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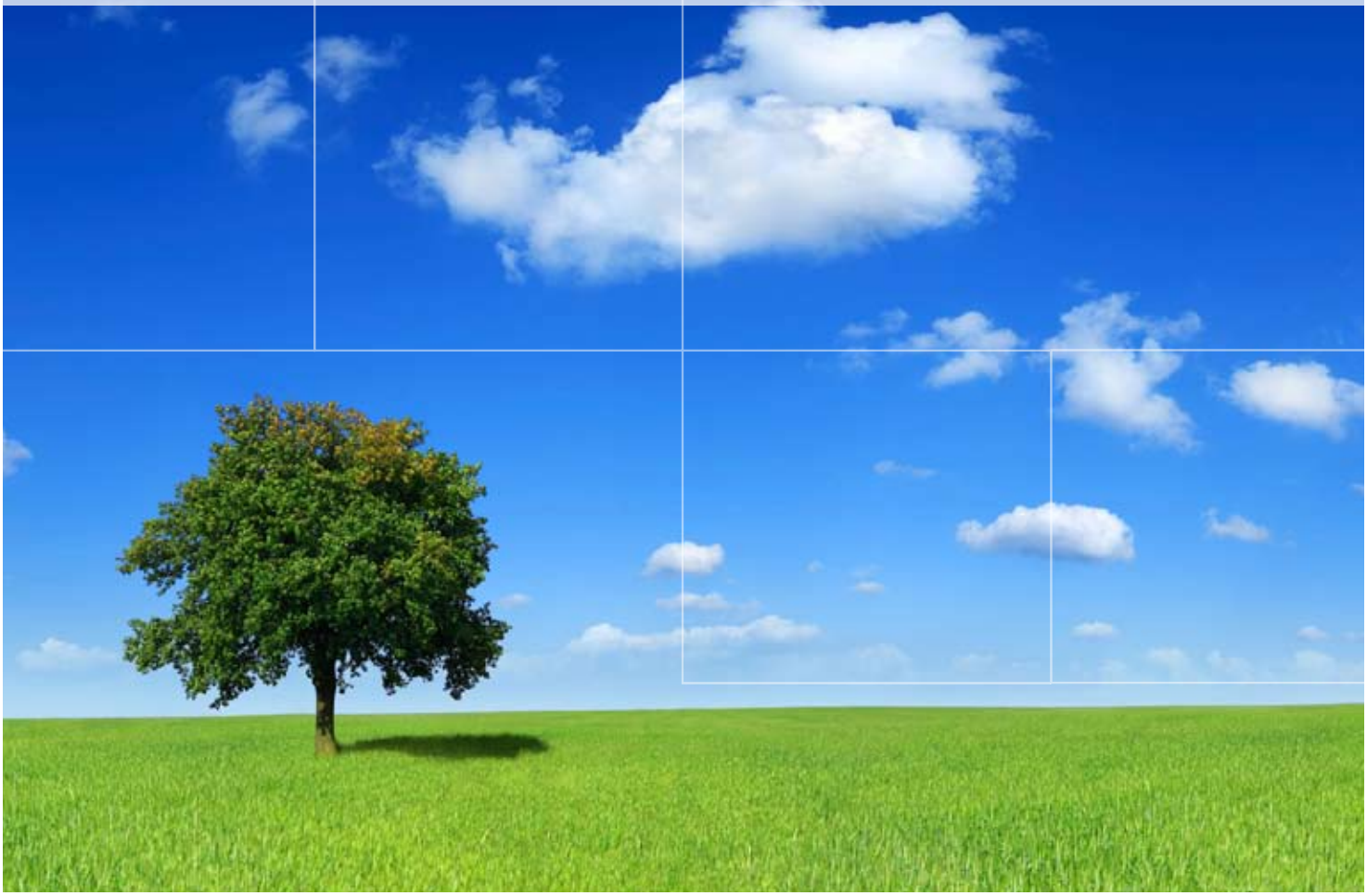
Nordic Environmental Technology Solutions (NETS) – Commercialization of Key Business Sectors

- Common challenges call for closer co-operation
- Commercialization is the key
- Focusing on Nordic strengths



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Nordic Environmental Technology Solutions (NETS) - Commercialization of Key Business Sectors

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Abstract:
Within the NICe-funded project “Nordic Environmental Technology Solutions (NETS)” new type of networking at the Nordic level was organized in order to jointly exploit the rapidly growing market potential in the cleantech sector. The project aimed at increased commercialization of Nordic clean energy and clean water business segments through closer co-operation of national business networks and strengthening their capacity to plan and carry out joint Nordic actions. The visibility of Nordic environmental solutions was improved through focused promotional activities, including joint representation in relevant trade fairs, a web platform and several joint brochures. In addition, the availability of Nordic cleantech solutions was increased through support to companies in forming value chains and in business-to-business (B2B) marketing.

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EXECUTIVE SUMMARY

The main objectives of the project were:

- To develop a platform for commercialization of at least five key business sectors in order to increase the competitiveness of Nordic cleantech companies in the global cleantech market
- To increase the availability and visibility of Nordic cleantech solutions through joint promotional activities and capacity-building of national business networks to support companies in forming value chains and in business-to-business (B2B) marketing.

The objectives have been achieved by:

- Creating cooperation among Nordic companies in Finland, Sweden, Denmark and Norway in the following business sectors:
  - clean energy: bioenergy, solar energy, waste-to-energy, wind energy, wave energy and energy efficiency of buildings
  - clean water: sludge treatment and environmental monitoring.
- By conducting joint seminars and workshops in order to build the capacity of national cleantech business networks in networking at Nordic level and in supporting Nordic cleantech companies, especially SMEs, to build value chains and to do B2B marketing.
- Planning and implementing joint promotional activities, including a web site, several brochures and participating in relevant trade fairs and other industry events.

Methods used

The main method was to develop close cooperation among national cleantech business networks ("a Nordic cleantech hub") that as project partners were responsible to activate and commit the companies from their home countries to participate in the project activities. In order to facilitate the work of the national network organizations, their capacity to identify key business areas, create and coordinate business networks at Nordic level was strengthened through external expertise and experience-sharing among the project partners. The key business sectors were identified by project partners based on available market studies and an analysis of Nordic strengths in the target sectors. In the implementation of the project, the leading role for each chosen business segment was assigned to the most experienced partner in order to gain maximum value from networking. The approach was first to develop and test the networking model in clean energy sector and then to apply it to the water sector. Therefore, specific value chains were identified in response to chosen tenders only in the water sector. In joint promotional activities, the expertise and global presence of national trade promotion organizations was exploited to achieve better outreach.

Concrete results and conclusions

- The awareness and understanding of Nordic strengths in clean energy and water business sectors have grown both within the project network (consisting of project partners and the participating companies) and among wider audience, including potential international customers, as a result of closer cooperation and joint marketing activities.
- The capacity of Nordic cleantech companies, especially SMEs, to cooperate at the Nordic level has been strengthened through coordinated support provided by the project partners (i.e., the national business networks) at the national level. Especially smaller companies value the joint promotional activities and support for networking and B2B contacts to find

reliable partners at Nordic level. Out of 870 companies contacted during the project, 86 companies that were mainly SMEs actively participated in project activities, e.g., in trade fairs, web site and brochures. The impact achieved by targeted promotional activities and involvement of national trade promotion organizations has been significantly higher than any individual company could achieve on its own.

- It is much easier to activate the companies in building value chains in the form of consortium for specific international tenders than generic value chains for networking purposes as it is difficult for them to commit resources for something that does not provide for immediate results. Network-building is a lengthy process in which a two-year project can only lay the foundation for interested companies to take the lead in developing it further.
- It is essential that the development of the Nordic Cleantech Hub continues and the started cooperation is further developed and strengthened. The companies that have been committed to participate in the network are waiting for continuing services. Even when the project partners are now well aware of challenges related to Nordic networking, including the lack of available resources, concrete plans are already under development to continue the work after the project ends. This willingness can be seen as further proof of the added-value that Nordic level networking generates in the cleantech sector.

Recommendations for continued Nordic cooperation in cleantech sector

- In order to build a stronger Nordic cleantech brand, the national business networks should continue co-operation in the chosen business sectors. The project has shown that this co-operation is most effective when partners from two main responsible countries of the specific sector take the leading role and the other partners support the activity in case they have own interest in promotion of the sector. Closer co-operation with the national trade promotion organisations enables better impact and is worth further development, especially since these national organizations are already active in the cleantech promotion and have dedicated resources for this purpose.

- The national business networks should also continue supporting the companies in forming Nordic consortia for tendering in international competitive biddings when the expertise of individual companies complements rather than competes with each other. Main focus areas could be e.g., water sector (Sweden has been earlier the driving force) and environmental monitoring (Norway and Finland have started preparations).

- For public sector (funding) organizations, it is recommended to continue supporting the coordination and networking activities at Nordic level. Especially SMEs clearly benefit from the work carried out by national network organizations. However, these organizations need extra external resources for work at the Nordic level as it is often outside their national mandate. It should also be noted that the public sector often has a key role in creating the market in the environmental sector through public procurement as well as financial support for investments, export, research and innovation. Therefore, closer co-operation with public sector authorities and research institutions, both at national and Nordic level, is needed.

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PREFACE

Cleantech is one of the fastest growing business sectors in the world. Issues like global and local resources to solve environmental problems are discussed in every corner of the world. New and innovative technologies are continuously developed to reduce emissions and make the use of resources and energy more clean and efficient.

Nordic countries have been reported to be the most advanced countries in the adoption of environmentally friendly practices for the development of the society. Many small and medium-sized companies in the area have developed world-class innovative technologies and services for sustainable growth. The physical environment in all Nordic countries and the structure of the society are highly similar. At the same time, on global markets, the marketing forces of individual Nordic companies are often too limited. These common starting points, interests and challenges were the main reasons for starting the NETS (Nordic Environmental Technology Solutions) project with the focus on strengthening the networking and cooperation among Nordic SME´s in order to be more competitive in global environmental technology markets.

Nordic collaboration with partners from Sweden, Finland, Norway and Denmark has been established to activate cleantech companies in the Nordic countries for closer cooperation and for joining forces to increase their visibility in global markets.

On behalf of the partner organizations, Green Net Finland would like to thank the Nordic Innovation Centre for their generous financial support. Also, we thank the national financiers and cooperation partners as well as the companies and other organizations that have contributed to this project.

We hope that the co-operation initiated during this project will lay basis for increasing, widening and deepening networking and will result in more innovative and globally competitive Nordic cleantech solutions.

Lauri Hietaniemi
Project Director
Managing Director
Green Net Finland

COMMON CHALLENGES CALL FOR CLOSER CO-OPERATION

Nordic know-how and the image of Nordic environmental technology are at high level. Although the environmental business sector is a remarkable employer today, domestic markets in the Nordic countries are rather small. Yet, the global market is huge, estimated being €550 billion per year with an annual growth of 5-20 per cent.

On the global cleantech market, customers are increasingly demanding integrated solutions where different products and services form together comprehensive value chains that are tailor-made to fulfill the customer needs during the whole life-cycle of the product. Especially on the area of environmental technology, these integrated solutions often require expertise across many sectors, including energy, water and waste. However, international customers have difficulties to find suitable Nordic solutions for their growing needs because the industry is fragmented by providing very specific technologies and solutions that are also often marketed by small companies with limited resources.

Most of the Nordic environmental technology companies are faced with the same barriers in entering the global markets or establishing a deal with international customers. These barriers include:

- Products´ limited visibility for customers
- Competing and winning contracts in international projects where individual companies are too small for larger projects
- Having adequate references and showing the required company or personnel/ overhead capacity for large projects
- Lack of cash flow for projects´ co-financing demands
- Limited financial capacity to assist the customer or client in implementing new environmental technology, e.g., through support to project planning and feasibility studies.

Based on the similarity of domestic problems and markets in Nordic countries, it can be expected that this business area could benefit from consolidations and networking in the Nordic countries. The Nordic Innovation Centre's pre-study (2006) on "Cooperation between Environmental Technology Networks in Nordic Countries on Export" investigated the possibility of establishing cooperation between industrial networks and companies in the Nordic countries, aiming at increasing export of environmental technology from the countries. Also, the development of Cleantech Scandinavia for the promotion of innovations and investments in the field is a sign of the need for closer Nordic cooperation.

Therefore, **the Nordic Environmental Technology Solutions (NETS)** project was developed in order to remove some of the above-mentioned barriers. The **main objectives** of the NETS project were:

- To develop a platform for commercialization of at least five key business sectors in order to increase the competitiveness of Nordic cleantech companies in the global cleantech market
- To increase the availability and visibility of Nordic cleantech solutions through support to forming value chains, marketing cooperation and capacity-building of national business networks.

The main method chosen to achieve the project objectives was to develop close cooperation among the already existing national cleantech business networks from Finland, Sweden, Norway and Denmark. As project partners, these network organizations were responsible to activate and commit the cleantech companies to participate in the project activities. The partner organizations were also responsible to seek additional national funding in each country to complement the Nordic (NICe) financing.

The project partners can be seen as cluster engines in their home countries, regions or business sectors. Green Net Finland and Green Business Norway are both representing a national network of environmental technology organisations and Baltic Sea Solutions (Denmark) is a regional cluster engine. Energidalen AB (Sweden) is specialised in the promotion of bioenergy. Grontmij/CarlBro from Denmark as a large multinational consultancy company has in-depth expertise in value chain building.

COMMERCIALIZATION IS THE KEY

The challenge of increasing Nordic environmental exports requires strongly integrated co-operation between existing national key institutions and business networks. The specific national business networks demand a multilateral "Nordic Hub" for adequate marketing and export services. This hub – in the form of Nordic marketing platform by the national key institutions – can function as a gateway into and out of the region.

The starting point in the NETS project was to develop coordinated commercialization activity that should benefit Nordic companies in:

- Faster access to the regional production market
- Better comparability of products
- Synergy effects (faster business development: know-how in marketing, funding, venture capital, networking, verifications and standards, quality and environmental management systems, eco-business effects).

It was also expected that:

- Potential customers are looking for total solutions for their needs rather than a separate product or service
- The Internet, combined with language diversification, offers a good tool for accessing international customers / markets.
- Capacity-building improves intercultural marketing and operational business capacities of the "Nordic Hub" (e.g., virtual networking for tendering procedures and project implementation).

FOCUSING ON NORDIC STRENGTHS

In order to gain maximum impact from the joint efforts, the project started with an analysis of Nordic strengths in the most potential business sectors.

Building a register of Nordic cleantech companies

To begin with, a register, including 600 Nordic companies representing different clean energy and energy efficiency related business areas, was collected and analyzed by the project partners in order to identify Nordic strengths in the wide collection of different energy technologies, products and services. The companies were then divided into 25 different energy business areas (e.g., from energy efficiency in transportation to turbines and generators) that were further analyzed. Specific criteria were set up for companies in order to be included into the register, such as the level of internationalization. Even if the collected register might not be totally comprehensive, it gives a good overview on the Nordic strengths on these business areas and can be used for building the Nordic Hub, for example, by providing contact details for partner searches.

Analyzing the market potential

The selection of the final business areas for networking and promotional activities was done by analyzing the market potential on the basis of recent market studies available to project partners. The studies proved that although the global environmental technology market is growing in most sectors, it depends on the specific product or business segment where the most potential market is. For example, there is demand for sludge treatment in the East and Middle Europe and, more generally, potential for wave energy in ocean shore countries. China offers potential for all sectors but especially for air and water monitoring solutions. Therefore, at the early start of the project it became obvious that an overall strategy cannot be designed for the "Nordic environmental technology" as such but it has to focus on a specific business sector, for example, energy efficiency of buildings. This conclusion was strengthened by companies in the Copenhagen workshop in September 2007.

The participating companies were contacted on their interest in expanding and exporting to countries like China and Russia. A general perception was that these markets are not of highest priority for most of the companies. Still, starting up in those markets through assistance from already established networks and / or within a consortium of partners for a combined product solution generated more interest among the companies to enter these markets. Yet, many small companies were hesitant in entering unknown markets due to cultural differences as well, and often these perceived difficulties weighed over expansion needs.

Choosing target segments

Based on the market analysis, the Steering Committee chose clean (renewable) energy and water sectors as the main focus areas for long-term Nordic co-operation. Specifically, the focus areas were the following:

- clean energy:
    - Energy Efficiency in Buildings
    - Bioenergy
    - Solar Energy
    - Wind Power
    - Wave Energy
    - Waste-to-Energy
- water:

- Water Resources - groundwater/protection of catchment areas
- Water Supply - securing good drinking water quality
- Capacity – how to handle with extreme urban storm water/over flooding
- Waste Water Treatment
- Sludge Treatment.

Short introduction to these focus areas is found in Appendix 1.

In the NETS project, the approach was first to develop and test the networking model in clean energy sector and then to apply it to the water sector. In the latter, the activities focused on sludge treatment and environmental monitoring.

BUILDING THE NORDIC NETWORK

As stated above, the main purpose of the project was to strengthen Nordic networking in order to support Nordic cleantech companies to increase their share of the global market. Networking was developed as a long-term activity to form a *Nordic Cleantech Hub* between national cleantech business networks. The other dimension in networking was to develop B2B (business-to-business) opportunities for Nordic companies to find partners and build value chains.

Putting networking theory into practice

Networking accelerates know-how and increases competitiveness. Business networks have been studied a lot and the term "cluster" is well-known among business developers. Michael Porter introduced the cluster theory in 1990, according to which a cluster includes also the public sector and the national/global business environment in addition to companies. A cluster includes different networks. The project's focus areas energy and water, being (at least partially) public goods, are highly influenced by public decision-making and thus public-private cooperation is essential. Networking of companies, NGOs, local and regional authorities and research organizations on these sectors promotes regional well-being and global competitiveness.

Business value chains typically need a "lead company", in practice often the contractor, who coordinates and leads the operations and is also most visible to the customer. Lead companies are in vital role in forming value chains and in winning tenders. After the selection of the focus areas of the project and mapping of companies operating in those fields, the project partners proceeded to identification of the lead companies in each area. These companies were the main target group of project activities: their interest was regarded most important to gain right from the start of the project in order to convince SMEs to join in as well. This approach was followed by all partners and proved to be the right strategy during the project implementation.

The basic forms of networks are:

- Discussion forum to generate development of a special theme
- Virtual network established for a special task
- Value chain formed by enterprises
- Marketing network.

In NETS project, all these forms of networking were in use in the following activities:

- building “a Nordic Hub”, a network of national networks
- building virtual networks/ consortia for tenders
- promoting the formation of B2B value chains, and
- joint promotional activities.

The challenge in networking is to know the networking partners both from public and private sectors well enough to be able to define common goals and strategies. The usual barriers to networking are:

- Incompatibility of the partners, networking organizations and their strategies and processes
- Focusing only on internal issues
- Insufficient information flow
- Lack of trust
- Lack of engagement
- Too small resources given for the use of the network
- There is no real need for cooperation as business is uphill anyhow.

During the NETS project implementation, some of these barriers, especially resource constraints, had to be dealt with decisive actions.

Capacity-building for network engines

To prepare the project partners in building the network at Nordic level, an internal capacity-building workshop was organized in Oslo in May 2007. The purpose of the workshop was to address key issues on how to develop a well-driven and dynamic cluster or network, from which the members/stakeholders can receive additional value for their own business. Therefore, the workshop aimed at giving the participants a better understanding of the mechanisms that are important for running a cluster or a network and a clearer view of the different challenges in the four participating countries. Also, an agreement was reached on common areas of interest on product portfolio management (i.e., similar services to be provided to companies in each country).

To guide the networking process, *a generic networking model* was used at the workshop (as shown below) to ensure that the participants were able to address and agree on the most critical aspects.

With regard to organizing networking/clustering, the following criteria need to be considered:

- Organisational capacity of the cluster engine must be operational (reserve resources).
- The administration (organisational capacity) must have established relevant structures to operate as cluster engine.
- A methodology; how to work with the members in the cluster on 1 – 3 must be defined:

- at cluster –individual company level,
- at cluster – group of company level, and
- for the cluster as a whole.

After organizing the network management, a product portfolio of services must be defined, taking into consideration the methodology mentioned above. After committing key companies in the network, they will attract and invite other companies, especially SMEs, to join.

Following this methodology, the leading role for each chosen business segment was assigned to the most experienced partner in order to gain maximum value from networking. It is natural that in such a case "the network engine's" own country comes first due to the established contacts with the business sector. The leading roles for each partner are described in table 1.

Table 1. Sector-specific network engines

Sector	Network Engine	Partner in the group
Bioenergy	Sweden	Finland, Denmark
Solar Energy	Denmark	Norway
Waste to energy	Norway	All
Wind Energy	Denmark	Norway
Wave energy	Norway	
Energy efficiency of buildings	Finland	Denmark
Water	Sweden	All

Activating companies through participatory planning

The tentative product portfolio to be provided within the NETS project included B2B services, Export Initiatives, Innovation Management and Marketing and Promotion. The companies' expectations for the services to be derived from the project were collected in the Energy Workshop held in September 2007 in Copenhagen. From the around 40 participants, half were companies, representing mostly SMEs from all NETS countries. Several theses about SME challenges were addressed by the workshop participants and feedback was structured into a summary document (Appendix 2).

Response from the SMEs indicated a need for an extensive portfolio of services to be developed. Taking into consideration the timeframe of the NETS project, the portfolio was divided into short-term and long-term services. Short-term services were considered to be services or activities the NETS project could implement within the project period, while longer term services should be considered in a follow-up project.

One conclusion from the workshop was that SMEs with limited resources will to a large extent base their decisions on external input. In order to develop successful SME businesses, the workshop

participants identified a strong demand for business intelligence. A central SME challenge is to separate less relevant market information from highly relevant and accurate information.

Furthermore, the workshop concluded that NETS role is to act as a facilitator, coordinator and initiator. The core competence to be developed within the NETS team is to professionalize towards these roles. The companies also recommended that the NETS project should on case-by-case basis involve external expertise if the project team itself would not be able to demonstrate the necessary competence for the chosen portfolio of activities.

Networking in practice

Altogether 870 Nordic companies were contacted by the project partners in order to introduce the NETS project and activate them to participate. Out of these, 86 companies have participated in the activities (see Appendix 3). Among the participating companies, there are both high technology niche SMEs and large globally operating key companies, which represents an ideal structure for a cluster.

In general, the feedback from contacted companies towards the project was positive. Nordic market is often seen as "home market" and the companies saw easily the benefits of networking: getting new contacts and making themselves known and visible. They also saw the potential of business-to-business (B2B) contacts and value-chain building within the project framework. The SMEs were particularly interested in joint marketing activities. They admitted that their visibility grows many-fold through joint marketing and that the joint promotion of "Nordic cleantech" will draw more customers to Nordic companies.

In Finland, Green Net contacted approximately 120 companies in clean energy field to introduce the project, out of the 180 companies in the Finnish register. 16 companies that were mostly new contacts for Green Net decided to participate in the project, also with a financial contribution. Although initiated by NETS project, the new co-operation has been valued by the companies and some of them have already become involved in Green Net's other projects as well. Also, the managing director of one company has become the chairman of the board at Green Net Finland.

In Denmark, the project partners contacted about 350 companies in the energy and water technology sectors. NETS co-operation was introduced in detail, emphasizing its close connection and support by the Danish Export Council, the Confederation of Danish Industries, as well as the Danish Energy Authority – the latter providing co-funding to the project. The total number of companies that the NETS project has been working with in Denmark amounts to 33 companies. Of these, 20 companies have published their company profile via the NETS project website and directly benefited from further serviced offered within the project (brochure, fairs, B2B service, translation, etc.). Furthermore, several technology marketing initiatives have been contacted to coordinate their efforts with NETS, including:

- Coordination with Danish Bright Green Initiative and VE-Net (Renewable Energy, Energy Efficiency Denmark, 2008)
- Coordination with Danish initiative "World Energy Showroom" (Renewable Energy, Energy Efficiency, Denmark, 2008)
- Involvement in ongoing Danish COP 15 discussions, UN Climate Change Conference (Denmark 2009).

In Sweden, more than 150 companies were contacted and more than 50 visited in order to find suitable forms for co-operation on a case-by-case basis. 35 companies were willing to participate in the project, and, at the end of the project, 10 more companies were planning to join the NETS co-operation, including lead companies from different sectors in the area of energy.

***Photo: Networking in Practice**. The Norwegian state secretary Ms. Liv Monica Stubholt from Department of Petroleum and Energy visited the NETS stand at WIREC 2008 in Washington, USA, and was informed about the NETS cooperation by Thor Sverre Minnesjord, CEO of Green Business Norway.*

In Norway, existing network organizations such as GreenPartner Norway and Entech BA (before merging to Green Business Norway) were utilized as distribution channels to reach companies in the environmental and renewable energy technology sectors. About 250 companies and institutions were defined as a target group. 17 companies took part in B2B and joint marketing activities and 50 companies took part in surveys on water and waste-to-energy sectors.

In addition to companies and other business networks, the project co-operated with many public sector, research and funding organizations at country-level. A list of these organizations in found in Appendix 4.

PROMOTING NORDIC CLEANTECH

In addition to strengthening the co-operation of the network engines at the Nordic level, the major focus on the project was on promoting Nordic cleantech through joint actions and facilitating the networking of Nordic cleantech companies. The participating companies were offered the short-term services prioritized in the Copenhagen workshop: market information, value chain building and B2B focused joint promotional activities that are all described in more detail below.

Activities in water sector pave way for future

After the groundwork for network creation and capacity strengthening was completed on the clean energy sector, the Nordic networking model was replicated in the water sector.

At the start, IVL, a Swedish research organization, was subcontracted in Sweden as an external expert to lead and coordinate the water sector activities, while in other countries the project partners coordinated the work themselves. A report on Nordic water sector challenges was made in order to find long-term networking/ development needs which resulting in the selection of sludge treatment and monitoring sectors for the focus areas. These focus areas were clarified in the Stockholm Water workshop in March 2008 in which 12 persons participated. On sludge treatment, the activities within the project were mostly promotional activities, whereas in monitoring sector the approach was to identify key segments and companies for potential co-operation beyond the project time-frame.

A study on Nordic monitoring companies and organizations was made to get a view on Nordic strengths especially for Chinese markets. Rapid scanning of Nordic environmental monitoring companies and institutions has shown that there are several enterprises active in the environmental monitoring field in each of the Nordic countries. It was possible to identify around 40 companies both in Finland and Sweden. In Norway and Denmark, the scanning resulted in around 10 major companies. Based on the rapid scanning, it can be expected that with more in-depth analysis, there are probably several smaller companies also in Norway and Denmark, as were identified in Finland and Sweden. The study provided an overview of potential for value chain building, noting that many of the companies focused on consulting services that utilize environmental monitoring data and probably conduct the sampling and measurements most often by themselves. Companies, that provide (only) measurement instruments and data collection and management systems, were more difficult to find, whereas companies focusing on soil and water monitoring are plenty but less numerous on air quality monitoring. The study also found that the national authorities and institutions in the environmental monitoring field in the Nordic countries seem to be quite well organized which probably enhances environmental monitoring business development as well. The results of the study could be easily expanded into a Nordic environmental monitoring company database.

B2B activities bring fastest results

Creation of B2B contacts between companies was considered an important “basic activity” in the project in order to create added-value for companies. The NETS partners took a systematic approach in dealing with B2B activities by:

- Development of NETS B2B forms (Norway and Denmark)
- Promotion of the opportunities to provide B2B services, utilizing the network engines’ national networks in all participating countries in order to have a wider outreach.

A special contact form was designed by CarlBro/Grontmij for the companies to use if they search a Nordic business partner. The form was tested by a couple of companies. The filled form with definitions on wanted partners was delivered among the network engines that in each country were able to introduce potential partners to one another. During the project, B2B activity was mostly

built between Danish and Norwegian companies by Green Business Norway and CarlBro/Grontmij. 10 potential B2B cases were introduced and 3 of them are now proceeding.

Value chains for tenders offer high potential

In the water sector, 45 international tenders were scanned for further evaluation in 2007-2008 in order to for build a consortium and prepare a commercial offer. Two consortiums with an offer were prepared for the following tenders:

- EBRD: Zagreb Holding Water and Sewer Investment Project, Croatia. ID 5698-GPN-38501

- WORLD BANK: Consulting services for the projects on sustainable tourism development project in Serbia-Montenegro. Identification of the alternatives for enhanced wastewater treatment and disposal in Ulcinj and Bar and preparation of their final designs. ID P093461

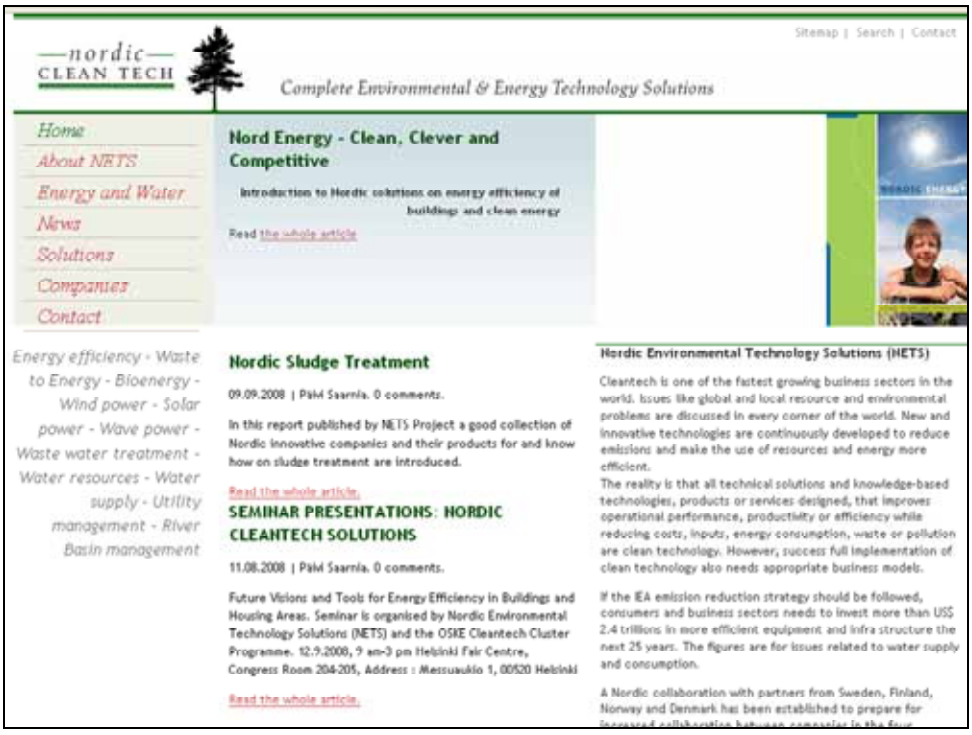
Joint marketing achieves greater impact

The strategy for promotion was based on both face-to-face contacts and internet. The following printed materials were prepared for marketing and promotion of Nordic Environmental Technology Solutions:

- Nordic Clean Technology Solutions (project introduction) (500 copies)
- Nordic Energy – Clean, clever and competitive. The publication introduces 52 Nordic solutions or initiatives and has proved to be very popular among experts and potential customers. (6000 copies)
- Sludge Treatment – Nordic Waste water Treatment (2000 copies)
- Project posters.

In co-operation with the national trade promotion organizations, these publications were widely distributed throughout the world to potential clients. According to Finpro, that delivered 2 500 copies via its country offices, these brochures turned out to be extremely popular.

A joint website www.nordiccleantech.net was established by Green Net Finland with company search tools to introduce Nordic cleantech solutions. The site is a window to Nordic environmental know-how. The challenge is to involve more resources to keep the site up-dated and in continuous development. This is under discussion among Nordic organisations through, for example, partially integrating the information to the new “Nordic Energy Showcase” platform coordinated by Nordic Energy Research.



Picture: www.nordiccleantech.net

The main trade fairs and industry events where the NETS partners participated during the project together with interested companies were:

- Environmental Technology 2008 (Helsinki, Finland)
- 3rd Nordic Sustainability Conference (Odense, Denmark, 2008)
- Copenmind, (Copenhagen, Denmark 2008)
- Environmental Technology & Innovation hosted by the Nordic Council of Ministers (Copenhagen, Denmark 2008)
- RESTA 2008 (Building Technology, Vilnius, Lithuania)
- WIREC (Renewable energy, Washington D.C., USA 2008)
- Green Trade Network Summit (Santa Cruz, USA 2008)
- World BioEnergy 2008 (Jönköping, Sweden)
- Nordic Green Technology Conference (Palo Alto, USA, 2008)
- Green Business Norway Conference 2008
- Meeting Arena Environmental County Västernorrland (project) (Sweden 2008)
- 16th European Biomass Conference & Exhibition. (Valencia, Spain 2008)
- EU water seminar (Brussels, 2007)
- Swedish Delegation to Shanghai, Nanjing and Zhongsan (2007)
- International Ecological Fair POLEKO (Poznań, Poland 2007)
- The 15th European Biomass Conference & Exhibition (Berlin, Germany 2007)
- easyFairs INDUSTRI & MILJÖ I NORR (Sundsvall, Sweden 2007).

During these events, the strong interest for Nordic Environmental Technology Solutions became obvious. The printed materials were on high demand and attracted many visitors to start discussions on the NETS stand shown in the different locations.

Some of the key events are described below in more detail:

Environmental Technology 2008

The NETS final seminar "NORDIC CLEANTECH SOLUTIONS - Future visions and tools for energy efficiency in buildings and housing areas was organized jointly by NETS project and the Finnish Cleantech Cluster Programme in September 2008. 120 persons, including all NETS partners and representatives from architects, construction companies, housing financiers and municipal planners, participated in the seminar that was organized as an official side event to the exhibition "Environmental Technology 2008" at Helsinki Fair Centre. In addition, a joint exhibition stand was organized at the fair. As a result of the seminar and the exhibition stand, Nordic co-operation got a lot of visibility; the NETS energy and sludge brochures were requested to be sent to Dubai and India, for example.

Photo: NETS final seminar at the Helsinki Fair Centre in September 2008.
120 persons, including all NETS partners and representatives from architects, construction companies, housing financiers and municipal planners, participated in the seminar.

Photo: NETS stand at the Environmental Technology 2008 Fair in Helsinki. *Co-operation between project partners: Ms. Päivi Saarnia from Green Net Finland and Mr. Christian Theel from Baltic Sea Solutions congratulated each other on successful project.*

RESTA 2008

Green Net organized a stand at the Building Technology exhibition RESTA 2008 in Vilnius, Lithuania, in April 2008. The fair is biggest of its kind in the Baltic countries and, for the first time, energy efficiency was the main topic. RESTA was a perfect place to be visible for NETS as crowd of exhibition visitors were very willing to make contacts with Nordic companies and / or buy their products. A list of potential contacts was made as a result of the exhibition. 400 energy brochures were handed out to visitors during 4 days which means almost as many face-to-face contacts.

Wirec 2008

The NETS project was present at the Wirec Conference and Exibition in Washington DC in March 2008. Green Business Norway organized the stand in close cooperation with Baltic Sea Solutions and Grontmij Carl Bro. 4 companies, representing mainly geothermal and waste-to-energy solutions, were present at the exhibition.

The materials used at the exhibition included on-line access to NETS web site, NETS publication, brochures from Finland, Sweden and Denmark promoting networks, showcases and companies as well as company presentations.

Results from the exhibition were as follows:

- About 200 visitors where registered at the NETS stand.
- 40 contacts where established for follow up, either directly as B2B connections or more long term cooperation development.
- The Norwegian state secretary Ms. Liv Monica Stubholt from Department of Petroleum and Energy visited the NETS stand and was informed about the NETS cooperation.

- The companies attending the exhibition emphasised the importance of NETS as a facilitator and coordinator.
- The brand “Nordic Environmental Technology Solutions” received high recognition from the visitors.

World BioEnergy 2008

At the World Bioenergy Fair in Jönköping, Sweden in May 2008, Energidalen had a centrally located conference hall rented in direct connection with the fair area. The focus was entirely on making contact with new companies suitable for participating in NETS project. The conference hall became an oasis and a hub for the NETS activities as the majority of visitors chose to get the information directly, producing interesting discussions. About 100 NETS brochures and other kind of marketing materials, like CDs, were distributed. All together 25 persons were approached, representing 15 companies. 13 of those qualified for the NETS contact list as bioenergy companies, which resulted in around 10 new members in the NETS network. These companies are all waiting for the continuation of NETS project.

Green Business Conference 2008

Green Business Conference is the annual Green Business Norway conference, and took place April 9th, 2008. A Nordic dimension was integrated in the conference programme, presenting Swedish and Danish showcases as best practice examples for sustainable environmental technology solutions.

The Green Business Conference was a combined conference and exhibition attracting 22 exhibitors, and 140 delegates, from the Nordic countries. The delegates included 80 technology based companies, 20 investment companies (banks, venture funds, private investors etc.), 20 end users, looking for new technology solutions and 20 public sector/government representatives.

3rd Nordic Sustainability Conference (Odense, Denmark)

The NETS project participated in the 3rd Nordic Sustainability Conference in Odense, September 2008. The conference addresses both authorities as well as technologies.

The conference offered an exhibition area to Danish and Nordic companies to present their products. The present NETS partner made a strong effort to address further companies to participate in NETS.

As a result, 5 new companies expressed their interest in participating in NETS.

Poleko Fair 2007

Green Business Norway and Energidalen took part in Poleko Fair November 2007. Green Business Norway organized the stand in close cooperation with Innovation Norway. The NETS cooperation was promoted during the seminars and stand. A joint seminar was also held together with Innovation Norway and Clean Tech Mid-Norway presenting Norwegian solutions for the Polish Market.

18 Norwegian companies where present at the exhibition. All companies distributed their own brochures presenting their products and services. One joint brochure was made in Polish for presenting the co-operation and participating companies. Also, advertisements were placed in exhibition catalogue and some Polish magazines.

As a result of the exhibition, a contact list of potential customers with names of 250 Polish decision-makers was collected. Later, letters with information about Norwegian companies and the benefits of co-operating were sent to them and contacts established with several organizations. At least one Norwegian company has been discussing with a Polish company to become their representative on the Polish market. Moreover, encouraged with the good results, more than half of the participating companies were also participating in Poleko exhibition 2008. Energidalen was in contact with about 20 companies, mostly in the biomass sector.

LESSONS LEARNED FROM NORDIC NETWORKING

During the two-year project co-operation, the project partners faced many challenges, yet achieved the project objectives so successfully that the willingness to continue co-operation has only grown during the process. The lessons learned from Nordic networking as described here are not sector-specific and can easily be applied to other business areas as well.

Country-specific challenges can be overcome

At the start of the project co-operation, country-specific factors that could pose risks in expanding the national networks to Nordic level were identified and discussed by project partners.

Promoting the idea of a Nordic Environmental Technology Network was not very popular in Denmark due to experiences gained by public and especially private institutions with “Green Cities Denmark” – a comparable network at the national level. This network had just gone bankrupt with financial losses to all shareholders some months before the NETS idea started to develop. This incident clearly caused the reluctance of companies to become active members in NETS project with a financial contribution or to even show interest for participating in NETS activities.

Furthermore, Denmark experienced a special situation: it occurred in 2007 that Denmark was declared host for COP 15, the 15th United Nations Climate Change Conference in Copenhagen in December 2009. Since then, the focus on cleantech and especially on energy technology as well as on measures and tools for climate change adaptation have become of high political and commercial interest. Not only that demonstration projects on innovative technology are boosted for showing the world Danish technology at its best – but also marketing efforts for technologies to attract as many future clients as possible have been appearing all over. This situation resulted in a heavy competition among upcoming “Cleantech networks” to attract companies’ involvement and members’ fee.

Taking into account the driving force of strong national companies to convince also smaller companies about the quality of an initiative, the Danish NETS partners feel to have used the early hour in 2007 quite well: Vestas, Velux, Solar Cap and VE-net have seen potential in NETS and became members. The Bright Green Initiative offered to promote NETS through their website. And the Danish Energy Authority approved to support the activity financially. This is also due to the fact

that none of these national initiatives has established a comparably strong Nordic focus as the NETS partners are already consolidating.

In the NETS starting phase, Finnish environmental networking was strengthening in different parts of the country. Green Net Finland had been founded a few years ago and had an established role already. In its traditional business areas, such as environmental monitoring, bioenergy, waste management and mining, Green Net had been working successfully in cluster development and in offering B2B services (finding partners, building value chains, etc.). However, the activity chosen in NETS project as Green Net's specific focus area (energy efficiency of buildings) was new to Green Net and, thus, extra efforts were required to get the key companies committed. In any case, this choice was made strategically, as at the same time, energy efficiency in the urban environment was chosen to be Green Net's second major focus area in the national cleantech cluster, for which Green Net is designing and implementing the programme in the Uusimaa region for years 2007-2013.

Sweden started building a national clean energy network and succeeded well. They also had some kind of barriers in the beginning, as the company register of SWENTEC was already functioning. Yet, 35 Swedish companies joined NETS activities and there are 10 more expected to join in the near future. The Swedish companies are very much waiting for B2B activities and they underline that as this network has been set up, it must now be further developed and taken care of.

Green Business Norway instead relied on their recent member companies, though also building new contacts. This seemed to be a good strategy to start effectively new Nordic networking activities. Green Business was able to concentrate on B2B activities perhaps quicker than other partners.

Networking needs trust, time and resources

The project partners were also faced with some common challenges that are not country-specific but rather typical for project-based business networking:

- Companies seemed not as ready as expected to utilize the project as a means to find partners and build value chains. 86 out of 870 contacted companies participated in the project. Competing technology markets in the neighbouring Nordic countries hindered free floating of technology back and forth between the member companies. Establishing B2B contacts to build value chains was not desired as many of the bigger companies already had established networks and smaller companies were lacking the required references and resources. It is much easier to commit the companies in building value chains in the form of consortium for international tenders than generic value chains for marketing purposes, as it is difficult for them to commit resources for something that does not provide for immediate results. Network-building is a lengthy process in which a two-year project can only lay the foundation for interested companies to take the lead in developing it further. Based on the experience of project partners, the coordination of a joint Nordic B2B promotion is not simple and the communication structures for such activities need further planning.
- It is also very important to take the limited capacities into account that companies can apply for initiatives outside their core business. The partners exchanged experiences how to inform and attract companies to the NETS network without disturbing their daily business. Therefore, short information and registration forms where developed to make involvement into the NETS website as time effective as possible. Still, respecting cultural differences as well as the already

established relations with key companies that the national networks had in their home countries was determined to be a key factor for succeeding in attracting new companies.
- Regardless of close co-operation between Nordic countries on financing environmental projects, e.g. through NEFCO, NIB and NDEP, at governmental level, there seem to be financial barriers that also limit Nordic cooperation as these institutions/instruments tend to finance strictly national activities rather than joint Nordic activities.

Concrete results push forward

There were many concrete results achieved during the NETS project which motivated the project partners and the participating companies to continue the networking activities. Some of the results are highlighted below and summarized in Appendix 5.

- The awareness and understanding of Nordic strengths in clean energy and water business sectors have grown both within the project network (consisting of project partners and the participating companies) and among wider audience, including potential international customers, as a result of closer cooperation and joint marketing activities.
- The capacity of Nordic cleantech companies, especially SMEs, to cooperate at the Nordic level has been strengthened through coordinated support provided by the project partners (i.e., the national business networks) at the national level. Especially smaller companies value the support for marketing and B2B contacts to find reliable partners at Nordic level that otherwise they would not have the resources to undertake. It should be noted that out of 870 companies contacted during the project, 86 companies that were mainly SMEs actively participated in project activities, e.g., in trade fairs, web site and brochures, including some of the leading companies in their fields. Marketing cooperation showed its power as the partners were able to reach far more contacts jointly than working solely by themselves.
- More concrete results include the two commercial offers made by Nordic consortia for international water sector tenders, the three B2B contracts under preparation, successful marketing activities and popular promotional materials, large number of companies participating in project workshops and seminars (e.g., 40 companies participated in the Copenhagen NETS workshop and 133 in the NETS final seminar “Visions for energy efficiency in housing sector” in Helsinki).
- The national export promotion organisations showed to value the project cooperation, especially as NETS supports their own efforts – limited by capacities – to guide international delegations through the Nordic Cleantech landscape. The impact achieved by targeted promotional activities and involvement of national trade promotion organizations has been significantly higher than any individual company could achieve on its own.

Stronger support and wider participation is needed

It is essential that the development of the Nordic Cleantech Hub continues and the started cooperation is further developed and strengthened. The companies that have been committed to participate in the network are waiting for continuing services. At the end of the project, 10 more Swedish companies and 6 more Danish companies were planning to join the network. Even when the project partners are now well aware of challenges related to Nordic networking, including the available resources, concrete plans are already under development to continue the work after the

project ends. This willingness can be seen as further proof of the added-value that Nordic level networking generates in the cleantech sector.

Based on the two-year experience of co-operation of Nordic cleantech networks, the following recommendations are made for further co-operation:

- In order to build a stronger Nordic cleantech brand, the national business networks should continue co-operation in the chosen business sectors. The project has shown that this co-operation is most effective when partners from two main responsible countries of the specific sector take the leading role and the other partners support the activity in case they have own interest in promotion of the sector. Closer co-operation in promotional activities with the national trade promotion organisations enables better impact and is worth further development, especially since these national organizations are already active in the cleantech promotion and have dedicated resources for this purpose.

- The national business networks should also continue supporting the companies in forming Nordic consortia for tendering in international competitive biddings when the expertise of individual companies complements rather than competes with each other. Main focus areas could be e.g., water sector (Sweden has been earlier the driving force) and environmental monitoring (Norway and Finland have started preparations).

- For public sector (funding) organizations, it is recommended to continue supporting the coordination and networking activities at Nordic level. Especially SMEs clearly benefit from the work carried out by national network organizations. However, these organizations need extra external resources for work at the Nordic level as it is often outside their national mandate. It should also be noted that the public sector often has a key role in creating the market in the environmental sector through public procurement as well as financial support for investments, export, research and innovation. Therefore, closer co-operation with public sector authorities and research institutions, both at national and Nordic level, is needed.

APPENDIX 1. FOCUS AREAS

Definition of the project's focus area was started by analyzing the potential in environmental business and choosing the most promising business areas on the basis of Nordic know-how and market information of resent market studies.

After the first Steering Committee held in Helsinki on January 12th, 2007, the potential sectors were listed and a collection of information on the companies operating on these sectors was done. The register of these companies include over 600 companies. The sectors are:

- Transportation
- Solar energy
- Geothermal energy
- Construction and engineering
- Biogas
- Biomass technology or fuel delivery
- Pellet Technology
- Peat
- Windpower
- Hydro Power
- Measurement and automation
- Energy efficiency of buildings • IT solutions
- Waste to energy
- Gasification Boilers (small)
- Enrgy saving fireplaces
- Boiler plants
- Heating pumps
- Fuel treatment, burners
- Purification of exhausting gases
- Expert services, project management
- Electrification
- Turbines, generators
- Big boilers
- Steam boilers
- Energy plant components
- Building services
- Construction materials
- Contracting, total solutions
- Services, energy efficiency consulting

Based on the analysis of, and discussions on, the sectors, priority areas were chosen, first picking up 10 sectors, being:

1. Urban energy efficiency
2. Energy efficiency in small houses
3. Energy efficiency in industry
4. Energy efficiency in transporting and logistics
5. Forest based bioenergy
6. Agricultural bioenergy
7. Wind energy

8. Solar energy and hydrogen cells
9. Hydropower
10. Waste to energy solutions

The final selection for the priority areas in NETS project was made by the Steering Committee in its meeting in Oslo on May 22nd, 2007. These priority areas were:

Clean Energy:

- Energy Efficiency in buildings
- Bio Energy
- Solar Energy
- Wind Power
- Wave Energy
- Waste to Energy

• Water sector.

In the water sector, the NETS activities focused on sludge treatment and environmental monitoring.

Below is a brief description of these focus areas.

OVERVIEW OF CLEAN ENERGY SECTOR

The Nordic solutions for clean energy are based on local renewable energy resources combined with proven technologies and clean efficient processes. The use of local renewable resources increases energy security and benefits both the environment and the local economy. In the field of clean energy, the Nordic countries not only have similar strengths, but they also complement each others in many ways. Denmark is a forerunner in utilizing integrated district heating concepts and wind power technology. Finland provides a large share of the world's wind turbine components. Sweden and Finland are strongest in utilization of bio-energy in combined heat and power production, providing technological solutions from forestry machines to logistical chains and clean combustion. Norway has in-depth expertise in hydropower and carbon capture and storage at the bottom of the sea, while Sweden has top knowledge in utilizing the energy from the seawater. Together, the Nordic countries offer top-level know-how on clean energy in many areas.

According to Nordic Energy Research, the export of energy technology from the Nordic countries is currently worth €18-19 billion, corresponding to approximately 11 percent of the total value of EU 15 member states' energy technology export. In all Nordic countries, the export of energy technology has increased, particularly during the last 2-3 years. Total Nordic energy technology export to rapidly growing economies in Brazil, Russia, India, China (BRIC) and Eastern Europe (EU-10) was approximately €2.8 billion in 2006, corresponding to 15 percent of the total Nordic energy technology export. By comparison, energy technology export to the US was 9 percent of total. The Nordic energy technology export to BRIC and EU-10 increased by 14.3 percent from 2005 to 2006.

By utilizing the Nordic clean energy solutions, the Nordic countries are able to lead the way to combat global climate change. By the year 2050, the Nordic countries have set themselves an ambitious target of reducing green house gas emissions by 60-80% relative to 1990 levels. The

advanced technological solutions of Nordic countries in many fields are based on close cooperation between the industry and the leading research organizations. This cooperation at the Nordic level enables the Nordic countries to stay on top of the latest knowledge and turn it to new innovations.

Energy Efficiency in Buildings

Energy Efficiency of buildings refers to products, systems or technologies using less energy to do the same or better job than conventional products, systems or technologies. Energy Efficiency saves energy and money as well as helps to protect the environment by reducing the effects of green house gases. The products include ventilation and automation systems, lightning and heating technology. In the long term, low energy building concept is developed. Company groups and value chains formed by building companies together with niche product producers can offer total solutions for the customers, who can be construction companies, building contractors, private house builders and hardware wholesalers and stores.

International, EU and national regulations increase the demand of energy efficient buildings. Building sector counts for nearly 40% of energy used in the EU. The European Union Green Paper on Energy Efficiency, adopted in June 2005, sets the goal that the European Union could make 20% savings in its energy consumption by 2020. The other EU market drivers affecting the construction and building maintenance sectors are: The Directive on the energy performance of buildings; Cutting greenhouse gases by up to 30 % by 2020 compared to 1990 levels; Target for renewable energy (20 per cent by 2020). In addition to the EU, there are international market drivers that increase the demand of energy efficient products and/or even the low energy building concept. International Energy Agency IEA says that the possibility of energy efficiency within all available technologies to decrease green house gases is 58% until 2030.

Solar Energy

Solar energy is the most natural energy source available globally. Like other renewable energy sources buying equipment is rather expensive, however, very cheap in operation compared to fossil fuel sources. The value of solar energy contribution in residential buildings is profound because room heating and hot water heating account for over 75 % of the energy used in single and multi-family homes. Solar energy can cover up to 100 % of this demand.

Solar heating equipment is used for domestic water heating with a minor part being used as a combination of room heating and hot water. In addition, solar energy is used in pools and larger plants in connection with district heating often in combination with biomass like pellets and straw. Solar heating in households can be used together with other energy sources such as oil, wood, heating pumps and electric heating.

Solar cells used in production of electricity for households are entering the market with decreasing equipment prices. Solar cells are expected to play an important role internationally in future energy supply. A solar cell is an advanced semiconductor which transforms influx of light to electricity.

Wind power

The Nordic countries are among the world's leading producer of high-tech wind power systems covering development, manufacture, sale, marketing and maintenance of wind power systems that use wind energy to generate electricity. Global experience and local expertise go hand in hand.

Working relationships with turbine owners do not end with delivery. On the contrary, final delivery of a turbine marks the beginning of close collaboration over a period of at least 20 years. Utilization of wind power can take place both on and off shore.

Waste-to-Energy solutions

An increasing attention is paid to the resources available in waste, both the reuse of waste materials, and the energy potential. There are four key macro drivers that support the booming potential of waste to energy solutions:

- Increasing energy demand and hence increased energy prices
- Closing of landfills, turning towards recycling
- Local energy control
- Stricter emission control

Wave energy

In the last 25 years the persistent efforts in R&D and accumulated experience has improved the performance of wave power techniques. Today wave energy solutions are closer to commercial exploitation than ever before.

Bioenergy

Bio energy (energy from biomass and waste) is recognized as the most important amongst the Renewable Energy Sources (RES) and its potential contribution to several global policies is considered very high. There has been a continuous development of bio energy technologies over the last three decades with various degrees of acceleration during certain periods in time as a reflection of the variations in the price of oil. Climate change offers the opportunity for long lasting policies for a constant support of bio energy.

OVERVIEW OF WATER SECTOR

Half of the Earth's available freshwater is already appropriated. Concurrent with an increase in freshwater demand, the supply of "clean" water continues to dwindle as a result of contamination from pollutants. This contamination, from municipal and industrial discharges and non-point source runoff affects coastal receiving waters, inland water bodies and groundwater. Every year, over 2 billion people suffer from water-borne illnesses and water-related diseases account for 5 million deaths. Further, more than one-fifth of the world's people do not have access to safe drinking water and one-half of the world's population does not have adequate sanitation and more than 30 countries in Africa and Middle East have acute shortage of water. Years after adopting the millennium development goals the progress on the water sector is still very inadequate. Therefore, water quality monitoring is critical to the future health of the human population as well as the health of the ecosystem by determining the current status of water quality conditions and helps anticipate, and hopefully avoids, future water catastrophes.

There are also encouraging developments in the water sector, but much has to be done. The world summit in Johannesburg has headed the political agenda. There is an agreement in the international discussion regarding the central importance for water in the human development. The UN has a water agenda up to 2015. Political initiatives like G8 for Africa and the EU water initiatives express

an increased determination of the government of the industrialized countries and developing countries to tackle the problems together. The millennium goals, the EU countries programmes on water and the concept Integrated Water Resources Management are the main guidelines for European community.

The view point and approach regarding water sector was different from that of energy sector. It was agreed that Nordic countries traditionally have succeeded in water related business but are nowadays losing opportunities and this trend need to be changed. Past and recent experiences and studies in the water resources sector, particularly in the water supply and sanitation sub-sector, show that a number of issues which hampered the development of the sector are still outstanding and need to be addressed immediately to avoid further widening gaps in the sector. Among the major issues identified are the following: fragmented planning in the sector, lack of comprehensive regulation, inadequate institutional capacity and financial constraints.

The market is huge in the water sector as the demand for drinking water and sanitation is growing. In general, existing water supply systems have problems meeting the growing demand for water even in developed countries. Some urban areas are already experiencing severe water shortages and threatened water supply sources. Existing sanitation and sewerage services are also unsatisfactory and inadequate to meet health and environmental standards, which eventually result in groundwater and surface water pollution and outbreaks of epidemics of waterborne diseases.

Many developing countries have problems in accessing appropriate water quality monitoring technologies to enable them collect the type of data which permit useful assessment, coherent environmental management and which can guide investment decisions. Water quality data programs are often fragmented, often collect the type of information, that does not reflect the real needs and objectives, and are inefficient in terms of information collection, use and cost. Also conventional water quality monitoring methods are increasingly less suitable due to their cost and their inability to deliver results quickly.

It has thus been identified that a key constraint on the development of the sector is the access to capital and innovative technology. New technology solutions are very import tools for being able to reach the millennium goals. Development of cost effective small scale technologies is the right track. Innovative technology solutions that are easy to adapt in the developing countries and scale concepts are important.

The challenge and also opportunities in developing the technologies are enormous and thus very potential for the Nordic countries that could form “a silicon valley” for water technologies due to long research experience, strong economic development and a history of entrepreneurship.

The country-specific priority areas were studied in NETS resulting in:

Norway	• Coastal zone water management • Measurements of water quality • Discharges of oil
Denmark	• Manure dispersal • Drinking water • Change in water consumption • Rain water issues

Sweden	• Protection of ground water reserves • Surface water quality • Rain water issues • Waste water treatment
Finland	• Water quality • Waste water treatment • Water treatment in heavy industry • Water ecosystem management

Sludge treatment

Due to the physical-chemical processes involved in the treatment, the sludge tends to concentrate heavy metals and poorly biodegradable trace organic compounds as well as potentially pathogenic organisms (viruses, bacteria etc) present in waste waters. Sludge is, however, rich in nutrients such as nitrogen and phosphorous and contains valuable organic matter that is useful when soils are depleted or subject to erosion. The organic matter and nutrients are the two main elements that make the spreading of this kind of waste on land as a fertilizer or an organic soil improver suitable.

The progressive implementation of the Urban Waste Water Treatment Directive 91/271/EEC in all EU Member States is increasing the quantities of sewage sludge requiring disposal. The Sewage Sludge Directive 86/278/EEC seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. Land-filling as well as incineration in some Member States are the most widely used disposal outlets. (European Commission Environment DG, http://ec.europa.eu/environment)

Sludge treatment:

- Reduces organic ingredients
- Removes odour
- Reduces volume and weight
- Improves hygiene by removing of pathogen organisms
- Prepares sludge for further utilization or disposal

As VTT Technical Research Centre of Finland points out, sludge could be considered as a valuable source for nutrient use, reuse of inorganic material, carbon upgrading processes, and energy production. In the Nordic countries there is a good industry base to cover the most promising recent innovative technologies.

Monitoring

One purpose of monitoring is to enable assessments of the current state of water quantity and quality and its variability in space and time. Often such assessments are appraisals of the hydrological, morphological, physicochemical, chemical, biological and/or microbiological conditions in relation to reference conditions, human health effects and/or the existing or planned uses of water. Such reference conditions may take into account elevated concentrations of specific determinants due to “natural” geophysical and geochemical processes.

Another purpose of monitoring is to support decision-making and operational water management in critical situations. In critical hydrological situations, such as floods, ice drifts and droughts, timely and reliable hydro-meteorological data are needed, which often requires telemetric systems to transmit data continuously. When pollution events occur, reliable data are needed, which may require early warning systems to signal when critical pollution levels are exceeded or toxic effects occur. In these cases, models can often support decision-making.

Water quantity and quality monitoring using on-line technologies combined with latest information and communication technologies as well as so called turn-key solutions have been identified as very promising and most relevant areas.

APPENDIX 2. SUMMARY OF THE COPENHAGEN WORKSHOP

September 11th 2007, parallel sessions

The summary below is based on input from all parallel sessions during the workshop. The proposals represent:

1. Concrete and specific activities to be conducted, either in the NETS project or in a NETS 2 or as a separate specific spin-off with its own ad-hoc funding.
2. Services to be provided either in the NETS project or in a NETS 2 project

Short term services: Services and/or activities to be conducted during the NETS project period
Longer term services: Services and/or activities to be conducted in a NETS 2 project

Proposals	**Short Term Services**				**Longer Term Services**				**Comments**
Innovation Management session	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Project manual on innovation management, best practice examples, case studies –good and bad examples						X			
Innovation Management training (courses and programs for companies)						X			
Innovation Management mentorship on company level						X			
Business Dating/speed dating/match making						X			
Innovation project dating/coupling (E-bay: buy a project)						X			
Legislation lobbying and training						X			
Joint Innovation Day in all NETS companies where individual companies receives ideas on internal projects, projects with customer and/or NETS partners						X			

Proposals	**Short Term Services**				**Longer Term Services**				**Comments**
Innovation Management session ***continues…***	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Database with profiles of the participating companies					x		x	x	Should NETS be responsible for the profile, or should the companies?
Collection of market information, and a system for sharing knowledge about good market reports			x	x			x	x	
Innovation Camp, dealing with a particular focus e.g. how to choose 1 winner idea from 101 good ideas					x	x			
Workshop with companies and customers discussing current and future needs					x			x	
Marketing and promotion	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Print a magazine with 60 – 100 pages, to be distributed through trade councils, and exhibitions abroad				x					A magazine should be 1. rather short and general, and work as an "extended" business card to attract people to the web site 2. If a magazine is made it should be high class and used as a gift from companies and the trade councils **Note:** The participants were in general reserved to the idea of a high quality magazine.
Web site as the main marketing instrument for NETS				x				x	The nets web site can be developed and adjusted to different needs and target groups, should also contain links to company web sites
Organise and participate at Trade fairs			x	x			x	x	It was impossible to name trade fairs that should be visited. There are many target groups, A selection has to be made at a later stage depending on the engagement of the companies/or the first value chains

Proposals	**Short Term Services**				**Longer Term Services**				**Comments**
Marketing and promotion *continues*….	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Lobbying • Government • Regional administrators • Parties in target countries								x	Lobbying was a service named by many participants, as different legislation is one obstacle while doing business in the (Baltic Sea Region). Lobbying could increase government's awareness and willingness to change.
Market surveys, and common knowledge about target markets			x	x			x	x	There is a huge amount of information offered already by different export organisations. A part of a service offered by NETS could be to help the members to identify the relevant information
Energy Map for promotion of best practice/applications/production sites/project related to renewable energy							x	x	Energymap.dk is a google based map (an example of what could be done on a Nordic level)
UN Climate Summit 2009 in Copenhagen as a window to present Nordic Cleantech to the world					x	x	x	x	Could be a suitable stage to present Nordic Cleantech to the world. Instead of going to fairs out in the world, NETS could use this high-class event, where the world will look to Denmark. First two weeks in Dec. 2009. Ulla Röttger (participant from I/S Amagerforbrænding, Denmark) prepares a World Energy Showroom and offered cooperation. Also, a "total Nordic solution" in form of a built house with NETS-technologies was proposed.
Nordic Conference involving companies, the political environment, research and development organisations etc. to discuss Nordic needs and promote Nordic solutions					x		x	x	Could be done as an alternative to participate in trade fairs

Proposals	**Short Term Services**				**Longer Term Services**				**Comments**
B2B (business to business services)	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Establish a database for internal and external purposes			x	x			X	x	A database should be integrated with the website www.nordiccleantech.net
External purposes: 1. marketing and promotion, illustrations of showcase/total solutions	x				X				
Internal purposes: 1. A support tool for Nordic companies/members to identify technological solutions, exchange of knowledge 2. Experience with Brussels, information about public regulations	X				x				
Establish a mechanism for cooperation between small and large companies 1. Focus on partnership development (technology development and verification, market introduction etc.) 2. Subcontracting	x		x		x		X		
Financial engineering 1. The network NETS to act as financial engineers in project development and export activities on behalf of groups of companies (3rd party funding)	x		x		x		X		

Proposals	Short Term Services				Longer Term Services				Comments
B2B (business to business services) ***continues..***	B2B	IM	EXP	M&P	B2B	IM	EXP	M&P	
Events, conferences and workshops aiming at promotion of Green Business/Cleantech sector 1. E.g. a Nordic conference involving companies, the political environment, and research and development organizations/institutes –focus: Energy efficiency in cities	x			x	x			x	
Industrial Symbiosis/synergies (energy production in Lahti as an example 1. Support/develop value chains that creates e.g. more optimal use of energy, reduced energy consumption and improved environmental performance	x				X				
Establish mechanisms/programs for creating demonstration projects for promotion of technology and solutions provided by Nordic companies/member companies • Public sector • Private sector (e.g industrial parks)	x				x				Such idea could be defined as a spin out project or a programme (long term activity including several projects)
Regular Match Making when member companies present their need to NETS project team • Technology demand • Engineering capacity demand • Personnel/employees • Joint ventures, distributors	x		x						Requests from companies could be coordinated through the project team

APPENDIX 3. PARTICIPATING COMPANIES

Company	Key words	Web	Country
Arontis solar concentrator AB	Solar energy	www.arontis.se	Sweden
Ageratec AB	Bioenergy, Waste to energy	www.ageratec.com	Sweden
Abelko Innovation AB	Energy efficiency of buildings	www.abelko.se	Sweden
Aquasol AB	Solar energy	www.aquasol.se	Sweden
Bioprocess Control Sweden AB	Bioenergy	www.bioprocesscontrol.se	Sweden
Biofuel - Solution	Bioenergy Research	www.biofuel-solution.com	Sweden
Compower AB	Bio -Solar-Waste to energy	www.compower.se	Sweden
ClimateWell AB	Solar, District heating, E. E.	www.climatewel.com	Sweden
Componordic System AB	Waste to energy	www.componordicsystem.se	Sweden
Econova Energy AB	Bio energy, Waste to energy	www.econova.com	Sweden
Emotron AB	E.E. , Measurement autom.	www.emotron.se	Sweden
EcoTec värmesystem AB	Bioenergy, Boilers, Burners	www.ecotec.net	Sweden
Effpower AB	Energy Storage	www.effpower.com	Sweden
Enstar AB	Many activities se web	www.enstar.se	Sweden
Firefly AB	Fire protection	www.firefly.se	Sweden
Grabitech Solutions AB	Bio energy, Waste to energy	www.grabitech.se	Sweden
Gällivare PhotoVoltaic AB	Solar energy	www.gpv-solar.com	Sweden
Minestro AB	Hydro power	www.minestro.com	Sweden
Optimation AB	Many activities se web	www.optimation.se	Sweden
PPC engineering ab	Many activities se web	www.ppc.se	Sweden
Scandinavian Biogas Fuels AB	Bio energy, Waste to energy	www.scandinavianbiogas.com	Sweden
Splitvision Development AB	Waste to energy, E. efficiency	www.splitvision.se	Sweden
SkyCab AB	Transportation	www.skycab.se	Sweden
Swebo Bioenergy AB	Bioenergy	www.swebo.com	Sweden
Stridsberg Powertrain AB	Transportation	www.powertrain.se	Sweden
Snowpower AB	Waste to energy, Construction	www.snowpower.se	Sweden
TTM Energiprodukter AB	E. effiency and services techn.	www.ttmenergi.se	Sweden
Texsun AB	Solar energy	www.texsun.se	Sweden
Ulma AB	Bioenergy, Burners	www.ulma.se	Sweden
Lackebywater Group AB	Water, slugde	www.lackebywatar.se	Sweden
Vilokan AB	Water, cleaning	www.vilokan.se	Sweden
Mercatus AB	Water, purification	www.mercatus.se	Sweden
Ariterm AB	Burners, Stovers, Boilers	www.thermiapellets.se	Sweden
Mafa AB	Silos	www.mafa.se	Sweden
Envor Biotech	Waste processing	www.envor.fi	Finland

Company	Key words	Web	Country
Kemira	Water treatment	www.kemira.com	Finland
Preseco Oy	Waste water	www.preseco.eu	Finland
Watrec Oy	Waste water	www.watrec.fi	Finland
VTT	Research	www.vtt.fi	Finland
SYKLI	Education, consulting	www.sykli.fi	Finland
Pöyry Environment Oy	Consulting, environment & infra	www.poyry.com	Finland
Pöyry Building Services Oy	Consulting, Building & construction	www.poyry.com	Finland
BMH Technology	Energy and waste	www.bmh.fi	Finland
Puzair/Puztec Oy	Energy and Waste	www.puzair.fi	Finland
Fidelix Oy	Building Technology	www.fidelix.fi	Finland
Enervent Oy	Building technology	www.enervent.fi	Finland
FCG Planeko Oy	Consulting,	www.fcg.fi	Finland
Uponor	Building tech, plumbing, heating, pipes	www.uponor.com	Finland
Oilon Oy	Energy, burners	www.oilon.com	Finland
Tepcomp Oy	Building technology, lightning	www.tepcomp.fi	Finland
EcoVent Aps	Building tech, ventilation, heat recovery	www.ecovent.dk	Denmark
Cenergia Energy Consultants	Energy	www.cenergia.dk	Denmark
ANS Solar Energy	Solar Energy	anssolarvarme.dk	Denmark
IRD Fuel Cells A/S	Hydro power	www.ird.dk	Denmark
JHM-Moldow A/S	Building techniology, filters	www.jhm-moldow.com	Denmark
Landia A/S	Water treatment equipm.	www.landia.dk	Denmark
SavePower A/S	Energy saving products	www.savepower.eu	Denmark
Simon Moos Maskinfabrik A/S	Waste water treatment, sludge equip.	www.simonmoos.com	Denmark
SolarCAP A/S	Solar Energy	www.vkr-holding.com	Denmark
SolarVenti A/S	Solar Heating	www.solarventi.dk	Denmark
SOLUM Ltd.	Waste treatment	www.solum.com	Denmark
UniTErm	Solar Heating	www.uniterm.dk	Denmark
VELUX A/S	Solar Heating	www.VELUX.com	Denmark
VE-Net	Energy	www.ve-net.eu	Denmark
Vestas Wind Systems A/S	Wind	www.vestas.com	Denmark
Gaia Solar A/S	Solar Energy	www.gaiasolar.dk	Denmark
H2Logic	Hydrogen	www.h2logic.com	Denmark
Ro-Clean Desmi A/S	Oil Spill response	www.ro-cleandesmi.com	Denmark
Owec Tower	Offshore wind mill structure	www.owectower.no	Norway
Wave Energy	wave energy	www.wavenergy.no	Norway
Lindum Ressurs og Gjenvinning	waste to energy	www.lindum.no	Norway
Cambi	waste to energy and water	www.cambi.no	Norway

Company	Key words	Web	Country
	treatment		
BioTek	waste to energy and water treatment	www.biotek.no	Norway
Goodtech MRAB	waste to energy and water treatment	www.goodtech.no	Norway
Rock Energy	geothermal energy	www.rockenergy.no	Norway
Alcym AS	waste to energy	www.alcym.no	Norway
EcoRisk Finance AS	business development	www.ecoriskfinance.com	Norway
Aquateam	water treatment expertice	www.aquateam.no	Norway
Geoenergi AS	geothermal energy	www.geoenergi.no	Norway
Miljøbil Grenland AS	electric vehicles	www.miljobil.no	Norway
Miljø-Teknologi AS	odour reduction systems	www.mtgruppen.no	Norway
Septik 24	water and sludge treatment	www.septik24.no	Norway
Infratech AS	energy efficiency	www.infratech.no	Norway
Østlandet Plast og Dykkservice AS	water treatment	www.opd.no	Norway
Ibsen Business Group AS	business development	www.environ-consulting.com	Norway

APPENDIX 4. PUBLIC SECTOR AND OTHER INVOLVED ORGANIZATIONS

Finland	Ministry of Environment Tekes, the Finnish Funding Agency for Technology and Innovation National Cleantech Cluster Sitra, the Finnish Innovation Fund Finpro Nefco Finnish – German Chamber of Commerce VTT National Research Centre of Finland
Denmark	Danish Export Council Danish Ministry of Foreign Affairs Confederation of Danish Industries Danish Energy Authority Danish Agricultural Council Technical University of Denmark Danish Association of Consulting Engineers Forest & Landscape Denmark, University of Copenhagen
Norway	Innovation Norway Federation of Norwegian Industries Arena cluster programme (a cluster development programme coordinated by Innovation Norway Clean Water Norway Cleantech Mid-Norway
Sweden	Exportrådet Swedish Trade Council Länsstyrelsen Västernorrland IVL Svenska miljöinstitutet Sollefteå kommun Energidalen

APPENDIX 5. SUMMARY OF OUTPUTS, RESULTS AND CONCLUSIONS

The table below summarizes the main outputs and results achieved within the project.

Outputs	Results	Conclusions
• 86 companies involved and more interested • Contact lists of 600 companies made • 10 potential B2B cases promoted and 2 consortia built for tenders • Common brochures prepared and delivered to customers, Common Website built • Seminars: approx. 300 seminar participants to discuss Nordic cooperation • Exhibitions: worldwide contacts (USA: Baltic States, China, Spain, Germany...)	• Awareness and understanding of Nordic strengths in clean energy and water sector has grown • Nordic level clustering and B2B activity have been tested and proved to be possible and potential • Marketing cooperation has been effective and visibility of *Nordic* solutions has increased	• Interest in Nordic B2B cooperation has increased • B2B activities need a lot of efforts, resources and effective communication structures • Willingness to Nordic experience exchange has increased • Common marketing needs a lot of resources, cooperation with National export organisations is essential • Networking can be made in several business areas, also other than the chosen focus sectors

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Nordic Innovation Centre

Nordic Innovation Centre

The Nordic Innovation Centre initiates and finances activities that enhance innovation collaboration and develop and maintain a smoothly functioning market in the Nordic region.

The Centre works primarily with small and medium-sized companies (SMEs) in the Nordic countries. Other important partners are those most closely involved with innovation and market surveillance, such as industrial organisations and interest groups, research institutions and public authorities.

The Nordic Innovation Centre is an institution under the Nordic Council of Ministers. Its secretariat is in Oslo.

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