



11.-13. September 2017, Bliesgau Biosphere Reserve, Germany

International Workshop on Renewable Energies and Biosphere Reserves



Biosphärenreservat
Bliesgau



Background

“Biosphere Reserves are an effective instrument for mitigating climate change and serve as models for adaptation to the impacts of this change. This applies particularly in the domains of sustainable land use, green economies, safeguarding ecosystem services, energy efficiency and the use of renewable energies. Biosphere Reserves are learning sites for sustainable development.”

(2011 Dresden Declaration on Biosphere Reserves and Climate Change)

Renewable energy

The past few years have seen technological, financial and policy barriers to renewable energy being overcome at a rapid pace. Together with an increased concern globally for climate change calling for mitigation measures, including energy, this has resulted in an important expansion of renewable energy installations and operations ranging from the smallest pico systems to sophisticated smart grids and large-scale centralised installations and increasingly efficient and reliable storage systems. Wind, marine energy, photovoltaic, solar, hydro, geothermal and biomass installations are therefore already today making an important contribution to the global energy supply. The renewable energy sector will undoubtedly continue to grow in the foreseeable future, not only helping to meet energy

demands, but also in the urgent fight against climate change.

The massive expansion of renewable energy installations, operations and consumption, has however also raised sustainability concerns in terms of their actual and potential negative effects, notably in relation to biodiversity, ecosystems services, cultural landscape, land and property prices, food and water security. In order to maximize its positive effects and to minimize any potential negative impacts, these concerns call for taking a cautionary approach also in relation to renewable energy, as with all other energy sources. Identification and sharing of good renewable energy practises and models in different socio-economic, cultural- and natural environments are therefore needed.

The UNESCO MAB Programme and its World Network of Biosphere Reserves

UNESCO's Man and the Biosphere Programme (MAB) is an Intergovernmental Scientific Programme that aims to establish a scientific basis for the improvement of relationships between people and their environments. The World Network of Biosphere Reserves (WNBR) constitutes the main tool for the implementation of MAB.

Biosphere reserves are areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use.

Biosphere reserves are 'Science for Sustainability support sites' – special places for testing interdisciplinary approaches to understanding and managing

Vision and Mission of the MAB Programme

Our vision is a world where people are conscious of their common future and interaction with our planet, and act collectively and responsibly to build thriving societies in harmony within the biosphere. The MAB Programme and its World Network of Biosphere Reserves (WNBR) serve this vision within and outside Biosphere Reserves.

Our mission for the period 2015-2025 is to:

- develop and strengthen models for sustainable development in the WNBR;
- communicate the experiences and lessons learned, facilitating the global diffusion and application of these models;
- support evaluation and high-quality management, strategies and policies for sustainable development and planning, as well as accountable and resilient institutions;
- help Member States and stakeholders to urgently meet the Sustainable Development Goals through experiences from the WNBR, particularly through exploring and testing policies, technologies and innovations for the sustainable management of biodiversity.

MAB Strategy 2015-2025

Vision and Mission of the MAB Programme

changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity.

Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Their status is internationally recognized. There are presently 669 biosphere reserves in 120 countries, including 20 transboundary sites.

MAB Strategy 2015-2025

In accordance with the MAB Strategy 2015-2025 and the associated Lima Action Plan, MAB concentrates its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources and supporting mitigation and adaptation to climate change. Subsequently the

MAB Strategy foresees the following expected result (4.3) Member States and other decision-makers recognize and promote biosphere reserves as priority sites in developing and implementing strategies on climate change mitigation and adaptation, in particular through: (1) energy efficiency and the development and adoption of renewable and clean energy, including energy saving through responsible consumption; and (2) approaches related to carbon sequestration and REDD+ (Reducing Emissions from Deforestation and Forest Degradation).

The importance of renewable energy in the context of MAB and its WNBR is also well established in 2011 Dresden Declaration on Biosphere Reserves and Climate Change.

In addition to providing good conditions for developing, testing and assessing renewable energy

strategies, biosphere reserves offer an optimal setting to find solutions which ensure an environmentally sound production of energy that also takes into account the socio-economic factors and the support of local communities, in-line with the 2030 Agenda for Sustainable Development.

Therefore, the aim of the workshop was to promote exchange of experiences and good practices related to renewable energy production, distribution and consumption in and around biosphere reserves. Good practises refer here to renewable energy applications that are compatible with the 2030 Agenda for Sustainable Development and the pursuit of green, low carbon economies, biodiversity conservation and the creation of benefits for the local population.



*View into the Biosphere Reserve
Bliesgau*

More specifically the Workshop aimed at:

organisations (list of participants see Annex A III).

- Fostering the exchange of experiences and good practices among biosphere reserves in relation to sustainable renewable energy applications
- Identifying opportunities for applying and multiplying lessons learned in biosphere reserves to other areas, including in sites not designated as biosphere reserves
- Examining the opportunities for international networking among biosphere reserves as 'Renewable energy Observatories'

Against this background, the workshop brought together 62 participants from 26 nations, including biosphere reserve managers, government representatives and National MAB Committees, experts from research and civil society

The workshop

[...] I am confident that this workshop will be most interesting and that it will lay the foundations for strong collaboration and information exchange in the future, not only among biosphere reserves, but also with World Heritage Sites and UNESCO Global Geoparks [...]

Peter Dogsé, Representative of the UNESCO MAB-Secretariat

Welcome addresses

Flavia Schlegel, Assistant Director-General for Natural Sciences of the UNESCO: In her video message she pointed out, that renewable energies are a key to achieve milestone international agreements notably the 2030 Sustainable Development goals and the Paris Agreement on climate change. Renewable energies provide vital opportunities in support of sustainable development and climate change mitigation, but they can also pose challenges, if they are not well implemented. These concerns include potential impacts on biodiversity, water, mineral resources and cultural landscapes. That's why the results of the workshop will be relevant for biosphere reserves but also for other categories of UNESCO site designations (i.e. World Heritage Sites and UNESCO Global Geoparks).

Reinhold Jost, Minister for Environment and Consumer protection of the German federal state Saarland, welcomed the participants of the congress in an ambience of a historical ironwork - a structural contemporary witness of the industrial past. Despite the industrial past, Saarland is at the head within the national comparison of biodiversity. The Minister of Environment emphasized that economic strength is compatible with environmental ambitions. Climate protection measures are qualified to protect nature und environment. The minister explained that several activities within the Bliesgau Biosphere Reserve illustrate the compatibility: Environmentally friendly management methods such as the use of renewable Energies in the "Masterplan 100% Klimaschutz", the photovoltaic plant in a former chalk-mine near Gersheim or the participation at the Zero Emission

Nature Protection Areas contribute to the success of an energy revolution.

Dr. Christiane Paulus, Chairperson of the German National MAB-Committee, pointed out that the topic of "Biosphere reserves and Renewable Energies" is forward-looking for the implementation of global Sustainable Development Goals. She emphasized that biosphere reserves in particular can showcase how nature conservation and the use of renewable energies are compatible.

For this reason, the German MAB National Committee adopted in 2012 a position paper on the use of renewable energies from wind power and biomass, with which it makes recommendations for the sustainable use of wind power and biomass and proposals for the creation of appropriate framework conditions in the areas.



Mr. Peter Dogsé, Representative of the UNESCO MAB-Secretariat, underlined that MAB and its World Network of Biosphere Reserves can play a crucial role to promote progress on renewable energy.

Peter Dogsé, Representative of the UNESCO MAB-Secretariat, reminded the audience that the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate change call on the international community to strengthen cooperation on renewable energy as a key contribution to meeting the Sustainable Development Goals, SDGs, and to mitigate climate change.

He stressed the importance of the MAB Strategy and the Lima Action Plan for MAB and its World Network of Biosphere Reserves (WNBR) for the period 2015-2025 calling on MAB and the WNBR to contribute actively to the realization of the 2030 Agenda and the Paris Agreement on climate change, including through the development and adoption of renewable and clean energy, including energy savings. He underlined that MAB and its World Network of Biosphere

Reserves, which consists of 669 sites in 120 countries, can play a crucial role to promote progress on renewable energy. But most importantly, the unique feature of biosphere reserves is that they seek to promote nature conservation in an overall sustainable development context. Notably, this includes taking a holistic view incorporating biodiversity, cultural landscapes and local and regional realities into consideration when planning for and investing in renewable energy.

Moderated Round Table

After the key notes, a roundtable moderated by Barbara Engels, Federal Agency for Nature Conservation (BfN), highlighted the theme climate protection, renewable energies and biosphere reserves from the point of view of local, regional and national stakeholders.

Participants of the Round Table were:

- Mr. Peter Dogsé, Representative of the UNESCO MAB-Secretariat,
- Dr. Christiane Paulus, Chairperson of the German National MAB-Committee,
- Mr. Roland Krämer, Undersecretary of state of the Minister for Environment and Consumer protection of the Saarland,
- Dr. Theophil Gallo, Head of association und District administrator of the Saarpfalz-Kreis,
- Dr. Henning Krämer, Climate protection manager of the Biosphere Reserve Bliesgau

Dr. Gallo pointed out the importance to integrate people in the discussions on climate protection and renewable energies. Practical examples in a biosphere reserve would prove that sustainable solutions



The roundtable highlighted the themes climate protection, renewable energies and biosphere reserves from the point of view of different stakeholders.

work. State Secretary Roland Krämer described the importance of the Bliesgau Biosphere Reserve as an area where it was explicitly tested how to balance land use and nature conservation.

Dr. Krämer reported on the challenges of his work as climate protection manager of the biosphere reserve, in particular when soliciting funds.

Dr. Paulus reported on the discussions on the topic of climate protection and renewable energies in the German MAB National Committee, while Mr. Dogsé assessed Germany's climate change mitigation efforts and renewable energy policies as a bit more advanced than in other countries.

The round table discussions enabled participants to gain inside views from different governance levels.

Presentations

“Renewable Energies in German Biosphere Reserve“, Dr. Ulrich Gehrlein, IfLS

Dr. Gehrlein reported on the Research & Development (R&D) project „Renewable Energies and National Natural Landscapes“. Aim of the project was the establishment of development perspectives for biosphere reserves and nature parks in the conflict area of nature conservation and renewable energies. The project wanted to show specific management approaches for protected areas. 14 protected areas were analyzed concerning conflicts and risks as well as synergies and consequences of wind energy plants, biomass and open-space photovoltaic plants.

Concerning wind power and photovoltaic, the main problems are land consumption, natural

scenery, bird protection, as well as noise exposure.

With a view to biomass, the main risks are land consumption, increase of intensively managed maize cultivation, increased nutrient input caused by digestate spreading and increased/excessive utilization of wood.

The project revealed the following synergies of model regions for sustainable economic activities:

- Regional energy production and adding value
- Connection of landscape conservation and renewable energies (protection by utilization)
- Empowerment of urban-rural-relationships by energy production in rural areas and consumption in the cities
- Inclusion of nature conservation standards into the generation of renewable energies
- Climate protection contribution
- Strengthening of the role model function of biosphere reserves



Dr. Ulrich Gehrlein reported on the Research & Development project „Renewable Energies and National Natural Landscapes“.

Dr. Gehrlein concluded that the study sees possibilities for action of administrations and responsible bodies of biosphere reserves mostly in the fields of information, awareness-raising and co-operative action.

Further important stakeholders are

- Legislators and regulators at federal and state level
- Responsible bodies of the regional planning
- Enforcement authorities

Concerted action on many levels is required. Considering nature conservation requirements various contributions for sustainable economic activity and sustainable development will be present.

“The Biosphere Reserve Bliesgau and the masterplan „100% climate protection“, Dr. Gerhard Mörsch,

Manager Biosphere Reserve Bliesgau

Dr. Gerhard Mörsch presented the Biosphere Reserve Bliesgau, which is since 2009 one of 16 UNESCO Biosphere Reserves in Germany. With around 311 inhabitants per sqkm, it is one of the UNESCO Biosphere Reserves with the highest population density. This and the special relationship between urban space and rural space are unique features compared to other biosphere reserves.

The Biosphere Reserve Bliesgau has – funded by the Federal Ministry for the Environment, Nature, Conservation, Building and Nuclear Safety – established the master plan „100 % climate protection“. Goals are halving energy consumption until 2050 and reduction of greenhouse gas emissions up to 95 % comparing to the year 1990. The plan encompasses six fields of action:

- Energy saving, energy efficiency

- Energy production, Energy supply
- Climate protection and nature protection
- Housing development
- Spatial development
- Sustainable mobility management

As factors of success for the master plan, Dr. Mörsch identified a clear concept, the Masterplan manager, who cares for the implementation and an Advisory council for climate protection.

Presentation “Demonstration site Mariestad”, Ulrika Lindahl, Lake Vänern Archipelago Biosphere Reserve, Sweden

Ms. Ulrika Lindahl presented the Biosphere municipality Mariestad/Sweden, which is working towards independancy of fossile fuels and an industrial renewal. The goal of the test and demonstration site Mariestad is

the development of sustainable transport solutions and energy systems. It's a broad initiative for revitalization of Mariestad with regard to industrial renewal, new job opportunities and ambitious environmental goals (independency of fossil fuels till 2030)

The project ElectriVillage has the main focus on sustainable solutions for the transport sector like full electric transport vehicles, Nimbus electric boats or Fuel cell cars.

The project HydrogenVillage is focused on local production, storage and distribution of renewable energy.

“Renewable Energy adoption in Biosphere Reserves in eastern Africa”, Paul Makenzi, Ph.D., Afri Mab, Kenya

The Biosphere Reserves in the Eastern African region have a great potential for the use of renewable energies. People residing in or close to the biosphere reserves need to access clean and economically viable renewable energy for sustainable development.

As main challenges of renewable energies adoption in Africa, Dr. Makenzi identified:

1. Policy: politics is till now unable of establishing a regulatory framework for renewable energy
2. Planning: poor renewable energies -Development Plans factoring (LCPDP) , Least Cost Development Plans, rolling plan to develop committed energy generation and transmission projects.

3. Financing: Because of inadequate financing, an allocation of financial resources towards renewable energies is necessary

4. Capacity: lack of capacity and technology for adoption and management of renewable energies

5. Innovative renewable energy models to enhance adoption.

To overcome these challenges, Paul Makenzi identified the need for supportive policies, capacity building, knowledge transfer, financial support mechanisms, market stimulation and sensitization of the population, both at the national and the local levels.

Capacity enhancement and mechanisms for information flow about emerging technology should be one of the key considerations for effective adoption of renewable energy technologies in the developing countries. biosphere reserves should continue serving as laboratory sites for adoption of renewable energies for sustainable development.

“Electricity and heat from the meadows – Biogas plants in the „land of the open distances“, Julia Rösch, Rhön Biosphere Reserve, Germany

The lecture by Ms. Rösch addressed the question, which sort of renewable energy use is suitable for the Rhön Biosphere Reserve. The use of wind power is excluded by the objectives of the biosphere reserve but the use of biomass

with a focus on silage and manure could be a suitable possibility.

As an example, the biogas plant of family Hückl in Fladungen was presented. This biogas plant produced 2015 4.369.506 kWh electricity. Furthermore it delivers heat to a local heating supply network with 47 participants. Family Hückl is also engaged in landscape management and interested in the use of “Landschaftspflegematerial” (material from landscape protection measures)” as a resource for renewable energy. The University of Kassel tested the use of Lupinus polyphyllus, an invasive species, as substrate for a biomass plant. The tests showed, that it is possible to use grassland biomass with Lupinus polyphyllus after hydrothermal conditioning and mechanical separation as solid fuels.

“El Vizcaino Biosphere Reserve”, Celerino Montes, Reserva de la Biosfera El Vizcaino, Mexico

Celerino Montes presented the use of renewable energies in the “El Vizcaino Biosphere Reserve”. This biosphere reserve has a size of more than 25,000 Sq km and about 60, 000 people live inside its boundaries.

In the Municipality where the reserve is located, 32% of the energy is produced by renewable energies: 10 MW by a geothermal power plant, 2 MW by solar energy and 0,7 MW by wind energy.



The audience listens to the presentations.

The next goals are the promotion of a further increase in production of renewable energies and to carry out an education campaign to promote the sustainable use of energy.

Presentation “Biomass for energy transition? - CAP-BIOTER: A territorial ecology approach in French biosphere reserves, Juliette Cereceau, France

Juliette Cereceau pointed out that European and national policies place a significant emphasis on biomass to lead the energy transition.

In France, the National Action Plan for Renewable Energies (2009-2020), following the 2009 European Directive, sets the share of renewable energies in final energy consumption at 23%, half of which would be produced by biomass energy derived from

outputs of agriculture, forestry and related industries as well as industrial and municipal waste treatment.

In the CAP-BIOTER-Project three French biosphere reserves where two biomass energy recovery strategies coexist, were examined. The strategies are:

- Decentralization of supply and multiplication of recovery units,
- Centralization of supplies around a single recovery unit.

The CAP-BIOTER project aimed at analysing the evolution of the biosphere reserve system facing an increased mobilization of biomass generated by political choices in terms of energy transition, through a qualitative assessment of:

- “Resilience”: the capacity of biosphere reserves to absorb endogenous and exogenous perturbations generated by the energy transition;

- “Capability”: the capacity of biosphere reserves to generate innovation and collective actions on the basis of local tangible and intangible resources.

Territorial ecology questions the nature of interactions occurring between human beings and their environment, within a contextualized and localized area. Borrowing ecological principles and concepts, it proposes to analyze the territorial dynamics and trajectories by focusing on the circulation of tangible and intangible flows between human societies and the biosphere.

The objectives of territorial ecology are:

- to identify new opportunities of interactions between local stakeholders (synergies) to foster the socio-ecological coherence and resilience of a geographical area,
- to assess and increase the collective capacity local

stakeholders have to co-construct a project of development in coherence with their immediate environment.

Local actors are included in the process to identify the environmental, social and economic impacts of biomass extraction and in the construction of new opportunities of biomass recovery and valorization by fostering interactions among them.

The benefits for the biosphere reserves are the enhancement of local knowledge on the circulation of tangible and intangible flows, the switch from an “eco-actor logic” to an “eco-network logic” and the foster of wealth generation dynamics.

The socioeconomic partners have the opportunity to find new markets for by-products, find local resources meeting local needs and create opportunities for the development of new activities, especially linked to social entrepreneurship.

So the project fosters the socioecological transition by increasing individual and collective resilience.

“Providing access to sustainable energy for human development”, Julio Eisman Valdes, ACCIONA Microenergia Foundation

The Spanish corporation ACCIONA develops its activities within three strategic lines of business: Renewable Energy, Water and Infrastructure, with an approach to sustainable development.

The access to basic services, such as water, energy and other infrastructures, is essential for human development.

ACCIONA started the ACCIONA Microenergia Foundation in November 2008 as an expression of its social responsibility and commitment to those who have no access to basic services. The Foundation’s objective is to provide access to basic services (energy, water and sanitation) to people who have no expectations of having access to them.

The ACCIONA Microenergia Foundation started the non-profit associations ACCIONA Microenergia Peru and ACCIONA Microenergia Mexico in January 2009 and March 2012 respectively, with the aim of implementing its delivery models to give access to electricity, with clean energy, to low-income people and communities, which have no expectations to cover those needs.

In 2013, the “Luz en Casa” programs were recognized as one of the Best Practices of the RENFORUS’s “Success stories on sustainable and renewable energies in UNESCO Sites”. In Latin America, the majority of people without electricity live in remote locations, some millions of them in the Amazonia.

Features of Amazonian communities:

- Mainly indigenous population.
- Access exclusively by fluvial way.
- Extreme weather conditions (hot and rainy).
- Different social conflicts.

In these communities:

- Grid connection is technically and economically unfeasible;
- people get electricity from diesel generators for just 2-3 hours daily, if affordable.
- People use alternative lighting elements (candles or oil lamps).

The aim of one of the projects was the provision of a new electricity delivery model for isolated communities in the Peruvian Amazonia. The target was the evaluation of the feasibility and acceptability of the proposed delivery model in at least 50 households. As a result 61 families (325 people) of the Napo basin are very satisfied with the electricity service through 3G solar home systems, which are considered easy to use. A Customer Service Centre (so called CAU) is now offering technical services in a reference locality.

Relevant figures given by this project:

- Households use electric lighting for an average of 6 h daily.
- That lighting is mainly for study (67%), work (43%) and preparation of meal (21%), and
- avoid harmful elements such as torches (79%), oil lamps (30%) and candles (25%).

3G Solar Home Systems provide safe and clean electricity:

- Enough intensity of lighting
- No works necessary: plug&play architecture
- No pollutant components
- No emission of CO₂ and reduction of disposable batteries
- Displacement of the use of diesel generators



Dr. Gerhard Mörsch presented the Biosphere Reserve Bliesgau and his masterplan „100% climate protection“.

Local authorities support the initiative with information and access to the communities.

- Users, after the corresponding training:
 - Meet the service conditions; payment and use
 - Some of them represent their communities (CEF)
 - A few become franchisee of “Centro Luz en Casa”
- Sustainability for the provider and affordability for users
- Social tariff guarantees low-income people access to electricity.
- ACCIONA Microenergía is in conversations for the inclusion of the 3G systems in the Peruvian regulation.

The conclusions are:

- People living in protected/sensitive areas have to “access to sustainable, affordable, secure and modern energy”(SDG7). “No one left behind”
- The conventional solutions are not suitable for this problem.

There are energy delivery models based on renewables that are sustainable and affordable.

- There is not only one model for all. Public and private sectors have to collaborate searching and implementing innovative solutions.
- The dilemma between conservation of natural resources and energy access has alternatives.

“Kafa Biosphere Reserve, Ethiopia”, Asaye Alemayehu, NABU Ethiopia, Kafa Biosphere Reserve, Ethiopia

Asaye Alemayehu started with introducing his organization NABU, one of the largest and oldest nature conservation organisations in Germany, with more than 620,000 members and supporters and 30,000 volunteers. NABU is further registered in Ethiopia as an

international NGO and has 6 offices with 40 staff members. NABU supported Ethiopia in establishing the two Ethiopian biosphere reserves Kafa and Lake Tana and is currently working in four of the five UNESCO biosphere reserves in Ethiopia.

In 2010, the Kafa region in the southwest of Ethiopia became the first biosphere reserve of the country, which covers an area of approximately 760,000 hectares and is home to a population of around 1 million people. Part of the Kafa Biosphere Reserve is one of the last cloud forests of Ethiopia (422,260 ha), which forms the core of the last remaining populations of wild-growing *Coffea arabica* and are considered to be the original source of this species. The Kafa region is part of the Eastern Afro-montane Biodiversity Hotspot where about 250 plant, 300 mammal and 300 bird species can be found.

The traditional energy supply in the region is wood, which is often burned in a three stone open stove - with a very low energy efficiency. The current wood consumption is estimated at more than 2.1 t of wood per household and year. This results in an immense deforestation and carbon dioxide emission. Mainly women and children shoulder the burden of this traditional energy supply (collection, transport, smoke inhalation and burns).

NABU activities towards alternative energy supply:

- Diversification of energy sources
 - In-depth study on wood demand per household, alternative locally available energy sources and development of new energy sources e.g. briquettes from coffee husk in collaboration with science
 - Community plantations with fast growing native trees
 - Participatory Forest Management
- Development and introduction of technology
 - Improvement and adaptation of energy saving stoves to local habits in cooperation with GIZ and Swiss partners
 - Production and dissemination of 13,000 improved stoves with jobless youngsters
 - Collaboration for solar energy with Solarkiosk
 - Awareness creation e.g. posters
- Training women in pottery for the production of improved energy-saving stoves
- Training of jobless youth in technology development and marketing

Asaye Alemayehu concluded that BRs are optimal model sites for

- Piloting of alternative energy sources
- Collaborating with expert partners, community groups, science and government for development and introduction of alternative energy methods
- Passing knowledge e.g. to delegations from other African BRs

The good collaboration between different partners in the biosphere reserve made the following success possible: nearly 40% of fuel wood equal to 11,800 t of carbon dioxide emissions annually were saved.

But there are also remaining challenges which are:

- Scattered settlements and therefore difficulty to reach target communities
- High costs and limited purchasing power of rural women
- Support from government's side needed
- Maintenance and care of new technology e.g. solar systems, biogas

Still, with its outstanding work in the field of energy-saving and alternative energy use, Kafa Biosphere Reserve has been acknowledged as best-practice case for sustainable and renewable energies by UNESCO/RENFORUS and will further strive for improvements in the future.

“Renewable Energy Decisions (North Devon Biosphere Reserve)”, Andrew Bell, North Devon Biosphere Reserve, UK

Andrew Bell introduced the North Devon Biosphere Reserve and their strategy towards renewable energy.

The biosphere reserve has produced the Sustainable energy strategy for the area and is coordinating its delivery.

In the Sustainable energy strategy they analyzed the energy consumption and found out, that the cars are the main contributor to transport energy consumption. The goals of the energy strategy are:

- reduce energy demand,
- switch to renewable energy and
- generate locally founded renewable energy.

So the biosphere reserve thought about different renewable energy types and their benefits or disadvantage.

The good points of anaerobic digestion are e.g. that it is an alternative to waste disposal and it is renewable. But on the other side it has a large land take and can result in knock-on-effects in soils. With barrage tidal energy there was a potential of 45MW and a potential reduction in flooding in coastal towns. But it could have tremendous effects on coastal life. So the BR tried to identify the relative benefits delivered in each scenario based on stakeholder responses and involvement. In their strategy they concluded that all renewable energies have their impact, which can be mitigated with some rules and that using a natural capital approach might offer a better



Paul Makenzi asked a question.

informed decision making. Having good empirical data on your area is important for that.

“Renewable Energy - A Sustainable Solution for African BR’s”, Adam West, Western Cape Biosphere Reserves Forum, South Africa

Adam West presented the different ways of renewable energy generation in South Africa:

- Wind
- Solar PV & Solar TE
- Hydro
- Biomass: Bio-, Syngas & Steam
- Tidal and
- Geo-thermal

In the last years there was a race between the cost of Photovoltaic and wind energy in South Africa:

- Similar turnkey price trend in the commercial and residential solar sectors.

- There has been a significant drop in solar module prices, especially in Southern Africa where the market is very competitive.
- However, there is currently a huge demand globally for solar modules, so we are not expecting further decreases in module prices in the next 6-9 months.

But in some areas of South Africa there are problems with bat caves that are near wind energy farms. In this area exists the biggest solar plant in the region or even in the world, but the development of renewable energy is stopped and the policy supports the development of nuclear energy.

“Zero Carbon Resorts and renewable energy in Palawan Biosphere Reserve, Philippines”, Madrono P. Cabrestante, Palawan Biosphere Reserve, Philippines

Madrono Cabrestante presented the Palawan Biosphere Reserve. Palawan is an archipelagic province of more than 1,700 islands, straddling the South China Sea or West Philippines Sea and the Sulu Sea. It covers a total area of 1.5 million hectares and is a UNESCO-designated biosphere reserve since 1990.

As Palawan’s Mitigation Mechanism, Madrono Cabrestante presented the Zero Carbon Resorts for Sustainable Tourism Project (ZCR), a 4-year project funded by the European Union’s SWITCH-Asia Program, to promote sustainable production and consumption. It aims at contributing to sustainable development in the tourism sector and its value chain. It shall also



Barbara Engels moderated one of the four workshop groups.

make the tourism industry energy efficient in a sustainable and competitive way through a progressive approach. It engages the 3R methodology: reduce, replace or redesign.

The core areas of ZCR in Palawan are situated in the tourist areas of Puerto Princesa City, San Vicente/Port Barton, El Nido, and Coron. As of May 5, 2017, there are already 330 ZCR members in Palawan. Generally, the members are the micro, small and medium-sized tourism enterprises (or SMEs), which include hotels, resorts and any form of accommodation. Other tourism-related establishments such as restaurants, dive shops, and souvenir shops are also invited. The ZCR Project is also implemented in key tourism sites in the Philippines such as Boracay, Cebu and Bohol.

As of today, the ZCR members annual saving are 22.5 million kW

energy per year, 593.3 million liters water per year and 2.15 million liters fuel per year. So, 15.76 million kg CO₂ have been avoided. The total economic savings for 202 companies in Palawan and the rest of the ZCR members around the country amounts to around 304 million pesos.

Workshop

In the first part of the workshop - phase, four groups worked on the questions in relation to solar energy, hydropower, wind energy and biomass:

- 1) What are the benefits & opportunities, biosphere reserves experience in relation to renewable energies ?
- 2) What are the challenges & problems biosphere reserves experience in relation to renewable energies?

- 3) What solutions have biosphere reserves developed to maximize benefits and to overcome problems?

In the second part, participants answered the questions:

- 1) What are the tools and instruments biosphere reserves can use in the context of renewable energies?
- 2) Where do BRs need more support? What needs to change nationally/internationally?
- 3) How can renewable energies lessons learnt in BRs best be shared among biosphere reserves, as well as with other areas?

The results

Renewable energies are a central topic for biosphere reserves, both for climate change mitigation and for improving access to safe energy

(cp. Lima AP A.1.4).

Key messages

Renewable energies are a central topic for biosphere reserves, both for climate change mitigation and for improving access to safe energy (cp. Lima AP A.1.4). Mitigating climate change also needs to be understood as contribution to nature conservation.

Biosphere reserves are well placed to promote renewable energies, since as model regions for sustainable development, they are places for innovation, participation, creation of local value, negotiation of interests, education and public awareness.

Key assets of biosphere reserves to promote renewable energies are their longstanding experiences in:

- Systems solutions and new collaboration
- Participation of the population

- Solutions that create local value, i.e. (cheaper) access to energy, entrepreneurship and jobs
- Solutions that go hand in hand with education and a cultural transformation
- Addressing conflicts of interests, e.g. nature / landscape conservation
- Solutions that also take into account other sustainability challenges such as water resource management

Biosphere reserves should strengthen and upscale their work on renewable energies, using Agenda 2030 as a framework.

The replacement of conventional sources of energy by renewable energies must go hand in hand with improving energy efficiency. Therefore, biosphere reserves should promote those forms of renewable energies which after sound comparative benefit analysis are most suitable for their region, as part of overall energy

mix. They should address renewable energies and energy conservation as an integral part of the development agenda and not as end in itself. The context of expanding renewable energies is an opportunity for biosphere reserves to redefine and reinforce their role towards communities, investors and public authorities.

Biomass is seen as a key renewable energy for all biosphere reserves globally. Particular opportunities are seen in the use of waste and by-products e.g. from agriculture (e.g. maize and coffee husk), husbandry, forestry; using invasive species as biofuel, which can combine multiple benefits. In many biosphere reserves, creating alternatives to conventional wood or charcoal cooking is a priority. Promoting double-use of heat and electricity generation is an important issue. Strong momentum towards intensive



Dr. Lutz Möller presented the results of the workshop.

biomass production with its potential negative biodiversity impact is seen as a key biomass [biofuel?] challenge. Effective use of biomass is also challenged by other factors:

- Lack of appropriate technologies for all types of biomass
- Limited awareness, capacities, and funding (incl. investors)

Solar energy is also a key renewable energies for all biosphere reserves globally, i.a. due to

- Low and decreasing price; ease of use
- Mobility, availability in small quantities, off-grid use in remote areas
- Associated commercial opportunities
- Low environmental impact

Still, often people perceive challenges such as

- Availability depending on weather, lack of fully reliable batteries

- High upfront investment, unclear maintenance
- Safe disposal of panels and batteries
- Expected further price decrease can also hamper investment

In particular with widely available solar energy, biosphere reserves should focus on providing education and public information about existing, sound and cheap solar energy solutions.

Wind energy is also a key renewable energy for most biosphere reserves. Expanding wind energy must be sensitive in particular to

- Sensitive species such as (migratory) birds and bats, in particular flagship and endangered species
- Landscape and cultural values, Zonation

Biosphere reserves should promote wind energy solutions which

- Are decided and run locally, after adequate consultation creating local value, e.g. through citizens' cooperatives
- Are technologically adapted (wherever possible)
- Promote cooperation among communities and with enterprises

In particular with regard to wind energy, biosphere reserves, where they have the mandate, should support identifying the most suited installation places, promote appropriate spatial planning, EIA, and consider trade-offs.

Hydropower can be a useful form of renewable energy, but mostly if it is small-scale community-owned hydropower with good cost-benefit-relationships for local communities, since it is well tested and typically reliable 24/7.

Biosphere reserves should support hydropower projects only if they deliver benefits for local communities, based on thorough impact assessment,

comprehensive participation and planning; identification of most suitable places for instalment, and assessment of realistic prices discounting subsidies.

Large-scale hydropower can have high costs and wide impacts (displacement of communities, sedimentation, flooding, etc.), in particular if high planning standards are not followed.

In this context, biosphere reserves should also promote catchment management, and technologically (fish ladders etc.) and socially (e.g. excess energy at night for irrigation) adapted solutions.

So what can biosphere reserves do to fulfill their role in the context of renewable energies?

The workshop concluded that biosphere reserves should

- Review their role: what does “model region” mean?
- Adopt RE Master Action Plans, linked to Lima AP
- Position themselves as “test beds”
- Support research and assessment for optimal RE mix and optimal places for new installations
- Support (technological and social) innovation
- Bring together stakeholders / twin communities
- Support good participatory planning processes that optimize trade-offs and maximize local benefits
- Strengthen implementation of policies
- Support education and capacity building

- Integrate RE with CC adaptation and resilience
- Support generating funding (incl. from international cooperation and carbon markets) and incentives
- Support further developing regulatory framework; advocacy, create public awareness and commitment
- Build local identity/brand, i.a. through products
- Support monitoring and evaluation of progress.

What do biosphere reserves need to be successful?

The workshop suggested the following points to be crucial:

- Capacity Building, coaching, training - More generally and focused on renewable energies
- Financial support (international fund?)
- Staff exchange, twinning
- Better cooperation and experience sharing, for example with the following instruments
- Regular national / regional meetings
- Website, Newsletter, Dashboard, Expert Roster
- Award system
- Site visits, workshops
- Media coverage

The workshop suggested the following next steps:

- Exchange good practice globally, among biosphere reserves and beyond, including for planning processes of renewable energies, in particular through twinning arrangements;
- Renewable energies should be included into the agenda of all

MAB Governing Bodies and Regional / Thematic Networks;

- MAB website should feature detailed renewable energies success stories;
- Periodic Review forms should be adapted to include reports on renewable energies activities;
- Biosphere reserves/the MAB network should extend cooperation to the Energy Sector;
- Continue the exchange established in the Bliesgau Workshop.

The field trip

The workshop finished with a half-day field trip through the Biosphere Reserve Bliesgau.

First stop was the biomass power station St. Ingbert. This big power station heats a business park, the town hall and a civic hall.

participants the three wind energy plants in Blieskastel.

After that, the photovoltaic plant in a former chalk-mine near Gersheim was visited. With a total collector area of 2,5 hectare, the plant generates 1,6 million kilowatt hours of electricity and saves so more than 1000 tons of CO₂.

The trip finished in the town hall of Gersheim. The Mayor welcomed the participants of the workshop. The community of Gersheim had replaced the old heating system of the town hall by a woodchip heating installation. By this way, they use renewable energy and reduced the heat consumption in the connected buildings around 20%.

On the way back to St. Ingbert, the organizers showed the

Annex

AI: Workshop program

Day 1: Monday, 11 September 2017

14h00 Opening and welcome addresses
Reinhold Jost,
Minister for Environment and Consumer protection, Saarland
Dr. Christiane Paulus,
Chairperson of the German National MAB-Committee
Peter Dogsé,
UNESCO

14h30 Keynote address:
Renewable energies in german biosphere reserves
Ulrich Gehrlein,
Institute for Rural Development Research (IFLS)

14h50 Keynote address
The Biosphere Reserve Bliesgau and the masterplan „100% climate protection“
Dr. Gerhard Mörsch, Biosphere Reserve Bliesgau, Germany

15h10 Moderated roundtable with local, regional and national Stakeholders

15h50 Questions and discussion

16h00 Coffee break

16h30 Case study presentations
Ulrika Lindahl, Lake Vänern Archipelago Biosphere Reserve, Sweden

Paul Makenzi, AfriMAB, Kenya
Julia Rösch, Rhön Biosphere Reserve, Germany

Celerino Montes, Reserva de la Biosfera El Vizcaino, Mexico

17h30 Questions & discussion

17h45 Visit of venue and exhibition on German biosphere reserves

18h30 Dinner at the conference venue

Day 2: Tuesday, 12 September 2017

09h00 Wrap-up from Day 1

09h10 Views on renewable energies in biosphere reserves Research:

The CAP-BIOTER project: Social, economic, environmental impacts of energy transition, Juliette Cerceau, France

The energy sector:

Julio Eisman Valdes, ACCIONA Microenergy Foundation

09h40 Questions & discussion

09h50 Case study presentations
Asaye Alemayehu, Kafa Biosphere Reserve, Ethiopia

Andrew Bell, North Devon's Biosphere Reserve, UK

Johan West, Western Cape

Biosphere Reserves Forum, South Africa

Madrono P. Cabrestante, Palawan Biosphere Reserve, Philippines

10h30 Coffee break	10h45-11h30 Visit of the woodchips heating installation in the town hall of Gersheim
11h00 Working groups: Potential conflicts and good solutions	
12h15 Lunch	11h30-12h30 Drive to St. Ingbert via Blieskastel-Webenheim Explanation during the drive on short rotation forestry, use of biomass, biosphere-bus and wind energy.
13h15 Working groups: Instruments for biosphere reserves in the context of renewable energies	
14h15 "Marketplace" for networking	12h30 Departure possible from train station St. Ingbert
15h15 Summary presentations of the working groups	
16h00 Coffee break	
16h30 Final discussion	
17h30 Conclusions	
18h30 Dinner (venue close to the conference centre) Afterwards: Shuttle back to the hotel	

Day 3: Wednesday, 13 September 2017

08h15 Field trip

Activity during the field trip on Wednesday, 13 September 2017

8h30- 9h15 Visit of the biomass power station St. Ingbert

9h15-10h00 Ride to Gersheim

10h00-10h30 Visit of the photovoltaics generation plant in an one-time chalk-mine in Gersheim

10h30-10h45 Drive to the town hall of Gersheim

A II: Further informations in the internet

1.) Presentations

“Renewable Energies in German Biosphere Reserve“

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/BR_Gehrlein_.pdf

- further information:

<https://www.bfn.de/fileadmin/BfN/service/Dokumente/skripten/Skript467.pdf>

Tagung/documentation/Makenzi_Eastern_africa.pdf

- further information:

<http://www.accioname.org>

“Strom und Wärme von der Wiese? – Biogasanlagen im Land der offenen Fernen“ („Electricity and heat from the meadows) – Biogas plants in the „land of the open distances“)

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Prsentation_Rsch.pdf

“Kafa Biosphere Reserve, Ethiopia”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Kafa_Alemayehu.pdf

- further information:

<https://en.nabu.de/projects/ethiopia/kafa/area/>
<https://en.nabu.de/projects/ethiopia/kafa/biodiversity/17379.html>

“The biosphere reserve Bliesgau and the masterplan „100% climate protection“”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/02_MoerschUNESCOen_kompII.pdf

-further information:

<http://www.biosphaere-bliesgau.eu/index.php/de/>
<http://www.biosphaere-bliesgau.eu/index.php/de/themen-und-projekte/klimaschutz>

“El Vizcaino Biosphere Reserve”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Montes_clean_energies.pdf

“Renewable Energy Decisions (North Devon Biosphere Reserve)”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Prsentation_Bell.pdf

- further information:

<http://www.northdevonbiosphere.org.uk/biosphere-energy-plan.html>
<http://consult.torridge.gov.uk/file/2419953>
<http://consult.torridge.gov.uk/file/3626635>

“Demonstration site Mariestad”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Lindahl_Mariestad.pdf

“Biomass for energy transition? - CAP-BIOTER: A territorial ecology approach in French biosphere reserves

- further information:

<https://www.researchgate.net/project/CAP-BIOTER-Territorial-capability-biomass-and-energy-transition-territorial-ecology-applied-to-French-Biosphere-Reserve>

<https://www.mab-france.org/workspace/uploads/mab/documents/cap-bioter.pdf>

“Zero Carbon Resorts and renewable energy in Palawan Biosphere Reserve, Philippines”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Palawan_Cabrestante.pdf

“Renewable Energy adoption in Biosphere Reserves in eastern Africa”

- original presentation:

http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/BR_Gehrlein_.pdf

“Providing access to sustainable energy for human development”

- original presentation:

<http://www.biosphaere-bliesgau.eu/images/Unesco-Tagung/documentation/Prsentation-Eisman.pdf>

2.) Documents

2011 Dresden Declaration on
Biosphere Reserves and Climate
Change

<https://www.unesco.de/en/wissenschaft/biosphaerenreservate/ma-b20110/dresden-declaration.html>

Lima Action Plan

<http://unesdoc.unesco.org/images/0024/002474/247418E.pdf>

A III: List of participants

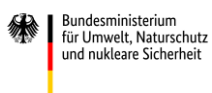


Name	Organisation	Country
Adam West	Kogelberg Biosphere Reserve	South Africa
Julia Rösch	Biosphärenreservat Rhön	Germany
Joel Samuel	UNESCO NATCOM Tanzania	Tanzania
Dr. Kamukasa Adonia Bintoora	Uganda Wildlife Authority	Uganda
Peter Dogsé	UNESCO	France
Frieder Mundt	Landesamt für Umwelt Brandenburg	Germany
Celerino Montes	RESERVA DE LA BIOSFERA EL VIZCAINO	Mexico
Gencho Iliev	Central Balkan Biosphere Reserve	Bulgaria
Duska Dimovic	WWF Adria	Serbia
Dr. (PhD) Paul Makenzi	EGERTON UNIVERSITY/AfriMAB	Kenya
Viktor Reminnyi	Ukrainian National Committee for UNESCO Programme MAB	Ukraine
Dr. Ping Zuo	Nanjing University	China
Hagar Reuveni	Megido biosphere region	Israel
Dr. Möller Lutz	German Commission for UNESCO	Germany
Dr. Frauke Druckrey	UNESCO MAB National Committee	Germany

Name	Organisation	Country
Andy Bell	North Devon Biosphere	UK
Bernhard Wern	IZES gGmbH	Germany
Christian Koch	Institut für angewandtes Stoffstrommanagement	Germany
Beaula Chipoyera	Zimbabwe National Commission for UNESCO	Zimbabwe
Johanna MacTaggart	Swedish MAB Programme	Sweden
Helga May-Didion	Ministerium für Umwelt und Verbraucherschutz	Germany
Hadas Bashan	KKL	Israel
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Brigitte Adamek-Rinderle	MUV, Beigeordnete	Germany
Dr. Ulrich Gehrlein	Institut für ländliche Strukturforschung	Germany
Joachim Götz	BEG Bliesgau eG	Germany
Dr. Hans-Henning Krämer	Stadt St. Ingbert	Deutschland
Gordana Beltram	Ministry for the Environment and Spatial Planning	Slovenia
Madrono Jr Cabrestante	Palawan Biosphere Reserve - Palawan Council for Sustainable Development (PHILIPPINES)	Philippines
Sergey Aleksandrov	Central Balkan Biosphere Reserve	Bulgaria
Alhassane Abdou Sidi Dit Sanndy Touré	OPERATION AMENAGEMENT DU PARC NATIONAL BOUCLE DU BAOULE	Mali
Vitaliy Gromov	Kazakhstan MAB National Committee	Kazakhstan
Dejan Miletic	State Enterprise for Forest Management "Srbijasume" Belgrade	Serbia
Dr. Andrian Delinschi	Moldova Heritage International School	Republic of Moldova
Tatjana Arnold Sabo	Public institution for management of protected parts of nature and ecological network in Virovitica Podravina county	Kroatien
Aleksei Cherepitsyn	Daursky Biosphere Reserve	Russia
Hannah Jaenicke	Bonn University/Centre for Development Research (ZEF)	Germany
Ronja Krebs	Naturschutzbund Deutschland (NABU) e.V.	Germany
Marika Flierl	Biosphären-VHS St. Ingbert	Germany
Frank Ehrmanntraut	Biosphären-VHS St. Ingbert	Germany
Monika Conrad	Stadt St. Ingbert	Germany
Uli Fremgen	Stadt Homburg/Biosphärenzweckverband	Germany
Ulrika Lindahl	Municipality of Mariestad	Sweden
Thomas Johansson	Municipality of Mariestad	Sweden
Elena Vaseeva	Daursky biosphere reserve	Russia
Carl Bruessow	Mulanje Mountain Conservation Trust	Malawi
Asaye Alemayehu	NABU Ethiopia	Ethiopia
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Name	Organisation	Country
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