



GREEN SHIFT

A HANDBOOK FOR ENVIRONMENTALLY FRIENDLY REGIONS IN EUROPE

EXAMPLES FROM REGIONS IN ÖRESUND, KATTEGAT AND SKAGERRAK

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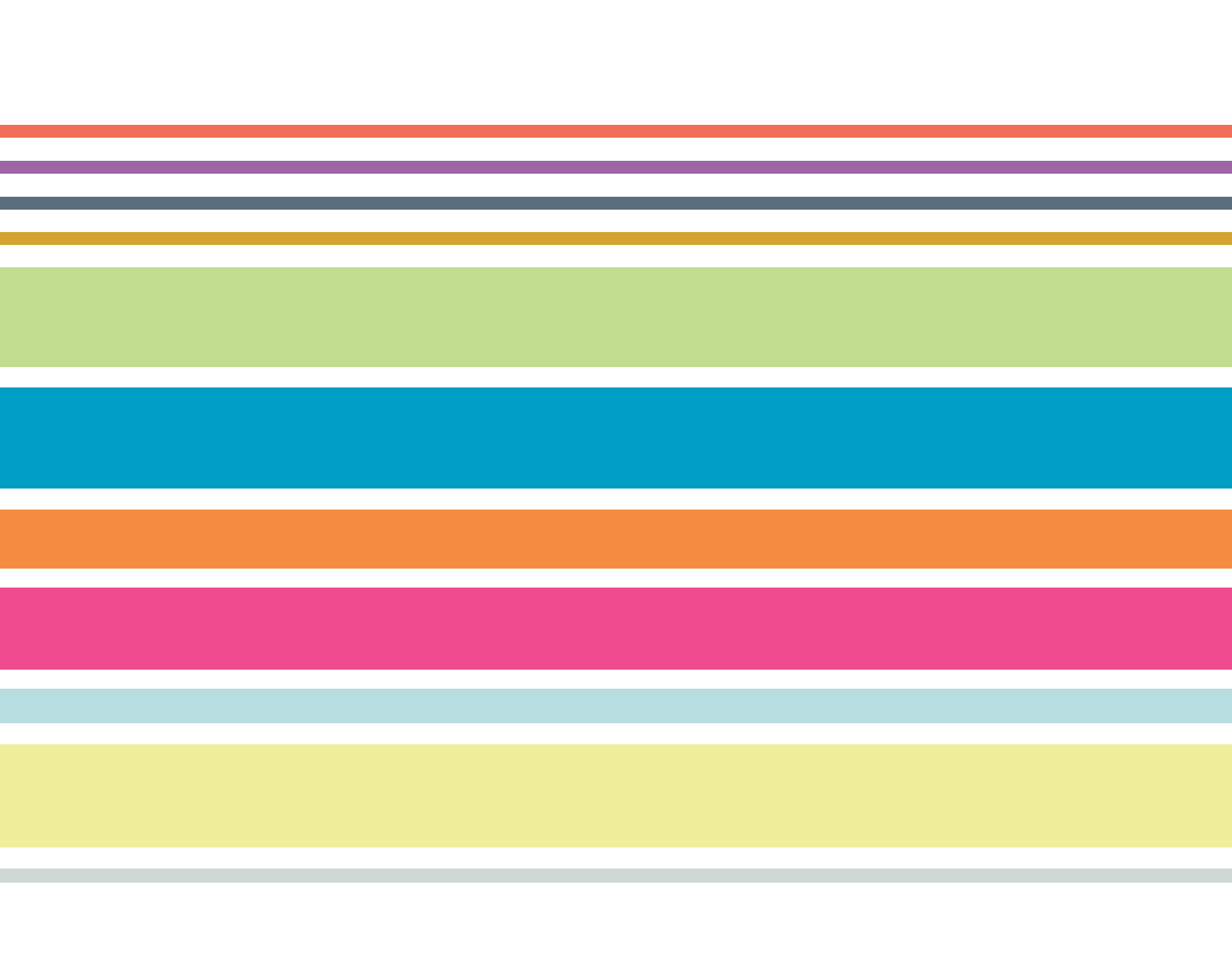


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FOREWORD

Global warming is becoming an increasingly alarming threat to both mankind and the environment. Yet politicians, members of society and entrepreneurs the world over have not yet succeeded in implementing the changes needed to stop the global trend towards increased emissions. How do we explain this lack of assertive action? Why is it so difficult for the individual and society to take the conscious step to change this trend and create a different future?

During the years that I have worked on climate issues, I have encountered on many occasions environmental campaigners who have become exasperated and resigned to the situation, and have asked themselves whether democracy is too immature to address the climate problem. Since knowledge about what needs to be done already exists, the step towards taking action should be a short one, so many would argue.

However, the step from possessing knowledge to changing society has never been a short one, and never simple either. On the contrary. The question of how large-scale social reform should be implemented and how it is to succeed has been the subject of intensive debate for decades among both politicians and social scientists. It affects the very foundations of our culture and society, from democracy to socio-economics.

This perspective requires our taking a broader approach to the climate question. It requires us to think afresh about everything from business development to economic policy. It requires us to involve people at all

levels of society and to agree on common values and goals. It also requires us to see that climate adaptation is putting at risk our entire culture and the entire established social order. There are no easy shortcuts to achieving a sustainable climate system in a long-term, sustainable national economy.

I regard this book as being an important contribution to a more broad and long-term approach to the climate question. Basing their views on the experiences of two regions, Halland in Sweden and Agder in Norway, the authors discuss the potential of the regions for aiding the campaign against climate change. The main focus of their analysis is on ways to promote collaboration between companies and public-sector actors. This is the starting point for proposing concrete methods to reduce climate emissions while at the same time developing green goods and services. The overriding goal is to show how regional actors can work towards achieving both a healthier trade and industry sector and reduced emissions.

As County Governor, I consider the great

value of this book to lie not least in its taking a regional perspective. Those of us wishing to pursue climate adaptation at regional level feel that it is just these concrete methods and pieces of sound advice that are needed for knowing how to implement projects and promote collaboration between public and private-sector actors. It is my hope that the methods presented in this book for addressing climate issues will provide strong support to the ongoing work on climate issues being done not only in Halland and Agder but also in other regions.

*Lena Sommestad,
County Governor of Halland.*

Recent reports issued by the UN Panel on Climate Change leave us in no doubt that climate change is gradually becoming ever more urgent. We are feeling the full force of climate change, and we have precious little time to implement measures for limiting global warming to a level that coming generations can live with. Everyone should do their bit, and the regional authorities share a significant responsibility in ensuring this. If regional and local authorities do not take a proactive approach, the world has no chance of achieving the international climate goals set.

Agder has taken this quote to heart and, in accordance with the motto "high goals – low emissions", has identified climate as one of the five main points of our new regional plan for 2020. According to this plan, taking climate into account is to be a supreme requirement for all decision-making at regional and local level that affects social. An increasingly large share of our heating requirements must be met by energy providers other than those supplying electricity and fossil fuels, and the greenhouse gas emissions produced by the transport sector must be substantially reduced.

In this regard, Aust-Agder County Council wishes to put its own house in order and take the lead by setting a good example. In 2009, we took the decision to be the first county council in Norway to become climate-neutral in accordance with the UN definition. This means that each year we measure greenhouse gas emissions produced by the county council's own activities, set new reduction targets, and offset excess emissions by purchasing Certified Emission Reduction Units.

However, we also see the necessary transition toward the low-emission society

of tomorrow as representing an opportunity. Our goal is for Agder to become by 2020 a leading region internationally for the climate-friendly production and distribution of renewable energy, a region equipped to make the change-over in energy that will mean supplying more environmentally friendly energy to the Continent. And Agder's export industry will prove to be a global role model, thanks to its high level of innovation in the areas of climate-friendly production processes and efficient energy consumption.

A chief factor for success in implementing this plan is to bring about effective collaboration between private and public enterprise. At this point I would like to draw particular attention to the Climate Partners Network in Agder, which will be described in more detail in this book. Aust-Agder County Council, together with Arendal Municipality and the UN-related GRID Centre in Arendal, took the initiative to establish this Network in 2009. Climate Partners' chief objective is to reduce greenhouse gas emissions and introduce new green goods and services. Right from the beginning, the County Council has provided

the administrative services required for the Network, one now covering nearly 50 organisations with a total of 22,000 employees. Those who have been with us from the start have reduced their greenhouse gas emissions by an average of 32 percent. If everyone were to manage to do the same, the world would achieve its international climate goals.

It gives me particular pleasure to list all the commendable initiatives mentioned in this book that are helping to bring about greenhouse gas reductions and the development of a competitive green trade and industry sector. I support the conclusion made in this book regarding the great potential that exists if the use of these methods becomes more widespread. As Chairman of the County Council, I would like to help ensure that the opportunities for collaboration to achieve a more effective green shift in the Öresund–Kattegat–Skagerrak area, and which are mentioned in this book, can be realised.

*Bjergulv Sverdrup Lund,
County Council Chairman,
Aust-Agder County Council.*

As Harry Martinsson once wrote: "Earths are in short supply." And it's true. Never have the challenges facing our only planet been as great as now. And yet at the same time, never have awareness of the threat and the opportunities to solve these problems been so great.

The Swedish Parliament has identified 16 environmental goals. The County Administrative Board has been tasked by the Government to take charge of the work toward achieving these goals. However, many of us are needed for finding a solution if we are to achieve these goals.

Right now our progress toward these goals is too slow. It seems we will not achieve twelve of them, given the measures that have been implemented or decided on to date. This applies especially to the goal of "Limited Climate Impact". And this is serious, because it means we have less chance of achieving the other environmental goals.

Right now truly a positive step is being taken in the form of extending both the railway and road networks in Western Sweden. Despite this, however, the problems associated with emissions from road traffic threaten to persist.

Since we know this, is it not time to say stop to this growth? No, I do not think so. Someone said that the only way to achieve an environmentally friendly society is to get there by bicycle. Yet this is not true: we can achieve it in many ways. We have railways, biogas vehicles and electric cars. Indeed, we are now in the process of creating the world's first region/cross-border region of

fossil-free vehicles, lying between Norway and Sweden.

We need growth: it gives us greater opportunities. We also need, however, to switch to a form of sustainable development in both social and economic as well as environmental terms. This is possible if we work together, but much will be required. We need decisions to be made at EU level, but we need them even more at global level. We need to think globally while also acting locally.

A lot is happening already: Region Västra Götaland is investing in Smart Energy. The Swedish Association of Local Authorities and Regions is making vigorous efforts to highlight our environmental goals. Nine out of ten municipalities have adopted or are in the process of adopting environmental goals of their own or backing the national ones.

However, much more is required: We must ensure that our environmental goals are incorporated to a far greater degree into our everyday activities in all areas. This will mean tough decisions, but we will pay an even higher price in the future if we do not solve these problems today. Together we can achieve a lot. We can plan how to create a society that makes it easier for every individual to make choices that are long-term and sustainable. We can create communities

where public transport is the norm instead of the car.

And we are going in the right direction. We can see many fine examples in Västra Götaland: K2020, Göteborg Region's structural illustration, the Coastal Zone Project and Cooperation Plan in Northern Bohuslän, Focus on Nutrients, and Roadmap 2050. This book, produced by the Alexanderson Institute, gives us a map that can be of real help on the road to achieving a sustainable society.

"When the problem is global warming, part of the solution is a cool West, a cool Scandinavia."

*Lars Bäckström,
County Governor of Västra Götaland.*



INTRODUCTION

This book is about the challenges and opportunities related to the green shift; that is to say, the necessary transition to the low-emission society the world needs in order to limit global warming to two degrees. The book provides a short overview, based on the most recent reports issued by the UN Panel on Climate Change, of the global problem posed by climate change. The time squeeze facing us is short and inexorable, greenhouse gas emissions must be dramatically reduced over the coming decades, and we must adapt to the aspects of climate change that are inevitable. In order to achieve our global climate goals, it is absolutely essential that regions take a proactive role.

Against this background, the book examines what is happening in the Öresund–Kattegat–Skagerrak area, while focusing on Halland in Sweden and Agder in Norway. All these regions would like play their part in the green shift by both reducing greenhouse gases and developing new green workplaces. It is however, clear that any basic statistics that could serve as a "base line" for a green shift are hard to come by. And even if there are resolutions made by municipalities and counties that look fairly ambitious on paper, these are hampered by the fact that funding at local or regional level for a green shift is strictly limited.

The main focus of the book has been to describe "methods" put into practice in local trade and industry, local and regional authorities and public-private partnerships (PPP) within the ÖKS region – organisations that are helping to bring about the green shift. We find a number of good examples here as regards arenas and networks, climate-smart

developments in trade and industry, green innovation, the production of new forms of renewable energy, and climate accounting. There is great potential in collaborating with others and seeing the use of these methods spread to others within and without the region.

One conclusion drawn in the book is that a green shift will mean significant opportunities for the growth of green workplaces, while businesses dependent on the oil and gas industries will have to prepare themselves to adapt or else make cutbacks. Greater collaboration between the private and public sectors and academia would be a significant factor in ensuring a green shift.

The book recommends that these conclusions are presented to the local and regional authorities within the ÖKS area who are interested as forming a basis for making more more efficient the work to bring about a green shift in the region.

Funding provided by the Alexanderson Institute has made it possible to produce this book at short notice. Special thanks are due to Ida Boström, Tony Christensen and Tomas Johansson at the Alexanderson Institute, Magnus Falk and Emma Hellberg at the Coalition for Energy and Environment (EMC), Agnese Berkholt and Hans Fløystad of Aust-Agder County Council, Ragnhild Hammer of Arendal Municipality and Kim Øvland of Kristiansand Municipality, and friends and acquaintances in Sweden and Denmark.

*Svein Tveitdal,
Arendal, June 2014.*



CONCLUSIONS

This book illustrates the conditions and strategies for bringing about a green shift in the regions within the Öresund–Kattegat–Skagerrak (ÖKS) area. The book is a product of a climate and environment survey that is part of the CO₂RE project. The Project was prompted by recent alarming reports from the UN Panel on Climate Change (IPCC) confirming that climate change is the greatest challenge of our time to global society.

If we are to achieve the international climate goals set and to limit global warming to two degrees, at least two thirds of our known coal, oil and gas reserves must be left untouched, while production of renewable energy must increase dramatically and nuclear energy exploited to a degree that is justifiable. It is also essential that we work on a broad front to bring about a green shift in all parts of society. The challenges we face require innovative and effective solutions, and these we can bring about by stimulating and paving the way for green innovations, climate-smart business development and an efficient use of resources.

The fight against climate change means that efforts at regional level play a particularly important role. Without a proactive approach on the part of local and regional authorities and trade and industry, the world will not be able to achieve the international climate goals set. This book highlights a number of projects implemented at regional level for promoting a green shift. Below is a summary of the book's conclusions and recommendations.

Climate change in the ÖKS area

The regions in the ÖKS area are already feeling the significant impact of ongoing climate change. The consequences of climate change in the area will be seen in the following areas in particular:

- A rise in temperatures.
- Extreme weather patterns, especially in the form of flooding and landslides.
- A rise in sea levels and acidification of the sea.
- Changes in biological diversity, a threat to various species and the emergence of new species.

Climate change in the future will become even more noticeable in the ÖKS regions when temperatures in these parts will most probably rise above the global average. Even so, the changes will still be noticed less by the communities in the ÖKS area than by the world's most vulnerable communities such

as the small island states, the delta areas in Asia and Sub-Saharan Africa.

Threats and opportunities facing trade and industry

The trade and industry sector is becoming increasingly aware of the threats and opportunities posed by climate change and environmental damage. All sectors need to prepare themselves for a green shift to take place as soon as possible. This green shift will offer substantial business opportunities and can also offer competitive advantages to those companies succeeding in meeting the demands for a low-emission society. Sectors and companies that can help bring about a green shift by providing environmental and climate-smart products, services and business models have great development opportunities. At the same time, those sectors dependent on the oil and gas industries must prepare themselves for considerable challenges where a green shift and extensive cutbacks in emissions will have to take place so as to be competitive in a low-emission society. This book highlights a number of

examples that show how several actors have become winners by investing in a green shift and creating green workplaces.

Current level of preparedness and strategies for a green shift in the ÖKS area

Actors at regional level have an important part to play in combating climate change. Today most of the regions and municipalities in the ÖKS area have several kinds of strategies for the way they can adapt to climate change, help reduce greenhouse gas emissions and help bring about a green shift in society. How extensive and in-depth these strategies are, however, varies considerably between the different regions and municipalities in the ÖKS area. While some regions and municipalities have taken a progressive approach and are in at the forefront, others have barely scratched the surface in terms of the action needed to bring about a green shift. One major challenge is to persuade all the regions in the ÖKS area to understand the importance of a green shift and to work together towards a common goal. An initial challenge will be to identify common denominators for the implications of a green shift. At present definitions and statistics often differ between actors, which means a lack of measurable results and difficulty in comparing the efforts made in different subject areas or across national borders.

The methods described in this book illustrate how to help bring about a green shift and how such efforts can be measured and

shared with other actors. These methods are often developed in the form of collaboration between public and private-sector actors, experts from universities and colleges, or consultancy firms. Many of these methods have shown positive results that will mean significant gains for society and help bring about a green shift if they are developed further and shared more extensively. These methods are basically of a general nature and can in most cases be applied both within and without the ÖKS area. Most of them have not, however, been applied to any great extent other than in the pilot studies documented in this book. Climate Partners and Lönsamma Miljöaffärer (Profitable Environmental Business) are two examples of organisations applying methods that are currently being rolled out in geographical terms and that are thus more effective in helping to bring about a green shift. Seen overall, collaboration between the actors in charge of applying these methods is very limited, and cross-border collaboration in applying them is often inadequate; therefore more transnational collaboration is an essential step in achieving a green shift. A further key factor for success in the quest for a green shift is the collaboration between the public and private sectors, often known as PPPs (Public-Private Partnerships), and with the academic sector too – a three-way collaboration often known as the Triple Helix.

Conclusions

A clear indicator provided by the survey as

shown in this book is the broad range of measures that can be taken and methods that can be applied in order to move a step closer to a green shift, and this broad range is proof of the enormous complexity of the issues. In this context it is also important to point out that initiatives for bringing about a green shift must be based on different regional conditions. Major urban and rural regions often have fundamentally different requirements and levels of capacity as regards a green shift. The survey also shows that the efforts made to promote a green shift differ between regions in terms of both intensity and scope. Political goals, commitment to green issues, networks and individuals who act as a driving force are some of the factors crucial to determining the degree of investment made in different regions for achieving a green shift.

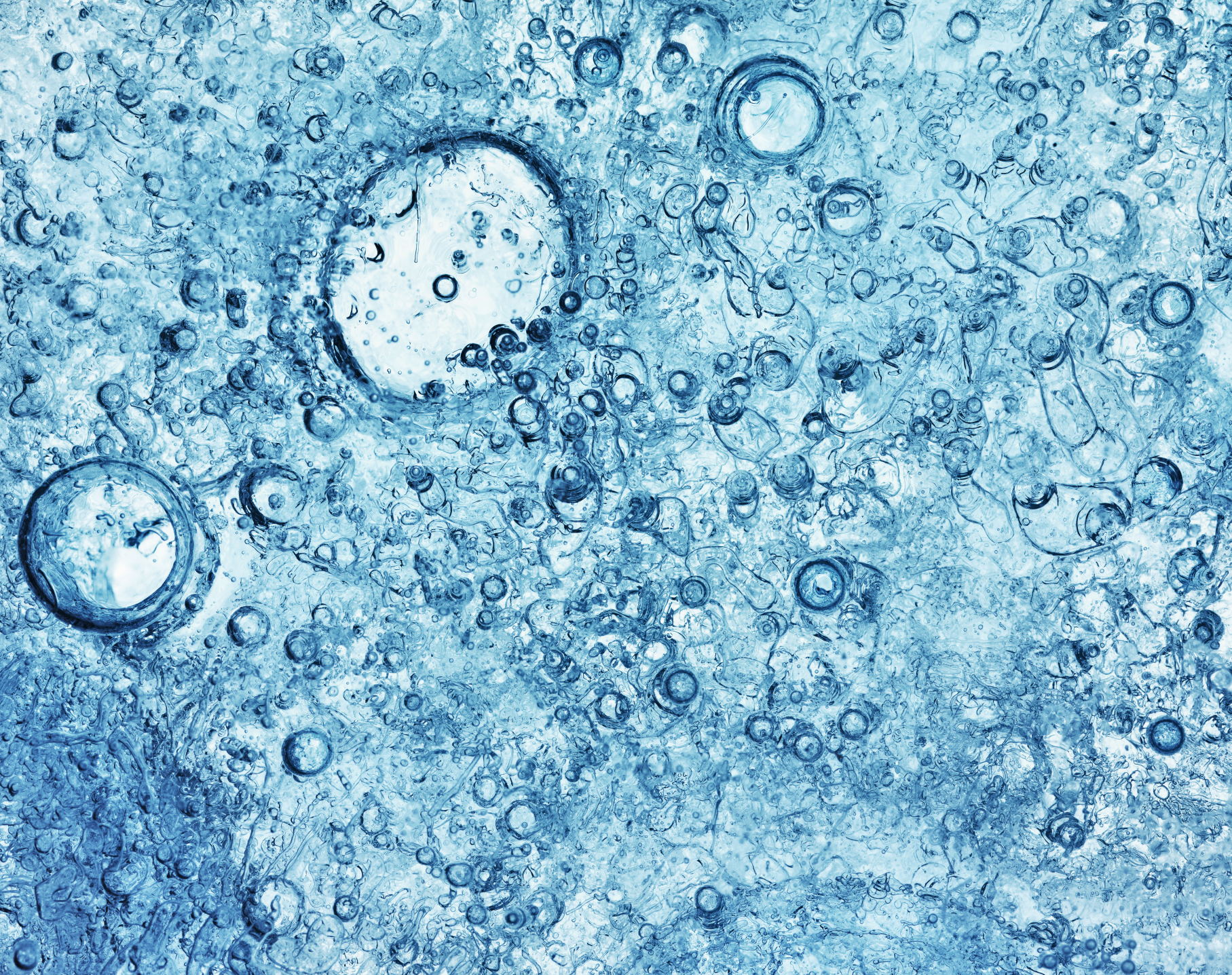
The work done on this book has made clear that project funding is a most essential instrument in policy-making relating to environment and climate issues above all else. Many of the efforts made are organised in the form of projects and are dependent on external project funding. As a result of this, the greatest efforts being made are those where project funding is available. The trend is therefore heading very much in the direction dictated and prioritised by policy.

Another important conclusion drawn from this survey is that the public sector is very much responsible for pursuing green shift issues together with trade and industry, and

PPPs constitute a most important method of seeking to bring about a green shift. In addition, both the public sector and companies have a great opportunity and a high degree of responsibility for wielding influence, given their purchasing power, in those areas where green purchasing and green negotiations can play a key role in bringing about a green shift. It is also essential, wherever the opportunity exists, to persuade these actors to purchase green products and services.

The five theme-based chapters of the book provide interesting conclusions on how to employ a number of different approaches that show great potential for bringing about a green shift. The chapter on 'Arenas and Networks' shows clearly that well-established arenas and networks play a key role in serving as forums for sharing knowledge, providing and receiving inspiration, and exchanging experiences in order to promote a green shift. The chapter on 'Climate-Smart Business Development' shows that a company's goal-oriented approach to environment and climate issues should be seen as a great opportunity for brand reinforcement and one that can lend a sharp competitive edge. The most important conclusion drawn by the chapter on 'Green Innovation' is that success in achieving a green shift will require a revised way of thinking and acting in many areas. The chapter provides examples of how to provide stimulus to green innovation. The most important conclusion drawn by the chapter on 'Resource Efficiency' is

that no one can do everything but everyone can do something. Resource efficiency is one of the most clear and simple ways for each individual and organisation to help bring about a green shift. And finally, one conclusion provided in the chapter on 'Environmental calculations' highlights the importance of measuring one's environmental and climate efforts; sound environmental calculation is essential for knowing what is done well, where extra resources are needed, and which steps to take within an organisation.



CLIMATE CHANGE

– THE GREATEST GLOBAL CHALLENGE OF OUR TIME

The climate crisis is well and truly upon us. The urgency of the situation is remorseless and we have little time to act if we are to avoid the catastrophic consequences. We have known this for a long time. 97 percent of the world's climate researchers and the UN Panel on Climate Change have been telling us so. Current emission trends make it more likely that temperatures will rise by six, not two, degrees. This is a recipe for climate catastrophe.

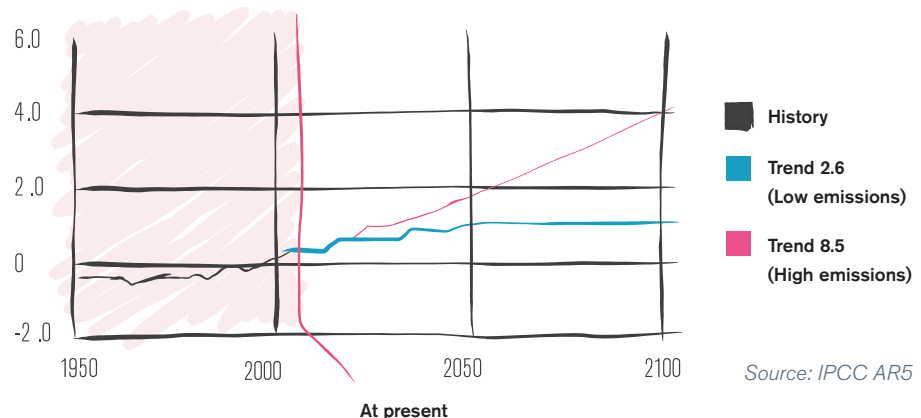
While a rise in global warming by two degrees would create considerable problems for generations to come, a rise by six degrees would result in a world that could best be described as a science fiction scenario. For the first time in modern history, we will be passing on to the next generation a planet in worse shape than the one we inherited from the previous generation. The problems that future climate change will create for our grandchildren are showing an alarming increase as each year goes by when no action is taken. It is more important than ever that the world's population mobilises its forces in the fight against climate change.

According to the most recent report from the UN Panel on Climate Change, the solution to the problem is a radical increase in renewable energy, the use of as much nuclear power as is justifiable, and the introduction of emission allowances on carbon dioxide that will make carbon capture and storage

(CCS) profitable. And we have about fifteen years in which to make this happen. It will not be enough to get going with the big reductions before 2030; they will need to have come a fair way already if the international climate goals are to be achieved.

The graph below shows different emission paths. We are currently on course with the topmost one, which will result in a rise in temperature by four degrees. If we are to succeed in limiting it to a maximum of two degrees, emissions will need to level off very soon indeed.

Changes in average global surface temperature



The diagram below shows historic CO₂ emissions. In recent years, global emissions of greenhouse gases have continued to increase by approx 3 percent per year, and follow an emission path that could in a worst-case scenario, according to the Panel, result in a rise in global warming by 5–6°C during this century.

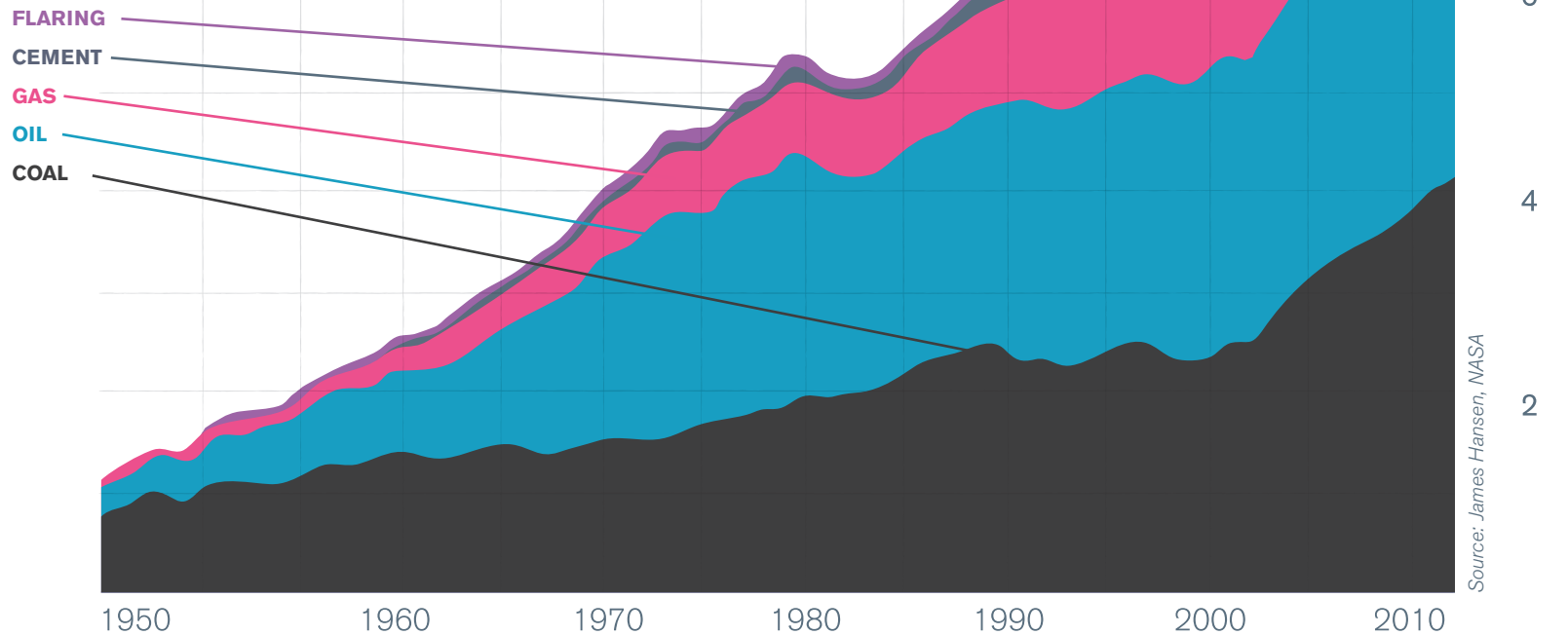
At the Copenhagen Climate Change Conference in 2009, the world's leaders, headed by President Obama, acknowledged the scientific view that global warming will need to be limited to two degrees above pre-indus-

trial levels. The diagram below shows the dramatic shift required in climate policy if this goal is to be achieved. An annual increase in emissions must be reversed to achieve an annual reduction of between 6 and 64 percent, depending on whether the halt in emissions is achieved now or in 2024.

In its most recent report, the UN Panel on Climate Change states that at least two thirds of the world's coal and oil reserves must be allowed to remain in the ground if we are to succeed in achieving the interna-

tional climate goals. It is referring here to reserves where extraction is technically possible and economically viable. Even if these still remain underground as seen from a technological point of view, from an economic point of view they are already regarded as having been exploited.

Global Fossil Fuel CO₂ Emissions (GtC/year)



Source: James Hansen, NASA

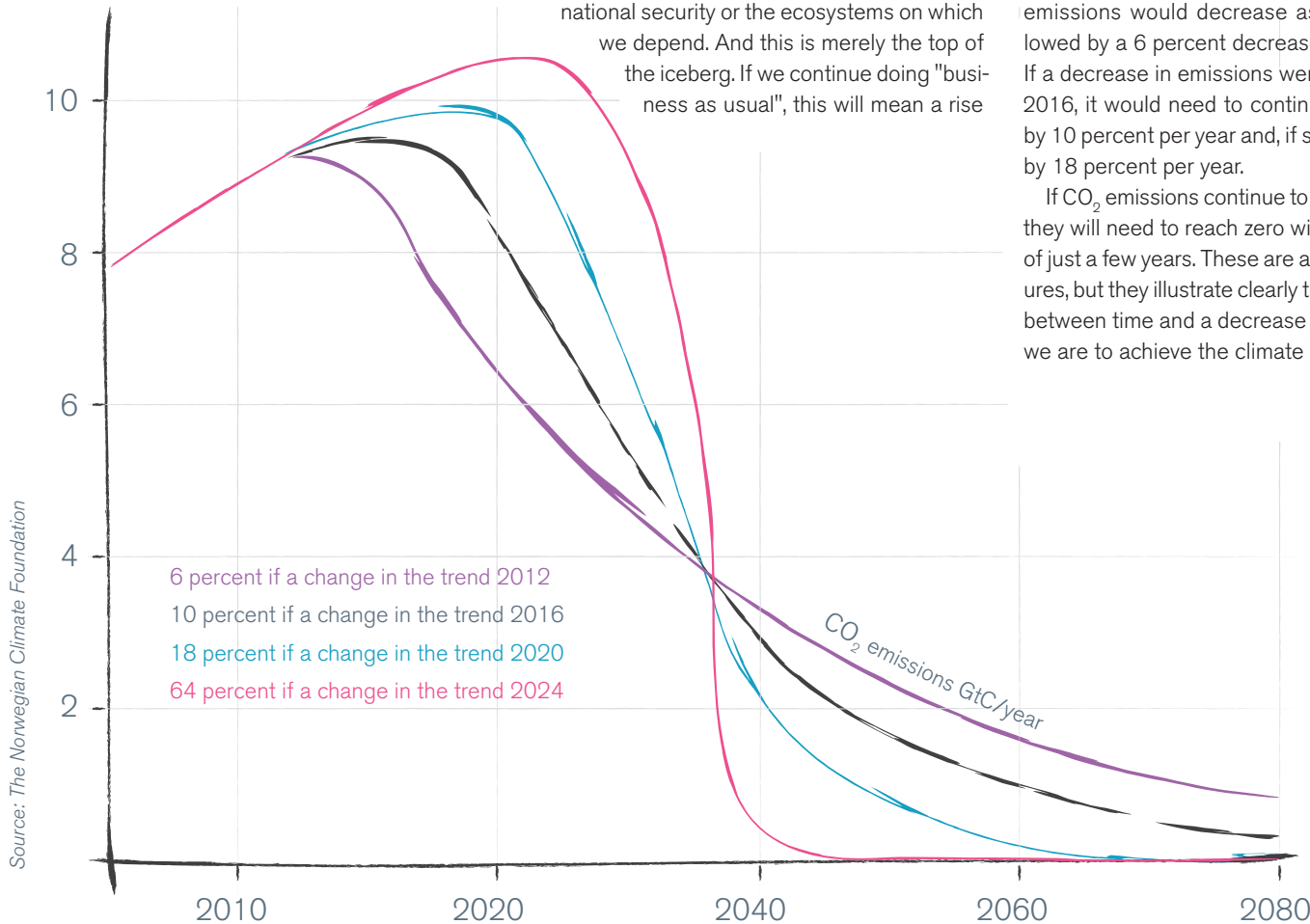
They have been incorporated into shares, businesses lend money against them, and they form the basis of calculating national budgets. This gives us a clear picture of the political and scientific aspects of our dilemma. We can

ensure either a healthy balance sheet in these businesses or a relatively healthy planet, but it looks as though we cannot have both. Climate change has already had a big impact on mankind and the environment, regardless of whether we are talking about food, water, land, national security or the ecosystems on which we depend. And this is merely the top of the iceberg. If we continue doing "business as usual", this will mean a rise

in global warming that will lead to far more dangerous and potentially irreversible effects on the planet and mankind.

The diagram shows four different ways of achieving the two-degree goal. The purple curve shows that global greenhouse gas emissions would decrease as of today, followed by a 6 percent decrease in emissions. If a decrease in emissions were to start in 2016, it would need to continue decreasing by 10 percent per year and, if started in 2020, by 18 percent per year.

If CO₂ emissions continue to rise until 2024, they will need to reach zero within the space of just a few years. These are approximate figures, but they illustrate clearly the relationship between time and a decrease in emissions if we are to achieve the climate goals set.





REGIONAL ACTIONS IN A GREEN SHIFT

With climate change posing an ever more serious threat and the need for fast action increasing, regions will have to play an increasingly important role in the work of reducing greenhouse gas emissions and adapting to the aspects of climate change that will be inevitable.

In the case of the Scandinavian regions, the threat is chiefly linked to a rise in extreme weather conditions that will place greater demands on infrastructure such as road and railway networks, water and sewage networks, energy grids and flood defence structures. A green shift would, however, also create opportunities to develop new goods and services that would be needed by a low-emission society, such as the further development of renewable energy.

RISKS AND CHALLENGES

If the international climate negotiations fail, we may experience a rise in sea levels by more than one metre during this century.

This poses a threat to the lower lying areas such as Bryggen in Bergen, which is home to approx 13 properties on which stand 61 listed buildings that are included on the UNESCO World Heritage list. In the case of Denmark, roughly 2 percent of Copenhagen's inhabitants live lower than one metre above sea level, and approximately 24 percent of the entire

industrial research sector in terms of value lies below this level as well. The city is well protected in the form of flood barriers and other dam-like structures, but even a sea level rise of 0.5 metres could result in the costs of a hundred-year flood increasing from the current estimate of € 3 billion to € 5 billion.

Sweden has already been affected by major landslides, and the risk of such an event is expected to increase in the future, especially in those areas already very much at risk today, such as Vänern and the Göta älv valley. Approximately 200,000 buildings in Sweden lie close to stretches of water where the risk of a landslide will increase.

WORKPLACES ARE AT THREAT, BUT NEW OPPORTUNITIES ARE EMERGING

The necessary green shift that the world is facing is a threat to workplaces, especially those in the coal, oil and gas industries. At the same time, however, it is making possible new job opportunities. If the world is to succeed in achieving its emissions targets

in a short time (*see page 19*), this will create a huge market for new goods and services that could make such rapid changes possible. The table below shows Norway's green industries in 2008. These are expected to grow fast in the case of a green shift.

EXAMPLES FROM TWO REGIONS

Regions have an important role to play in bringing about a green shift. Most of the regions and municipalities in the the ÖKS area employ a number of strategies today for promoting a green shift. How extensive these strategies are differs widely from region to region. This chapter looks at interesting examples from two interesting regions: Agder in Norway and Småland in Sweden, which have come a long way in the work being done at regional level to develop structures promoting a green shift.

GREEN SHIFT IN AGDER

Consumption and production of energy
In 2012, 15.7 TWh of electric power was pro-

duced in Agder County. Hydroelectric power represented 99 percent, while the rest came from thermal power and wind power. Consumption in the region was 7.6 TWh.

Net household consumption of electric power is approx 7,000 KWh per year and inhabitant. Consumption shows a falling trend (0.5 percent during the period 1978–2012), but household consumption still shows a slight increase as a result of the population figure rising.

The production of electric power in the region is expected to increase sharply with the establishment of several new and large hydroelectric power stations, a number of small hydroelectric power stations, and a significant number of wind power farms. The region is expected to produce a surplus of electric power amounting to 11 TWh in the year 2025. Consumption of electric power is expected to increase slightly.

Assuming that Agder's share of the heat pump market remains the same in relation to the population, consumption of heat pumps are estimated to potentially provide a net energy gain of 250 GWh in Agder.

Key performance indicators for production and consumption of energy in Agder in 2012

	ENERGY	
	Production	Consumption
Net production of electric power	15714	7610
Petroleum products (based on purchase statistics)	3815	3815
Bioenergy (wood consumption in homes)	460	460
Bioenergy (wood chips and pellets for local district and district heating)	110	110
Biogas (from sewage sludge and household waste)	10	10
Solar power (heating and electricity)	0	0
Total GWh	20109	12005

The pink table above shows the key performance indicators for the production and consumption of energy in Agder in 2012.

An increasing proportion of renewable energy in Agder

Norway, just like the countries in the EU, has implemented the EU Directive on renewable energies. The aim of the Directive is that the proportion of renewable energy in the EU

will increase to 20 percent by 2020 (from 8.7 percent in 2005). Each country has its own target, and the target for Norway is 67.5 percent. The result at national level was 64.5 percent in 2012. There is no estimate available for the proportion of renewable energy at regional level. Agder is probably above the national average, and its proportion of renewable energy is clearly growing.

Both Aust-Agder and Vest-Agder are

Net consumption of electric power in Agder in 2012. GWh

Power-intensive industries	Mining and extraction	Non-power-intensive industries	Miscellaneous support and waste management	Transport/Storage	Construction and facilities and other services	Households and agriculture
3355	9	629	58	74	1310	2177

prominent actors in addressing climate issues from the perspective regional development. Given below are several examples from the Agder region.

Brainprint

The County Council is responsible for providing education for 16 to 19 year olds. The 'brainprint' of the work it is doing on climate is probably of far greater significance to global climate issues than is its 'footprint'. We have succeeded well in linking education to the concrete establishment of passive houses as a result of collaboration between schools, universities, financial institutions, architect agencies and municipalities. Proactive communication and knowledge building associated with the project has given the students the feeling that what they are learning about this sector and the low-emission society could be of benefit in the future. This educational concept has been called 'the Blakstad model' and has inspired many schools to implement similar projects.

Green Business

The Agder region has a large and growing surplus of renewable energy in the form of hydroelectric power. This has formed the basis of the world's cleanest processing industry. The County Council has enabled these businesses, which account for half of the region's energy consumption and greenhouse gas emissions, to collaborate with the Eyde Network while focusing specifically on

improvements in processing, reduced energy consumption and reduced greenhouse gas emissions. Ongoing technological developments and the day-to-day innovations made by these businesses make it possible to prevent production from being transferred to other parts of the country where it would emit far higher levels of greenhouse gases.

The Green Battery of Europe

The Agder region is home to a large share of Europe's water storage capacity. Power can be produced in the same instant that the market demands it. It can be developed further by pumping water up into storage facilities during periods of surplus power. The region's goal is to become an international leader in the production and distribution of renewable energy. The water storage facilities are able to balance the naturally varying supply of electricity from solar and wind power, and thus create the preconditions for phasing out fossil energy sources used for supplying electricity.

Transport

Only 5 percent of all travel in the region takes place using public transport. The County Council has the important task of organising and funding a range of transport services that could mean this share will increase. The land use and transport plans of the urban regions are essential for ensuring a reinforcement of the client base in the long term. This has been implemented in the

Kristiansand region and is now being done in the Arendal region. A regional transport plan due for completion in 2015 is also being drawn up. Long-term work is also being done to construct a new stretch of railway that will give the region far better connections with the Oslo region. Private cars are the dominant mode of transport. National funding has ensured a sharp increase in the number of electric cars (approx 1,500 in May 2014). The County Council has helped ensure that charging stations have been erected along main roads so that those who drive electric cars should not have to worry about distances the way they did previously. This work is being intensified and focusing on sparsely populated areas where the private car is indispensable.

Regional Development Plan Agder 2020

The counties of Aust-Agder and Vest-Agder, which together form the region of Agder, have a joint climate and energy strategy that is described in the Regional Development Plan Agder 2020. The two county capitals also have their own climate and energy plans.

The Regional Development Plan Agder 2020 is a political platform for the development of Agder, which consists of 30 municipalities and the counties of Aust-Agder and Vest-Agder. The main purpose of the plan is to develop a strong rural region that is attractive to residents and trade and industry in both the coastal areas and the inland districts.

One of the five areas of focus is climate:

"High Ambitions – Low Emissions". The plan contains a number of measures regarding climate issues. It is followed up by a political coordination group, a group of municipal heads and teams of experts.

There is a special team of experts that follows up climate issues. Its most important task is to promote and coordinate the implementation of climate measures in the entire region. In order to reach the ambitious goals set by the Regional Development Plan Agder 2020, the group is proactive in stepping up considerably their work on climate issues. The Regional Development Plan Agder has its own website: www.regionplanagder.no

Aust-Agder County Council

The Regional Development Project Agder (RUP Agder) is one of the tools employed by Aust-Agder and Vest-Agder County Councils for following up the Regional Development Plan. The projects mentioned below come under RUP Agder:

- Green Battery
 - energy exchange with Europe.
- Climate Partners
 - a network focusing on the reduction of greenhouse gas emissions and the development of greener products and services.



- Oil-free
 - campaign to phase out oil boilers.

industry and research carried out jointly with Alcoa.

Vest-Agder County Council

Vest-Agder County Council has its own support programme regarding climate and energy issues, such as:

- Support for developing the infrastructure for electric cars in Lister.
- The establishment of a "Centre of Excellence" for the carbothermal production of aluminium. A collaboration between

- Ventus Offshore. Collaboration with Kristiansand Municipality, Agder Research and the trade and industry sector in Agder regarding offshore wind power.

Regional Research Fund Agder

The Regional Research Fund Agder (RFF Agder) is to increase the research into regional innovation and development by supporting the region's priority areas for action and

promoting further research and development. Examples of projects that have received support from RFF Agder:

- Agder Energi Nett: Solar power grid (skills-training and business projects).
- PE Reefs AS: Artificial reefs for the creation and conservation of biological diversity in the sea after intervention (a major skills-training project).
- Coriolis AS: Clean energy from the sea – Foil Swing Generator (a major skills-training project)

VRI Agder

The VRI Programme (Instruments for Regional Research, Development and Innovation) represents the special investment being made by the Research Council of Norway in research and innovation in Norway's regions. This Programme is to help boost innovation and economic potential in regional trade and industry. This will take place by promoting greater collaboration between R&I institutions, businesses and regional authorities, and by forging close ties with other national and international networks and systems. One of VRI Agder's areas of investment is energy and technology.

Innovation Norway

Innovation Norway helps those who are either about to set up or already run a com-

pany in one of Agder's counties by offering funding, advice and a number of services that enable them to set up an even better business or to invest in new markets.

One area of investment has been environmental technology – technology that directly or indirectly improves the environment. This can be cleaning technology for limiting pollutants, environmentally friendly products and production processes, or more efficient use of resources and technological systems that reduce the environmental impact.

Innovation Norway offers a broad spectrum of services that are important for development in the agricultural sector, such as the Bioenergy Programme that offers investment support to agricultural businesses wishing to erect facilities for selling heating systems, heating plants for farms, greenhouses, biogas and wood chip production.

Aust-Agder Development and Competence Fund

The Aust-Agder Development and Competence Fund is funded by Aust-Agder's 15 municipalities. The aim of the Fund is to help increase competence and innovation capacity in Aust-Agder.

Below are several examples of climate and energy-related projects that have received support from the Fund.

- Inspirasjon Grønt Batteri, the applicant being Setesdal Regional Council.

- Tidevannsenergi, the applicant being Flumill.

The Competence Development Fund of Southern Norway

The Competence Development Fund of Southern Norway is a public foundation established by the municipalities of Vest-Agder. The Competence Development Fund of Southern Norway is to help boost competence in Vest-Agder and guarantee workplaces and good living conditions. Renewable energy and environmental technology are two of the Fund's areas of investment.

Examples of renewable energy projects that have received support from the Competence Development Fund of Southern Norway:

- Lister Nyskaping AS, Lister Biovarme and Lister Biogas
- University of Agder, Lister-Renewable Energy.
- Agder Research, Energiknutepunkt Lister.

GREEN SHIFT IN ARENDAL MUNICIPALITY

Arendal Municipality has focused on developing Arendal as an environmental city, and has achieved a string of results that have aroused considerable interest both nationally and internationally. The most important success factor has been that its political and

administrative leaders have set ambitious goals for the Municipality's climate work, and that this has been backed by a unanimous Municipal Board.

Arendal Municipality's focus on the environment began in 1988, when Nidarkretsen granted municipal pre-project funding for establishing the environmental information centre GRID-Arendal. In August 1989, the Centre was officially opened by the then Prime Minister Gro Harlem Brundtland, as Norway's follow-up to the Brundtland Commission Report. The Municipality and GRID are joint owners of the UN building in Arendal, which was opened in 2006.

After discussions with UN Environment Programme representatives and the Norwegian Ministry of the Environment in 2008, the Chairman proposed that Arendal be the first city in Norway to have a climate-neutral administration in accordance with the UN definition. The proposal was unanimously accepted by the Arendal Municipal Board on 27 March 2008. At the same time, the Municipality decided to appoint Svein Tveitdal, a former Director of the UN Environment Programme, as Environmental Ambassador for the Municipality, with the main focus on climate and environmental management and international collaboration.

Climate management is in practice carried out today in the form of monthly meetings between the Chairman, Vice Chairman, Municipal Head, Head of Planning, Environmental Advisor and the Environmental Ambassador. The agenda for these meetings includes items that are essential for climate management in Arendal, such as follow-up of the climate-neutral administration, the degree of ambition shown in climate and energy planning, project development and national and international collaboration. As of 2008, the Chairman, Environmental Advisor and Environmental Ambassador have held a series of lectures nationally and internationally on

ORGANISATION	PROGRAMME	NOK MILLIONS
Aust and Vest-Agder County Councils	Regional development projects in Agder	1.3
Aust-Agder County Council	Regional development projects in Aust-Agder	1.0
Vest-Agder County Council	Climate and energy work	2.5
Regional Research Fund Agder	Energy, environment and climate	1.4
VRI Agder	Energy and technology	1.2
Innovation Norway Agder	Environmental Technology Programme	82.3
Innovation Norway Agder	Bioenergy Programme and similar programmes	8.1
Aust-Agder Development and Competence Fund	Development of new skills	1.3
The Competence Fund of Southern Norway	Renewable Energy and Environmental Technology	3.3

the city's climate management. Arendal is a member of ICLEI and the Union of the Baltic Cities (UBC), and collaborates with the UN Environment Programme (UNEP). As of 2012, the Municipality is taking part in ZERO's spearhead project for Norwegian municipalities and county councils that have distinguished themselves in terms of good climate management.

Arendal Municipality's climate and energy plan is monitored at regular intervals and has been adopted by the Municipal Board. It is the practical tool for implementing the work being done by the Municipality on climate and energy issues.

GREEN SHIFT IN KRISTIANSAND MUNICIPALITY

Kristiansand is known in Norway as an environmental city, and is one of the country's leading cities in the areas of waste management, cycling, public transport and environmental measures. The Municipality has drawn up an ambitious municipal plan up to the year 2022, when 'the Climate City' will be one of three areas of focus. One result of this is that the Municipality has set ambitious goals for achieving climate-friendly urban development, a climate-friendly transport system and climate-friendly management and administration, and this means the Municipality will enable residents and businesses too to make climate-friendly choices.

By purchasing emission quotas, the Municipality's administration will be climate-neutral



as of 2014, while the long-term goals are to reduce climate emissions by 20 percent up to the year 2020 compared to 1991 and to achieve climate-neutral status by 2050.

Its systematic and long-term efforts to tackle climate and energy issues meant that in 1999 Kristiansand was one of the first Norwegian municipalities to succeed in adopting an action plan of its own on climate issues. By way of regional collaboration with six neighbouring municipalities, a joint climate plan was drawn up in 2009 that incorporated cross-municipal border goals. The climate plan is followed up by sector-wide climate groups, whose tasks include responsibility for climate accounting and assisting other municipal bodies in the form of environmental and climate competence.

The Municipality's internal focus has mostly been on energy management, and during

the period 2007–2013 approx NOK 60 million was invested in an energy programme relating to 120 municipal buildings. This has meant a successful reduction in energy consumption by 16 million kilowatt-hours per year, which has attracted national attention. Carbon emissions have been reduced by an amount equivalent to the emissions produced by 800 residential homes.

In order to stimulate green developments in society and trade and industry, Kristiansand Municipality has established a 'Green Centre' which is run jointly with Miljøfyrtårn (the Eco-Lighthouse Programme) and the Climate Alliance. This is a competence centre and venue for holding courses, lectures and debates that focus on climate and the environment.

Almost all the municipal organisations in Kristiansand are environmentally certified by either Miljøfyrtårn or Grønt Flagg (Green

Flag). Miljøfyrtårn is Norway's largest certification body, which originated in Kristiansand Municipality, and the 'Sustainable Local Community' Project in 1996. At that time the Municipality introduced measures in collaboration with private businesses in different sectors. After 2000, Miljøfyrtårn received funding from the Government budget before it became a nationwide privately run foundation in 2003. The goal is to persuade companies, municipalities and other organisations to introduce environmental management in their operations and to take environmental protection and climate change seriously.

As part of the 'Cities of the Future' project, Kristiansand together with twelve other cities/municipalities in Norway is collaborating with the State and trade and industry sector to reduce greenhouse gas emissions and make the cities more pleasant places to live in. In conjunction with this project, the Municipality will develop jointly with private construction companies 'The Urban District of the Future', with the focus on energy in housing, town planning and transport, consumption and waste, and climate adaptation. The construction of 500 homes in the urban area will provide both public and private-sector businesses with practical experience of climate competence.

GREEN SHIFT IN SMÅLAND

The southern part of the Småland landscape is home to a regional association today. This area is a base for several public and private-

sector actors working to achieve a sustainable future. In the opinion of many regions, southern Småland has set the lead in creating groups of several different interested parties so as to address climate issues at regional level. Two distinct trends in this region are cooperation and an annual report on CO₂ emissions.

Cooperation

Public-sector actors cooperate in carrying out their tasks, and cooperation also takes place with businesses both big and small in the region. Several joint platforms have been established in the region for stimulating cooperation between different actors. The Kronoberg Climate Commission and the Energy Agency for Southeast Sweden are two examples of such platforms.

Annual CO₂ report

Each municipality and county council carries out an annual survey and report of the CO₂ burdens resulting from their operations. These differ to some extent but are on the whole comparable.

Given below is a brief account of the most important actors in Småland's efforts to tackle climate change.

The Kronoberg Climate Commission

Kronoberg is to become a fossil-free region!
In order to achieve this goal, more actors will need to make brave decisions, make climate-smart choices, and take responsi-

bility for their climate impact at every stage.

The Regional Council of Southern Småland has, together with the Energy Agency for Southeast Sweden AB and the Kronoberg County Administrative Board, set up the Kronoberg Climate Commission in cooperation with the trade and industry sector, universities and the public sector.

The Kronoberg Climate Commission is a forum for providing information, conducting dialogue and publicising the good examples being set in the region. By focusing on reduced climate impact in the areas of transport and energy consumption, the Commission is seeking to create a sustainable future and a fossil-free community and achieve its vision of becoming "the greenest region in Europe".

The Energy Agency for Southeast Sweden

The Energy Agency for Southeast Sweden AB is working to increase energy efficiencies and the supply of renewable energy in society. The work it does is carried out under different cooperation and development projects from local and regional level up to European level.

The Energy Agency for Southeast Sweden AB is owned by the Association of the Energy Agency for Southeast Sweden, whose members consist of municipalities, regional councils and county councils in the counties of Blekinge, Kalmar and Kronoberg.

The Energy Agency for Southeast Sweden will be proactive in creating a sustain-

able energy system in our region to serve as a role model for Europe. It will offer up-to-date, objective and impartial information and knowledge in the energy and transport sectors. It is the biggest energy agency in Sweden and the Nordic Region.

Since 1999, the Energy Agency for South-east Sweden has initiated, participated in or coordinated hundreds of projects at local, regional, national and European level. All these projects have aimed to bring about more efficient energy consumption in different sectors in society.

The EU, the Swedish Energy Agency, the Swedish Environmental Protection Agency, the Swedish National Agency for Education and the Swedish Transport Administration are its biggest employers. Its regional employers include both public and private-sector actors in the Southeast Region, and EU projects take place in cooperation with other energy agencies and organisations throughout Europe.

Its work is divided into three spheres for carrying out projects that focus on different areas:

- Housing – energy in housing and the supply of renewable energy.
- Transport – sustainable travel, freight transport and fuel.
- Learning and lifestyle – information, education, impact on behaviour.

Kronoberg County Council

The County Council has signed a climate agreement with the County Administrative Board. The agreement is a voluntary declaration of intent for promoting the work being done on climate issues in the County. Good examples are intended to inspire other companies and organisations to reduce their climate impact.

Ongoing efforts are being made within the County Council to reduce energy consumption, and importance is placed on considering the energy aspects by adopting the life-cycle approach (LCC).

A good number of personal and goods transports take place on behalf of the County Council. The transports produce high levels of carbon emissions and account for a large share of the County Council's climate impact. Exhaust fumes from traffic are also damaging to human health. The County Council is therefore working to make more efficient use of its transports.

Sustainable Småland

Sustainable Småland was set up in January 2011. It is a regional network focused on knowledge sharing and developing innovative and challenging environmental solutions. The network is located in Växjö.

Network members jointly reinforce and develop their environmental knowledge. This is where products and services provided by world-leading environmental technology businesses with experience and knowledge

of the public sector and the latest research are combined. This combination and the broad range of skills available enable the network to develop jointly environmental solutions for the future. Together they create:

- Sustainable member businesses possessing environmental skills that are world-class.
- Innovative and challenging environmental projects.
- A more green and sustainable region.

Linnæus University

Linnæus University is to be a driving force and role model in the work to achieve a sustainable society by way of education, research and cooperation. The goal is for staff and students to be highly knowledgeable about sustainable development and able to assess critically the principles and with the capacity to put this into practice. The University's work on sustainable development is based on people's participation, knowledge and understanding, and takes into account the naturally defined limitations.



ARENAS AND NETWORKS

The fight against climate change can only be won by persistent effort; no actor has the capability to solve the climate crisis on their own. Arenas and networks play an important role in creating the best possible conditions for achieving a green shift and a climate-efficient environment. Such arenas and networks, when well established, are an invaluable forum for sharing knowledge, inspiration and exchanging experiences.

No one can avoid playing their own part in the fight against climate change and in seeking to bring about a green shift. In order for our society to manage the climate crisis facing us, climate-efficient environmental work must be shared at all levels, from climate negotiations at UN level to the climate network at regional level, to energy efficiencies made by the individual firm. One important tool for working to share knowledge at local and regional level and inspire actors to take progressive environmental measures is to develop networks and arenas where collaboration and the exchange of experiences regarding environmental issues are the focus of attention. Preparing platforms for collaboration and open discussion creates the best conditions for success in tackling the challenges we face today.

This section introduces us to four standalone networks in Denmark, Norway and Sweden, each of which in their own way has created important meeting places. These networks have all been successful in employing a variety of methods to create collaboration platforms for actors at local

and regional level. The way in which these networks work differs, but common to them all is that by mobilising actors in their own region they help increase knowledge and opportunities for collaboration which benefit the green shift. The description provided of these four networks may serve as an inspiration for the way in which local and regional actors in other regions too can make use of networks and meeting places as a means of bringing about a green shift.

Climate Partners in Agder, Norway, is a public-private network that is working to bring about a green shift in the Agder region in Southeastern Norway. Climate Partners' focus is on supporting their partners by reducing greenhouse gas emissions and supporting the development of green services and goods. The Coalition for Energy and Environment (EMC) in Halland, Sweden, is a trade and industry initiative whereby companies in the region have come together in a non-profit association with the aim of highlighting climate issues in trade and industry. Energy City Frederikshavn in Denmark is a network aimed at residents, companies and

the public sector in Frederikshavn Municipality. Energy City's purpose is to support actors in changing their energy supply and thus help cut greenhouse gas emissions. The Climate Partnership in Aarhus, Denmark, is a public-sector initiative whereby businesses are invited to sign a climate agreement with the Municipality. The Climate Partnership helps create closer collaboration between the public and private sectors and gives the participating businesses the opportunity to develop action plans for achieving a green shift.



CLIMATE PARTNERS

AGDER

Climate Partners is a public-private partnership network that is working to bring about a green shift in the Agder region (Aust-Agder and Vest-Agder counties). The focus is on reducing its own greenhouse gas emissions and developing green goods and services.

The businesses that have taken part since the start have reduced their greenhouse gas emissions by an average of over 32 percent. More new green goods and services have been developed. The network has meant a significant increase in knowledge and collaboration on the part of politicians and the trade and industry sector in Agder, so they can address the threats and opportunities posed to their region by climate change. In April 2014, Climate Partners had 46 member businesses representing a total of 22,000 employees.

BACKGROUND AND SETTING-UP PROCEDURE

In January 2009, Arendal Municipality, Aust-Agder County Council and GRID-Arendal set up the Climate Partners network as a sub-project under 'The UN City of Arendal' project. These actors wished to establish a collaboration with trade and industry that would help equip Aust-Agder as far as possible to face the challenges associated with the climate question and the low-emission society of tomorrow.

In order to get the project going, Arendal Municipality and Aust-Agder County Council carried out pre-project planning in 2009. A number of companies in the region were paid a visit and the concept presented. There proved to be sufficient interest among local companies for starting the network, which was extended in 2010 to include Vest-Agder County Council.

The primary motive for the public-sector actors was the opportunity to establish a collaboration with the trade and industry sector for developing Agder as a green region. Goals such as this have been drawn up in plans that include the Climate and Energy Plan for Arendal Municipality and the Regional Plan Agder 2020, whose climate goal is "high ambitions, low emissions". The primary motives for trade and industry to take part were as follows:

- Competitive power and more effective results – These companies want to be competitive in the low-emission society of tomorrow.

- Knowledge – They want greater knowledge about the threats and opportunities posed by climate change for their activities.
- Social accountability – They want to be on the right side of the social development they see coming; they are proud to think that their activities could be part of the solution.
- Image – They want to create a stronger external and internal image.

The Project was officially launched during the 'Common Goal for Southern Norway' Conference in Kristiansand in January 2009, and in April 2010 the network was set up as a project in its own right with all of Agder as its focus area. Aust-Agder County Council is the project owner and Vest-Agder County Council the project partner.

ABOUT CLIMATE PARTNERS

Climate Partners is a binding collaboration between public and private-sector actors in Agder. The undertakings that must be made by its members to join the network mean that only serious actors take part and that members avoid accusations of greenwashing. The cooperation of the public sector has proven to be very important indeed in establishing the platform needed for involving trade and industry. Experience has shown that this type of network does not just ap-

pear by itself on the market. The demands placed on members are "stricter" than in other comparable networks such as Klimaløftet (in Norway) or EMC (Halland in Sweden).

ACTORS

The members are the network's key players. The biggest public-sector members are Aust-Agder and Vest-Agder County Councils, the cities of Arendal, Grimstad and Kristiansand, and also Risør, the University of Agder and the Hospital of Southern Norway. Private-sector members come from 14 sectors:

- Architecture
- Rehabilitation
- Waste management
- Banking/insurance
- Car sales
- Construction and installation
- Wildlife parks
- Energy production and distribution
- Hotels and restaurants
- Consultancy
- IT
- Environmental certification
- Transport
- Printing services

In January 2014, the network included 47 organisations with a total of over 22,000 employees. 12 of these are public-sector and 35 private-sector.

Every region in Scandinavia and Europe would like to reduce its greenhouse gas emissions and develop greener workplaces. Climate Partners is an efficient method for achieving this.

Svein Tveitdal, Project Manager and former UN Director

ORGANISATION

Climate Partners is organised in project form with Aust-Agder County Council as the project owner. The project is headed by a team of eight people, four of whom are from the public sector and four from the private. Their chairperson sits on Aust-Agder County Council. There is a temporary project manager (working 500 hours per year), and Aust-Agder County Council has provided a project coordinator who is employed 60 percent of full-time working hours.

FUNDING

Climate Partners is funded by private means and subsidies from bodies including Aust-Agder and Vest-Agder County Councils and members of the network.

RESULTS

Emission reduction

Members of Climate Partners have achieved excellent results in terms of reducing their own greenhouse gas emissions. Those who have been involved since 2008 have reduced their emissions by an average of 32 percent. Arendal Municipality, which was one of the

initiators of the Climate Partners network, has reduced its own emissions by approx 78 percent. The goal is a reduction of 90 percent by 2017, with 2007 as the base year.

Product development

The results have also been successful in terms of developing new green goods and services. The Climate Partners members Thon Hotels and Miljøfyrtårn have developed a concept for 'green conferences' that is now being rolled out at all the biggest conference hotels in the Thon Hotels chain in Norway and Brussels.

Knowledge development

The network's focus is on knowledge, and it has so far produced eight knowledge reports. These reports are produced by members of the network who have an interest in the themes taken up. The knowledge reports are normally presented at breakfast or lunch meetings where there are invited speakers. Members of the network have acquired extensive knowledge about climate change and the threats and opportunities these pose for their activities.

PUBLICITY

The work done by Climate Partners to disseminate information takes place primarily in the form of knowledge reports and via the website and Twitter. The members publish all the relevant news about climate-related products and services on their website. This information is also made available via Twitter, where [@Klimapartnere](#) has approx 7,000 followers.

FUTURE PLANS

Climate Partners wish to strengthen the network in the future. The main focus is on increasing the number of members, bringing

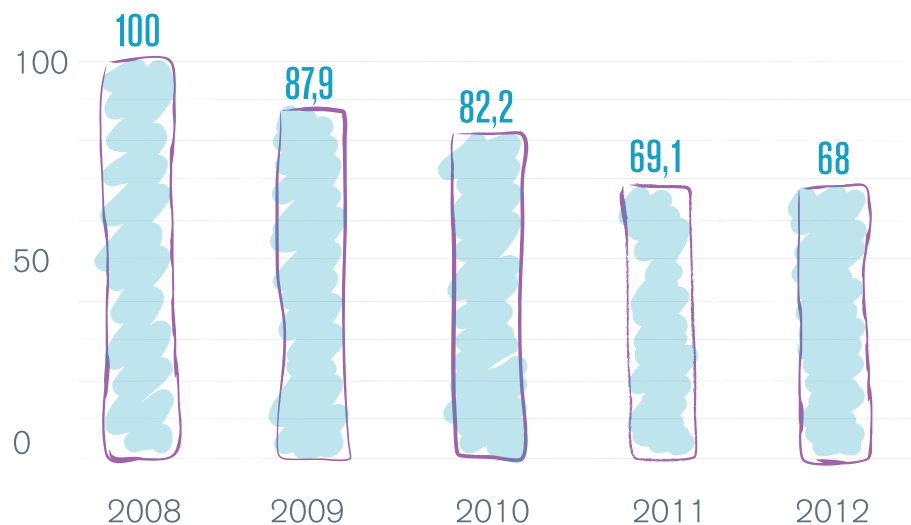
about permanent funding of the network's administration, collaborating with other regions in Norway and abroad, and developing projects based on private funding in collaboration with other regions and trade and industry networks in Norway and abroad.

HOW DOES THIS METHOD HELP BRING ABOUT A GREEN SHIFT?

The method has proven to be an effective tool for implementing the climate goals set out in the Regional Plan Agder 2020. The network has, for instance, made a very real contribution to the following points in the Plan:

- To help ensure that the public sector is a driving force in bringing about a green shift in trade and industry, and in promoting contacts and arenas for collaboration between the trade and industry sector and academia.
- To serve as a platform for knowledge and debate about climate in Agder.
- To produce action plans at regional and local level that describe concrete measures for facing the challenges posed by climate.
- To help reduce greenhouse gas emissions in the region.
- To help ensure that attention to climate and making climate adaptations are included in drawing up municipal plans and plans for greater expansion, and also in the development of general and transport plans in the region.
- The public sector should be at the forefront of adopting climate-friendly measures.
- To help Agder succeed in achieving the status of an international climate region.
- To incorporate climate issues into the school curriculum from nursery school to university.

Development emissions 11 partner 2008–2012



- To implement initiatives on information and popular adult education at local level in collaboration with regional skills environments and trade and industry.
- To encourage more green public procurement in Agder.
- To achieve greater energy efficiency in public buildings and work to achieve a transition to climate-friendly heating.
- To stimulate the regional development of climate-friendly technology by supporting projects and initiatives that focus on making energy efficiencies and on the development and expansion of renewable energy and are the result of collaboration between academia, trade and industry and the public sector.

APPLICABILITY IN OTHER REGIONS

Climate Partners' operations are limited to Agder in geographical terms, but their method can be implemented in all regions that have similar goals. The network has aroused great interest in Norway, and in 2014 Climate Partners was also set up by Hordaland County Council in collaboration with Bergen Municipality and a number of major companies in the County. Climate Partners in Hordaland started out with 14 members and approx 40,000 employees. There are also plans to create similar networks in Østfold and Buskerud. Climate Partners in Agder

are very much in favour of this, and see opportunities for advantages on a large scale (joint websites, knowledge reports, national events) if more regions were to take part.

The vast majority of regions in Norway/the Nordic Region/Europe are interested in a green shift. However, not much is happening yet. In the Nordic Region, regional authorities and trade and industry are assumed to have much the same views and wishes regarding the climate threat and the dangers and opportunities posed by it.

The most important success factor for Climate Partners is the collaboration between public and private sector. With the public sector taking the initiative and challenging trade and industry, an arena is created that promotes innovation and collaboration regarding both emissions reduction and green product development.

DOCUMENTATION

Further information and documentation are available on the website:

www.klimapartnere.no



EMC – THE COALITION FOR ENERGY AND ENVIRONMENT HALLAND

The Coalition for Energy and Environment is a unique trade and industry initiative in Halland, whereby a number of businesses have joined forces to put climate issues well and truly on the agenda in the trade and industry sector. It is a non-public sector, non-profit association with no political affiliations. Membership is open to all companies that need inspiration and help regarding energy and environmental issues or have something to offer other businesses.

ABOUT EMC

The Coalition for Energy and Environment (EMC) began with a discussion between Varberg Energi and Varbergs Sparbank during the autumn of 2006. In the spring of 2007, seven companies were recruited to take part and fund the start up of the network, and EMC held its first annual meeting. EMC has a total of six founders and just over 70 members who have all recognised the importance of collaboration in order to develop.

Goals and aims

To serve as a trade and industry network for climate-efficient business development.

1. To stimulate, support and raise awareness of energy and environmental issues in a way that will result in a re-

duced climate impact and a sustainable society in the long term.

2. To promote in a proactive way activities and projects that increase the practical and commercial use of renewable and energy-efficient technology.
3. To serve as a forum for meeting and developing ideas and as a network whereby different actors can expand on energy and environment issues and climate-efficient knowledge, and develop services and products.

To reinforce, develop and raise awareness of EMC as an attractive organisation in terms of energy, environmental and climate issues.

TARGET GROUP

EMC is aimed at businesses operating in Halland wishing to develop their operations in the areas of energy and the environment, and to exchange knowledge and experiences in these areas together with other businesses that have similar development goals.

ACTORS

The members are the most important actors of the network. EMC attracts members primarily from private companies operating at local, regional, national or international level and located in Halland. The size of these businesses varies and can range from the large-scale Ringhals power plant with over 1,500 employees to the self-employed consultant. EMC also includes institutions at centres of higher education in Halmstad and Borås and in Region Halland with a membership of 20–50 participants.

ORGANISATION

EMC is an economic association whose management is responsible for the strategic direction of the organisation. EMC's day-to-day management team consists of two part-time staff, an operations manager and an events coordinator. Thanks to the Alexanderson Institute, which is a municipal development arena, EMC receives support in the form of communications, premises and project development as well as cost cover. EMC has an office at Campus Varberg in Varberg, but organises network meetings throughout the County.

The subjects covered and the type of meeting vary: they might be anything from a property's energy consumption to green IT and lighting issues. One standing item on EMC's agenda is the much appreciated breakfast meetings, which attract 20–50 participants. These meetings address areas that are of concern to local trade and industry.

EMC also acts as a project developer and has been involved in several projects at national and EU level.

FUNDING

EMC is funded by membership fees and monies from cooperation partners for the costs of joint activities. As a business network under the auspices of the Alexander-son Institute, EMC also receives financial support and resources in ways that include administration services and premises and its cooperation on a number of EU projects.

RESULTS

The result has been to provide companies in Halland with good examples of trade and industry working toward sustainability, and to increase competitive power whereby climate work in its different forms is a major contributing factor. Here are examples of new kinds of communication, new markets and more products that have greater environmental value. More companies have become more efficient in their energy consumption because more of them have begun using an environmental management system. Companies have also

been developing products from the point of view of sustainability in this process.

EMC was a driving force in setting up the Lönsammare Miljöaffärer ('More Profitable Environmental Business') project, which proved successful for the 14 businesses taking part. During 2013, EMC developed a number of business networks that were organised into subject-specific clusters. These clusters encourage greater dialogue and contribute to skills development and the exchange of experiences between companies in the same sector. Today EMC organises clusters for solar power companies, construction companies, logistics companies and recycling companies.

PUBLICITY

EMC publicises the good examples created by way of network meetings for existing and prospective members in the region, and this involves just over 30 activities during the year. The association markets itself by sending out weekly mailshots to approx 800 interested parties, and it takes a proactive part at network meetings.

FUTURE PLANS

EMC will significantly increase its membership during the coming years. It will play a proactive role both in the municipalities and in other trade and industry environments in Western Sweden. Together with similar networks such as Climate Partners in Norway and the rest of Europe, new methods will be

jointly developed. In order to be able to develop the skills of members within their areas of interest, EMC will take part in projects at national and EU level. EMC will find a new role as a niche consultant for public-sector actors in Halland wherever it is assigned to manage operations and develop new skills to benefit trade and industry in Halland.

HOW DOES THIS METHOD HELP BRING ABOUT A GREEN SHIFT?

This method helps stimulate the public sector's interest in green business development, and it facilitates the establishment of a forum for collaboration between trade and industry and academia. The organisation also creates a common platform for knowledge about climate issues in Halland.

Trigger points are set up for action plans at regional and local level describing specific measures for managing climate change that will help bring about a green shift. The method helps ensure that climate issues and forms of climate adaptation are included in preparing municipal plans, procurement policy and strategies for sustainability.

With the aid of this method, companies are encouraged to develop climate-friendly technologies by providing support for projects and initiatives that focus on energy efficiency, renewable energy and sustainable business. The method promotes improved energy efficiencies in public and private buildings and benefits the work of transition to fossil-free and efficient heating.

APPLICABILITY IN OTHER REGIONS

Both Swedish and international actors have visited and interviewed EMC members about their activities in order to receive inspiration. There are no great difficulties in transferring these activities and methods to other private or public-sector actors in the rest of the Nordic Region. EMC is also very much involved in identifying effective methods and tools used by similar actors in other regions in order to test these out in the Halland region.

DOCUMENTATION

Further information and documentation are available on the website: www.emcsverige.se



ENERGY CITY FREDERIKSHAVN

It was a unanimous Municipal Council that took the decision in 2007 that by 2015 Frederikshavn, Strandbygaard and Elling should be using 100 percent renewable energies for their electricity, heating and transports.

Energy experts emphasised that what was special about the area was the fact that Frederikshavn was the right size for enabling the testing of energy industry solutions and was in the right location in terms of agricultural and maritime areas capable of accommodating many kinds of technology. Frederikshavn already has facilities for producing renewable energy, and the region also boasts a pilot project for offshore wind farms, with more on the way. Last but not least, Frederikshavn has the strong will, not to say clout, to justify its ambitions. It was in a sense obliged to start its entire operations again from scratch after a municipal merger in 2008, when new plans were put forward affecting the new and larger municipality as a whole. As a result of this the project was extended too, and the new vision applies until 2030.

The Danish government's new energy savings plan means that the proportion of energy produced in Denmark that is renewable will have at least doubled by 2025. Frederikshavn is a role model and can play an important part in achieving this goal.

BACKGROUND AND SETTING-UP PROCESS

Energy City Frederikshavn is a municipal industrial development project that is in the process of switching Frederikshavn's energy supply over to 100 percent renewable energies by 2030. Energy City's task is to take the initiative and facilitate and coordinate projects that help create green growth and new job opportunities locally in the energy sector. Energy City is also responsible for making it easier for demonstration projects to promote the production, distribution and use of renewable energy.

Energy City is organised so as to be at the heart of development and trade and industry. Its role is to promote developments coming under the Municipality's fourth area of growth, "Energy", which has great potential to create job opportunities in many different sectors. By collaborating closely with companies, research and educational institutions, inventors and members of society, Energy City is taking the lead in creating a 'show room' for trying out the full gamut of sustain-

able climate and energy technologies.

Its day-to-day activities are managed by a tiny administration that is in charge of planning, tasks, project management, cost-free energy advice to home-owners in the Municipality, and communications on Energy City's activities.

There are 2.5 full-time employees at Energy City Frederikshavn.

ABOUT THE METHOD

The project means that Frederikshavn is working to achieve sustainable social development in urban and rural areas so as to create growth and job opportunities in green technology, also known as Cleantech.

What makes Energy City Frederikshavn unique is that it is based neither on a single technology nor a particular line of work. Its focus lies instead on developing a uniform system for renewable energy. Frederikshavn's goal is to be one of the first fossil-free urban centres in the world.

This vision will require investment in the billions, and presupposes that public and private-sector businesses will invest in new systems and technologies. These investments will need to be profitable in both environmental and economic terms. It also means that the vision is to be realised on an arm's length basis. The vision is for the project to help create growth and employment as well as local competence in a measurable way.

TARGET GROUP

Residents, companies and public-sector organisations in Frederikshavn Municipality, with the aim of changing their energy supply and thereby reducing emissions of climate gases.

ACTORS

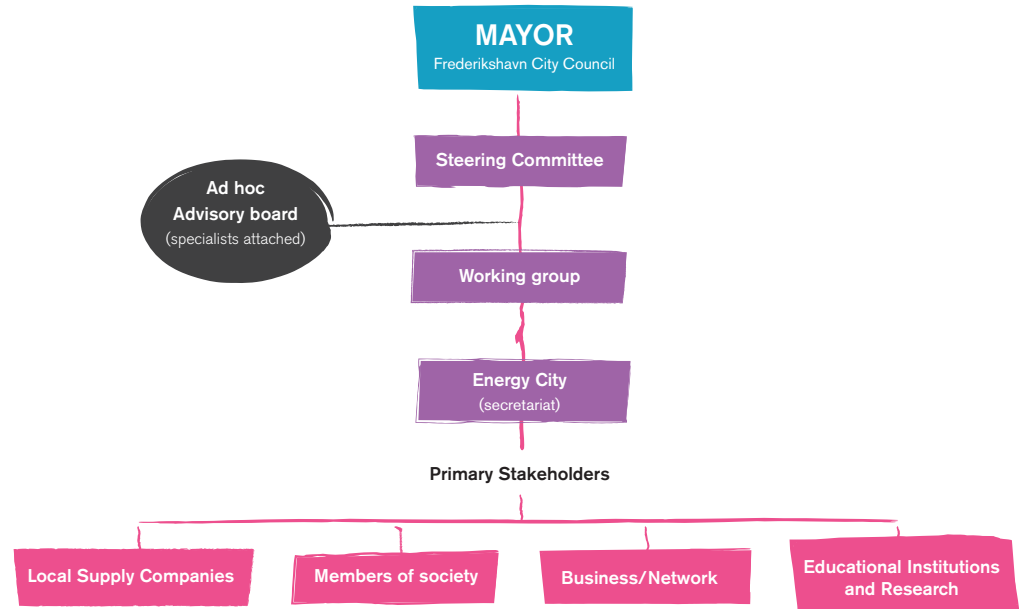
The chief actor is Frederikshavn Municipality.

ORGANISATION

The transition to renewable energy is achievable using different combinations of technology and energy sources that in combination help create a well-balanced supply of energy for electricity, heating and transport.

Action plan

- To integrate renewable energy in all climate and energy planning, including urban, municipal and local planning in urban and rural areas.
- To reduce energy consumption in municipal housing, reduce the environmental impact of transports and introduce sustainable public procurement in the Municipality.
- To reduce energy consumption in private households in urban and rural areas.
- To reduce energy consumption and ensure the production of renewable energy in housing cooperatives.



- To increase the use of renewable energy in energy infrastructures and to replace fossil fuels in the collective energy supply.
- To increase production of renewable energy by establishing new renewable energy plants.
- To establish infrastructure for promoting sustainable transports in the Municipality and region.
- To promote projects for renewable energy systems, including smart networks, smart energy and smart lighting.

- To establish infrastructure for sustainable transports based on renewable energy.
- To improve infrastructure for sustainable transports, including the promotion of cycling.
- To promote district heating in densely populated areas.

Frederikshavn Municipality has drawn up a strategic plan for achieving renewable energy by 2030 in order to meet its goals. The strategic plan covers special action plans for the change-over in local consumption of

Energy City Frederikshavn will make Frederikshavn's energy consumption 100% renewable by 2030.

electricity, heating and transports that will mean a 97 percent reduction in fossil energy by the year 2030 compared to consumption in 2010. The Municipality's goal to reduce carbon emissions is also being compared to local carbon emissions in 2010. Implementing this strategy plan will reduce the Municipality's carbon emissions by as much as 97 percent compared to its carbon emissions in 2010.

In June 2013, a photonics cluster was set up to provide support to the lighting sector in their promotion of development and export. A total of DKK 4 million is available in funding. The cluster is also run with the help of consultants.

Energy City Frederikshavn also embraces regional skills development that takes place on an ad hoc basis where there is demand. Frederikshavn also brokers requirements and capital arising from the collaboration between companies, financial backers and scientific institutions.

RESULTS

Frederikshavn has already achieved several results. A locally developed wave power plant called Crestwing has been tested and demonstrated off the coast. The wave power plant's energy performance is excellent, according to Aalborg University.

One feature of the business development strategies drawn up for the construction industry has been that North Denmark Region has identified a number of themes that,

when combined, cover the development of energy-efficient building and renovation of existing homes and the growth potential of the municipalities in North Denmark. They have created future-proof home solutions and renovation solutions for creating growth in urban and rural areas and supporting the experience economy on the coast.

The project has meant the creation of energy solutions resulting in significant savings for the use and maintenance of private and municipal buildings, and indirect savings generated by greater efficiency and the efforts to achieve better standards of comfort in homes and institutions.

SmartCityDK, in collaboration with the municipalities in the north, has identified a number of measures that, when combined, can mean more energy-efficient construction regarding both new-builds and the renovation of existing properties.

PUBLICITY

Frederikshavn markets itself via its website www.energibyen.dk and its ambassadors.

FUTURE PLANS

Knivholt Manor, just outside Frederikshavn, is home to a demo centre that hosts an exhibition of renewable energies representing different technological solutions. The plan

and vision is for this to be the first fossil-free manor in Denmark. Today Knivholt organises a host of different activities, and approx 70,000 visitors a year are attracted to its variety of cultural events, courses and exhibitions. This means that the environmentally friendly energy demonstration to come has promised a potentially large audience from the start, since the project is a natural part of the other activities in this area.

A local magazine on energy issues, called "e+", has also started up, in which members of the public can publicise energy projects of their own. The first edition of "e+" came out in 2011, and since then it has been distributed free of charge three times a year to every household and business in Frederikshavn Municipality. The aim is to give the inhabitants an idea of all the local initiatives being inspired by energy issues.

One action plan for Energy City Frederikshavn in the future is to see further reductions in energy consumption in municipal buildings. Further integration of renewable energy in connection with the construction, renovation and maintenance of buildings. The implementation of fleet management of the municipal fleet and a common holistic approach toward sustainable public procurement within both the Municipality and companies.

The Municipality also plans to offer 'energy tours' to show visitors some good examples of these energy-saving efforts.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

Energy City Frederikshavn is helping to bring about a green shift by using 100 percent renewable energy for electricity, heating and transports in the region.

PRACTICABILITY IN OTHER REGIONS

The project has attracted considerable attention in the international arena. In the long run, there is a good chance that the Frederikshavn model can be exported to other countries both within and without the EU. Energy City has also taken part in the EU project PRINCIP, whose aim was to see the exchange and publicising of experiences between different actors in the ÖKS area.

DOCUMENTATION

Further information and documentation are available on the website: www.energibyen.dk



CLIMATE PARTNERSHIPS

AARHUS

Aarhus Municipality has developed a close collaboration with the trade and industry sector to reduce both energy consumption and the risk of flooding in the city. This is part of the new climate plan. Aarhus Municipality will be working alongside businesses, members of society and knowledge institutions, with all these playing an active role in achieving the goal of making Aarhus fossil-free.

Energy consumption should not only be reduced but should also be fossil-free. The vision is for the Municipality to be carbon neutral by the year 2030. At the same time, Aarhus is at the forefront of climate change to ensure that higher water levels on the Aarhus coast and cloudbursts will not pose the threat of flooding in the city.

Aarhus will provide motivation and bring together expert advice in order to create a dynamic and encourage innovation. Aarhus Municipality will take the initiative to create systems and infrastructure that can help us meet the climate and energy challenges we face. This applies to the designing of both technical and organisational systems.

BACKGROUND AND SETTING-UP PROCESS

Aarhus Municipality has approx 350,000 inhabitants at present, a figure that is increasing sharply by 7 percent a year. This

means that 3,000 new homes and offices are needed to meet the dramatic expansion taking place.

Aarhus City Councillors have decided on a number of overall goals for carrying out the future work of creating green oases, aquatic environments and energy efficiencies. The goals describe the guidelines for the way to create green growth in Aarhus. Aarhus is in close collaboration with companies, agencies, universities, research centres and other local authorities for developing solutions to create a greener city and growth in the environmental technology sector.

With this now on board, the Municipality has set itself the goal of becoming climate neutral by the year 2030. It has created different solutions for reducing carbon emissions from heating and electricity to 1.3 million tonnes, and wants to pave the way for the green, safe and efficient use of fossil-free energy. At present, 25 percent of carbon

emissions are produced by municipal activities and 75 percent by private individuals and companies. The Municipality will set a good example and intends to eliminate its net carbon emissions emanating from fossil fuels and provide assistance to companies wishing to develop innovative solutions for bringing about a greener City and creating growth in the environmental technology sector.

The Climate Plan for 2012–2015 is the basis for Aarhus' climate measures over the coming four years.

ABOUT THE METHOD

At present 43 businesses have signed contracts with the Municipality to take part in Climate Partnerships. Climate Partnerships make use of business-driven and strategic contracts, which means significant opportunities for business development and also paves the way for Aarhus to become carbon-neutral. At the same time, trade and industry is given motivation to take part in meeting this big challenge. The area of focus is that element of the trade and industry sector that can achieve growth by applying environmental technology solutions: Cleantech.

The Climate Secretariat facilitates sustainable growth by helping companies in the form of actor involvement, process management, funding and communication. Just what this set up looks like and which areas a company needs to make greater investment in differs between businesses.

43 companies in Aarhus are collaborating with the Municipality to make Aarhus carbon-neutral by 2030.

TARGET GROUP AND AIM

Companies in Aarhus Municipality, the Central Denmark Region and Denmark as a whole that sell services or products that relate to the environment and energy, with the aim of getting these involved to help make Aarhus carbon-neutral by 2030.

ACTORS

The Department of Nature and Environment in Aarhus Municipality.

ORGANISATION

This was started up four years ago, and during its initial phase the first ten companies were invited in while others registered their interest. What came to light after this initial round of invitations was that more companies wanted the opportunity to meet more often and to focus on cross-selling among companies, something which has now been taken into account.

The Municipality arranges four Partnerships meetings a year that are organised on the basis of different themes depending on company requirements. Climate agreements are signed with the companies that involve several stages. First of all an action plan is drawn up for each company. After this the companies attempt to develop their products and services together with other companies

involved in the collaboration. The businesses then make known their work externally.

All the actors then come together to discuss the opportunities that exist and share their experiences. The first stage is for the company wishing to take part to enter an agreement with the Municipality. This agreement ensures that both sides commit themselves to working to achieve a circular economy by reviewing their products and services.

Once the agreement is signed, they collaborate with the other companies taking part to build clusters. The aim of these clusters is for companies to cooperate in developing together services, products and action plans. This will help consolidate the position of the companies and their environmentally correct technology and environmentally correct services.

The Municipality will also create sub-projects with companies pressing for further development. When submitting their project applications, the companies always write the initial application themselves before receiving professional help.

FUNDING

The Climate Secretariat's work is funded by Aarhus City Council to a total of DKK 7 million a year.

RESULTS

The Climate Secretariat in Aarhus Municipality has done a survey of the companies involved:

- 68 percent feel the method works well.
- 48 percent have achieved the results expected.
- 71 percent are satisfied with the Climate Secretariat's overall assistance.
- 68 percent are satisfied with their own funding.
- 49 percent are satisfied with other parties' funding.

FUTURE PLANS

Future plans are to work hard to ensure the Partnerships can create sustainable Cleantech businesses in trade and industry. Methods of approach and concrete goals will be adapted to the developments taking place.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

Wherever the Municipality carries out its work by applying Cleantech solutions, it wants to ensure at the same time that future consumption can be solved using renewable energy that is part and parcel of a green shift.

APPLICABILITY IN OTHER REGIONS

This approach, involving agreements and collaboration in clusters, is a general one, and has a good chance of being used successfully in all regions in the ÖKS area. Aarhus Municipality also has a collaboration on exports with China in the form of town twinning.

DOCUMENTATION

Further information and documentation are available on the website:

www.gogreenwithaarhus.dk



CLIMATE-SMART BUSINESS DEVELOPMENT

The trade and industry sector has a unique opportunity to help bring about a green shift and fight climate change. When every company is doing its bit to increase sustainability at each stage of its operations, we will succeed in going far together in our efforts to bring about a green shift. Furthermore, environmental efforts that are consciously made and radical by nature for boosting business sustainability are an excellent strategy that often contributes more profitable business and a stronger brand.

When we talk about climate-smart business development, there is one thing that everyone should take with them to the negotiating table; namely, that something that is good for the Earth's climate and environment is also good for the business and brand of the individual company. Fundamental to this climate-smart business development is the idea that effective and goal-oriented climate and environmental work is not a burden to be superimposed on a company's day-to-day operations but is a strategic competitive advantage that is incorporated into all stages of those operations.

For many minor businesses, it can be difficult to put one's finger on where and how they should begin on their quest to achieve sustainability. Where day-to-day operations lay claim to all the resources available, it can be tricky identifying the methods and skills required for introducing a green shift. In order, therefore, to facilitate a green shift and

get climate-smart business development under way, it is essential that the companies interested can be offered a platform for collaboration, inspiration and expertise regarding climate-smart business development. Where companies that are interested come together to collaborate and match themselves up with specialists in their area, all the right conditions are in place for discovering each company's full potential to achieve sustainability and develop the action plans needed to that end.

This section presents two successful methods that have been developed in Sweden and Denmark with the aim of stimulating and achieving climate-smart business development in small and medium-sized businesses. The Coalition for Energy and Environment in Halland, Sweden, has used the Lönsammare miljöaffärer (More Profitable Environmental Business) method. This method involves companies that are

interested being given the opportunity to take part in a project whereby they have the opportunity to develop an action plan for climate-smart business development in a number of workshops, in consultation with specialists and the other companies taking part. Development UMC in Herning, Denmark, has developed a method called Rethink Business. This method is a tool for adapting a company's activities to a circular economy where the focus is on the reduced use of resources. Workshops and external consultancy advice are central to the participation of the companies. Rethink Business is also innovative in that it encourages new constellations and unconventional forms of collaboration between companies, public-sector institutions and consumers.



LÖNSAMMARE MILJÖAFFÄRER

EMC –THE COALITION FOR ENERGY AND ENVIRONMENT

Lönsammare Miljöaffärer (More Profitable Environmental Business) is a dynamic method for enabling companies to discover their potential to achieve sustainability where the focus is on their brand. Fourteen businesses took part, and after a number of workshops an action plan unique to each company was drawn up.

BACKGROUND AND SETTING-UP PROCESS

The concept has been developed by the Swedish Industrial Design Foundation (SVID), an organisation that has been refined and adapted to create what are now five different projects in Norrbotten, Jämtland, Västra Götaland, Jönköping County and Halland. Financial backers for these different projects have included the Swedish Agency for Economic and Regional Growth, the Alexanderson Institute and Almi. The initiative for Lönsammare Miljöaffärer in Halland was made by the Coalition for Energy and Environment (EMC).

ABOUT THE METHOD

Part of the educational thinking behind this was based on giving the business leaders the opportunity to share their experiences. Participants have been given tasks such as

presenting aspects of their insight analysis. At every meeting a dialogue forum has been created to provide companies with an opportunity to exchange experiences. One clear message is that *you need to give in order to get* in order to be able to stimulate various forms of exchange.

The business leaders had to leave their day-to-day operations behind and meet other business leaders from other sectors. They were able to attend lectures, receive advice, take part in interactive exercises and share experiences regarding an issue common to all present: how to create a more reliable brand targeted at the environment.

TARGET GROUP AND AIM

The aim of Lönsammare Miljöaffärer in Halland was for companies to boost their competitive power by mapping and developing their potential and communication skills when arguing in favour of sustainability

and the environment. The target group was business leaders interested in developing a brand targeted at the environment. The aim was for the project to create at least four new posts in these companies and that everyone involved in the evaluation would describe the project as having been a support in developing their business.

ACTORS

Region Halland, the Science Park in Halmstad and the Alexanderson Institute in Varberg were in charge of the project. In total 74 companies from different sectors in Halland received an invitation to take part, and 14 of these accepted.

ORGANISATION

The project was run with the help of three specialists appointed to it, who created the content and recruited companies over a six-month period. Seen overall, two full-time posts were needed to this end. This group was reinforced by a project economist and a communications officer who were employed by the hour. A relatively large part of the budget was spent on hiring in consultants who carried out the insight analysis and ran workshops for the companies attending meetings that were included. A whole series of specialists were attached to the project.

The meetings were carried out on company premises and at conference facilities. Over a nine-month period, divided into two halves, the companies taking part were in-

vited to two private meetings with coaches and a meeting platform in the form of eight workshops.

The project was carried out on weekdays, from Tuesday to Thursday, so as not to disrupt the start and end of the working week. This structure meant that every other meeting took up a whole day from 8 am to 4 pm, while the meetings they alternated with lasted from lunchtime until lunchtime the following day with an overnight stay included. The work structure meant that two to three representatives from each company, together with their coaches, carried out an insight analysis of the company's image, current situation and vision of its goals. This analysis helped the business leaders see the customer's perspective and in that way see their own company from both within and without – and in this case they did so through the eyes of experts in the areas of design, branding and environmental work.

The analysis was followed by one workshop per company together with the project

team. The companies explained what they had found out on the basis of the analysis and how they viewed their business from the inside from the shared perspective of the environment and sustainability.

The final stage involved eight workshops at which each company was represented by a minimum of two individuals. During the workshops, experts gave talks on their particular fields and dialogue took place among the business leaders. Focus lay on the collective elements in the method when the whole group was assembled, and this was begun with inspirational lectures and followed by dialogue and reflection on the part of the participants on areas that could be changed. Experience showed that in order to create a dynamic in a group there should be a minimum of eight companies with two individuals from each one. The team appreciated the fact that not more than 15 companies should take part in order to preserve the dynamic in the group as a whole. There were other elements too whereby the

participants, two from each company, drew up possible measures for their own company.

The layout of the first half, which included an insight analysis, a meeting with a coach and four workshops, was repeated in the second half. At the final meeting the companies presented their action plans and received support from the other companies for the changes they would now be making on returning home.

FUNDING

The budget totalled SEK 3,000,000, of which 50 percent came from the Swedish Agency for Economic and Regional Growth, 30 percent from Region Halland, 10 percent from the Alexanderson Institute, and 10 percent from Science Park. In addition to this there was a small participation fee charged to all 14 companies plus the participants' working hours totalling approx 140 hours per company.

RESULTS

All the companies made changes in the area of communication in general and in environmental matters in particular. One company started up in a new business area directly linked to the project, and took on four new employees. Several companies began involving their staff in different aspects of environmental work and appointed them as ambassadors for the new company profile. Another company, having attended the Lönsammare Miljöaffärer workshops, changed its self-

FIRST HALF

1. Start-up meeting
2. Insight analysis 1
3. Target group and profiling
4. Customer meeting
5. Core value to vision

SECOND HALF

1. Product and service
2. Insight analysis 2
3. One's own environmental work
4. Brand name and ecotypes
5. Action plans

image and method of communication from those of an engineering company to those of an environmental technology company.

Yet another company underwent a three-year period of change, carried out in stages, in the areas of communication, branding, graphic profile and range of services. As a result of the project, this company has increased its customer base and expanded on an annual basis, exceeding its expectations as a result.

PUBLICITY

The idea behind this project has spread to Västra Götaland in the form of 'Ecoprenör', run by Innovatum, and to Jönköping County in the form of 'Det gröna affärssprånget', run by Design Region Sweden on behalf of Almi Business Partners.

FUTURE PLANS

A fresh look is now required for producing a new version of the project, since a clear demand for this has been expressed by companies and trade and industry developers since the first one came to an end.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

The method helps bring about a green shift by providing companies with an analysis of their current situation and by supporting a process of change whereby the companies first put their internal affairs in order and then incorporate these changes through-

out their organisation. A later phase involves improvements being made in their product/service that can later be communicated externally too. In this way the company becomes involved in a green shift on several levels. The participating companies' carbon reductions and reduced energy consumption are a direct effect of the project. The project has also resulted in companies replacing their company cars with biogas cars; this is one way for a company to advertise the fact that it is seeking solutions based on biogas. Another company is highlighting its use of non-toxic clean-up methods as something it had done only on a modest scale prior to the project.

APPLICABILITY IN OTHER REGIONS

The idea behind Lösammare Miljöaffärer can be passed on to other municipalities and regions wishing to focus more on the competitive power of trade and industry in bringing about a green shift. The experiences and expertise gained from projects such as that in Halland can be made available.

In the same way that the experiences of the first project in Halland were passed on to different sectors and four different municipalities in Halland, the experiences in Norway and Denmark could reinforce this method and its results by carrying out similar projects in future.



RETHINK BUSINESS

DEVELOPMENT CENTRE UMT

We live in a time when an increasing number of people who are making ever greater demands regarding their standard of living is putting greater pressure on raw materials and the earth's resources. The result of this is that our already limited resources are being depleted even further and that mountains of waste are piling up.

Rethink Business is a pioneering Danish initiative that has taken the lead in sparking the revolution needed for tackling the challenges regarding resources and the problems regarding the environment. By focusing on development and sustainability, Rethink Business is showing us how a circular economy can generate innovation, new growth, new jobs and added value for society as a whole.

Denmark is a master of innovation, and it needs to be able both now and in the future to export its knowledge to the rest of the world. A transition to the circular economy requires a new industrial revolution. A revolution created by business, industry, public authorities, organisations, non-state organisations, educational institutions, politicians and individuals all demonstrating their commitment and working together to boost the Danish economy for the future and make Denmark a role model for the rest of the world.

BACKGROUND AND SETTING-UP PROCESS

Central Denmark Region in Denmark has known for a number of years how companies can be supported in their transition to new business models that are based on a circular economy for creating growth. A survey of 500 of the Region's business leaders shows that many were aware of the need to adapt to smart and sustainable growth, but few had the capacity to meet the new market conditions and legal requirements making such a transition difficult.

The Central Denmark Growth Forum went a step further and looked at the way the circular business model can boost the innovation capability, production and competitive power of companies. The result was a three-year collaboration between Rethink Business, companies and municipalities, at the heart of which was the thinking behind the circular economy. This vision is to make Denmark the first country in the world to

achieve the goal of a circular economy by solving the challenges of the future in a sustainable and innovative way.

TARGET GROUP

Development Centre UMC is focused on nurturing enterprise in the furniture, textiles, fashion and lifestyle sectors, while enjoying close links with research.

The Centre was established 13 years ago and is the first development centre to report directly to the Danish government. A total of 10 parties own the Centre, of which seven are R&I and three are expert organisations, and which have employees in Herning and Copenhagen whose focus is on exports over products. Meetings are arranged several times a year for the purposes of dialogue and identifying future trends. Many hold a dialogue every year with companies throughout Denmark, and 300 companies are involved in the project on an annual basis.

The aim is to help boost the number of innovative companies that create viable projects and goods which will be in increasing demand on the global market too. Rethink Business will help bring about an internationalisation of Danish companies, and help improve conditions for small and medium-sized companies and equip them to solve the challenges they will face on the road ahead for creating the economy of the future.

Rethink Business aims to create growth and new workplaces as well as new business models that can, when combined, boost

green development at regional and national level – and this includes providing a boost to international parties. Within the course of only one year, Rethink Business will lead the way in ensuring Denmark's transition to circular economy. The goal is to involve 40 companies, grass-roots movements and politicians in this process of transition.

TARGET GROUP

Small and medium-sized enterprises (with a maximum of 250 employees), municipalities and users of goods and services.

ACTORS

Rethink Business was created on the initiative of Central Denmark Region, and Development Centre UNT is carrying out the project. The project has received funding from Central Denmark Region, the Growth Forum and the European Regional Development Fund. The project is a collaboration between the actors listed below:

- CradlePeople Denmark, support and sparring partner.
- Innonet Lifestyle – Interior & Clothing, skills development and training.
- Cradle to Cradle Denmark/EPEA Copenhagen, support and sparring partner.
- Municipal Liaison Committee for Central Denmark Region, sparring partner.

- The University of Southern Denmark, Sønderborg, skills development and training.
- Aalborg University Copenhagen, skills development and training.
- VIA University College, skills development and training.
- The Dania Academy of Higher Education, skills development and training.
- Væksthus Midtjylland (Business Development Centre Central Denmark), support and sparring partner.
- Innovationsagerterne, support and sparring partner.
- Ellen McArthur Foundation, England, support and sparring partner.
- EPEA Hamburg, Germany, support and sparring partner.
- The C2C ExpoLab Foundation, The Netherlands, support and sparring partner.

ORGANISATION

The consultancy firms *COWI* and *Væksthus Midtjylland* meet up with the companies in the form of on-site visits to review their circumstances and conditions. Group meetings are hosted by the companies or else held

on municipal premises, with 4–6 companies per group.

The survey done to identify these companies is based on a search for companies via the Internet and other networks. The relevant businesses are contacted by email and thereafter by telephone in order to introduce them to Rethink Business and hear if they are interested. The final stage of the survey involves paying the company a visit and holding a dialogue with management or key employees regarding that company's interest/motivation and ability to take part in the project. A couple of premises might be that the company is in manufacturing and has the resources to take part in the project, or that it has fewer than 250 employees. Thereafter a specially produced review document is used that has been drawn up by Rethink Business themselves.

A total of 140 companies are contacted and asked if they are interested in taking part in Rethink Business. Four review documents are then sent out to collaboration partners who decide on which should work with the company.

The organisation has carried out a review of 40 companies, which is the purpose of its activities, but not all want to or are able to proceed since a few of them are not capable of making the transition. The goal has been to involve three municipalities, and five municipalities in all have become involved.

Denmark's transition to a circular economy is following the four stages in this model.

The aim of Rethink Business is to create growth and new workplaces and also new business models that when used in combination can boost green development at regional and national level.

Make it known

In order to bring about change it is essential that all the regions, politicians, municipalities, companies, schools and universities take part in Rethink Business' activities and help spread the word about Denmark making the transition to a circular economy.

Create demand

Demand is the key to change. It is therefore a matter of creating demand for products and services that are based on the principles of the circular economy. The principles of the circular economy are good business for public-sector institutions, companies and users, and by jointly creating demand the market can be changed. The bigger the demand, the bigger the carrot offered to companies, and the more quickly the change to a circular economy can be realised.

The agenda for the municipalities carrying out projects under Rethink Business is that they, together with local trade and industry, try to create demand for products and solutions that are based on the circular economy. A couple of examples are Skive Municipality and Herning Municipality.

Draw up action plans

Companies and municipal authorities draw up action plans to redesign production and services so that the absolute minimum or nothing at all goes to waste. Central Denmark Region has already taken the lead and provides businesses and municipal authori-

ties in the region advice and assistance free of charge for drawing up action plans and carrying out collaboration projects.

Establishing new constellations

Companies, public-sector institutions and users must find a totally new way of working together if the common goal is to think through what the companies of the future will look like and what their relationship with organisations and users will be. By creating non-traditional constellations that favour all parties we will be able to maintain our levels of energy consumption.

Each company that cooperates with others receives 140 hours of consultancy services to review its operations and receive suggestions as to how these can be adapted to a circular economy. This work is carried out by the company itself together with the consultancy firms COWI and Cradle2Cradle Denmark. At the start, two workshops are held for the participants. Also at the start, 6–8 companies meet as a group and are then offered individual support.

Each company undergoes training that involves producing tools, good examples etc that are used by the University and the two other organisations mentioned above.

Demonstration cases can then serve as examples for other companies and municipal authorities.

RESULTS

The Rethink Business project has generally been seen by the companies taking part to have had a positive outcome. Most of the companies are interested in a green shift, but not all of them know what is required of them, and not all of them have the resources to make this transition.

One example of this is a survey being done by Rethink Business of 52 companies. Thirteen of these have pulled out of the project over the years, and five are taking a break because of lack of time and too few resources to take part in it. The organisations taking part have all felt the outcome was a positive one on completing the Rethink Business project.

The results for all the companies are documented on www.rethinkbusiness.dk

FUTURE PLANS

Within a year the project will mobilise over 1,000 individuals and 100 companies, non-governmental organisations and politicians.

The Rethink Business project will come

to an end in December 2014. It is still not clear whether it will continue in a new shape and form

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

It is still too early to say anything about the full effects of this project. UMT has not come sufficiently far in the project to be able to show in detail how much the companies have saved in terms of resources and materials by taking part in Rethink Business. Below are a number of case studies that provide a snapshot of the way the companies perceive their work and the effects of a green shift.

Eurotag's participation in Rethink Business has meant that up to 60 tonnes of ready-cut roofing felt have now been collected and are being used as a resource in the production of new rolls of roofing felt.

For the two-man company Workform, participation in Rethink Business has proven valuable in terms of design and the production of greener furniture and furnishings. And, as a positive side effect, its management has gone from strength to strength in terms of its business clout – and what this means for the company's future operations.

Gardin Lis Aps is a supplier of blinds and awnings to private individuals, institutions and companies. Gardin Lis would, in the long-term, like to see returned all the different kinds of blinds and awnings for them to re-use or recycle, and to reap the maximum value where possible. This would be done

via a plan for retrieval of their own or by collaborating with others in the textile industry.

One of the companies participating in Rethink Business is Advance Nonwoven, which has developed a power plant that can produce "non-woven" carpeting manufactured from recycled fibres or granular material. Both kinds of raw material are the residues created by natural materials such as wood, flax and hemp and also waste products such as mineral wool and polyester.

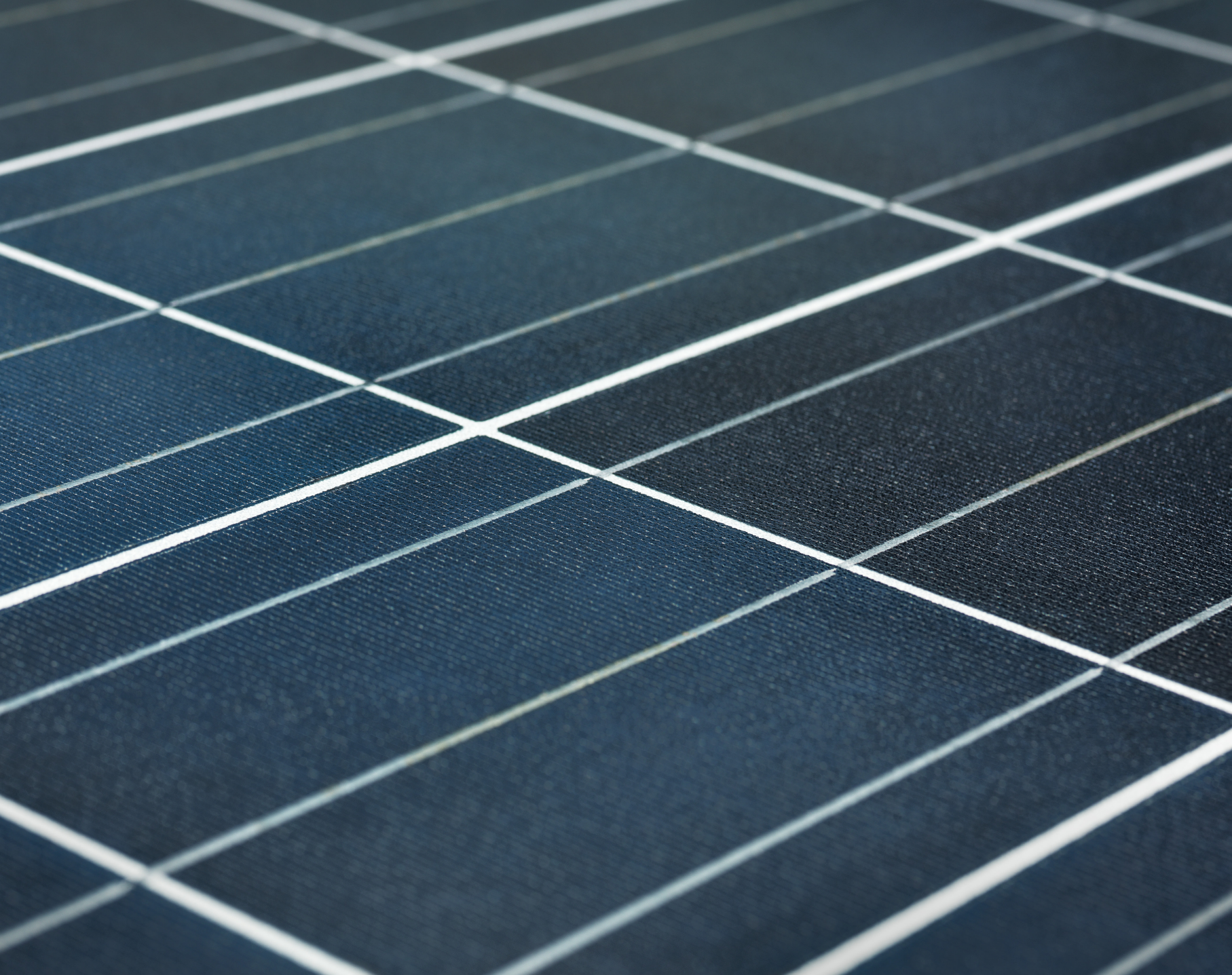
APPLICABILITY IN OTHER REGIONS

The method is of a general nature and should be able to be applied without problem in other regions within the ÖKS area. Thought should be given as to how to hire external consultants – in this case COWI – so as not to circumvent the various rules on procurement. Furthermore, involving a university or higher education department in the area of industrial design can be a strength, especially when this is to help SME's who do not have their own design department.

DOCUMENTATION

Further information and documentation are available on the website:

www.rethinkbusiness.dk



GREEN INNOVATION

There is a substantial and untapped potential for green innovations on the market. There is a huge demand for both products and services that are green, sustainable and climate-smart. Stimulating the further development of green innovation and lowering the thresholds for these innovations to launch them on the market are an urgent matter for both the public and private sectors. By targeting investment where it is needed, there are no end of opportunities to pave the way for a future full of green innovations.

In order for a green shift to succeed, we need to revise our way of thinking and acting on many points. Change is what is required, and we must have the courage to do things differently to the way they have been done before. What is required is green and sustainable innovation. To bring about a green shift, green and sustainable innovation has a key role to play. Environmentally friendly goods, climate-smart services, sustainable organisations and green processes are just some examples of areas where green innovation has boundless potential for development.

Green innovation is facing a number of challenges today. And we must join forces if we are to facilitate and create the opportunities for these innovations to develop at a faster pace and help accelerate a green shift in society. Stimulating an ever greater demand, organising innovation competitions, matching supply with demand, making it easier for trial products to get on the market and offering joint funding for research and

development are just some of the ways in which public and private-sector actors can help. Procurement of green innovation is another important investment we need to see more of on the part of public-sector actors in the future.

In order to inspire and suggest methods of how to go about stimulating green innovation, we are devoting this section to highlighting three initiatives started up by actors from various parts of Sweden with the aim of helping to bring about a green shift. The Green Innovation Contest is an innovation competition arranged by Innovatum AB in Trollhättan. The competition is aimed at giving exposure to sustainable environmental innovations and helping these innovations to be launched on the market more quickly. Test Beds for Sustainability is an initiative taken by the Sustainable Business Hub network in Southern Sweden. This initiative matches up new environmental innovations requiring testing with a customer who is prepared to try out the product, thus providing an op-

portunity for new and untested products to come on to the market. Another initiative that has been taken by Sustainable Business Hub is Innovation Process. This is an initiative that brings together public-sector actors, private-sector businesses and universities to discuss the challenges faced by the city and to identify examples of innovation and new products that can help solve these challenges.



GREEN INNOVATION CONTEST

INNOVATUM AB

The Green Innovation Contest is primarily a national collaboration platform for attracting new examples of environmental innovation and making this known to contacts with access to the right nodes, investors, trade and industry and other actors. Innovation and market demand are at the heart of turning new sustainable innovations into business-making ventures on an international market.

The project will continue during 2014 and 2015, and will include two competition rounds. The competition is carried out in collaboration with national or regional innovation and business support organisations.

BACKGROUND AND SETTING-UP PROCESS

The aim of the competition is to help achieve long-term and sustainable growth at regional and national level. This will be achieved through the exposure given by the competition to environmental innovations and will be a source of learning and inspiration for innovators, the public-sector innovation system and the trade and industry sector in Sweden. All this is to ensure that environmental innovations will be turned into Swedish competitive power in the fields of energy and environmental technology in new and existing companies.

The Green Innovation Contest takes a long-term view of an innovation's potential. One aim is to teach the competitors to develop and demonstrate the full potential of their innovations, whereby the application form is treated as a CV for the innovation to which it applies. The innovator thus also learns to see which aspects of the innovation are needed for both its development and the skills needed to apply it.

The Green Innovation Contest has a channelling function whereby competing innovators receive help in finding the right support based on placement, cutting-edge skills, targeting and contact networks as is needed for their innovation.

Market exposure is an important factor in reaching valuable contacts. Using the website as a communication platform, the competition gives exposure to environmental innovations and helps ensure that contacts are made

between potential collaboration partners, financial backers and/or customers.

To this end, the competition will help bring about greater cooperation in transferring knowledge between local, regional and national support organisations for innovation and business development, and will make apparent the opportunities offered by the national innovation system to both innovators and the existing trade and industry sector.

ABOUT THE METHOD

The overriding aim of the competition is to help create the conditions for sustainable energy and environment-related welfare for future generations. It is to provide support, begin work on verification and draw attention to Sweden's most interesting environmental innovations and to set up qualitative meetings between environmental innovators and potential customers for greater commercialisation. It is also to serve as a teaching process as regards verification and coaching, and thus establish cooperation and knowledge transfer between local, regional and national support organisations for innovation and business development.

The competition should highlight the opportunities presented by the national innovation system for the actors involved and help establish cooperation and knowledge transfer between local, regional and national support organisations for innovation and business development.

TARGET GROUP

The competition is aimed at private individuals, small businesses and academia in Sweden that have a sustainable environmental innovation ripe for development as a product or service for the market.

ORGANISATION

The competition is held by Innovatum AB in Trollhättan, the project owner, in cooperation with other innovation support organisations that have cutting-edge skills in environmental issues and sustainability throughout Sweden.

Between 1 April and 11 July, innovators from all over Sweden are able to submit their entries. After the summer, a preparatory group assesses the entries submitted complete with research findings and interviews in order to prepare for and provide the jury with supporting material and views. In October, the jury nominates the environmental innovations submitted that have the greatest business and environmental potential. These will then be the designated prize-winners. There can be several prize-winners, and they can come from many different areas.

The questions in the application are formulated to serve as a simple verification of the innovation, and this is supplemented with learning material. After the competition, the innovators can continue using the learning material and working on their innovation with reference to the application form. During this phase, moreover, the competitors gain more knowledge about suitable innovation nodes

that could provide support going forward. Follow-up of the prize-winners takes place on an ongoing basis after the prize-giving until the start of the next competition round.

FUNDING

Innovatum AB in Trollhättan is the project owner, which receives financial backing from the Swedish Energy Agency, the Swedish Agency for Economic and Regional Growth and Västra Götaland Region.

RESULTS

In 2012 Innovatum initiated the first round of the Green Innovation Contest. This has resulted in the innovators taking part acquiring new points of interface and now taking their work forward in collaboration with holding companies, customers and collaboration partners. The competition was also a success in several respects, and it more than achieved its goals. Furthermore, it attracted plenty of attention from public authorities, companies, organisations, investors and innovators.

PUBLICITY

The project is mainly given publicity on its website www.greeninnovationcontest.se, this being a communication platform for the national support system, innovators, interested parties, customers, financial backers and collaboration partners. Presented here are both the innovators taking part and organisations in the fields of innovation and business de-

velopment. Other channels/methods used are:

- A press room for publishing major news stories and press announcements.
- Social media such as Twitter and Facebook.
- A newsletter sent out to registered followers.
- Networking whereby the project organisation makes use of face-to-face meetings with the aim of creating long-term relationships.

FUTURE PLANS

The aim is make the Green Innovation Contest a permanent and regular event.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

The method helps in a general way to bring about a green shift by stimulating and encouraging green innovation. The method also helps more specifically to bring about a green shift in that the competition is a platform for innovative products. Examples of the 2013 entries include one innovation that enables the recycling of water from industrial flue gases, a highly effective converter for solar power plants, and new and efficient small-scale wind farms.

APPLICABILITY IN OTHER REGIONS

The project is a national one and includes all of Sweden's regions. The concept has a great potential for spreading elsewhere, and similar activities could well be carried out in other regions and countries too.

DOCUMENTATION

Further information and documentation are available on the websites:

www.greeninnovationcontest.se

www.innovatum.se



TEST BEDS FOR SUSTAINABILITY

SUSTAINABLE BUSINESS HUB

By testing new products directly on a target group, companies can both establish new business relationships, identify any teething problems associated with the product, and acquire reference assignments for creating new business. Furthermore, the method helps bring about a green shift since the process puts the innovator in touch with environmental technology companies that possess new green solutions adapted for the future.

BACKGROUND AND SETTING-UP PROCESS

Sustainable Business Hub Skåne is a network that helps companies addressing environmental and energy issues to increase their competitive power and develop their business within Sweden and on the export market. In 2008 some of the organisation's member companies expressed a need to be able to test their products on potential end customers. The aim was partly to see if the product had any teething problems and partly to create references for use in discussion with new customers. In brief, the method serves to broker and help companies launch their new products by testing them on customers in the region.

ABOUT THE METHOD

The first step when a company asks to have its product tested is to find out what kind

of product it is and investigate what kind of end customer would potentially consider acting as a Test Bed. Often the company taking the initiative has its own vision of a desirable placement for the product, and this idea is then further developed together with Sustainable Business Hub in order to make a good match and carry this out.

The next step consists of making contact with the company or organisation where the product is to be tested so as to agree on the conditions for the Test Bed. This often involves negotiation between the two parties to find a solution satisfactory to everyone.

TARGET GROUP

The method can be applied in both large and small companies. It is often newly set-up companies that ask for support when they need to obtain references for establishing themselves on the market.

ACTORS

Sustainable Business Hub

ORGANISATION

1–2 employees from Sustainable Business Hub are matched up with the company wishing to test its product on the basis of these employees' previous areas of knowledge, competence and networks. Sustainable Business Hub's chief responsibility is to identify a Test Bed host. The company will normally be represented by its chief executive and head of development, who are responsible for their product and ensuring it is as workable as possible for the customer.

FUNDING

Each case is unique, but the underlying principle is that the funding is based on matching supply with demand; the differences between each project in terms of responsibility and cost distribution are therefore considerable. It is up to each company to negotiate with its municipality the conditions applying to the Test Bed they wish to use. The normal scenario is for the cost of the product to be met by the company while the municipality funds any additional work.

RESULTS

Companies are as a rule very much in favour of the method. Municipal authorities and other customers too regard the method as having many advantages in relation to the costs that arise from testing untried products. One

good example is the newly started, small-sized company Knycer, which successfully launched its energy-saving drying cabinet in Malmö Municipality after using a Test Bed.

PUBLICITY

Sustainable Business Hub disseminates information via its network and also most often at the meetings arranged, in newsletters and any special forms of communication made relating to this area.

FUTURE PLANS

The method is still in its infancy but there is the will to develop it. Plans are in place to collaborate with actors in Denmark and thus make it possible to invite companies to try out their products on Test Beds in both Sweden and Denmark.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

All products designed by the member companies are more environmentally friendly than those currently used on the market, since the method is aimed at a speedier launching of new environmental technology products on the market. There are, however, several products that are hard to persuade municipal authorities to want to test, especially if these are expensive or complicated and difficult to place.

APPLICABILITY IN OTHER REGIONS

Dialogue is ongoing to apply the Test Bed set-up in the entire Öresund region.

DOCUMENTATION

Further information and documentation are available on the website: www.sbhub.se



INNOVATION PROCESSES

SUSTAINABLE BUSINESS HUB

The idea behind Innovation Processes is to bring problem owners together with those who can potentially provide parts of the solution. The process is there to hammer out real problems and find potential solutions. The basis for using the method is, in part, that there is a relevant problem to address, but also of importance is to have knowledge available and companies in the region who could be part of the solution.

BACKGROUND AND SETTING-UP PROCESS

This method has drawn on the experiences of other methods developed by Sustainable Business Hub. Innovation Processes is, unlike other methods applied under Sustainable Business Hub, very much rooted in the public sector; that is to say, it is the towns and cities that are the problem owners. Sustainable Business Hub has worked on modified variants of this method over a couple of years.

ABOUT THE METHOD

Together with public-sector actors, companies and universities, members of Sustainable Business Hub get together to discuss the challenges faced by a town or city. This is the basis on which a number of areas are identified where the conditions exist for creating new products that are not on the market at present. These products are the com-

mon focal point for companies, purchasers etc and undergo a kind of challenge-driven innovation process. All the actors involved need to understand the potential and problems that exist, and an important part of this process is for all the actors to recognise the opportunities offered through collaboration on all sides. Sustainable Business Hub's contribution is to process solutions for both sub-areas and products.

The method is based on creating demand on the market. Demand for these processes exists and is on the rise. One problem with the method is that much work needs to be done if everyone is to set aside the time required for enabling the work to go ahead.

TARGET GROUP

Companies, universities and public-sector actors, with the aim of launching new and innovative environmental technology products on the market.

ACTORS

The method is being applied in Skåne, Sweden, where 33 of the region's 49 municipalities are taking part. The method is currently under discussion and is being compared with the method in Copenhagen which is constructed in a similar way.

Sustainable Business Hub is working to create 2–3 sub-areas during year one.

ORGANISATION

Discussion at the first meeting between public-sector actors, companies and universities is focused on challenges. Together they raise a number of areas where the conditions exist for creating new products for the market. Having decided on which product is in demand, contact is then made with companies, purchasers etc who are knowledgeable about the relevant area so they are able to develop and carry out an innovation process together.

The innovation process, seen in more detail, is based on bringing together the relevant actors to discuss the future challenges facing sustainable towns and cities and on persuading these actors to join forces to address a number of sub-areas that they feel offer the best conditions. A sifting out is then needed of individual products that might solve a number of these challenges and form the basis for developing these products.

The challenges arising from the innovation process are at the same time broken down to form concrete products that are also tested from a business perspective.

FUNDING

The financial backers for the method are Vinova, Region Skåne, members of Sustainable Business Hub and other partners from both the public and private sectors. Sustainable Business Hub contributes a small share that funds the matching of supply with demand. Later on in the process is a phase that is individually tailored to the product to be launched. Funding of this later phase may be used, for example, to submit an application to the sector programme Horizon 2020.

RESULTS

This is the process used today for examining water sensors and low-temperature district heating etc. The process depends on there being a clear opportunity for commercialisation.

All the parties are in favour of cooperating in this process, and much activity is taking place in the network. What remains is to finish processing the first real products and to set up the funding for this phase. However, the effects have not yet been gauged.

PUBLICITY

Sustainable Business Hub disseminates information about Innovation Processes and its other methods through its contacts with companies. Dissemination takes place by way of the meetings it arranges, its regular newsletters and the special efforts it makes in this area.

FUTURE PLANS

The aim is to expand into a full-scale project with a budget of approximately SEK 10 million a year. The aim is also to put in place a process that is the same on both sides of Öresund; that is to say, in Skåne and Copenhagen.

APPLICABILITY IN OTHER REGIONS

The method has the potential to be applied in other regions, and Sustainable Business Hub now has the goal of ensuring it will be incorporated into a method used throughout the Öresund area.

DOCUMENTATION

Further information and documentation are available on the website: www.sbhub.se



RESOURCE EFFICIENCY

No one can do everything, but everyone can do something. In seeking to bring about a green shift, every organisation and individual has a great opportunity – and a great responsibility – to help bring about a greener society. How well we make use of the limited supply of natural resources is crucial to how well we succeed in bringing about a green shift. Improved resource efficiency and sustainable recycling are two of the biggest and most important challenges to address in seeking to bring about a green shift. These two challenges are especially exciting because they give private individuals and individual actors great opportunities for pushing the green shift in the right direction, even if only with limited means.

Improved resource efficiency and sustainable recycling are all about creating sustainable consumption. To do this, we must all play our part. Private individuals and individual public and private-sector organisations alike are responsible for making greater efficiencies in their consumption of natural resources and for ensuring the sustainable recycling of that consumed.

Investment in improved resource efficiency and improved recycling is more about knowledge input and less about economic investment. Small means can make a big difference. Since investment in improved resource efficiency means doing away with over-consumption, this helps create not only a greener world but also financial savings for the individuals and organisations taking on the challenge. Increasing awareness on the part of individuals and organisations of meeting the challenge by improving resource efficiency, and providing

knowledge and inspiration as to how this can be done, is a necessary measure for succeeding in bringing about a green shift. Essential measures for stimulating improved resource efficiency and improved recycling include providing inspiration in the form of showing good examples and matching those individuals and organisations interested with the right knowledge and methods. For those who have become conscious of their own consumption of resources and are interested in improving their resource efficiency, finding the right knowledge, methods and tools to achieve this must be made easy and readily available.

This section presents an innovative and exciting method for improved resource efficiency and sustainable recycling that was tested in Denmark in 2013. The project is called Nulskrald (Zero Waste), and has been developed by Affaldsselskabet Vendsyssel Vest (AVV) in Hjørring and Brønderslev in

Denmark. The project aims to give advice and support to individuals who want to achieve greater resource efficiency and become better at recycling. The highly successful outcome of the project helped the individuals taking part to reduce their waste production by more than half during the period they were involved. This result is an interesting example of what can be achieved by disseminating knowledge to target groups about resource efficiency and recycling.



NULSKRALD (ZERO WASTE)

AFFALDSSELSKABET

VENDSYSSEL VEST (AVV)

The Nulskrald (Zero Waste) organisation believes that the behaviour of each individual is the key to change. If less waste is to be produced, every consumer must change his or her own behaviour. There is plenty of good advice available telling people what they need to do to protect the environment. Nulskrald takes a different approach. It starts at home with the consumer. Nulskrald examines how each household can produce minimal amounts of waste.

Nulskrald invites consumers to work towards a common goal, with the aim of minimising waste production. The goal is encapsulated in the term "to nulskraldise". How to achieve this goal is up to each consumer. In this way systems are developed that can be used by others. Nulskrald has thus been developed by members of society who wish to bring about change by being proactive.

BACKGROUND AND SETTING-UP PROCESS

The idea for Nulskrald started out as a pilot study at the beginning of 2013, when all the households affected in Hjørring and Brønderslev municipalities were invited to take part. The idea was created in collaboration with the waste management company AVV and the communications agency

Tankegang. Both parties wanted to have a greater insight into what motivates people to manage waste as a resource and to see the results of consumption.

Over a hundred families volunteered to take part in the Nulskrald pilot project, which meant that for five weeks they sought to generate as little waste as possible to minimise the amount of waste for incinerating. The four changes made as part of the project were more efficient sorting of one's own waste, generating more compost at home, avoiding the production of food waste and shopping sensibly. The aim was to bring together people's experiences and in this way gain an insight into future solutions for managing waste. Nulskrald was an open process whereby the inhabitants and everyone else shared their experiences and ideas on the way.

ABOUT THE METHOD

Nulskrald's fundamental approach is to allow the inhabitants themselves to decide what to do and offer them the assistance and equipment available and needed by them. Nulskrald also has to be very proactive in communicating with the public, the press and other interested parties. Last but not least, the outcome of the efforts made has to be measured. The aim of the collaboration between the parties is to influence people's attitudes so that those living in North Jutland in Denmark generate less waste and make more efficient use of waste resources.

Students and researchers from Aalborg University followed Nulskrald's progress during this experiment and carried out surveys and in-depth interviews with a small number of the participants. Two project teams from the University drafted a report.

TARGET GROUP

The project is currently aimed at the inhabitants in Hjørring and Brønderslev municipalities and is also intended to be carried out in schools, housing associations and companies, as well as by enthusiasts and the majority of Denmark's inhabitants.

ACTORS

Nulskrald is a collaboration between the waste management company for Brønderslev and Hjørring (AVV), Aalborg University, Thinking A/S, Brønderslev Municipality and Hjørring Municipality.

105 families in Hjørring and Brønderslev succeeded in reducing their amount of waste by 51 percent in only 5 weeks.

ORGANISATION

The method is based on the inhabitants themselves choosing how they wish to apply it. Its underlying principle means that the way it is organised varies in each individual case. The Nulskrald organisation has been instrumental in seeking contributions to a fund for green enthusiasts. The city's green enthusiasts meet in different groups to set up Nulskrald activities together. An essential part of the organisation is its website and in particular Facebook. The Facebook website is given over discussing questions both big and small and to sharing advice. AVV also provides answers to these questions to a large extent – during weekends and holidays too. Participants in the Tversted project have also created a closed Facebook group although they also use Nulskrald's public page.

FUNDING

Nulskrald's future development will be funded by foundations, organisations and companies as well as whichever Nulskrald project is being carried out. Several other companies in waste management have shown interest in Nulskrald, and Tjæreborg near Esbjerg has been testing it out on an ongoing basis with AVV sharing its experiences.

RESULTS

Nulskrald came to an end in 2013, and the results exceeded expectations. The participating families had reduced their amount of waste by 51 percent during the five-week

period of the project. The project also encouraged the families to start thinking about how they could make better use of products and raw materials, and how they could avoid buying too many or unnecessary goods.

There was a strong will to share knowledge and experiences with others, and this serves to prove that future waste solutions must come from members of society themselves.

Up to now two projects have been launched using the Nulskrald method. In the first project, volunteers in Hjørring and Brønderslev were asked if they would like to take part. The other project is still ongoing and covers an entire city.

PUBLICITY

Nulskrald is still alive and well since the end of the pilot project, on both Facebook and Nulskrald's website. Today Nulskrald is being developed with the help of a think tank representing major companies and the research and communications sectors, but it will always be individual members of society and their suggestions that lie at the heart of this approach.

The think tank is part of a collaboration agreement with the University whereby new ideas are discussed on an informal basis. The think tank has also been the place for gathering everyone together, which means that for

over a year greater efforts have been made to develop new business models for Nulskrald and to share experiences with others.

FUTURE PLANS

The most recent initiative has been to create Denmark's first Nulskrald Rural Community in Tversted. Affaldsselskabet Vendsyssel Vest (AVV) has secured DKK 345,000 for the Green Enthusiasts Fund in order to complete a one-year study in Tversted. The money will be used to start up different activities in collaboration with Tversted, its inhabitants, the commercial sector, citizens' groups, the cultural sector, schools etc.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

The project will help bring about a green shift in several stages. First and foremost, the project will help raise awareness of the problem of over-consumption and waste production on the part of private individuals and organisations. In the long term, this will mean the project can help reduce waste production considerably and improve resource efficiency in those places where the project has been carried out.

APPLICABILITY IN OTHER REGIONS

The Nulskrald approach can easily be trans-

ferred to other regions. Involving members of society and focusing attention on the individual's efforts and opportunities are measures that can thus far be applied anywhere. The opportunities and capacities in waste management at local level will for their part differ, and this might affect the separation of waste, such as which kinds of waste are sent for recycling. It would in this case be relatively easy to adapt Nulskrald to prevailing circumstances.

DOCUMENTATION

Further information and documentation are available on the website: nulskrald.dk



ENVIRONMENTAL CALCULATIONS

An important tool for planning and following up the climate and environmental impact of actors is the use of measuring instruments and mapping. Measuring factors such as climate gas emissions, energy consumption and resource efficiency creates an awareness of where these actors' biggest climate and environmental challenges lie. A well-documented background and insight analysis simplifies the planning and follow-up of strategic and effective efforts to bring about a green shift. An environmental calculation also provides measurable results that can be used to show the green progress made by an organisation.

A green shift in society requires measures being made on several fronts at the same time. Not infrequently, the green shift appears to be a challenge so huge that identifying where an organisation should make a start can be tricky. A good starting point, therefore, for all actors who are set on achieving a green shift is to make use of Environmental calculations and measuring instruments of different kinds. With the aid of measuring instruments and mapping, an organisation can identify the biggest challenges and also point out those areas most in need of the resources for achieving a green shift.

Environmental calculation is also an essential tool for creating measurable results in one's environmental work. The most important – and perhaps also the most common – reason for using Environmental calculations in an organisation is precisely because it provides measurable results that can be used for further developing the organisation and

enabling it to measure itself against other organisations. A further advantage of using Environmental calculations is that it is something that both public and private-sector actors can present to the outside world for reinforcing their organisation's brand.

There is an abundance of different kinds of environmental calculations and measuring instruments for measuring environmental work within an organisation. This includes everything from the well-known measuring instruments used globally, such as ISO standards and the Greenhouse Gas Protocol (GHG Protocol), to more or less niche-market measuring instruments from different kinds of local and global environmental networks. Organisations have different needs, and which measuring instrument is best suited differs depending on the kind of environmental work to be measured.

This section presents methods for the way three different organisations have chosen to carry out their environmental work using

Environmental calculations and measuring instruments to making this work more effective. Arendal Municipality in Norway is addressing the climate question in a purposeful and goal-oriented way in order to reduce its climate gas emissions. To this end, it is making use of methods that include the Climate Neutral City Administration and the Global Protocol for Climate Gas Emissions in Cities and Municipalities, which are presented here. Also presented here are the Energy Management System, a method promoted by Hållbar utveckling Väst which is the regional energy agency of West Sweden, and the GHG Protocol/CEMASys, a method promoted by Climate Partners in Agder, Norway.



CLIMATE-NEUTRAL CITY ADMINISTRATION ARENDAL MUNICIPALITY

In 2008, Arendal Municipal Authority took the unanimous decision that its municipal administration should be made climate-neutral in line with the UN definition. Climate neutrality has been an important method for reducing the Municipality's greenhouse gas emissions.

The aim is to reduce emissions by 90 percent up to 2017, 2007 being the base year. By 2013 emissions had been reduced by 78 percent. The efforts to achieve climate neutrality in Arendal has attracted a lot of interest and attention both in and outside Norway. Aust-Agder County Council took the decision to become a climate-neutral administration in 2009. A number of companies in Agder and Norway have decided to become climate-neutral using the same method.

BACKGROUND AND SETTING-UP PROCESS

In August 2007, the UN Environmental Programme arranged a meeting on climate neutrality at the GRID Centre in Arendal. The Chairperson of Arendal Municipality, Torill Rolstad Larsen, was at the meeting and suggested that Arendal should be the first city in Norway to be run on a climate-neutral basis in line with the UN definition.

After she had met the UN Environmental Programme representatives, an investigation was carried out into whether Arendal could become the first municipality in Norway to be run on climate-neutral lines, what this would mean for the Municipality's greenhouse gas emissions and its environmental and climate profile, which activities should be started up, and what the cost would be.

The decision that climate neutrality should be a part of Arendal's action plan on energy and climate was adopted unanimously, first by the Culture, Environment and Trade and Industry Committee, and then by the Municipal Board in 2008.

This goal was set out in a presentation of the facts to the Municipal Board as follows: Arendal Municipality would be the first climate-neutral municipality in Norway as of 2008.

- Arendal Municipality and the UN City of Arendal could cite this goal to portray themselves as a proactive and future-

oriented municipality that takes environmental and climate issues seriously. This document is available for reading in its entirety on www.arendal.no

A climate-neutral municipal administration means:

- Measuring the imprint of the municipality's greenhouse gas emissions.
- Carrying out carbon reporting.
- Taking strategic and practical measures to reduce emissions.
- The remaining emissions are offset by the purchase of certified/approved quotas.

This process is repeated on a yearly basis.

ABOUT THE METHOD

The decision to become climate-neutral is a voluntary one. According to the UN Panel on Climate Change, global emissions must be reduced by up to 80 percent by 2050 compared to pre-industrial levels if we are to limit the increase in global temperatures to 2 °C. The trend in recent times indicates that achieving this limit may be very difficult, and that the requirement regarding emission reductions must be more strictly enforced. Rural areas, urban areas, companies and private individuals choosing to become climate-

neutral and thus avoiding their contributing to greenhouse gas emissions help make this goal achievable, show that words are followed by deeds, and assume responsibility for tackling the climate threat we face.

The UN definition of climate neutrality

On World Environment Day in 2008, the UN launched a new guide to climate neutrality called "Kick the Habit". In its foreword, the UN Secretary-General Ban Ki-moon states: "The message of this book is that we are part of the solution. Whether you are an individual, a business, an organisation or a government, there are many steps you can take to reduce your climate footprint."

Below is a short description of climate neutrality as a method. It can be used by private individuals, companies, municipalities and organisations.

Companies or municipalities wishing to become climate-neutral in line with the UN definition must take this decision at the most senior level within their organisation and adhere to the cycle shown in the diagram here. The individual activities referred to in the diagram are described below.

1. Measuring one's climate footprint.

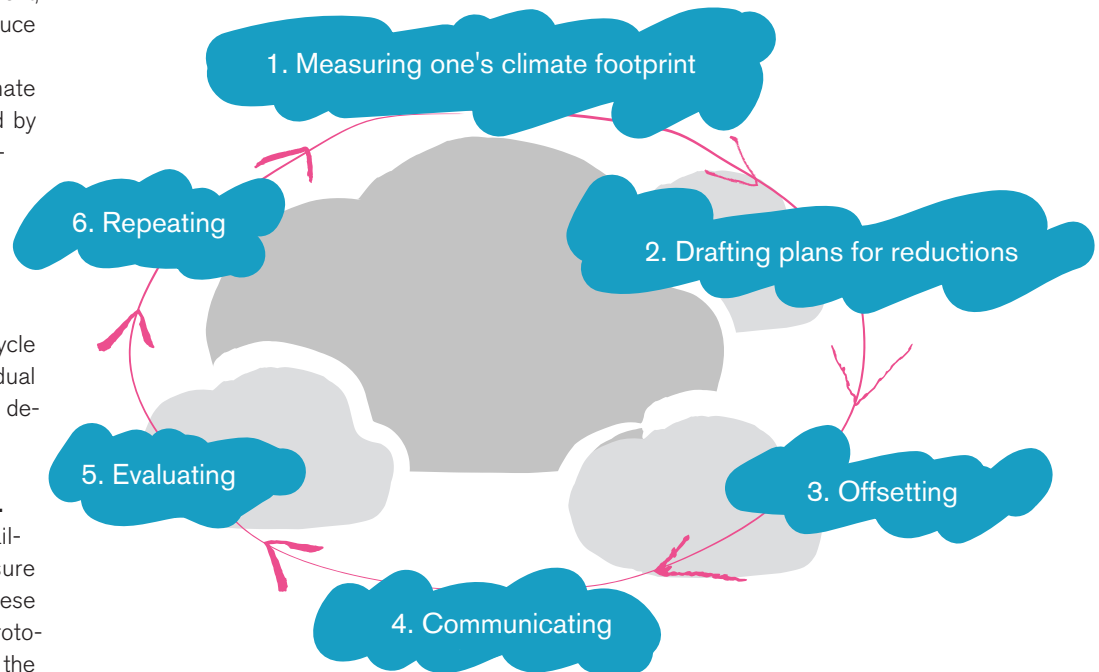
There are many calculation tools available online that can be used to measure greenhouse gas emissions. Most of these are based on the Greenhouse Gas Protocol (GHG) which has been drawn up by the

World Resources Institute and the World Business Council for Sustainable Development. This standard is recommended by the UN, and describes which measures are mandatory (Scopes 1 and 2) and which are voluntary (Scope 3). This is described in more detail on page 82.

2. Reducing the emissions produced by one's own activities.

The vast majority of businesses can reduce their greenhouse gas emissions significantly

by taking simple measures. This can be done, for example, by way of energy efficiencies, switching from fossil fuels to renewable energy, making fewer journeys thanks to the increased use of videoconferencing etc. Climate-neutral businesses must draw up plans on an annual basis to find ways of reducing greenhouse gas emissions and measuring the results in conjunction with preparing their carbon reporting for the following year.



3. Offsetting remaining emissions by purchasing climate quotas.

The emissions remaining after reductions have been made will be offset by purchasing climate quotas that will reduce emissions just as much elsewhere. There are several different options on the market regarding climate quotas. Arendal Municipality uses CDM, the UN funding mechanism for clean development.

4. Communicating

Climate-neutral businesses must serve as good role models. It is therefore essential to disseminate information in society regarding greenhouse gas emission reductions and climate neutrality.

5. Evaluating

Each year the results are evaluated in relation to the goals established the year before. The plans for reductions for the following year are drawn up and any adjusting of long-term goals made.

6. Repeating

Climate neutrality is an ongoing process. Every year new measurements are made, with further reductions in emissions and new purchases of certified climate quotas for offsetting remaining emissions.

This method also fulfils the Norwegian Consumer Ombudsman's criteria for enabling an organisation in Norway to call itself climate-neutral. The Consumer Ombuds-

man's guidelines can be read in their entirety on the website: www.forbrukerombudet.no

ACTORS

Internal actors in the Municipality are the Environmental Coordinator, Environmental Ambassador, Municipal Head, Chairperson, Vice Chair and the Municipal Board. Several municipal bodies are involved in the annual follow-up. Once a month a meeting of the so-called Environmental Ambassador's group is arranged, attended by the Chairperson, Vice Chair, Municipal Head, Planning Officer, Environmental Coordinator and Environmental Ambassador. Central to these meetings are carbon reporting and climate neutrality, with the focus on further reductions of municipal greenhouse gas emissions.

In recent times, several seminars on climate neutrality have been arranged that have been attended by all or some of the Board members.

ORGANISATION

Each year plans are drawn up to address ways of reducing greenhouse gas emissions produced by municipal activities. The results achieved are reported as part of the follow-up of Arendal Municipality's action plan on energy and climate.

Each month the Chairperson, Vice Chair, Municipal Head, Planning Officer, Environmental Coordinator and Environmental Ambassador for Arendal Municipality attend a meeting where environment and climate are

on the agenda. Decisions are taken at this meeting that do not require addressing by a committee or the Municipal Board, such as measures to reduce greenhouse gas emissions. This means that climate and the environment come high up on the management's agenda and that Arendal Municipality's climate management is run on a sound basis.

FUNDING

The implementation of plans regarding climate neutrality and the purchase of climate quotas is funded by the municipal budget. Quota prices vary depending on the type of quota, volume and type of method, such as EUA, CER and the Gold Standard. The price varies between approx NOK 20 and NOK 120 per tonne of carbon dioxide equivalents.

The price of a quota purchase in 2012 was approx NOK 50,000.

FUTURE PLANS

Climate neutrality is part of Arendal Municipality's climate and energy plan, and will be decided on by the Municipal Board in conjunction with these plans being approved. There are no plans to change this practice.

RESULTS

Arendal Municipality's goal is to reduce greenhouse gas emissions produced by its own activities by 90 percent during the period 2007–17. In 2007, the Municipality's carbon reporting showed its total emissions as being 7,107 tonnes. In 2012, this had

been reduced by 78 percent to 1,569 tonnes. The most important measures have been the phasing out of old oil boilers, the transition to the use of renewable energy, making energy efficiencies, purchasing electricity that has a guarantee of origin, and reducing emissions produced by the Municipality's car parks. By putting a price on greenhouse gas emissions produced by the Municipality's activities, all the municipal bodies have been given the incentive to see these are reduced.

Right from the start the interest in this project has been great both in and outside Norway. In 2009, the UN Environmental Programme UNEP published "A Case for Climate Neutrality", where Arendal was presented as taking the lead in terms of climate-neutral municipal activities. Ahead of the climate summit in Cancun in 2010, the UN Environmental Programme presented Climate Partners and Climate-Neutral Arendal as one of thirty good role models throughout the world (30 Ways in 30 Days). Climate-neutral Arendal was also among the winners in a competition arranged in 2011 by municipal associations in Norway, Sweden and Finland for identifying good examples of climate work at municipal level. In 2013, Arendal Municipality became one of three Norwegian municipalities to go on to the final for being one of the best climate cities in the world, as part of a competition arranged by Earth Hour 2013.

Arendal Municipality sees climate neutrality as being a method for reducing its own

emissions of greenhouse gases. The most important aspect of this method is indeed its focus on emissions. Carbon reporting is a most effective tool for being able to produce cost-efficient plans for reducing emissions (What is measured is managed). Without this tool, it would hardly have been possible to achieve the results presented here.

PUBLICITY

Information on the project is available on the Municipality's website and Twitter and in a number of talks and articles provided by the Chairperson, Environmental Ambassador and Environmental Advisor.

By becoming climate neutral, Arendal has given the Municipality a positive image and has becoming involved in several national and international projects focusing on climate and energy.

WEAKNESSES

The set-up regarding the purchasing of climate quotas has been the subject of widespread political debate both at national level in Norway and in Arendal Municipality. Many feel that the purchase of climate quotas acts as a kind of "modern-day indulgence" and does not help reduce greenhouse gas emissions. This uncertainty can be seen as a weakness in the method. Arendal has purchased quotas from projects where emission reductions have already been made (CDM) and where it has been easy to account for how these were done. We have applied

projects that reduce greenhouse gas emissions from landfill sites and are comparable to the Municipality's own arrangement for collecting methane gas from the municipal waste facility for use in the supply of heating. More detailed information on the CDM project from which quotas are purchased is also available on the Municipality's website.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

The businesses in Agder that have taken part in Climate Partners since 2008 have reduced their emissions by an average of 32.9 percent. Furthermore, they purchased quotas to the equivalent of 43,000 tonnes of carbon dioxide during the period 2008–2012. Arendal's pioneering activities in the area of climate neutrality have helped without doubt to increase awareness and knowledge about greenhouse gas emissions and also about the reductions made in them in Agder.

APPLICABILITY IN OTHER REGIONS

The method is capable of being used by all other municipalities, county councils and companies. Out of all the municipal activities being run in Norway today, only Arendal Municipality and Aust-Agder County Council are climate-neutral. Kristiansand and Vestvågøy municipalities have decided to become climate-neutral using the same model. CO2focus, a member of Climate Partners, has approx 50 customers in Norway, including major companies such as KLP and

Storebrand, that offset their greenhouse gas emissions on an annual basis.

Arendal's experiences are also being applied in a trial project on climate-neutral government administration in Norway. The report produced by this trial project is a positive one, in which the government is recommended to take further steps to achieve a climate-neutral administration. According to the former Minister for the Environment, Erik Solheim, Arendal's experiences were the main reason for the Ministry of Climate and Environment to initiate the trial project to see whether Norway could become a climate-neutral state.

DOCUMENTATION

This method is documented in "Kick the Habit: A UN Guide to Climate Neutrality" and in Climate Partners' first knowledge report on climate imprints, climate quotas, climate neutrality and environmental certification which was published in 2009.



ENERGY MANAGEMENT SYSTEMS

HÅLLBAR UTVECKLING VÄST

Energy management is a tool for monitoring and managing a company's energy consumption in a systematic way. It provides the opportunity to reduce financial losses created by unnecessary energy consumption. Energy mapping means the ability to implement improvements in a company's energy consumption in the form of an ongoing process based on planning, implementation, follow-up and refinement. One well-known standard is ISO 50001.

BACKGROUND AND SETTING-UP PROCESS

A business network will be set up to include Falköping, Hagfors, Sala, Upplands Väsby and Vänersborg municipalities, all of which are taking part in The Sustainable Municipality, a Swedish Energy Agency programme. The Energy Management Light programme will then be implemented through these networks. One goal is for companies that have scarcely addressed energy issues up to now to be able to save approx 20 percent of their energy consumption by systematically adhering to an energy management system. Furthermore, the municipalities can in this way create a more energy-efficient and competitive trade and industry sector.

ABOUT THE METHOD

The project uses a light version of an energy management system designed by SWEREA

Swecast as part of the Enig 1 and Enig 2 projects. The Energy Management Light system is based on the energy management standard ISO 50001, but has been considerably simplified for relatively easy implementation by companies with limited resources.

Trade and industry policy is a focus area as part of the third stage of the Sustainable Municipality programme that has been singled out in particular, in line with the Swedish Energy Agency's regulation letter for 2011. The aim is to support companies in making the shift to a sustainable society. The Energy Management System project for local development could be made a part of this.

The aim of the project is to get small and medium-sized companies to make energy efficiencies and increase the amount of renewable energy they use on a systematic and ongoing basis. An energy management system can be of real help in this work. A

number of the companies taking part in the project are to introduce a light version of a energy management system.

TARGET GROUP

Municipal employees, who have themselves received basic training in this area and are now training business leaders in their municipality.

Business networks are to set up that include at least five companies per municipality. All these are to receive training in energy management. The training is carried out by municipal employees in collaboration with an energy consultant.

The aim is to get small and medium-sized companies to implement Energy Management Light and use this tool.

ACTORS

The actors are from Hållbar utveckling Väst which coordinates the project, manages networks together with the municipalities taking part, and organises training courses. The municipal employees cooperate in the form of identifying companies, setting up and running a network and providing training for companies under the Energy Management Light programme. The municipalities involved apply to take part in activities that come under The Sustainable Municipality. The companies, once they have received their training, are in turn included in the network, take part in training courses and address energy issues on a systematic basis.

One goal is for companies that up to now have scarcely addressed energy issues to be able to save approx 20 percent of their energy consumption by systematically adhering to an energy management system.

ORGANISATION

The bulk of the training given to the municipal employees was at two meetings that took place in Falköping and Sala. In addition, support was provided in the form of teleconferences. An energy consultant was also available to answer the municipal employees' questions. The municipal employees taking part made an on-site visit to a major company in Hagfors to show how to address issues related to making energy efficiencies.

The municipalities tried to set up business networks using different methods: assigning a consultant, ringing round companies in general, ringing the companies that were hand-picked, advertising in the local paper and sending out emails to addresses supplied by registers held by the trade and industry agency. Success has been varied. The advertising and mailshots did not really lead to anything. Taking a more qualitative approach by ringing up hand-picked companies and asking a consultant to help identify companies resulted in some business networks in the municipalities working in this way.

Falköping Municipality received extra funding from the Swedish Energy Agency

to enable it to share its experiences by setting up a business network. This is one way in which to provide inspiration to other municipalities.

The number of participants varies between the municipalities. Small groups of up to five companies are common. In certain municipalities, however, there is no network at all despite many attempts to make contact with companies either on a broad scale or by targeting individual sectors.

A number of group meetings were arranged with business leaders who received training on the spot, partly on municipal premises and partly on company premises.

FUNDING

The project was funded by the Swedish Energy Agency.

RESULTS

The companies taking part are interested in addressing energy issues. It is, however, too soon to see any results in terms of savings made in MWH.

There is a demand on the part of the companies to have a tool and/or skills in order

to address energy issues. A certain amount of preparation is required if the municipality or county administrative board are to carry out energy monitoring in accordance with the Swedish Environmental Code. One of the method's weaknesses is the difficulty in persuading companies to participate, with many citing lack of time as a crucial factor.

PUBLICITY

The project is marketed by way of press releases and direct mailshots to companies via the networks and channels created by the project.

FUTURE PLANS

The Energy Management Light website is to be managed as part of the Enig 2 project. The Sustainable Municipality programme will end in 2014, which is why the project cannot be extended or repeated. The municipalities will, however, try to run a network that is dynamic. Falköping, for example, will hold various lectures and training courses on subjects included on the wish lists of the companies. The first subject to be addressed is life cycle costs – LCC.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

The method provides companies with the tools to achieve efficient energy consumption in their business through effectiveness and the use of renewable energy. The companies are paying attention to energy is-

sues and will discover that reducing energy consumption is relatively easy, which means improving the economic situation.

APPLICABILITY IN OTHER REGIONS

The project has great potential for being applied in other countries and regions. The online tool Energy Management Light is currently available in Swedish and is adapted to Swedish conditions. In its present form the project can be applied in other regions in Sweden without any problem. Furthermore, a translation of this tool and adaptation to local conditions would mean the project could be implemented in other countries too.

DOCUMENTATION

Further information and documentation are available on the website:

www.hallbarutvecklingvast.se



GLOBAL PROTOCOL FOR GREENHOUSE GAS EMISSIONS IN CITIES AND MUNICIPALITIES

ARENDAL MUNICIPALITY

During the past decade, an increasing number of cities and municipalities all over the world have begun measuring their climate impact and reducing their emissions. Up to now, however, there has been no commonly used international standard for cities and municipalities.

That is why the World Resources Institute (WRI), the C40 Cities Climate Leadership Group (C40) and Local Governments for Sustainability (ICLEI) have joined forces to produce an international standard. This has been given the name of the Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC). More than 30 cities from all parts of the world that have experience of carbon reporting are taking part in the project. Arendal, whose goal is to be proactive in helping to introduce a common standard for the carbon reporting done by cities and municipalities, received an invitation to take part, and this they accepted in the autumn of 2013.

TARGET GROUP AND AIM

The GPC will provide a framework and a method that local and regional authorities the world over will be able to use with the aim of:

- Ensuring that cities and municipalities report and calculate emissions using a common method that is consistent, transparent, relevant and accurate.
- Making it easier for cities to identify emission sources and reduction opportunities and to follow up results on the basis of the goals set.

DIRECT EMISSIONS

SCOPE 1 EMISSIONS

All direct emissions from sources with the system's boundaries

- Creating the conditions for national and regional authorities to set up emission targets and monitor development over time.
- Bringing about collaboration at international and national level with respect to, and with sympathy for, the establishing of a common framework.

ACTORS

The main parties in this project are: WRI, C40, ICLEI and 30 pilot cities from all over the world; see pages 88–89.

The actors in Arendal Municipality are the Environmental Coordinator/Environmental Consultant and the Environmental Group. Several bodies in the Municipality are involved in the follow-up. Other actors supply information, such as energy companies, Statistics Norway, clean-up companies, transport companies, the Norwegian Environment Agency etc.

INDIRECT EMISSIONS

SCOPE 2 EMISSIONS

Energy-related emissions from consumption of electricity, district heating and district cooling

SCOPE 3 EMISSIONS

All other indirect emissions

DESCRIPTION OF METHOD

The method is based on principles familiar from previous GHG Protocol standards, and the challenge lies first and foremost in stating the boundaries set in the system and what should be included within and without city and municipality boundaries.

Direct emissions are emissions from sources (both public and private-sector) that come from within city and municipal boundaries.

Indirect emissions are those generated as a result of the city's/municipality's activities but which come from outside city or municipal boundaries.

1. The city/municipality is to obtain and compile sales figures/consumption figures or estimated figures for all consumption of fossil fuels from stationary and mobile sources. Arendal has based its estimates on the total sales made in

the Municipality. If possible any process emissions in the municipality should also be estimated.

2. Furthermore, statistics need to be compiled for the total consumption of electricity and district heating/cooling.
3. As part of Scope 3, emissions from all waste generated in a municipality should be estimated, regardless of whether this is managed within or without the municipality.
4. If reporting BASIC+, emissions from agriculture, forestry and land use as well as indirect emissions of fuels (production) should be included in the estimates as far as possible.

The GPC standard uses two reporting levels. Arendal has chosen to report through BASIC+.

Basic

Scope 1

Energy-Stationary

Energy-Mobile

Wastes

IPPU

Scope 2

Scope 3

Wastes

Basic+

Scope 1

Energy-Stationary

Energy-Mobile

Wastes

IPPU

AFOLU

Scope 2

Scope 3

Wastes

Energy-Mobile

Expanded Full coverage of Scopes 1, 2 and 3

Arendal Municipality has calculated its emissions from forestry and made an assessment of certain emissions from agricultural activities (AFOLU category). In addition, indirect (upstream) emissions from fuel consumption in the Municipality have been calculated.

FUNDING

Arendal Municipality has engaged consultants to carry out the work associated with the pilot study, compile figures and information, and report to the GPC project management team. Implementation of the plans relating to the Municipality's climate measures is funded by the municipal budget.

RESULTS FOR ARENDAL

For a number of years now, Arendal has been reporting figures on energy and climate that relate to its own activities – activities over which the Municipality itself has considerable influence. Emission statistics

Arendal Municipality is collaborating with 30 cities throughout the world to develop a new standard for measuring the climate imprints of cities.

at municipal level are not available to Norwegian municipalities.

The pilot project produced the following results for emissions in Arendal; more information is available in the diagram.

- The total amount of emissions calculated for Arendal Municipality and reported through BASIC+ are 229,656 tonnes of carbon dioxide equivalents.
- The emissions come mainly from public and private-sector road transports. These amount to 146,388 tonnes of carbon dioxide equivalents. In order to improve the quality of transport emissions, more traffic studies ought to be done to examine the relationship between refuelling and through traffic. Traffic estimates carried out by the Norwegian Automobile Association (NAF) on certain routes have not been sufficient to make a good assessment.
- Consumption of electricity and district heating in the Municipality gives a precise picture of actual consumption, and amounts to 64,262 carbon dioxide equivalents. The emission factor used relates to an average mix in the Nordic Region's electricity supply (2008–2010).
- Detailed comments have been submitted to the WRI Secretariat on ways in

which its drafting of the GPC standard could be improved.

- Feedback from the WRI has been very positive, and the quality of the data reported is completely in line with that reported by other municipalities.

FUTURE PLANS

The framework for GPC BASIC/BASIC+ was published in the spring of 2014. A more detailed version of the GPC (GPC Expanded) is planned for 2015.

Arendal Municipality will work to ensure the method is adopted by Norwegian municipalities. For its own part, the Municipality will use the results of the pilot study in its communications on climate issues. There are hopes that the Norwegian association of municipalities, Kommunesektoren, will introduce the same standard for all municipalities in Norway. The WRI will use the results and comments as a basis on which to finalise the first official version of the standard, and the results when compiled will be presented in 2014.

HOW DOES THE METHOD HELP BRING ABOUT A GREEN SHIFT?

Regions and cities wishing to reduce their greenhouse gas emissions need their car-

bon reporting to be the best they can manage if they are to succeed in planning their emission reductions and following up the goals agreed upon to this end. Approximately one third of global greenhouse gas emissions have a negative cost attached. This means that they pay for themselves straight away in that the energy cost falls.

The method helps create a common understanding of carbon reporting at regional/municipal level. It is thus easier for regions and cities to make comparisons with each other and share responsibility for emissions.

POTENTIAL FOR USE IN OTHER REGIONS.

The cities taking part in the pilot project are shown on the next page. Once the drafting of the Protocol has been completed, it can be applied in all those regions/cities that are interested.

DOCUMENTATION

Further information and documentation are available on the website:

www.ghgprotocol.org/city-accounting

GPC No.	IPCC Class	Scope	GHG Emissions Sources	Accounting Approach	Notation keys				GASES								Data Quality		
					IE	NE	NO	NA	tCO2	gCH4	gN2O	gHFC	gPFC	gSF6	CO2e	H	M	L	
I.			Stationary Units																
I.1			Residential Buildings																
I.1.1	1A4b	1	Direct Emissions (Scope1)	In-Boundary Fuel Combustion					1 447							1 447		X	
I.1.2		2	Energy Indirect Emissions (Scope2)	In-Boundary Energy Consumption					34 103							34 103	X		
I.2			Commercial/Institutional Facilities																
I.2.1	1A4a	1	Direct Emissions (Scope1)	In-Boundary Fuel Combustion					425							425		X	
I.2.2		2	Energy Indirect Emissions (Scope2)	In-Boundary Energy Consumption					30 159							30 159	X		
I.3			Energy Generation																
I.4			Industrial Energy Use																
I.4.1	1A2+	1	Direct Emissions (Scope1)	In-Boundary Fuel Combustion					255							255		X	
I.5			Fugitive Emissions																
II.			Mobile Units												-				
II.1			On-Road Transportation																
II.1.1	1A3b	1	Direct Emissions (Scope1)	In-Boundary Fuel Combustion					146 388							146 388		X	
II.2			Railways																
II.2.1	1A3c	1	Direct Emissions (Scope1)	Proportional Fuel Combustion					12							12		X	
II.2.2		2	Energy Indirect Emissions (Scope2)	Proportional Energy Consumption					13,3							13,3	X		
II.3			Water-Borne Navigation																
II.3.1.	1A3dii	1	Direct Emissions (Scope1)	Proportional Fuel Combustion					4 393							4 393		X	
II.4			Aviation																
II.4.1	1A3aii	1	Direct Emissions (Scope1)	Proportional Fuel Combustion					13,6							13,6		X	
II.5			Off-Road																
II.5.1	1A3eii	1	Direct Emissions (Scope1)	In-Boundary Fuel Combustion					2 394							2 394		X	
III.			Waste																
III.1			Solid Waste Disposal																
III.1.1	4A	1+3	Option-1: First Order Decay (FOD) Method - Direct (Scope1-Current Year) and Indirect (Scope3-Previous Years) Emissions from Landfills Located Within the Community Boundary (excluding emissions due to incoming waste from other communities)	In-boundary Waste Generated and Proportional Waste Treated						37 586 025						789,3	X		
III.3			Biological Treatment of Waste																
III.4			Incineration and open burning																
III.4.2		3	Indirect Emissions (Scope3) from Incineration and Open burning of Wastes Outside the Community Boundary	Proportional Waste Treated					9 200							9 200	X		
III.5			Wastewater Treatment and discharge																
IV.			Industrial Processes and Product Use (IPPU)																
V.			Agriculture, Forestry, and Land Use (AFOLU)																
V.1	3	1	Direct Emissions from AFOLU	In-boundary areas					66.5								67	X	
			GPC 2012 BASIC (tCO2e)	229 590	IE	NE	NO	NA	No. of occurrence and GPC No. for use of Notation Keys (out of 28 data entries)										
					4	3	10	1											
			GPC 2012 BASIC+ (tCO2e)	229 656					Sources included in BASIC+ (out of 5 data entries)										
			GPC 2012 EXPANDED (tCO2e)	229656					Sources included in EXPANDED										
			Scope1	148 514					155326										
			Scope2	64 262					64275										
Scope3		9200																	

Arendal Municipality is collaborating with 30 cities throughout the world to develop a new standard for measuring the climate imprints of cities.







CEMASYS AND THE GHG PROTOCOL

CLIMATE PARTNERS, AGDER

A green shift in the economy means that private and public-sector businesses must adapt to be able to produce goods and services in a more climate-friendly way than before. This means more efficient use of resources and greater energy efficiencies. Achieving this will require effective climate management.

Climate management means that climate issues have become a permanent feature of an organisation's corporate governance and management policy. It means, for instance, that climate issues are integrated into its business strategy, goals and efficiency plans. The way to do this is by *carbon reporting*, which is as such the first step towards incorporating climate management into the organisation.

ABOUT CEMASYS

CEMASys is a cloud-based climate management tool that has been developed by the company CO2focus, which has focused on developing the area of *climate management* for Nordic Region businesses, both public and private-sector, since 2007. Today the company can count approx 200 companies, municipalities and organisations among its customers, and all of these use CEMAsys as a tool for measuring and carrying out their carbon and energy reporting. The users include some of Norway's biggest companies. As of 2014, CEMAsys has been certified by the renowned

foundation CDP (Carbon Disclosure Project) as a global *programme software tool for managing carbon dioxide emissions*.

As well as encompassing climate and energy, CEMAsys can also be used for reporting other environmental aspects such as water consumption, chemicals and other emissions. The system is module-based and also contains important functions such as archives for uploading documents, non-conformance reporting and an HMS module. CEMAsys acts therefore as a complete environmental management system.

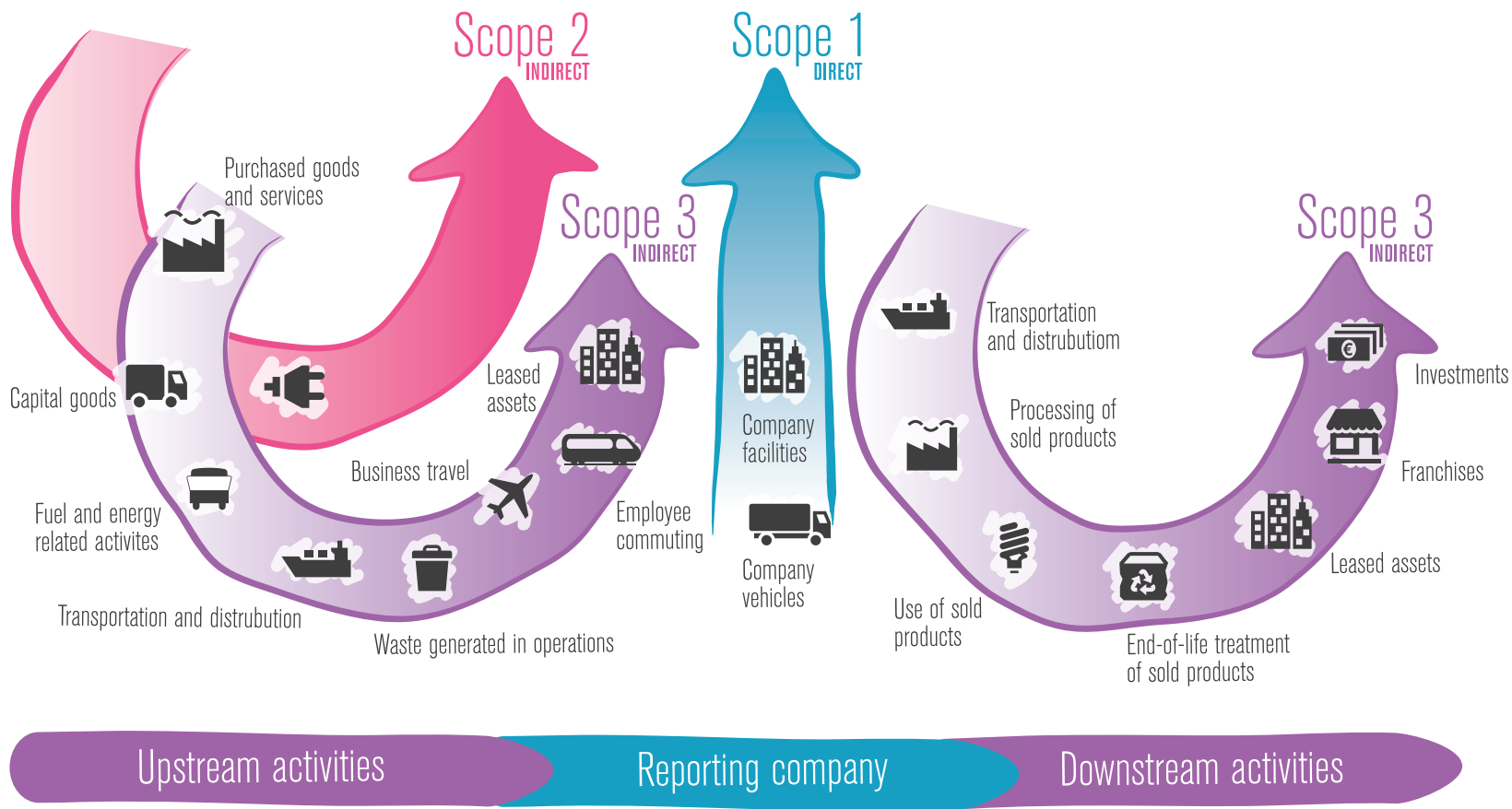
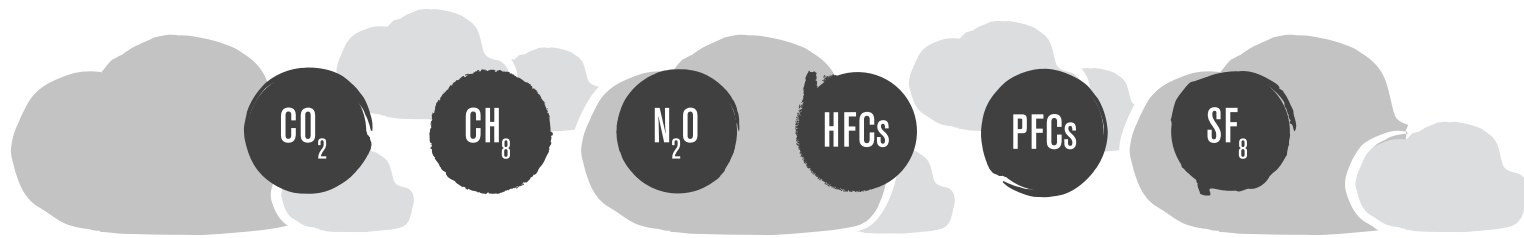
A BRIEF DESCRIPTION OF THE METHOD BEHIND CEMASYS – THE GHG PROTOCOL

The initiative for the GHG Protocol was taken in 1997 when the WBCSD (World Business Council for Sustainable Development) convened with the WRI (World Resources Institute) to discuss the need for a common standard for carbon reporting. They devoted four years to developing what would become

the Greenhouse Gas Protocol, a corporate standard. The standard was revised in 2004, and new calculation tools and manuals are still being produced for specific sectors and emissions categories. In 2006 this method served as a basis for when ISO developed its own version of the standard.

Together with the ISO version, the GHG Protocol is the standard used most often for carbon reporting, and its users include thousands of companies and organisations all over the world. Most Norwegian municipalities who carry out carbon reporting do so based on the GHG Protocol. Arendal and Kristiansand, like all the municipalities in Østfold, are examples of Norwegian municipalities that adhere to the GHG Protocol. The method has general application, and therefore there is nothing stopping it being used by businesses. It can be adapted to any kind of business at all. *Climate Partners* in Agder, that have been mentioned elsewhere in this book, use CEMAsys. The bringing together of the public and private sectors serves to create an interesting meeting place where politicians, business leaders, employees, academics and experts can meet to exchange experiences and skills. This is how commitment and new ideas are created. CEMAsys is used as a "climate-administrative members' register". Members use the tool to report their consumption and prepare a carbon report both for themselves as individual organisations and for the members as a whole.

The goal is to create an effective process for preparing a carbon report that will form



the basis for developing an action plan for emission reductions. Adhering to the GHG Protocol creates a process that is systematic and structured the whole way from boundary setting to data collection and quality assurance. The standardised definition of how companies should set boundaries and categorise emissions in Scope 1, 2 and 3 enables comparisons to be made between companies and makes clear the degree of control these companies have over different emissions.

TARGET GROUP/AIM

CEMASys' target group is businesses wishing to exercise good climate management. The tool can be adapted to all kinds of organisations, irrespective of sector and irrespective of whether they public or private. Great advantages are to be had for large organisations or networks that include many units (*factories, business sites, members etc.*) that are able to report, analyse and store data in an efficient way. CEMAsys can work for all kinds of organisational hierarchies, and all users are given their own account for which user rights are determined according to where in the hierarchy that individual/user is placed. All consumption data reported to CEMAsys is accumulated upwards in the hierarchy and analysed along the way, so that carbon reporting is automatically calculated for different parts of an organisation in accordance with the customer's wishes. All the information is collected on one and the same database. Using CEMAsys assures continu-

Enhet	Funksjon	Data input Per år	Kilder, kommentar
Bensen	liter	0	
Diesel (B5)	liter	0	
Propan	kg	0	
Bensen	liter	0	
Lett fyringsolje	liter	0	
Diesel (B5)	liter	0	
Propane (NO)	kg	0	
Legg til ny			

Examples of reporting of consumption data in CEMAsys

ity regarding its operations and history.

CEMASys is tailored to the methodical framework described by the GHG Protocol. The tool has the following main functions: **1)** to help the user gather and report data on consumption, **2)** to convert consumption data into greenhouse gas emissions in the form of carbon dioxide equivalents, **3)** to store all information safely and **4)** to analyse the information produced. The aim of carbon reporting is to enable an organisation to set up realistic climate goals and work out a concrete action plan capable of being followed up to achieve these goals.

HOW CAN GOOD CLIMATE MANAGEMENT AND CEMASYS HELP BRING ABOUT A GREEN SHIFT?

The result of bringing about a green shift in the economy will be that the climate imprint for all goods and services that have been adapted will be reduced. In order for the global climate goals to be achieved, the climate imprint needs to be reduced by a minimum of 80 percent up to 2050. This will probably require a dramatic change in the consumption patterns of today, and require all businesses selling a product or service to produce it in a new and more energy-efficient way with the help of renewable resources and partially recycled raw materials.

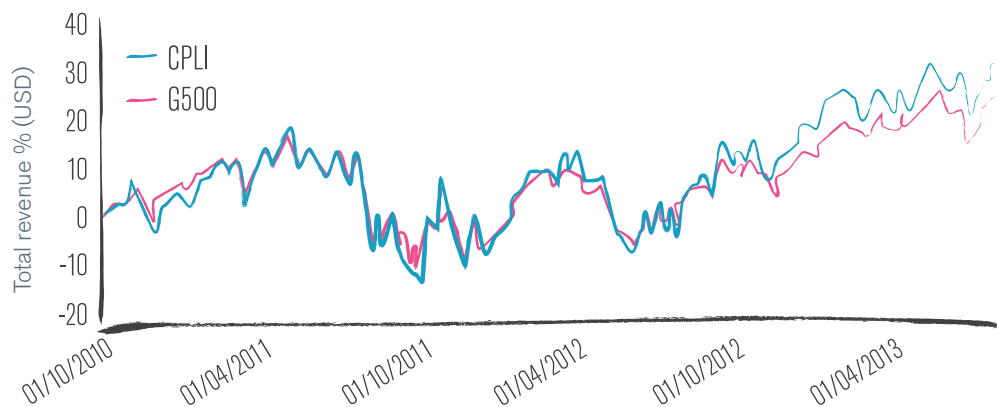
The winners of the future will be those

companies who make the green shift. A long-term "survival strategy" is therefore being initiated today by having climate management incorporated into one's own organisation. The next step will be for the company to look at its own value chain from a broader perspective. A tool such as CEMAsys is an important piece of the puzzle for incorporating climate management, since the starting point for an organisation is calculating its own climate imprint. Thereafter goals can be set up and action plans carried out.

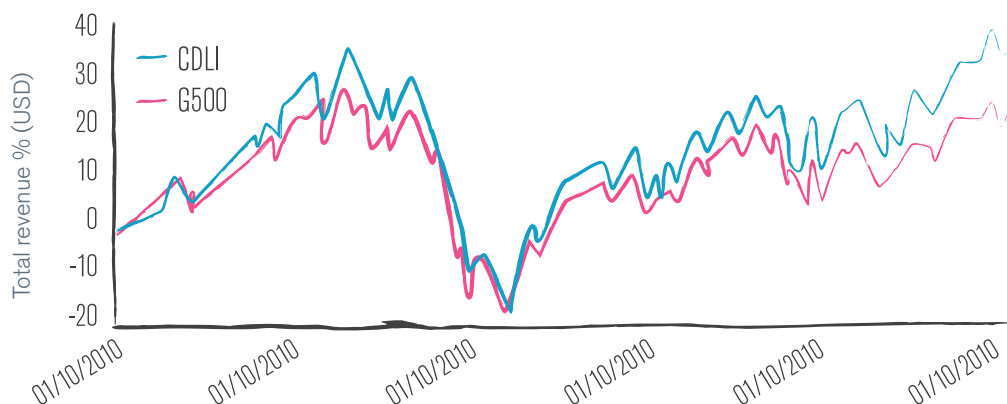
Climate management is not only smart but also profitable! Each year, the independent foundation CDP measures and evaluates the ways in which approx 5,000 (the figure rises each year) of the world's business groups exercise climate management. The figures below show a comparison of the revenue generated by the companies that are best at climate management and that generated by the world's 500 biggest companies in terms of stock market value. The graphs show that those that are best at climate management generate more revenue on average than do the world's 500 biggest companies, and the gap is widening. This underlines the claim that the winners of the future can be found among actors who take climate management seriously, and that there is no reason to wait.

The diagrams containing the suggestions provided on the previous page show how companies exercising good climate management create more value on average.

CPLI [2010–2013] revenue compared to the average for Global 500



CDLI [2005–2013] revenue compared to the average for Global 500



Source: CDP Report, "Global 500 Climate Change Report 2013, Sector Insights: What is Driving Climate Change Action in the World's Largest Companies?", 2013. Further information on the report and the report itself are available on the website <https://www.cdp.net/en-US/Pages/HomePage.aspx>



EPILOGUE

This publication has been produced as part of the project CO₂RE (Collaborate to Reduce and Renew). The project was carried out by the Alexanderson Institute in Halland in collaboration with the EMC (Coalition for Energy and Environment) business network, and by the Aust-Agder County Council in collaboration with the Climate Partners network.

THE ALEXANDERSON INSTITUTE

The Alexanderson Institute is a development platform in Halland which is located at Campus Varberg. The work of the Alexanderson Institute aims to stimulate and create the conditions for developments that are in demand, and this takes place through co-operation, networks and the exchange of experiences between those in Sweden and those abroad. Such work gives rise to new projects, business opportunities and collaborations between the actors involved: trade and industry, the public sector and academia.

This book has been produced in collaboration with the business network EMC (the Coalition for Energy and Environment), which together with its member companies focuses on business development in relation to energy, environmental and climate issues. Since the start, EMC has been a local trade and industry initiative that in collaboration with the Alexanderson Institute has been able to develop its activities and to increase its geographical spread. In recent years the symbiosis has become more apparent, and today EMC is an integrated part of the Alex-

anderson Institute. (*Read more about EMC on page 36.*)

The result was a method book

This book has been produced as part of the project CO₂RE (Collaborate to Reduce and Renew). The project, which was funded by Interreg IVA – Öresund-Kattegat-Skagerrak, was focused during the autumn of 2013 until the spring of 2014 on surveying methods to find out how regions and municipalities can encourage a reduction in climate impact and at the same time increase sustainable growth. The idea has been for the survey to form the basis for more widespread use, further development and the implementation of methods in the Kattegat-Skagerrak region. The lead partner was the Alexanderson Institute and the Norwegian project owner Aust-Agder County Council.

The decision was taken at an early stage of the project that all the good ideas and approaches suggested during the project would not turn into a product or skill that would remain an internal feature of the pro-

ject. Instead, we wish to share both our own experiences and those of others in creating development methods for a green shift in a regional context. The hope is that this method book will make clear which kinds of approach will work and ensure they are seen as workable in other regions too. By doing this, we hope we can inspire and help bring about further initiatives regarding these important issues.

Tool for regional development

The most important tool the Alexanderson Institute has for bringing about developments that are in demand is, indeed, to take part in EU projects. This means, obviously, that we receive funding for our work, but it also gives us opportunities to establish strong international contacts and exchange ideas, receive inspiration and learn from some of the leading lights in those areas we address. Our collaboration with Aust-Agder County Council on this project has, for instance, meant our getting to know the main author of this book. Sven Tveitdal has contacts all over the world after his many years of working on climate

issues in the UN, and he has skills and experiences that have been a real pleasure for us to share – skills and experiences we have also shared with environmental actors in Halland and its trade and industry sector as well as other interested parties both in Sweden and internationally.

Further examples of the valuable contacts we have acquired through EU projects are, naturally, the actors that have contributed their experiences in the section of the book devoted to method: these we wish especially to acknowledge. Thank you for your skills, time and ideas. We look forward to working with you in the future!

ABOUT THE AUTHOR

SveinTveitdal is a qualified engineer and surveyor who has worked on environmental and climate issues for most of his career. In 1989 he was the initiator behind the environmental information centre GRID Arendal, and in 2002 he was appointed Director of the UN Environmental Programme UNEP at their Head Office in Nairobi, where one of his tasks was being in charge of the UNPCC Secretariat in Geneva. Svein now runs his own company as a climate consultant with the firm Klima2020. He initiated the Climate Partners network in Agder for which he is now the Project Manager, and is also the Environmental Ambassador for Arendal Municipality. He sits on the Board of several companies that address climate, environmental and energy issues. He has

collaborated on several book projects, is a speaker in great demand, and has more than 100,000 followers on Twitter.

THE ALEXANDERSON INSTITUTE AND THE COALITION FOR ENERGY AND ENVIRONMENT (EMC)
IN COLLABORATION WITH CLIMATE PARTNERS

GREEN SHIFT

A HANDBOOK FOR ENVIRONMENTALLY FRIENDLY REGIONS IN EUROPE

EXAMPLES FROM REGIONS IN ÖRESUND, KATTEGAT AND SKAGERRAK

This publication has been produced as part of the project planning for CO₂RE – Collaborate to Reduce and Renew. The project was carried out by the Alexanderson Institute in Halland in collaboration with the EMC (Coalition for Energy and Environment) business network and by the Aust-Agder County Council in collaboration with the Climate Partners network.

We decided at an early stage of the survey not to allow all the good ideas and methods of approach we came across simply to be products and skills that remained internal features of the project. Instead, we want to share both our own experiences and those of others by creating development methods to address environmental and energy issues in a regional context. We hope we have provided a handbook that clarifies the processes involved and enables them to be seen as workable in other regions too, and we hope we have been able to inspire and help encourage further initiatives to be taken on these important issues.

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