WISIONS
of sustainability

2

PREP

Promotion of Resource Efficiency Projects

Water and Energy – Precious Resources

II. Issue 2004

www.wisions.net

WISIONS

Sustainable development is possible

WISIONS is an initiative of the Wuppertal Institute for Climate, Environment and Energy, carried out with the support of the Swiss-based foundation Pro-Evolution to foster practical sustainable energy projects.

Sustainable development is possible. Numerous innovative and valuable contributions from different countries, fields and institutions have shown that an appropriate reconciliation of economic, ecological and social factors is not unrealistic utopia. A promising start is made, but the greatest challenge still facing humanity in the 21st century is to learn how to use the world's resources more efficiently and in an ecologically sound and socially balanced way.

Progress is being made; however, a dozen years after the UN Conference on Environment and Development in Rio de Janeiro, many people, especially in developing countries, still lack access to resources, clean technologies and education. At the same time, people's level of resource consumption and means of production remains unsustainable.

To meet global challenges like climate change, water scarcity and poverty, it is necessary to foster projects of potential strategic global importance by supporting them so that they can be implemented locally. Examples of good practice need to be actively promoted to a wider audience.

WISIONS promotes good practice in resource efficiency through its publication of relevant successful projects in its Promotion of Resource Efficiency Projects: PREP

WISIONS also provides consulting and support to ensure the potential seen in visions of renewable energy and energy efficiency can become mature projects through its Sustainable Energy Project Support: SEPS

Water and Energy

Precious Resources

Water and energy are two of the most precious and essential resources for human survival and well-being. All projections point towards a growing demand for water and energy in the future, due to population growth and/or improvement in living standards and also due to high levels of resource consumption in certain parts of the world. However, supplies of freshwater and fossil energy sources are limited. Hundreds of millions of people already lack adequate access to the clean water they need for drinking, cooking, sanitation and agriculture. During the past century, the world's population has tripled, but water use has increased six-fold.

Households in industrialised countries use more water than those in developing countries. Projections show that, by 2025, people living in developed countries will use 149 litres of water per person per day, while people living in developing countries will each use 93 litres. It is not only the water use that is unevenly distributed; the water resources themselves are concentrated in certain parts of the world. In conclusion, this means that by 2025 as many as four billion people, or one half of the world's population, could live in conditions of severe water scarcity, especially in Africa, the Middle East and South Asia.

Photo: Elke Oerter

The energy consumption in developing countries is expected to double within the next 20 years, leading to serious supply problems especially for fast growing economies like China. Clearly, water and energy are inseparably connected and a combined approach should be used to deal with both issues. The lack of access to energy often restricts the availability of fresh water and vice versa: for example, water delivery relies on energy for pumping, and conventional energy production is dependent on the availability of water.

Depending on local characteristics, water services can account for a major share of the total amount of energy consumed. In southern California for instance, water provision to residential customers consumes an equivalent of about one-third of the total average household electric use in the region. In Spain's Canary Islands, energy consumption of desalination plants is expected to double by 2012, by which point they will account for 20 per cent of the total amount of electricity consumed.

In this second brochure, WISIONS aims to focus on the significance of a combined approach to water and energy and to present a number of projects from around the globe that have been successfully implemented, with the intention of further promoting the particular approaches used by these projects. Using a key number of internationally accepted criteria, the main consideration for selection of the projects was energy and resource efficiency, but social aspects such as the inclusion of local population were also of relevance. The assessment of the projects also included the consideration of regional factors acknowledging different needs and potentials.

All projects that fulfilled our application criteria were independently reviewed, and five of them, with the potential to make a significant impact on global energy and resource efficiency, are published in the following pages. We are pleased to present good practice examples from ambitious projects which have been successfully implemented on four different continents. All of these projects are appropriate within their local context and have been developed to a level which meets our selection criteria. Although uniquely designed for a particular setting and problem, the projects presented can be adapted to different situations or can provide valuable information from their implementation phase. Links to the illustrated good-practice examples shown in the brochure, as well as a couple of other issue-related projects, are available on our website www.wisions.net

The selected projects are not intended to represent the only possible directions to take in the field of water and energy but they do demonstrate promising approaches.

Integrating Women in Energy and Water Projects

Location:
Palpa and Dhankuta, Nepal

Project's Aim:
Promote the integration of women in decision-making, implementation and management of household energy and water initiatives, thereby developing their capacity for income generation

Technical Answer:
Increase women's access to clean technology to meet their needs

In order to identify the needs and obstacles relating to water and energy initiatives at household and community level and to initiate appropriate solutions, the Centre for Rural Technology, Nepal (CRT/N), in partnership with local NGOs, implemented a two year pilot project between April 2002 and April 2004. The project, entitled "Women in Energy and Water Management", took place in two of the hilly districts of Nepal, i.e. Palpa and Dhankuta, and was supported by the International Centre for Integrated Mountain Development (ICIMOD) and the United Nations Environment Programme (UNEP).

The field project implementation started with the collection of baseline information, the development of guidelines and training manuals, and a variety of training activities for women's groups. The field implementation also included the supply of specific, high priority technological equipment related to household energy and water. The project was implemented in a participatory manner and women were involved in all the stages from need identification to planning and implementation. Emphasis was also given to developing links with other local institutions and support agencies.

BENEFITS

The project has generated a significant impact in terms of improving women's access to household energy and water management services, thereby reducing their workload. The time saved can eventually be used for income generation. These activities are undertaken based on the women's needs, their inherent skills and the locally available resources, thereby contributing to their economic capacity and increasing their access to improved and efficient water and energy services - which helps alleviate the hardship associated with the livelihood of these women and their families.

TECHNOLOGY

The technologies adopted are simple, proven and cost-effective. Within the short period of two years, 180 improved cooking stoves, 96 drip irrigation systems, 10 waste water management systems, 6 solar driers and 1 large green house, 48 modern toilets, 10 sprinkler systems and 52 bee-keeping practices were adopted at household level, and 1 water harvesting jar, 1 irrigation tank and 10 polybag nurseries were built at community level.

A technology village centre has been established in both the project sites incorporating the households of users for live promotion and demonstration of the application of appropriate technologies to the community. The technology village centre has been very well received by the community and line agencies in the district. The demonstrative effect of this is in the procurement of different technologies by members of the community. Realising its effectiveness, the local government body is in the process of replication in other areas outside the current designated project area.

SUSTAINABILITY

The sustainability of the project is guaranteed by the in-depth involvement of project members. Women participating in the project gain knowledge through technical training. 20 women are trained as 'trainers' and more than 200 women throughout the project area have received training on technical and institutional aspects and energy and water related business development. These trained women are actively engaged in providing information and technical services to the project communities.

The technology costs are met, for the most part, by the users, which increases the sense of ownership and guarantees optimal use. A revolving fund is available to women for investment purposes even after the phasing out of the project.

FINANCIAL ISSUES

The technology costs were mainly funded by beneficiaries; this contributed towards the effectiveness and sustainability of the project.

A revolving project fund was established to provide access to credit for investing in the procurement of the technologies and to support micro enterprise developments.

OBSTACLES

Initially, it was difficult to convince the local community, especially the male members, to participate in the project. This barrier was overcome during the project initiation workshop, which clarified that both men and women would benefit from the project.

REPLICABILITY

The scarcity of water and energy resources, the resulting heavy workload for women, and increasing degradation of water and energy resources are recognised as critical issues in many parts of Nepal. Due to the positive performance of the project in Dhankuta, the District Development Committee of the Government has decided to support the continuation of the activities within the present project area and to replicate the project in another village.

CONTACT

Centre for Rural Technology, Nepal (CRT/N)
Mr. Ganesh Ram Shrestha
Executive Director
e-mail: ganesh@crtnepal.org
URL: www.crtnepal.org

Local Production and Selling of Solar Water Heaters in Eritrea

Location:
Dekemhare, Eritrea

Project's Aim:
North-South and South-South co-operation of SMEs

Technical Answer:
Technology and knowledge transfer

The Swiss Foundation for Appropriate Technology and Social Ecology (Ökozentrum Langenbruck) has been working for five years in the field of renewable energy in co-operation with partners from Eritrea, Germany and Switzerland. The aim is the development of an economical North-South and South-South co-operation of small- and medium-sized enterprises (SMEs). After careful examination of the market potential of several solar technologies, a stable network of partners was formed. With a targeted training programme it was possible to import the technological knowledge of solar water heaters as well as to create a production site in Eritrea. Based on this technology transfer the local company partner in Dekemhare, Eritrea, Tesinma Sh. Co., was able to construct and sell 163 solar systems within one year. Follow up projects are already in progress. These are designed to:

- transfer the technology for producing solar drying systems for drying fruits by environmentally friendly means and to a high quality, and
- to build up trading partnerships for their distribution in Switzerland.

BENEFITS

This project generates environmental as well as social benefits. By switching to renewable energy, CO_2 emissions are reduced in the long term.

The population benefits from the generation of new jobs to meet local production needs. During the production phase of solar systems about 30 people are employed for one month. For installation of the systems three to four people are engaged at 70 per cent for a year. The production of solar systems so far

has generated the equivalent of between seven and eight full-time positions during the initial year of production.

Hygiene standards are improved due to the possibility of using hot water for cleaning and washing instead of cold water with low dissolving effect.

TECHNOLOGY

So far 163 Solar Water Heaters of 2 sqm collector area and 140 litre storage tanks have been sold and are in operation.

SUSTAINABILITY

Eritrea does not possess fossil energy sources; therefore by producing solar systems, the project has a sustainable effect on the economy by reducing import needs and improving the local market. In addition to technology transfer, the transfer of knowledge is also essential. Since 2003 a summer school has been established for all teachers in Eritrean vocational schools. In collaboration with the Ministry of Energy and Mines 32 teachers have been instructed in the areas of solar energy and use of biomass.

FINANCIAL ISSUES

Total project costs were 69,000 Euro, which included 27,000 Euro for materials and transport. 750 project hours over two years were needed. Financial support from northern governments was low; the project was mainly financed by private foundations and individual investors.

The first 150 solar water heaters have been sold at a price of 450 Euro each, totalling 67,500 Euro. The installed systems save about 2000 t CO_2 in ten years; therefore one system saves about 10 t CO_2. These greenhouse gas emission savings are recognised by myclimate which funds climate protection projects by offering air travellers the opportunity to compensate their flight's impact on the climate by buying a climate ticket in addition to their regular flight ticket. With this money, myclimate has co-financed 200 solar water heating systems at the rate of 168 Euro each. This amounts to a total of 33,600 Euro, of which 25,000 Euro will directly be transferred to the local producer. The remainder is used for other purposes, e.g. selection and monitoring.

OBSTACLES

The most significant obstacle to implementing projects in developing countries like Eritrea is the need to work on a professional basis. A further difficulty is convincing local government and private businesses to offer their support. A successful strategy to help overcome these obstacles is to build strong local partnerships and to gain their confidence by continuity and long term co-operation.

REPLICABILITY

The replication of this project is realistic only for areas that are in need of hot water and which are located at high altitude in the northern or southern hemisphere; sub-tropical regions are less qualified. Factors that increase the possibility of replication include the availability of facilities for metal work to a good technical standard, existing technical knowledge of metal work and management, high solar radiation and moderate external temperatures, high energy prices and the availability of raw materials such as steel, copper and glass.

CONTACT

Foundation for Appropriate Technology and Social Ecology, Switzerland
Mr. Bernd Sitzmann
e-mail: sitzmann@oekozentrum.ch
URL: www.oekozentrum.ch

Drip Irrigation with Photovoltaic Pumping Systems in Chile

Location:
Northern Chile

Project's Aim:
Demonstrate alternatives to diesel pumping irrigation systems

Technical Answer:
Photovoltaic pumping irrigation systems

Photo: GTZ, PVP-Programme

In locations which are distant from the electric grid, water pumps are usually run by diesel engines that require frequent maintenance and depend on a regular fuel supply. In remote areas of developing countries diesel pumps are often inoperable due to technical problems, resulting in a lack of water and, therefore, in economic risk to the farmers.

In recent years photovoltaic pumping (PVP) systems have proven their technical maturity and high reliability in many remote sites in developing countries, thereby giving scope for the use of PVP coupled to drip irrigation systems for cash crop production.

In the northern part of Chile the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, together with local farmers, field tested PVP coupled drip irrigation systems. The aim was to clarify whether, and under what circumstances, these systems represent an attractive option for small farmers.

The project focused on peri-urban small and medium-sized farms that use energy and water-conserving forms of irrigation to grow cash crops on up to three hectares of land, generating income that could be used to finance a PV-based irrigation system. Four pilot plants for cash crop production were installed in the Atacama Desert in Northern Chile.

BENEFITS

Farmers in remote areas appreciate the greater reliability of PVP versus diesel systems. Despite extreme climatic conditions, the photovoltaic pumping systems are robust and require low maintenance. For a certain range of applications and water demand, the cost of PVP over the duration of its life is lower than the cost of diesel pumps and therefore offers economic advantages to farmers.

PVP systems offer many environmental benefits. Compared to diesel systems, CO_2 emissions are ten times lower; SO_2 emissions as much as fifty times lower. In addition, the water balance is maintained because economics dictate that systems are not over-sized; therefore, the drip irrigation system delivers a water-saving means of cultivation of land.

TECHNOLOGY

The installed capacity of the four pilot plants ranges between 0.3-1.2 kW peak. The solar modules, pumps and filters which are used are standard components. National manufacturers produced the irrigation systems at a lower cost than international suppliers. However, the photovoltaic pumping systems had to be imported.

During the project, both direct and indirect irrigation systems were tested. The latter pump water into high-level tanks during the day, and the fields are irrigated with a drip irrigation system using gravity. In direct irrigation systems the water is dispersed straight into the irrigation system, resulting in variable irrigation pressure and water flow rates during the day.

SUSTAINABILITY

To encourage sustainable distribution processes, suppliers of PVP irrigation systems and their local partners or companies were involved in the overall operation of the project. Additionally, great emphasis

was placed on the training of project partners and system users, resulting in a lasting support network able to offer qualitative guidance to the Chilean farmers.

FINANCIAL ISSUES

The initial investment cost of a PVP is approximately three times as much as diesel pumps; however, once a PVP is in place, the operating costs are only a fraction of that of diesel pumps. The life-cycle costs (investment plus operating costs) are in favour of PVP for the small and medium-sized systems used in the project. Cost efficiency is best for PVP with a relatively steady water demand over the year. A cost/revenue analysis for various cash crops was undertaken for an average field of 3 hectares. The results indicated that irrigated farming is profitable in Northern Chile.

REPLICABILITY AND OBSTACLES

Particularly in regions with no access to grid power, PVP can be advantageous for small scale irrigation. In order to be economical, photovoltaic pumps have to be working to full capacity during the whole year. This requires the fields to be cultivated with successive vegetable or permanent crops in arid climates. Furthermore, the size of the field to be irrigated should be below four hectares. The investment costs of PVP coupled drip irrigation are high. Financial services and a credit facility for farmers could overcome the investment barrier. Demonstration projects and an advisory service for farmers are essential to increase the deployment of PVP coupled drip irrigation.

CONTACT

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH
Dr. Rolf Posorski
e-mail: rolf.posorski@gtz.de
URL: www.gtz.de

COMMUNITY SOLAR PUMPING AND IRRIGATION SYSTEM IN KWAZULU NATAL, SOUTH AFRICA

In 2002 EDF and its partner Total formed an affiliat (KwaZulu Energy Services - KES) to install solar power into homes in a poor, arid region of KwaZulu Natal. Recognising that there was also a need to stimulate economic activity in the area, EDF and UK subsidiary EDF Energy joined forces with a local NGO - Siyazisiza Trust which helps local community co-operatives to form and develop small enterprises. One of these enterprises is Masazane Garden where, with the support of the Siyazisiza Trust, a co-operative of around 70 people - almost all of them women - had formed a community garden. However, given the local soil erosion and drought problems, the women were having to carry heavy containers of water on their heads from the river to the garden and were therefore struggling to cultivate the garden.

EDF Energy funded the installation of a solar powered pump next to the Masazane Garden, plus water storage tanks, water taps and irrigation hoses. The co-operative members were trained in the maintenance of the system and in the basics of how to manage a small enterprise to sell their agricultural products. It is hoped that once subsistence needs are being met, the garden can supply fresh produce to the local school and hospital, plus higher-value crops such as spices to a much wider market.

CONTACT

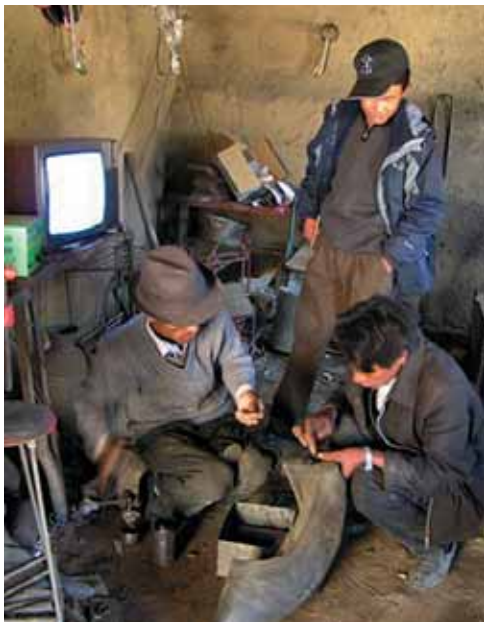
EDF Energy
Ms. Jennifer Gramolt
e-mail: jennifer.gramolt@edfenergy.com
URL: www.edf.fr
www.edfenergy.com

Productive Use of Energy through Rehabilitation of Small Hydro Power Plants in Tibet

Location:
Tibet

Project's Aim:
Improve the living conditions of the rural population

Technical Answer:
Provide electricity through rehabilitation of small hydro plants for productive use.



The project "Rural Infrastructure and Vocational Training" carried out by the Integration Environment & Energy GmbH on behalf of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, aims to support income generation in rural areas by providing electricity for productive use. Electricity is provided through the rehabilitation of small hydro power plants operated in isolated grids. The project started in 1995 and is expected to run until 2006.

About 30,000 people have been supplied with electric power so far. Some 600 people have participated in business and technical training activities.

The sustainable operation of the plants is ensured by the introduction of a private leaseholder structure. Both the leaseholder and the plant owner have to save a certain amount of their income in order to guarantee the availability of sufficient funds for the operation, maintenance and repair of the plants. At the same time new appropriate technology has been introduced.

BENEFITS

The project resulted in environmental as well as economic benefits. In all of the villages supplied by electricity the cash income increased remarkably. Productive use of electricity created sustainable economic activities at local and regional level. The data obtained so far indicates that one kWh of productive used electricity increased the villages' total income by about 2 US Dollar.

Small hydro power plants do not have a negative impact on the environment. The water used in the power station represents a very small part of the river and does not cause damage to life along the riverbank or within the river itself. Fish ladders guarantee that fish can pass the weir buildings. Additionally, the generation of power by small hydro power plants replaces the operation of diesel driven generators and thus reduces CO_2 emissions. The hydro power is generated locally, which prevents energy transport by truck, and therefore additionally reduces CO_2 emissions and other harmful substances.

TECHNOLOGY

The project rehabilitated about 32 hydro power plants with capacities ranging from 20 kW up to 500 kW. The rehabilitation process lasted about 6 to 12 months.

The technology used is adapted to the local conditions. Locally manufactured equipment guarantees the availability of spare parts in the local market and access to technical advice.

The improved technology introduced to the hydro power plants by the project improves the lifetime and operation quality of the plants and, by applying this technology in other plants, to the overall power situation.

SUSTAINABILITY

The financial sustainability is guaranteed by a private leasing structure. The revenue from the hydro power plants covers operational and management costs and, to some extent, capital costs. The leaseholder's monthly income exceeds the average income in the area about 3-5 fold. He is therefore highly motivated to keep the power station running.

To ensure successful operation of the plants, know-how is transferred by means of non-formal training courses. The economic activities are supported by non-formal technical and business training, based on modules lasting between two and four weeks each. Furthermore, a special monitoring system updates all parties involved on a regular basis and allows for early intervention in the case of operational problems or malfunction.

FINANCIAL ISSUES

The specific rehabilitation cost of the hydro power plants is about 800 to 2,000 US Dollar / kW installed.

To support the economic activities of the rural population the programme launched a micro-credit scheme which is operated in close co-operation with the Agricultural Bank of China. To date, about 100 micro credits ranging between 150 and 2,000 US Dollar have been granted. The pay-back period is 1-2 years, with a pay-back rate of 100 per cent.

Additionally, the Tibetan provincial government supported the project by contributing to funds and investments, and by providing office space and technical and administrative personnel.

OBSTACLES

People were used to obtaining their power from the government free of charge. They had to learn that power generation costs money. Decision makers and administration officers had to be convinced that the training of adults was important in order to achieve the objective.

REPLICABILITY

The project can be replicated in other places. The concept provides a complete strategy for improving rural living conditions by creating business activities. It involves the whole village community and, therefore, contributes to the reduction of poverty and of gender-related tensions.

Locally available business opportunities and natural resources are taken into consideration. The participatory approach leads to low investment costs but creates high identification by the target group with the project's outcomes.

The management concept of the hydro power plants is particularly suited to remote isolated sites and was greatly appreciated by the provincial Tibetan government. After close examination by the provincial Tibetan government, this management concept was adopted as the general concept for the operation of another 700 power plants.

CONTACT

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH
Peter Engelmann
e-mail: peter.engelmann@gtz.de
URL: www.gtz.de

Integration Environment & Energy GmbH
Dr. Ulrich Frings
e-mail: Ufrings@integration.org
URL: www.integration.org

Decentralized Desalination with Renewable Energies

Location:
Canary Islands, Spain

Project's Aim:
Promote and implement new technologies in the renewable energy and water treatment sectors

Technical Answer:
Stand-alone desalination systems powered by renewable energy

The Canary Islands Institute of Technology (ITC Canarias) is involved in renewable energies, water technology and sustainable development. One of ITC's aims is to stimulate the industrial development of the Canary Islands in the renewable energy and water treatment sectors by means of promoting and implementing new technologies on the Islands. ITC uses its testing ground in Pozo Izquierdo as a platform for demonstrating the potential of new technologies and innovative products. ITC has developed many projects at this location, with the main objective being the development of stand alone renewable energy-driven desalination systems which are able to produce fresh water at any location that has renewable energy potential. In addition to this, the projects focus on the development of appropriate systems with the potential to combine renewable energy technologies and desalination processes. Projects which are currently dealing with desalination by renewable energy are as follows:

- **SDAWES** (Sea Water Desalination (SWD) by means of an Autonomous Wind Energy System)
- **AEROGEDESA** (Wind "Electrical" SWD)
- **DESSOL** (Solar "Electrical" SWD)
- **AERODESA I** (Wind "Mechanical" SWD)
- **AERODESA II** (Wind "Hydraulic" SWD)
- **Punta Jandía** (Wind "Diesel" SWD)

BENEFITS

These desalination systems provide water scarce areas with fresh water; areas where the water supply usually comes from wells and where the demand for water is greater than the water recovery. In some cases this can lead to the use of brackish water which has a harmful impact on human health, and can also result in the drying-up of natural water sources which produces negative consequences for the environment. Furthermore, the use of renewable energy contributes to the reduction of CO_2 and SO_2 emissions. For example, the avoided CO_2 emissions in the SDAWES project account to 1.7 t per year, and the avoided SO_2 emissions to 40 t per year.

TECHNOLOGY

The projects mentioned above all deal with desalination systems powered by renewable energy, namely wind or solar energy. The majority are designed for coupling to a reverse osmosis plant only. One exception is the SDAWES (Sea Water Desalination by means of an Autonomous Wind Energy System) project: it consists in an off-grid wind farm with two wind generators which have 230 kW nominal power each, supplying electricity to three different kinds of desalination systems:

- *Reverse Osmosis (RO)*:
  8 plants with 25 cubic meters per day nominal production each, being connected or disconnected depending on the available wind power
- *Electro Dialysis Reversal (EDR)*:
  1 plant with a production capacity of 200 cubic meters per day, using as feed water artificially produced brackish water
- *Vapour Compression (VC)*:
  1 plant with a production capacity of 50 cubic meters per day

The control of the isolated grid (frequency and voltage) is carried out by means of a flywheel and a synchronous machine.

SUSTAINABILITY

In many places in the world the use of fossil fuels results in high dependence on imported energy as this resource is concentrated in very few areas. This situation is particularly evident in island locations and, therefore, the use of a local renewable energy source such as wind can substantially reduce, or even avoid, this dependence.

FINANCIAL ISSUES

Desalination systems using wind energy are generally more economic than those using solar energy. For example, relying on data from the DESSOL project where water is desalinated by means of solar energy, sale prices vary between 7 and 9 Euro per cubic meter. When assessing the economic data of a desalination system using wind energy from the SDAWES project only reverse osmosis (RO) plants have been taken into consideration. In these cases the final prices greatly depend on the size of the RO desalination plant. For a plant of 1,100 cubic meters per day a price of around 0.82 Euro per cubic meter can be attained. This price can be competitive in relation to the current water production systems powered by conventional energy.

OBSTACLES

One of the most significant obstacles has been raising finance to develop the necessary technology. On the supply side other obstacles, especially in developing countries, are the problems associated with introducing new technologies, the lack of training of local staff, the risk of equipment theft, the risk of the project being abandoned, etc.

REPLICABILITY

These desalination systems are easily transferable to developing countries. Due to their simple, robust and reliable operation, and low maintenance, they are adaptable to the varying conditions of target locations.

Several replications of former mentioned ITC projects have already been installed, or are in execution, in a number of African States like Morocco, Mauritania, Tunisia and Senegal.

CONTACT

Canary Islands Institute of Technology (ITC Canarias)
Mr. Gonzalo Piernavieja
e-mail: gpiernavieja@itccanarias.org
URL: www.itccanarias.org

Next Prep-Topic: Sustainable Transport

The forthcoming PREP-brochure will mirror the stated objectives of prior issues, namely to collect, evaluate and promote good practice examples, and will highlight the issue of 'Sustainable Transport'.

BACKGROUND

Transport enables individuals to move from one place to another, to go to work or to participate in social life and it also facilitates the movement of commercial goods. Transport supports the financial and social development not only of individuals but of whole regions. Therefore it is indispensable nowadays and the demand for it is growing worldwide.

Apart from all its positive effects transport also has several adverse effects on our health and on the environment. More than 600,000 people die every year in road accidents and about 50 million people are seriously injured. The World Health Organisation estimates that traffic accidents will be the second main cause of death and injury in the developing countries by 2020. Additional health risks derive from polluting substances emitted by vehicles such as sooty particles, sulphur dioxide and heavy metals.

According to the German Federal Environmental Agency (UBA), in Germany, for example, up to 150 hectares of land are consumed daily for habitation and transportation reasons especially on greenfield sites. Construction and expansion of transport infrastructure therefore pose a threat to biodiversity by causing habitat fragmentation - the splitting of natural ecosystems into smaller and more isolated units.

Photo: Nikolai Bockholt

Most transport trends are unsustainable and estimates predict that greenhouse gas emissions and energy consumption caused by transport will double by the year 2025. If the developing countries in Asia, Africa and Latin America become motorised to the same degree as the USA and Western Europe, the consequences for the global environment, energy and economy will be devastating.

In accordance with the objectives of WISIONS the new PREP topic 'Sustainable Transport' focuses on promoting good practice examples adopted through innovative strategies, energy efficiency and renewable energy in the field of sustainable transport. This includes for example the improvement of automotive fuel consumption, an issue which is ever more urgent in view of the current high oil prices. Technical improvements such as low-weight vehicles or hybrid concepts can enhance energy efficiency in the transport sector. Likewise, alternative drives such as fuel cells, as well as alternative fuels like bio fuels or hydrogen, are interesting in terms of their potential contribution to increasing the share of renewable energies.

Of course, it is not only passenger cars that are of significance but also two wheelers, means of public transport and the freight sector.

In addition to technical improvements, structural changes in transport activity are also essential on the road towards sustainable transport. In view of the ever-growing volume of transport it is evident that technical improvements alone will not outweigh this development. Structural improvements mainly focus on decreasing the volume of private car use. Corresponding examples include the enhancement of Public Urban Transport and abatement strategies based on innovative settlement structures and short-distance material cycles.

FIELDS OF INTEREST:

- Energy Efficiency in the Transport Sector
- Renewable Energy in the Transport Sector
- Public Urban Transport

Photo: Nikolai Bockholt

SEPS - Sustainable Energy Project Support

Energy is essential, be it for cooking, lighting, or industrial application. However, people have yet to learn how best to use natural resources. Sustainable development depends on the efficient use of resources, and specifically on the widespread use of clean and renewable energy.

Widespread use of fossil fuels threatens climate and health because of dangerous emissions, leading to high social and economic costs. Today there are still more than 2 billion people who do not have access to sufficient energy.

As the global population rises and the world economy grows, challenges will also increase. In particular, this will be the case if we simply continue with, or copy, conventional approaches.

Therefore intelligent, sustainable energy projects of strategic global importance need to be implemented and promoted.

SEPS OBJECTIVES

Realistic visions and concepts for effective projects for sustainable energy exist, but much needed implementation sometimes fails. The key objective of SEPS is to identify those projects with the real potential to be of strategic importance in the renewable and efficient use of energy.

By providing technical and other forms of support, SEPS seeks to overcome the obstacles and be instrumental in making clean and efficient energy commonplace.

Projects supported must be innovative, sustainable and suitable for replication in other parts of the world. They have to be in a state ready for implementation and a well-developed implementation strategy must be in place.

ACTIVITIES & BENEFITS

The most promising renewable and energy efficiency concepts are selected using transparent analysis based on internationally recognised criteria. Once a project is selected, SEPS can provide additional guidance and support, for example:

- Practical expert advice and knowledge transfer for effective implementation
- Potential financial support to assist with project implementation
- Guidance and support for obtaining additional funding
- Promotion to relevant institutions, decision makers and scientists
- Publication on www.wisions.net

CRITERIA FOR OBTAINING SEPS SUPPORT

SEPS has a set of criteria used in selecting appropriate sustainable projects and relevant forms of support. The following 5 criteria are obligatory:

- Technical viability of the project
- Economic feasibility
- Local and global environmental benefits
- Marketability and replication posibilities
- Implementation strategy

ADDITIONAL CRITERIA

As the goal of sustainable development requires an integrated approach, some additional criteria are also applicable:

- Social aspects
- Inclusion of local population/ structures
- Employment potential
- Co-operation with other stakeholders

More information about SEPS can be found at:

www.wisions.net/pages/SEPS.htm

Contact us:

More information about WISIONS, application criteria for PREP and SEPS , as well as prior PREP-issues are available at:

www.wisions.net

Wuppertal Institute
for Climate, Environment and Energy
Doeppersberg 19
42103 Wuppertal
Germany

e-mail: info@wisions.net
Phone: + 49 (0) 202 . 24 92 252

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