per year
Profit sector	
Restaurants	241,000,000
Canteens/catering	150,000,000
Cost sector	250,000,000
Total	641,000,000

Miljøstyrelsens key figure of 125 g food waste per meal gives a total of approx. 80,000 tons a year.

Data on avoidable food waste

There are few studies in Denmark with information on avoidable food waste, e.g. about the proportion of food waste that must be considered as avoidable food waste. The earlier mentioned study from the University Aarhus estimates the amount of avoidable food waste to be in the range of 40–75% of the total.

As mentioned in chapter 3.1.3 Miljøstyrelsen has commissioned a new study in order to assess the avoidable food waste also within the hospitality sector.

2.2.2 Finland

Data from EU

The BIOIS report estimates the total amount of food waste from food service/catering to 143,500 tons for Finland based on an average food waste generation for EU15.

³⁴ BIOIS – Preparatory study on food waste across EU 27 (DGV Env 2010).

³⁵ EU 15 – Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

Data collected in this study

The number of meals served outside of home in Finland is about 850 million per year, see chapter 1.3. Combining these data with the key figure 125 g food wastes per meal we find a total of approx. 106,000 ton food wastes per year for the total hospitality sector in Finland.

2.2.3 Norway

Data from Statistics Norway

Statistics Norway (SSB) publishes yearly new statistics on waste from the service industry. This includes both private and public service industry and retail sale. The service sector exclusive retail sale will include both horeca – industry, canteens and catering and therefore more or less corresponds to hospitality sector. However canteens and catering in the primary and secondary sectors are not included.

The statistics from SSB show both separate collected food waste and residual waste including food waste. In Table 11 below the amount of separate collected food waste for each segment of the service sector is taken from SSB. The amount of food waste in residual waste is calculated for each segment, by combining data from SSB on residual waste and data for the proportion of food waste in residual waste from sorting analysis on commercial waste in Oslo municipality³⁶

Table 11: Total food waste from service sector in Norway. (Numbers are rounded)

Service sector	Source separated food waste	Food waste in residual waste	Total
Accommodation and food service	18,900	32,400	51,300
Information and communication	3,400	2,800	6,200
Finance and insurance	700	2,800	3,500
Professional, scientific and technical services	5,700	7,100	12,800
Commercial services	5,500	11,500	17,000
Public administration, defense, social insurance	6,100	2,300	8,400
Education	3,700	7,700	11,400
Health and Social Services	9,800	26,700	36,500
Culture, entertainment and recreation	2,800	5,600	8,400
Other services	1,700	5,300	7,000
Total	58,300	104,200	162,500

Source SSB

³⁶ Oslo kommune, REN – Plukkanalyser på avfall fra næringskunder (Mepex 2010).

Data from other literature

In a study from 2008 ENOVA used key figures for food waste from different segments of the hospitality sector.³⁷ We have recalculated the amount of waste based on these key figures and the total number of employees in the different segments from SSB.

Table 12: Total amount of waste from hospitality sector exclusive the cost sector

Nace	Industry	Employees	Key figure	Food waste
			kg/employee year	ton/year
55.101	Hotels and motels with restaurant	18,000	3,000	54,000
55.301	Restaurants and cafes	34,500	3,000	103,500
53.302	Fast food	3,600	3,000	10,800
55.51	Canteens	4,200	1,400	5,900
55.53	Catering	4,700	500	2,300
	Total			176,500

The amount of food waste estimated in the table above includes the profit part of the hospitality sector, e.g. excluding the cost sector.

An earlier study performed by Mepex for the Orio program indicates a rough estimate of food waste from horeca – industry at approx. 80,000 tons / year based on statistics from producers using food waste to produce animal feed.³⁸

All estimates above focused on total food waste and do not distinguish between edible and non-edible food waste. There is considerable uncertainty in the figures.

Other Norwegian studies like The FORMAT – project, the EMMA – project³⁹ and a study prepared by Mepex for KLIF⁴⁰ focuses primarily on food waste from households.

Data from EU

There are no data for Norway in the BIOIS – report. If we use the key figure for the generation of food waste from food service / catering at 27.32 kg per capita (EU15), we get at a rough estimate of 136,000 ton food waste per year from the hospitality sector in Norway.

³⁷ Enova, Potensialestudie for Biogass i Norge, (H.L. Raadal et al/Østfoldforskning 2008).

³⁸ ORIO – Matavfall fra storhusholdninger (Mepex 2004).

³⁹ LOOP/NOX – EMMA – Emballasjeoptimering og forebygging av matavfall (Mepex/Østfoldforskning 2010).

⁴⁰ Klima- og forurensningsdirektoratet(KLIF) – Forebygging av matavfall (Mepex 2011).

2.2.4 Sweden

Data from Naturvårdsverket⁴¹

SMED⁴² has recently performed a study for Naturvårdsverket that estimates the amount of food waste throughout the value chain from farmer to consumer.⁴³ The calculations are mainly based on key figures of source-separated food waste from the various value chains. The hospitality sector in this study includes restaurants and school kitchen only. Results from calculations are shown in the table below.

Table 13: Amount of food waste from restaurants and school kitchen.

	Source separated food waste (tons/year)	Total food waste (tons/year)
Restaurants	9,500	99,000
School kitchen	17,000	26,000
Total	26,500	125,000

Source: SMED

It is obvious that this study does not represent the quantities of food waste from the total hospitality sector. The calculations are based on data from companies that source-separate food waste, and it is assumed that these companies have 100% sorting efficiency. Experience shows that there can be significant amounts of food waste in the residual waste even from companies that have introduced source separation. In addition oils from separators and deep-fat are excluded.

Naturvårdsverket⁴⁴ has in another study⁴⁵ indicating a total amount of food waste from the hospitality sector to approx. 300,000 tons, with reference to the BIOIS – report from EU.⁴⁶

Data from other studies

In Sweden there has been much focus on avoidable food waste in school kitchen. Every day free food is served in schools from pre-school and even up to high-school level. Totally there are served 260 million portion of food in Swedish schools restaurants per year equal to 1.4 million

⁴¹ Environmental Protection Agency of Sweden.

⁴² Svenska MiljöemisjonsData.

⁴³ Naturvårdsverket – Matavfall 2010 från bord til jord (SMED 2010).

⁴⁴ The Swedish EPA.

⁴⁵ Naturvårdsverket – Nyttan av att minska livsmedelssvinnet i hela kedjan (2011).

⁴⁶ BIOIS – Preparatory study on food waste across EU 27 (DG Env 2010).

portions per school day. Avoidable food waste occur in both the preparation of the food and the food not eaten up (plate loss).

Tyresö municipality conducted a survey in 2002 of the plate loss from the serving of school lunches at 16 school kitchen in the municipality. The results of the study demonstrated a mean plate loss at 9.6% of the served food.⁴⁷ A similar survey conducted at 4 schools in the municipality of Gothenburg in 2011 demonstrated a plate loss of 7.5% of the served food.⁴⁸ According to this study each portion has a weight of 0.333 kg. A plate loss of 7.5% thus equals 25 grams only.

Another study of 6 school kitchen in Eskilstuna in 2009 showed a plate loss at an average of approx. 6% of prepared food, while waste from the kitchen and the buffet was approx. 12% on average.⁴⁹ Another survey performed in the same project of 4 different types of dining places (school kitchen, restaurant and staff canteen) showed similar amounts of waste. In total, they recorded 18% avoidable food waste of which a plate loss of 10%, 4% loss in storage and preparation and 4% loss in the serving.⁵⁰ Based on an average portion at schools of 0.333 kg a avoidable food waste of 18% equals 60 gram per portion.

Avfall Sverige⁵¹ performed in 2006 a study to determine key figures of food waste from restaurants, canteens, shops etc. The study includes a limited number of restaurants and catering, and it is unclear how representative the survey is for all types of commercial kitchens (profit sector). The survey is based on interviews with personnel in the restaurants and municipalities. The weights are generally calculated on the basis of volume of waste.

The study also calculates key figures for oily and fatty waste from preparation of food.

The following figures were obtained in the survey:

⁴⁷ Tyresö kommun – Ingen mat är näringsrik förrän den är uppäten – konsumtion av skolluncher (2002).

⁴⁸ Göteborg Stad, Miljöförvaltningen – Nyckeltall för klimatpåverkan från tallrikssvinn (2011).

⁴⁹ Naturvårdsverket – Minskad svinn av livsmedel i skolkök (2009).

⁵⁰ R.Karlsson – svinn i storhushåll (Stockholms universitet 2002).

⁵¹ Waste Management Sweden.

Table 14: Key figures (kg/employee in the kitchen /year) for food waste, oil and fat and deep-fat from restaurants etc.

	Solid food waste	Oil and fat	Deep-fat
	Kg/employee year		
Restaurants	2,000 – 4,000 (3000)	0 – 4,000 (1500)	0 – 100 (40)
Fast food	500 – 2,000 (1000)	500 – 2,500 (1500)	100 – 500 (300)
Kitchen(schools, hospitals)	500 – 3,500 (1400)	200 – 1,000 (500)	-

The table above shows range and typical value in parenthesis.

The number of employees in the profit part of the hospitality sector in Sweden is approx. 116,000, see chapter 1.5.2. We can thus combine data on the number of employees with key figures from Table 13 and calculate the total amount of food waste. The distribution between the different types of commercial kitchen and the proportion of part-time employees is unknown. We can roughly assume that the total man year accounts for 80% of the total number of employees and that 60% are employed in restaurants, 30% in different kitchen and 20% in fast food sector. This rough calculation gives a result of approx. 350,000 tons food waste a year including oily and fatty waste.

Data from EU

The BIOIS report estimate the total amount of food waste from food service/catering to 298,880 tons for Sweden based on data from Naturvårdsverket.

2.2.5 EU and other countries

EU

Data from EU are summarized in the BIOIS report. The key figure for waste generation is, as earlier mentioned, 27.32 kg per capita for EU15. The BIOIS – report also refers to a few national studies of food waste from the hospitality sector shown below:

Table 14: Food waste in national studies.

Country	Ton per year	Kg per capita	Year
Slovenia	11,405	6	2010
Austria	103,500	13	2009
France	1,080,000	17	2004
Estonia	24,564	18	2008
Germany	2,000,000	24	2009
Sweden	298,880	33	2010
UK	3,000,000	50	2008
Average		23	
Median		18	

Source: BIOIS

As we see, the key figures vary a lot, from 6 to 50 kg/ inhabitant and the average value is slightly lower than the average for the EU15.

UK

In a recently published report from WRAP quantities of food waste from the Horeca industry was estimated to 600,000 tons per year or 9.7 kg per capita and year, covering just the food from the mixed waste.⁵² This is considerably lower than previous estimates from 2008 of 3 million tons food waste from food service and restaurants. Both figures include only professional restaurant and catering businesses.⁵³

Food waste from public hospitals, schools, prisons, military camps, etc. are normally included in the figures for household waste (MSW waste). WRAP has also conducted a study on food waste from public schools where it is estimated a rate of approx. 80,000 tons / year.⁵⁴ But as we can see schools do not represent the total cost sector in UK.

In the North East Public Sector Food Waste Research Project 2009 the best estimate of food waste from the public sector is calculated to

⁵² WRAP, The Composition of waste Disposed of by the UK Hospitality Industri (2011).

⁵³ WRAP, Waste arisings in the supply of food and drink to households in the UK (2010).

⁵⁴ WRAP, Food waste in schools (2011).

9,724 tons per year for the whole region.⁵⁵ If this is representative for the UK the total amount of food waste from the public sector is approx. 240 000 tons a year.

This gives a total of 840 000 tons food waste per year from the hospitality sector in UK, or 13.8 kg per capita.

2.3 Comparing results

2.3.1 *Best estimate of total food waste*

It is difficult to specify a best estimate of the quantities of avoidable food waste from the hospitality sector in the Nordic countries. As the literature review shows:

- There are great variations in the estimates
- Studies include different parts of the total food waste generated
- Many of the national reports only include data from a part of the hospitality sector

The estimates with reference to Eurostat data shall represent the total amount food waste from food service and catering, and is therefore regarded as the best available overall statistics. We therefore choose this as a best estimate. The uncertainty in the estimate is however significant.

Table 15: Total amount of food waste from hospitality sector

Country	Range	Best estimate
	Tons/year	Tons/year
Denmark	46,000–148,000	140,000
Finland	106,000–143,500	140,000
Norway	80,000 – 176,500	140,000
Sweden	125,000 – 350,000	260,000
Total	357,000–818,000	680,000

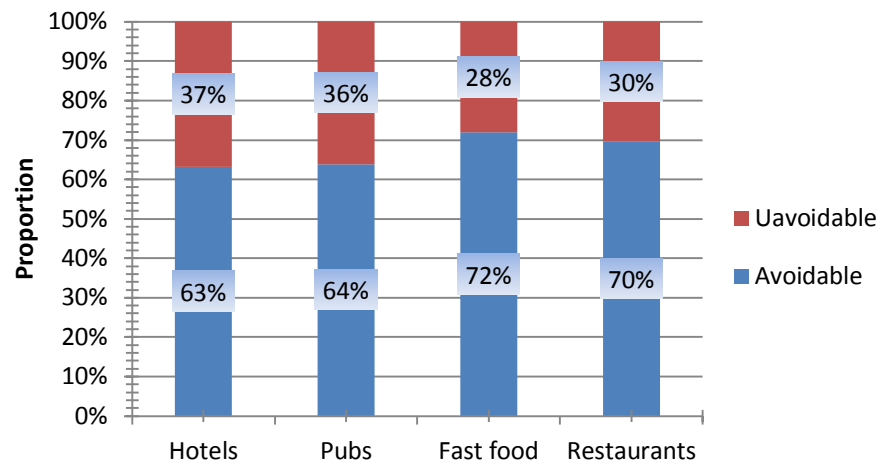
The figures in the table above show the total amount of food waste both avoidable and not avoidable. It also includes fats and oil, but not other waste and liquids poured out in the sewer.

⁵⁵ Environmental Agency North East – A Study of Public Sector Food Waste Arisings and Processing Options within the North East Region (2009).

2.3.2 Avoidable food waste

Nordic statistics and literature provide little evidence to estimate the amount of edible food waste. Therefore, we have compiled data from the WRAP study of the hospitality sector in United Kingdom. The proportions of avoidable food waste are shown in the figure below.

Figure 2: Avoidable food waste in hospitality sector in England (profit sector)



The average rate for avoidable food waste for the profit sector is calculated to 67%. If we add this as a basis for edible food waste in Nordic countries, we get the following estimates:

Table 16: Best estimate of total food waste and avoidable food waste in Nordic countries

Country	Total food waste	Avoidable food waste
	Tons/year	Tons/year
Denmark	140,000	94,000
Finland	140,000	94,000
Norway	140,000	94,000
Sweden	260,000	174,000
Total	680,000	456,000

2.4 Useful key figures for food waste

Key figures can be useful in order to calculate the total amount of food waste from the total hospitality sector, from a special part of the sector or from a single business.

It is a wide variation between the estimated key figures for different segments of the hospitality sector. The data must therefore be used with caution.

Most key figures are related to “food waste,” often the expressions “food waste” and “avoidable food waste” are mixed up.

2.4.1 Key figures for food waste within the hospitality sector

Key figures from literature

The key figure from the BIOIS report used in this study is 27 kg per capita for the total hospitality sector. This key figure represents solid food waste both from profit and from cost sector.

Key figures from survey

The results from the survey show relatively few answers to questions about food waste production. This is probably due to the fact that companies normally do not register such data today. This applies specially to food waste that is disposed together with other waste in residual waste. Companies that have answers to this question have therefore estimated the amounts of food waste based on judgment.

Approx. 30 organizations responded to all the questions about turnover, number of servings and total amount of food waste. This gave the following figures (median value):

Table 17: Key figures from survey – total hospitality sector

	Total food waste (median)
Kg per 1,000 euros turnover	7.5
Kg per serving	0.12

As we can see the key figure per serving corresponds with the old key figure from Miljøstyrelsen of 125 g per meal.

2.4.2 Key figures for food waste within hotels

The following key figures are found in literature for hotels with restaurant.

Table 18: Key figures for hotels with restaurant

Key figure	Unit	Source
3,000	Kg per employee and year	Enova (2008)
745	Kg per employee and year	Miljøstyrelsen (2002)
1,226	Kg per mill DKK turnover	
900 – 2,200	Kg per employee and year	WRAP (2011)

2.4.3 Key figure for food waste within restaurants

The following key figures are found in literature for restaurants.

Table 19: Key figures for restaurants

Key figure	Unit	Source
3,000	Kg per employee and year	Enova (2008)
300 – 2,800	Kg per employee and year	WRAP (2011)
2,000 – 4,000 (3,000)	Kg per employee and year (Solid food waste)	Avfall Sverige (2006)
0.2 – 0.5 (0.3)	Kg per serving (Solid food waste)	Avfall Sverige (2006)
0 – 4,000 (1,500)	Kg per employee and year (fat from separators)	Avfall Sverige (2006)
0 – 100	Kg per employee and year (deep fat)	Avfall Sverige (2006)
1,059	Kg per employee and year	Naturvårdsverket (2011)
490	Kg per employee and year	Miljøstyrelsen (1995)

Key figure for food waste within fast food

The following key figures are found in literature for fast food/quick service.

Table 20: Key figures for restaurants

Key figure	Unit	Source
3,000	Kg per employee and year	Enova (2008)
1,200 – 1,500	Kg per employee and year	WRAP 2011
500 – 2,000 (1,000)	Kg per employee and year (Solid food waste)	Avfall Sverige (2006)
0,01 – 0,1	Kg per serving (Solid food waste)	Avfall Sverige (2006)
500 – 2,500 (1,500)	Kg per employee and year (fat from separators)	Avfall Sverige (2006)
100 – 500 (300)	Kg per employee and year (deep fat)	Avfall Sverige (2006)
1,059	Kg per employee and year	Naturvårdsverket (2011)

The study from WRAP shows key figures from different types of hotels, restaurants and fast food categorized by the number of employees. The figures show a clear trend towards less waste per employee in the largest companies, especially for hotels and restaurants:

Table 21: Key figures for hotels, restaurants and fast food/quick service

Employees	Hotel	Restaurant	Fast food
	kg per employee and year		
1 – 9	2,200	1,700	1,200
10 – 19	2,100	2,600	1,200
20 – 49	1,200	2,800	1,500
50 – 99	1,700	300	
100 – 149	900	400	

2.4.4 Key figure for food waste within canteens

The following key figures are found in literature for canteens. The figures from Avfall Sverige also represent canteens in the cost sector.

Table 22: Key figures for canteens

Key figure	Unit	Source
1,400	Kg per employee and year	Enova (2008)
500 – 3,500 (1,400)	Kg per employee and year (Solid food waste)	Avfall Sverige (2006)
0.02 – 0.2 (0.06)	Kg per serving (Solid food waste)	Avfall Sverige (2006)
200 – 1,000 (500)	Kg per employee and year (fat from separators)	Avfall Sverige (2006)
0.02 – 0.07 (0.05)	Kg per serving (fat from separators)	

Key figure for food waste within the cost sector

The key figures shown in Table 23, also represents canteens in the cost sector.

Key figures from a publication from Stockholm's University show food waste from three different kitchens.⁵⁶ Key figures represent total avoidable food waste from storage, preparation, serving and plate residue.

Table 23: Key figures on avoidable food waste in cost sector

Key figure	Unit	Segment	Source
95	g per serving	School kitchen	Stockholm University (2002)
75	g per serving	School kitchen	
115	g per serving	Staff canteen	

Source: R.Karlsson

These results are lower than the result from an older Swedish study from 1979.⁵⁷

Table 24: Key figures on avoidable food waste in cost sector

Key figure	Unit	Segment	Source
64	g per serving	School kitchen	STU (1979)
97	g per serving	Hospital Kitchen, breakfast	
164	g per serving	Hospital Kitchen, lunch-dinner	
156	g per serving	Military kitchen, breakfast	
243	g per serving	Military kitchen, lunch-dinner	
119	g per serving	Staff canteen	

Source:STU

⁵⁶ R. Karlsson – Svinn i storhushåll (Stockholms Universitet 2002).

⁵⁷ Avfall, energi- och vattenförbrukning i storkök – STU 1979.

2.5 Conclusions

The different studies analyzed come to different results regarding food waste from the hospitality sector. The avoidable food waste is seldom calculated in available reports. Differences in the results might be explained:

- The hospitality sector has so far been less focused compared to households and retail trade
- The hospitality sector covers a variety of operations, often integrated in other sectors, e.g. canteens. Catering services and fast food also generate waste ending up in other sectors, inclusive in private homes
- The food waste is partly sorted for separate collection, partly included in residual waste. In addition a certain amount of food waste is flushed from plates and pots etc. ending in sewage often not covered by statistics. In addition the kitchens generate oil/fat and deep fat partly included in studies
- The studies have simplified the assessments based on different methodology and assumptions, often just focusing on a limited part of the whole hospitality sector and parts of the food wasted (not including beverages/ liquids, food for PET food/ food returned to supplier etc.)

Based on the above analyses we conclude, as a best estimate, that the hospitality sector in the four countries generates 680,000 tons food waste, of which 456,000 tons avoidable food waste. The food waste equals 27 kg / inhabitant while the avoidable food waste equals about 18 kg/ inhabitant.

The literature review on the amounts of avoidable food waste underlines the need for better statistics, including better definitions and reporting systems.

Poor statistics make it difficult also to fix any avoidable food waste reduction targets.

Operators within the hospitality sector should, in the meantime, measure their avoidable food waste and develop appropriate key figures for internal reporting. In addition to assess both total food waste and avoidable food waste, these amounts should be compared by number of servings and/or food turnover. Such key figures should be developed as an efficient tool for each operator and also for society in order to follow up national avoidable food waste ambitions and targets.

3. Instruments and initiatives on avoidable food waste prevention within the hospitality sector

In this chapter we will describe instruments of the Government (4.1) and initiatives of the hospitality sector itself (4.2). The presentation gives an overview of the activities illustrated by some examples written in *italics*. In addition the different initiatives are related and linked to the answers from the survey. See chapter 5 for more information about the survey.

As can be seen, there are now a huge number of initiatives in order to reduce avoidable food waste. However there is a lack of documented results of the different actions. This is partly due to the fact that the avoidable food waste issue has been on the agenda for just a few years. Another reason might be that prevention of waste is often difficult to calculate.

3.1 Instruments of the Government/Authorities

3.1.1 *Instruments and initiatives on EU level*

Avoidable food waste has been on the agenda of EU for some time. The EU Parliament's agriculture committee approved a resolution on 23rd November 2011.⁵⁸

- Declaring 2014 the "European Year against Food Waste" (first 2013 was proposed)
- Take "radical measures" to reduce waste – "from farm to fork" – by 50% before 2025

⁵⁸ <http://www.euractiv.com/cap/parliament-pushes-slash-food-waste-europe-news-510225>

- Improve enforcement of existing EU and national government sanitation laws that mandate recycling of bio-degradable waste
- Set food waste-prevention targets for member states under the current waste-reduction target to be in place within 2014 (according to Waste framework Directive)

The abovementioned initiatives are all in progress. According to the European environment commissioner Janez Potočnik “The restaurant and catering sectors will need to manage their systems and services so as to reduce drastically their food waste losses”.⁵⁹

Furthermore EU has developed a Strategy 2020 including a plan for resource efficiency. Reducing avoidable food waste might also be regarded as part of this overall strategy. In the Roadmap to a Resource Efficient Europe food is described as a key sector and actions are proposed in order to reduce the amount of food waste.⁶⁰

In addition EU has supported financially different studies on food waste as basis for further strategies for EU and as basis of knowledge for all stakeholders. In 2009 the report “Preparatory study on Food Waste across EU 27” was made by BIO Intelligence Services (BIOS) on behalf of DG Environment.⁶¹

In 2009, during the Swedish presidency, DG Agriculture and Rural Development of EU Commission supported the “Climate Smart Food” conference in Lund in Sweden where avoidable food waste was on the agenda.

The Life+ Programme has financially supported the European Week for Waste Reduction (EWWR), a 3-year campaign held in 2009, 2010 and 2011. The aim has been that the project will have a lasting impact, and that it will progressively extend its scope within Europe, reaching as wide an audience, and raising awareness among the greatest number of citizens possible. There are five categories of common actions, focusing on various symbolic issues:

⁵⁹ <http://www.letsrecycle.com/news/latest-news/compost/europe-targets-50-reduction-in-edible-food-waste-1>

⁶⁰ EU, Roadmap to a Resource Efficient Europe, COM/ 2011/0571 final.

⁶¹ EU DG ENV – Preparatory study on Food Waste across EU 27 – Ms. V. Monier et al/Bio Intelligence Services – 2009.

- Paper waste reduction
- Food waste reduction
- Repair & reuse
- Excessive packaging waste reduction
- Clean-up days (to highlight the amount of waste thrown away)

The hospitality sector in Denmark, Finland and Sweden have been involved in this work, see chapter 3.2.11.

3.1.2 Instruments and initiatives on national level within EU

Based on the above mentioned BIOIS report the following initiatives are examples relevant for the hospitality sector.

- The report describes ca. 100 initiatives in Europe, of which 23 British, 35 Dutch and 10 Belgian initiatives
- About 21% of the initiatives were related to awareness campaigns, another 12% to information tools and training

10 initiatives were related to food banks and redistribution of food to people who needs the food. The report stresses that such food banks have a huge potential in Europe. Some regulative measures/ legal requirements on reporting of avoidable food waste might boost the development further the report says. Food banks have often been related to food from the retail trade, but such redistribution is also relevant and also already used by the hospitality sector.

Several initiatives in the BIOS report are related to schools, like awareness campaigns, training and competitions etc. and thus also relevant for all food services.

Some initiatives are related directly to the food services:

- Serving portions according to the needs of the guests (Portugal)
- Good practice guide for restaurants (Belgium)
- Guide for food waste prevention for canteens and hospitals (Ireland)
- Sustainable catering (Netherlands)
- A la carte menu for hospitals (Denmark, Hvidovre case, see 4.2)
- Experiment at lunch catering (Netherlands)
- Green hospitality award scheme (Ireland)

Some of these initiatives have reported positive results. However most of them had just started and have not reported any results. In conjunc-

tion with the mentioned Irish Green hospitality award scheme, the National Waste Prevention Programme of the Irish EPA, funded “A Guide to Minimising Food Waste in the Catering Sector” with the title “Less Food Waste More Profit”.⁶²

EU has filed more information about these and other prevention initiatives.⁶³

The BIOS report from 2009 recommends four policies to the EU-Commission:

- Introduce reporting requirements to member states on food waste and a standardization of methodologies for calculating food waste
- A clarification and standardization of food date labels and information measures to reduce confusion and avoidable food waste
- Creation of food waste prevention targets for member states, as part of the waste prevention targets by 2014 based on Waste framework directive
- Recommendation of separate collection of food waste/ biodegradable waste in member states from households and *food service sector*

These four proposals are all regarded as relevant signals also to the hospitality sector.

The British campaign Love Food Hate Waste, supported by the Government and operated by WRAP is a major contributor to the list of initiatives in the BIOIS report. So far WRAP has focused on avoidable food waste from households and retailers, but parallel to the Nordic initiative also WRAP has started its work on the hospitality sector, partly also based on an assessment of the food waste generated within this sector in 2011.⁶⁴

The British campaign focuses on both loving food and hating the waste, this positive attitude seems to give good results. In a similar way also initiatives in the four Nordic countries combine the food waste issue with positive messages or parallel campaigns, e.g. the www.fokusmatgledje.se of the Hushållsselskapet in Sweden.

⁶² EPA National Waste Prevention Programme, Ireland – “A Guide to Minimising Food Waste in the Catering Sector” with the title “Less Food Waste More Profit, 2010.

⁶³ <http://ec.europa.eu/environment/waste/prevention/practices.htm>

⁶⁴ WRAP- The Composition of Waste Disposed of by UK Hospitality Industry – 2011

Austria

The Austrian Federal Waste Management Plan 2011 includes a waste prevention program consisting of plans for a few numbers of areas inclusive food waste. For industrial kitchens and catering trade measures like awareness campaigns, training programs and incentive systems (best practice) are described. Legal clarifications and harmonization of the legal framework is also part of the avoidable food waste prevention plan, especially related to food banks.⁶⁵

3.1.3 Economic instruments within the Nordic region

Financial support

The Governments in the four countries have supported projects and studies on the issue of food waste and avoidable food waste in general. Some examples:

- The Danish EPA is commissioning a study on avoidable food waste covering households, retailers, hotels, restaurants and canteens 2011–2012, by Econet AS
- MTT (Agrifood Research Finland) Avoidable food waste project, also focusing on the hospitality sector will be completed in March 2012. The study has been commissioned by the Finnish Ministry of Agriculture and Forestry
- The Climate and Pollution Directorate in Norway (Klif) commissioned a similar study in 2011, whereby Mepex Consult assessed the amounts of avoidable food waste and analyzed instruments used within Europe
- Matavfall2010 från jord til bord, SMED 99/2011, was supported by the Swedish EPA. The report includes an assessment of food waste sorted within the hospitality sector

Furthermore projects and communication initiatives have been supported, see 4.1.5.

The campaign and the training activities of the Swedish Hushålls-selskapet, “Mindre Matsvinn” is supported by Swedish Board of Agricul-

⁶⁵ Lebensministerium, Asutria – Federal Waste Management Plan 2011, Volume 1.

ture.⁶⁶ The aim is to reduce avoidable food waste within the public owned kitchens.

VAT, value added tax

VAT is not an instrument intended to reduce avoidable food waste. However the VAT legislation might have an impact on food waste and avoidable food waste, at least related to where the waste is generated. This is the reason for this brief comment on VAT rules in this report.

The VAT rules might have an influence on:

- Competition between hospitality and service trade sectors
- Competition within the hospitality sector, e.g. between for profit and the public cost sector

VAT rules can have an impact on the structure of the hospitality sector in general and thus also on the food waste generated from this sector. In Norway a system with differentiated VAT might be regarded as a discrimination of the horeca sector (25% VAT) compared to retail and service trade (15%). The VAT split stimulates “take away food” compared to “eat at the restaurant”. Take-away of food means also a “take away” of the food waste by the customer. The VAT system stimulates the use of disposables not belonging to any take-back system, and even littering of both food waste and the disposables. Similar split in the VAT rules are changed in both Sweden and Finland.

The complicated VAT rules on canteens vs. catering etc. might also be regarded as discrimination between the cost-sector and the profit sector in Norway.

Landfill and incineration taxes

Taxes on waste treatment make it more expensive to waste food. Taxes might thus be an instrument to stimulate avoidable food waste prevention. However taxes on landfill are not relevant any more as degradable organic waste is diverted from landfill by law.

Taxes on incineration are removed both in Norway and Sweden. At the same time the overcapacities in the market these days result in very low gate fees and thus the total cost of wasting food.

⁶⁶ www.mindrematsvinn.nu

In Denmark the tax on waste brought to incineration is replaced by a new tax which can be regarded as a combined energy and CO₂ tax. Food waste sorted is not covered by municipal authorizing rules, e.g. the operators can use collection and treatment services of their own choice.⁶⁷

3.1.4 Regulatory instruments within the Nordic region

The most important instruments affecting the hospitality sector is the HSE (health, safety and environment) rules and “Internal control”. The rules are regarded as strict and operators might be closed if rules are offended!

The food safety regulation is the key legislation for the hospitality sector. Prevention of avoidable food waste is not the primary aim of these legislations, but the rules might have an impact on avoidable food waste. Rules, for example related to food storage etc. might also be a good basis for avoidable food waste reduction.

Based on the regulations the hospitality sector in the four countries have developed practical tools for the hospitality sector, often in cooperation with the food safety authorities, like in Finland:

In cooperation with the Finnish Evira, the Finnish food safety authority, MaRa has produced a self-regulation guide for the hospitality industry. These guides have an EU status of “national good practice” and e.g. hygiene inspections must be done according to the guide. Food self-regulation guide includes guidelines on purchasing of raw materials, logistics, handling, storage, food preparing, serving, cleaning, waste, water use, measuring temperatures, staff hygiene, health certificates, hygiene knowledge, food poisoning, documentation etc. The guide does not give information about avoidable food waste as such as it is concentrated on the hygiene aspects.⁶⁸

The Finnish example illustrates the fact that food safety has an influence on avoidable food waste, but the issue of avoidable food waste has not been focused so much as such, so far. According to MaRa such a guide might easily be expanded to cover the issue of avoidable food waste.

⁶⁷ Miljøstyrelsen – Forundersøgelse af madspild i Danmark – B. Kjær, M. Werge/Copenhagen Ressource Senter – 2010.

⁶⁸ www.evira.fi/portal/en/evira, MaRa memo 2011

An example from the hospitals in Finland underlines the fact that food prevention guidelines can be developed in line with legislative requirements. A guide for hospital staff was made as a tool for avoidable food waste reductions in connection with a change from disposables to reuse plates etc.⁶⁹

Within the hospitality sector the method HACCP is common, e.g. Hazard Analysis and Critical Control Points. In Norway courses are developed by industry and Kost- og ernæringsforbundet based on this method. Such education is again based on national legislation.

Other quality standards implemented, like ISO 14001 are sometimes followed up together with the legislation:

Sodexo in Norway says the company in this way links legal requirements to voluntary business standards.

Some representatives from the hospitality sector feels strict food safety rules and routines might generate more food waste than necessary, e.g. requirements saying that prepared food has to be wasted if not sold/ consumed within a certain time. Some companies are also frustrated as the requirements from inspectors are unpredictable and might vary from time to time and place to place. Having such a strict regime related to food safety, but no legislation against wasting food nor any similar tough consequences when discarding food, it might be questioned whether it is too easy to waste edible food within the hospitality sector today: Is wasting food been too acceptable?

According to the interviews made, some organizations have planned to make guides for their members on how to reduce avoidable food waste. However the plans did not come through as the organizations did not want to risk the consequences if the guide said anything wrong that could be regarded against food safety legislation!

According to the survey 16% says that more flexibility in the legislation is important in order to reduce avoidable food waste, another 13% says that same practice within the whole country is important, but just 5% says it is important to change the legislation.

Waste regulations

Waste regulations in EU and in the four Nordic countries are for the most not directly focused on prevention, but related to limiting land-filling of organic waste with an objective to reduce GHG emissions from landfills.

⁶⁹ YTV 2009: Welfare and Health. It's smart with less waste, www.ytv.fi

Any obligation to sort organic waste is now more related to the treatment of food waste rather than preventing the generation of this waste.

The responsibilities regarding food waste collection and treatments differ between the countries. In Norway and Denmark, the municipalities have responsibilities just for food waste stemming from households.

Instruments stimulating investments in composting and biogas plants might be good for better treatment of food waste. On the other hand the focus on correct sorting and the improved treatment opportunities might have had another consequence; less focus on prevention of food waste! As long as the food waste ends up as biogas and compost, wasting food might also in this way be regarded as more acceptable in our society today! Some reports propose however that sorting of food waste also has a positive impact on prevention as the amount of avoidable food waste is getting more visible.

The required national waste and prevention plans according to the EU Waste framework directive might be a good basis for both better treatment of food waste and for a reduction of avoidable food waste, also from the hospitality sector. This report might be a basis for such prevention plans.

3.1.5 Communicative instruments within the Nordic region

National targets

In Sweden a reduction target of 20% for food waste has been proposed as part of the national targets for environment. The Government is expected to discuss this food waste reduction target as part of the Swedish environmental target system during spring/ summer 2012. The proposed milestone target is fixed for 2015 with 2010 as a basis. As the target comprises all food waste, it is calculated that the 20% target equals a 35% reduction of avoidable food waste/ avoidable food waste. The target comprises all sectors in society, including the hospitality sector. It is calculated that the target means a 35.000 tons reduction of food waste and a benefit for society of SEK 12–23 bn. A target of 40% is proposed for biological treatment of all food waste.^{70, 71}

⁷⁰ Sanna Due, Naturvårdsverket, Svenska strategier och initiative för tt minska matsvinnet, a presentation in Oslo, 15.11.11.

⁷¹ Miljödepartementet, etappemål i miljömålsystemet. SOU 2011:34, <http://www.regeringen.se/sb/d/14454/a/165232>

SHR is positive to increased focus on avoidable food waste and also national ambitions and targets. According to SHR increased knowledge and competence both among players in the market and among food safety inspectors might help to stimulate more actions and thus achieving the targets.

According to the survey 44% says fixing their own prevention targets is the most important future action for reducing the avoidable food waste. Fixing prevention within the hospitality sector might be stimulated by national, Nordic and even EU reduction targets. (See more details about the survey in chapter 5).

Supporting initiatives from industry

In Norway the Government has supported the ForMat initiatives taken by industry.

The project is financed by industry and Ministries of Agriculture and Food and Ministry of Environment and Innovation Norway. The objective is to reduce the avoidable food waste by 20% within 2015 (2010 as basis). Depending on future financing, ForMat also plans to focus on the hospitality sector.

The hospitality sector is already involved in the process; Sodexo was one of the speakers at the last FORMAT conference 2011.⁷²

Best practice – exchange of knowledge

Food waste and avoidable food waste have been on the agenda in Sweden for some years. Several organizations have been active and now about 30 organizations take part in the network “SaMMa” (Samverkegruppen för minskat matavfall). The group discusses issues on avoidable food waste and exchanges experiences and knowledge. Also organizations involved in the hospitality sector are involved in “SaMMa”:

- Hushållningssekskapet
- SHR

⁷² <http://www.nhomatogdrikke.no/format/>

SHR taking part in "SaMMA" regards this as a very constructive cooperation where all stake holders can exchange experiences.

National authorities are also well represented; Ministry of Environment, Swedish EPA (Naturvårdverket), National Food Agency (Livsmedelsverket) and the Ministry of Agriculture and the Ministry of Rural affairs. This cooperation might be regarded as the "driver" for reducing avoidable food waste in Sweden.

"Mindre Matspild" Charter

The Ministry of Environment established in March 2010 the "Initiative group against avoidable food waste" in Denmark. The aim has been to involve stakeholders in the food value chain to involve and commit themselves to the avoidable food waste issue on a voluntary basis. In June 2011 the partners signed a charter in order to reduce avoidable food waste. Each participant has committed itself to take three initiatives within 2012.

The hospitality sector was represented within the initiative group by Scandic, McDonald's Danmark AS, Jensens Bøfhus and Compass Group Danmark.

Compass Group has based on the charter developed a prevention program with a central register, TRIM TRAX for their Eurest canteen operation. The program was fully implemented in October 2011. Avoidable food waste prevention awareness campaigns towards guest will also be organized as part of this program. Eurest cooperates with other stakeholders on this issue too.

The Danish Ministry of Environment has also supported prevention campaigns on avoidable food waste in general. Avoidable food waste was one of key elements in this "Brugmerespildmindre" campaign.⁷³ This campaign is also evaluated in an open report.

Studies

Several studies on the topic food waste and avoidable food waste have been commissioned by the Governments in the four countries. These reports are also referred to in this report.

⁷³ <http://www.brugmerespildmindre.dk/>

Other Ministries and Directorates involved

Not only the Ministries of Environment and the Environmental Protection Agencies have been active on the avoidable food waste issue. In Sweden also the National Food Administration (Livsmedelsverket) has made reports to increase knowledge on the issue avoidable food waste.⁷⁴ Work is also going on to integrate the avoidable food waste issue into the general work towards food services at schools and social care. The National Food Administration is also identifying areas for improvements in legislation in order to reduce avoidable food waste.

As already mentioned the Swedish Board of Agriculture has been involved supporting campaigns.

The avoidable food waste issue is thus a topic that is related directly and indirectly to several Ministries and Public Directorates.

3.2 Initiatives taken by the Nordic hospitality sector

This chapter comprises initiatives taken by the hospitality sector itself and initiatives taken by others whereby the hospitality sector participates. Sometimes it is difficult to know who exactly invented the wheel – the most important here is to describe what the hospitality sector is doing in order to reduce their avoidable food waste, the results and their further plans.

Initiatives mentioned are not limited to special actions and projects with the aim directly to reduce the avoidable food waste, but this chapter also includes overall policies, general routines and actions with relevant impacts on the amount of avoidable food waste.

This chapter is based on literature, interviews and the survey undertaken in January 2012.

3.2.1 *A general attitude to the avoidable food waste issue*

According to the Danish Diet & Nutrition Association in 2011 the awareness within the hospitality sector of the avoidable food waste issue is high;⁷⁵

⁷⁴ Livsmedelsverket – Livsmedelsvinn i hushåll och skolor – en kunnskapssammanställning – R. Modin/Livsmedelsverket – 2010.

⁷⁵ Kost- & Ernæringsforbundet – tal fra 2011, from Stop Wasting Food.

- 94% of canteen leaders say they are aware of avoidable food waste and do something to reduce the losses
- 16% says they know exactly how much food is lost
- 74% says they have a feeling on how much food is lost
- 19% says they have avoidable food waste from food not yet prepared
- 95% says most food is wasted “outside” the kitchen

The interviews of organizations within the hospitality sector also showed a great interest and a positive attitude towards the topic of avoidable food waste.

According to the survey 47% says they have ambitions/ targets related to reducing avoidable food waste.

On the other hand, some organizations expressed some fear about the risk that actions on avoidable food waste prevention might increase the health risk or at least violate food safety regulations and/ or create conflicts and bad image instead of a positive reputation. The overall challenge is thus to find ways to both reduce the avoidable food waste and keep the high standards related to food safety. The aim of this report can thus be to lead the way out of this “inability to act situation” and to bridge the two important fields; food safety and avoidable food waste.

3.2.2 Overall strategies, objectives and commitments

Normally reducing “avoidable food waste” is not mentioned as part of overall strategies. However several organizations mention “waste reduction” as an overall ambition. Sodexo is even more focused:

Sodexo has a global plan for sustainability; the Better Tomorrow Plan. This plan includes 14 commitments, including a promise to reduce the amount of organic waste and support initiatives for recycling of this waste.⁷⁶

The Sodexo plan underlines that global companies within the hospitality sector include avoidable food waste prevention even in their overall strategies.

⁷⁶ <http://www.sodexo.no/dk/Sodexo-Norge/Miljo-og-samfunnsansvar/The-Better-Tomorrow-Plan/Vi-gjor/>

Commitments to reduce avoidable food waste or sort food waste

This study has not found any concrete commitments (in % or kg) to reduce avoidable food waste within the hospitality sector. However the whole food industry in Norway has and overall target:

As mention Norwegian Industry (several organizations) has through ForMat project committed itself to a national 25% reduction in avoidable food waste within 2015, compared to 2010. So far the hospitality sector is not directly involved. On the other hand, their suppliers of food and beverages are committed, e.g. the value chain has already committed itself!⁷⁷

Commitments within the hospitality sector are normally more related to sort their waste in general and sometimes also to sort their food waste.

In Sweden McDonalds has a policy to sort their food waste. However some municipalities do not offer such a service. In the same way Rica hotels in Norway want to sort their food waste at every hotel, but struggle to find solutions within some regions.

3.2.3 Environmental certifications and eco-label

According to the survey 70% says they are certified or part of an eco-label. The organizations have chosen different standards and some use the Nordic eco-label.

According to the survey only 15% says environmental certification is an important part of their work today reducing the avoidable food waste. Just 5% says certification is an important part of their further work in the future in order to reduce avoidable food waste.

On the other hand the survey concludes that fixing reduction targets, assessing and reporting on avoidable food waste, training and implementing better routines are key activities for further reductions. All these activities can be regarded as elements of a certification program. An environmental certification might thus be regarded as a possible basis for the avoidable food waste prevention work. As can be seen below, certification programs focus on many environmental issues, avoidable food waste reduction is in some cases not even mentioned. It is up to the hospitality sector to integrate the avoidable food waste into their chosen certification program. The certification systems might also review their focus areas.

⁷⁷ <http://www.nhomatogdrikke.no/om-format/>

ISO 14000

Some companies have implemented the ISO 14001 standard, a system whereby the certified company has to fix targets and document annual improvements. This might include efforts related to loss of food.

ISO 14001 has in some cases been implemented based on a requirement for customers:

ENTRA Eiendom in Oslo (owner of the Postgiro building) had such a requirement as part of their tender on canteen services. Sodexo, Norway was thus ISO 14001 certified in 2011.

Nordic Choice, the hotel chain, has ISO 14001 certified all their 160 hotels in Scandinavia.⁷⁸

Eurest in Denmark is ISO-certified and the company is thus committed to improvements, e.g. the avoidable food waste shall be reduced as follows as an overall target for all canteens:

- 3% in 2013
- 5% in 2014
- 7% in 2015

The environmental management system of ISS in Denmark is also ISO14000 certified, including also a commitment to deliver Eco-labelled canteen services to customers who asks for this. Local targets and plans are also part of the concept. Catering services shall be climate neutral.

Miljøfyrtårn (Eco-lighthouse)⁷⁹

Other organisations within the hospitality sector are certified by the Norwegian “Miljøfyrtårn”. The system has developed special requirements to restaurants, canteens and hotels. The lists of requirements are however more oriented towards waste sorting and minimizing the use of disposable packaging than to prevention of avoidable food waste. This “light” certification program has had a great success in Norway and several organizations within the hospitality sector are certified:

- Catering, 6 (Example: Drammen Storkjøkken KF)
- Hotels, 112 (Example: Thon hotels)
- Restaurants, 48 (Example: Fazer Food Services)
- Nursing homes, 84

⁷⁸ www.hmsmagasinet.no

⁷⁹ <http://www.miljofyrtarn.no/>

Ecolabel

Several hotels are certified to use the Nordic Eco label. In total 410 hotels in five Nordic countries are certified.⁸⁰

Table 25: Number of hotels with Eco label in the five Nordic countries

Hotel Chain	Denmark	Finland	Iceland	Norway	Sweden	Total
Independent		9	3	4	138	154
Scandic	22	12		14	71	119
Best Western				1	63	64
Rica				31	6	37
Radisson Blu	5	7		12	9	33
Hilton		1			2	3
First					2	2
Totalt	27	29	3	62	291	412

Source Eco-label

The certified hotels have to meet the requirements of the Eco-label, including reduced energy and water consumption and less use of chemicals. Reduction of avoidable food waste does not seem to be required.

Scandic Hotels is the hotel chain with the highest number of eco-labelled hotels, in total 119. In 2011 Scandic Hotels was awarded by the Nordic Council of Ministers and environmental prize for sustainable tourism.

Also some restaurants, cafés and canteens are eco-labelled.

Green Key, Denmark

Green Key, in Danish “Den Grønne Nøgle” is an international tourism label, rewarded to companies that guard the climate and environment such as hotels, youth hostels, conference- and holiday centres, campsites, holiday-houses and leisure facilities. Green Key has for a long time been owned by Danish HORESTA. Green Key is found in 17 countries, among them Denmark.⁸¹

To obtain The Green Key the company has to fulfil a list of environmental requirements. These requirements are contained in a number of criteria. Besides environmental demands (for example to decrease and limit the production of waste, the use of water, electricity, etc.), the criteria include demands on policy, action plans, education and communication.

Green Restaurant concept comprises:

⁸⁰ <http://www.ecolabel.no/>

⁸¹ <http://www.green-key.dk/>

- follow up of the buffet in order to reduce avoidable food waste
- sorting food waste

Green Cooking comprises:

- focus on reducing avoidable food waste

Today there are 100 Green Key certified organizations in Denmark, of which 80 are hotels, including several Best Western and Comwell hotels.

In 2012, Denmark hosts the Presidency of the Council of the European Union. As a result, the Danish Ministry of Foreign Affairs will organize over 100 meetings from January 1st to June 30th, attracting more than 15.000 participants (including 400 ministers and 2000 persons from the press) visiting Copenhagen and the city of Horsens in central Jutland.

The majority of meetings in connection with the EU Presidency 2012 Denmark will be held at companies awarded with the international eco-label Green Key. Foreign Ministry Eigtveds Pakhus (the canteen is operated by Eurest)⁸² has just been approved to Green Key, while Bella Centre and Bella Sky Comwell in Copenhagen are already rewarded with the label.

In addition to venues, accommodations for the meetings will also be hotels which have met sustainability criteria for Green Key certification.

In Horsens Hotel Opus was awarded with Green Key in 2009, while the Forum Horsens is currently undergoing the process of being labelled and is anticipated to be awarded certification before EU meetings begin in May.

3.2.4 Projects and surveys undertaken by the hospitality sector itself

Projects commissioned by the Governments were listed in chapter 4.1.5. Also the organizations within the hospitality sector have implemented some studies, here is a recent example:

Unilever Food Solutions, a supplier of food to the hospitality sector has made a survey among 4,000 consumers in 8 European countries as basis for avoidable food waste prevention actions. According to this survey:

- *8 out of 10 consumers are concerned about avoidable food waste within the hospitality sector*

⁸² According to Eurest this kind of meetings often generate up to one kilo food waste per guest.

- 2 out of 3 want to know more about what the kitchen is doing in order to reduce avoidable food waste
- 1 out of 2 is willing to pay more at restaurants and canteens that care about the avoidable food waste issue

According to the Unilever report a typical restaurant wastes 480 gram food per meal served and a reduction of 20% can easily be obtained by better purchasing, storage and preparation of food. Unilever cooperates with TV 2 in Norway in promoting the ideas and results.⁸³ The 480 gram result is higher than literature referred to in chapter 3.

Rigshospitalet in Copenhagen implemented an avoidable food waste reduction project in 2011 partly based on assistance from the “Stop Spild Af Mad” campaign. During three months the food raw materials were reduced by 17% compared with the year before. The number of excess portions ordered was reduced from 12,000 to 5,000.⁸⁴

In Sweden “Skolematens venner” is active and has also made several studies on the food services within schools, inclusive the issue of avoidable food waste in schools.⁸⁵

3.2.5 Internal routines

Initiatives and actions within the hospitality sector are often closely related to management systems and routines. In this way the actions are not just “a one shot” project, but an integrated part of the operations. Below some key routines related to avoidable food waste are described.

Management reporting systems

Most companies report on avoidable food waste as part of cost control and their management reporting systems. Within the hospitality sector advanced systems follow up the cost of goods per serving. Each canteen, restaurant and hotel are measured on these key figures (besides productivity and quality) and do benchmarking with other units in the chains/industry in order to be more efficient. This management reporting systems seems to be a common and efficient tool in order to prevent avoidable food waste within the hospitality sector.

⁸³ www.Horecanytt.no 02.03.12

⁸⁴ Køkkendriftskonsulent Diana Hierbæk Gjellebøl – figures from 2011.

⁸⁵ Skolmatens Vänner, Kartläggning av Sveriges kommuner gällande de måltider som i dag serveras på landets grunnskolor och förskolor, 2011.

The measuring does normally not comprise further details on which kind of food is discarded. Such analyses could have been a good basis to find possible reasons behind avoidable food waste and for developing targeted actions and to follow up such actions, e.g. how much bread is discarded. However most of the interview partners expressed interest in doing this; e.g. undertaking analyses in order to improve their understanding and as basis for further actions.

One hotel chain in Norway has a key figure for the cost of goods (“varekost”) of 31% within its food and beverage operation. 80% of these costs are related to the kitchen, their planning, purchasing, preparation, portioning of food and routines for reuse of not served and sold food. Avoidable food waste has a strong impact on the cost of goods/ serving.

Fazer Food Services, the leading private canteen operator in Finland, introduced a new “Key Performance Indicator” system for their canteen and restaurant operations in 2011. This includes also a weekly feedback on waste generation. A simple traffic light system indicates whether the waste situation is acceptable or not.

A conclusion from the interviews is that this reporting on costs is today the strongest tool to follow up avoidable food waste within the hospitality sector. The results from the survey confirm this:

According to the survey 51% says education of staff on “varekost” is an important part of their work today reducing the avoidable food waste. Another 24% says reporting on “varekost” is an important part of their work today reducing the avoidable food waste. The survey also concluded that both these activities are important for the future. In addition the survey tells that fixing targets for avoidable food waste reduction is the most important tool for the future.

Eurest in Denmark has developed the Trim Trax registration and measuring system. Each canteen registers their purchases, production and buffet losses. The data is collected both in DKK and in volume/ litre. The system calculates the cost of goods (“Køkkenprocent or varekost”). The system also tracks the goods stocked according to dates. All canteens are obliged to register on a daily basis. The system will also be introduced in Norway and Sweden.

Systems like Trim Trax seem to be good examples and valuable tools for management in order to improve their present reporting systems. With defined targets, systems for measuring and reporting on avoidable food waste the hospitality sector might give avoidable food waste a much higher attention in management meetings on all levels.

According to the survey 21% says assessing and measuring the food waste should be an important part of their further work on reducing the

avoidable food waste. 44% says that fixing reduction target will be a key element of their future work. The measuring of the food waste is a necessary basis both for fixing the targets and for the follow up. Any target should be based on an assessment up front. This is important both for each kitchen and organization and for the whole hospitality sector and even for nations. This study has shown that defining the hospitality sector, food waste and avoidable food waste are of vital importance for any reporting system.

Incentives

The above mentioned reporting systems are common within the hospitality sector. Probably the results reported also influence the salaries and bonuses to management and staff.

According to SOKOS in Finland the bonus for chefs are based on several elements; food costs, customer satisfaction, labour costs, satisfaction of labour. Indirectly the amount of avoidable food waste is thus a part of the incentive system.

Planning the menu

According to the survey 52% says planning the menu is an important part of their work today on reducing the avoidable food waste. Planning the menu is thus the number 2 ranked action after purchasing routines. The survey also says that 36% says menu planning is important for the future in order to prevent avoidable food waste further, e.g. the number 4 ranked action on the list.

According to the survey 30% says that utilization of food not used in other recipes is an important part of their work today on reducing the avoidable food waste. Utilizing such resources is closely related to menu planning.

ISS in Denmark has developed a tool for menu planning in order to optimize the use of raw materials and food that has not been served.

At the IBM canteen in Finland, Fazer Food Services, the canteen operator, has developed a system for menu planning based on a daily feedback from the guests: What do you want for lunch tomorrow?

Planning production

According to the survey 42% says routines for planning the production is an important part of their work today on reducing the avoidable food waste. The survey also says that 30% says routines for planning the production are important for the future in order to prevent avoidable food waste further, e.g. the number 6 ranked action on the list.

McDonalds in Sweden is a typical restaurant chain having advanced production planning tools, other operators say they have such planning tools as well. This means that such restaurants can forecast the demand for different food and beverages based on historical data, the weather and other key parameters hour for hour.

Fazer Food Services in Finland says that they do not prepare 100% of the food in advance. Instead the canteens base their operation on batch production. In addition sauce and some other ingredients are added just in last minute also to minimize avoidable food waste.

Schools like Källängen and neighbouring schools of the same central kitchen have defined clear rules for ordering and cancelling meals in advance. It is also normal to punish those who do not follow the rules and thus causing avoidable food waste.

Production optimization

Within the hospitality sector operators are working in order to optimize their production and logistics, including the structure of kitchens; for example central vs. local kitchens. The structure of the production might have an influence also on the avoidable food waste along the value chain. Dependent on strategy waste generation can be moved upwards to the food producer (the central kitchen) or downwards to the local kitchen or even to the guest being served at home.

In hotels eggs and bacon are often fried on demand in the breakfast hall. The guests are often delighted by this activity and the loss of food is kept very low as the food is made on request.

According to a Danish study, food prepared far from the guest implies a lower knowledge of the guest's needs, e.g. a patient in a hospital, and thus generate more avoidable food waste.⁸⁶

At Hvidovre hospital in Denmark changes in production resulted in a 40 tons reduction of food waste, e.g. a 33% reduction. The kitchen now works as a restaurant and the patients order their meals when they want. The food is served within 45 minutes. The changes are undertaken with the same budget.⁸⁷

⁸⁶ Jordbrugsvidenskabelige Fakultet ved Aarhus Universitet (DJF) og Fødevarøkonomisk Institut ved Københavns Universitet (FOI) – fra Fødevarerministeriets konference "Det skjulte madspild" i 2011.

⁸⁷ Dagens Medicin, Miljøstyrelsens Forundersøgelse af madspild i Danmark – figures from 2008 og 2010.

Purchasing and stocking food

The turnover/ rotation of goods/food within hotels and restaurants is high, some chains have a target of 10 days rotation of stocks. The turnover rate is followed up in order to obtain an efficient operation. The FIFO principle (first in first out) is followed. This also means that food seldom expires by date. This expiry date problem, well known from studies on avoidable food waste from households, is hence not regarded as an important issue within the hospitality sector. Food that is not used is packed and labelled with a date, and stored properly, according to rules of traceability too.

According to the survey 54% says purchasing routines is an important part of their work today on reducing the avoidable food waste, in fact this was the highest ranked action taken so far. Another 35% says freezing/ stocking of unused food is important today.

According to the survey 26% says purchasing is important for the future in order to prevent avoidable food waste further. 22% says freezing/ stocking of unused food is important in the future.

*The Danish hospital Sønderborg Sygehus included the avoidable food waste issue in their tenders in 2003 as basis for a closer cooperation with suppliers also on waste prevention.*⁸⁸

Buffet management

According to the survey 24% says routines for follow up of buffets are important parts of their work today on reducing the avoidable food waste. The survey also shows that 13% says this is important for further actions in the future in order to prevent avoidable food waste.

The follow up of buffets is easier when production takes place close to the buffet or even better, the buffet is replaced by a la carte menu.⁸⁹

Eurest in Denmark has developed routines to reduce avoidable food waste from the buffets. Based on the fact that guests normally serve themselves just once per course, the number of portions on the buffet is now better adjusted to the number of guests.

ISS in Denmark explores ways to reduce the risk that guests serve themselves too much. In order to reduce avoidable food waste from the plates of the guests ISS says it is important that guests feel they can serve themselves twice if they want to.

⁸⁸ Sønderborg Sygehus 2003: Miljøkrav til leverandører. www.miljoefolkesundhed.dk

⁸⁹ Jordbrugsvidenskabelige Fakultet ved Aarhus Universitet (DJF) og Fødevarøkonomisk Institut ved Københavns Universitet (FOI) – fra Fødevarerministeriets konference "Det skjulte madspild" i 2011.

Size of portions

According to the survey 40% says serving the right portion is an important part of their work today reducing the avoidable food waste. The survey also shows that 39% think this is important for further actions in the future in order to prevent avoidable food waste.

According to interviews with canteens smaller plates and smaller serving spoons might be useful tools in order to optimize portions at buffets or other self-serving systems.

Doggy bags

According to the survey just 2% says that routines for doggy bag are important as part of their efforts to reduce avoidable food waste today and nobody answers that doggy bags might be important for further actions in the future.

Food brought home in doggy bags used for feeding dogs or other animals are not regarded as an avoidable food waste prevention activity as reduction measures only include food for human beings. However such food often is used for human beings.

Excess food for staff

Only 11% says internal routines for eating not sold food internally (by staff) are important parts of for their efforts to reduce avoidable food waste today. 8% says that such routines are important for further actions in the futures.

3.2.6 Waste management systems

Sorting food waste

According to the survey 28% says that training on environmental and sorting waste is important as part of their efforts to reduce avoidable food waste today, only 7% says reporting on waste sorting is important.

The general impression from interviews is that waste management is on the agenda within the hospitality sector. The interviews show that the focus within the hospitality sector first of all is related to sorting of waste in general and efficient and hygienic food waste solutions. This means that prevention of food waste so far has not been focused that much.

This also seems to be the case in organisations with an environmental manager; environmental reporting systems are often focusing on sorting waste rather than on preventing waste.

Some organisations are following the results on waste sorting closely, often based on statistics delivered from the waste management partner:

The Rica Hotel chain focuses on one parameter; the residual waste/ guest. In this way the quality of sorting is measured, indirectly also sorting of food waste

Several operators, like Sodexo, want to support local sorting solutions for their food waste according to their corporate policies. However the hosting company (for canteens) and the local waste management company sometimes do not have any service for separate collection of kitchen waste. According to some hotels, the local waste management companies in some cases, often a municipal operator (by law in Sweden) or a company owned by municipalities, prefer collecting just mixed/ residual waste. This undermines the idea of a national waste sorting system for hotel-, canteen- and restaurant chains. This also make it difficult to keep track on waste statistics as the local operators often also offer information on amounts waste collected. May be the lack of good local solutions is the reason for some hotels to invest in their own food waste treatment solutions.

In regions with separate collection of food waste, the solutions are often more expensive than the residual waste solutions. Organizations without a clear policy to sort the kitchen waste are thus tempted to leave the kitchen waste with the residual waste for incineration. Incentives for sorting are often missing.

McDonalds operates 221 restaurants in Sweden and serves 440,000 guests daily. McDonalds is the leading company within the hospitality sector in Sweden with a total turnover of SEK 4.5 bn. McDonalds sort their food waste for years into two fractions;

- *Food waste before food is prepared and*
- *Food waste from prepared, not sold food*

The amount of waste is followed up at each restaurant and compared with net sales in order to improve and reduce avoidable food waste. So far it has been difficult to develop a system for weight information from waste operators.

In addition some food is wasted by guests. In order to reduce the weight of the food waste from guests most restaurants have facilities for guests to empty beverages and ice in a sink. In more and more restaurants several waste fractions are sorted too. Food waste is treated in accordance with the local municipal solution. An increasing number of municipalities have separate collection of food waste, while still some collect all waste for incinera-

tion. Except from two restaurants all McDonalds restaurants sort out and deliver their oil for biofuel production, biodiesel to be used by the company's own trucks. The wasted fat is however sorted as residual waste.⁹⁰

Within the catering and canteen sector waste handling in some cases is not an included element of the contract with the customer. The waste issue is thus left over to the customer. In addition to saving the costs, the catering and canteen operators do not obtain the feedback needed on avoidable food waste, e.g. the amounts and the costs of food wasted. This waste in theory belongs to the "hospitality sector waste statistics", but in practice the waste is included in the waste statistics of the customer and thus his business and public subsector or even households.

Sorting food waste for compost and biogas

Some hotels have installed equipment for local treatment of its kitchen waste. According to the respondents sometimes the end product is usable as compost, sometimes further treatment in biogas og composting plant is needed, in some cases the treated food waste is sent to incineration. Such equipment has according to the hotels given a low pay-back period, mostly due to the compaction of the food waste treated on site. In addition the investment is regarded as a hygienic solution and both practical and pedagogic showing immediate results after just 48 hours.

Hotel Continental and Hotel Rica Park Holmenkollen in Oslo have both invested in equipment for grinding, heating and degrading of food waste. The volume of the food waste is reduced 10:1. This is mainly because much of the water in the food waste is removed by drying in the composting process. The hotels thus save costs both related to collection and the gate fee at the incineration plant. If the compost is to be sold further research and development must be carried out to ensure that the compost meets the requirements of the Norwegian fertilizer trade regulations.

3.2.7 Training of staff

According to the survey 51% says training of staff on issues related to costs, inclusive losses in production is an important part of their work today on reducing the avoidable food waste. This means that such training is the number three ranked action taken today. The survey also

⁹⁰ Johanna Schelin, Svenska McDonalds, meeting 16.11.11.

shows that 38% says this is also important for the future in order to prevent avoidable food waste further.

According to the survey 28% says training on environmental affairs inclusive sorting of waste is an important part of their work today reducing the avoidable food waste. The survey also shows that 21% says this is also important for the future in order to prevent avoidable food waste further.

The above mentioned results indicate again that the focus on costs is regarded as one of the key activities today for reducing avoidable food waste. Training on waste sorting is regarded as less important for reducing the avoidable food waste.

Hushållningssekskapet in Sweden have been very active with their training activities for the municipal operated kitchens as part of the campaign for a reduction in avoidable food waste ("Mindre Matsvinn"). The training is based on workshops with few participants. In 2011 200 people have been trained at 12 locations in Sweden.⁹¹ Results in 2011 will be summarized as basis for further workshops in 2012. Similar workshops are organized by the Martha Organization in Finland.⁹²

Eurest in Denmark says that avoidable food waste can be reduced by training staff, especially training of the chefs and the sandwich makers.

Danish Diet & Nutrition Association stresses also the importance of competence and training, inclusive LEAN, quality management, better use of raw materials and taking the seasons into account. In addition management skills like motivating and implementing are important for persons in leading positions. Last but not least interdisciplinary working, communication and understanding different cultures are important in order to obtain results on avoidable food waste prevention.

SHR experienced low interest from members in May 2011 on the issue avoidable food waste as a seminar topic. However the avoidable food waste issue is regarded as a relevant topic for education within the hospitality sector.

⁹¹ www.mindrematsvinn.nu

⁹² http://www.martat.fi/in_english/

3.2.8 Internal communication and dialogue with the guests

According to the survey different routines are regarded as key elements for reducing the avoidable food waste, such as right portioning, menu planning, right use of recipes and storage and freezing of food

In order to develop and implement these routines – internal communication, training and even a dialogue with the guests are necessary.

According to the survey 11% says that awareness /making avoidable food waste not social acceptable is an important part of their work today on reducing the avoidable food waste. Further 11% says direct dialogue with the guests is an important part of their work today on reducing the avoidable food waste. Better dialogue with guests can be regarded as a food basis for right portions. The survey also shows that 15% says that incentives are important for the future in order to prevent avoidable food waste further while 34% says awareness campaigns are important for the future success. 15% says that it is also necessary to review all internal routines also taking avoidable food waste aspects into consideration.

A good dialogue with staff and guests is important to obtain good results on avoidable food waste prevention. In addition, some guest might be worth an extra campaign.

Eurest operates the canteen of the Foreign Ministry in Copenhagen. Denmark has the presidency of EU first half 2012. A buffet on this level normally generates a avoidable food waste of 1 kg/guest. During this half year guests are informed about the avoidable food waste issue. In addition the presidency is Green Key certified.

In addition to the above mentioned training activities for staff described in 4.2.7 the conclusion is that both internal communication and dialogue with guests are important elements of the internal work in order to obtain good results on avoidable food waste reduction.

At the Källängen school in Lidingö outside Stockholm, now operated by Sodexo, avoidable food waste from the plates are measured every day and reported by a poster. Results are visualized in order to compare with results last year. The economic savings from reduced avoidable food waste are shared with the pupil of the school. The gains are invested in improvements of service according to pupil's wishes.

Figure 3: Poster at the Källängen school in Lidingö (S) illustrating avoidable food waste prevention results monthly (Photo: Author)



McDonalds in Sweden involve also their guests; at 60 restaurants the customers might sort their food waste themselves. At several restaurant guests can dispose excess beverage and ice in the sink in order to reduce the food waste

3.2.9 Food for people with needs and food banks

According to the survey only 3% says it is an important element of their prevention work today to develop routines in order to help people who might need the excess of food produced. 7% says this is important as part of further work in the future.

Maybe lack of knowledge of the food bank concept is the reason behind the low focus on this issue as part of a total food prevention program.

Food banks can be described as a redistribution centre for food, distributing edible food to people in need, often organized by charity organizations. Food banks are more and more common in other countries. There are food banks in 36 countries. In UK food banks or redistribution solutions are important elements in avoidable food waste prevention work.

A food bank in Oslo is planned by Church Mission in Oslo (Kirkens Bymisjon) in cooperation with the ForMat program.

Some food service companies support local social initiatives, such as Church Mission in Oslo and want to join in if any permanent food bank is established (e.g. Sodexo, SSP and Rica Hotels). As the infrastructure is not in place there are no good system taking care of this on an everyday basis. According to the operators the food safety regulations also limit the possibilities for supplying excess food to such a bank today. More work has to be done in order to find practical and safe solutions.

Sodexo has developed globally the project STOP Hunger. In Norway the cooperation with Church Mission in Oslo is part of this global activity.⁹³

In Sweden Allwin is a foundation operating as a redistributor of excess production from food and other products on behalf of private and public organizations and at the same time helping people with their needs. Allwin has also partners within the hospitality sector and might be an example as a possible future partner of the hospitality sector in order to reduce avoidable food waste.⁹⁴

In Denmark a food bank has been in operation since 2008: "fødevare-Banken".⁹⁵

Within SHR the use of food banks have been discussed. Due to possible conflicts with food safety regulations SHR regards the use of food banks as not yet mature for the hospitality sector.

⁹³ <http://www.sodexo.no/dk/Sodexo-Norge/Miljo-og-samfunnsansvar/Stop-Hunger/>

⁹⁴ <http://allwin.nu/>

⁹⁵ <http://www.foedevarebanken.dk/index.php?id=4>

3.2.10 Events and other external communication

Events

Events are often a powerful and efficient way of communicating. Events have also been used to promote the issue of avoidable food waste reduction. Preparing food expired by date is a powerful way of giving the message about the opportunities to reduce avoidable food waste in society. Tristram Stuart obtained huge media attention with his “Feeding the 5.000” at Trafalgar square in London.⁹⁶

The company Sodexo supported the Feed the 2011 event in Oslo in cooperation with the ForMat program and the NGO Grønn Hverdag. Sodexo prepared and served the food to all people meeting and passing by outside the Parliament building in Oslo in June 2011. Even with a limited budget this event, inspired by Tristram Stuart obtained good media coverage.

Annual reports / environmental report

Both for internal and external purposes, annual reports/ environmental reports are good channels to communicate on results compared to targets and commitments.

SSP Norway makes an annual environmental report presenting strategies, activities and results, inclusive results on waste sorting. The strategy includes reducing the amount of residual waste, but no direct objectives related to food waste prevention.⁹⁷

3.2.11 European Week for Waste Reduction (EWWR)

With the support of the European Commission’s LIFE+ Programme, the *European Week for Waste Reduction (EWWR)* was organized for the third time between 19 and 27 November 2011, with the aim of informing large numbers of European citizens about the simple actions that they can take in everyday life to help contribute to waste reduction efforts.⁹⁸

According to the last count, *7,035 EWWR actions* were implemented in 2011. Once again, the previous year’s record was broken! (4,346 actions in 2010) In order to coordinate and promote the 2011 Week, *34 organizers across 20 countries* were mobilizing stakeholders and validat-

⁹⁶ <http://www.feeding5k.org/>

⁹⁷ <http://www.foodtravelexperts.com/norway/page/about/norwegian>

⁹⁸ http://www.ewwr.eu/sites/default/files/EWWR%202011-11-16%20Press%20Release_EN.pdf

ing their actions. The EU supported EWWR is open also for non EU members as well and will be arranged also in 2012.⁹⁹

Three Nordic countries took part in 2011:

- The 21 Danish activities included prevention activities at the canteen of the University Hospital in Odense and also other canteens within this municipality. The Stop Wasting Food campaign was also on the list
- The 55 Finnish activities included a “bio waste reduction week” at schools and restaurants with measuring the waste, communication from the Martha Organization and awareness activities at hospitals in the Helsinki region
- The 174 Swedish activities included actions to reduce the avoidable food waste at schools and canteens, contests and awareness campaigns

The European character of the EWWR was reinforced by introducing *common actions* across Europe in 2011. These common actions took place during the Week in different locations in Europe using the same methods, sharing the common objective of highlighting their real impact on waste reduction. The idea is to measure the waste avoided during the actions themselves and to communicate this information.

EWWR has gathered common actions on how to reduce food waste, including a number of ideas for canteens.

The most outstanding European Week for Waste Reduction actions will be rewarded at the *European Waste Reduction Awards Ceremony in June 2012 in Paris*.

In Sweden Eurest (Compass Group) with its 120 canteens and cafés in 44 municipalities joined the EWWR in 2010 and was also awarded for their work to reduce avoidable food waste. During the period November 2009–February 2010 Eurest reported a 23% reduction in avoidable food waste per serving from 130 gram to 101 gram.

According to Eurest this project was a good opportunity to involve both employees and guest and also inform them about the environmental aspects of avoidable food waste. Based on clear messages to the guests on both volumes of waste and environmental impacts results have been achieved.¹⁰⁰

These are the most relevant lessons (2010):

⁹⁹ www.ewwr.eu

¹⁰⁰ <http://www.compass-group.se/Ansvar/Miljo/Europa-minskar-avfallet/>

- In Sweden (2010) 32% of the projects had food waste reduction as their objective
- In Sweden 87% of the partners (the individual activity leaders) evaluated the project as important, 85% as necessary. 49% say the campaign was very useful in 2010, 45% said quite useful
- Such a European campaign generates a high degree of media attention and engage different stakeholders; NGOs, industry and authorities

EWWR can be regarded as a basic infrastructure for any avoidable food waste campaign and synergies might be obtained by joining forces.

SHR has actively informed its members about EWWR to its members and promoted the good results of Eurest in Sweden.

4. Results from the survey

4.1 Overall results of survey

The survey was undertaken simultaneously in the four countries, in four languages, during January 2012. The questionnaire was distributed to operators through national organisations and other contacts referred to in the attached list of personal references. The questionnaire was developed and tested out in cooperation with organisations within the hospitality sector.

In total 289 persons answered the survey, but not all of them answered all the 34 questions.

The results of this survey must be treated with care. It is not advisable to split the answers according to different groups of respondents (nationality, type of operation etc.) as the number of answers is too limited to draw conclusions on detailed levels.

However the survey gives some clear conclusions and information about the hospitality sector:

- A high degree of certification/eco-labelling within the hospitality sector
- A high focus on waste sorting in general
- A prioritized list of actions undertaken today in order to reduce avoidable food waste
- A prioritized list of actions planned for the future order to reduce food
- A low interest for Governmental instruments beyond supporting campaigns and initiatives taken by the hospitality sector itself

Key overall information from the survey: (In some cases more answers are possible, thus some results exceed 100%):

Table 26: Key overall information from the survey

Question	Answers
Position	38% chefs, 26% general manager, 15% manager of department.
Kind of operation	76% private, 24% public
Kind of public operators	70% self-operated, 30% suppliers to others
Kind of private operator	41% restaurants, 37% hotels, 15% canteen operators, 15% bars, 14% cafés, 9% catering, 3% self-operated canteen
Coverage of answers	52% answered on behalf own operation, 48% answered on behalf of whole company
Certification	17% Eco lighthouse, 16% Eco label, 16% ISO, 17% charter/ other policies, 15% in process, 30% no policy on certification
Environmental targets	68% has targets on waste sorting, 57% on energy use, 47% sorting food waste, 47% amount avoidable food waste, 46% amount residual waste, 44% waste prevention in general, 37% amount food waste
Scope of food waste sorting	59% sort food waste separately, 39% sort out deep fat, 36% cooking oil
Food waste sorted	61% of food waste from production is sorted, 54% from guests, 46% not sold prepared food

4.2 Detailed results on food wasted within the hospitality sector

Below further the results are summarized. The tables below analyse the results for different food waste generated, in total and at different stages; production/ kitchen, prepared but not sold and waste from the guests.

The general results indicate that there is neither any single source nor any specific kind of food wasted that contributes much more than other. For each operator the results can differ, the tables also indicates a few extremes, e.g. some answers that more than 50% of the food waste stems from one source (for example the guests) or from one kind of food (for example bread).

Results from the questions related to food waste generation, % distribution of answers:

Table 27: Food waste generation, % distribution of answers

Share of food waste is generated:	<5%	5–25%	25–50%	50–75%	>75%	No answer
Production/ kitchen	25	37	11	6	4	20
Food prepared, but not sold	42	24	7	1	1	24
Guests/ plates	30	25	11	11	7	15

As can be seen the food waste is generated at all stages, but the distribution differ somewhat within the hospitality sector, for example 4% says that more than 75% of food waste is generated within the production/ kitchen.

Results from the questions related to food waste generated in production/ kitchen, % distribution of answers:

Table 28: Food waste generated in production/ kitchen, % distribution of answers

Share of food waste generated in production/ kitchen:	<5%	5–25%	25–50%	50–75%	>75%	No answer
Non edible (bones, skins etc)	26	22	14	14	16	8
Expired by date/ rotten food	51	31	6	1	0	11
Quality deviations by production	67	13	3	1	0	17

As can be seen, in total, non edible food waste contribute the most of the food waste within the production/ kitchen as several operators report high share of this kind of waste.

Results from the questions related to food waste generated from food prepared but not sold, % distribution of answers:

Table 29: Food waste generated from food prepared but not sold, % distribution of answers

Share of food waste is generated:	<5%	5–25%	25–50%	50–75%	>75%	No answer
Bread/ sliced bread	34	37	10	2	0	17
Baguettes, sandwiches	30	46	2	2	0	20
Salads, vegetables	24	51	7	0	0	17
Meat, hot-dogs, burgers	49	29	5	2	0	16
Fish	46	29	7	0	0	17
Potatoes, chips	34	37	7	0	0	22
Desserts, ice cream etc.	56	20	2	0	0	22

As can be seen, waste from prepared, but not sold food consists of many kinds of food. The answers are of course reflecting the different kind of operations and their different menus.

Results from the questions related to food waste generated from guests, % distribution of answers.

Table 30: Food waste generated from guests, % distribution of answers

Share of food waste is generated:	<5%	5–25%	25–50%	50–75%	>75%	No answer
Bread	25	42	7	1	1	22
Potatoes, chips	25	43	3	0	1	27
Rice	31	31	3	0	0	34
Not edible, bones, skins	33	33	6	4	0	24
Meat	36	37	4	0	1	21
Fish	40	31	1	0	1	25
Salads, vegetables	19	55	4	3	1	16

As can be seen, waste from the guests consists of many kinds of food. In general it is thus difficult to pin point a typical food residue wasted by guests.

4.3 Actions taken today in order to reduce avoidable food waste

On the question what are the most important you are doing in order to reduce the avoidable food waste, these where the answers:

Table 31: The most important actions according to operators for their efforts today on avoidable food waste reduction

Answer	%	Comments/ references in report
Purchasing routines	54	4.2.5
Menu planning	52	4.2.5
Internal education/training on costs (cost of food/total costs)	51	4.2.5, 4.2.7
Production planning	42	4.2.5
Routines for right portions	40	4.2.5
Storage routines	35	4.2.5
Utilize food not used in other recipes	30	4.2.5
Training on environment and sorting waste	28	4.2.6
Routines for following up buffets	24	4.2.5
Reporting on costs (cost of food/total costs)	24	4.2.5
Use of recipes	19	
Environmental certification	15	4.2.3
Dialogue with guests	11	4.2.8
Routines for leftovers for internal use	11	4.2.5
Not social acceptable to waste food	11	4.2.8
Reporting on waste sorting	7	4.2.6
Routines on excess food for distribution to other people with needs	3	4.2.95
Doggy bag routines	2	4.2.5

The list gives an indication of activities today and the prioritization of different measures based on a given list in the questionnaire. As can be seen from the right columns, the results are described further in chapter 4.

4.4 Actions planned for the future in order to reduce avoidable food waste

On the question what will be the most important further actions in order to reduce the avoidable food waste in the future, these were the answers:

Table 32: The most important actions according to operators for further actions in order to reduce avoidable food waste

Answer	%	Comments/ references in report
Fix targets for avoidable food waste reduction	44	4.1.5, 4.2.1, 4.2.5
Routines for right portions	39	4.2.5
Internal education/training on costs (cost of food/total costs)	38	4.2.7
Menu planning	36	4.2.5
General awareness campaigns on avoidable food waste prevention	34	4.2.8
Planning production	30	4.2.5
Purchasing routines	26	4.2.5
Freezing and storage routines	22	4.2.5
Reporting on costs (cost of food/total costs)	21	
Training on environment and sorting waste, incl. on avoidable food waste	21	4.2.7
Assess and measure the food waste/ avoidable food waste	21	4.2.5
Introduce incentives for reducing avoidable food waste	15	4.2.8
Review legislative requirements and routines taking avoidable food waste issue into account	15	4.2.8
Routines for following recipes	15	
Follow up buffet routines	13	
Reuse of excess production and leftovers	13	
Routines for excess production for internal consumption	8	4.2.5
Routines on excess food for distribution to other people with needs	7	4.2.9
Better routines for waste sorting	6	
Introduce environmental certification	5	4.2.3
Routines for reporting and follow up waste sorting	4	
Doggy bag routines	0	4.2.5

As can be seen from the right columns, the results are described further in chapter 4.

It is interesting to see that fixing targets for avoidable food waste reduction is the highest prioritized action as basis for the future.

4.5 Actions to be taken by the Government

The operators were also asked about their opinion on possible instruments and actions to be undertaken by Government:

Table 33: The opinion of operators to possible instruments and actions to be undertaken by Government

Answer	%	Comments/ references in report
Economic instrument: Financial support to campaigns and training	26	
Regulative instrument: More flexibility in the legislation	16	4.1.4
Regulative instrument: Same practice for whole country	13	4.1.4
Economic instrument: Financial support to research and projects	12	
Regulative instrument: Change legislation	5	4.1.4
Economic instrument: Taxes on avoidable food waste	3	
Regulative instrument: Ban on avoidable food waste	3	

According to survey and interviews the hospitality sector in general is reluctant to any interference by Government in order to reduce avoidable food waste. Most operators say that the hospitality sector might solve the avoidable food waste issue themselves.

However some support is welcome from the Government. The most popular instrument is Governmental financial support to campaigns and training.

The survey also tested out the response to more radical instruments; taxes on avoidable food waste and a ban on avoidable food waste. Such strong instruments were not appreciated at all.

Both the survey and the interviews showed some frustration related to legislation; for example a lack of flexibility and willingness to find practical solutions. Furthermore the larger companies are frustrated by different practice between food administration inspectors operating in different areas of the country.

4.6 Expectations from the guide

The operators were also asked about what kind of information should be included in the planned guide:

Figure 34: The opinion of operators on what kind of information should be included in the planned guide

Answer	%
Practical advices on how to reduce avoidable food waste	34
The impact of avoidable food waste on the environment and society	26
Proposals regarding motivating staff and incentives related to avoidable food waste reduction	19
How to organize the process	16
How to measure avoidable food waste	14
How to sort food waste	13
Competitions in order to win	11

As can be seen the survey tells that practical advices is the most wanted information wanted for the guide. See chapter 7 for more information about the guide.

5. Proposals and new ideas on avoidable food waste prevention

5.1 Feedback and proposals from hospitality sector in general

All the initiatives described in chapter 4 underline the fact that the hospitality sector think avoidable food waste is an important issue. Much is done and the operators have further plans in order to reduce avoidable food waste.

If the Government shall use any instruments, the hospitality sector often stress that they want more positive stimulation than rules focusing on negative sanctions. This is regarded as an important message in order to motivate the organisations and the staff.

Many companies feel obliged by law and also by internal routines to waste too much food.

Regarding the existing regulations and the system with inspections the hospitality sector signals a need for more dialogue with the inspectors from the Food Administration and a fruitful discussion on actions and best practice solutions related to food waste prevention.

Operators also ask for more flexible rules related to compulsory discarding of edible food. Further the operators are positive to make use of food banks, but such a use also need legal and practical clarifications.

Some operators are frustrated due to the lack of local food waste collection. Stricter rules for separate collection are thus wanted.

5.2 Need for further efforts to reduce avoidable food waste?

Chapter 4.2 shows that several initiatives have been undertaken by the hospitality sector during the last years and that the operators have plans for further actions.

Some results are documented. Anyway experiences so far underline the huge potential for further reductions. Some improvements can be made based on simple changes in routines; sometimes just a change of the size of the serving spoon! Other improvements are results of long term focus and staff training and even changes in business concepts.

Based on the interviews and the survey it can be argued that the hospitality sector will continue its work to reduce avoidable food waste and that the sector in general does not need any Governmental instruments due to:

- High media and guest attention to the issue of avoidable food waste
- Concrete customer demands for improvements and environmental standards
- Long term strategies and commitments made by the larger operators to different certifications, eco labels, green key etc.
- Smaller operators will follow the leaders based on best practice work within the sector
- Reducing avoidable food waste often gives a reduction in costs

On the other hand it can be argued that instruments are needed due to:

- Avoidable food waste in society is an important environmental issue – further reductions are both important and possible to achieve. The results give positive benefits to society
- The new EU prevention ambitions and the target of 50% require more action. Going beyond the reductions obtained so far requires new thinking and concepts for preparation and serving food
- Based on possible binding EU-targets, Governments have to develop and follow up national targets. Such targets require at least statistics and reporting systems
- Already Member states are obliged to develop general prevention plans as of 2013 due to the Waste framework Directive. Avoidable food waste reduction is anyway a part of this work. Furthermore the new EU resource efficiency policy will require even more efforts from the Governments, probably also on issues related to food
- There are still some conflicts of interest between the two ambitions; food safety vs. avoidable food waste prevention. It is thus a need to join forces and build bridges between two important goals for society. Still it is regarded too easy to discard edible food!
- Discarding food is relatively cheap and thus not an important factor to reduce avoidable food waste compared to the potential extra revenues by selling more food available

- Wasting food can be regarded as more acceptable in society as new biogas solutions are introduced and promoted. More attention on avoidable food waste prevention is thus needed for the sake of balance
- It is a need for an infrastructure in order to utilize all food better, incl. a system for food banks/ redistribution of food. Just like recycling stations for packaging, food banks might be a natural part of the infrastructure in society; for the food industry, retailers and the hospitality sector

5.3 Proposals and ideas for further initiatives and instruments

Avoidable food waste reduction is regarded as an important part of national overall prevention plans. Such plans need defined ambitions – the EU target on food waste reductions gives a basis for such national targets. Instruments listed might be combined and also considered together with other instruments as the avoidable food waste issue within the hospitality sector is linked to several other issues.

In this chapter alternative instruments are described briefly as possible national instruments, but in some cases a Nordic reinforcement is relevant:

- In order to coordinate and reinforce activities a Nordic avoidable food waste reduction target might also be developed as part of a joint Nordic food waste prevention ambition and possible joint plans
- A Nordic cooperation might strengthen the Nordic position within EU; both on prevention policies in general and on the new avoidable food waste issue
- A Nordic cooperation might also be a basis for a stimulating competition between the Nordic countries, and also between hotels, restaurants and other organisations within the region. Competition creates both energy and attention, inclusive media attention. Competition is also a good basis for awards that might generate even more motivation and attention. An initiative based on some competition between the countries is thus regarded as a positive approach

5.4 Economic instruments

Based on national ambitions and targets it might be expected that the Governments stimulate some fundamental actions, e.g. financial support to:

- Awareness campaigns
- Training of staff and students both within the hospitality sector and among inspectors and National Food administrations
- Other avoidable food waste reduction initiatives and projects initiated by others
- Research in general
- Developing better statistics and methodology, incl reporting systems (See BIOIS proposal for EU 4.1.2)
- Developing an infrastructure of food banks/ redistribution of food

Taxes on waste generation or taxes on different kinds of waste treatment might also be evaluated in order to stimulate waste prevention in general. However such taxes based on the “pay as you throw” philosophy might be more appropriate for increased sorting than for increased prevention.

VAT regulations have already been adjusted in some of the countries. VAT regulations and other taxes should anyway be reviewed in order to remove any unwanted impacts on avoidable food waste. This is however a political issue as it is related to the competition between the service trade and the hospitality sector and between professional and the public self-operated canteens.

5.4.1 *Regulatory instruments*

Extended producer responsibility

Extended producer responsibility (EPR) is a well-known key instrument in Europe within the waste sector. Such an instrument might also be developed for food. In this way the producers, the whole value chain for food production, preparation and distribution get a certain responsibility for:

- Take-back and treatment of food waste according to national/Nordic targets
- Prevention of avoidable food waste according to national/Nordic targets

Such an EPR solution can be based on voluntary agreements and/ or legislation. The above proposal assumes that both treatment of food waste and reduction of avoidable food waste can be included in the same

instrument, as the two activities are closely linked together: Reduced avoidable food waste mean also reduced amount of food waste to be collected and treated. Voluntary agreements might be a good option within the private for profit sector as the operators are well organized in national associations. Public operators are not that well organized.

An EPR instrument does not mean that “producers” shall cover all costs related to waste treatment, campaigns etc. The idea is rather to obtain a commitment from “producers” in order to contribute on these issues in a structured and efficient way over many years to come, e.g. towards 2025.

Alternatively an EPR solution might be limited to avoidable food waste prevention according to some national prevention targets, and/ or specific targets for different sectors, such as the hospitality sector.

Compulsory prevention plans and reporting

Alternatively to the above mentioned collective EPR solutions, compulsory prevention plans for all companies might be a possible solution. This can include all organisations or just the largest organisations within some special segments only. Reporting of avoidable food waste and food waste might also be compulsory. Such an obligation is also related to any new methodology for avoidable food waste and food waste statistics to be developed and harmonized within EU.

Food banks

Alternatively local food banks can be established whereby operators with a certain amount avoidable food waste are obliged to finance and use these banks/ redistribution solutions.

Reviewing and developing existing legislation

As part of a general avoidable food waste reduction policy, food safety legislation and systems should be reviewed in order to identify possible improvements to reduce avoidable food waste without reducing the ambitions on food safety. In addition further avoidable food waste prevention actions might be integrated in these regulations.

Zero avoidable food waste ambition

A general ban on wasting edible food from the hospitality sector (and retailers etc.) might be evaluated in order to stress the importance of reducing avoidable food waste. Such rules might be combined with an obligation to report any violation of such an ambition/ ban. Such a ban might also be combined with a compulsory use of food banks. At least a general Zero ambition for avoidable food waste might be a basis for best

practice operations within the hospitality sector, whereby avoidable food waste is regarded as a deviation from normal good operation and thus reported. Such reports can be regarded as a perfect tool for internal learning and for further improvements.

5.4.2 Communicative instruments

Most of the economic instruments mentioned in 6.3.1. might be regarded as communicative instruments as well. In addition other instruments are:

Statistics as basis

It is recommended that the Nordic countries work for a European standardization of methodologies for calculating food waste quantities at member state level to ensure comparability. This standardization is also a basis for better statistics, more attention of the avoidable food waste issue and a basis for developing prevention targets and reporting. A close cooperation between Nordic countries might be an efficient way to improve statistics both for the Nordic countries and for EU.

Targets as a strong communicative instrument

Based on good definitions, statistics and reporting systems, national prevention targets might be developed further. Avoidable food waste reduction targets for the hospitality sector might be part of such a target hierarchy. The targets will be an important part of overall prevention plans. It is important again to stress that the hospitality sector is closely linked to other sectors as operations, food and waste-streams, are linked together.

Promoting both food and the hospitality sector

Reducing avoidable food waste does not need to be regarded as an isolated project. Inspired by the British “Love Food Hate Waste”-campaign, prevention of avoidable food waste, can be combined with other initiatives in society, e.g. promotion of:

- Enjoy food
- Nordic and local food
- Hospitality sector
- Packaging optimization
- Food safety
- Healthy food

5.4.3 Other ideas in order to reduce avoidable food waste

All environmental standards and eco-label should be stimulated to give priority to the issue of avoidable food waste reductions. As many leading companies are certified this might be an efficient strategy to implement the avoidable food waste issue into other systems and routines within the hospitality sector. The examples in chapter 4.2.3 on ISO certification and Green Key underline that avoidable food waste reduction measures are and can be integrated in standards.

6. The concept of the guide

6.1 Reported needs from the hospitality sector

According to the survey 34% of the respondents (see chapter 5) wanted that the guide should include practical advices on how to reduce avoidable food waste. This was also the original idea of the guide and thus also the core content of the brief guide.

Some respondents also wanted that the guide should comprise how to organize their internal process, how to motivate and give incentives to the staff and how to measure avoidable food waste. These topics are also briefly included in the guide on a general level. As regards how to organize the work it is important to stress the fact that the hospitality sector comprises a variety of operations, from just one employee to global companies of 70,000 employees.

Some operators also wanted to include a description of the environmental impacts of avoidable food waste and information on how to sort food waste. Information on environmental impacts is however regarded as background information and therefore covered very briefly in the guide. According also to other feedback from the hospitality sector the guide is more related to the overall business objective of efficiency than to environmental affairs in general. Reduction of avoidable food waste is thus regarded as a positive opportunity to improve the efficiency and the economic results of the operators rather than relate avoidable food waste to global environmental impacts. To keep it simple the environmental aspects are therefore less focused in the guide itself. Environmental aspects might however be given more focus when promoting the idea of avoidable food waste reductions in general and when reporting on results.

The guide is also regarded as a feedback to all organizations that kindly contributed with information to this report in general and also testing, distributing and answering the questionnaire in the survey.

6.2 Other lesson from the hospitality sector

Based on the interviews here are some general lessons from the avoidable food waste prevention work in the four countries that are relevant also for the guide:

- In order to motivate staff initiatives have to be communicated through key personnel/local leaders. The daily meeting with staff is an important place for dialogue
- Local leaders and personnel are confronted by several initiatives and requirements. The most important issue for leaders is related to costs whereby avoidable food waste is related to the costs of the goods to be reported. As avoidable food waste increases the costs, it is a good idea to link avoidable food waste to the routines and reporting of losses in production
- Buffets generate normally more food waste than “a la carte”. On the other hand hotels experience that the cost of avoidable food waste is lower than the cost of manpower saved by operating a buffet instead of “a la carte”. This is regarded as a challenge for the food waste prevention work
- In some of the larger companies all staff is trained by e-learning, and tests are also done by computers. In order to teach and motivate staff, e-learning might be extended to avoidable food waste initiatives
- Avoidable food waste reduction campaigns have to compete with other issues on the agenda. To obtain attention any activity has to be associated with something positive and motivating. (Like Love Food – Hate Waste and www.matglädje.se)

6.3 How to use the guide

The idea of the guide is that it can be distributed by internet through all the organizations that have been involved in the project and that these organizations and their members might download the guide for free.

Each organization might either use the guide as it is or adjust it to their own activities and campaigns – e.g. use what they want from the guide. This idea is based on the fact that the hospitality sector comprises very different kinds of organizations and operations; some is very advanced regarding avoidable food waste, while others have not started their work on this issue yet.

In order to use as much as possible of the guide in an efficient way, each organization should have opportunity to pick the most relevant information and also integrate the messages into their own way of communicating with and training their staff.

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Prevention of food waste in restaurants, hotels, canteens and catering

This report covers and describes all kinds of operations preparing and serving food outside private homes, we call all these operations the “hospitality sector”.

According to Danish and Finnish statistics it might be concluded that one third of all food is served within the hospitality sector. This means that the hospitality sector is important also when it comes to fighting avoidable food waste in society.

Due to the fact that the hospitality sector is complex and comprises various kinds of activities and organisations, the report contains a thorough description of this sector in each of the four Nordic countries.

Based on different methods the amounts of food waste and avoidable food waste are calculated in order to illustrate the situation of avoidable food waste within the hospitality sector in general and for different segments. The analyses conclude with a best estimate for total avoidable food waste in the four countries of 456,000 tons, e.g. about 18kg/ inhabitant. The differences between available reports underline a need for better statistics, including better definitions and reporting systems.

Prevention of avoidable food waste is an important environmental issue. Each country will be affected of new EU ambitions on avoidable food waste reduction. Further, every member state has to develop waste prevention plans for 2013. New EU strategies on resource efficiency will probably also comprise the issue of avoidable food waste. The report describes initiatives taken both by Governments and operators in the market. Both EU and some countries are also about to define reduction targets on avoidable food waste. Many operators within the hospitality sector are active as well in order to reduce their avoidable food waste, both in order to reduce their costs and reduce the environmental impacts of food that is not eaten by humans.

The report concludes that new instruments are needed in order to meet overall avoidable food waste targets, to reduce environmental negative impacts and obtain benefits for society. Instruments are also required in order to bridge the ambitions and rules related to food safety and avoidable food waste prevention. Different economic, regulative and communicative instruments are listed without concluding on which instrument or package of instruments that should be chosen. The report proposes that national instruments might be reinforced and coordinated on a Nordic level.

The project results consist of a report and a guide. The guide includes practical advices for the operators within the hospitality sector. The report and the guide are partly based on information gathered from interviews and a survey undertaken in the four countries in January 2012.