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CaRe-Lands: Carbon Reduction Through Nature

2 Mers Seas Zeeën
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PREFACE

Jacqueline Cramer
Director of the Utrecht Sustainability Institute and former Minister of Housing, Spatial Planning and the Environment.

Sustainable development is high on the global social agenda. The need to leave a viable planet for future generations is now widely accepted. Our challenge in the 21st century is to achieve this. The main environmental problems we must tackle are climate change and the depletion and unsustainable use of natural resources.

To guard against natural disasters, global temperature increase needs to be limited to a maximum of 2 degrees Celsius above preindustrial levels. If we fail to take action, estimates suggest that the temperature could rise by as much as 6.4 degrees during the course of this century. The hotter the earth becomes, the more extreme the weather will get and the greater the consequences will be for man and nature. Our increasing use of natural resources is cause for serious concern. It is predicted that between 1980 and 2030 global consumption of natural resources will double. Our consumption already exceeds what nature can provide in a sustainable way. At the same time, fresh water is becoming scarce and continuous population increase means more and more agricultural land is needed to produce food.

Yet there are ways of reversing these trends. We are technologically capable of developing a sustainable economy. An economy based on sustainable energy systems, the efficient use of energy and natural resources, and closed loop recycling – ideally using renewable resources that can be sustainably produced from biomass.

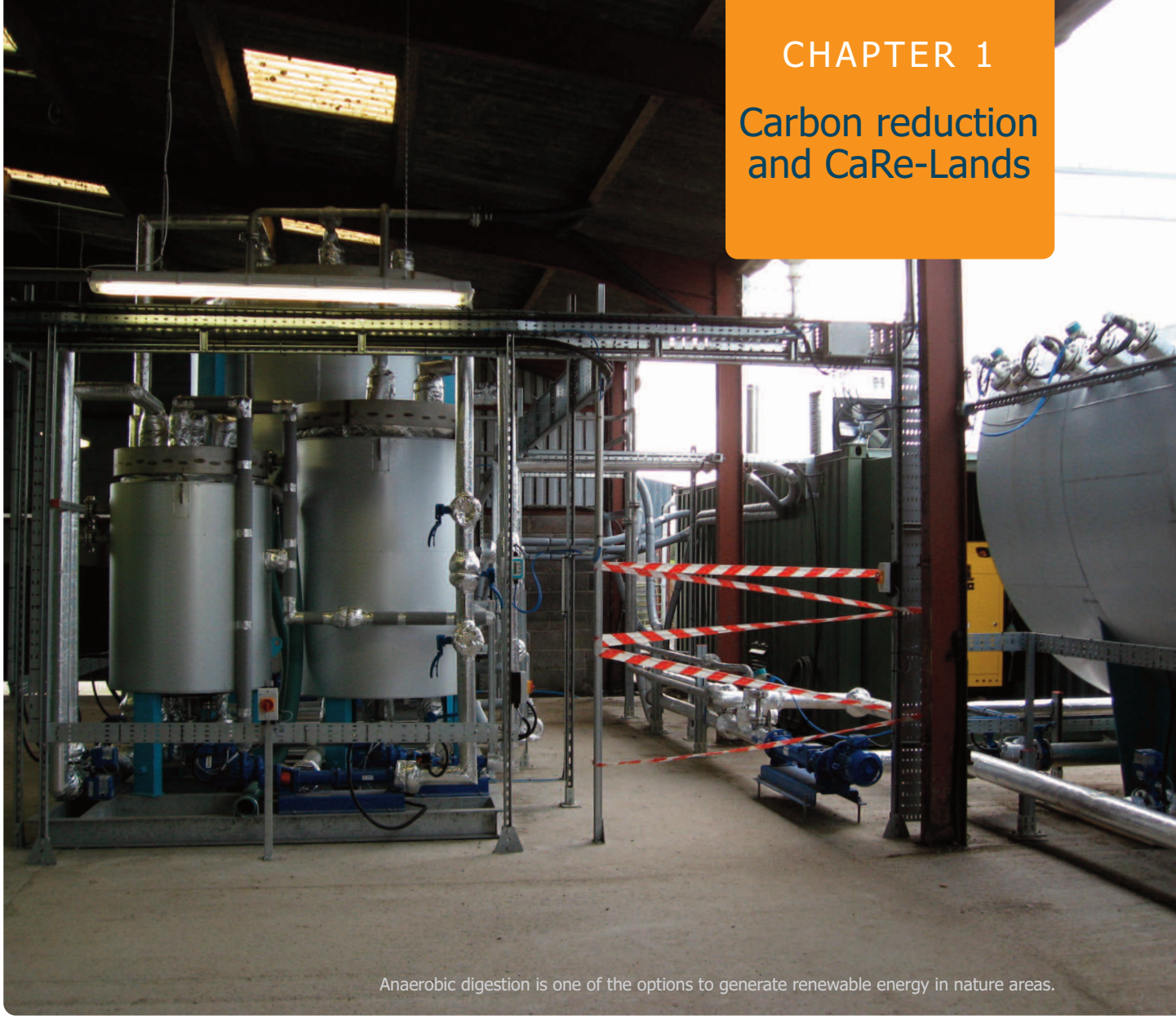
The endeavour to secure sustainable development requires global agreements and a local approach, because the desired innovation has to be implemented at a local level. To make significant progress in the area of sustainability, we need change at economic, organisational and social levels, as well as technological innovation. To succeed we will have to create widespread public support, and everyone will need to use their own skills and interests to contribute to the necessary changes.

In short, sustainability is something we have to tackle together. The partners involved in the CaRE-Lands cluster project, in which a number of organisations and companies from different countries are working together to achieve shared objectives relating to protected nature and landscape areas, are well aware of this. They emphasise the urgent need to ensure sustainable development and collaborate on local-level initiatives that focus on CO2 reduction and sustainable energy. In this magazine they share their experiences, results and conclusions. May it inspire you to do your bit to help create a sustainable and energy-secure future!

Jacqueline Cramer

CHAPTER 1

Carbon reduction and CaRe-Lands



Anaerobic digestion is one of the options to generate renewable energy in nature areas.

In Europe and in the countries within the 2Seas Programme Area carbon reduction is closely related to climate policy and energy policy. Although the exact numbers differ the policies are comparable on headlines. The options to reduce CO_2 emission through nature conservation and land management are apparently not recognised yet. The CaRe-lands project identified options for carbon reduction in those areas.

Carbon Reduction in Europe

In 2011 the European Commission published the Roadmap for moving to a low-carbon economy by 2050 [1]. The Roadmap suggests that, by 2050, the EU should cut its emissions to 80% below 1990 levels through domestic reductions alone. It sets out milestones which form a cost-effective pathway to this goal - reductions of the order of 40% by 2030 and 60% by 2040. It also shows how the main sectors responsible for Europe's emissions - power generation, industry, transport, buildings and construction, as well as agriculture - can make the transition to a low-carbon economy most cost-effectively.

Energy efficiency will be a key driver of the transition. By moving to a low-carbon society, the EU could be using around 30% less energy in 2050 than in 2005. Households and businesses would enjoy more secure and efficient energy services. A low-carbon economy would have a much greater need for renewable sources of energy, energy-efficient building materials, hybrid and electric cars, 'smart grid' equipment, low-carbon power generation and carbon capture and storage technologies.

Following the European Commission, the governments of the countries within the 2 Seas Programme Area (the Netherlands, Belgium, France and the UK) presented national targets for carbon reduction and energy policies.

The Dutch Government heads towards low carbon energy management [2]. There are three main objectives in Dutch energy policy. The energy supply must be sustainable, reliable and affordable. The Netherlands aims to cut CO_2 emissions by 80-95% by 2050 (compared with 1990). Renewable energy is vital part of the plan, but at the moment it is still relatively expensive. The Dutch Government is therefore pursuing an innovation policy to drive down the cost of renewable energy, and encourage large-scale application of renewables in the long term. In addition to this long-term goal, the Netherlands has set the following short-term goals for 2020:

- 20% reduction in CO_2 emissions (compared with 1990).
- 14% renewable energy (as a percentage of the overall energy requirement).
- 20% energy saving.

In Belgium both the federal government and the regional governments are responsible for climate policy [3]. The federal government can make use of important policy tools for taxes and product policy. The regional governments provide policy for energy use, renewable energy, environmental laws and climate issues in mobility and agriculture. In Belgium the following goals for 2020 are set:

- 15% reduction in greenhouse gas emissions.
- 13% renewable energy.
- 9.80% increase of energy efficiency.

The different regional governments have their own climate action plans (set or in progress) to achieve these goals. However the exact division of these 2020 targets over the different regional governments is still to be made. After the European Commission issued the roadmap, the French Minister for Environment asked the Centre d'Analyse Stratégique to look at the implications of that objective for France. The Trajectoires 2020-2050 Committe (Pathways 2020-2050) brought together trade union organisations, officials, experts, researchers and non-governmental organisations [4]. The Committee offered nine proposals to facilitate a successful transition to a low carbon economy:

1. Strengthen industrial policies aimed at promoting the transition towards a low carbon economy.
2. Promote strengthened R&D and dissemination of technological innovations enabling the transition to a low carbon economy.
3. Extend the predictability of climate policy by defining binding European targets for 2030 and strengthen its credibility by renovating its governance.
4. Strengthen the carbon price signal by making it economy-wide and improve regulation of the European CO_2 trading system.
5. Improve and implement the flexibility mechanisms at the international level and promote their use within the European Union.
6. Ensure fully transparent management of auction proceeds and future climate-energy contributions, with the aim to promote economic growth, social equity, the development of low carbon innovation and international solidarity.
7. Anticipate changes in the job market and plan for achieving successful job transitions.
8. Develop innovative financing schemes that combine public and private equity and use of carbon value as leverage.
9. Effectively integrate climate policy objectives into urban and rural planning policies.

In the UK the government is working at home and abroad to adapt to the effects of climate change and reduce greenhouse gas emissions by investing in low-carbon energy sources, improving fuel standards in cars and increasing energy efficiency wherever possible [5]. In order to reduce the greenhouse gas emissions, the following actions are announced:

- encouraging the EU to demonstrate leadership on climate change.
- negotiating for a comprehensive global climate change agreement.
- reducing the impact of climate change in developing countries and the overseas territories.
- providing £3.87 billion through the International Climate Fund to help developing countries mitigate and adapt to climate change.
- financially supporting developing countries through REDD+ to reduce greenhouse gas emissions from deforestation and forest degradation.
- leading the diplomatic effort to mitigate climate change.
- building an evidence base to understand and predict climate change.

CO_2 reduction and sustainable energy in nature conservation areas

Although nature conservation areas are not specifically mentioned in the EU Roadmap for moving to a low-carbon economy by 2050 or in any of the national policies, these areas can contribute to the reduction of carbon emissions in several ways. Nature conservation covers large areas, which can contribute to reducing overall carbon emissions through good soil, water, vegetation and land management. Carbon may be sequestered in soils (by groundwater management

and manure techniques), but also in woodlands and Green Infrastructure. In nature conservation areas there is energy consumption through motorised transport, motorised equipment, by visitors to the area and in the buildings (visitor centres and offices). Reducing energy consumption by visitors and increasing the energy efficiency of buildings and transport contributes to carbon emission reductions. Good information for the visitors to raise awareness and adjustments to the 'hard ware' (infrastructure and buildings) will be needed to reduce emissions. In addition, generating renewable energy within the nature areas can contribute to delivering carbon emission reductions. Energy from biomass, wind power, solar panels and hydropower can all contribute to the sustainable energy targets of nature conservation areas, if they are appropriately located.

Why CaRe-Lands?

In spring 2013 the Interreg IVA 2 Seas programme took the initiative to set up Cluster Projects. The primary goal of these Cluster Projects is to assemble the results of several similar and (almost) completed 2 Seas Projects, and to valorise and disseminate these results. Each Cluster Project chose a central theme around which all the partners had worked in their IVA 2 Seas projects, to enhance the sharing and dissemination of the results. The partners and projects in CaRe-Lands have chosen the theme of 'carbon reduction in nature and landscapes'. In the component 2 Seas Projects sustainability was already an important issue, but the possibilities (and obstacles) for carbon reduction were not explored in detail. Nature and conservation areas can contribute significantly to carbon reduction, but all kinds of technical, organisational, legal and social issues have to be overcome.

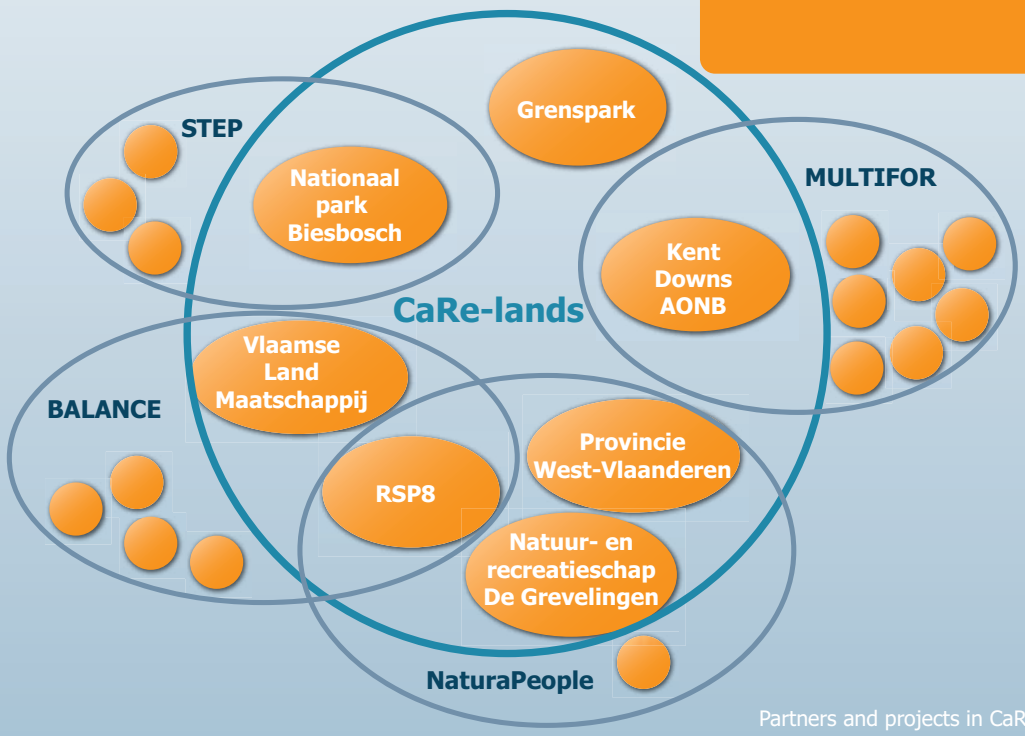
Aims of the CaRe-Lands project

The CaRe-Lands project aims to consolidate, valorise and share best practices and results of four IVA 2 Seas projects, Natura People, STEP, MULTIFOR and Balance, especially regarding carbon reduction and the use of renewable energies in protected nature and landscape areas. In chapter 2 the projects are introduced and some results are presented. The lessons learned in general and specifically to the central theme of this cluster are presented in Chapter 3.

A second aim is to share the understanding on how these precious areas can best contribute to carbon reduction (mechanisms) in general, and, more specifically, to the production of renewable energy. The project will explore what research, experimentation and investment is needed to make progress. The identification of (new) options for carbon reduction and the generation of renewable energy in nature and landscape areas are described in Chapter 4. Land management and biomass chains, green transport and technological solutions in construction and buildings are the most important themes for future cooperation, alongside raising awareness about carbon reduction. Part of raising awareness is the identification of businesses who want to be engaged in carbon reduction and renewables in nature and landscape areas and the development of stakeholders groups.

CHAPTER 2

The projects in the cluster



Partners and projects in CaRe-Lands.

The CaRe-Lands project consolidates, valorises and shares best practices and results of four IVA 2 Seas projects, Natura People, STEP, MULTIFOR and Balance. First the projects are introduced and some results are presented.

BALANCE: Balancing nature and recreation in peri-urban and rural areas

The project

The goal of the BALANCE project was to make Europe a more BALANCEd place, with mutual harmony between nature, recreation and the economy, accessible for everyone.

The availability of natural spaces within and around the urban areas can improve the quality of life for the citizens and people in their surroundings. When nature development and recreational possibilities can be combined, there is a real win-win situation. A good example is a multi-sports activity venue Cyclopark all set within 43 hectares of parkland, located to the east of London in the county of Kent, providing an area rich in wildlife which is also fantastic for recreation. *Cyclopark* has helped generate local employment in the café, cycle shop and health treatment facilities as well as training volunteers and apprenticeships for young people.

Another example is the renovation of greenways in the 8 towns situated between the rivers Scheldt and Leie by the Flemish Land Agency (VLM) in the province of East-Flanders. The renovation was combined with the development of a route planner (http://routeplanner.vlm.be), which creates routes along as many greenways as possible. By promoting the use of this route planner amongst locals and visitors, VLM wants to encourage the use of greenways as a safe and pleasant alternative to regular roads.

Together, the partners shared, developed and evaluated their methods and experiences in cross-border cooperation in order to find the best solutions. New ways to create, manage and evaluate high natural spaces in urban areas have been set up.

Carbon Reduction

Although Carbon Reduction was not an initial aim in the BALANCE Project, some carbon reducing ideas were developed within the project. These ideas looked at the conversion of harvested material resulting from reserve habitat management works, previously cut to waste, into energy products. Trials were also undertaken looking at reducing moisture content of this material (*Juncus Effusus*) to increase calorific value and facilitate conversion. BALANCE enabled this

work, and the successful harvesting and conversion into briquettes resulted in a spin-off project (governmental funded) about biomass, harvesting drying and conversion into energy products. The renovation of Greenways (walking and cycling routes along Green Infrastructures) and the promotion of these routes added to the Carbon reduction in the areas of BALANCE and to the awareness of the options and relevance of carbon reduction to the BALANCE partners.

Natura People: engaging with people to build a sustainable future for natural heritage of Natura 2000 sites

The project

Natura People brings together European partners to ensure the long-term protection of the natural environment. The partners are demonstrating the economic, social and health benefits of nature reserves, and developing best practices to encourage more visitors to the sites.

Connecting Businesses, Economics and Nature, included both measuring and demonstrating economic value of nature and the development of business networks. In order to measure and demonstrate economic value, a simple, easy to understand model to define the value Natura 2000 sites bring to local economies was developed.
The partners recognized the importance of local communities and businesses to Natura 2000 sites and built a transnational business network, bringing together similar organizations in different countries to share their experiences of engaging with Natura 2000 sites and investigate ways to

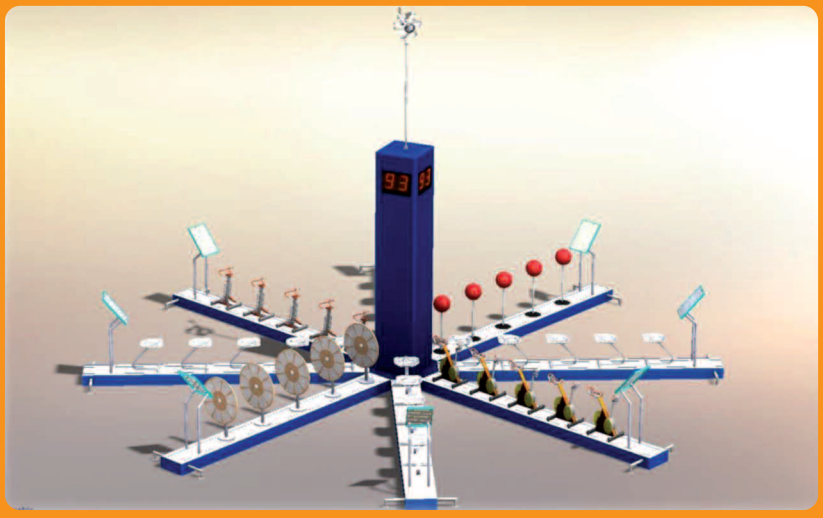
Energy Garden (Natura People)

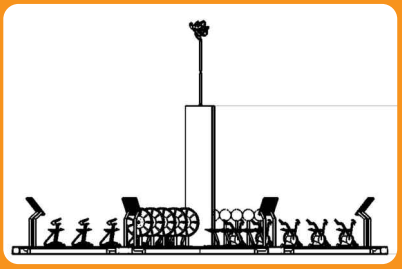
Using energy in a sensible way can only be done after you understand what energy is, how it is produced, how much it costs and what is needed to get it. And you can't start learning that too early in your life.

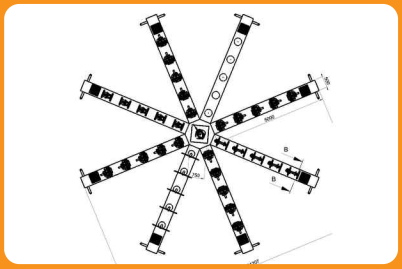
In order to teach children about energy in a playful way, the Energy Carousel was created. The Energy Carousel is a mobile playground that enables children to produce and use energy. The Carousel is placed in an Energy Garden that provides teaching material, manuals, task forms and an app about energy games.

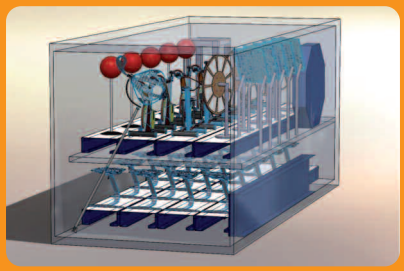
The Energy Garden is mobile, a nicely designed 20ft sea container in which the Energy Carousel is placed. The Carousel can easily be unfolded and is ready to use. It can be placed next to schools or events, tourist attractions and markets. The operation is monitored by remote control.

The Energy Garden is developed in the Grevelingen within the Natura People project. To actually build the garden the Grevelingen is searching for local partners in the area. A connection with the planned Information and Inspiration Centre seems logical, although the Energy Garden can be used in many other places and is not solely developed for the Grevelingenmeer.









Design for the Energy Garden

optimize this, including business diversification. The Ambassadors courses increased the business engagement significantly.

Connecting People with Nature started with a common philosophy: An enjoyable visit to a N2000 site will leave a positive legacy - encouraging repeat visits, visits to other N2000 sites and inspiring the environmental supporters of the future. Within this theme, each site implemented an innovative people engagement program, testing new techniques and the experiences of the partners were shared. Examples are a marketing and promotion tool Meergrevelingen.nl, an Energy Garden and RSPB team challenges such as gorse and scrub bashing, reed cutting for bitterns and maintaining footpaths.

Carbon Reduction

Carbon Reduction in the Natura People project was mainly focusing on reducing motorised transport and reduction of the energy consumption in the visitor centres. In the area of the Grevelingenmeer, part of Natura People the production of renewable energy is an important topic. The economic model demonstrating the value of Natura 2000 areas also included carbon sequestration.

MULTIFOR: Toward the multi-functional forest

The project

In order to tackle challenges, arising nowadays in the forestry sector, project partners from France and England are working towards addressing a common aim: To strengthen the multifunctional role of forests, in a way that integrates long-term management planning, yet considers the needs of stakeholders and the forest ecosystems to adapt themselves quickly to changing contexts.

The project monitored how forest ecosystems and biodiversity, within the cross-regional area, are adapting to global change. Also a genetic study, driven by the Forestry Research Agency in England, has worked towards finding species and material suited to future climatic conditions. The study focused mainly on Beech tree species. In addition experimental sites were established where forest management can adapt to global changes.

Experimental activities were undertaken to identify how to adapt forest management in response to global changes with the objective of creating alternative answers.

Sensitizing about multifunctional forest management of private woodland based on study cases was an important part of MULTIFOR. The objective of this activity was to evaluate, from technical and economical points of view, how

Harnessing energy from Kent's woodlands (MULTIFOR)

The Kent Downs Woodfuel Pathfinder project has brought a focus to the issues and opportunities surrounding woodland management and the development of woodfuel (biomass) supply chains in Kent. The project began in 2011 and prioritised three work areas:

1. Building demand for locally produced wood chip by delivering feasibility studies for buildings where there is an opportunity to displace fossil fuels;
2. Studying woodfuel supply opportunities at a landscape scale;
3. Promoting best practice around woodland management and woodfuels by engagement of the sector.

The project provided support to a wide variety of people in over 100 locations. This included 40 detailed feasibility studies of which 20 were for Kent County Council (KCC) schools. To date the project has help stimulate over 2 MW of installed biomass heating capacity and has studied supply opportunities in 1,400 hectares of woodland.

Case study: Cobham Hall is a large Grade I listed Jacobean house, formerly home to the Earls of Darnley and now operated as an independent boarding school. They were keen to explore the potential for biomass (wood fuel) as a more sustainable form of heating. The Kent Downs Woodfuel Pathfinder project, provided support focussing on the technical aspects of replacing 1.4 MW of oil boilers with a biomass heating system. The business case that was required to satisfy the school Trustees included a supply-chain study, which demonstrated the security of supply of wood chip from within a few miles of the school. The school has recently selected a supplier and installation of the 950 kW wood chip system is about to commence.

Cobham Hall explored the potential for wood fuel heating

ecological and/or social functions could be integrated with the economic functions of private woodlands. This study resulted in the writing of a plan which will optimize the management of private woodlands

Carbon Reduction

Within MULTIFOR Kent Downs AONB started a building design project, aiming for reduced GHG emissions and increased landscape enhancement. Renewables (e.g. energy) are one way to mitigate. While wind mills were expected to decrease the quality of the landscape, biomass served as an example of a renewable that can enhance the quality of the landscape. Therefore, the objective was to design a more sustainable woodland management, not only focusing on biodiversity, but also on wood fuel. In this way not only the wood heat supply chain could be formed, it would also create a self-sustaining forestry sector in the area. To support the wood heat supply chain technical feasibility studies were performed (104 sites visited to see where it might or might not work, e.g. farms, rural estates, manufacturing, schools) and management plans for chains with good quality supply were created together with woodland owners in the so called cluster studies. In Kent Downs the achievements on carbon reduction were 2 MW of biomass heating capacity and 1000 tons of wood chip per year from Kent.

STEP: Sustainable Tourism in Estuary Parks

The project

The STEP project aims to develop sustainable tourism in the estuarine nature areas involved in the project: the Broads in England, the Polders of Kruibeke in Flanders and the Biesbosch in the Netherlands. All sites were situated near a tidal river and were shaped by people working against or hand in hand with nature. These areas are increasingly confronted by environmental problems and social developments.

STEP focussed on developing the concept of sustainable tourism, innovative forms of visitor management and cooperation between public and private partners in developing sustainable tourism. The concept of sustainable tourism dealt with infrastructure (solar powered ferry, electric charging points, floating mooring places and foot and cycle paths), overnight stays in Ecolodges and branding (new corporate identity, entrepreneurs as park ambassadors and new websites). Also new technologies have been used to enhance the experience such as the 'Park Ranger', an app for smartphones for all three areas.

Together with tourism entrepreneurs, visits have been organized to gain inspiration for projects in their individual areas and to initiate *public-private cooperation*. The 3 partners organized an excursion to the Lake District to take a look at a concept 'visitor giving'. The trip led to The Broads and the Biesbosch setting up similar conservation trusts. 'Visitor giving' is a simple way of inviting voluntary donations from visitors. Visitors who feel inspired to put something back to preserving the places they love.

Carbon Reduction

In STEP some measures were taken to decrease energy consumption, such as the design of eco lodges, solar ferries connecting walking routes and cycling paths and the installation of drifting pontoons for boaters. In addition to these hard measures, creating awareness was done by e.g. the organization of plating events or festivals.

Greener options for boating (STEP)

In STEP several green options for boating were developed and implemented. To encourage electric powered boating a number of charging points were installed and this will be expanded in both The Broads and the Biesbosch. In the Biesbosch a solar-powered ferry connects De Hollandse Biesbosch with other parts of the Biesbosch. The ferry is used to transport both hikers and bikers.

Solar ferry in the Biesbosch

Green Boat Mark

The Broads Authority, in partnership with Broads Tourism and the Green Tourism Business Scheme, launched the new Green Boat Mark accreditation for eco-friendly holiday motor cruisers. Three boat rental companies have now obtained the Green Boat Mark for all or part of their rental fleets. In cooperation with the Green Key organisation a similar system was also developed in De Biesbosch.

Wood fuel heating installation

CHAPTER 3

Lessons learned in the projects

CaRe-Lands is a cluster project in which sharing experiences and disseminating knowledge was the main aim. In all projects a better protection, conservation and management of nature and landscape is a central issue. Apart from the Multifor project, carbon reduction is not the central theme of the individual projects. On the other hand it is an important link between the projects and the subject of the joint ambition to take further steps. All projects identified questions, ideas and possibilities to combine visitor and land management with carbon reduction.

This chapter first outlines the lessons learned on projects with a direct link to carbon reduction. Next the lessons learned on the other common themes are summarized. Finally the experiences of cooperating locally with stakeholders and cross border with international partners are shared.

Lessons learned regarding CO_2-reduction

Developing wood fuel supply chains needs to focus on both demand and supply

In the Kent Downs, the search for demand started in buildings with a high heat demand such as churches, old school buildings and rural estates. These buildings need heat and could save money and carbon by switching to a more sustainable fuel source such as wood fuel. However, when only demand is well organized, there is a risk of over-exploitation of the surrounding woodlands and sustainable woodland management cannot be guaranteed. Kent Downs AONB are also working to connect demand to a sustainably managed wood fuel supply. Since surrounding woodlands are often managed by a broad range of private owners, who all have different aims (biodiversity, wood supply), woodland management plans also had to be developed. The AONB needed to work with woodland owners to build skills and knowledge in sustainable woodland management that maximizes biodiversity gains as well as wood fuel source. The MULTIFOR pilots have shown the success of the approach, however the work needs to be broadened out to a regional level, as well as involving the commercial sector and community groups in future pilots linking wood fuel use and sustainable woodland management.

MULTIFOR Case Study: Biomass heating in public sector schools

There are thousands of public sector buildings in Kent, managed by Kent County Council (KCC), including schools, offices, leisure centers, depots and country parks. In energy terms these buildings are expensive to run and have a high carbon footprint. Implementing low carbon technologies, such as biomass heating, is therefore a strategic opportunity for the council to decrease costs and emissions. However, deployment is slow, there is a negative perception of biomass due to past failures and in the current economic climate the public sector will struggle to finance technologies that cost more than fossil fuel alternatives. There are over 600 schools in Kent and KCC is directly responsible for maintaining around half of them. Together these schools consume a large amount of energy. Many of them are in rural and off-gas areas, and are therefore reliant on oil and LPG.

In general, however, uptake of biomass heating in public sector schools has been slow and the results mixed. Even with the introduction of the Renewable Heat Incentive (RHI), a number of barriers remain which conspire against faster uptake in the public sector. The net impact of these problems is that confidence about biomass heating at KCC level has been compromised and concerns about a wider roll-out of this technology have been raised.

In 2012 MULTIFOR designed and implemented a study of 21 rural, off-gas schools to determine the technical and economic feasibility for retrofit with biomass heating. The main aim of this project was to develop a preliminary business case for biomass heating in schools and to encourage KCC to implement a pilot project involving multiple sites simultaneously. A key result from this work was the development of a finance package that guarantees that the school is better off from day one when a biomass system is installed. This is a key point for this sector due to the increasing demands placed upon local government as a result of the economic downturn.

Following the delivery of the above results KCC has established a working group to oversee the procurement of a biomass installer for a pilot project at six sites. This group has built upon the work above and delivered a series of internal documents relating to procurement and mechanical/electrical specification. The MULTIFOR project has played a key role in this work. It enabled all of the initial research and site surveys and helped deliver a finance model that will allow KCC to proceed with biomass projects in the future.

Converting conservation biomass into energy

Conservation habitat management can produce large amounts of redundant biomass which is currently underutilized and problematic to site managers. The production of large amounts of material can result in poor habitat management, the designation of sacrificial areas for disposing of material or the habitat not being managed at all.
In attempt to address this problem on the wet grassland of the Exe Estuary, RSPB completed small-scale trials to investigate ways of utilizing this waste wetland biomass to make briquettes, which could then be used in domestic heating.

Material from habitat management was cut and collected, i.e. seasoned wood chips from Aylesbeare RSPB Reserve and cut rush from the Exe Estuary RSPB Reserve, and different combinations trialed in the production of briquettes.

All combinations work without the need for an additional binding agent. No difference was found between 40% and 70% of rush, and due to compaction it held together, the key was to reduce the moisture to enable it to be compacted sufficiently. It was felt from the success of the trials that 100% rush could have been used. However the following conclusions were reached:

- Harvested material needs to have moisture content of 20% or below to be suitable for briquetting.
- The need for drying can be reduced by including binders if a rotary briquetter is used, which also reduces the need for secondary grinding.
- The ash content of briquettes produced was only slightly greater (3.75%) than wood briquettes and less than the ash content of recycled wood briquettes.

This work laid the foundations for future study into wider applications and opportunities for converting conservation biomass into bioenergy.

Pisten bully cutting biomass

Reducing motorized transport/ traffic by visitor management

Natura People, STEP and BALANCE defined visitor management as an ideal tool for zoning and leading visitor appropriately through nature areas without disturbing sensitive areas. Additionally visitor management can also play an important role in carbon reduction. It can be used to have influence on the sustainability of the visits by limiting carbon producing activities in the area and facilitating sustainable alternatives and educating visitors how to act in harmony with nature.

On this topic partners were mainly focused on the reduction of motorized transport in and around the nature area's. The different projects indicated that visitor centers or "main gateways" should be near the borders of the nature area close to public transportation. The gateways should be well facilitated with a lot of parking spaces and provide alternative and more sustainable transportation.

Besides well facilitated gateways, a good integral network of pathways is essential. Using one or few starting and transferring points gives management the opportunity to inform visitors about the area, provide clear routes to lead visitors to specific parts of the area and lead them away from the most vulnerable parts of the park.
New ICT applications can help visitors in reducing their impact of their visit. It can encourage visitors to explore the area in a more sustainable way. For example, within the Natura People project a route planner was developed for visitors to plan their own routes in the area by foot or by bicycle. Virtual information via smart phones or tablet can also reduce the amount of physical signs in the area.

Electric boating

Reducing motorized transport has a direct effect on carbon reduction. Eliminating the use of all motorized vehicles in and around nature areas is not always an option. Developing and encouraging solutions for greener transport can then be a good alternative. Installing electric charging points can stimulate both visitors as local businesses to make use of electrical vehicles. This does not only apply to cars and bicycles, it is also very attractive for transport over water. The STEP project had some good experiences with charging points for boats. Electric boats are not only much greener, they also produce less noise. These boats are much more suitable to navigate through nature without disturbing the wildlife. The Biesbosch, partner in the STEP project, also developed a solar powered ferry.

Storing carbon by building Greenways

Green areas play a very important part in the reduction of carbon dioxide because of their storing capacity of carbon. The renovation of Greenways (walking and cycling routes along Green Infrastructures) and the promotion of these routes added to the Carbon reduction in the areas of BALANCE and to the awareness of the options and relevance of carbon reduction to the BALANCE partners. Pathways can be a tool to increase the amount and quality of green spaces, as the BALANCE Project has shown. In the peri-urban area of Gent, Belgium, where green places are scarce and the pressure on remaining open spaces is high, the restoration of greenways for access was delivered alongside their ecological development.

Sustainable tourism accreditation schemes encourage carbon reduction

Sustainable tourism accreditation schemes can be used as a tool to encourage local entrepreneurs to play their part in the task to reduce carbon. STEP and BALANCE developed sustainability accreditation schemes for entrepreneurs in and around their areas in order to improve the quality of local services. Both entrepreneurs and visitors interpret an accreditation, such as Green Key, Green Tourism Scheme or Park Ambassadors, as a guarantee of quality. In STEP, the Park Ambassador concept was developed to an even higher level. In the Biesbosch, individual agreements about mutual rights and obligations between the park and the local ambassadors were defined. The ambassadors also pay an annual fee to cover the costs of maintaining and improving the quality of the scheme.

Some lessons on sustainability accreditation schemes were learned in the projects:

- Within the 2Seas programme area, the partners were confronted with several labels in the different countries. In the UK the Green Tourism Scheme is used, while in Belgium and in the Netherlands the Green Key Label is common.
- Developing a new label provides tailor made solutions, but is time consuming. The CaRe-land partners suggest using existing labels, but also acknowledge that the development of a European Sustainability Accreditation Scheme would be the best solution.
- In order to ensure the level of sustainability after accreditation, the government should continue to encourage and facilitate the entrepreneurs with support.

Other Lessons learned

A good network of pathways is essential for attracting visitors in nature areas

A well-developed network of pathways for different users turns out to be a very important factor in attracting visitors to nature areas. Although the investments in constructing and maintaining them can be considerable, the economic return is often much higher since visitors are key element for the viability of both the reserve and local business. Out of this economic return to local entrepreneurs, various multiplier-effects occur, regarding the local economy, creating jobs and increasing tax income.

A network of pathways, connecting interesting sites in the area, provides new opportunities for local businesses. They can, for example, profile themselves as bike-friendly café or farmers can develop the selling of farm products. A pathway network also stimulates the cooperation of local business, for example organizing special arrangements, where different activities are presented together in a package for visitors.

New concepts for visitor centers, the main gateways to the visiting area

Visitor centers are traditionally seen as the main visitor hub, where facilities, education and the provision of information about the area meet in one building. However, visitors needs have changed, using and maintaining the buildings and manning the facilities, exhibitions and counters are all expensive and new concepts for the sustainable facilitation of tourism in nature areas are needed. A joint conclusion is that visitors need a starting point for their visit. Visitor centers need to facilitate the visit with good services: providing parking spaces, toilets, restaurants, etc. These good services can also be outsourced to private stakeholders.

Easy access gate increases the accessibility of nature areas

STEP introduced recognizable main gates (with different facilities) as starting and transfer points for visitors. These main gateways are a tool in managing and zoning the amount of visitors within the area.

Natura People indicated that centers can be a potential source of income, either by being an attraction itself, or by being a base for organized activities and events.

The BALANCE project emphasizes that the visitor centers are ideal to raise awareness of the value of nature, to attract more people to nature and recreational areas, and to educate and share knowledge.

Sustainability plays an important role in all initiatives of visitor center concepts. Not only in the design and construction (i.a. landscape design, building materials), but also in the exploitation (i.a. use of water, electricity, heat, local food) and programming (i.a. information and education, activities). The new visitor centers or gateways have an example function. Asking visitors and other users of the area to be sustainable, the facilities in the area also have to be so. Being sustainable will have a positive effect on the identity of the site and therefore will attract visitors that find this important.

New ways to reach visitors with new ICT applications

In a changing world, managers of nature areas are now searching for opportunities to reach their (potential) public audiences using ICT applications. Mobile internet provides an almost unlimited range of possibilities. In the 2Seas projects several ICT applications, such as apps, mobile websites, social media, QR-codes, 3D, augmented reality and gaming were explored and developed.

The ICT applications provide many advantages. For instance it can encourage visitors to explore the area in a more sustainable way. It can provide information or education on site in a better way that signs ever can do. Information can be updated almost in real time and adapted to seasons or temporary points of high interest. In addition, the amount of signs in the area can gradually be reduced. Through social media, visitors can play an active role in communication about and promotion of the area. ICT applications can help to reach a new and younger target group, especially through the use of apps.

Although the digital world seems to offer a lot of advantages, in practice there are some difficulties. Technologies and user interfaces are subject to fast and parallel developments, so new solutions appear rapidly, and existing apps become obsolete or old fashioned very fast. Due to a lack of international standards, for example in mobile data

networks, it is hard to develop and launch cross-border products. In addition, the remote locations of many nature areas mean that mobile data, or even mobile reception, is not available at all sites.
The information provided through the apps also needs intensive coordination and renewal. It is wise to organize the maintenance of the tool and the content right at the start of the development. Both aspects can be very labor intensive, which is to be avoided. A good example of efficient use of data is the mobile website MeerGrevelingen that is connected to the up-to-date database of the local tourist information service.

Nature provides money and jobs

Socio-economic research has demonstrated that nature reserves can provide society with significant benefits for income and employment at local and national levels. These benefits are often located in remote, rural or coastal areas, where economic opportunities tend to be fewer and less diverse. It is however difficult for the organizations managing nature reserves to demonstrate the added value they are creating (e.g. tourism infrastructure outside the nature reserves or raised local property values).

An Ecosystem Services (ESS) approach as a way of describing the economic value of a nature reserve is a very powerful tool to raise awareness about the different functions provided by the ecosystems of a specific area. Although in the ESS concept not all functions can be monetized, and even research on assigning economic values is complicated and sometimes difficult to establish objectively, the participating projects experienced that an ESS approach help to let the numbers tell the tale.

Alternative private sources of income strengthen nature development

Nature areas have a big storage capacity for carbon and that makes them very important for the reduction of carbon. Financing nature development can be difficult because of little or no direct economic benefits. In the paragraph above it is stressed that nature does have significant indirect economic benefits. The projects Natura People and STEP had some good experiences with alternative private sources of income for nature development.

Recent developments show that with the right mindset economic and ecological objectives do not have to be mutually exclusive. On the contrary, they can even strengthen nature development. Within the Waterdunen project in the Netherlands (part of Natura People) a project developer worked together with the provincial government to create a new tidal nature reserve with recreational facilities. Without uniting public and private funds this project would have been financially impossible.

Working together towards a sustainable future

Involvement of stakeholders provides more support and increases chances for follow-up

Local connections with stakeholders are very important for a successful project. Within BALANCE a participatory approach was used to develop peri-urban green areas, which fulfill the needs of several target groups. Within STEP and Natura People the involvement of local businesses led to stronger relations between nature protection and economic development. In the Natura People project local businesses adapted the role of area ambassadors, linking their business models more strongly to the conservation and development of the natural qualities of the area. In the MULTIFOR project, close cooperation with private wood owners was established to improve multifunctional woodland management.

All projects discovered the importance of the early involvement of stakeholders, right from the start of developing

Visitor Giving

In 2012 the STEP partners visited the Lake District to view how entrepreneurs and the manager of the National Park work together to generate funds through a visitor payback scheme. Soon after the visit, the Broads started the "Love the Broads" visitor giving scheme, where contributions from visitors are spent on managing and maintaining the area. In 2013 three Biesbosch entrepreneurs, who also joined the excursion to the Lake District, started a "Beleef en Geef de Biesbosch fonds" (Experience and support the Biesbosch fund). Through the "Beleef en Geef fund" visitors are invited to give a voluntary donation for maintaining specific recreational facilities in the Biesbosch.

Visitor Giving in the Biesbosch

local initiatives. Doing so increased support for the projects, and also allowed projects to use local knowledge and experience, which is still often undervalued, to develop more sustainable and supported solutions. Project partners also experienced that it is easier to develop follow-up projects, as they were based on the established cooperation and trust.

CaRe-Land partners in St Margaret's at Cliffe

Added value of cross border cooperation

Cooperating on joint challenges with partners from different countries can be very interesting. Individual countries can have ideas, tools or approaches to comparable problems. Sharing knowledge and experiences can be of added value. Some good examples from the cooperating partners of the projects in CaRe-lands.

A prominent example of good benefits of cooperation was the joint solution for the design of visitor's centers in STEP. Beforehand all partners planned to (re)build or renovate their visitor's centers, but during the project all partners together found that the old style visitor center was not appropriate anymore. They concluded that those centers should be organized with other stakeholders, like restaurants.

In Natura People the partners learned a lot of the joint development of the Ambassadors concept. Not only the official site managers are responsible for a welcoming attitude towards the visitors, but all stakeholders, entrepreneurs, local community in the area have their responsibility. Given this insight, Ambassadors course were developed and held. The results are very positive.

In the BALANCE project, the engagement of volunteers and children in planning and management of the nature areas was an eye-opener for all partners. A targeted approach on these groups brought better results than expected.

MULTIFOR strengthened cross-border awareness of the similarities and differences between forestry, woodland management and the wood fuel sector. In particular field-based activities highlighted fundamental differences in silviculture, climate change research, education and access, collaboration and cooperation between land managers and the state of development of wood fuel and biomass heating sectors. For the wood fuel topics the project really helped to develop mutual understanding of market drivers and how the forestry and renewable energy sectors are responding to new and emerging opportunities.

Ambassador course for entrepreneurs

Local entrepreneurs are often the first contact for visitors to a nature reserve or area. It is wise to actively involve those entrepreneurs in the area, and acknowledge their roles as hosts to increase their involvement. An Ambassador Course is an ideal way to engage entrepreneurs and organizations in the recreation and tourist sectors with the nature reserve and the local area.

In multiple sessions, the Ambassador Course teaches local entrepreneurs about the nature, landscape, culture, history and other facts about the area. They can share this knowledge with their guests and the entrepreneur becomes an Ambassador of the area. During the course they get to know each other, which stimulates the forming of a network of entrepreneurs. The cooperation between entrepreneurs has led to several new joint initiatives in the areas. Visitors are also more easily reached via the network of Ambassadors.

The Ambassador courses were a success in the partner areas. In all regions there was a great deal of interest for participation in the course and entrepreneurs who have finished the course were very positive. The Natura People partners shared the concept of the Ambassador Course and applied it to their own area. There is already a lot of interest from other areas.

CHAPTER 4

Local inventories and joint future opportunities

Local workshop with stakeholders for the Grevelingen area

In the previous chapter, it was made clear that the partners within the implemented 2 Seas Projects were already busy with carbon reduction, but often indirectly and not based on coordinated project objectives. Nonetheless, what does emerge reliably from the various best practices in the area of CO_2 reduction is that there are many more options and that there are interesting prospects in sight.

That is why the partners in this cluster are actively looking for new and attractive possibilities for CO_2 reduction in their specific areas. For this purpose, they have carried out two actions. The first one is oriented on their own options and the most prospective ones for reducing the CO_2. In the second action, we have asked potential stakeholders what they would like and in which actions they are prepared to participate. Below we have described how the actions were carried out and the conclusions that we were able to draw.

Local inventories: method and results

In order to systematically analyse the local possibilities for CO_2 reduction, a format was created in which all the measures for CO_2 reduction are listed. The measures (around 30 in total) are divided into five categories:

- Increase energy efficiency (e.g. use of residual heat and waste flows).
- Reduce energy consumption (e.g. reduce lighting).
- Generate renewable energy (e.g. solar energy).
- Use renewable energy (e.g. buy renewable energy).
- Sequester and hoard CO_2 (e.g. green infrastructure).

Figure 4.1 shows an example of the result. It concerns a local inventory made by Kent Downs in the area of the categories 'increase energy efficiency' and 'reduce energy consumption'. These local inventories of all seven partners were put together and explained and discussed in a workshop. What emerged from this is that the partners mainly see the possibilities in the area of the following themes:

- Generating and using renewable energy.
- Decreasing motorised transport.
- Enhancing the sustainability of using buildings and other constructions.

Redividing the measures within these three themes provides the following tables (see Figures 4.2, 4.3 and 4.4) for the entire partnership.

In addition to these three themes, the cluster partners also see possibilities in the area of CO_2 anchoring (in soil, water and green infrastructure) and what they consider important is the aspect of raising awareness. However, the precise possibilities and effects of the first-mentioned aspect is unknown. Therefore, we need more in-depth understanding. The theme 'raising awareness' is relevant, but the measures that this entails are in most cases a part of the measures in the other categories. The clearest example of this is decreasing motorised transport. It is very essential to offer alternatives (e.g., electrical transport), but the switch-over will come about only if it is accompanied by a good and intensive awareness campaign that will actually make this a reality.

Renewable energy

Generating and using renewable energy sources are the measures that provide many prospects for all the partners in their own specific area(s). In the first instance, biomass and solar energy are the preference for this. In addition, some partners also see prospects in the area of streaming sources: wind and water. The latter obviously does not apply to all areas; sometimes there is no flow of water and wind can have many adverse effects (damage to landscape). Yet it seems that in the area of wind, many new and very small-scale solutions are under development, which in the long-run could lead to prospects. All the partners agree that the various options need further research and elaboration. The initial experiments of Kent Downs (in the area of wood fuel) and of RSPB (in processing clippings into briquettes) are positive, but a lot more materials and applications must be further developed.

Measure (category)	yes	no	why	Explanation of measure
Increase energy efficiency				
Use of residual heat and waste flows		n	**Domestic energy measures we see as the remit of the broader County Council, not the KDAONB.** **Use of biomass is interesting for us. I added comments in renewable energy as biomass is renewable.**	• Reusing heat from a waste incinerator or industrial plant for heating buildings • Reusing biomass (e.g. from maintenance of nature area) for the construction of information panels or furniture
Cooling and isolation	Y		**We would promote these in our work on building design guidance for protected landscapes.**	• Green roofs on buildings • Use heat-cold storage in groundwater to heat/cool buildings
Saving equipment	Y		We promote dark skies; and would like to work with the Highways agency to switch off unnecessary road lighting. We could advance this measure to renewable powering of highways lighting perhaps.	• Outdoor lighting on energy from wind or sun • Use glow-in-the-dark materials for lighting • Heating terrace on energy captured by solar cells
Retro-fitting of buildings	N		We would promote this is design guidance but it is not the remit of the KDAONB but of KCC more widely.	• Making old building more energy efficient (isolation, PV-cells on the roof)
Monitor Energy Use		N	We would promote this is design guidance but it is not the remit of the KDAONB but of KCC more widely.	•
Raising Awareness	Y		We would promote this in partnership and in relation to specific project measures but not as a separate campaign as that would be the remit of KCC more widely.	•
New developments energy savings	Y		There is a target of 140,000 new houses for Kent by 2026. We would like to ensure that growth enhances the Kent Downs. Working with Kent Architecture Centre to engage local people in learning about place making and built heritage, and how to protect it and to enhance it in new developments. This would include energy saving measures and ideally a pilot wood fuel district heating system.	•
Reduce energy consumption				
Reduce motorized transport	Y		**Definitely of interest, we have worked on access paths etc. but have not specifically promoted electrical transport. We have a large cycle path creation scheme as part of our upcoming Darent Valley project, in the Medway Valley and in the Stour Valley – we see promoting sustainable access to the Kent Downs as an important priority and we would be interested in collaborative working on this.** We currently host management of the North Downs Way national trail, and one action is the Green Pilgrimage (encouraging pilgrims to use sustainable forms of transport from Winchester to Canterbury and onwards to the continent).	• Access of nature areas by non-motorized transport (e.g. 'white bikes' in National Park De Hoge Veluwe) : both stimulating by information and facilitating (bikes, special bike routes or hiking routs)

Figure 4.1. Local Inventory Kent Downs regarding 'increase energy efficiency'

Measure	Biesbosch	Grenspark	Grevelingen	Kent Downs	VLM	RSPB	West-Vl
Wind power		✔		✔		✔	
Hydropower	✔		✔			✔	
Biomass energy	✔	✔		✔	✔	✔	
Cold-heat storage						✔	✔
Geothermal power							
Solar energy	✔	✔	✔	?	✔	✔	
Energy from ambient vibrations				?			
Buy renewable energy				?		✔	✔

Figure 4.2. Overview of selected measures for generating or using renewable energy within the partners organisation, area/areas or projects. '?' indicates that the partners did not select the measure but use arguments that indicate they do consider the measure.

Measure	Biesbosch	Grenspark	Grevelingen	Kent Downs	VLM	RSPB	West-Vl
Moving locations public transport		✔					
Reduce motorized transport		✔	✔	✔	✔	✔	✔
Electric transport	✔	✔	✔	✔		✔	✔

Figure 4.3. Overview of selected measures on transport

Measure	Biesbosch	Grenspark	Grevelingen	Kent Downs	VLM	RSPB	West-Vl
Sustainable construction				?	✔		✔
Cooling and isolation		?		✔		✔	✔
Retro-fitting of buildings			✔		✔	✔	
Use of residual heat and waste flows		✔	✔		✔	✔	✔
Saving equipment		✔	✔	✔	✔	✔	✔
Monitor energy use	✔					✔	✔
New developments energy savings	✔		✔	✔		✔	
Reduce lighting				✔	✔	✔	✔

Figure 4.4. Overview of selected measures on buildings and construction (technology). '?' indicates that the partners did not select the measure but use arguments that indicate they do consider the measure.

Transport

The partners think that the most prospective measures in the area of transport are reducing motorised transport and stimulating more sustainable alternatives, such as electrical transport. In fact, most of these measures are an extension of one another. At the same time, these measures are only possible if the availability of electrical transport is improved. Technically, there are many new possibilities that are already available. However, what is lacking here is serious, large-scale investment in this area. To achieve this, the partners have determined the need to cooperate with public and private parties in and around the nature and landscape environments. A starting step must be to set up a broadly based mobility plan, including financing and implementation plans.

Builings

Many measures can be taken in buildings in order to reduce CO_2. The partners want to deploy two such measures in particular: decreasing energy consumption and switching over to the use of sustainable energy sources. Nowadays, there are many new techniques available also in this area. However, the available techniques are deployed far too infrequently. On the one hand, this has to do with lack of familiarity and on the other hand, the additional costs of applying these techniques. There are conceivable solutions for both obstacles and the partners are planning to develop an action plan and projects for this purpose.

Local workshops with stakeholders

Working on CO_2 reduction is not an activity that an organisation that manages landscape and nature can undertake entirely on its own. For that purpose, you need local stakeholders who will pitch into the actions that you want to carry out. Therefore, the partners have invited local parties to a workshop and have presented them with questions via a particular method.

Figure 4.5 shows an example of this. The stakeholders fill in cards to indicate which measures (from the categories listed for this purpose) in the field of CO_2 reduction they would like to carry out and why, and which obstacles they think that they may face. The potential measures are subsequently grouped and discussed.

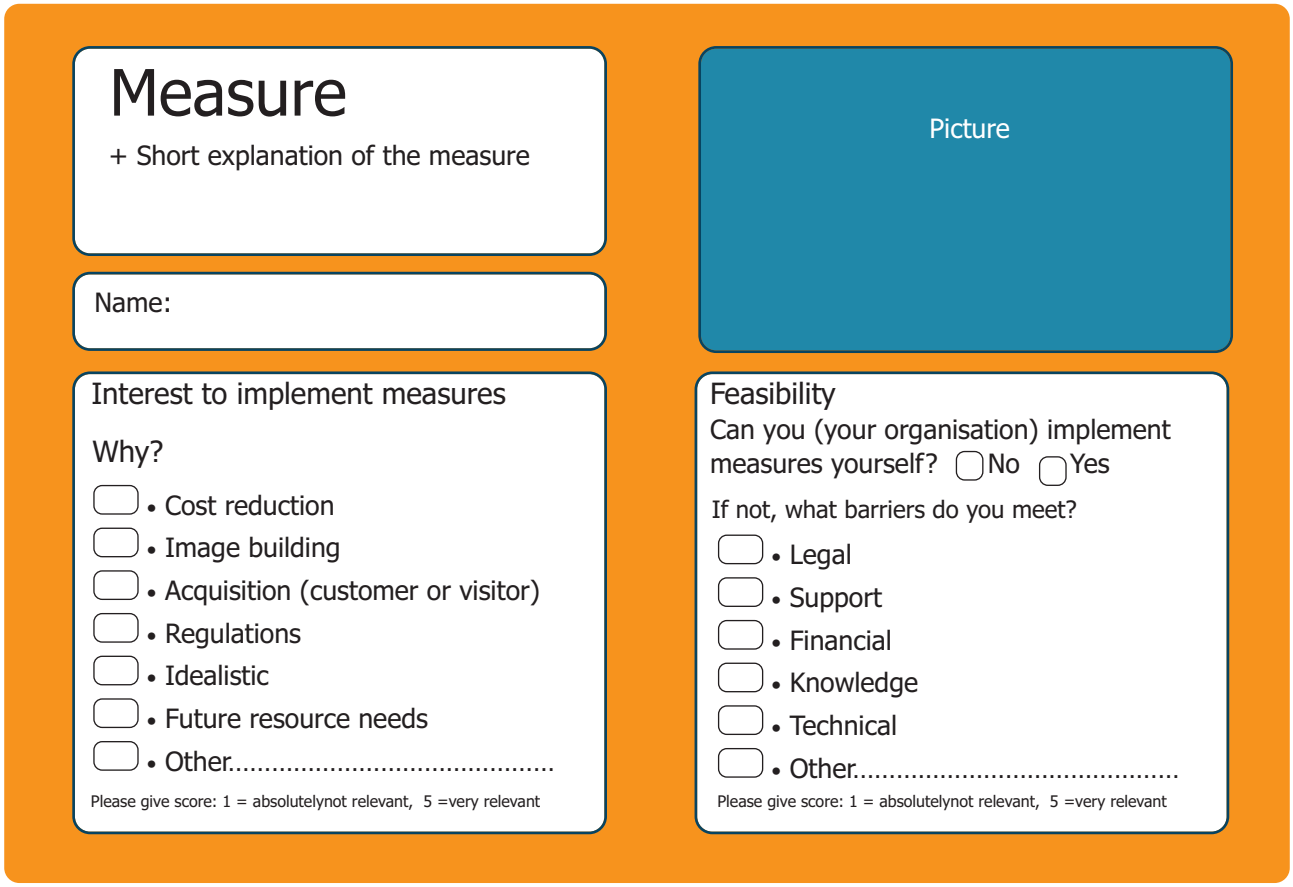


Figure 4.5: example of a data collection card, as used in the stakeholder workshops. Measures were to be added (text/explanation and picture) by the partners after they made a selection of measures.

Results

All the workshops had a good or very good level of attendance, an average of around 15 to 20 participants. All the participants were also very enthusiastic about pitching in together in the area of CO_2 reduction. An often-heard remark was that people themselves do not know how to tackle this theme and that there is a great need for specific and technical know-how and support. Obviously, the results from the various shareholders workshops differ. Below are the most striking ones (a complete report can be downloaded from the CaRe-Lands website).

- VLM: invest efforts into biomass chains on a regional level and on green infrastructure.
- Biesbosch: invest efforts into electricity generated from water basins, solar energy and biomass.
- Grevelingen: invest efforts into tidal energy, possibly in combination with solar and wind, biomass in water and energy from waste.
- RSPB: energy from biomass, solar and wind.

In addition, many location-based ideas also emerged and the stakeholders were very glad about this initiative.

Conclusions

The methods used to make inventories, have discussions and draw conclusions about the potential and most prospective actions for reducing CO_2 within the individual organisations and jointly with the local/regional stakeholders were very successful. This method can be deployed broadly by many organisations in the 2 Seas area.

Based on their own local inventories and the workshops with stakeholders, the partners have drawn conclusions in a joint session about the next stage (preferably Phase 2 of this cluster project). First of all, the issue discussed was: what are the most effective measures for achieving CO_2 reduction in your own nature or landscape environment? Additional research is required in this area, but perhaps it is possible to use existing research materials. In addressing this issue, the partners mainly assume measures in the area of three preferred themes:

- Land management and biomass chains.
- Reducing motorised transport and changing transport modes (especially to electric modes).
- Using new technologies in buildings to reduce fossil fuels and to increase renewable energies.

Pines Calyx

Briquetter demonstration Avalon Marshes

These 3 themes and their related measures were selected because they seem to offer the best prospects for the partners and because the stakeholders expressed a clear preference for measures in these areas (and they see the possibilities of taking steps in these!). The following provides a brief explanation of how these themes will be elaborated further.

More and better use of biomass

In order to use biomass more effectively, it is essential to first get a good picture of the biomass production in one area, the lack of use of it, its potential users and its supply & demand (with regard to quantities, times, types/features). Subsequently, potential biomass chains can be mapped and these chains can be organised accordingly. For this purpose, the effects of this on the ecological and economical objectives in these areas will have to be studied explicitly. In fact, this means that an integral land management model must be designed, tested and introduced: a very innovative approach (Theme 1 of the EU-2020 strategy) and an effective way of realising CO_2 reduction (Theme 3 of the EU-2020 strategy).

Reducing and changing transport

To realise CO_2 reduction in the transport sector, it is necessary to develop an integrated mobility plan for one area in which the focus is on reducing the motorised transport and offering an alternative, environment-friendly transport means. In drawing up such a plan, we not only have to involve the relevant authorities, but also entrepreneurs and public transportation. Additional and very important elements are financing and raising awareness. Drafting a good plan will not be the most difficult part in this endeavour, but what will weigh heavily is obtaining sufficient funds and changing the mindset of people. That will be a major challenge!

Zero carbon buildings

We can make lots of progress in CO_2 reduction in our built-up environment. This starts already with the design of new buildings and infrastructure, but in addition also by implementing new technologies that lead to a sharp reduction of CO_2 and by using renewable energy sources (solar, thermal, wind). The possibilities in these areas are countless, but it seems that there is still a great deal of unfamiliarity among contractors and principals, and that extra costs are often impeding factors. Working on the first obstacle is actually easy and action plans will be drawn for this purpose. These plans will also include new frameworks for financing.

Conclusions from the event

To conclude Phase 1 of the cluster project CaRe-Lands, a conference was held on 25 June 2014 about CO_2 reduction through nature under the title 'Going Green'. This conference reviewed the results of the cluster project, a number of interesting lectures were held, and inspiring examples were demonstrated in the area of CO_2 reduction and sustainability. Participants from the United Kingdom, Flanders and the Netherlands attended the conference. They represented companies, authorities, nature management organisations and knowledge institutes.

Some of the conclusions drawn from this conference were:

- It is urgently necessary for us to change our energy consumption and to look for alternatives.
- There is a serious need for stand-alone innovations as well as an integral approach.
- We can learn a lot from each other through cross-border exchange.
- On a local level, there are scores of good and interesting examples, such as Pines Calyx in Kent (a conference building that on balance has no CO_2 emission), the conversion of bio-waste to bio-energy (DECC project RSPB), a resort and marina that recycles water and energy (futuristic marina in Brouwershaven).
- The options for CO_2 reduction are plenty and are continuously under development. Now it is time for action in which the nature and landscape organisations can and should play an important role.

Participants Cluster Event

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Colofon

Managing Editor: Véronique Weyland-Ammeux
Director of the INTERREG IV A 2 Seas Programme.

Authors and contributors: Annemieke Smit (Alterra-Wageningen UR), Bert Barla (Flemish Land Agency, VLM), Helen Barnard (RSPB), Catherine Brady (Kent Downs AONB), Marianne den Braven (Parkschap NP De Biesbosch), Wim van Hooff (NL RNT), Nick Johannsen (Kent Dows AONB), Sally Mills (RSPB), Wim de Roo (Province of West-Flanders), Caroline Simoens (Flemish Land Agency, VLM), Lodewijk Vormer (Grevelingenschap)

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INTERREG IV A 2 Mers Seas Zeeën
Secrétariat Technique Conjoint / Joint Technical Secretariat / Gemeenschappelijk Technisch Secretariaat
Les Arcuriales - 45/D, rue de Tournai - 5° étage - F-59000 Lille
T : +33 (0) 3 20 21 84 80 - F : +33 (0) 3 20 21 84 98
contact@interreg4a-2mers.eu

RÉGION Nord-Pas de Calais Managing authority

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