

Measure title: **Sustainable SME Logistics for the food industry**

City: **Malmö**

Project: **SMILE**

*Measure
number:*

10.7

A Introduction

Many SMEs (Small and Medium sized Enterprises) in the food sector have difficulty providing competitive logistics solutions to access optimum markets. Existing logistics systems focus on large flows of a limited number of products whilst demanding a high uniformity on food producers and suppliers that only larger market players can fulfil.

At the same time, there is an increase in the market for high quality fresh products with distinct character and diverse range. The result is that a growing number of SMEs in the local and regional food sector are involved in an inefficient transport system in which small volumes of specialist products are transported rather long distances to the cities, often in the back of the farmer's van, or even in some cases, in the car of the purchaser.

This system is neither economically nor environmentally efficient, and at the same time food miles are becoming an issue of increasing public concern. Studies have shown that organically and locally farmed food can have dramatically lower CO₂ emissions associated with the food itself yet at times these benefits from the food are eroded or even outweighed by the high environmental impacts of transporting the food to market and the ultimate consumer.

It is within this context that the idea of a web-based, cost-efficient and environmentally sound co-ordinated logistics solution was born.

According to the city of Malmö the project is the first of its kind in Europe. Modern IT technology is used to create a professional market place dedicated to the regional food industry, and which will be owned and operated by the partners involved. Thus, the project addresses the growing demand for locally produced food of clear origin with the need to ensure an environmentally efficient transportation of products.

A1 Objectives

The overall aim of the measure is:

...the development of a web-based food logistics system, linking 40-50 small food producers in the region with 5 purchasers in the city of Malmö, using co-ordinated transport and clean fuel-vehicles.

The measure objectives were:

- Development of an IT-based logistics tool on the web, containing seasonal planner, ordering and confirmation and a transports co-ordination system,
- 40-50 small food producers and 5 purchasers linked to the system
- Conduct of an analysis of supply and demand, including logistics operators, and of product flows and development potential, thus identifying market opportunities,
- Appointment of a part-time co-ordinator/quality controller during the first 2 years of the project to ensure that the system operates smoothly during the establishment phase

- Hold a number of training events for all actors included in the system to ensure the smooth operation of the logistics system
- A procurement of a logistics operator which in turn should convert/purchase 5 vehicles to operate on cleaner fuels, thus lowering CO₂ emissions, will be conducted
- Develop an “environmental (eco-) barometer”, which will provide customers and end-users with information on the environmental impact of the food products,
- Produce dissemination packages (brochures etc.) specifically for end-users (restaurant visitors, shoppers etc), purchasers (restaurant owners, delicatessen owners etc) and food producers

A2 Description

Within this measure the City of Malmö was to develop an open source logistics system which would enable customers (restaurants, shops and stores) in the city to order products directly from producers/suppliers in the region of Skåne (see map in section B3), and get these delivered in an economically and environmentally efficient way. An IT based logistics tool containing seasonal planner, ordering and confirmation and transports co-ordination system was developed. A training programme was implemented for all businesses included in the system, to ensure the smooth operation of the logistics system. The original plan was for the appointment of a logistics operator to make several improvements concerning more environmentally friendly vehicles (clean fuels), more optimised routes and education in eco-driving.

Within the system, purchasers would be able to see the availability of different fresh products planned throughout the season and producers in the region would likewise be able to identify market demand for products. The co-ordinated orders from purchasers were to be fed into the logistics run to ensure that products were picked up on time but also maximising vehicle capacity and minimising vehicle kilometres.

The logistics system and tool would be owned by a large number of small businesses and the City of Malmö would act as a guarantee of the independence of the system. Thus, it would be ensured that information is open to all involved in the system. In this way there is no monopoly of information which ensures that there is a healthy competition and co-operation amongst all businesses involved.

Actions that was planned when initiating the measure:

- Analysis of market opportunities
- Development of IT based logistics tool
- Development and implementation of training programme
- Procurement of logistics operator
- Convert/purchase up to 5 vehicles (operator)
- Development of an “eco-barometer”
- Evaluation
- Production of dissemination packages

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach, within EU** – According to the city of Malmö, the project is the first of its kind in Europe in which a professional web-based marketplace is dedicated to the regional food industry, **and** which is owned and operated by the partners involved. The project addresses the growing demand for locally produced food of clear origin with the need to ensure an environmentally efficient transportation of products.
- **Use of new technology/ITS, regionally** – The project is based around the provision of modern IT technology to create the web-based marketplace. Thus, IT technology is being used to solve a reality-based situation in which supply and demand on a regional food product market can be interconnected.
- **New mode of transport exploited, regionally** – The project sets out to replace conventional transport (i.e. diesel) of food products within the region with vehicles run on a clean fuel (biogas and/or ethanol)
- **New organisational arrangements or relationships, regionally** – The project aims at creating the right preconditions for more efficient partnerships and agreements within the regional food products market. In this way, more sustainable and efficient transports of the products involved can be foreseen.

B2 Situation before CIVITAS

As stated in section A many SMEs in the regional food sector were/are experiencing difficulties providing competitive logistics solutions to access urban markets. Existing logistics systems focus on large flows of a limited number of products whilst demanding a high uniformity on food producers and suppliers that only larger actors on the market can fulfil.

At the same time, there is an increase in the market for locally and regionally produced food. Summing up the situation, this means that a large number of SMEs in the food sector are involved in an inefficient transport system in which small volumes of specialist products are transported relatively long distances, in the worst cases in old, conventional vehicles run on diesel.

Several studies and surveys have pointed in this direction. For example, the Skåne County Council has conducted regional surveys on the matter.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Initiating efforts for a web-based IT-solution to be realised (2005-2006)

Not being part of the initial application for the CIVITAS package of measures, the measure got a slow start late in 2005. The initial stages involved an analysis of supply and demand, including logistics operators, and of product flows and development potential, thus identifying market opportunities. This was initialised in cooperation with the County Council.

Furthermore, time was allocated to building networks with fundamental actors. First steps were taken when it comes to elaborating on the technological IT solution.

Stage 2: Development of web-based IT-solution and analysis of market (2006)

The analysis of supply and demand resulted in reports as well as two separate lists, one with producers in Skåne (Scania) (see map of the region below) and one with purchasers in Malmö, containing a number of potential actors within a future web-based regional market place. The main activity during this period was to cooperate with the subcontractor for the development of the web tool. The more substantial elements of the web tool were finalised during this stage.

Figure 1. A map of Skåne, the most southern part of Sweden, which constitutes the regional food market within the measure.



Stage 3: Training programme, marketing efforts and recruitment (2007)

First of all, a user reference group with both producers and purchasers was founded. This group was to lead the move to implementation and operation and to prepare to take on the long term management of the project. In the autumn, a large introductory training session was held with producers and purchasers. Moreover, targeted marketing efforts with individual meetings with a number of producers were conducted, with the help of a consultant. In this way the first producers were recruited, and linked to the system. A continuous upgrading of the functions of the web tool was carried out during the period.

Figure 2. The front page of the web tool (www.lokalmat250.se).



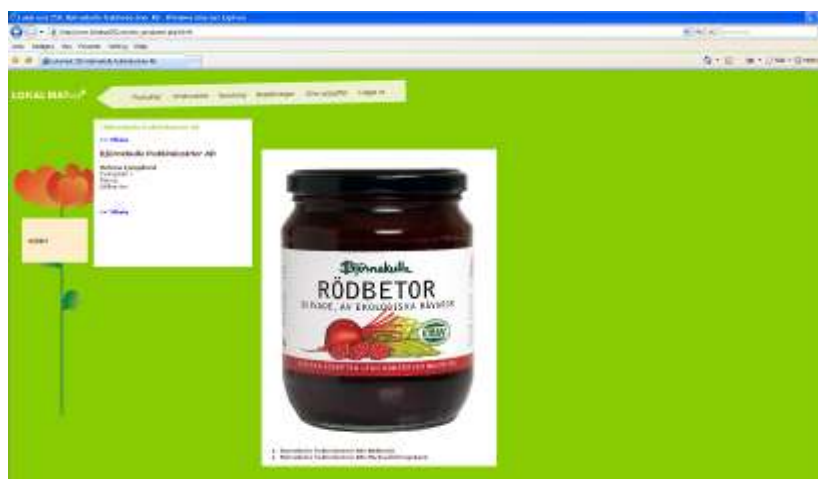
Stage 4: Finalising the web tool and procurement of logistics operator (2008)

Further work had to be carried out on the recruitment of producers to the market place and to finalise arrangements for the logistical solutions. New meetings with the reference group were held. An informative brochure was produced. One producer, already responsible for logistics of organically/ecologically produced food in the region, agreed to become the logistics partner in the project. A consultancy firm was working actively with the operator on improved logistics planning and eco-driving to further minimise transport impact. Finally, in October, the web tool was launched, and the first orders were made within the system. At this point, 21 producers were linked to the system.

Figure 3. The front page of the produced brochure.



Figure 4. A web page from the web tool, presenting one of the recruited producers.



B4 Deviations from the original plan

The overall deviations from the original plan comprised:

Deviation 1: Launch of internet market delayed

There was an overall delay of the measure due to primarily two reasons. First, the process of recruiting producers was slower than expected because of the fact that they were extremely unavailable and unapproachable during their high-season (from April-September each year). Moreover, they were also unavailable in the sense that communication over e-mail did not work, since most of the producers almost never used e-mail. Second, the technological and functional elaboration of the web tool was much more complex than it was thought to be. Ironically, this was in turn due to the fact that the tool needed to be user-friendly.

Deviation 2: The “Environmental (eco-) barometer” not produced

The main reason for not producing the Barometer was that it turned out to be a much more complex endeavour than was anticipated when writing the “Description of work”. Furthermore, it appeared at the time as if several other actors were in the process of producing similar products.

Deviation 3: Reduced ambition for the measure

As the delays and difficulties with the measure were recognised the ambition for the measure was reduced from 40-50 to 20-40 producers and from 5 to 2-5 purchasers being registered with the system by the end of summer 2008.

B5 Inter-relationships with other measures

The measure was not initially related to any other measures within the SMILE-project. However, as the project developed and synergies between measures were identified links with the possible use of methane (gas) powered vehicles via measure 5.2 Biogas on the net and ecodriving training (various measures in Malmö) were identified.

C Evaluation – methodology and results

C1 Measurement methodology

Initially, a short note on the shortcomings of the methodology used for evaluating the measure is in place. Two main issues constitute the reason for the shortcomings.

First, no complete baseline study was made in the beginning of the process. This means that a simplified baseline had to be constructed late in the process, when evaluating the measure (see C 1.2). Here, interviewing in total 31 potential producers (19) and purchasers (12) over the telephone constitutes one important input for the baseline. Also the market analysis that was conducted in the beginning of the SMILE-period has proved important here. From this analysis, several qualified assumptions about the situation prior to the virtual market place, have been made.

Second, the delay of the measure has made it impossible to determine any effects in the form of vehicle kilometres, fuel and energy used and emissions at this time. This is due to the fact that the web tool was actually launched just a few weeks ago. Instead a scenario projection of the potential within the system has been done, based on a number of assumptions. These have in turn been derived from data and facts from the telephone interviews (see above). Thus, the projections set out to show the impacts on emissions of CO₂ for three different scenarios.

In the light of the above shortcomings, and thus in the absence of reality-based quantifiable impacts and effects from the measure, focus has been put on the above mentioned scenario projection, and on measuring the current awareness and acceptance levels among the stakeholders (producers in Scania and purchasers in Malmö). Qualitative indications of these levels have been derived from 29 out of the 31 telephone interviews. These levels give relevant input to both how successful the measure process has been, and to estimations concerning the future potential of the recently launched web tool.

C1.1 Impacts and Indicators

Table of Indicators below.

GUARD nr.	INDICATOR name	DESCRIPTION	DATA /UNITS	Comments
3	Vehicle Fuel Efficiency	Fuel used per vkm, per vehicle type	MJ/vkm, quantitative, derived or measurement	Not used
4	Fuel Mix	Energy used per type of fuel, per vehicle type	MJ, quantitative, derived or measurement	Forms part of three projected scenarios developed to assess possible measure impacts for different levels of take-up. The assumptions made for the scenarios were derived from telephone interviews with both potential producers and purchasers, and from data-simulations on optimised distribution routes. The results from the scenario projections are presented in section C 2.2
8	CO ₂ Emissions	CO ₂ per vkm	G/vkm, derived	Derived from the three projected scenarios of different measure take-up. The results from the scenario projections are presented in section C 2.3
10	NOx emissions	NOx per vkm	G/vkm, derived	Not used
11	Particulate emissions	Pm10 per vkm	G/vkm, derived	Not used
13	Awareness level of measure	Degree to which the awareness of the policies/measures has changed	Index, qualitative, collected, survey	Measured through 29 telephone interviews. The assumption is that nobody knew about the web tool before initialising the measure. See section C 2.5 for more details
14	Acceptance level	Attitude survey of current acceptance with the measure	Index, qualitative, collected, survey	Yes, new indicator added in the evaluation process (oct-08), measured through the telephone interviews. The assumption is that relatively high acceptance levels indicate a large future potential. See section C 2. 5 for more details
21	Vehicle flow by Vehicle Type - peak	vkm per day, quantitative derived	Information from Transshipment Centre operator plus desktop analysis	Aggregate vehicle flows addressed using the three projected scenarios of different measure take -up using data-simulations on optimised distribution routes. The results from the scenario projections are presented in section C 2.4
22	Vehicle flow by Vehicle Type - off-peak	vkm per day, quantitative derived	Information from Transshipment Centre operator plus desktop analysis	Aggregate vehicle flows addressed using the three projected scenarios of different measure take up using data-simulations on optimised distribution routes. The results from the scenario projections are presented in section C 2.4
23	Average vehicle speed - peak	km/hr/quantitative data	Information from Transshipment Centre operator plus desktop analysis	The scale of the application to date has not allowed this to be possible
24	Average vehicle speed - off-peak	km/hr/quantitative data	Information from Transshipment Centre operator plus desktop analysis	The scale of the application to date has not allowed this to be possible

C1.2 Establishing a baseline

A baseline is a determination of the situation prior to the starting of the measure. Thus, the baseline for measure 10.7 is the situation of the regional food market before starting the implementation of the measure in 2005. The baseline situation has been based on both the market analysis conducted in 2005-2006 and on the recent telephone interviews with 30 potential producers and purchasers. The key question is how regionally produced food products were being transported from producers in the region to buyers in urban Malmö.

The overall picture that emerges when trying to answer the above question is that the regional food market is complex and diverse, spanning from producers themselves driving fresh products direct to purchasers often in small quantities in a way that is both cost and environmentally inefficient, to individually purchased logistics solutions for specific deliveries of processed products. In addition the volumes and the delivery frequencies vary a lot between the producers. In a few cases coordinated (between several producers) distribution seems to exist. Moreover, one can see several examples of producers of food products that have settled on the business strategy of selling their products at their own farm shops. One reason might be that for a small company, transport costs tend to make up a relatively large portion of total costs. Thus, a cost-efficient logistics solution ought to be an attractive alternative.

A desk based assumption of the total km driven by the producers to deliver goods prior to start of SMILE has been calculated from the baseline supply and demand analysis. This has also been used as a basis for the calculation of baseline emissions.

As for the transport being conducted, small vans or lorries run on diesel constitute the absolute majority of vehicles used. In some cases heavy trucks (coordinated distribution among a number of producers), or conventional passenger cars are used for transport.

C1.3 Building the business-as-usual scenario

The business-as-usual scenario describes what the situation would be today or at a similar point in time if the measure was not carried out. In the case of this measure, the baseline and the business-as-usual scenario are most likely identical. If comparing the market analysis, conducted in 2005-2006, with the recent telephone interviews (oct-08), no evidence has been found that point in the direction of any major changes taking place in reference to transport solutions for regional food deliveries.

The above goes with the exception that some vehicles may have been upgraded between now and 2005. Furthermore, it might be the case that the growth trend in regionally produced fresh food, with a small ecological footprint, is even stronger today than it was a couple of years ago.

In conclusion, for the purpose of this evaluation, we will equate the baseline with the business-as-usual scenario.

C2 Measure results

The results are structured under sub headings corresponding to the areas used for GUARD indicators – economy, energy, environment, society and transport. For some of the areas no concrete results have been achieved as of today. This is mainly due to the delay in the overall implementation of the measure.

In sections C 2.2 – C 2.4 the results presented are the result of three scenario projections. The assumptions behind the scenarios are based on data from the market analysis and from 31 recent telephone interviews. Furthermore, in the absence of certain data, qualified suppositions

have been made, and simulations on optimised distribution routes have been conducted. In the projections:

- scenario 1 is a mirror of the current situation (21 producers),
- scenario 2 includes an increase in the number of producers participating in the system to 50,
- scenario 3 is an even larger system, with 75 producers.

In the scenarios three different measures have been active in decreasing emissions of CO₂:

- Firstly, educating the drivers of the logistics operator in eco-driving is assumed to give a long-term conservative decrease in fuel consumption, and thus in CO₂-emissions, of 5 %.
- Secondly, simulations on optimising distribution routes show a possible decrease of kilometres driven by the logistics operator, and thus of CO₂-emissions, of 12 %.
- Finally, by substituting all vehicles run on diesel with vehicles run on biogas, the logistics operator would be able to decrease overall emissions of CO₂ by 70 % on average.

Based on current emissions, these three measures will decrease emissions of CO₂ by 75 % in total, where eco-driving contributes 6 %, vehicles run on biogas 80 %, and optimised routes 14 % of the total decrease (100 % of the 75 %).

As for the concrete objectives of measure 10.7 (see section A1), these are accounted for in the below section, C3.

C2.1 Economy

At this stage revenue generated through the system is small and cannot be seen as added revenue, but is instead replacing other sales outlets – the growth aspects of the project will take time (maybe many years) to be realised, and have not yet become apparent.

C2.2 Energy

As explained in the definition of indicators section, an attempt to project the potential reductions in energy use resulting from the virtual market place being operational has been made.

The CO₂ emission calculations suggest energy savings of approximately 30 000 MJ/year in scenario 1, 480 000 MJ/year in scenario 2, and 1.75 million MJ/year in scenario 3 as the distance travelled decreases and the energy mix becomes progressively more in favour of biogas.

C2.3 Environment

As explained in the definition of indicators section, an attempt to project the potential reductions in CO₂ emissions resulting from the virtual market place being operational has been made.

In all three scenarios the logistics operator of the system would be able to reduce CO₂ emissions through (1) optimised distribution routes, (2) clean distribution vehicles (biogas), and (3) educating drivers in eco-driving. The nature of the projected scenarios means that the figures in the table below are merely desk-based projections of the possible impact of the measure.

	No. of producers	Time span	CO ₂ emissions (tonnes/year) <u>No virtual market place</u>	CO ₂ emissions (tonnes/year) <u>Virtual market place **</u>	CO ₂ emission (tonnes/year) <u>reductions***</u>
Scenario 1*	21	0-1 year	3	1	- 2
Scenario 2	50	2-3 years	50	20	- 30
Scenario 3	75	3-5 years	200	90	- 110

* Scenario 1 could more or less be seen as a mirror of the current situation

** In the virtual market place it is assumed that a number of local producers with farm shops, who before the system opened did not deliver anything to Malmö, have been able to increase their production with the volumes sold within the system.

*** If the assumption instead would be that the volumes going into the system from the farm shops are replacing the direct sales at the farm shop the reduction of CO₂ emissions would be even larger, since the emissions from vehicles going to the farm shops will decrease in correspondence to the decrease in sales volumes at the farm shop.

C2.4 Transport

From the three scenarios above, the decrease in CO₂ emissions from optimised distribution routes can be used to arrive at approximate reductions in vehicle kilometres (GUARD indicator 22). In the scenarios the decrease in vehicle kilometres is approximately 700 km/year (scenario 1), 10 400 km/year (scenario 2) or 38 000 km/year (scenario 3).

C2.5 Society

Results on levels of awareness (GUARD indicator 13) and acceptance (GUARD indicator 14) are divided into four groups; producers who participated at an introductory measure meeting in November 2007, and producers who did not take part in the meeting. In the same way interviews were conducted with both purchasers who participated and who did not participate in the meeting. In total 29 respondents took part in this survey.

Awareness: The overall assumption under this heading is that before measure 10.7 was initiated neither producers nor purchasers were aware of the concept of a web tool.

As for the producers who took part in the meeting that was held one year ago it was expected that almost all of them would still be somewhat aware of the measure one year later. Results show that this was the case. However, a majority (6 out of 11) stated that their awareness level was just a 2, on a four-graded scale, where 4 correspond to a very high awareness level, and 1 represents no awareness. Only 2 producers in this group had a very high awareness level (4). This is somewhat surprising, and should probably be interpreted in a way that suggests that more efforts need to be put into communication and marketing.

On the other hand, among those producers who did not take part in the meeting one year ago, 4 out of 6 producers stated that they were at least somewhat aware of the web tool. The other 2 were not aware of the measure at all.

When it comes to the purchasers that took part in the meeting, half of the group (4 out of 8) stated that they had an awareness level corresponding to 3 (1 purchaser) or 4 (3). However, the rest of the purchasers had a low awareness level, corresponding to 2 (3) and even 1 (1). Also here, it seems important to initiate more marketing activities.

Among the purchasers who did not participate in the meeting one year ago, only 4 interviews were held, and 3 of the respondents said that they were not aware at all, while one of the purchasers said that he was very well aware of the initiative.

Acceptance: When looking into acceptance the main assumption is that a high degree of acceptance of the general idea of a virtual market place for regionally produced food, stipulates a high potential.

The levels of acceptance are shown below:

- A. acceptance of the measure through participation today
- B. acceptance of the measure as something that their organisation will participate in starting soon
- C. acceptance of the idea as something which their organisation could participate in
- D. acceptance of the idea, but will not take part
- E. no acceptance of the idea as of today

As for the producers who participated in the introductory meeting in 2007, a majority have a high acceptance level. 6 out of 11 respondents answered A (4) or C (2), while the rest of them either stated that they would not take part, D (2), or that they had no interest in participating in the virtual market place, E (3). One of these three argued that the reason for this was the lack of information about the project.

Not very surprisingly, the producers who did not participate in the meeting were less accepting than the above group. Only 1 out of 6 respondents accepted the idea as possible for their own business (C), while 1 respondent argued that they would not participate (D). 4 producers had no acceptance of the measure today (E). However, 2 of these respondents said that this was due to the fact that they had not noticed the web tool yet. This again suggests shortcomings when it comes to the marketing of the measure.

Among the purchasers who participated in the meeting one year ago 5 out of 8 respondents answered with an A (1), B (2) or C (2).

As for the purchasers that did not participate in the meeting, only 4 were reached. 2 of these acknowledged the idea as possible (C). 1 purchaser did not accept the idea, and 1 did not know anything about it and therefore could not comment at this point.

The 29 respondents were also asked directly about their opinion concerning the potential of the virtual market place. On a four-graded scale from “no potential” (1) to “very large potential” (4), the accumulated answers gives an average of 2.9. Another way of putting it is that 7 out of 10 stakeholders believe that the idea has a large potential (rather large or very large). Only 7 % of the respondents say that the idea has no potential at all.

C3 Achievement of quantifiable targets

A short comment on the below table is in place. Several of the objectives/targets of this measure are more qualitative than quantitative in their nature. This means that also the assessment of the level of fulfilment in the table below often is more qualitative in its nature.

No. (see section A1)	Target and Assessment	Rating
Objective 1	<u>Target:</u> An IT-based logistics tool on the web developed and launched <u>Assessment:</u> web tool launched in October 2008, first 3 orders made within the system.	**
Objective 2	<u>Target:</u> 40-50 small food producers and 5 purchasers linked to the system <u>Assessment:</u> 21 producers and 3 purchasers linked to the system as of today	*
Objective 3	<u>Target:</u> An analysis of supply and demand, including logistics operators, and of product flows and development potential conducted <u>Assessment:</u> This was done in 2005-2006 in collaboration with the County Council	**
Objective 4	<u>Target:</u> A co-ordinator/quality controller will be appointed part-time during the first 2 years of the project <u>Assessment:</u> System not launched during the period that was intended.	0
Objective 5	<u>Target:</u> A number of training events for all actors included in the system <u>Assessment:</u> An introductory meeting, three reference group meetings, and app. 15 individual meetings with producers or purchasers have been conducted	*
Objective 6	<u>Target:</u> Procurement of a logistics operator which should convert/purchase 5 vehicles to operate on cleaner fuels <u>Assessment:</u> A logistics operator contracted, and 4 vehicles run on biogas has been ordered, but have not been delivered as of today	*
Objective 7	<u>Target:</u> Minimise CO ₂ emissions through more efficient logistics <u>Assessment:</u> Scenarios and calculations show potential substantial reductions in CO ₂ emissions, but these have not been achieved within the contractual period of SMILE	0
Objective 8	<u>Target:</u> An “environmental (eco-) barometer” <u>Assessment:</u> The idea was abandoned early in the process	0
Objective 9	<u>Target:</u> Dissemination packages (brochures etc.) will be produced <u>Assessment:</u> Only one brochure produced rather late in the process	0
NA = Not Assessed 0 = Not achieved * = Substantially achieved (> 50%) *** = Achieved in full **** = Exceeded		

C4 Up-scaling of results

When discussing an up-scaling of the results of the measure process so far, the scenarios presented above (section C2.3) carry a strong relevance. In this respect, it could be argued that if the barriers dealt with in section D1.1 below could have been counteracted in a more efficient way than has been the case, it would have been both technically and practically possible to reach at least scenario 2 above by the end of CIVITAS II (2009). Scenario 2 corresponds to 50 producers linked to the system, and a reduction in CO₂ amounting to approximately 30 000 kg per year.

As for the year 2015, that has been agreed as the second time span of interest here, it can easily be argued that scenario 3 above, corresponding to 75 producers being linked to the system, and a reduction of CO₂ of well over 100 000 kg per year, is practically possible.

Furthermore, another aspect of the discussion of up-scaling the results that needs to be mentioned here is the replication potential inherent in this measure. This goes both for the regional perspective, where a number of other cities (and their potential purchasers in the forms of shops, stores and restaurants) within the region could join the existing system, and the national perspective, where several other regions in Sweden could follow the good example of Skåne, thus bringing about additional reductions in emission levels.

C5 Appraisal of evaluation approach

Some of the shortcomings in the process of implementing measure 10.7, especially the absence of a thorough baseline study and the extensive delays, have affected the evaluation process in several ways. In retrospect, more efforts should have been put on:

1. An extensive baseline study, setting out to falsify/verify the assumptions that were made beforehand as well as obtaining quantitative data with regard to km driven, emissions, etc..
2. A more thorough SWOT analysis in the drafting of the measure plan, that would have mitigated the barriers (see section D1.1) involved in the implementation.
3. Creating better correlations between the objectives of the measure and relevant indicators within the GUARD-framework of indicators.
4. Focusing on fewer objectives and fewer indicators
5. Starting the last phase of the evaluation process, leading to the point of writing this report, in an earlier stage, thus allowing for more data and a more reflective process

In the best of worlds, the system would have been running for at least two years now. This also, of course, would have resulted in a more comprehensive evaluation process.

Another problem associated with the evaluation of the measure, besides the delay, was that the measure contents appear to have changed compared to the initial description of the measure as approved of at the time the measure was added to SMILE. Then no mention was made of the provision of eco-driving to participants or the purchasing and or retrofitting of vehicles since the focus and content of the measure was the web tool to facilitate communication and logistics, generate more market potential and thereby lead to a reduction of emissions. Conducting a baseline study according to the initial understanding of the measure only to discover that the measure content had been changed would have made the baseline study less useful. This means that the evaluation can only be as good as the measure implementation, and also relies upon communications about key changes in the measure happening in a timely manner as the measure develops.

C6 Summary of evaluation results

The key results are as follows:

- **Key result 1** – The measure implementation has been significantly delayed. This in turn means that an absolute majority of indicators deemed relevant when planning the measure have been impossible to assess as of today.
- **Key result 2** – In the absence of an extensive full-scale baseline-study, assumptions might have played a too large role in the description of a baseline and of the business-as-usual scenario.

- **Key result 3** – Scenario projections have shown that substantial reductions in CO₂ emissions are likely if/when the system reaches critical mass.
- **Key result 4** – 7 out of 10 stakeholders (purchasers and producers of food products) believe that the idea of a virtual market place has a large potential (rather large or very large). Only 2 out of 29 (i.e. less than 1 out of 10) respondents believe that the idea has no potential at all.
- **Key result 5** – Both awareness levels and acceptance levels are reasonably high, pointing to a rather large potential, but also suggesting that more efforts should have been made when it comes to “selling the idea” through information, communication and marketing.
- **Key result 6** – An absolute majority of the objectives/targets of this measure are more qualitative than quantitative in their nature. This means that also the assessment of the level of fulfilment often is more qualitative in its nature.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Barrier 1 (technical) – Problems concerning the technological solution** – Early on in the process an influential entrepreneur convinced the measure staff to choose his technological solution. Thus, the measure got stuck with one possible IT-solution. Unfortunately, this solution has over time turned out to be too complex and less user-friendly than was expected. Over the implementation phase several efforts have been made to adapt the web tool.
- **Barrier 2 (staff related) – Problems concerning the staff involved** – The issue of personnel within the measure has been characterised by several recompositions (sick-list, maternal leave etc.) an initial absence of sales competence, time shortage, and at certain points in time, an absence of commitment. These problems have been dealt with, through both recruitment of new staff, and through employing consultants.
- **Barrier 3 (constraint to realisation) – Problems concerning stakeholders’ commitment** – In the recruitment process it soon became clear that the food producers are extremely hard to get in contact with while their businesses have their high seasons. Therefore, during the period April-September each year the measure suffered from a more or less complete absence of engagement when it came to the regional food producers. Furthermore, the problem was enhanced by the fact that the producers often turned out to be less frequent e-mail users than the average person.
- **Barrier 4 (critical circumstance) – A too strong belief in the idea behind the measure** – In retrospective, it could be argued that a too strong belief in the idea behind the measure among the staff, probably resulted in a somewhat naive approach to the implementation phase. The idea, it seemed, was considered so brilliant that it would almost implement itself. Over time, this became clear for the staff involved, which then in turn had to put more effort into the implementation of the measure.
- **Barrier 5 (organisational) – A lack of successful collaboration with the Skåne County Council** – Even before the start of SMILE it was clear that the regional government, the County Council, was striving for implementing a somewhat similar idea. The initial idea was obviously to pursue this in collaboration. However, as time went by, the County Council lost its credibility among the stakeholders for several reasons. The inevitable response from the staff involved in the measure was to withdraw from any concrete joint efforts.

- **Barrier 6 (technical/organisational) – A mismatch in competence and measure design.** – As the measure leader and/or evaluator has noted, farm producers involved in or potentially involved in this measure did not answer emails to the extent desired by the measure leader and as hoped for in the measure design. Given that the measure in its ultimate implementation requires a certain IT-savvy and willingness to use on the part of the farmers, it would seem to be a paradox that the measure did not check willingness to use IT communications as part of a pre-study/scoping exercise. How can one expect the farmers to use this measure's web-tool on a regular basis if they either are reluctant to answer emails or have difficulty mustering the technical competence to use email?
- **Barrier 7 (financial)** – the measure is seen as a good idea, but has to overcome a financial barrier in terms of set up and operational costs. Low take-up will make it difficult for the local authorities to justify the ongoing operation of the measure that they desire in terms of cost effectiveness. Ultimately the justification may be on perceived economic support to the region rather than environmental or pure financial grounds.

D1.2 Drivers

- **Driver 1 (societal) – A strong idea supported by the societal trends** – From almost any viewpoint it is hard to argue with the general idea behind the measure. Furthermore, a strong societal trend, based primarily on the debate on climate change, has supported and reinforced the idea as well as the measure.
- **Driver 2 (organisational) – A project owner with high credibility** – The City of Malmö being the project owner has most certainly made it easier to sell the idea, than if a private actor (with commercial interests) had done the same thing. The municipality is a neutral actor on this highly competitive market.
- **Driver 3 (staff related) – Successful changes in staff** – As a response to barrier 2 (see above) a consultant with a strong network and a high competence when it comes to “selling the idea” was recruited in 2007. Furthermore, a new staff member with a strong commitment and relevant coordinating skills came into the process in the beginning of 2008. These changes have been fundamental in taking the process to the next level, where the launch of the web tool became a fact in October 2008.
- **Driver 4 (organisational) – A reference group with stakeholders** – A first step towards making the stakeholders themselves take over the virtual market place in a partnership has been to found a reference group, consisting of both producers and purchasers on the food market. In this way, the stakeholders themselves get to own the process more and more over time. The reference group has also contributed with important input to the implementation process.

D2 Participation of stakeholders

- **Stakeholder 1 – Producers of regionally produced food** – These SMEs are interested in selling their products on the regional market in Scania. Malmö being the “capital” of the region is an important market for many of these producers. Thus, their main interest is probably commercial, but in many cases regional small-scale food producers also focus on ecological issues. A listing of SMEs within the food producing sector points in the direction of approximately 135 active producers in Scania/Skåne. 24 participated in the introductory measure meeting held in November 2007, and a couple of them are members of the reference group of the measure. 14 individual meetings between the measure staff and one producer at a time have been held.
- **Stakeholder 2 – Purchasers of regionally produced food** – In this context the purchasers are defined as stores, shops or restaurants in Malmö interested in regionally produced food as an input to their business. Today, customer preference is becoming important when considering the ecological footprint of a certain food product. Thus, providing

locally produced food might be a business concept that gives competitive advantages. Within this group we could find hundreds of purchasers. It is however impossible to assess exactly how many might be interested in the regional and local food market. The number seems to be growing over time, following the societal trend. 18 potential purchasers took part in the introductory measure meeting in November 2007, and a couple of them are members of the reference group of the measure. A few individual meetings with specific purchasers have been held as well.

- **Stakeholder 3 – End-users of regionally produced food** – The customers of stores, shops and restaurants in Malmö are more indirectly involved in the measure. However, their preferences and behaviour might be significant for the success of the system. A general assumption today might be that the customers are becoming more and more aware of the environmental impacts of different product groups. No end-users have taken an active part in the implementation process of the measure.
- **Stakeholder 4 – Malmö City Council** – The role of Malmö City Council was to co-ordinate project activity and to develop contacts with purchasers in the city and producers in the region.
- **Stakeholder 5 – Skåne Regional Council** – The role of Skåne Regional Council was to promote more coherent working to promote efficient logistics in the region by drawing together a logistics working group.
- **Stakeholder 6 – Contracted Logistics Provider** – The role of Mossagården was to pick up food products from producers in the region and deliver these to purchasers in the city with clean fuel vehicles.

D3 Recommendations

As stated above (section C4) there is a replication potential inherent in this measure. This is due not the least to the societal trends of today, focusing on more “climate efficient” lifestyles and consumption patterns.

A couple of short recommendations for other cities and municipalities in reference to this might be in place:

- **Recommendation 1** – Priority number one when choosing the technical solution should be the end-user. That is, the web tool has to be user-friendly rather than complex. Otherwise the initial barrier might be too high for the potential user.
- **Recommendation 2** – Employ committed staff members with the right skills. It is of utmost importance that skills involving coordination/administration as well as marketing are represented among the staff members.
- **Recommendation 3** – Initial efforts put on a well-planned marketing and communication strategy are fundamental. For example, take into consideration that a majority of small-scale food producers are unavailable during their high season. Try to make contact and build networks during winter season (October-March). Do not use e-mail or IT in any form when initiating contacts with producers (and purchasers).
- **Recommendation 4** – Early on, plan and conduct a baseline study which can give answers to fundamental questions about preferences among stakeholders, demand and supply structures, and product flow patterns. The target groups are so disparate that there will be a clear need for central co-ordination of a plan and resources in order for the measure to succeed. This is probably a role for a local authority or development agency.
- **Recommendation 5** – To make the best impact consider, when contracting a logistics partner for the system, the use of clean fuels (biogas), educated drivers (eco-driving), and skills within the fields of optimised routes and logistics as part of the selection criteria.

- **Recommendation 6** – For farmers that want to participate in the system but who lack IT skills/resources/interest/competence consider establishing a system whereby the farmer can complete and submit a paper form with information about produce available to a central service which then types this information into the web tool on behalf of the farmer. Another potential option is to permit farmers to SMS/text message information to a central service and then receive requests via SMS by mobile phone. This attention to the needs and interests of the producer end-user is important.

D4 Future activities relating to the measure

Any additional future activities within the project are not determined as of today. Ultimately, it all comes down to the funding issue. However, the city of Malmö has the intention to keep supporting the system, maybe in cooperation with other municipalities in Skåne.

When writing this the system has just been launched and 21 producers are linked to it, while only three orders have been placed. It is likely / hoped that with continued marketing and engagement works in the low season a significant increase in product flow would be seen in future summer seasons.

In the longer perspective the expectation is that the system and the virtual market place can be owned directly by a partnership of a number of producers and purchasers. The exact details of this partnership remain to be solved.