



Report on the Project BASREC Seminars:

Energy Efficient Street Lighting

Sustainable and Energy Efficient District Heating and Cooling



30.06.2014

Päivi Suur-Uski
Irmeli Mikkonen
Annika Niemi

Motiva Services Oy

Abstract

Achieving the EU 2020 and 2050 energy and climate goals requires strong and focused energy development strategies and improved efficiency. To ensure efficient utilization throughout the development process the interaction between the electricity and heat market are of utmost importance.

Improved efficiency in street and other public outdoor lighting provides an opportunity for substantial energy savings, contributing significantly to the realization of the energy efficiency targets on local and national level.

The project consisted of organizing of a two-day event with seminars Energy Efficient Street Lighting and Sustainable and Energy Efficient District Heating and Cooling taking place on 20 and 21 May, 2014 in Helsinki, Finland. The purpose was to disseminate information and exchange experiences of new technology implementation practices, financing options and good practices in the Baltic Sea area countries. The seminars were targeted to relevant stakeholders, e.g. public authorities, decision makers, planners and practitioners in municipalities, financial institutions, industry, research organizations, Baltic Metropolis Network, Covenant of Mayors network and the EU Commission. The seminars gathered over 40 experts representing a wide variety of organizations from nearly all Baltic Sea countries, namely Denmark, Estonia, Latvia, Lithuania, Norway, Poland, Sweden and Finland.

The seminar programmes and presentations offered the participants a good overview of European, national and local strategies and policies, research point of view, practical implementations in large and small extent, and collaboration activities between stakeholders and countries. The seminars proved to be useful. Networking, sharing of practices, experiences and examples of practical implementations is important for improving energy efficiency and sustainability on national and regional level. The seminars strengthened the collaboration in the thematic areas between the Baltic Sea countries. Providing opportunities to stakeholders representing different aspects of the topic to share experiences face to face and thus networking events, such as the two seminars, is of focal importance .

The participants and speakers were asked for feedback on the seminars through an electronic questionnaire. In general the feedback was very good (overall rating 3.2 on the scale 1-4).

The project was commissioned and financed by the Baltic Sea Regional Energy Cooperation (BASREC) network. The work was carried out by Motiva Services Oy, Finland.

Foreword

Baltic Sea Region Energy Cooperation (BASREC) activities focus on promoting energy efficiency, renewable energy and other sustainable sources of supply in the Baltic Sea area. The Ministers encourage the public authorities and organizations in the region for closer cooperation to complement the ever more important energy efficiency work. The Baltic Sea countries can learn from each other and in cooperation develop concrete actions for the energy efficiency work.

The target of this project was to provide an overview of the current situation and future prospects on the selected thematic areas; Energy Efficient Street Lighting, and Sustainable and Energy Efficient District Heating and Cooling in the Baltic Sea countries.

The project organized an event of two seminars on 20 and 21 May, 2014 in Helsinki, Finland. The seminars were mainly targeted to relevant stakeholders, e.g. public authorities, decision makers, planners and practitioners in municipalities, financial institutions, industry, research organizations, Baltic Metropolises Network, Covenant of Mayors network and the EU Commission. The seminars gathered over 40 experts from Denmark, Estonia, Latvia, Lithuania, Norway, Poland, Sweden and Finland.

The seminars gave a good overview of recent studies commissioned by BASREC, examples of practical implementation and experiences of new energy-efficient technologies in the Baltic Sea countries and an opportunity for sharing information.

The project was financed by BASREC and it was supervised by the current chair of the network, Mr Hannu Lipponen from the Ministry of Employment and the Economy in Finland and Ms Vivi Yieng Kow from Danish Energy Agency.

The work was carried out by Motiva Services Oy. The work was carried out by a team with Expert Päivi Suur-Uski working as the project manager, Group Leader Irmeli Mikkonen contributing to planning and implementation of the seminars and project assistant Annika Niemi assisting in practical arrangements. The team received valuable insights and support from Päivi Laitila, Head of Unit at Motiva.

The organizers want to extend their sincere thanks to the BASREC network, the seminar chairmen, the speakers and to all seminar delegates for their enthusiastic and active participation.

Helsinki, 30 June, 2014

Päivi Suur-Uski, Irmeli Mikkonen and Annika Niemi

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1 Project Overview

The project organized an event of two half-day thematic seminars in which experts and stakeholders from Baltic Sea countries had an opportunity to exchange expert insights and to share experiences. The seminars were arranged on two consecutive days to ensure the delegates participation to both events. The first day seminar topic was Energy Efficient Street Lighting covering presentations on recent studies and practical implementation cases on large and small level. The second day seminar focused on Sustainable and Energy Efficient District Heating and Cooling studies and best practices in the BASREC member countries.

The core of the seminars' contents and introductory presentations were the recent studies commissioned by BASREC and Nordic Investment Bank NIB: "LED and other relevant light source technologies for street and other public outdoors lighting" and "District Heating and Cooling, Combined Heat and Power and Renewable Energy Sources – Best Practice Survey". The studies were carried out and presented at the seminars by Aalto University in Finland, and by Nuorkivi Consulting (Finland) and COWI (Denmark) respectively. Other seminar presentations covered current technologies and future prospects, funding opportunities for investments, profitability and sustainability of projects and best practices and experiences of already accomplished projects.

The seminars were mainly targeted to key stakeholders in the thematic fields representing public authorities, municipalities, financial institutions, industry, research organizations, and regional and European networks. The target was to bring together about 40 experts from Baltic Sea countries.



District Heating and Cooling, Combined Heat and Power and Renewable Energy Sources – Best Practice Survey was presented by Else Bernsen of COWI.

The seminars were to contribute to strengthening the Baltic Sea co-operation on energy issues. The Baltic Sea countries can learn from each other and in cooperation develop concrete actions for improved energy efficiency in terms of advanced technologies and practical implementation using new, innovative funding tools and sustainable planning. It is valuable to create opportunities for different stakeholders from research to practitioners and from financing institutions to local planners to share best practices and experiences of implementation of new technologies and project funding

The two-day event provided a good overview of European and national strategies and policies, status-quo and future insights to the research of the topics, examples of practical local implementation from small to large extent, and an opportunity for exchange of collaboration carried out between different stakeholders and different countries.

The seminar presentations are attached to the report in Appendix 4. They are also downloadable on BASREC's website at <http://basrec.net/events/>.

2.1 **Energy Efficient Street Lighting seminar**

Street Lighting is experiencing major changes currently and in the coming years. European policies requiring improving of energy efficiency translate to boosting energy efficient technologies on the market. Conventional lighting sources commonly used in street lighting are gradually being phased out from the European markets by April 2015.

LED technology has improved enormously during the past few years and provides an option to improved energy efficiency in street lighting. The prospects of LED technology are promising and LEDs will dominate as the most energy-efficient light source in the future. However, there are still barriers for wider application of LEDs in street lighting mainly due to relatively high investment costs and irregularities in the quality of the LED luminaires on the market. Durability of the light sources as well as the maintenance needs play also a big role in the decision making of street lighting investments.

The market penetration of LED lighting is currently rather low in Europe, but the pace will speed-up considerably during the next few years, studies show.

The goal of the Energy Efficient Street Lighting seminar was to present the findings of the recent studies, give an update on the technology development, to showcase practical implementations utilizing advanced energy efficient solutions, and plans on local development projects, and to share information, knowledge and experiences on energy efficient street lighting. The presentations also brought attention to innovative investment financing opportunities.

The seminar attracted stakeholders from local and regional authorities, from consultancies, industry and relevant associations, from research and education community and financing institutions.

The chairman of the seminar, Managing Director Heikki Härkönen of Illuminating Engineering Society of Finland summarized the output of the Energy Efficient Street Lighting seminar:

“The seminar gathered more than 40 specialists with backgrounds and fields of activity related to street lighting. However, the interesting topics were same for all. The huge ongoing transformation in street lighting technologies (e.g. LED), EU EcoDesign legislation requirements (e.g. phasing out mercury lamps in 2015) and totally new market actors and financing possibilities in lighting business make the life different from the past. Some – including the seminar participants – say “It is a jungle!”

The seminar was a brilliant opportunity to get a good view with examples of street lighting projects and especially the possibilities of new financial instruments to make the investments. Even more, the details became clear in the discussions between the presentations.”

Energy Efficient Street Lighting seminar was held in the afternoon of 20 May 2014. The seminar programme and participant list are attached to the report as Appendices 1 and 2 respectively.

2.2 Sustainable and Energy Efficient District Heating and Cooling seminar

Achieving strict European energy and climate goals for 2020 and 2050 require strong and focused energy development strategies from all member states. Improving energy efficiency and integration of renewable energy sources into the markets of electricity and heating are important steps in the development process.

The energy systems in the Northern European countries provide a solid foundation for meeting the challenges of the future. The Baltic Sea region is endowed with vast natural resources in terms of biomass, wind and hydro power potential and there is a long tradition for electricity cooperation between the Nordic countries ensuring optimal utilisation of the resources in short, medium and long term. To ensure efficient utilisation throughout the development process, however, the interaction between the electricity and heat markets are of utmost importance.

Combined heat and power and district heating play a key role in helping Europe to reach the energy efficiency target of 20% by 2020. District heating infrastructure is important in phasing out the direct use of fossil heating fuels.

Baltic Sea region countries have an opportunity to lead the way towards more sustainable and energy efficient development.

To contribute to meeting global energy challenges the BASREC member countries are concentrating the energy co-operation activities on increased use of renewable resources available in the region, including integration of fluctuating wind power into the electricity system, and rehabilitation and development of DHC and CHP.

District Heating and Cooling, Combined Heat and Power and Renewable Energy Sources – A Best Practices Survey commissioned by the BASREC and carried out by Nuorkivi Consulting of Finland and COWI of Denmark describes well the European and regional policy goals, requirements for future development, and provides focused country overviews in the Baltic Sea member countries.

The seminar aimed at serving the audience a snap shot on the current situation in terms of research and technology developments, insights to European and national policy and sector strategies, showcase best practices, learn of the financing opportunities, and to exchange knowledge and experiences. The seminar was followed by an excursion to Helsinki energy company's district heating and cooling plant hosted by Turo Eklund of Helsingin Energia.

Else Bernsen of COWI gave the keynote speech of the seminar presenting the findings of the study. Her presentation was followed by European and national DH and CHP strategy overviews, and local practical implementation experiences.

Chairman of the seminar Dr Arto Nuorkivi of Nuorkivi Consulting described the topic and the outcome of the seminar day:

“In district heating and cooling (DHC), BASREC is suggested to support (i) district cooling, (ii) integrated energy systems as well as (iii) integral energy and urban planning as ways to mitigate Climate Change and to improve competitiveness of BASREC countries. The suggestions were emphasized by the key-note presentation covering all BASREC countries (COWI), the EU level policies and requirements (Euroheat&Power) and the brand new and challenging renewable energy policy of Denmark (Danish Energy Agency). As examples of suggested activities the energy and urban planning in Porvoo and the district cooling in Helsinki were presented, the latter supported with a site visit to the internationally awarded DHC plant named Katri Vala.

The presentations were strongly focused with key lessons as follows:

- The energy import of EU amounts to about €400 billion, which is about equal to the value of the losses in the European energy systems. DHC with CHP offers a mature solution to substantially reduce such losses.*
- BASREC representing 92% of the DHC sector in Europe, including the European part of Russia, can have a significant impact on spreading DHC with CHP to other parts of Europe to reduce energy losses and extend RES usage.*
- Denmark has set the latest goal to have the electricity and the heating sector 100 % based on RES by year 2035 already, in which DHC has an important role.*
- Integral urban and energy planning is a new way to incorporate DHC and RES to the urban structures in a sustainable way.*

During the breaks fruitful discussions continued how the excellent messages above can be shared with the political leaders of BASREC in order for them to take decisions towards more energy efficient and RES using Europe. The authors of the key note speech report will prepare a policy brief to be presented to the ministerial meeting (2015).”

Sustainable and Energy Efficient District Heating and Cooling seminar, and the excursion to Helsingin Energia’s district heating and cooling plant, took place on 21 May 2014. The seminar programme and participant list are attached to the report as Appendices 1 and 2 respectively.



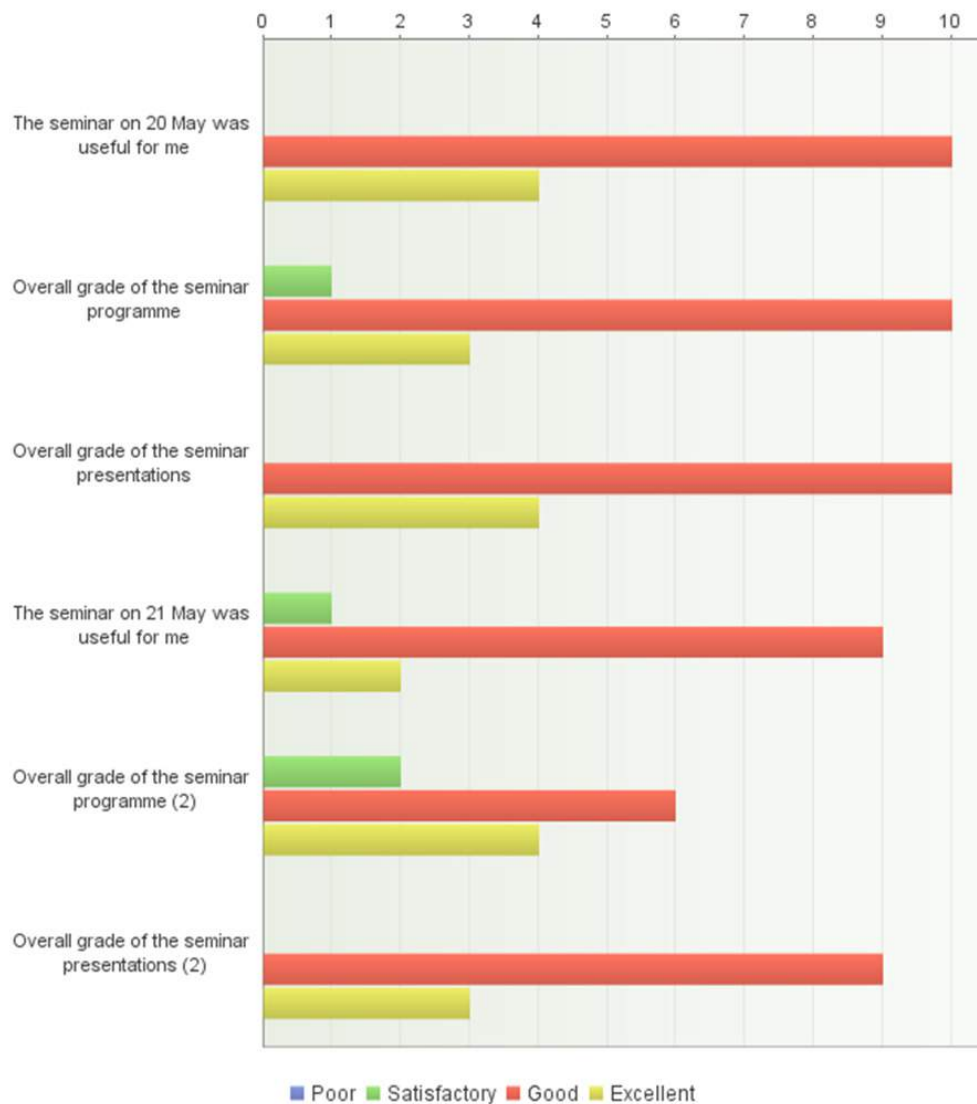
The seminar delegates had a chance to visit the Katri Vala DHC plant.

2.3 Attendee feedback to the seminars

The seminar participants and speakers were asked to give feedback on the seminars through an electronic questionnaire. Altogether 17 questionnaires (29%) were returned. In general the feedback was very good. The feedback questionnaire form is attached as Appendix 3.

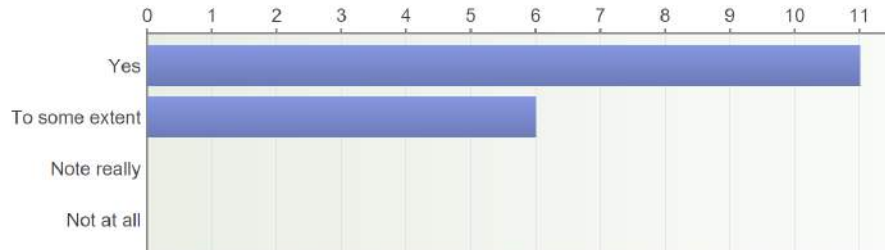
The main findings of the feedback are presented in the tables below:

1. Overall evaluation of the seminars, average: 3,2
(4 = Excellent, 1 = Poor)



2. Workshop arrangements received an average grade of 3,3.
(4 = Excellent, 1 = Poor)

3. Did the seminar meet your expectations?



The event tackled two very important issues local and regional authorities are facing today. Energy infrastructure, heating and cooling especially in this context, and street lighting are substantial, yet necessary, investments usually in the municipalities' responsibility. European objectives to improve energy efficiency and increase use of renewable energy sources set requirements to improve and update energy using infrastructure to more energy efficient.

Baltic Sea Region Energy Cooperation – BASREC is focusing activities on increasing energy efficiency, use of renewable energy sources and sustainability in the Baltic Sea area. The Baltic Sea member countries' ministers are encouraging the public authorities and relevant organisations in the region to closer cooperation to meet the ever tightening energy efficiency requirements. Several projects utilising advanced technology have been carried out in the Baltic Sea countries, and sharing the experiences and learning from each other will benefit the common goal of sustainable Baltic Sea region.

Seminar presentations brought forward good overall picture of European policies and strategies involved and examples on action plans on national level. Real-life solutions on financing substantial renovation and modernization projects cost-effectively were highlighted through on-going project examples and presentations on financing opportunities available. Good practices on sustainable street lighting and district heating and cooling projects provide benchmarking examples for the stakeholders planning similar projects.

Information on different aspects of energy efficient improvements and projects related to street lighting and district heating and cooling is crucial.

- Sharing project implementation processes step by step is important to avoid (often costly) mistakes.
- One source to financing options for project planning and development (technical assistance) and investment itself. Overview of the options with links to original sources.
- Collection of good practices with sources for further information.
- Register of stakeholders: public authorities, municipalities, energy companies, planners, consultants, financial organisations, associations, studies, networks, internet portals.
- Thematic network events (e.g. seminars, workshops) and studies

Commissioning of studies on key issues is crucial to improve knowledge and awareness of recent and upcoming development.

Agreeing to long-term commitment (beyond the three-year periods) of the Baltic Sea countries on energy cooperation to strengthen sustainability and accelerate development of regional energy solutions.

Collaboration within the Baltic Sea region between countries, authorities and other organizations shall be encouraged in different forms. BASREC has a focal role in initiating and supporting the collaboration.

Appendices

1. Programme of the seminars
2. List of participants
3. Feedback questionnaire form
4. Link to presentations

Appendix 1

Welcome •

The 2-day event is targeted to key stakeholders in the field, e.g. public authorities, decision makers, planners and practitioners in municipalities, financial institutions, industry, research organisations, Baltic Metropolises Network, Covenant of Mayors network and the EU Commission.

Energy Efficient Street Lighting, the 1st day seminar will focus and showcase:

- recent studies and practical implementation cases
- current technologies and future prospects
- financing instruments for sustainable investments
- examples of completed projects

Sustainable and Energy Efficient District Heating and Cooling, the 2nd seminar will present and showcase:

- recent study on the best practices of DHC and CHP in the Baltic Sea Region
- experiences of already accomplished sustainable projects
- current technologies and future prospects
- funding opportunities for investments

Language

The workshop language is English.

Dinner

The seminar dinner will be take place at Restaurant Loiste on Tuesday, 20 May at 19:30. Address: Restaurant Loiste, Sokos Hotel Vaakuna, Kaivokatu 3, 10. floor.

Registration

Please register your attendance to the seminar(s) and excursion through the electronic registration form **at the latest by 12 May 2014**.

The attendance (incl. meals) is free of charge.

For further information on the seminars, contact:

Päivi Suur-Uski tel. +358 (0)424 281 243, paivi.suur-uski@motiva.fi

Motiva

The two seminars are organised by Motiva commissioned by the Baltic Sea Region Energy Cooperation BASREC

Energy Efficient Street Lighting Sustainable and Energy Efficient District Heating and Cooling

Seminars

20.-21.5.2014

Sokos Hotel Presidentti
Eteläinen Rautatiekatu 4
00100 Helsinki
FINLAND



Programme •

Tuesday 20 May, 2014

Energy Efficient Street Lighting

Chair: Mr Heikki Härkönen, Illuminating Engineering Society of Finland

- 11:30- Registration**
Registration will take place in the lobby of Sokos Hotel Presidentti
- 12:00-13:30 Lunch**
- 13:30 Welcome and Introduction**
- Key note speech: Led and Other Relevant Light Source Technologies for Street and Other Public Outdoor Lighting**
Ms Marjukka Puolasto, Aalto University, Finland
- Road Lighting in Transition**
Mr Daniel Strömberg, ÅF Lighting, Sweden
- Vilnius Street Lighting Modernization via PPP**
Mr Imantas Butkus, Invest in Lithuania, Lithuania
- 15:15 Coffee break**
- 15:45 Financing Instruments and Completed Projects**
Mr Yngve Söderlund, NIB, Finland
- Lighting Design a Way to Avoid Quality Pitfalls of Led Lighting Applications**
Mr Mariusz Ejsmont, LUG SA company, Poland
- Innovative Lighting Solutions for Smart Cities**
Ms Leena Tahkämö, Aalto University, Finland
- 17:15 Closure of the day**
- 19:30- Dinner, Restaurant Loiste**
Welcoming words by Hannu Lipponen, Chair of BASREC
Ministry of Employment and the Economy in Finland
- Address: Restaurant Loiste, Sokos Hotel Vaakuna, Kaivokatu 3, 10. floor
Dress code: smart casual

Wednesday 21 May, 2014

Sustainable and Energy Efficient District Heating and Cooling

Chair: Mr Arto Nuorkivi, Nuorkivi Consulting

- 8:30 Registration**
- 9:00 Welcome and Introduction**
- 9:15 Key note speech: Best Practices of DHC and CHP in Baltic Sea Region**
Ms Else Bernsen, COWI A/S, Denmark
- CHP and DHC Development in Europe, Policy Context, Experiences and Lessons Learned**
Mr Birger Lauenstein, EuroHeat & Power, Denmark
- Integral Energy and Urban Planning**
Mr Eero Löytönen, City of Porvoo, Finland
- 10:30 Coffee break**
- 11:00 How to Reach the National Goals - Analyses of the Energy System of the Future**
Ms Vivi Yieng Kow, Danish Energy Agency
- DH and CHP Strategies in Finland**
Mr Antti Kohopää, Finnish Energy Industries, Finland
- District Cooling in Finland**
Mr Juro Eklund, Helsingin Energia, Finland
- 12:15 Closure of the seminar**
- 12:30 Lunch**
- 13:40 Excursion to a large District Cooling Source Underground (Katri Vala)**
Departure from the Hotel lobby at 13:45.

**Energy Efficient Street Lighting seminar
20 May 2014
Participant list**

Appendix 2

Ahtiainen	Mikko	VLA Tech Oy, Finland
Andersson	Magnus	Nordic Investment Bank, Finland
Autio	Simo	Finland
Butkauskas	Irmantas	Invest in Lithuania, Lithuania
Ciszewska	Aneta	Ministry of Economy, Poland
Czerniakiewicz	Maciej	Embassy of the Republic of Poland
Diržienė	Marina	SE Energy Agency, Lithuania
Edna	Ole-Jacob	Ministry of Petroleum and Energy, Norway
Ejsmont	Mariusz	LUG SA company, Poland
Helminen	Markus	Easy LED Oy, Finland
Hietasara	Jarkko	Sähkösuunnittelutoimisto SHS, Finland
Härkönen	Heikki	Illuminatin Engineering Society of Finland
Jahkonen	Jaana	Oy MTG-Meltron Ltd, Finland
Kekki	Marjo	City of Pori, Finland
Kerppola	Juhana	Control Software Oy, Finland
Ketomäki	Jaakko	VTT, Finland
Korhonen	Janne	Empower Oy, Finland
Korhonen	Juhani	Econex Ot LTD, Finland
Kuusik	Marko	OÜ MKC, Estonia
Kuusinen	Roman	Econex Oy, Finland
Lagerstedt	Per	Nordic Investment Bank
Laitila	Päivi	Motiva, Finland
Lipponen	Hannu	Ministry of Employment and the Economy, Finland
Magnusson	Jukka	Metropolia, Finland
Markkanen	Olli	Helen Group Outdoor lighting, Finland
Martikainen	Marko	OSRAM Oy, Finland
Mertala	Arto	Control Software Oy, Finland
Mikkonen	Irmeli	Motiva Services Oy, Finland
Nevalainen	Antti	Valopaa Oy, Finland
Palmunen	Juhani	Lahti Energy Ltd. , Finland
Puolakka	Marjukka	Aalto University, Finland
Pihlajaniemi	Henrika	University of Oulu/Faculty of Architecture, Finland
Rantanen	Pia	City of Helsinki, Finland
Rauhala	Anna-Maria	Municipality of Tuusula, Finland
Seppälä	Tiina	Municipality of Sipoo, Finland
Sillanpää	Pekka	City of Espoo, Technical Center, Finland
Strömberg	Daniel	ÅF Lighting, Sweden
Suur-Uski	Päivi	Motiva Services Oy, Finland
Suvitaival	Pekka	LEDISOL Oy, Finland
Söderlund	Yngve	NIB, Finland
Tähkämö	Leena	Aalto University, Finland
Wikgren	Leif	Oy Mitaten Finland Ab, Finland
Vitkauskaitė	Rasa	SC Energy Agency, Lithuania
Vähätiitto	Tarja	Diluminia JAL SA, Finland
Yieng Kow	Vivi	Danish Energy Agency, Denmark

**Sustainable and Energy Efficient
District Heating and Cooling seminar
21 May 2014**

Appendix 2

Participant list

Alpua	Jussi	Oilon Scancool Oy
Andersson	Magnus	Nordic Investment Bank
Bernsen	Else	COWI A/S
Ciszewska	Aneta	Ministry of Economy, Poland
Czerniakiewicz	Maciej	Embassy of the Republic of Poland
Dirziene	Marina	SE Energy Agency
Edna	Ole-Jacob	Ministry of Petroleum and Energy, Norway
Eklund	Turo	Helen Group
Heikkinen	Timo	Aalto Executive Education
Hietasara	Jarkko	Sähköinsinööritoimisto SHS
Huuskonen	Susanna	Fortum Power and Heat
Kekki	Marjo	City of Pori
Kerppola	Juhana	Control Software Oy
Ketomäki	Jaakko	VTT
Kohopää	Antti	Energiateollisuus ry
Kurki-Suonio	Katja	Energiateollisuus ry
Kuusik	Marko	OÜ MKC
Laitila	Päivi	Motiva Oy
Larsen	Joakim	COWI
Lauersen	Birger	Euroheat & Power
Lipponen	Hannu	Ministry of Employment and the Economy
Löytönen	Eero	Porvoon kaupunki, Kaupunkisuunnittelu
Magnusson	Jukka	Metropolia
Martikainen	Marko	Osram Oy
Mertala	Arto	Control Software Oy
Mikkonen	Irmeli	Motiva Oy
Nieminen	Marko	Calefa
Nuorkivi	Arto	Energy-AN Consulting
Palmunen	Juhani	Lahti Energia Oy, LE-Sähköverkko
Rauhala	Anna-Maria	Municipality of Tuusula
Riipinen	Marko	Helen Group
Seppälä	Tiina	Municipality of Sipoo
Suur-Uski	Päivi	Motiva Oy
Tellier	Alexandre	Condens Heat Recovery Oy
Vitkauskaitte	Rasa	SC Energy Agency
Vähätiitto	Tarja	Diluminia JAL SA
Yieng Kow	Vivi	Danish Energy Agency

Feedback Questionnaire

BASREC Seminars

Energy Efficient Street Lighting 20 May, 2014
Sustainable and Energy Efficient District Heating and Cooling 21 May, 2014

Thank you again for attending the seminar / s.

The seminar organizers value your opinion and ask a few minutes of your time to give feedback and comments on the seminars
 Please, submit your answer by **Friday 6th of June** the latest.

1. I participated the following seminar/s *

- ☐ Tuesday 20 May - Energy Efficient Street Lighting
☐ Wednesday 21 May - Sustainable and Energy Efficient District Heating and Cooling
☐ Both seminars

2. Overall evaluation of the seminar/s

	Poor	Satisfactory	Good	Excellent
The seminar on 20 May was useful for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall grade of the seminar programme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall grade of the seminar presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The seminar on 21 May was useful for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall grade of the seminar programme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall grade of the seminar presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Seminar arrangements

	Poor	Satisfactory	Good	Excellent
Overall grade	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pre-event communications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Venue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Catering (coffee, lunch)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dinner on 20 May	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Did the seminar meet your expectations?

- ☐ Yes
☐ To some extent
☐ Not really
☐ Not at all

5. Free Word

Feel free to give any comments, ideas on seminars and future collaboration on the topics.

6. Contact Information (voluntary)

First name

Last Name

E-mail

Company / Organisation

Workshop presentations

Appendix 4

All presentations are downloadable at

<http://basrec.net/events/seminar-on-energy-efficient-street-lighting/>

<http://basrec.net/events/sustainable-and-energy-efficient-district-heating-and-cooling/>

Heikki Härkönen, Illuminating Engineering Society of Finland, Finland

Chairman of the seminar

Energy Efficient Street Lighting

20 May 2014



Marjukka Puolakka, Aalto University, Finland

A?
Aalto University
School of Electrical Engineering
Lighting Unit
Finland

**Led and Other Relevant Light Source
Technologies for Street and Other Public
Outdoor Lighting**

Dr Marjukka Puolakka

Energy Efficient Street Lighting
May 20, 2014



Daniel Strömberg, ÅF Lighting, Sweden



Irmantas Butkauskas, Invest in Lithuania, Lithuania

Vilnius City Street Lighting Modernization

Irmantas Butkauskas
Helsinki, 2014-05-20
www.investlithuania.com



Yngve Söderlund, NIB, Finland

NIB Nordic Investment Bank NIB

in co-operation with
BASREC, Swedish and Finnish Government

**Financing Instruments and Co-projects
Street Lighting and CHP**

Helsinki, May 20, 2014
Mr Yngve Söderlund, Senior Manager
Energy and Environment
Nordic Investment Bank
E-mail: yngve.soderlund@nib.int



Mariusz Ejsmont, LUG SA company, Poland



Leena Tähkämö, Aalto University, Finland

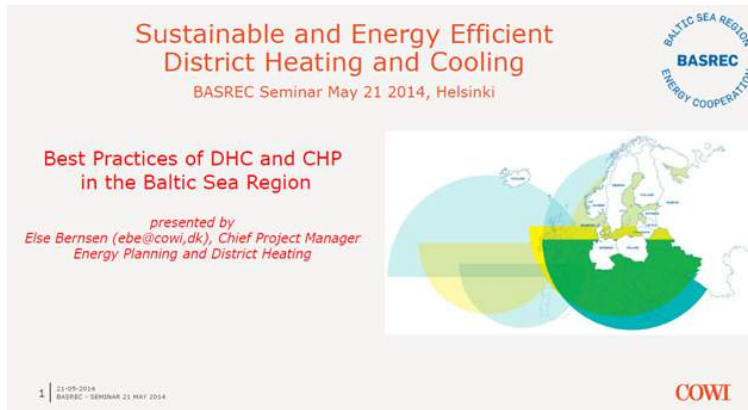


Arto Nuorkivi, Nuorkivi Consulting, Finland

Chairman of the seminar
**Sustainable and Energy Efficient
District and Cooling**
21 May 2014



Else Bernsen, COWI, Denmark



Birger Lauersen, EuroHeat & Power, Denmark



Eero Löytönen, City of Porvoo, Finland



Vivi Yieng Kow, Danish Energy Agency, Denmark

How to reach the National Goals

Analyses of the Energy System of the
Future/DH &CHP

Danish Energy Agency/Vivi Yieng Kow



Antti Kohopää, Finnish Energy Industries, Finland



DH and CHP strategies in Finland

Sustainable and Energy Efficient District Heating
and Cooling
21.5.2014
Antti Kohopää



Turo Eklund, Helen Group, Finland

*Sustainable and Energy Efficient
District Heating and Cooling*



DISTRICT COOLING IN FINLAND

BASREC
20.-21.5.2014 Helsinki



Marko Riipinen
Presented by Turo Eklund

M.R. / BASREC 21.05.2014

