Nordic CleanTechMarket Survey

A semi-qualitative survey of the Nordic. Cleantech market of demands and where further support will be needed to accelerate a sustainable development and efficient use of environmental friendly technology

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Nordic co-operation

Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and three autonomous areas: the Faroe Islands, Greenland, and Åland.

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Preface

The specific objective of the project is to increase the growth of the cleantech (eco-innovative technique, product and/or process) market in municipalities, yielding a decreased negative impact on environment.

The information gathered to produce the information needed to support decisions in this direction is done in this survey using a semi-qualitative survey of the Nordic cleantech market of demands and findings where further support will be needed to accelerate a sustainable development and efficient use of environmental friendly technology.

The project was appointed in April 2010.

The survey was financed by Nordic Council of Ministers, the Working Group for Sustainable Consumption and Production SCP (in scandinavian the HKP-group).

On behalf of the NMRHKP working group,

Inger Grethe England

Chair of the SCP working group,
Climate and Pollution Agency, Norway

Summary

Municipalities, counties and similar public organizations represent a dominating share of negative environmental impact in society. Swedish investigations, performed prior to this survey, show that two out of three Swedish municipalities are not able to overview new technologies and new opportunities when it comes to reducing negative environmental impact. The investigation also show, that the public purchasing process will be affected in such way, that the capabilities and quality aspects of the new alternatives available in the clean-tech industry, will not be included in the purchasing process, due to lack of knowledge. Thus, the major output and result of this project will, hopefully, in the long run be a major increase of awareness, followed by an increased use of new technologies and opportunities that accordingly will decrease negative environmental impact in this segment. The segment that includes municipalities, counties and similar public organizations, most commonly involve areas such as waste handling, waste water purification, energy (power plants and district heating), real estate, vehicle handling, sports facilities, swimming pools, large-scale kitchens, transports, waterworks, and road building. These 12 areas all pose some kind of negative impact on our environment, through inefficient use of energy, use of chemicals and inefficient use of other resources. Most of the 12 mentioned areas are in one way or another linked to materials recycling. 8 of the 12 areas involve buildings in some way. All 12 areas involve a large number of small and medium enterprises and their innovative products and services that make a contribution to decrease a negative impact on environment.

The core innovation aspect of this project has been tested at a small-scale project¹ at The Royal Institute of Technology in Stockholm. That small-scale project, containing all vital functions of the proposed project, proved that the multivariable assessment method with high volume is more efficient than conventional processes to spread new technology. During that project, the assessments of market needs were limited to municipalities in Sweden. The main idea and the principle innovation aspect of this project is to amplify the assessments so that it will cover all Nordic Countries and, after the project, find ways for the participating countries to facilitate information flow and good practice to municipalities in these participating countries, prior to each specific purchasing process. Consequently, the method yields enhanced possibilities for market uptake and market replication in the clean-tech segment.

The fundamental process in this project consists of an assessment of market needs, case by case, using a large number of variables. The work program

¹ Miljödriven Marknad – Pilotprojekt mellan KTH och Nutek/Tillväxtverket

as a whole has performed manual assessment and survey. The survey consists of a semi-qualitative gap analysis where the 12 municipal areas, as mentioned above, have been measured in terms of importance and reached achievements. Further, the survey has also concluded the actual market demand in terms of numbers of investment projects, divided in ETAP classifications.

Based on these facts, the proceeding cooperation between the five participating countries will more likely be resulting in more realistic and efficient objectives and processes in the work concerning the environment.

1. Performing the survey

During the period April 2010 to June 2010, OneAlyze Sweden AB has carried out a survey project financed by Nordic Council of Ministers the Working Group for Sustainable Consumption and Production SCP (in Scandinavian the HKP-group) and cofounded by OneAlyze Sweden AB).

The overarching aim of the project is to increase the growth of the cleantech (eco-innovative technique, product and/or process) market in municipalities, yielding a decreased negative impact on environment.

A large number of municipalities have been contacted in the project. All municipalities have been contacted by telephone and the majority of municipalities have also answered the survey via phone interviews. Many municipalities have an organisation where not only one person has the complete picture of the areas addressed but also the area of responsibility is distributed and thus the ability to answer the questions diverted. In many municipalities the skill to address the areas also lies on consultants tied to the municipality. Therefore the number of contacts made to answer the survey has been large and time-consuming. More than 2500 phone calls has been made during the timeframe. When a person has been reached in general, when understanding the purpose, it has been very positive feedback and interest for the result. However a number of municipalities have been completely uninterested and some has been virtually impossible to reach. The strike in Norway also shut down the possibility to reach municipalities over the phone during the planned period. The change of political ruling in Island also made it challenging to get hold of people that are willing to give answers to questions that in a sense is future oriented and politically managed.

Some of the municipalities also requested to not answer the survey via phone but via document sent by email. In short we can conclude that it is very difficult and time-consuming to get the surveys submitted, filled out and returned. Especially when the instructions was to direct the email to a generic mailbox. However some answers have been received and included in the report.

From many municipalities there was raised concerns about that the data from the survey result should be used in direct purpose to compare municipalities to each other and to, by that action, put them in “bad” spot.

We have assured them that we will only present aggregated result on a per country basis. For some municipalities we also had to provide proof that we were not calling from investigation newspapers. Not surprisingly we received “not applicable” regarding questions for Energy (District heating) and Water treatment plants from some of the municipalities in Iceland and regarding Water treatment plants also from some other municipalities in other countries referring to nature's clear water, however it was a limited amount.

1.1 Selection of municipalities

The municipal structure in the different countries varies significantly. Therefore we have made a selection of municipalities to preferably contact in respective country based on number of inhabitants. We have selected different cuts of municipal sizes to perform the survey on for different countries contacting the larger municipalities, but not the largest, as a preference. Municipalities not addressing any of the areas in the survey have not been addressed.

In Denmark where there are 98 rather large municipalities, we have contacted most of the municipalities except the largest and the smallest. In Finland where there are 342 municipalities, we have made the cut of municipalities with more than 7400 inhabitants. However there are a lot of cooperation and joint services provided especially on the countryside. In Norway where there are 430 municipalities, we have made the cut of municipalities with more than 7000 inhabitants excluding the largest municipalities. As in Finland there are a lot of cooperation. In Island where there are 77 municipalities, and a lot of them very small, we have made the cut at municipalities with more than 2000 inhabitants and municipalities with operations in the field of the areas of the survey addressing 16 municipalities. In Faroe Islands where there are 30 municipalities, we have addressed 18 municipalities.

1.2 Procedure for questions

The questions were presented in a way in line with common practice about how a multivariable gap survey should be performed. This means that all the questions was stated with one question addressing all survey areas at the time, then stating the next question for all survey areas etc.

After reading the survey areas for he addressed municipality the first question was stated as follows:

- *Generally speaking, how important is the environmental aspect in the areas I just read? Could you please grade them on a scale from 1–10, 1 being the least important and 10 being the most important.*

The following question was:

- *How far have you got in your efforts to reduce the negative environmental impact within these 12 areas? Could you please grade them on a scale from 1–10, 1 being “not done anything” and 10 being “done everything”.*

The third question was:

- *Does the municipality have any investment plans in the coming years that concern any of the areas previously mentioned?*
 - Please specify investments in respective area.

After each question the areas were stated and the answers entered into the TeleMarketing-system (TM).

A final question asked was:

- How hard is it to overview and review the cleantech market? Could you please grade them on a scale from 1–10, 1 being easy and 10 being difficult.

The answer was also entered into the TM (TeleMarketing)-system.

1.3 Translation for survey areas

In order to secure a homogenous answer base and make it possible for the respective agents calling for different countries, to put the survey questions in a qualitatively way, the survey areas were translated to respective countries native language.

The translations used in the survey can be found in Appendix: Translated Survey areas.

1.4 Diagrams

The results of the questions are presented in dot-diagrams and spider-diagrams where the countries arithmetic average on respective survey area has been plotted out in respect to the gap value. Where the gap value is the difference between importance (first question) and reached progress (second question).

The result of the questions is also aggregated into a diagram for the Nordic countries. That diagram is not weighted or indexed but just reflecting the aggregated score with the total number of municipalities participating in the survey.

2. Result of the survey

Described in the following are a series of diagrams stating the arithmetic average value of importance and gap for the surveyed areas in respective country.

The gap value is the difference between the perceived importance and the perceived reached progress as asked in the survey.

In general terms the gap values can be interpreted so that a big gap value indicates a big difference of importance and reached progress, hence a big difference between the perceived importance and “actions”. Also, in general terms, there is a tendency that a big number on importance also gives a big gap number. In similar way a small number on importance has a tendency to give a small gap number.

This can be explained with, that if the importance is recognized as high, the ambition is also high, giving that there are a lot of possibilities and actions to take to fulfil the ambition.

If the importance is recognized as low, the ambition can also be recognized as low, giving a less recognized environment for possibilities, less actions in that area and less efforts spent.

There are some main parameters likely to be considered when interpreting the values given in the survey by the participating municipalities.

Depending on the level of knowledge, regarding technologies, methods and processes to reduce the negative environmental impact in respective surveyed areas, there will be different gaps. If you do not have the knowledge about the possibilities given, there is a good chance that the ambition is inline with the actions taken and, vice versa, if you have the knowledge, the chance to comprehend the possibilities today, and in the future, is good and hence there is a difference in what is possible and what has been done.

The time aspect is likely to give different values on both importance and how big effort that has been done depending on the time horizon. If the work related to environment is made with a short time horizon it is likely that the ambition on efforts left to do is less then if the time horizon is longer. Another aspect could be that if the perceived time between ambition and action is short, the possibility to change and consider new technology and processes is also small. Vice versa, if the perceived timeline is long, the possibility to change is considered to be larger resulting in a bigger difference between importance and reached progress.

The aspect of cultural differences is also something to consider. Even though there are a lot of similarities between the Nordic countries there are surely some difference. One can suspect that some of them can be perception of time, as well as modesty of ambition.

Another parameter to consider is the organizational structure where the clean-tech work is managed. It can well be so that, when the clean-tech work is performed incorporated in the general organisation and the importance and work is put in direct relation to other municipal responsibilities, and general activities, it can be considered less important and have less reached progress then if there is a more freestanding organization measured more on its own and not, necessarily, in relation to other municipal activities. For certain the perception would be in that direction anyway.

Regardless of the reasons for values given, a small gap value can indicate less ambition regarding reduction of negative environmental impact, then what is possible to achieve.

In this survey there were two variables that, as stated previously, were included: importance and reached progress. The scale for these variables was unbiased and free to adapt as fit by the survey contenders. During the survey there was no attempts to moderate or change answers. This gives us that the resulting gap is either larger or smaller depending on some of the parameters but it can also be so that the resulting gap can be a result of fully aware decisions and policies made.

In the survey there were no questions asked about why the value given was the way it was. Maybe future surveys can give specific answer to that. In this survey we can only speculate about the specific answers even though it can be insightful speculations.

The question about “*How hard is it to overview and review the cleantech market?*” the last question asked, can help us in the interpretation of the answers. (some of the municipalities made a choice not to answer this questions but it was few, less than 10%).

With the interpretation that a value of five or more as an answer to this question is a value that indicates that it is more or less difficult to have an overview of the cleantech market two out of three municipalities in Sweden think that that is the case, the same in Iceland and Faroe Island. More then half think that this is the case in Denmark, three out of four in Norway and more than four out of five in Finland. It is clear that there is an opportunities to make it easier for municipalities to grasp the clean-tech area in all countries. The aggregated value for the Nordic countries regarding this question is shown in *Diagram 1* below.

Diagram 1

The average values in the survey for the Nordic countries clearly indicate the ranking between the surveyed areas. As an example it seems to be common that the importance of large-scale industrial kitchen is less than of wastewater purification. With a low value of importance and a gap value of almost zero for large-scale industrial kitchen we can conclude that the importance matches the reached progress which either gives us that the survey contenders has a well balanced reached progress inline with the importance in relation to everything else or there are some of the parameters discussed previously affecting the answer. In the case of large-scale industrial kitchens, with its very low gap value in general, it is not likely that technologies like garbage disposers with settling tanks, or grease traps are commonly implemented and used. Another example is indoor swimming pools that also have a small gap value. With the same reasoning as in the example with large-scale industrial kitchens it is also not likely that systems to reduce the negative health impact from water purification with chlorine reduction is commonly implemented and used.

Below are the findings for the Nordic region and the participating countries presented.

2.1 The Nordic region

Areas involving wastewater, transport and real estate have a general high importance and also a large gap value, indicating that there are a perception that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in these areas. High importance of waste management and water treatment plant with quite low gap values can indicate that there are a lot of efforts spent in these areas and that today's progress in these areas are to be considered enough. Energy (power plant) has a general low importance. A lot of municipalities in some of the partici-

pating countries answered the question about importance with zero and thus lowering the average value of importance of this area. Vehicle fleet has a very low gap value indicating the perception that currently not much can be done. Maybe this is because the investments in vehicles generally are done in batches and therefore the possibility to invest in new vehicles will present itself when the asset is depreciated. Energy (district heating) and road building have medium importance and quite low gap values showing less perception that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in these areas. Large-scale professional kitchen, indoor swimming pools and sport facilities generally have a very low gap value. Maybe this is because these areas represents small operational parts in the municipalities and because of this less effort spent on reducing negative environmental impact.

2.1.1 Diagrams for the Nordic region

Gap – Importance diagram 1

Gap – Importance diagram 2

2.2 Norway

Areas involving waste water, water treatment plants and waste management have the highest importance and also quite large gap values, indicating that the general perception is that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in these areas. The area of transportation has high importance and the highest gap value in the survey. Maybe this is because of an increased ambition regarding public transportations. A high awareness of that there are possibilities and things to achieve seem to be the general Norwegian perception in this area.

High importance and quite high gap values on the area of real estate and road building can indicate that municipalities in Norway considers the status on their real estate and roads to propose a good opportunity for development. Energy (power plant) and energy (district heating) has a medium importance and a quite high gap value and this is even though almost a fifth of all participating municipalities answered the question regarding importance for those two areas with a zero value. This shows a good awareness of that there are possibilities in this areas. Large-scale professional kitchen, indoor swimming pools and sport facilities have low gap values. Maybe this is because these areas represents small operational parts in the municipalities and because of this less effort spent on reducing negative environmental impact. In the area of large-scale professional kitchen a fifth of all participating municipalities answered the question regarding importance with a zero value.

2.2.1 *Diagrams for Norway*

The data is from 95 municipalities contacted and 79 positive full answers.

Gap – Importance diagram 3

Gap – Importance diagram 4

2.3 Denmark

Areas involving waste water, water treatment plants, waste management and real estates have the highest importance and also quite large gap values, indicating that the general perception is that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in these areas. The area of transport has both quite high importance and gap value. Maybe this is because of an increased ambition regarding public transportations. Energy (power plant) has a very low importance and a low gap value. This is probably because more than half of all participating municipalities answered the question regarding importance with a zero. The same applies to energy (district heating) where almost one fifth answered the importance question with a value of zero.

The area of vehicle fleet has importance in the mid scale. The quite low gap value can be a result that there are plans in place to do the investments already.

The low gap value of road building shows that the efforts spent is inline with the importance. Large-scale professional kitchen, indoor swimming pools, sport facilities have low gap values. Quite a lot of the municipalities, almost every third, answered the question regarding importance for large-scale professional kitchen with a zero. This together with that these areas maybe represents small operational parts in the municipalities and because of this less effort spent on reducing negative environmental impact, could be an explanation to the low gap values.

2.3.1 Diagrams for Denmark

The data is from 70 municipalities contacted and 68 positive full answers.

Gap – Importance diagram 5

Gap – Importance diagram 6

2.4 Finland

The result of the survey from Finland is different from the other participating countries regarding that many of the areas resulted in a zero or negative gap value. The area of waste water purification have the highest importance and also a quite large gap value, indicating that the general perception is that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in this area. The areas of water treatment plant, real estate and transportation have high importance and quite low gap values. Indicating that the perception of efforts spent on these areas are inline with the importance. The area of Energy (power plant) has low importance and zero gap value. Many municipalities, more than every third, answered the question regarding importance for that area with a zero this explaining the low value. A possible reason for the gap value of zero is that the efforts spent are in level with the importance. The areas of indoor swimming pools and large-scale professional kitchens also with zero gap values and quite low importance had almost every fifth municipality answering the question regarding importance for these areas with a zero, explaining the low value. One possible reason for the gap value of zero is that the efforts spent are in level with the importance. The areas of waste management, energy (district heating) and road building have quite high importance and zero value on gap imposes that the efforts are inline with the importance.

The areas of vehicle fleet and sport facilities show some importance and zero gap value again imposing that the effort are inline with the importance.

2.4.1 Diagrams for Finland

The data is from 99 municipalities contacted and 73 positive full answers.

Gap – Importance diagram 7

Gap – Importance diagram 8

2.5 Faroe Island

The areas of water treatment plants, waste management, sports facilities, roadbuilding and vehicle fleet all has high importance and low gap values. Maybe this imposes that the efforts in those areas are inline with the importance. The areas of energy (power plant), energy (district heating) and large-scale industrial kitchen have the lowest importance and very high gap values. Some municipalities, every fifth, answered the question regarding importance for these areas with a zero this explaining the lower values. The areas of real estates, indoor swimming pools and transports have high vales on both importance and gap values. A possible reason for the very high gap values could be that there are a good knowledge about that there exist a lot of possibilities to implement technology and processes to reduce the negative environmental impact in these areas.

2.5.1 Diagrams for Faroe Island

The data is from 18 municipalities contacted and 18 positive full answers.

Gap – Importance diagram 9

Gap – Importance diagram 10

2.6 Iceland

Areas of waste management, indoor swimming pools, waste water purification, road building and sport facilities have both high values of importance and gap. The areas of real estates, transports and vehicle fleet have less importance values and high gap values. Indicating that the general perception is that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in these areas. Energy (district heating), large-scale industrial kitchen and energy (power plant) have quite high importance values and low gap values. Maybe this indicates that the efforts in those areas are inline with the importance.

2.6.1 *Diagrams for Iceland*

The data is from 16 municipalities contacted and 16 answers

Gap – Importance diagram 11

Gap – Importance diagram 12

2.7 Sweden

All areas has both high importance and gap values indicating that the general perception is that there exist a lot of possibilities to implement technology and processes to reduce negative environmental impact in all areas. The Swedish data are from a survey prior this. The result and analysis of that survey can be found in – *Miljödriven Marknad – Pilotprojekt mellan KTH och Nutek/Tillväxtverket*.

2.7.1 Diagrams for Sweden

The data is from a previous survey of 277 municipalities contacted.

Gap – Importance diagram 13

Gap – Importance diagram 14

3. Conclusions

This chapter discuss conclusions from this survey based on the work done in Sweden from the earlier performed survey and the experience from that work, but also from a generic approach from other industries about how to use a GAP survey result and conclude results and actions from that information.

In order to start addressing the possibilities in all areas included in this survey, it is necessary to find an adequate starting point for that work. Experiences from the previously performed Swedish survey and following actions on that survey, shows that if efforts and possibilities targeted towards the environmental work are divided between all areas, it is not efficient to address them at the same time. Not only will that approach be less focused but also require a lot of resources. It will also most probably overwhelm the receiving municipalities with information and requests for actions. The probability for less efficiency in all area rises.

It is better to focus on the areas where the most clear possibilities for improvements exists, thus giving a clear starting point for a work that will continue for a long time but also to induce a sense of progress and achieved positive results.

In the result from the Nordic survey some clear observations can be made. The areas of Large-scale professional kitchen, Energy (power plant), Indoor swimming pools are, together with some other areas, in general considered to be considerably less important than the other areas. The areas of Wastewater purification, Waste management and Water treatment plant are considered to have high importance. In the figure *Nordic initial focus areas I*, two areas have been marked.

The marking on the left side, circling the surveyed areas with low importance can be categorized with *Why* as showed in the figure below. The marking on the right side, circling the surveyed areas with the highest importance and quite high gap values can be categorized with *How* as showed in the figure below. All of these areas can be considered as “low hanging fruit” as they are obvious and easy to address. The experience from working with these areas can then be used to continue the work on areas selected with not so obvious and straightforward parameters.

Nordi initial focus areas 1

3.1 Why areas

The *Why* areas with low importance values and low gap values needs to be informed *why* the areas included have a negative impact on the environment thus driving the importance to the right in the figure above.

An example would be the impact of chlorine in indoor swimming pools that creates cancerogenic chloroform that the users of the swimming pool are exposed to. The information given will then lead to that the perceived importance will raise and consequently be given more attention and resources to actions targeted to reduce the negative impact on the environment.

3.2 How areas

The *How* areas with high importance and quite high gap values needs to be informed about *how* known technology could be used to decrease the gap thus driving the gap value down in the figure above. There is no need to inform about the importance since it is already considered important. The clarification, about today known technology, will help the concerned municipalities to address the *How* areas with more attention, resources and adequate technology.

3.3 Implementation

The experience from the earlier project show that information and knowledge about processes and technology is less efficient spread if done by “pas-

sive” methods. This would be to spread information without any connection to actions.

The implementation of an “active” method has shown good results and efficiency as done in the before mentioned Swedish project. The first two steps are to put together specific information about the environmental issues within the selected areas and to gather information about companies working with technology to address those selected areas. The third step is to actively contact selected adequate municipalities with information about environmental issues and about companies that have technical solutions to address those issues.

As a result of this “active” approach more than 150 municipalities have been contacted with information and 50 Swedish municipalities have been matched with companies providing technology to the environmental issues raised by the municipalities. This has happened during the last 6 months and is still going on. The approach has developed to a service that allows municipalities to raise questions and commission pre-studies and investigations about the best available technology for the specific need.

3.4 Best available techniques (BAT)

To support the implementation and use of technology that generally reduces emissions and the impact on the environment as a whole, the EU Directive 2008/1/EC, concerning integrated pollution prevention and control, states the use of best available techniques (BAT).

Shortly it can be said that the directive embraces a large number of areas and defines the use of BAT. Many of the areas included in the directive, concerns municipal activities. In general it can be concluded that the knowledge about what this directive requires of the work done in municipalities especially for new facilities and constructions are limited. There is a clear need for clarification about what this directive means and how it should be used and implemented. The before mentioned service about pre-studies and investigations helps the municipalities to acquire the required knowledge to make well-informed decisions in this area.

Full information about the EU directive can be found at EU website <http://eur-lex.europa.eu/en/index.htm>

4. Sammanfatning

Kommuner och andra administrativa geografiska områden representerar genom sin verksamhet en dominerande del av negativ miljöpåverkan i samhället. En undersökning gjord i Sverige, innan den undersökning som denna sammanfattning avser, visar att två av tre svenska kommuner tycker att det är svårt att överblicka ny teknologi och nya möjligheter att reducera negativa miljöpåverkan. Undersökningen visade också att den offentliga processen för investeringar inom miljöteknik kommer att bli påverkad på ett sådant sätt att egenskaper och kvalitetsaspekter av de nya alternativ som finns på cleantech marknaden inte blir inkluderade i inköpsprocessen som ett resultat av bristande kunskap. På grund av detta behöver medvetenhet öka om nya teknologier och möjligheter för miljöteknik vilket kommer att leda till minskad negativ miljöpåverkan i samhället inom områden som avfallshantering, avloppsrening, energi(elverk), energi(fjärrvärme), fastigheter, fordonspark, idrottsanläggningar, simhallar, storkök, transporter, vattenverk och vägbyggnad. Dessa 12 områden representerar verksamheter med någon form av negativ effekt på miljön genom ineffektiv användning av energi, användning av kemikalier eller ineffektiv användning av andra resurser. De flesta av dessa 12 områden är på något sätt sammanlänkade med resursåtervinning, 8 av 12 områden berör byggnader på något sätt. Alla 12 områden berör ett stort antal små och medelstora företag och deras mer eller mindre innovativa produkter och tjänster som bidrar till att minska den negativa miljöpåverkan.

Den huvudsakliga innovativa aspekten i detta projekt har blivit testat i ett småskaligt projekt² på KTH, Tekniska Högskolan, i Stockholm. Detta projekt, kunde visa att en multivariant metod med stora volymer är mer effektiv än konventionella processer för att sprida ny teknologi. I det projektet var utvärderingen begränsad till kommuner i Sverige. Huvudidén och den principiella innovativa aspekten av detta projekt är att förstärka utvärderingen till att omfatta de Nordiska länderna och att, efter projektets genomförande, hitta sätt för de deltagande länderna att främja informationsflöde och goda exempel (best practise) till kommuner i de deltagande länderna innan varje specifikt inköp av miljöteknologi eller implementation av processer inom miljöområdet. Som en följd av detta, skapas en ökad möjlighet till en större marknad och replikering av kunskap inom cleantech området.

De grundläggande processerna i detta projekt består i att utvärdera marknadens behov, fall för fall, i det att man använder en stor mängd variabler. Genomförandet i stort har innefattat manuella utvärderingar och kartläggningar. Kartläggningen består av en semikvalitativ gap-analys där de 12 områden som tidigare nämnts har blivit mätta avseende hur viktiga de är

² Miljödriven Marknad – Pilotprojekt mellan KTH och Nutek/Tillväxtverket

samt hur långt man nått i att reducera negativ miljöpåverkan. Vidare har kartläggningen sammanfattat det aktuella marknadsbehovet i form av antal investeringsprojekt, fördelat på ETAP klassificeringar.

Baserat på dessa fakta, kommer förutsättningarna för det fortsatta samarbetet mellan de nordiska länderna att resultera i mer realistiska och effektiva mål och processer för miljöarbetet.

5. Appendices

5.1 Translated survey areas

This appendix states the translated survey areas used in the telephone interviews and email questionnaires.

English

Water treatment plant Gap
Waste water purification
Waste management
Energy (district heating)
Energy (power plant)
Sports facilities
Indoor swimming pools
Road building
Vehicle fleet
Large-scale professional kitchen
Transports
Real estates

Norwegian

Renseanlegg for vann
Avløpsrensing
Avfallshåndtering
Energi (fjernvarme)
Energi (e-verk)
Sportsanlegg
Svømmehaller
Vegbygging
Bilpark
Storkjøkken
Transport
Boliger

Danish

Rensningsanlæg
Spildevandsrensning
Affaldshåndtering
Energi (fjernvarme)
Energi (kraftværk)
Idrætsanlæg
Svømmehaller
Vejbyggeri
Vognpark
Storkøkken
Transport
Ejendomme

Finnish

Vedenpuhdistuslaitos
Jätevedenpuhdistus
Jätehuolto
Energia (kaukolämpö)
Energia (voimalaitos)
Urheilutilat
Uimahallit
Tienrakennus
Pysäköintialue
Suurtalouskeittiö
Kuljetus
Kiinteistö

Icelandic

Vatnshreinsun
Hreinsun affallsvatns
Sorphirða og sorpstjórnun
Hitaveita
Rafveita
Íþróttamiðstöðvar
Sundhallir
Vegavinna
Ökutækjafloti
Stór eldhús
Flutningar
Fasteignir

Faroese

Vatnverk
Reinsiverk til spillivatn
Rusk
Fjarhiti
Elverk
Ítróttarøki
Svimjihallir
Vegagerð
Parkeringsøki
Stórkøkar
Flutningur
Fastogn

Swedish

Vattenverk
Avloppsrening
Avfall
Energi (fjärrvärme)
Energi (elverk)
Idrottsanläggningar
Simhallar
Vägbyggnad, vägbeläggning
Fordonspark
Storkök
Transporter
Fastigheter

5.2 Comments

This appendix states an aggregated view of some significant comments for each survey area.

Water treatment plant

We have well protected water supply areas
 Large investments during the next fourth coming 2–3 years
 Will do investments during next year
 Currently running a project regarding this area.
 We just invested in a new facility
 This area are run by private interests
 There is no water treatment plant in the municipality.
 Water treatment methods are changing: ground water project.
 Plants are outsourced.
 Naturally great water, no cleaning
 We run this jointly with other municipalities

Waste water purification

New plan for this facilities where we double our investments
 Much work in this area
 New investment in this area of about 100M
 Do not do anything
 Run by joint municipality and private company
 Wants to optimize purification
 We run this jointly with other municipalities
 New facility ready by 2015
 New facility ready by 2011
 Some technical changes are coming in the near future.
 There are some conversations going on about shared pipelines with other municipalities.
 Needs to fix this the next 4 years

Waste management

Extending our time between household garbage collection
 More garbage separation
 New recycling facilities
 Joint investment in incineration plant
 Building waste collection facilities
 Switching to incineration, which affects recycling procedures.
 Improvements of biogas plant
 Outsourced
 Could be better and a political will to fix exists, everything is buried in the ground and no recycling.
 Methane production from buried waste an interesting thing for the muni
 Handled by cooperation with other municipalities

Energy (district heating)

Will invest in low temperature facility next year
 Run by private interests
 Don't have any facilities in this area
 We are CO2 neutral
 Investments from gas to biogas.
 We put a lot of money into this.
 Plan to build new facility
 Run centrally
 Will invest in district cooling

Energy (power plant)

We don't have any facility
 New plan for green energy and wind plants goal to be CO2 neutral 2029
 Investments in bio fuel
 Work with optimization in plant
 Investments of 0,5B to decrease CO2
 Influence 0
 We have 3 smaller plants. No fun. We need to promise to run them clean.
 We have small boiler plants.
 Planning for windmills

Sports facilities

Renovating facilities
 Big investment for rebuilding
 Plan to invest
 Increasing energy efficiency
 Pesticide free
 Privatized

Indoor swimming pools

Renovating facilities
 We do not have any facilities in this area
 Closing it down
 Solar panels on the roof to heat up water

Road building

Investing in more efficient light
 Investing in new road. Expensive.
 Investing in new bicycle roads
 Runs a motorway project.
 Bypass will be built in order to decrease city centre traffic.
 Bedrocks could be used more extensively
 No money

Vehicle fleet

Have evaluated how the muni uses its fleet
 Project with electric vehicles
 Looking for new technology
 Within 4 year changes to biogas and electric cars
 Trial with electric cars

Large-scale professional kitchen

They want to improve, but they haven't started planning yet.
 New central kitchen (schools, nursery schools, etc.) should be finished in September 2010.
 Building of a new large central kitchen is starting (school meals service).
 Invests in new technology for cooling etc
 Have a lot of small. Hard to evaluate.

Transports

Works with a strategy for bicycles
 Testing bio fuels in busses
 Miss a lot of public transportation
 Goal is to use alternative fuels.
 Hard to answer

Real estates

3 new municipality buildings (passive) ready 2010
 Solar panels on buildings
 We make energy saving investments
 We make investments to save energy
 Investment in new low energy school building
 Will invest in solar energy for nurseries and schools
 Main goal is to improve energy efficiency of the buildings.
 Most of the buildings are rather old and non energy-efficient
 We do energy consumption research
 When new buildings are planned environmental factors play important role

5.3 ETAP Areas

This appendix states the addressed ETAP areas.

In the survey the following ETAP areas was marked for the municipalities addressed. Notable is the alligment of the interest for respective areas with the type and number of of comments in the survey areas and also the alignment with the importance.

Nbr is the number of municipalities marked as interested or active within the ETAP area.

ETAP areas	Nbr
Water and wastewater treatment	97
Energy efficiency	85
Transportation	81
Sustainable building	78
Waste management and recycling	65
District heating	43
Bio energy technology	43
Bio energy fuel	43
Noise protection	33
Solar energy technology	19
Environmental training and information	11
Wind energy technology	8
Costal management	6
Hydro power	4
Air pollution control	3
Soil remediation	2
District cooling	2
Environmental consultants	1
Wave power	0
Systems engineering control engineering and monitor	0