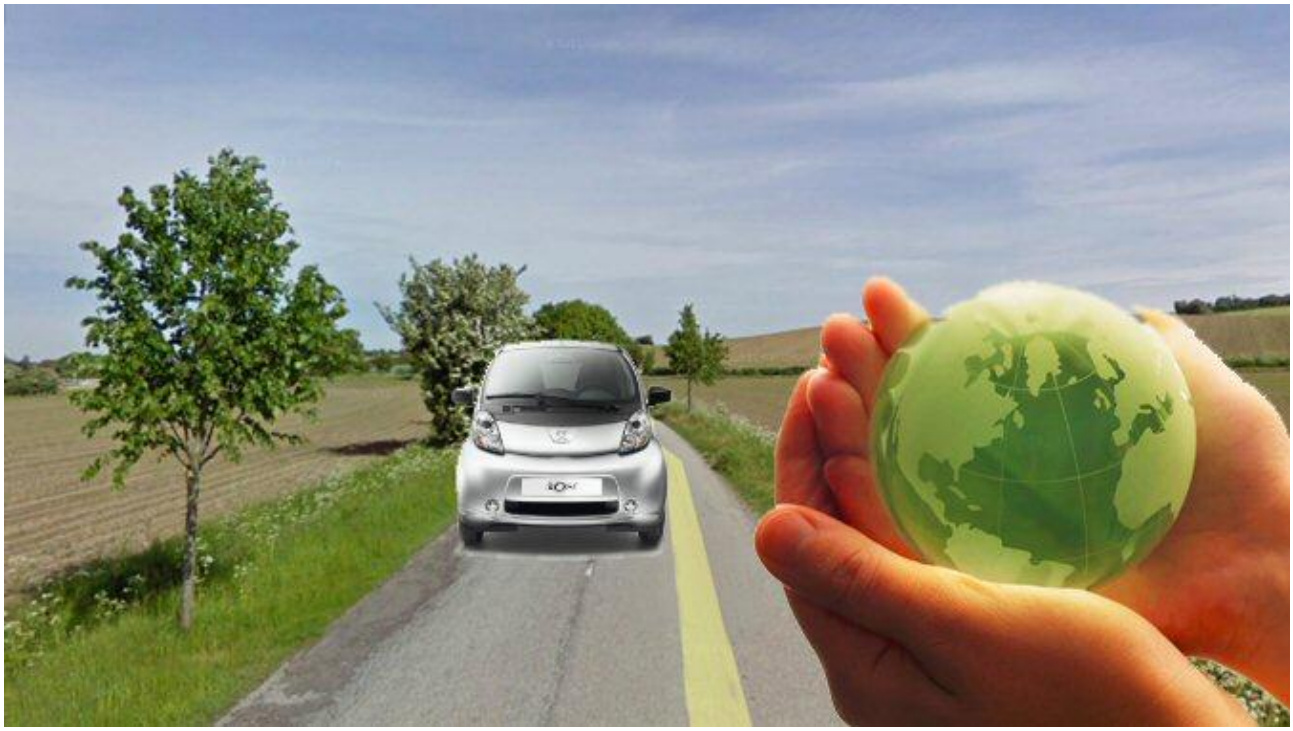
SYDDANSK UNIVERSITET

Sustainable transport in rural areas



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Executive summary

The objective of this report is to customize existing CO_2 decreasing solutions to the district of Dynt–Skelde–Gammelgab and similar rural areas. The collected data can then be used to improve their CO_2 emissions caused by transportation. We start out with basic research in the field of transport-related CO_2 emission-reduction.

This should prepare us for our first meeting with the villages' inhabitants, for whom we will prepare a questionnaire which will give us basic information on who lives in the village and what their transportation habits are. Based on this we get an overview of the circumstantial background.

Following this, we start detailing three different ways to improve the situation in the villages. This is done by examining what is already being worked on elsewhere in Denmark and applying this to a rural area like Dynt-Skelde-Gammelgab. These three concepts are detailed descriptions on electrical cars, electrical busses and carpooling.

In close cooperation with the villages' inhabitants and their representatives, we customize the concepts to fit the inhabitants' needs. In the end we come up with a recommendation divided into two parts. One concerning private and one concerning public initiative.

Furthermore, problems and unfortunate decisions during the project are discussed and evaluated to formulate statements about what to do better next time.

Project formulation

Project background

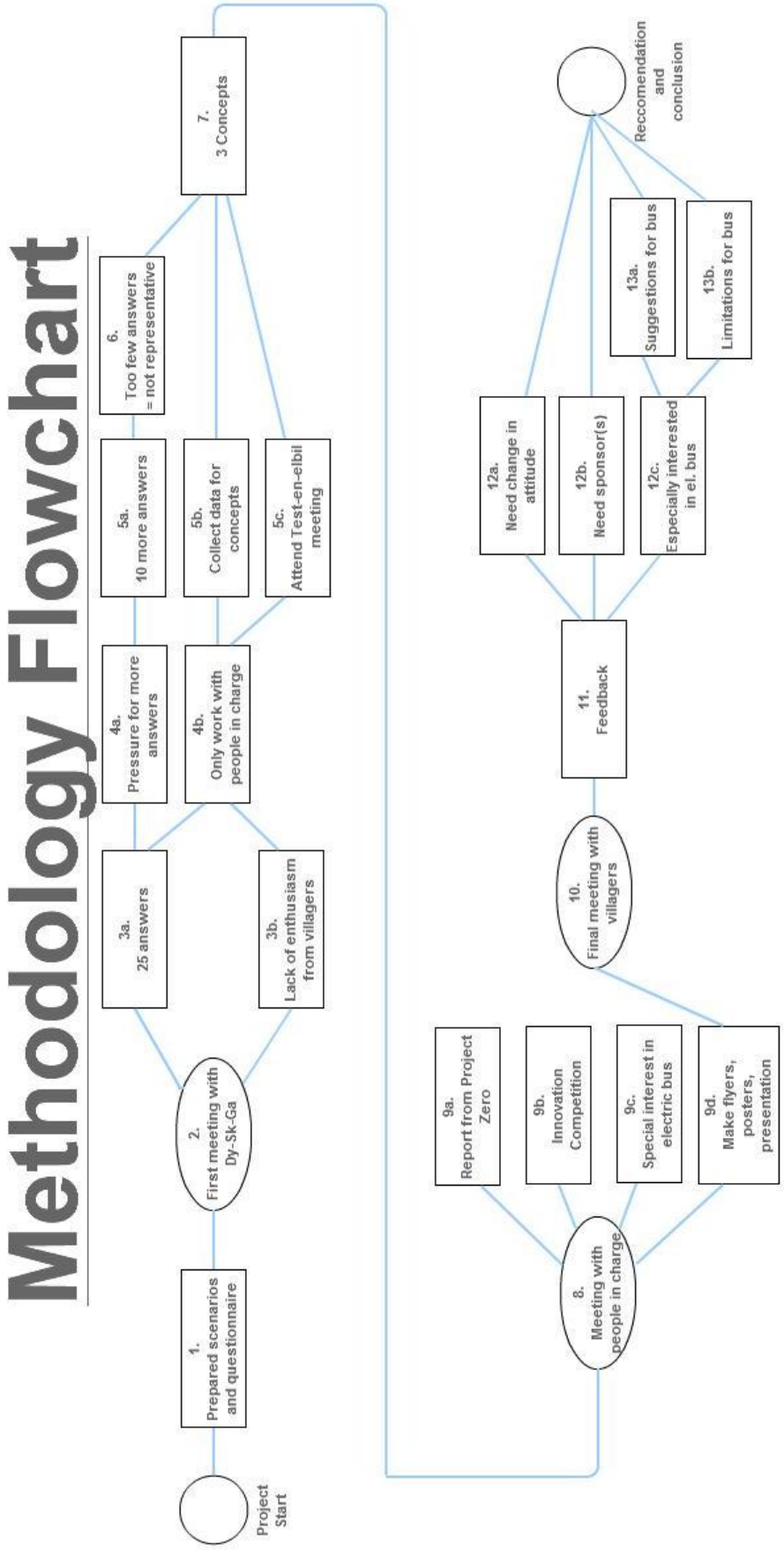
In our semester-project we were asked to create a joint solution with one of the rural districts around Sønderborg. Even though cars are getting more and more environmental friendly the amount of energy and CO_2-emissions in the transportation sector has increased over the last 30 years. Due to this fact we decided to work on improving the transportation in these areas and were therefore routed to work with Dynt-Skelde-Gammelgab, three villages which are placed in the south- west of Sønderborg.

Problem formulation

How can we make a concept for Dynt-Skelde-Gammelgab to improve their transport-related CO_2-emissions?

Project delimitation

The object of this report is to deliver different suggestions to improve Dynt-Skelde-Gammelgab`s transport-related CO_2-emissions. We will provide different solutions and show how they could be applied in this area. No Solution will be executable right after the project; the aim is to give detailed overview of the information needed by the local citizens to decide what to focus on.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Methodology and Work with Dynt-Skelde-Gammelgab

In this chapter we want to show how we worked and for what reasons we made which decisions. The methodology is chronically ordered and for making it easier you can find a “flowchart“ on the previous page and in A3-size in appendix 1. It is supposed to show our decisions and makes it easier to follow them. Each decision or step has a number and can therefore be found in the chart easily.

Our first meeting with the Dynt-Skelde-Gammelgab villages seemed to be very promising in the beginning. As far as we understood, they had a legitimate interest in improving their transportation system and therefore wanted us to help them work on this. In advance of the meeting we asked ourselves how we could get the most out of it.

Preparing for the meeting (1):

First of all we decided to hand out a questionnaire, so we could get some numbers and information which were necessary as a fundament for our future work. (The Questionnaire and it`s content is attached in appendix 4, 11 & 12). Secondly we prepared ourselves with some background information from existing projects, i.e. car sharing and looked how this could be translated to the Dynt-Skelde-Gammelgab area. This step was necessary to have some examples prepared to show the habitants who we were and what we could work on and what might be a promising way to decrease their transport-related CO_2-emissions.

First Meeting (2):

When we arrived at the meeting only a few people were already attending at that time and so we tried to get them in some conversation about the project theme. Here we had to realize that we were not as interesting as the amateur radio system which was running constantly in the background, spreading a submarine like atmosphere to the whole meeting (3b). Finally we were officially presented to the crowd and could hand out our questionnaire, that gave us the hope that there would be some outcome from that meeting. It started promising with the attending people filling out the questionnaires. We were also promised that they would get us up to 250 results from the habitants of the villages within the next 2 weeks. After filling out the questionnaire an

emotional discussion started about how Sønderborg city council is interfering with their interests and our project got out of their minds. (3b)

Meeting Outcome:

The main outcome was that going to these meetings seemed to be a waste of time concerning the interest from the average type of attending people. The average participant was 60 + years old and his benefit from attending this meeting seems to be cultivating his social life. What we could do better next time is that we should save the time wasted on attending these meetings and talk directly with the people which are in charge (4b) for projects like ours, like Marianne Tychsen who promised us to deliver the questionnaire answers and seemed to be way more competent in delivering us the necessary information for our project both faster and more uncomplicated.

But as promising as the 250 questionnaire answers seemed, as disappointing was it that we only got back 25 answers (3a), which were mostly answered by ”60+” people again, and was therefore not representative and therefore practically useless to us. We discussed how to go on and after a meeting with Marianne Stenger decided to extend the time for Marianne Tychsen to return the answers. We called her and agreed on a week more to get us the promised answers (4a). We needed the data urgently to finally get our basic information to start working.

We also made some more decisions. The first one was to inform ourselves more detailed about existing projects and go more in detail with that to be more prepared, if we would finally get some results. Another one was not to expect the habitants of the villages to show interest in the work with us anymore. This decision should make us independent from the questionnaire results. Instead we wanted to work out a couple of scenarios which would work in the Dynt-Skelde-Gammelgab area and once they were all worked out, go to the village again and present our results, so the local authority has some data they can use if the discussion about transportation is coming up more seriously in future (5b) .

In the process of looking at these scenarios we got the opportunity to participate in a meeting from the company ChooseEV which tests electric car concepts with Sønderborg Kommune (5c).

This meeting was very interesting for us and by talking to the representatives of the company we got a lot of new ideas and information about electric car concepts and how they could be implemented as well as technical data on electro cars. After this we decided to also implement scenarios including electrical car solutions in our report.

After one week we extended the deadline on the questionnaire results, but only got 10 more answers (5a). That was again a throwback for us because we thought that after the newest appoint with Marianne Tychsen the people got our project back in their minds and would answer more of the questionnaires. The fact that the people did not seem to be interested in our work was now stated black on white in the questionnaire results (6). 44% of the few answering people said that they have no interest in getting their transportation improved if it meant decreasing their independence.

Scenario Work:

Still we decided to work on and stick to the above mentioned decisions we made and kept on working on our scenarios (7). We looked at different scenarios all over the world to get inspired and then decided to focus on more detailed projects which are already running or are in the development stage in Denmark. Our focus was on collecting data about the electric car segment, which includes what kinds of cars are available and what their long run and short run costs and range are and what the charging station infrastructure is. On the other hand we also looked at a non-electric environmental friendly car to have a direct comparison showing where the advantage of the electric car is. To come up with a completely other way of approaching we also wanted to bring in car pooling as factor, even though this is exactly what the people seem to fear because of giving up their independence in transportation.

The next step on approaching the electric car segment was working out what the existing electric car projects are exactly working on, and what their sizes and results are. Then we had a look at the cars they are using and figured out their costs, like insurance and tax prices, which was in some cases very hard because the projects or the cars are still in a testing phase and there is no final product available yet. To get an overview of the ranges we collected data about where possible charging stations are available in Denmark and Northern-Germany. Then we printed a map and

marked all the available charging stations with red, green and blue dots on the map. See the map in the appendix and in the electric car chapter.

Meeting with people in charge:

After we collected this data we agreed on another meeting (8). The difference to the meeting before was the fact that we only met with the people in charge for our project. We presented them our scenarios which we worked out for their area and asked them for feedback on those. We piqued their interest especially with our electric bus – scenario (9c), because they have problems with their bus connections and a discussion about a pilot-project including this electric bus started. Through this meeting we also got the possibility to get a report from the University of Flensburg (9a) which was also dealing with transportation but within a way larger area , which didn `t really helped us out because it was too city related. Another outcome of this meeting was that Marianne Tychsen made the suggestion to participate in "det syddanske grøn vækst program"[1] (9b) with our electric bus idea, which we decided not to lay our focus on because we were already late with our project and the program did not start until the beginning of January.

Feedback – Meeting with habitants :

Last but not least we decided on another meeting in the beginning of January, but this time we wanted to include the habitants of the villages again to get feedback from them on our worked out scenarios with a special aim on the feedback what we could do better next time especially by including the habitants better in the project process. We prepared ourselves for this meeting by preparing general data concerning our scenarios on flyers and posters and made a presentation (appendix 5, 7 and 15) (9d). The flyers, posters and the presentation can be found in the appendices. The attendance at this meeting was not as we hoped (10). Only 8 people attended but fortunately they were very prepared and really helped us with a long discussion and very helpful feedback.

The outcome of their feedback, i.e. how we could change the attitude of the people to get them interested and other helpful recommendations (12&13), which was then included in our final recommendation , where we used the habitants influences and wishes and connected these with

[1] http://www.regionsyddanmark.dk/wm372921

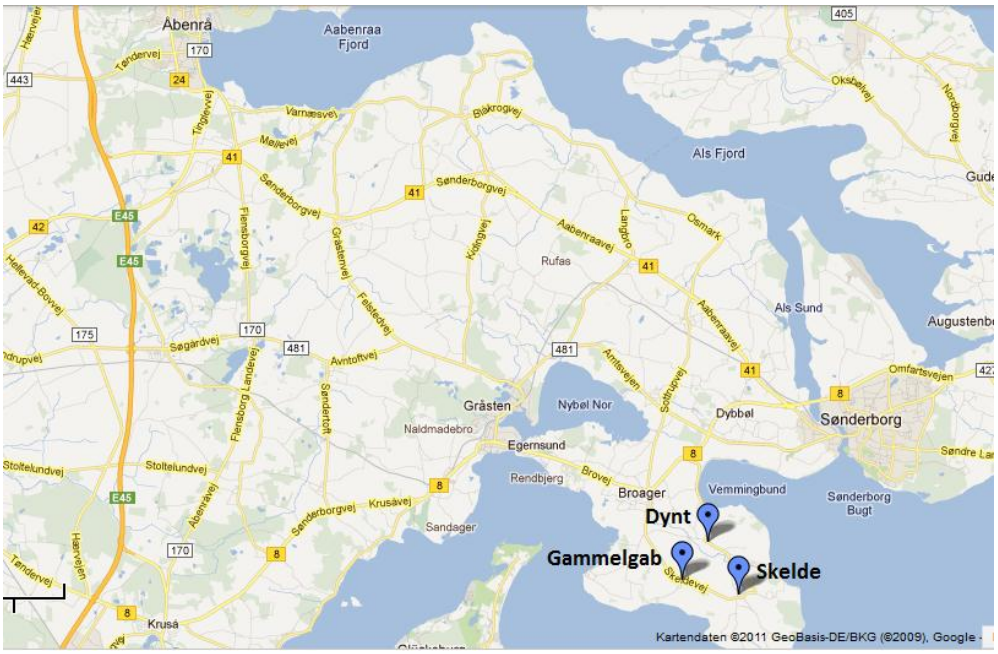
our ideas. The feedback about what to do better if we would do the project again can be read in the chapter project evaluation.

Presenting the three concepts to the people in charge and citizens

Results and analysis

Circumstantial Background

First of all we need to have background about the societal and environmental background within the three villages Dynt, Skelde and Gammelgab.



The three villages, which are found in the southwest of Sønderborg are lying close together within an area of not even 25km². Based on the small number of citizens the amount of traffic in the area is very low. About 1200-1500 live in the three villages in total.

The nearest cities are Sønderborg (ø 10km), Graasten (ø 11km) and Aabenraa (ø 37km). The nearest highway is the E45 at a distance of ø26km.

The public traffic infrastructure is not recommendable for daily routine but it's usable. A bus can be ordered from the villages to Broager nine times a day which can than be used by the habitants to go to Graasten, Sønderborg or Flensburg rather easily by changing the bus.

The streets are mostly small country roads, where sometimes not even 2 oncoming cars can pass each other without one holding on the edge of the street. Other roads are more like a field track and not even or hardly tarred.

The nearest grocery store is found in Broager and therefore people without a car a depending on the bus or a taxi to get there.

To get a better overview of the habits of the people concerning their traffic habits and the amount of cars they own and some more information to get an overview with what kind of people we were dealing with we made a small questionnaire.

First of all we asked general questions about the gender, the peoples' age and the amount of people living in their houses, as well as if they have kids. After these general questions we asked more precise questions about their transportation situation. We wanted to know which means of transport they use in general, how many cars they have, the amount of drivers a car is used by, the distances they are driving within a week and how many people usually are sitting in the car simultaneously.

At last we wanted to know if they are willing to do something like driving with others, to decrease the CO_2 emission of their village to get a first impression how to deal with them concerning the thematic.

The questionnaire and the results of it can be found in appendix 4, 11 and 12.

Questionnaire results

From the 250 answers we were expecting after the meeting we only got 32 questionnaires back. 63% of the people answering were males. The range of age is big, since 25% of the people answering were between 20 and 30 and 34% above 60 years. Most of the people are living in single households with two people, while nearly each household has a minimum of one car. A small majority (56%) even has two cars which is understandable if we look at the infrastructural situation they have to deal with. On the other hand it shows us that there is the possibility to improve the CO_2 exhaust by using less cars and carpool more. 44% of the people living in Dynt, Skelde and Gammelgab replied that they drive more than 100km per week. Another peak (25%) can be found at 20 – 40km per week. If we look at the distances to the nearest larger town we can

say that these 25 % are using their car only to go shopping twice a week or for other important needs like seeing the doctor. This result gives us good reason to look for example how these shopping rides could be made more efficient if people were using other transportation methods. The next interesting information is that as many 63% drive alone in their car, only 28% are using two spots per car which is again stating the above mentioned fact that there are a lot of possibilities to improve their traffic situation. The peoples will to participate actively in changing their situation and their CO_2 pollution is split up in two parts with nearly the same size. 56% are willing to change something in their behavior to save CO_2 emission whereas 44% enjoy their independence of driving alone whenever they want. An interesting fact is that mostly people over 60 are not willing to give up their independence.

All in all this questionnaire gives us only a small overview and is not hitting the aim we wanted to have with the questionnaire mostly because we just didn`t got a representative amount of answers but also because we should have asked the questions in a different way. More about what we made wrong and what we would do better next time can be found in the chapter Methodology. But what we got from the questionnaire is that for the people answering the questionnaire there would definitely be a lot of room to actually reduce their CO_2–emission as long as they want to participate in this actively.

Existing CO_2-reducing projects, products and services

Electric Cars

An **electric car** (also called EV – electrical vehicle) is powered by an electric motor instead of a gasoline engine. The motor gets the needed energy from a controller that is in charge of regulating the amount of energy provided, this controller is actuated by a common pedal pressed by the driver. The energy is stored in a rechargeable battery, while recharging can be done by ordinary household electricity.

Unlike a hybrid car, which is both fuelled by energy and gas, an electric car is only powered by electricity.

For a long time electric cars have been very unpopular, mostly known as golf cars, mainly because of the very limited driving range and long recharging times. A usage in everyday life was a vision for the future.

Evaluating on the newest techniques and upcoming milestones in battery capacity and recharging systems, the conclusion suggests itself. The future has come.

More and more companies are starting to produce electric cars. In terms of comfort and safety EV's have reached equality compared to common cars. The niche market is about to become a major one within only a few years. Particular Denmark is about to get a nationwide infrastructure for recharging stations. This includes so called quick charge stations which give drivers the possibility to charge their cars within minutes.

The newest electric cars can drive from 60-140km with one charge. All depends on the users driving style. The users can drive 100km at the costs of Kr. 35,-. With a gasoline fuelled car the user can drive 100km on an average of Kr. 51,- (see appendix 2 for more details. This example uses a Peugeot iOn. The table is from Peugeot's Danish homepage.

Common electric cars drive up to 130 km/h. This is not the top of technical feasibility, the fastest ones drive up to 220 km/h.

Ideally, an electric car can be completely CO_2 free. In reality it depends on the energy source the driver uses to charge the car. The idea is to get your energy from green sources like wind or solar energy, using energy generated by a coal-fired power station makes it senselessness.

ChoosEV

ChooseEV (Choose Electric Vehicle) is a Danish electric mobility operator running under the slogan "Our Mission – No Emission". As one of Europe's leading companies in their sector they are running Europe's biggest test of electric cars with test-drivers all over Denmark – **testenelbil.dk**. ChoosEV is owned by energy providers SE and SEAS-NVE and the car rental company Sixt Danmark. In cooperation with companies all over Denmark, but also Germany, GB, Spain, Norway and Austria, they offer a whole package of support for EV drivers, including the creation of a nationwide infrastructure for charging stations.

The main service includes a home charging module, a 24h support service, entrance to all ChoosEV charging stations at better conditions, a mobilephone app to find nearby charging station and to track the energy consumption of the car. This service can be achieved for a monthly fee of Kr. 299,-.

At additional costs further services like exchange cars for longer distances (Kr. 199,- per month), a Falck subscription (Kr. 79,- per month) or car insurances (Kr. 299,- per month) can be purchased.

Further information can be found here: www.choosev.dk

Testenelbil.dk

Testenelbil.dk is Europe's biggest cars testing project. Administrative districts all over Denmark are taking part in this scientific test. People that want to take part in the project, either because they think about buying an electric car or to support the project itself have to make an application on the website of the project. There are certain requirements (for example the electrical installation in the house has to be on a certain level) they have to fulfil to be able to become a testpilot for three month.

If all the requirements are fulfilled the testpilot only has to pay the energy bill and give feedback by writing a driving book and a blog on the internet. The driving book includes information about km driven, recharges and general comments noticed during driving. The internet blog is a platform to let testpilots communicate with each other and share experiences. Further on every car has a GPS-tracker to save information about km driven. The gathered information is handled confidential but shared with companies taking part in the project.

Pilots are chosen due to different circumstances. Different experiences are needed, to get an overview how situations develop when the car is used to commute in everyday life or used as a second car just for the weekend.

The project is running in cooperation with the local authorities and local firms.

Further information can be found here: testenelbil.dk

Charging – at home

When using an electric car in Denmark a membership in ChoosEV is recommended. Together with ChoosEV the user can set up a charger[2] to his car at home.

The installation costs kr. **7.795,-.**

In the appendix you can see, that the charger has a few requirements. If the user is unsure if his electric setup at home is capable to handle a charger, he can order an a technical fitter to check the electrical setup at home.

The inspection costs kr. 1.495,-.

Charging a battery from 0 to 100% capacity with the 16 ampere charger at home takes round about 6 ½h. This is enough to drive between 60 and 140km, all depending on the user's style of driving.

[2] Intelligent lademodul type PH 0063 – appendix 10

The charger has different setups and functionalities. By setting up a charging profile you can choose when and more important how the car is charged. (Green energy, cheap energy, ...). Further on it has a tool included that gives the user the possibility to follow the energy consumption of the car.

Charging – outside

There are different possibilities to charge your car outside your home. The user can charge his car at any electrical outlet he finds. Here the car is charged with 10 ampere. So it takes a bit longer than at home. Further on there are two different public charging stations. The normal charging station offers a 16 ampere source. The quick charge stations are able to charge the battery from 0-80% (ca. 100km) within 20 minutes.

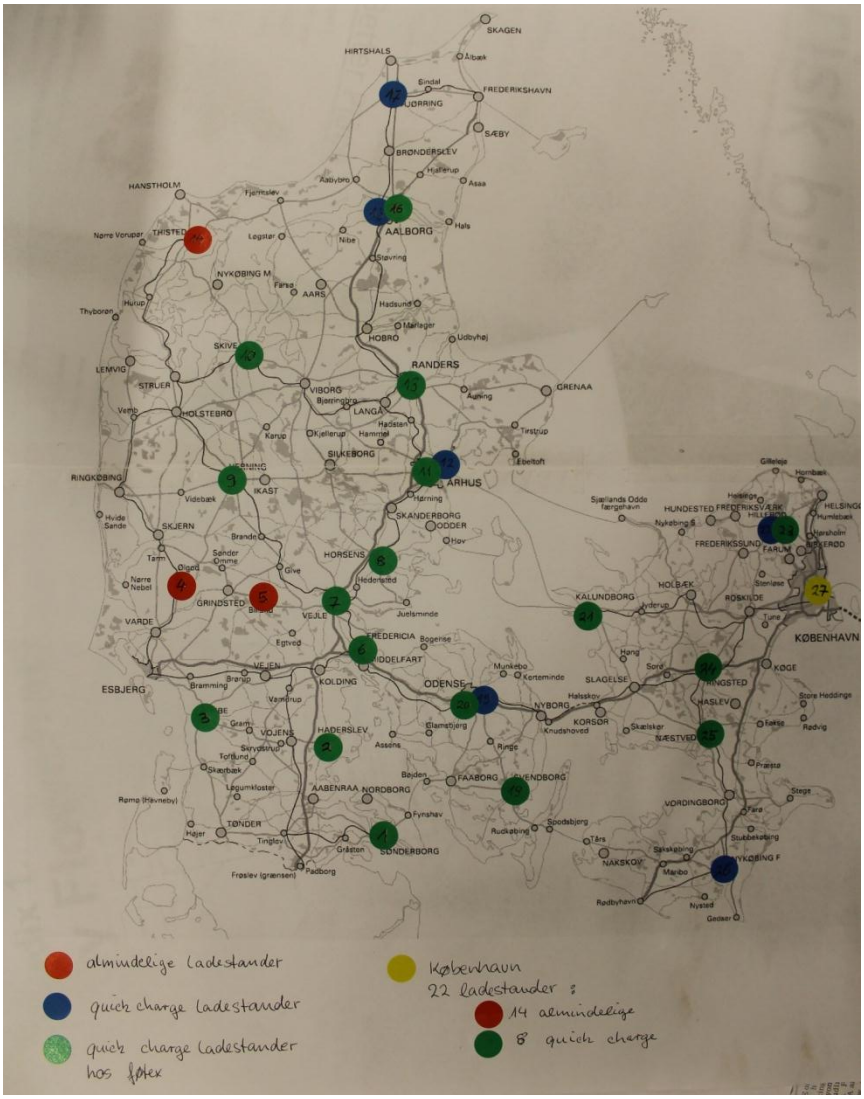
The following table shows the prices for 1kw/h. Here we have to differ between being a member of ChoosEV or not.

	Normal charger	Quick Charger
Normal price per kw/h	Kr. 4,75 ,-	Kr. 5,25 ,-
Price per kw/h with ChoosEV subscription	Kr. 3,50 ,-	Kr. 3,50 ,-

The prices in this chapter were on www.choosev.com.

The following map shows the different locations of charging stations all over Denmark. The supermarket chain Føtex has a project where they are setting up qiuck charge stations on their parking areas all over Denmark together with ChooseEV. [3] Within the middle of January there will be set up 8 quick charge stations, within summer 2012 the count will be up to 21.

[3] Føtex og elbil-operatøren ChoosEV giver plads og strøm til elbiler - appendix



Charging Stations in Denmark

1. Sønderborg QC Føtex
2. Haderslev QC Føtex
3. Ribe QC Føtex
4. Tistrup
5. Billund
6. Fredericia QC Føtex
7. Vejle QC Føtex
8. Horsens QC Føtex
9. Herning QC Føtex
10. Skive QC Føtex
11. Aarhus QC Føtex
12. Aarhus
13. Randers QC Føtex
14. Thisted
15. Aalborg 4x
16. Aalborg QC Føtex
17. Hjørring QC
18. Svendborg QC Føtex
19. Odensee 2x
20. Odensee QC Føtex
21. Kalundborg QC Føtex
22. Hillerød
23. Hillerød QC Føtex
24. Ringsted QC Føtex
25. Næstved QC Føtex
26. Nykøbing QC
27. København:

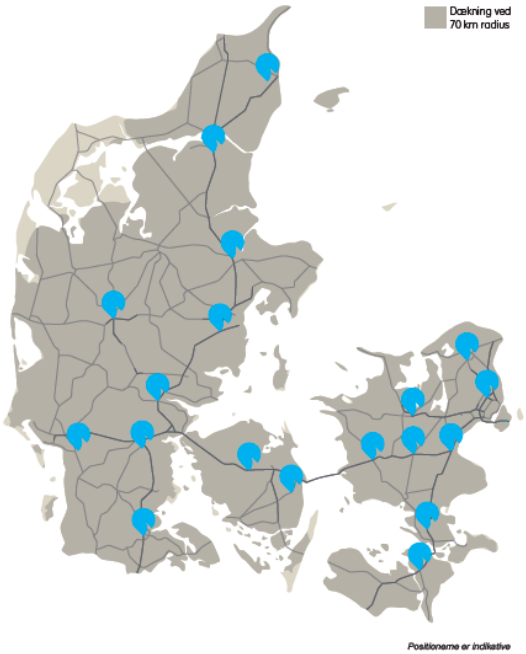
Normal Charge:	14
Quick Charge:	8

Better Place

Better Place is an Israeli-founded company with departments in Denmark, Australia, California, Hawaii and Ontario which aims to move the world from oil-based to sustainable transportation.[4]

In Denmark, they are competing with ChoosEV by building battery-changing stations and charging stations across the country. They sell a package including an electrical car and a subscription which includes a battery, free battery changing, free charging and a set number of kilometers per year[5].

Better Place launched its Danish infrastructure in late 2011 and plan to have 20 charging stations in Denmark by 2012, as seen on the map below.



Carpooling

Background

Carpooling is a form of travelling between one 's place of residence and a place of work or full time studying. It has allowed cities to grow to sizes that were previously not practical and it has led to the proliferation of suburbs. The typical commuter lives in the suburbs and travels daily to work in the city centers. Most of these people are going on their way to work at the same time with the result of rush hours. This again leads to a higher air pollution in the inner cities even though most of the people living in the city centers are using public transportation. Therefore there are different solutions available where the commuters can make appointments to share a car, so that more persons can travel or ride a car – carpooling – thereby reducing the pollution, decreasing the travel costs of the persons, the stress due to ride a car in the rush hours as well as it is increasing the amount of parking space in the inner cities.

This works as explained in the following. The driver gets in contact with ride-searching travelers through a medium such as a website (for example www.pendlernet.dk), Carpooling software, agencies or public pick up points, where the ride searching persons just goes and tries to get a ride

[4] http://www.betterplace.com/the-company-leadership-detail/index/id/shai-agassi
[5] http://danmark.betterplace.com/elbil-til-dig/better-place-medlemskaber/

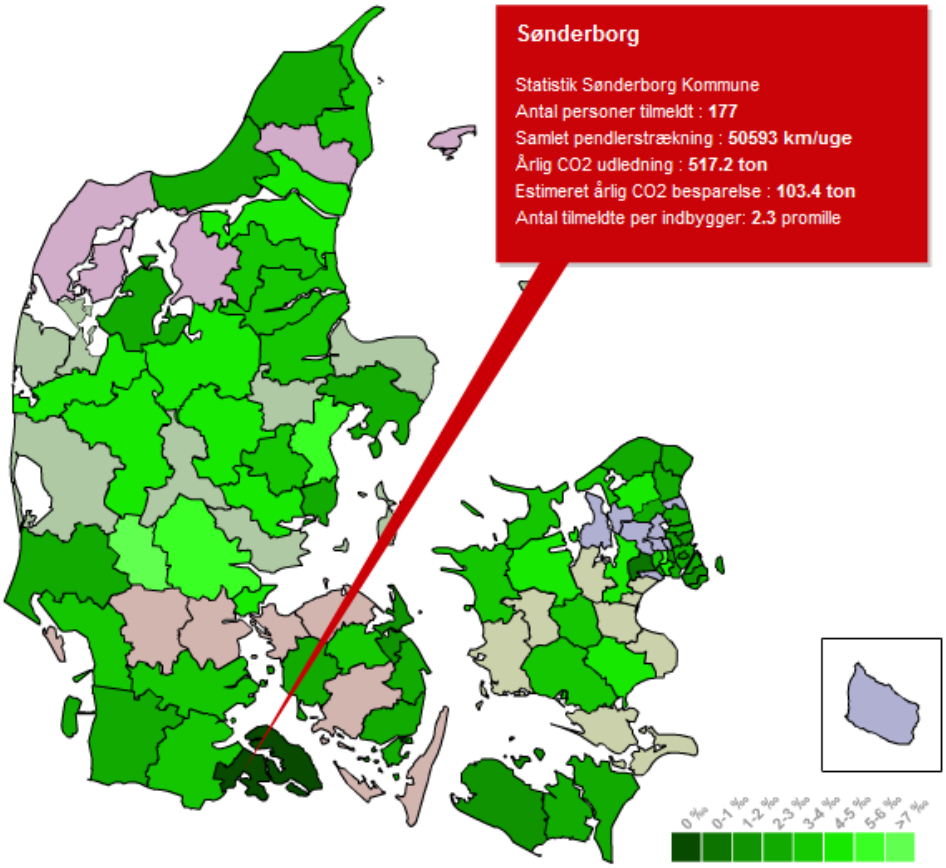
which is in this case not pre-arranged . Then, costs meeting points and times and other details are discussed and planned through this medium. Carpooling doesn't require one to ride the whole route the driver is taking. It is also possible to join a ride for parts of the ride.

Pendlernet.dk

One example of an existing carpooling initiative is www.pendlernet.dk, a Danish website where people interested in giving or getting a ride somewhere can post a starting place, destination and date, and then get in touch with people going to the same place and set up a carpool.

Pendlernet collaborates with Kraks Forlag A/S and a number of Danish municipalities. See the map below for details on which and to what degree. An interactive version can be found on http://www.pendlernet.dk/pnet/all.vi?VI=htm.vi&doc=samarbejde.htm. The people behind the website make no money from it, since they only organize the contact between the people offering rides and people looking for rides, letting them agree on a prize.

On 08/12/11 Pendlernet had 9595 active members, but only 177 of these lived in Sønderborg Municipality and an initiative like this obviously needs many active members to be useful for people living outside big cities.


Sønderborg
Statistik Sønderborg Kommune
Antal personer tilmeldt : 177
Samlet pendlerstrækning : 50593 km/uge
Årlig CO2 udledning : 517.2 ton
Estimeret årlig CO2 besparelse : 103.4 ton
Antal tilmeldte per indbygger: 2.3 promille
0 ‰
0-1 ‰
1-2 ‰
2-3 ‰
3-4 ‰
4-5 ‰
5-6 ‰
>7 ‰

Copenhagen's current electric busses

Background info

Electric buses currently drive on a route in Copenhagen[6]. The busses drive on an 8km long circular route, a bus passes each stop every 7 minutes, and each bus has room for 20 passengers.

The busses take 6-8 hours to fully charge and can drive 120-200km per charge.

Overview

In 2007, it was decided that Copenhagen should have electric busses. After 2 years of preparation, the busses were ready and started driving in Copenhagen. The busses – which are still in use today – were purchased and are run by the Danish Traffic company Movia and were delivered from Car-Ind S.p.A., Italy's biggest importer of Renault busses. 11 busses were bought, only 9 are in use, the last 2 are kept in reserve.

Early in the project, the busses had problems with the batteries, chargers and some of the mechanical parts of the busses, but these were solved through close collaboration with Car-Ind. Compared to busses using gasoline or diesel, the electric busses take longer to repair due to the workshop's lack of experience with electric busses, the fact that the technology is so new and lower availability of spare parts.

A diesel-using bus emits 1.7kg CO_2 per km, an electric bus emits no CO_2 on its own, but the electricity used to charge it will cause the power plant supplying it to emit 258g CO_2 per km, leading to an 85% reduction of CO_2.

[6] http://www.danskelbilkomite.dk/elbus_kbh.htm

Copenhagen's new electric busses

Overview

In the second half of 2012, the traffic company Movia (who are in charge of the electric busses currently driving in Copenhagen (see above)) plans to start a 2-year test of electric busses from the Chinese car manufacturer BYD in and near Copenhagen, the first time this is done in Europe.[7]

The busses are 12m long, have 27 permanent and 4 foldable seats, it takes 3-5 hours to fully charge and they can drive up to 250km on a full charge. They are expected to reduce the CO_2-emission by 55% compared to gasoline- or diesel-using bus.

The purpose of the test is to see if electric busses can replace the diesel-using busses currently used and thereby reduce pollution. After the 2-year test run, Movia will decide if the busses should be put to use on the roads of Zealand.

If the test a success, the city of Flensburg wants to invest in the same busses.[8]

[7] http://www.moviatrafik.dk/omos/Presse/Pressemeddelelser/Pages/moviatagergroentskridtmedkinesiskeelbusser.aspx

[8] http://ing.dk/artikel/121179-flensborg-skal-satse-paa-elbusser

Implementation and Recommendation

First of all we divide this chapter into two parts. The first part is about the busses, where an initiative of local authorities is necessary. It will give an overview of what local authorities could achieve by buying an electric bus to their village(s).

The second part will deal with electric cars and carpooling, which are in the need of private initiative to succeed. It implements the idea of giving an informational background to citizens living in the villages. We will explain what could be done to raise the level of information and awareness in the fields of transport related CO_2 emission decrease.

Part 1: Implementation and recommendation to local authorities

On page 20-21 we gave an overview about the usage of electric busses in Denmark and the newest techniques in this field. Due to this knowledge we created a concept for a pilot project dealing with the usage of an electric bus in rural districts, such as Dynt, Skelde, Gammelgab. First of all we were told that money doesn't matter in the first place. The town council Sønderborg has a budget concerning CO2 neutral projects, which we could apply for afterwards.

1. Based on the limited range of the busses we had to be aware of the geographical position of the three villages in connection to the surrounding points of interest. This will be important in the later steps of the project, when it comes to possible usage of the bus.

2. Further on there is the need for somebody that is in charge of the bus. Driving the bus and technical maintenance are not the only things to mention. Somebody needs to be responsible for bus bookings or decisions where to use the bus at which time and place.

3. On page 20 we referred to busses used in Copenhagen. Movia, the company in charge, made a lot of experiences and found out what is important to succeed with a project somehow like ours. If we should face unsolvable problems in the later stages of the project, we will try to create a co-operation with them. Movia and their experience is the main reason, why we chose the Renault busses from the Italian firm Car-Ind S.p.A.

We would love to involve Sydtrafik as a keypartner, because they are much more present in the area but since they have the monopoly for public transportation in southern Denmark, they are standing in full rivalry to our project and execution plans.

4. We didn't want to invent a schedule for the bus on our own. The bus has to be used by the local community, so we wanted to let the community decide what the field of application has to look like.

Based on the main topic above we prepared a presentation *(appendix)* to the local community in Dynt, Skelde and Gammelgab. We explained every topic and ended up with the following concept for a project.

The project will have two main headlines.

The appeal to the public will be to get people together, to increase the solidarity within the local community. This becomes an issue when it comes to the fields of application of the bus.

The appeal to the local authorities or another sponsor will be the decrease of useless traffic and CO_2 emission.

The reason why we chose to design the project on two levels (public and local authorities) is that The CO_2-emission decreasing argument will not win over the common citizen. There is the need for other pull-factors:

- **Easy to use**
  There will be an internet platform where random people can see the schedule for the bus. Free spots can be booked within a certain amount of days before.
- **No Costs**
  Due to a contract with the local authorities, Sydtrafik has the monopoly for paid public transportation in southern Denmark. Therefore, the bus can't charge a price per ticket.
- **Events**
  Transportation to public events and home again. Concerts and game-nights in Skelde (Nette Jensen Inn) are really common. Especially older citizens complain about possibilities to come around in the evening.

- **Weekly Agreements**

  There will be a shopping tour to Sønderborg 2-3 times a week. This could be extended or combined with things like swimming or bowling once a week.

Besides the bus activities depending on the individual citizen there will be agreements with local sport-clubs, the Adventure Efterskole Skelde and kindergartens in Broager. This is a win-win sitation for both parties, since on the one hand the bus is used in the early daytimes and on the other hand the institutions become more independent.

Concluding the things mentioned above we say: We are in the year 2012, times will come where steps like this concept are necessary anyway. Being one of the first ones to have the bravery, is a public branding. Circumstances fit and the local authorities are convinced and motivated to keep on working this project. To succeed with the project a full report has to be written, all instances mentioned need a detailed description. The platform to schedule bus driving has to be implemented.

As soon as the idea is as detailed as it can get we would start looking for key-partners like project zero, Movia or ChoosEV and we would include Sønderborg Kommune and sign up for a part of the budget they have for CO_2 neutral projects, not only since we would take part in the city's process of getting the CO_2 emission to 0 until 2029.

Part 2: Implementation and recommendation due to private initiative

Basically every new technique is useless until we learn how to use it. This also counts for CO_2 emission decrease. We know how to do it, we just haven't started yet. Before we get to a point where we utilize all our options a lot of public work has to be done. Our main recommendation is: If Dynt, Skelde and Gammelgab want to decrease their CO_2 emission, they have to teach their citizens how they can do that.

We took the first steps toward this by presenting our carpooling and electrical car scenarios to the people who showed up for our meeting in Skelde on 3/1/12, handing out appendix 5. and 6. in A4-size to them, and leaving some in the inn where we did the presentation for future visitors and giving the inn's owner the same 2 pages in A3-size which she intended to hang up in the inn.

Obviously, this will not reach all the 1200-1500 inhabitants of the 3 villages, but it is a start, and if there is an interest in the project, a larger advertising campaign can be started, including more presentations, more detailed brochures and – if sponsors can be found – a testenelbil- or pendlernet-like project in Dynt-Skelde-Gammelgab begun.

Project evaluation

Project tasks:

From the beginning on the aim of the project was to create joint solutions for the rural districts around Sønderborg that are environmental friendly and social beneficial. We had than to decide between three main topics we want to work on. These were:

- Energy consumption in houeseholds
- Transportation of people and goods
- Food consumption

We decided on working on the topic transportation of people and goods and were therefore routed to work with the land district Dynt-Skelde-Gammelgab. Through the project we were really challenged by working with the people in this land district and by the fact that this was the first project where we were partly depending on an external group of people. Through the process of the report we started out frustrated concerning the work with the habitants, but then managed to improve this. In the end we are quite confident that we managed to get out of the situation and reach a satisfying conclusion with the help of interested people from the villages.

Group work:

Our group work went surprisingly well. Even in situations where we experienced throwbacks everyone stayed calm and friendly. We divided the work pretty even and if there were situations like a presentation in Danish there were no problems with the fact that one person wasn `t speaking Danish.

What to do better next time:

In this project a lot of things went wrong or not in the way we wished they would. Especially concerning the communication with the villagers, how we approached them and how this interfered with our project planning. Another part which could be really improved is the starting phase of the project, especially our first questionnaire`s questions and how we dealt with the number of results we got from it.

Communication with the villagers:

Next time before we are participating in a big meeting of the villagers we should sit down with the people in charge for this meeting and our project and talk about their expectations from us and not just attend a meeting and prepare materials and questionnaires not fitting their expectations. With a previous meeting we probably could have gotten a better result. But this is not the only thing we could have done better. We should have thought more about how we can get the people interested in our project. It was really disappointing to see that they had no interest in theme of the project. This went way better in the second meeting where we had a meeting with the people in charge beforehand. It really helped us seeing their needs and helped to prepare the right material by presenting it first to those people. When we then arrived at the meeting there were on the one hand not that many people, but on the other, these few people were interested in our project, they were prepared and open for a long and constructive discussion, which really helped us develop our scenarios.

Schedule:

The starting phase of the project went wrong because the project differed quite a lot from our former project as mentioned in the chapter project planning. Especially the weeks we used on waiting for the questionnaire results should be used better by working on more detailed research and ways of getting people interested. At least after the first receiving of the questionnaire results we should have noticed that we are not approaching the people the right way and worked something out on this instead of leaning back on the fact that we can`t work if they don`t participate in the work.

Conclusion

After working on this project for a whole semester we can give a detailed overview of what the outcomes were, where we made the wrong decisions and where our cooperation with external instances failed.

Though the cooperation was less-than-successful in the beginning, we were able to work around it, came up with three distinct ways the villages' citizens or local authorities could decrease their transport-related CO_2-emissions and with the help of a few passionate citizens, customize these scenarios to the needs of the locals.

Since Sønderborg Kommune has a goal of reaching a 0g CO_2-emission by 2029, the amount of CO_2-emission these scenarios could reduce would be the argument used to convince the local authorities.

The local citizens, however, have made it clear that most of them do not care much about reducing their CO_2-emission, and therefore the sense of community that a carpool or bus could create would be the argument most likely to convince them that change their lifestyles.

A change of attitude is definitely necessary, though, and we believe that bringing a pilot project to the village might be just what is needed to be done.

At last we were really glad about the feedback we got from them. They have really appreciated our effort and its outcome, they were happy to see a solution that could work for them. For us the most important thing was their enthusiasm and spirit to keep the project in mind and bring it to real life.

Appendices

Appendix 1-13 are included with the report on a CD.

14. Project planning

At the beginning of our project work we decided on the following project schedule which can be seen underneath. We wanted to start out with some research and decide on a specific problem within the first two weeks, which should then give us enough time for Idea adjustements, the proof of our concept a market analysis and a conclusion and we planned to be finished at the beginning of December. This planning was based on our experiences we made in the first two semester-projects and was in our case completely useless. We didn `t know where the project was going because it differed so much from the ones before, i.e. concerning the work with the villages and especially that we were depending on their participation. That`s why the whole plan wasn`t used at all. To follow our project process it is therefore better to read our Methodology chapter in combination with the flowchart we made to it.

Week	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Research															
Decide on specific problem															
Problem Formulation															
Idea adjustments															
Proof of concept															
Market Analysis															
Conclusion															
Report Finished															
Skelde meeting															