



Analysis of Max Burgers AB's carbon footprint for 2017

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Summary

During the spring of 2018, Max Burgers AB – in collaboration with U&We, Sweden's most innovative sustainability consultancy – undertook a greenhouse gas emissions assessment of its business operations. The company's aim is to inspire hope with regard to climate change. The specific goal of this assessment was to comply from June 2018 with the requirements for carbon neutral products in the ISO 14021:2017 standard relating to self-declared environmental claims. Furthermore Max Burgers intends to compensate for greenhouse gas emissions by 10% over and above the level needed for carbon neutrality so that the burgers have a positive climate impact.

The assessment is based on input data from Max and its suppliers, together with emission factors from recognised databases and publicly available studies relating to the carbon footprints of food.

Max reports the entire carbon footprint of its meals on its website and on some of its menus. This helps guests choose the food which has the smallest carbon footprint.

Max was an early mover in switching to wind power for its electricity. In addition, it has successfully introduced new vegetarian products in the last two years. During the last ten years, Max has offset the carbon footprint of its own operations and those of its suppliers and farmers. This carbon offsetting is done through tree-planting with smallholders, which also reduces pressure on natural forests.

Max's total carbon footprint in 2017 was about 135,000 tons of carbon dioxide equivalents (CO₂e) per year. The assessment showed that of the total carbon footprint, from the farmers' soil to the guests' table, including guests' travel and waste etc, it is beef that has the greatest impact on the environment. Almost 53% of the carbon footprint comes from beef, while transport and travel only account for about 10%. Compared with 2007 Max's total carbon footprint has increased. However, per Swedish krona of sales the emissions have declined by about 15%¹.

¹ Based on carbon footprint adjusted for different conditions during the period. The calculations for previous years have been re-worked to reflect conditions during 2017.

The proportion of fossil-derived carbon dioxide in the production of beef is less than a quarter of Max's total carbon footprint (expressed as CO₂e). This means that just ending fossil fuel consumption would not reduce Max's carbon footprint significantly: it is also essential to reduce the emissions of methane and nitrous oxide.

Responsible at Max Burgers	Kaj Török, Information and Sustainability Manager
Companies included	Max Burgers AB together with its subsidiaries and all its franchisees
Company boundaries	The entire business operations of Max Burgers AB – 125 restaurants in six countries (Sweden, Norway, Denmark, Poland, Egypt and the United Arab Emirates) of which about 90% are directly owned by Max and the remainder are owned by franchisees. However Max products sold in supermarkets are not included.
Assessment boundaries	The company's entire operations, including upstream and downstream emissions arising from raw materials purchased and goods sold.
Description of operations included in the assessment	Max Burgers AB is a burger chain in Sweden with 125 restaurants and over 40 million guests each year.
Scope of the assessment	All emissions (scopes 1, 2 and 3) based on the principle of operational control defined in the GHG Protocol Corporate standard.
Method selected for the assessment of compliance	Third party validation by auditors Ernst & Young
Period of operation	1 January 2017 – 31 December 2017
Standards for greenhouse gas assessment	ISO 14067 Carbon footprint of products GHG Protocol Corporate Accounting and Reporting Standard, Corporate Value Chain (Scope 3) Standard and Scope 2 Guidance
Validation	The assessment is done in accordance with ISO 14067 which is based on the GHG Protocol. Auditors Ernst & Young have carried out an overview audit of compliance with the GHG Corporate Standard.
Carbon footprint of Max Burgers AB	See page 22 below.

Introduction

Background and purpose

With the assistance of U&We, Max Burgers AB has undertaken an assessment of the greenhouse gas emissions from its business operations (including emissions by suppliers). It is envisaged that this report will be used as supporting documentation for a Climate Report. In addition, Max wants greater insight into its carbon footprint so that it can reduce it, given that the overall objective is to inspire hope with regard to climate change.

Assessment context

Responsible at Max Burgers	Kaj Török, Information and Sustainability Manager
Companies included	Max Burgers AB together with its subsidiaries and all its franchisees
Company boundaries	The entire business operations of Max Burgers AB – 125 restaurants in six countries (Sweden, Norway, Denmark, Poland, Egypt and the United Arab Emirates), of which about 90% are directly owned by Max and the remainder are owned by franchisees. However, Max products sold externally in retail businesses are not included.
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Carbon footprint of Max Burgers AB	See page 22 below.

Food production is responsible for a considerable proportion of Sweden's overall impact on the environment. In total, the food production chain accounts for about 50% of eutrophication, 28% of greenhouse gas emissions and 20% of energy use in Sweden (Sonesson et al). Of these figures, a significant proportion arises from primary food production.

In food production, it is carbon dioxide, (CO₂), methane (CH₄) and nitrous oxide (N₂O) which represent the largest potential contribution to the greenhouse effect. The animal component, in particular the ruminants, represent a significant proportion of the carbon footprint. Methane is released from cows' digestion and from their manure. Losses of nitrogen in the form of nitrous oxide are proportional to the total nitrogen flow in the production.

Goals

The goal for Max Burgers in 2018 is to comply with the requirements for carbon neutral products in the ISO 14021:2017 standard relating to self-declared environmental claims. This will be validated against the GHG Protocol which ISO 14021:2017 is based on. The goal from June 2018 is to offset for greenhouse gas emissions by an additional 10%, over and above the company's emissions, so that the burgers have a positive impact on the climate.

The goal of this assessment was to calculate Max's greenhouse gas emissions from the following activities:

- **Scope 1**
- Refrigerants
- Leased cars
- Use of natural gas

- **Scope 2**
- Electricity consumption
- Heating and cooling

- **Scope 3**
- Waste
- Franchised restaurants
- Consumable supplies
- Packaging
- Guests' journeys to and from the restaurants
- Handling of customer waste
- Incoming transport of ingredients and materials
- Food production
- Staff travelling to and from their place of work
- Business-related travel
- Upstream emissions from the production of electricity and heating
- Outgoing transport of food and waste

The result is a quantitative measurement of Max's carbon footprint which will be followed up each year and which provides input for Max's external communication in the form of a brief and readable Climate Report. The results show where the company's impact on the climate is greatest, thereby providing guidance as to where efforts to reduce emissions should be focused. The results also allow restaurant guests to help reduce the company's carbon footprint by choosing the right menus.

This report presents the methodology used and the carbon footprint of Max's operations, including supplier emissions.

Participants

The main participants from Max were Marie Köster and Kaj Török, together with other Max employees who submitted data on different activities. Peter Wrenfelt, Katrin Dahlgren and Håkan Emilsson participated from U&We. Many of Max's suppliers have answered

questions relating to their activities which have an impact on the climate, including raw materials and transport. The authors would particularly like to thank all those who helped to gather the information needed to complete the assessment.

Method

ISO 14021:2017 (*Environmental labels and declarations — Self-declared environmental claims*) focuses on products. ISO 14021 refers to ISO 14067 for quantifying carbon footprints. In turn, ISO 14067 refers to Product Category Rules (PCR) for specific sectors for detailed guidance in terms of boundaries and other methodological issues.

No PCR has been written for restaurant operations. A PCR Basic Module exists for *Accommodation, food and beverage services* but this cannot be used in its entirety for carbon footprinting. However, in this instance it has been used to provide guidance, especially with regard to determining the boundaries of the life-cycle.

The carbon footprint of the company's operations is based on the Greenhouse Gas (GHG) Corporate Accounting and Reporting Standard. Separate research is done for the products since academic research into the impact of farming is constantly producing new results. Methane, nitrogen dioxide and other gases which impact the climate are re-calculated to CO₂ equivalents, so that an overall potential impact can be described. Emissions factors from DEFRA with GWP values over a 100-year period from the IPCC Fourth Assessment Report (AR4) have been used for calculations. Energy-related conversions have been based on publicly available conversion factors.

Activity data is based on information from invoices, suppliers and internal statistics. Input data from Max and from its supply chain has usually been for the period 1 January 2017 to 31 December 2017. Deviations from this are stated in the results section.

The basis for the analysis of the carbon footprint of food and materials is a range of different research studies that have been done in different conditions. The research studies may differ in terms of system boundaries, the data in focus and the conversion factors being applied to methane and nitrous oxide and other factors. This may affect

comparability and transferability. For obvious reasons, published studies have often been restricted to calculation methods which are agreed by researchers. For this reason, significant factors may be partly or entirely missing from studies which are only a few years old. Examples of this include the carbon footprint of potential land-use change (LUC), e.g. deforestation and carbon sequestration in soil.

The level of knowledge regarding greenhouse gas emissions from fossil fuels is relatively good, whilst there is uncertainty regarding emissions from biological systems (eg cultivation and rearing). There are also uncertainties about the impact of air travel, which is currently thought to be somewhere between 1.6 and 4.2 times higher than its carbon dioxide emissions since water vapour and nitrogen oxide at high altitude have an additional impact on the climate. In this respect, a Radiative Forcing Index (RFI) factor of two times emissions has been selected.

Farming research is often based on studies of individual farms, where the outcome is specific to the farms studied, even if the researchers strive for results which can be applied more generally. There can be large differences between individual farms, given that production conditions and methods differ. So uncertainties exist in the studies, particularly regarding biogenic emissions.

Starting from the research available, we have evaluated the potential emission factors of each relevant raw material. Based on the specific conditions which apply to Max (in terms of suppliers, farmland, raw material composition etc.) we have then selected or calculated an emission factor for each raw material. In those cases where transport beyond the farm gate has been included in the relevant Life-Cycle Assessments (LCAs), these have been deducted from the raw material emission factors where possible, and included in calculations of Max's other transport operations. Otherwise, emissions arising from animal products have been included up to and including the packaging facility after the slaughterhouse.

The result of the emissions assessment is therefore dependent on the current state of knowledge so corrections will be needed as knowledge is extended and refined. Although the current state of knowledge is uncertain in some areas, it is better to use what is currently available and then update it regularly, rather than to wait for "reliable" data.

Performance indicator

The overall result of the carbon footprint is set in relation to sales. The intention of this is to make it possible to follow changes in the carbon footprint in relation to a key figure which reflects the development of the company's market share over time. This key performance indicator is expressed as g CO₂e/SEK.

Scope of the assessment

The emissions assessment covers all of Max Burgers AB's operations where the organisation has operational control, as defined in the GHG Protocol. The countries/markets included are Sweden, Denmark, Norway, Poland, Egypt and the United Arab Emirates. The assessment covers all Max's restaurant businesses, both own operation and franchises. However, Max brand products sold in supermarkets are not included.

Data collection and quality

Almost all supplier activity data is based on actual data reported from the suppliers themselves, in respect of their own operations and transport, and transport by their sub-contractors. Estimates have been done where reported input data was obviously incorrect. The emissions from primary production have been calculated based on scientific studies and available emission factors on the raw materials being used.

The quality of the data used in the analysis (input data) determines the quality of the final calculation. Most suppliers have reported emissions-related activity data to Max for the last ten years. During that time, the quality has improved. The input data delivered by Max to U&We, upon assessment is built, is as follows:

- Electricity use for all restaurants in Sweden except those at Arlanda, Landvetter and Liseberg, reported by supplier and type of electricity. If figures were not supplied, estimates based on sales were used. For the office in Stockholm no data was available for 2017 so an estimate was done based on figures for 2014. No input data was available for Denmark, Poland, Egypt and the United Arab Emirates and estimates based on sales were used.

- Heating for all except 28 restaurants in Sweden, reported by supplier and energy source. A few of the restaurants have also used district cooling. Of those restaurants where information was not available, many of them were “Instore” which generally means that heating is included in the rent. In such cases, estimates have been made based on the floor area of the Instore restaurants and information from reporting restaurants. For offices for which no information was available, estimates were made based on size. No data was available for Norway or Denmark. For Norway, it has been assumed that heating is electrical. Figures for Denmark have been estimated, based on sales and average heating use in Sweden. Input data for business operations in Poland, Egypt and the United Arab Emirates has been assumed to be electrically based air conditioning.
- Waste and recycling. Information has been reported on the volume and treatment of waste by contractors in relation to 93% of the Swedish restaurants’. For the remaining restaurants estimates have been calculated on the basis of the average per restaurant. No data was available from Norway, Denmark, Poland, Egypt and the United Arab Emirates and data for these countries has been estimated based on an average for restaurants in Sweden. The emissions from transport and energy recovery have been calculated. Handling of waste that is removed by the guests themselves (take-away) has been estimated based on interviews with guests at a sample of restaurants. This data has been scaled up, based on Max’s own statistics relating to take-away, home deliveries and drive-through. The guests have stated whether or not they have recycled the waste.
- Company cars, taxis, hire cars and hotel nights have been reported for Head Office, Sweden and Norway. The data for Denmark, Poland, Egypt and the United Arab Emirates has been estimated based on sales.
- Business-related travel, by different modes of travel, has been reported for Head Office, Sweden, Norway and Egypt. Any business-related travel for Denmark, Poland, Egypt and the United Arab Emirates is included in the data reported for Sweden.
- Transport of raw materials to the producers and transport from suppliers to Max has been reported. The intermediate phase – transport from producer to supplier – has been estimated based on a standard distance.

- Packaging and consumable supplies have been reported by suppliers. Information about materials – volumes in kilos, producer, energy use and transport of materials has been collected using online and/or Excel-based questionnaires to suppliers.
- Food inputs have been estimated based on a grouping of ingredients into about 40 groups of ingredients/raw materials. Information about the number of kilos of raw materials used has been reported by suppliers. Information about primary production, packaging, production sites, methods of transport and routes, together with use of energy and other resources has also been reported. The information has been collected using online and/or Excel-based questionnaires to producers and suppliers.
- The Head Office has reported business data for calculating key performance indicators – i.e. sales, number of restaurants and number of employees.

This year, the supporting documentation for the calculations has been improved in relation to previous years in order to comply with the ISO 14021 standard relating to the communication of carbon neutrality. A breakdown of input data between Sweden, Norway and Denmark has been provided and the same applies to a certain extent for Poland, but it has not been possible to use these breakdowns in this assessment. The calculations regarding transport of packaging have needed to be supplemented with standard values in many cases.

Where Max has expanded to other countries in recent years, clarification has been necessary to determine whether all transport of raw materials has been included in the supplier survey data, and how the carbon footprint of these new countries is best calculated. A few initial steps to distinguish the flows of raw materials in these countries were taken in conjunction with the 2014 carbon footprint. For 2015, 2016 and 2017, suppliers and producers have largely been able to deliver separate data for Sweden/Denmark, Norway and Poland. The carbon footprint of the ingredients used in Norway has been calculated separately, whilst that of Denmark has been included with Sweden. For other countries - Poland, Egypt and the United Arab Emirates - the footprint for 2017 has been based on sales for some activities and on typical values per restaurant in Sweden for other activities (given that some activities are clearly related to sales, whilst others are not).

For Poland it's been possible to assess supplies and transport where products have been sent from Sweden, which is true for a large proportion of the supply. In Norway there were four restaurants in 2017 and three in Denmark. In Poland and Egypt there was one restaurant in the latter half of the year. In the United Arab Emirates there are two restaurants.

All data provided by producers in online questionnaires has been examined and checked for reasonableness against information from previous years and against key figures e.g. energy per kg of product and reported transport distances in relation to geographical distances. In most cases, volumes of products delivered have been reported by both producers and suppliers. These have been compared with each other to identify potential errors. When necessary, questions have been addressed to people at the companies that provided input data. A separate record of this data and assessments of data quality has been made.

Global warming potentials (GWP) for the conversion of methane, nitrous oxide and other greenhouse gas emissions into carbon dioxide equivalents were from IPCC AR4 (2007) in most of the sources. In some cases, sources have only been used only as reference points for assessing the reasonableness of other sources. In those cases where a source has been used for calculations, any deviations from IPCC AR4 have been re-calculated to ensure consistent application of GWPs.

As explained above, greenhouse gas assessments include inherent uncertainties because the scientific knowledge used to establish emissions factors is incomplete, as is the knowledge about the conversion factors for combining emissions of different gases.

Allocation of emissions

For Max, the most significant sources of emissions are the ingredients and raw materials used in the restaurant meals. The greenhouse gas calculations for these materials are based on emission factors in published life-cycle studies, together with the specific allocations made in each study – a financial allocation, a mass/volume allocation or a system expansion. The producers of the ingredients and raw materials purchased by Max have themselves either reported energy use

specifically for each article or they have allocated their total energy between the volume (or weight) of all articles.

Assessment Boundaries

The organisational boundaries for the assessment were based in principle on operational control according to the GHG Protocol.

Criteria for life-cycle boundaries were based on ISO 14067 - Carbon Footprint of Products - together with the boundaries suggested by the PCR Basic Module for *Accommodation, food and beverage services*. The GHG Protocol Corporate Standard has also been used as a reference.

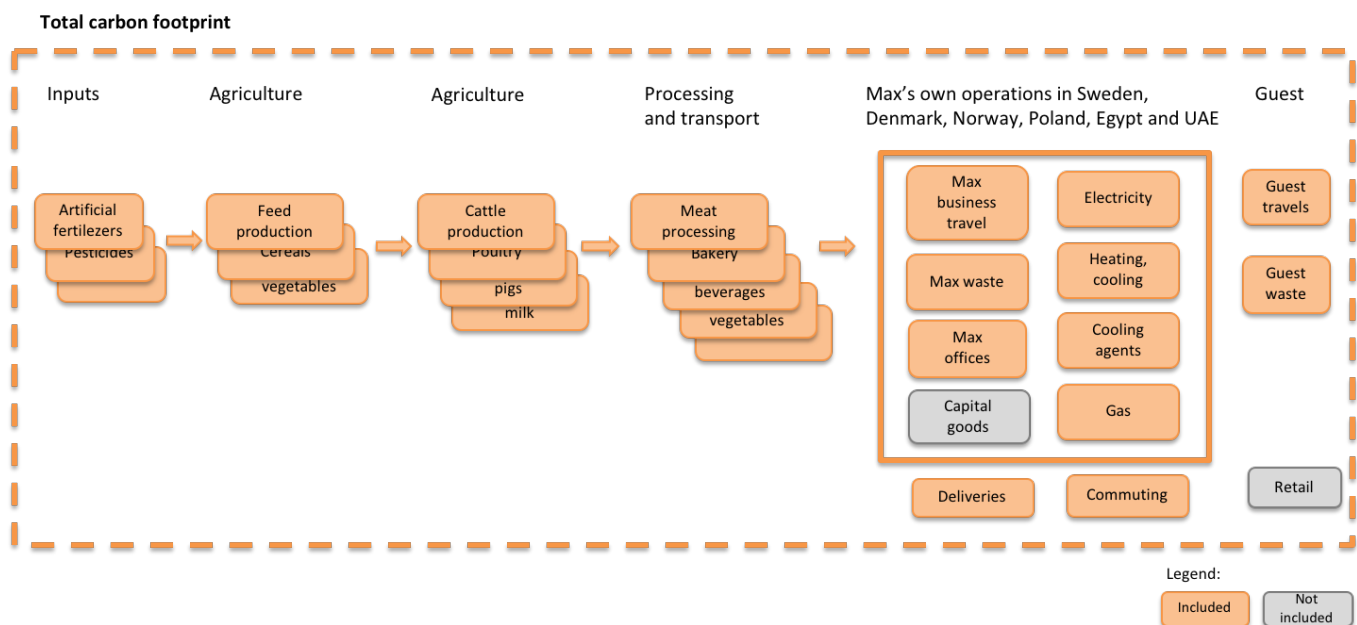


Figure 1. System boundaries for calculating Max's carbon footprint.

The main system boundaries used in the assessment are shown in the figure above. The food and its journey from soil to table has been assessed and emissions calculated. This includes everything from the agricultural inputs used to produce the food via the cultivation of fodder and vegetables, rearing and processing, preparation and serving to handling of waste.

Scope	Definition	Included emission sources/activities
Scope 1	Direct GHG emissions from vehicles/premises	Use of natural gas for heating and/or preparing food in restaurants.
		Refrigerants Leased cars
Scope 2	Indirect emissions from purchased heating and electricity from premises	Production of electricity, cooling and heating purchased for restaurants and offices.
Scope 3 - Upstream	1. Purchased goods and services	Purchased goods and services, such as agricultural products, processed food for cooking for consumption by guests, purchased packaging materials, other goods and consumables for restaurants and offices, together with packaging materials for purchased goods.
	2. Capital goods	Not included
	3. Other fuel- and energy-related activities	Scope 3 emissions from the production and distribution of electricity and heating.
	4. Upstream transportation and distribution	Transport of purchased goods/material, transport of waste etc.
	5. Waste generated in operations	Collection and handling of waste, sludge and frying oil from restaurants and offices.
	6. Business travel	Travel by air, rail, taxis, private cars and rental vehicles, together with hotel nights.
	7. Employee commuting	Employee journeys to and from work by bus, train and car etc.
	8. Upstream leased assets	Leased restaurants and offices.
	Scope 3 - Downstream	
	9. Downstream transportation and distribution	Guest journeys to and from restaurants, home deliveries.
	10. Processing of sold products	n/a
	11. Use of sold products	n/a
	12. End-of-life treatment of sold products	Waste from take-aways and home deliveries.
	13. Downstream leased assets	n/a
	14. Franchises	Franchise restaurants

Scope	Definition	Included emission sources/activities
	15. Investments	n/a

The following activities have not been included in the calculation:

- Purchase of electronic goods for offices (computers, telephones etc.)
- Marketing (printing and use of cloud-based services)
- Construction and capital goods (buildings and interiors)
- Retail products
- Consumption of fresh water

The table below provides the reasons for these exclusions.

Sources of emissions/activities excluded	Explanation
Construction and refurbishment	Data not available. Neither is construction and buildings a mandatory category in the current PCR basic module for <i>Accommodation, food and beverage services</i> . A rough estimate of the construction of the new restaurants showed the carbon footprint to be less than 1% of the total footprint (0.7%).
Printed material, TV advertisements and digital/cloud services for marketing	Data not available. This category of activity is not dealt with in the PCR Basic module for <i>Accommodation, food and beverage services</i> .
Retail products	Max has very limited control over the production and no agreement has yet been reached with producers about working towards carbon neutrality.
Consumption of fresh water	A rough estimate indicated that the production of fresh water represents less than 1% of the total carbon footprint (about 0.03%).
Purchase of electronic goods for offices (computers, telephones etc).	It is estimated that these purchases represent less than 1% of the total footprint (about 0.02%).

Time horizons

From a product perspective, most greenhouse gas emissions from ingredients, raw materials and waste occur during a limited time period. Most food is fresh or frozen and none of Max's products has a multi-year life ie a user phase. However, raising cattle takes place over a long period and the meat consumed by Max's restaurant guests comes from animals which, in some cases, have been slaughtered when they were over 3 years old (although generally the animals are younger than this).

Significant sources of emissions

From the carbon footprint calculations it was found that the following processes dominate the outcome for each scope of emissions. The share of the total carbon footprint is shown in brackets.

Scope 1:

- Leakage of refrigerants (0.4%)

Scope 2:

- Production of district heating (0.7%)

Scope 3:

- Food production, primary production phase, where beef is dominant (53%) followed by other animal products (just over 11%).
- Production of packaging and consumables (10%).
- Guests' journeys to and from restaurants (just over 4%)

These five activities together account for almost 80% of Max's entire carbon footprint.

Waste

Used frying oil is collected from Max's restaurants and used as a raw material for the production of biogas and the treatment of the oil is considered part of the life-cycle of biogas. The same applies for sludge collected from grease separators in the restaurants. However, the transport of the frying oil and sludge from the restaurants has been included in the assessment.

For general waste, transport is included for all fractions, together with the energy recovered from the waste. Fractions which are re-used belong to life-cycles outside Max's operations so only transport is included for these components. This information was reported for 93 restaurants. Data for other restaurants was estimated based on average waste per restaurant. An average transport distance of 20 km was assumed for this waste, with one collection per day and 220 collections per year.

Waste left by guests has been assessed through interviews at ten restaurants, chosen to be representative in terms of size and sales. The interviews took place between 11am and 8pm during eight days in February (16-24 February). The interview questions related to mode of transport to and from the restaurants, length of journey and handling of waste. 185 people were interviewed, many of whom were part of larger groups. In total there were 444 people in the groups, of whom 425 ate food or consumed drinks. From the total volume of packaging supplied, and statistics for take-away, home deliveries and drive-through, the proportion of packaging removed from restaurants has been estimated. Information provided by guests about recycling forms the basis of the calculations of energy recovery. For those guests who have indicated that they "usually" recycle Max packaging, it was assumed that 50% of the energy is recovered. For those guests who have indicated that they "sometimes" recycle Max packaging, it was assumed that 2/3 of the energy is recovered. For those guests who have indicated that they "rarely" recycle Max packaging, it was assumed that 95% of the energy is recovered.

Staff journeys to and from work

Staff journeys to and from work have been investigated using an online questionnaire at a selection of ten restaurants in Sweden. The selection of restaurants was the same as that used for the interviews about guest journeys and waste. Questions were asked about service received, mode of transport, type of fuel used in any cars or other vehicles and length of the journeys. The questionnaire was answered by a total of 138 people and the results were then scaled up, based on the number of full-time employees in the organisation. It was assumed that five working shifts per week comprise full-time work. Journeys to and from work by car have been assumed to reflect the average Swedish vehicle fleet.

Guests' journeys

Guests' journeys to and from the restaurants have been investigated through interviews at ten selected restaurants in Sweden (see also the information about guests' waste above). The interviews included questions about modes of transport, sizes of groups of people, ages, types of fuel used in cars and other private vehicles, distances and purposes of the journeys (whether they were just to visit MAX or also for other reasons). Journeys have then been allocated to Max according to the following principles.

Main purpose was a visit to Max

- For journeys that were shorter than 15-50 km, it was assumed that Max was not the main destination but a sub-destination. It was then assumed that 25% of the distance was related to Max.
- Where a longer journey was involved – between 50 and 500 km – only the exit distance was assumed to relate to Max.

The main purpose was other business

- For longer distances of 20 km or more only the exit distance from Max was taken into consideration.
- For the remaining short journeys of between 0 and 19 km, 15% of the journey was assumed to relate to Max.

A single journey away from a Max restaurant is assumed to be 0.5 km. Return journeys were calculated. 9% of car journeys were found to have been made in cars which used renewable fuel or electricity. These have been calculated separately.

To scale up the results to reflect the total number of guest journeys, calculations were based on the number of sales receipts where home delivery was stated. According to calculations done by Max, there are almost exactly 1.5 guests per receipt (Mattias Eriksson 2018-05-06). No data exists for Denmark, Poland, Egypt and the United Arab Emirates and estimates for these have been based on sales.

Land use change

The potential emissions from land use change (LUC) was estimated and is included for beef, dairy products and paper articles. The calculations

were based on Max's beef being representative of all the beef produced in Sweden, with a corresponding share of LUC emissions resulting from fodder production, which, in this year's calculations, increased the estimated emissions from beef by 6%. For dairy products, a potential LUC supplement of 8.8% has been estimated.

For paper articles and packaging, it has been assumed that for almost half (47%) of the volume, there is a risk of contributing to LUC, mostly because of uncertainty about the origin of raw materials. For this volume, estimates have been made of the volume of pulpwood, area of forest and potential LUC emissions for the corresponding area.

With regard to potential LUC emissions from the construction of new restaurants, we have spoken to those responsible for buildings at MAX and noted that during 2017 no restaurants have been established on land that was previously unexploited (i.e. directly on soil or turf).

Sensitivity of results

In general the quality of the data has been very good, most of it coming from invoices, suppliers and Max internal statistics. For the relatively few areas in which actual data was lacking, estimates were made which probably reflect or overestimate the actual carbon footprint. Where there were uncertainties, a higher figure or estimate was chosen rather than a lower one.

Overall the outcome of the assessment is likely to capture more than 95% of the actual carbon footprint. The activities that could not be estimated because of the absence of data, are listed under the heading Assessment Boundaries. They are estimated to amount to 0.75% of the total carbon footprint. The largest proportion of this impact is from capital goods (buildings and interiors) which, according to the PCR basic module, do not have to be included.

Marketing and retail activities are not included in the 0.75%. Retail activities were determined to fall outside the system boundaries and marketing is very unlikely to give rise to 1% of the total emissions. This means that more than 100% of the total emissions have been captured by the assessment.

A significant proportion of the total calculated footprint is the carbon footprint of the primary production of beef for Max's restaurants. If, for example, the emissions factors from the LCAs on which the calculations were based were 20% lower or higher, this would give a final result that was +/- 10%.

The criteria for life cycle analysis of climate impact do not actually take into account all climate impacts since researchers disagree on how to handle certain biogenic processes such as carbon sequestration in soils and release of greenhouse gases. The impacts of these processes are hard to judge but based on current research, we consider the calculations of the impacts of beef production to be reasonably accurate.

Guests' journeys are a relatively small proportion of the total carbon footprint. It is difficult to assess the proportion of these journeys which should be allocated to Max since guests often have several objectives with their journeys. Max's business concept is to make consumption of meals convenient for their guests so the restaurants are generally only stops on journeys made for other purposes, rather than being the primary destinations. Where a visit to Max is the main purpose of the journey, 2/3 of the kilometres are allocated to Max. In other cases, 1/3 of the kilometres are allocated. If the percentage of kilometres represented by guests whose main purpose was to visit Max was 20% higher, and that of those with another purpose were 20% lower, the total carbon footprint would increase by just 0.2%. If the exist journeys were twice as long for those with longer journeys (i.e. 2 km), the total result would increase by 0.6%. The proportion of journeys for which Max restaurants are the main destination is probably lower rather than higher than assumed.

Interpretation of results and limitations

The results cover Max's operations all the way from agricultural inputs, cultivation and breeding, to the consumption of burgers in restaurants/take-away, including waste and associated journeys. A life-cycle calculation for a restaurant chain is significantly more complex than for single products. The results are specific to Max and its suppliers and guests and cannot be directly applied to other restaurant operations.

Critical examination

Max Burgers has hired auditors from Ernst & Young to conduct an independent summary review of this assessment. For more information see the auditors' report on page XX.

The carbon footprint – from soil to table

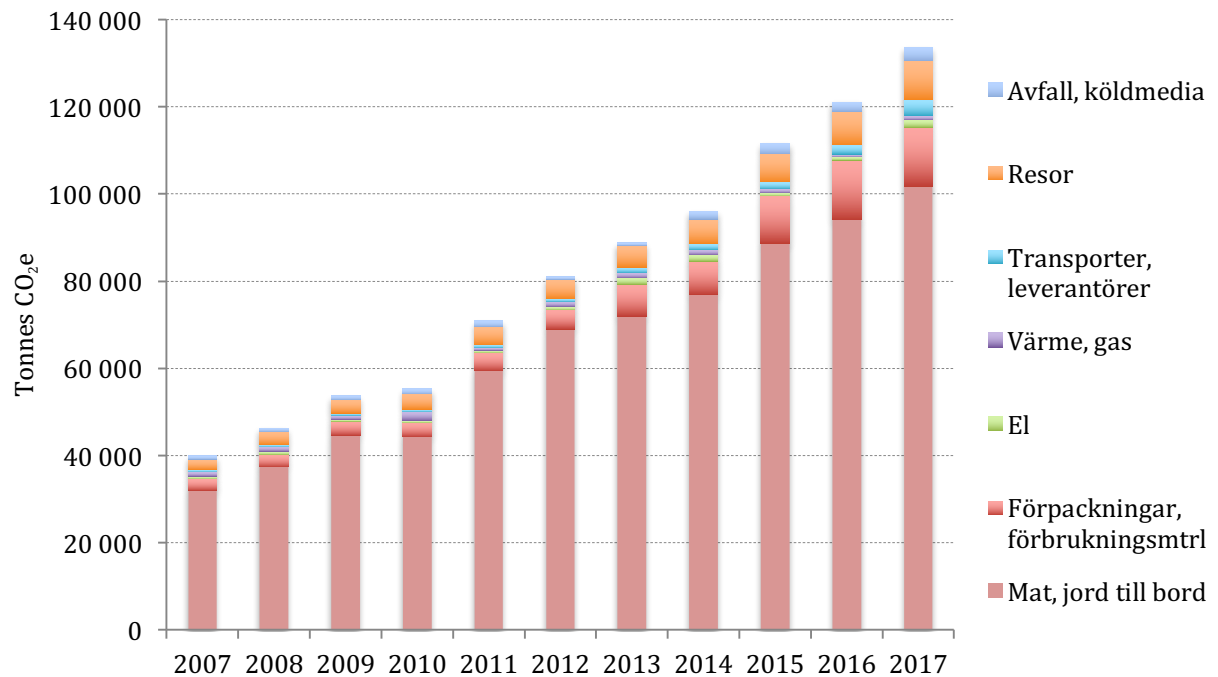


Figure 2 Max's carbon footprint from a life-cycle perspective from soil to table, i.e. from the production of fodder and rearing of animals to cooking in restaurants and on to guests' travel and waste.

The total carbon footprint (tonnes CO₂e) from soil to table increased between 2007 and 2017, mainly due to a significant increase in the number of restaurants. The number of restaurants almost doubled, from 56 to 125. In 2017, the total carbon footprint amounted to about 135,000 tonnes CO₂e for all countries (Sweden, Norway Denmark, Poland, Egypt and United Arab Emirates).

An online questionnaire was used, with a database, to collect data for the carbon footprint for 2017. Despite initial problems, this made data collection easier than in previous years and a relatively complete and substantial set of data was obtained from producers and suppliers which improved the quality and reliability of the calculations.

Analysis of the carbon footprint for 2017, from the farmer's soil to the guest's table, shows that beef makes the greatest contribution with almost 53% of the carbon footprint coming from beef. This is less than in previous years due to successful introduction of a wide range of vegetarian alternatives. Transport and business travel accounts for only 9% of the total footprint.

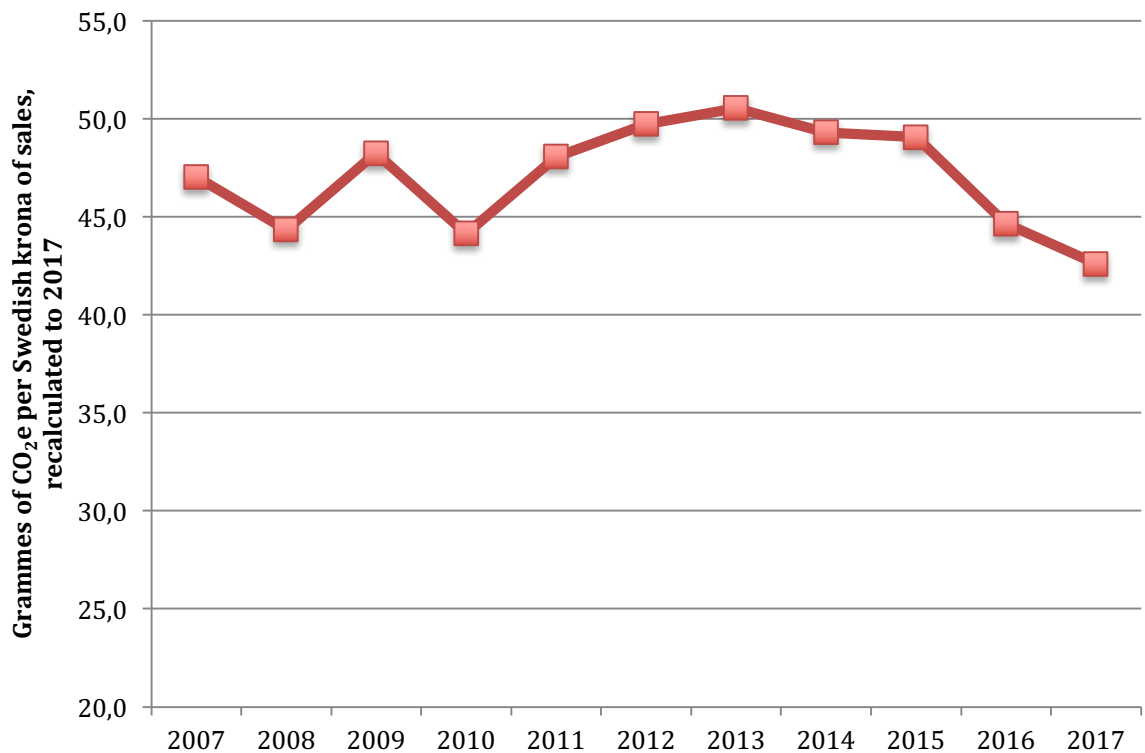


Figure 3 Max's carbon footprint, from soil to table and back to the earth, expressed as number of g CO₂e per krona of sales, 2007 - 2017.²

² To facilitate comparison, historical data for the years 2007 – 2016 has been re-calculated to reflect conditions prevailing in 2017.

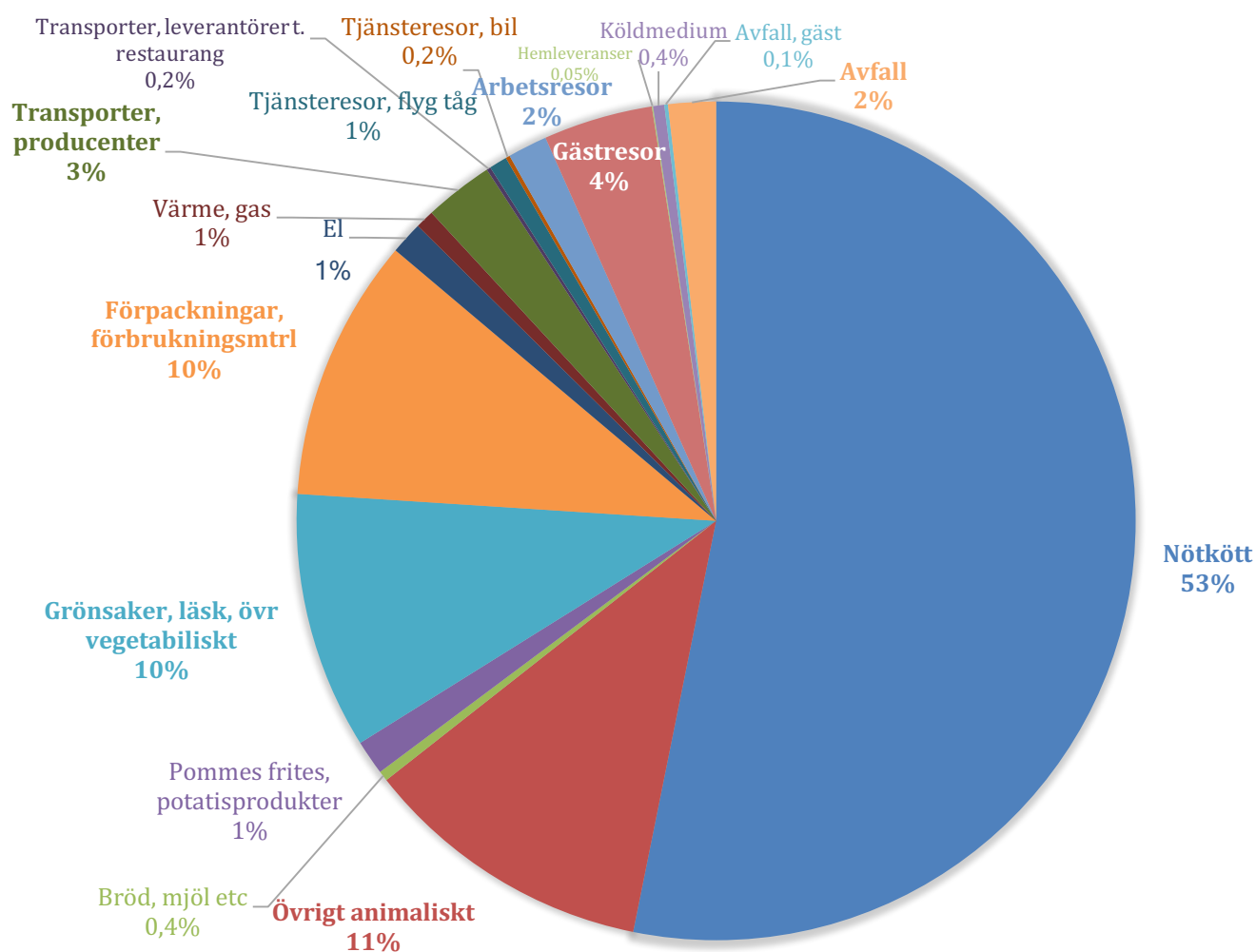


Figure 4 Max's carbon footprint divided into different ingredients and business activities for the year 2017

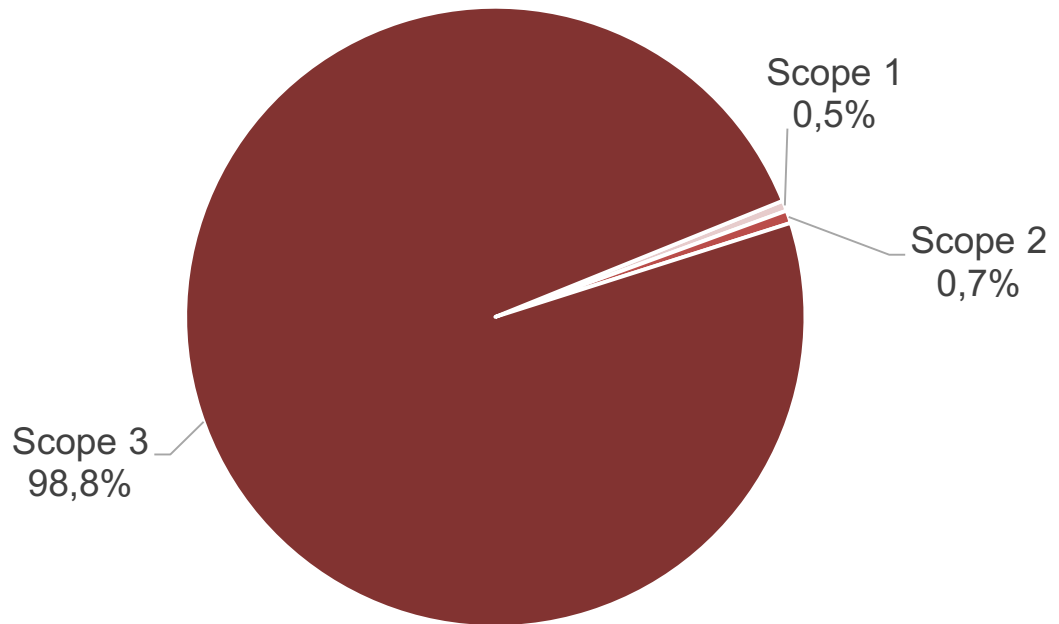


Figure 5 Max's carbon footprint divided by scopes of emissions for 2017.

	Scope of emissions	Total tonneCO ₂ e 2017
1	Direct GHG emissions from vehicles/premises under the control of Max Burgers	686
2	GHG emissions arising from the consumption of electricity and district heating on premises under the control of Max Burgers	831
3	Other indirect GHG emissions	133,307
	Total	134,824

The increase in emissions between 2016 and 2017, in absolute terms, is partly due to increased sales, and partly to the improved reporting of data from suppliers. However, per Swedish krona of sales, the carbon footprint declined by 9% between 2015 and 2016 and declined by a further 4% between 2016 and 2017. The reduced emissions were mainly

due to successful efforts to introduce vegetarian alternatives on the menu.

The carbon footprint of beef

No ingredient has a larger carbon footprint than beef. Production of beef up to the farm gate accounts for as much as 95% of beef's carbon footprint (the remainder comes from transport, slaughter, transport, packaging etc). Some of the most significant reasons for the large carbon footprint of beef are the following:

- Slow growth of cattle (non-effective fodder converters).
- Anaerobic digestion of the food (methane from belching).
- Manufacture of nitrogen-bearing fertilisers and agricultural production of crops for fodder.

Greenhouse gases

The greenhouse gases included in the assessment are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and hydrofluorocarbons (HFC). Methane (CH₄) is by far the dominant greenhouse gas emitted in the life-cycle of beef, accounting for about half of the total climate impact contribution in conventional farming. The next largest contribution to the carbon footprint is from nitrous oxide (N₂O), resulting mainly from high doses of nitrogen in the cultivation of pasture. Emissions of CO₂ come third place, arising in Sweden mainly from fossil fuels used in the production of meat. The impact on global warming of the different greenhouse gases varies. Carbon dioxide (CO₂), the most common greenhouse gas, is usually ascribed a global warming factor of 1. For the other gases index values are applied in the calculations (CH₄ = 25; N₂O = 298). For example, this means that methane gas (CH₄) is 25 times more potent than CO₂ as a greenhouse gas.

Carbon dioxide from non-fossil sources does not occur in the calculations for Max of emission in Scopes 1 and 2, other than in negligible quantities. Scope 3 emissions include some non-fossil carbon dioxide as a subset of different emission factors for ingredients and raw materials, as well as in the data reported to Max by producers in the online surveys that feed into the database of producers' operations and transport. It is not currently feasible to separate out this non-fossil

carbon dioxide given the amount of work involved, particularly since Max does not intend to calculate carbon dioxide emissions with no scope.

Other biogenic emissions, particularly of methane and nitrous oxide from agricultural production, are included in all cases in the calculations and are reported separately in the sources for some, but not all, of the emission factors. It has therefore been assessed as difficult to achieve a fair presentation of the split between fossil and biogenic-related emissions.

Carbon footprint of Max's business operations

Generally speaking, responsibility for emissions is considered to be associated with the ability to influence the activities that give rise to those emissions. The easier it is to steer and control what happens, the greater the level of responsibility.

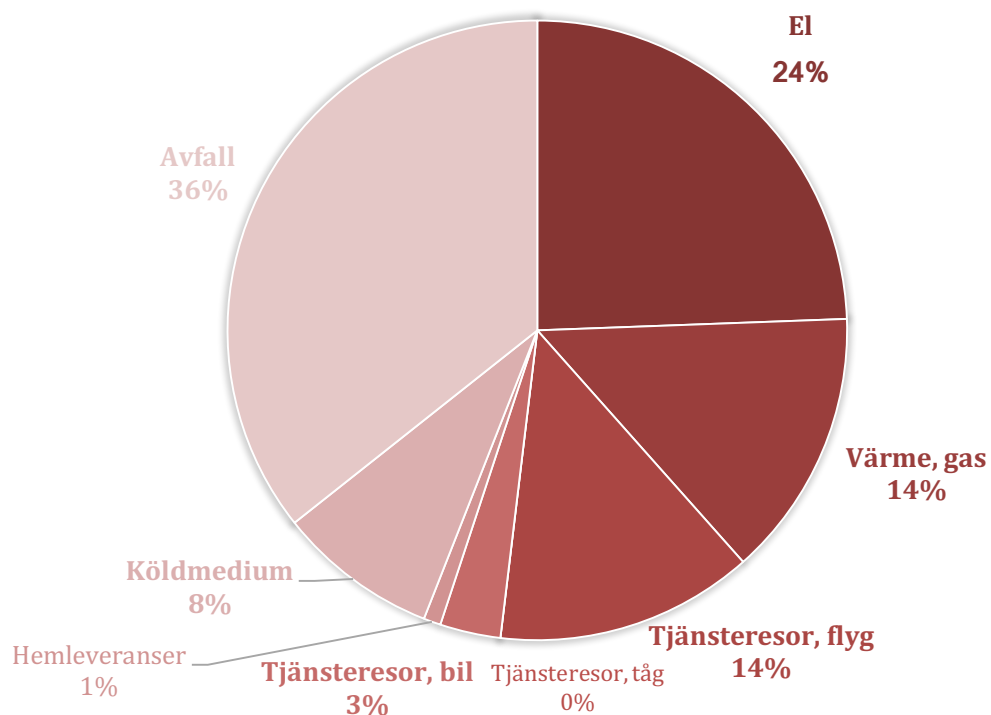


Figure 6 The carbon footprint of Max's own business operations, such as electricity, heating, cooling, refrigerants for restaurants and offices, together with business-related travel for 2017 (tonnes CO₂e).

In total, Max's own operations amounted to almost 6,900 tonnes of CO₂e in 2017, which corresponds to about 5% the company's total carbon footprint. Figure 6 shows the split between different activities.

One activity which contributes to the carbon footprint is the heating of restaurants. Heating comes mostly from district heating but electrical heating is also used.

Max only uses electricity from wind power so electricity makes a small contribution to the carbon footprint. The carbon footprint from electricity use calculated with the market-based methodology amounts to about 1,700 tonnes CO₂e. The corresponding impact from the use of electricity calculated with the location-based methodology amounts to about 2,400 tonnes CO₂e. In the final result, the market-based outcome is used.

Business-related travel has a relatively high climate impact, making up almost 1% of the total and 17% of the emissions from the company's own operations. Air travel is the main component, with 927 tonnes CO₂e.

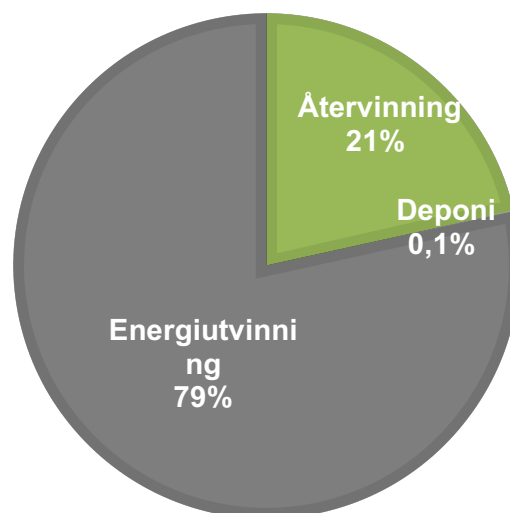


Figure 7 Handling of waste (in tonnes) at Max restaurants in Sweden during 2017.

The handling of waste has a major impact on the climate, accounting for 1/3 of the greenhouse gas emissions from Max's own operations. A significant proportion (79%) of waste is used for energy recovery and this has a negative effect on the environment. If the proportion of the waste that consisted of renewable materials was increased, the carbon footprint would be reduced. A reduction in the amount of resources which end up as waste would reduce the carbon footprint, as would a greater proportion of recyclable materials.

Home deliveries by Max have increased significantly and are made in more and more countries. The 40 restaurants which deliver burgers give rise to a relatively small volume of greenhouse gas emissions, corresponding to 62 tonnes CO₂e. Here, it is assumed that deliveries are made by car, but emissions are probably lower than estimated since a large proportion of deliveries are by bicycle and moped. However information from the distributors is not available.

Carbon footprint in different countries

Supporting documentation from the Norwegian business was more complete in 2017 than in previous years. The same applied to information from the Swedish operations. The calculations for Denmark for 2017 were based solely on a proportion of total sales. During 2017 work started to ensure that input data is received from operations in Poland and Egypt. However, the data received so far has not provided the basis for a specific calculation for these countries, given that they have been operational for less than six months. So emissions from these operations in these countries, together with the United Arab Emirates, have been estimated based on sales. The number of tonnes CO₂e per country is shown below.

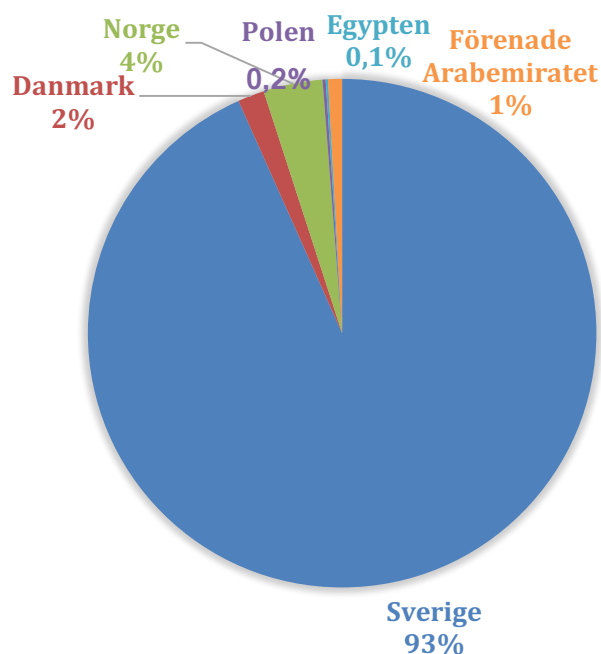


Figure 8 Distribution of greenhouse gas emissions (tonnes CO_{2e}) during 2017 for all of the countries in which Max operates.

The diagram below shows the carbon footprint per restaurant for the period 2007-2017.

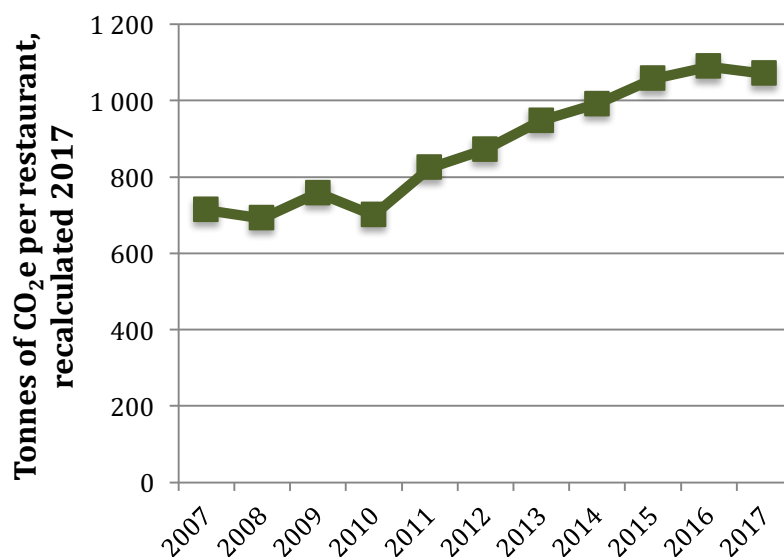


Figure 9 Max's carbon footprint expressed as tonnes CO_{2e} from soil to table per restaurant, between 2007 and 2017.

Max Burger's carbon offsetting

Background

Since 2008 Max Burgers AB has offset through ZeroMission the emissions from all its operations and menus, based on greenhouse gas assessments by U&We. This section of the report covers Max's carbon offsetting for 2017, which includes the purchase of 105,000 tonnes of carbon offset credits.

In 2017 100% of Max's carbon offsetting was allocated to the Plan Vivo-certified project Trees for Global Benefits in Uganda, run by the local organization Ecotrust.

Actors and concepts

The process from Max ordering carbon offsets through ZeroMission, through to the retirement of the credits issued by the Trees for Global Benefits project, includes several actors and various key concepts. Below is an overview and description of these.

Max: Carbon offset buyer.

ZeroMission: Swedish carbon offset reseller.

Plan Vivo: A carbon offset standard focusing on poverty reduction and payments for ecosystem services, used to certify projects in which trees are planted or preserved in cooperation with local people.

Plan Vivo Foundation: A registered non-profit foundation in Edinburgh, which reviews, validates, verifies and monitors carbon offset projects, and issues carbon offset certificates. The organisation specializes in sustainable forestry and tree-planting projects carried out in collaboration with smallholders and communities.

Ecotrust: Local well-established non-profit environmental organization in Uganda, which runs the project "Trees for Global Benefits."

Trees for Global Benefits: The name of the Plan Vivo project in

Uganda, through which Max did 100% of its carbon offsetting in 2017 and has historically done the bulk of its carbon offsetting.

Escrow: An account service by which payments made by Max for carbon offsets are secured until the Plan Vivo Foundation has approved the project's Annual Reports and subsequently issued credits. The purpose is to minimize financial risks.

Markit: An international register in which all Plan Vivo certificates are registered, transferred and retired.

Ex-ante credits: Max buys Plan Vivo-certified "ex-ante credits" which means the credits are sold in advance, before the full emissions benefit has been achieved.

Process description

Below is a description of the process from Max ordering carbon offsets in accordance with agreed volumes and prices for 2017, through to the money reaching the smallholders in the Trees for Global Benefits project. Beforehand a contract is signed, and the volume and prices agreed between ZeroMission and Ecotrust to ensure that the project is able to recruit and retain enough smallholders to meet Max's carbon offsetting requirements.

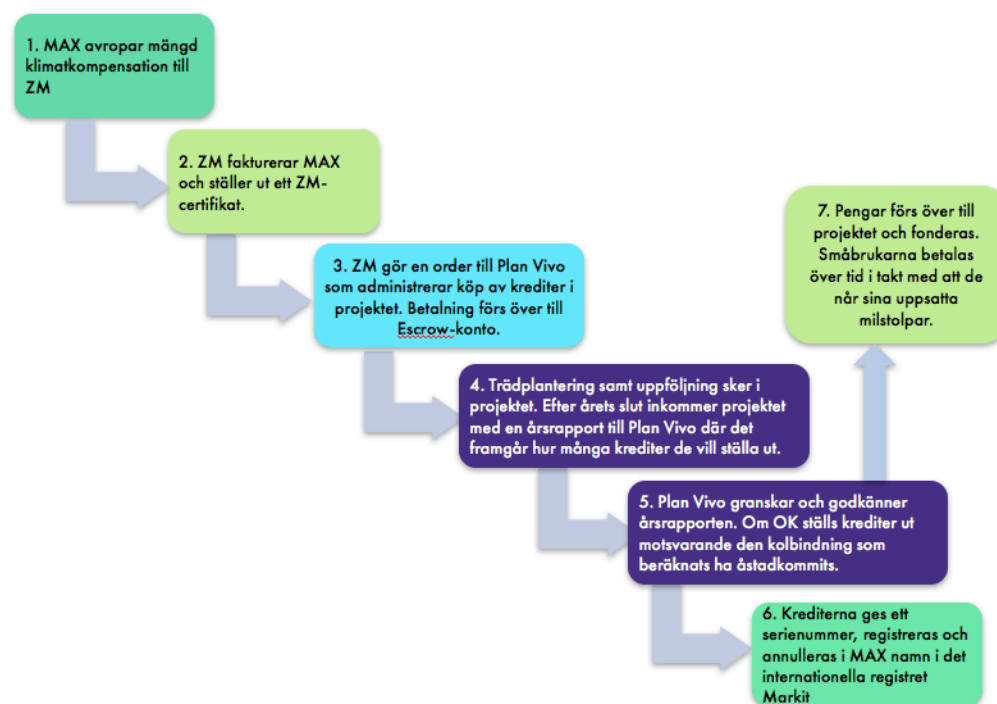


Figure 10. Process for Max's carbon offsetting via ZeroMission.

1. Max places an order for carbon offsets with ZeroMission. The volume of carbon offsets ordered is based on a forecast for the coming year which in turn is based on the previous years' carbon footprint. For 2017 Max anticipated that it would need 105,000 tonnes of CO₂e. After the greenhouse gas assessment for 2017 is completed, the volume of carbon offsetting is adjusted to take into account the results of the assessment. If the carbon footprint exceeds the forecast, more credits are purchased from the project. If the carbon footprint is lower than expected, the "extra" credits are deducted from the next purchase.

2. ZeroMission issues a ZeroMission-specific certificate and invoice to Max. The unique certificate number is recorded in ZeroMission's internal tracking system. 50% of the estimated volume of offsets required was invoiced in June 2017 to cover Max's requirements for Q1Q2. The remaining 50% was invoiced in October 2017 to cover requirements for Q3Q4. Invoicing in 2017 was done separately for Sweden, including franchise companies, and Norway. See Appendices 1-4.

3. ZeroMission sends an order to the project and payment is sent to an Escrow account held by the Plan Vivo Foundation. See Appendices 5-6.

4. Ecotrust recruits enough smallholders to plant the total number of trees required to sequester the required amount of carbon dioxide. From year to year Ecotrust may accumulate a stock of unsold credits – when results exceed forecasts - which they are likely to sell to their existing customer base.

During the year activities are carried out in the project with the smallholders. An important activity "monitoring", or follow-up, which takes place according to a pre-determined plan and which forms the basis for the issuance of credits and the payments to the smallholders. The monitoring determines whether the farmers have reached their milestones (eg number of trees of a certain size) and the carbon sequestered is measured and quantified. Everything is reported in the annual report that Ecotrust submits to the Plan Vivo Foundation at the end of the year. The Annual Report also lists the challenges faced by the project and how these are being addressed. The

Annual Report is available on the Plan Vivo Foundation website for anyone to read.

5. The Plan Vivo Foundation reviews the Annual Report. When the Annual Report is approved, credits are issued from the project corresponding to the carbon sequestration indicated by the monitoring.

3. The Plan Vivo Foundation issues the credits in Markit. ZeroMission will retire the credits bought by Max in Max's name, which means they are traceable and cannot be resold.

4. The money from the Escrow account is transferred to Ecotrust to fund payments to the smallholders over a 10-year period when they meet their pre-determined milestones.

5. The process outlined above extends over a period of a year. At the time of writing, the Annual Report by Trees for Global Benefit for 2017 is under review at the Plan Vivo Foundation and we have received preliminary notification that the credits will be issued in Markit later this summer.

Appendices

The following appendices were provided as evidence that Max's carbon offsetting is paid and ordered from the Trees for Global Benefits project.

Appendix 1. ZeroMission's certificate to Max for Q1Q2, 50 012 tonnes CO₂e, certificate number: 161277

Appendix 2. ZeroMission's certificate for MAX for Q3Q4, 50 012 tonnes CO₂e, certificate number: 171407

Appendix 3. ZeroMission invoice to MAX for Q1Q2, 50 012 tonnes CO₂e, invoice number: 60242

Appendix 4. ZeroMission invoice to Max for Q3Q4, 50 012 tonnes CO₂e, invoice number: 70028

Appendix 5. ZeroMission's order to the Plan Vivo Foundation for carbon offsetting Q1Q2, corresponding to 50,012 tonnes and 6,746 tonnes CO₂e which represented the difference between the forecasted emissions and the results of the emissions assessment for 2016. Order

number: 211

Appendix 6. ZeroMission's order to the Plan Vivo Foundation for carbon offsetting Q3Q4 corresponding to 50 012 tonnes CO₂e, Order No: 224.

Confidentiality

Since prices are confidential, the appendices are omitted from the public version of this report.

INDEPENDENT PRACTITIONER'S REVIEW REPORT ON MAX BURGERS AB'S GREENHOUSE GAS REPORTING

This is the translation of the auditor's report in Swedish.

To Max Burgers AB

We have undertaken a limited assurance engagement of the accompanying Greenhouse gas reporting (Analysis of MAX Burgers AB's climate emissions year 2017) of Max Burgers AB for the year ended December 31, 2017, comprising the emissions inventory and the explanatory notes on pages 7-21.

Max Burgers AB's Responsibility for the Greenhouse gas reporting

Max Burgers AB is responsible for the preparation of the Greenhouse gas reporting in accordance with the Greenhouse Gas Protocol (published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)), applied as explained in the Method section of the report. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of a greenhouse gas reporting that is free from material misstatement, whether due to fraud or error.

As discussed in the Method section of the report, greenhouse gas quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

The firm applies International Standard on Quality Control 1, ISQC 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements* and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Greenhouse gas reporting based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements 3410, *Assurance Engagements on Greenhouse Gas Statements* ("ISAE 3410"), issued by the International Auditing and Assurance Standards Board. That standard requires that we plan and perform this engagement to obtain limited assurance about whether the Greenhouse gas reporting is free from material misstatement.

A limited assurance engagement undertaken in accordance with [ISAE 3410](#) involves assessing the suitability in the circumstances of Max Burgers' use of the Greenhouse Gas Protocol as the basis for the preparation of the Greenhouse gas reporting, assessing the risks of material misstatement of the Greenhouse gas reporting whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the Greenhouse gas reporting. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance opinion about whether Max Burgers's Greenhouse gas reporting has been prepared, in all material respects, in accordance with the Greenhouse Gas Protocol applied as explained in the Method section of the report.

Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Max Burgers' Greenhouse gas reporting for the year ended December 31, 2017 is not prepared, in all material respects, in accordance with the Greenhouse Gas Protocol applied as explained in Method section of the report.

Stockholm June X, 2018

Ernst & Young AB

Micael Engström Ingrid Cornander

Authorized Public Accountant Specialist, Climate Change and
Sustainability Services

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