**Case Studies for CSD-14 Submitted by Major Groups**

The present collection of case studies is prepared as an on-line tool for the 14th Session of the UN Commission on Sustainable Development (CSD-14).

The case studies were compiled from information submitted by major groups' organizations to the CSD Secretariat in the form of written contributions to CSD-14, particularly the major groups' discussion papers and their inputs to the CSD-14 Secretary-General's Reports.

The collection is intended to highlight the involvement of major groups in projects and activities that are successfully moving the implementation process forward in the CSD-14 thematic areas of energy for sustainable development, industrial development, air pollution/atmosphere, and climate change.

In addition to major groups, a number of these case studies also involve other actors, including Governments, UN agencies, International Financial Institutions (IFIs) and Intergovernmental Organizations (IGOs) illustrating progress in partnership and cooperation among different stakeholders to achieve results that are beneficial to all. Such examples can often be viewed as models for replication in other geographical areas and socio-economic conditions.

Drawing attention to these case studies helps to fulfill the CSD-14 review session's purpose of collecting and sharing information on progress achieved within the thematic cluster, and outlining some of the challenges that must be addressed in the upcoming CSD-15 policy session.

The criteria used for inclusion in the present compilation included project descriptions and activities that have led to tangible results, involved partnerships among different actors including community participation, have a potential for replication elsewhere, and from which we can learn lessons that can be disseminated around the world. The text of these case studies has been kept as close as possible to the original submissions.

It is expected that many more successes, challenges and lessons learned involving major groups will be identified and shared in the course of the CSD-14 review session, particularly during the thematic discussions and the multi-stakeholder dialogues.

The present collection of case studies and all others submitted by major groups to the CSD Secretariat over the course of the past six months have been incorporated into the CSD-14 Matrix and included in the online case studies database for the CSD-14/15 implementation cycle. These web-based tools can be found on the Internet at http://www.un.org/esa/sustdev/csd/review.htm

Major groups are invited to continue to submit case studies through the Internet at: http://www.un.org/esa/sustdev/csd/casestudies/caseStudies.htm

New York, 27 April 2006

## I. ENERGY FOR SUSTAINABLE DEVELOPMENT

### 1. ABB: Access to Electricity Program Eases Poverty

***-Submitted by Business & Industry***

ABB's Access to Electricity program explores business models that facilitate electrification of low-income populations in developing countries, where local culture and established practices have not yet been exposed to the socio-economic benefits of electricity. The project's local, bottom-up projects focus on the productive use of electricity to establish sustainable power systems that can bear operating and maintenance costs. ABB takes on non-traditional partnerships and cooperates closely with UN agencies, Governments, non-governmental organizations and other civil society actors, and works together with other companies that are specialists in infrastructure development. A synergetic approach to other sectors such as water, agriculture, development of small- and medium-sized enterprises helps to achieve sustainable rural transformation.

In the remote village of Ngarambe, Tanzania, outside the Selous game reserve, ABB partnered with WWF, the local community and the district council in supplying electricity. The village, comprised of around 275 homesteads with a population of around 1800 people, supported itself on hunting and subsistence farming. The aim was to provide economic, environmental and social development while helping local conservation efforts. ABB supplied the mini-grid, and laid underground power lines so that wildlife in the area would not be disturbed. Power is supplied from a modern diesel generator, where retrofitted spark arrestors clean out emissions. ABB trained two generator attendants from the village to operate and maintain the system. WWF provided guidance on issues ranging from reducing deforestation and sustainable forestry and wildlife management to health care and education, including education on HIV/AIDS. Tangible benefits include allowing the schools to stay open late in the evening to provide more classes to more pupils; enabling local doctors being to treat patients in the evening and install a refrigerator to store medicines, saving patients the long trek to the hospital; and reduction of forest destruction hitherto relied upon as a source of energy in terms of firewood collection and charcoal burning. A feasibility study is being prepared to install a windmill to supply Ngarambe and a neighboring village with renewable energy, reducing the dependence on diesel and turning the present generators into back-up power.

Full case study: http://www.wbcsd.org/includes/getTarget.asp?type=DocDet&id=14048

**Objectives**

- Provide electricity to remote villages in developing countries
- Develop a sustainable energy market
- Reduce forest destruction by providing alternate sources of energy
- Provide renewable wind energy to the village
- Provide electricity without disturbing the wildlife in the area
- Create employment in the village
- Create better education and health care through provision of electricity
- Develop the economy of the village through time saving and provision of energy for income-generating activities
- Educate local communities on sustainable forest and wildlife management, health and education, including HIV/AIDS

**Lessons Learned**

- Partnership with WWF was crucial due to their strong relations with local communities and experience in conducting local development projects
- The chances of success increase significantly in a rural electrification project if there is a certain level of development in the area and other development efforts are being made
- Successful technologies can withstand severe climatic conditions, be resistant to vandalism and theft and are simple and easy to maintain
- An integrated view that includes certain development activities in neighboring villages, the customer's supply chain, and/or among end-customers may secure local sustainable business practices and attract a broader scope of partners, investors, financiers and donors
- Feasible projects include the supply of power to rural growth spots such as tourism, mining, agriculture and other small and medium sized enterprises with settlements in and around urban growth spots connected at low marginal cost helping further enterprises and improvement in local conditions
- Local manufacture in own factories keeps costs down and ensures performance and quality of products
- Educational and training schemes must be an integral part of the electrification process as resources and qualified personnel for operation and maintenance are not guaranteed

**2. Eskom: Electrification Program for South Africa**
***-Submitted by Business & Industry***

Eskom is South Africa's wholly state-owned electricity utility. It has 24 power stations with a nominal capacity of 40.585 megawatts, and is one of the lowest cost producers of electricity in the world. The company supplies electricity to over three million customers via approximately 350 thousand km of transmission and distribution lines. Eskom has connected 3.2 million homes since the inception of the electrification programme in 1991 with over 90% of urban and 40% of rural areas electrified. To counter costs associated greater distances from the established grid, Eskom partnered with Shell for a joint venture project to install pre-paid solar systems with storage. The solar systems feature four high-efficiency fluorescent lights and an outlet for direct current for television and radio. Local shops are used as outlets for the purchase of pre-paid cards used by local people to install and maintain the system, creating jobs in the communities. The supply of electricity has led to an increase in education and productivity levels and a decrease in harvesting firewood for biomass burning, which has in turn decreased ambient pollution and consequent respiratory diseases, and helped to protect biodiversity.

Full case study: http://www.wbcsd.org/includes/getTarget.asp?type=DocDet&id=606

**Objectives**

- Provide electricity to South Africa
- Provide off-grid electricity to remote rural areas where costs prevent grid connection
- Foster socio-economic benefits associated with electrification
- Enhance rural development and renewable energy
- Create jobs through FDI in energy-intensive manufacturing and new employment opportunities
- Increase small business development
- Provide access to communications and refrigeration
- Reduce harvesting of firewood and protect biodiversity
- Reduce ambient pollution from biomass burning
- Increase health benefits

**Lessons Learned**

- Projects need to be undertaken in a holistic manner

- It is not possible to separate planning and project management – continual re-planning is required, as are targets and technology plans
- A centralized approach for planning is necessary
- Customer knowledge is essential
- Standards must be based on proven pilots with innovation in the pilot phase
- Standards provide building blocks and allow the matching of tariffs and technology to customer requirements
- Tariffs and revenue collection are critical and must tie in to technology and culture
- Non-grid options need to be integrated in a controlled manner

**3. EDF, Tenesol, Total: Electrifying Rural Moroccan Households**
***-Submitted by Business & Industry***

ONE, Morocco's National Electricity Office, has developed a programme for the electrification of areas through solar power by a joint venture with EDF, Total and Tenesol. Its activities are based on the creation of small, locally-run companies that provide electricity, water, gas, and telephone services in rural areas in order to stimulate economic activity and contribute to wealth creation. In peri-urban areas, the programme aims to increase access and reduce poverty through adopted solutions, including demand-side management projects. In regions were housing is scattered it is impossible for the electricity grid to reach each individual house in a cost-effective way, but by using solar power the inhabitants of these regions can also enjoy the benefits of electricity. In order to generate its own electricity, each house is fitted with a solar home system in which the solar panel turns the sun's rays into electricity that is stored in a solar battery that provides electricity at night, and stores enough power to last up to five days. The electronic controller automatically manages the charging and discharging of the battery. Fees are adapted to the budgets of the local households so that they pay approximately the same amount as was paid previously for candles, gas, batteries, or battery recharging. The fees are lower than the cost of the equipment and maintenance because ONE gives a grant for each installation in order to provide equal energy access opportunities to the Moroccan population. The provision of electricity has improved local conditions by fostering commerce and providing direct employment and high-level-in-house training in technical, quality and customer relations. The solar programme is now being extended to more than 110,000 households, making Morocco the world leader in the use of solar power for rural electrification.

Full case study: http://www.wbcsd.org/includes/getTarget.asp?type=DocDet&id=15051

**Objectives**

- Provide affordable and sustainable rural electrification
- Improve rural local conditions to decrease rural-urban migration
- Develop rural economies
- Increase use of renewable energy

**Lessons Learned**

- The joint venture public-private partnership can be very effective where the government authority ensures the overall coherency of rural electrification, identifies the areas to which the solar solution will be the most adapted, defines specifications, selects and mandates the solar operator and ensures the commitments are respected and measured to the satisfaction of customers
- Incentives for private industry can be provided through grants which provides a solid base for a market in sustainable energy
- Running small stands at the local soul (market) allows interaction with existing and potential customers fostering a continued market

**4. WLPGA/UNDP LP Gas Rural Energy Challenge South Africa**
***-Submitted by Business & Industry***
This public-private partnership initiative between the UNDP and the World LP Gas Association (WLGPA) was launched at the 2002 World Summit on Sustainable Development. The initiative is designed to create viable and sustainable markets for LP Gas delivery and consumption as a means to deliver a wide range of productive services, and contribute to sustainable energy solutions in selected developing countries. LP Gas can provide energy to rural communities where costly grid-based energy services are unavailable. It can be easily stored and transported to reach isolated communities. It is inherently suited to an indoor fuel because it is clean, burns without smoke or residual particulate matter and is virtually free of toxic gases. LP Gas can provide many households with a modern alternative to traditional cooking fuels such as firewood, charcoal and dung, which contributes to a better quality of life, improves sanitation and liberates women from spending time collecting fuel, thus enabling them to spend more time on education and income-generating activities. Access to LP Gas also supports the creation and modernization of small commercial enterprises dealing with food preparation and processing (roasting coffee, cacao, pimento and peanuts; water heating; refrigeration; fish smoking), agriculture (driving irrigation pumps, crop drying, and weed burning), ceramics, glass and metal works.

In-country workshops have been held in Honduras, Morocco, South Africa, Ghana and Vietnam. Following the workshop in South Africa in which WLPGA/UNDP brought the government and the LP Gas industry together, the major LP gas suppliers in the country, under the auspices of the LPG Safety Association of South Africa, developed the LP Gas Low Income Household Programme, which aimed to supply on a commercially sustainable basis LPG energy to millions of poor households. The government provided a subsidy for the initial cost of switching with the acquisition of cylinders and cooking appliances and a range of other generic enabling activities such as user education, the creation of a local supply, providing employment for the previously disadvantaged, setting a maximum resale price, and the supply of small and easily portable cooking tops. Partnerships with local Black Economic Empowerment groups facilitated distribution. Private businesses participated on a competitive basis with their own independent offerings and advantages.

Full case study:
http://www.wbcsd.org/templates/TemplateWBCSD4/layout.asp?type=p&MenuId=OTQw&doOpen=1&ClickMenu=LeftMenu

**Objectives**
- Provide off-grid electricity to rural communities in developing countries
- Provide rural communities with cleaner, safer, and sustainable energy
- Liberate women from time-consuming collection of firewood
- Improve the quality of life, in particular of women, in rural communities in developing countries
- Provide energy to rural communities for the development of commercial enterprise in food preparation and processing, ceramics and agriculture
- Make access to LP Gas more affordable to low income households in developing countries

**Lessons Learned**
- Partnership with UNDP was helpful in attracting high-level government officials and key gatekeepers from the supply industry to meet and discuss the way forward
- In South Africa, partnership with UNDP allowed the government and private investors to define their own particular ethos and needs, which provided a basis for the workshop in building common ground, solving each of the problems and creating a common vision

- It is important at outset to identify which of the stakeholders actually have the resources and necessary skills and the power to act
- The working dialogue between industry and government needs to be guided by local circumstances and dynamics
- A body should oversee market expansion and allow industry participants to compete with each other rather than collaborate on a joint market expansion strategy. In South Africa this was achieved by appointing an independent energy consulting practice to the project

**5. Women in Bangladesh Make Battery-Powered Lamps**
***-Submitted by Women***

This project aims at improving the lighting and indoor air quality of rural households by replacing the traditional kerosene lamps with modern fluorescent battery-powered lamps, which have a reduced risk of fire and do not give off smoke and other emissions harmful to human health. Funded by the World Bank Energy Sector Management Programme (ESMAP), it has been running on the remote island of Char Montaz in the south of Bangladesh since 1999.

The fluorescent lamps are produced and marketed by a women's micro-enterprise in an area where an extension of the electricity grid is not likely in the next 20 years. If a woman constructs and sells two lamps a day, she earns wages equivalent to a skilled labourer, a significant opportunity which benefits both her family and improves her social status. The remote community also benefits from the lamps, which are highly efficient and have low energy consumption. Thus far 1,000 households are using these lamps, with a market of 20,000.

From the start, the project recognized the importance of rural women's knowledge of local conditions and used major inputs by these women in the design of the energy service mechanisms. Recognizing that women had gaps in their knowledge of electronic components, and a lack of skills with the tools needed to work with the components, the project gave appropriate training to ensure that reliable lamps were produced. Training was also given in accounting and bookkeeping. Male family members have also been encouraged to act as advisers to the women, especially on marketing, sales, and operating battery-charging services, a new activity that has developed out of the original project.

**Objectives**

- Provide energy to a remote community where grid extension is unlikely in the next couple of decades
- Replace kerosene lamps with more energy efficient, less fire prone, and healthier energy sources
- Provide sustainable trade and income generation for women in the community

**Lessons Learned**

- Using women's existing knowledge in project design and implementation improves the success of rural development
- Providing compensatory training for gaps in technical and business knowledge further enhances success

**6. Women in Bulelavata Design and Implement their Own Micro-Hydro System**
***-Submitted by Women***

The women in Bulelavata, a small, remote village in the Western Solomon Islands accessible only by sea, used to live a subsistence lifestyle typical of women in tens of thousands of other villages across the Pacific Islands. Then, in 1998, the community chose to begin the process of establishing an energy-for-

development project. In 2001, the community-owned micro-hydro system, funded by the Australian International Greenhouse Partnerships, Caritas, and the Provincial Government, was officially opened by the Provincial Premier. The system produces 24kw and has 1.5 km of high voltage transmission line, enabling the community to sell power to the Provincial Secondary School.

For the women of Bulelavata, the energy project has had some significant and profound impacts, ranging from the practical, quantifiable advantages of lighting and community income to qualitative outcomes such as solidarity and empowerment. The project design of the Bulelavata community micro-hydro scheme used a women's participatory action agenda, exploiting "action learning" (or learning-by-doing) as they were able to ground the workshops within the context of the occurring project in their lives. The workshops were comprised of policy support, female project management, female role modeling at varying levels, specific women's awareness and training workshops, visits by women to other villages, management committee positions for women, a new village institution for women, technical team leadership by women, and logistical project support teams being given equal status to technical project teams. This affirmative agenda was designed to encourage and facilitate active and meaningful opportunities for participation by the village women. It operated within existing Melanesian cultural and village religious mores while at the same time challenging the boundaries of perceived gender roles through the medium of the new technology.

The Bulelavata village men say that the electricity project has changed their women; they are pleased that women are now more confident and outspoken and participate more in community development activities.

**Objectives**

- Provide sustainable energy to a small isolated island
- Provision of action-oriented training to the community, women in particular, for management and maintenance of the energy system
- Improve women's social positioning and participation in the community

**Lessons Learned**

- The project had profound social impacts, particularly with regard to improved gender relations
- Workshops were successful in exploiting "action learning" and grounding training within the context of the project
- The workshops operated within existing Melanesian social mores, hence gaining the acceptance of the whole community, and successfully challenged the boundaries of perceived gender roles to the benefit of both women and men

### 7. Uganda: Solar Dryers Help Women Market their Produce

***-Submitted by Women***

Crops in Africa have traditionally been solar dried in order to preserve them. However, crops left outdoors are vulnerable to pests and need an attendant to guard them. Lack of control over the drying process can also result in under- or over-drying and consequent loss of overall quality.

In Uganda, an FAO/UNDP post-harvest program recommended small-scale solar dryers for long-term storage and household consumption of fruit and vegetables. However, rural women's groups were more interested in solar dryers for income generation than for food security. Subsequently, the "Fruits of the Nile" company was formed in 1992 to link rural producers with the market for dried fruit in Europe. Within three years, more than 50 women's groups had taken up the solar drier technology, and in 1995, the company exported more than 40 tons of dried fruit. The dried fruit is produced by the women's groups

and transported to a central collection point in Kampala. Produce is then inspected for quality and exported to a marketing group in the UK. The Matinyani Women's development Group uses solar dryers to dry mangoes. In thirteen weeks, each of the women in the group earns 6000 Kshs to supplement their income. They produce over 3 tons in one season. The mangoes have been tested in London, Brussels, and Tokyo and have been recommended as the best in the world.

Not only are the women gaining significant income, but original food security concerns are also being addressed as the women use the solar dryers to preserve their vegetables and fruits for home storage and consumption.

Full case study: http://www.energia.org/resources/newsletter/enarchive.html

**Objectives**

- Solar drying without the disadvantages of leaving crop vulnerable to rain and pests
- Long-term storage of crop for home use and export
- Development of income generation for women

**Lessons Learned**

- Successful introduction of modern solar dryers in developing countries depends upon their ability to generate income for their users
- Reduction of greenhouse gas emissions is not an immediate priority for rural communities in developing countries
- Local solutions can create global possibilities for marketing and trade

**8. Farming for Energy, for Better Livelihoods in Southern Africa (FELISA)**
***-Submitted by NGOs***

Farming for Energy, for Better Livelihoods in Southern Africa (FELISA) is both a concept and a project that promotes the use and production of bioenergy, particularly biodiesel. With FELISA, it is projected that countries in the Southern African Development Community (SADC) can satisfy their energy needs, hence making them less dependant on external vagaries of the exchange market, by allocating less than 10% of their cropland to energy crops.

Oil palm, at four tones per acre, has the highest productivity and is therefore the crop of choice. The cake that remains after oil extraction is fermented for compost. During composting, biogas is produced, which can be used for cooking, heating or for electricity production. The compost is reintroduced in the plantation, allowing recovery of nutritional elements. Crop production can potentially employ millions of labourers, and boost the rural economies. The income generated will provide access to fertilizer, contribute to food security, and support opportunities for export. With an increase of 100 million hectares, the SADC countries can provide 10 percent of the world's biodiesel in the future, amounting to $100 billion in the market.

**Objectives**

- Produce cleaner, renewable energy
- Reduce carbon emissions
- Provide for domestic energy needs of African countries
- Provide employment to rural labourers
- Boost rural economies of African countries
- Produce fertilizer
- Generate income for African farmers

- Increase food security of African countries
- Generate export opportunities for African countries

**9. Energie-Cities**

***-Submitted by Local Authorities***

The Energie-Cities Association includes 136 members from over 21 countries including France, Germany, Great Britain, Portugal, Sweden, Switzerland, Poland and Serbia and Montenegro. The members are mainly municipalities, but also inter-municipal structures, local energy management agencies, municipal companies, and groups of municipalities. As 75 percent of energy consumption in Europe occurs in urban areas, local authorities have a pivotal role to play in reducing energy consumption and energy bills while reducing local emissions and effluents, and stimulating local growth by making use of locally available resources.

Projects under Energie-Cities include:

- SMILE (Sustainable Mobility Initiatives for Local Environment), which aims to reconcile mobility needs with quality of life and environment, compiling results and experiences of European cities and towns in designing projects and measures according to the needs of specific target groups and presents successful models on how to involve citizens;
- RUSE (Re-directing Urban areas towards Sustainable Energy) which aims to improve the use of structural funds to new members states in the urban projects through capacity building in collective structures (city networks and agencies) and individual bodies (municipalities); DISPLAY works within and promotes the EU Directive on Energy Performance of Buildings by encouraging European municipalities to publicly display the energy, water, and greenhouse gas emissions of public buildings in order to raise public awareness on energy and environmental issues;
- PENELOPE (Promoting Energy Efficiency to Local Organizations) disseminates best practice cases in the cities and regions of the EU, outlining costs and benefits, partnerships established, recommendations, useful documents, weblinks and contacts;
- REST (Renewable Energies and Sustainable Tourism) aims to make hotels “carbon neutral” through energy audits to identify wasteful practices and renewable energy options. More than 16 hotels have signed the REST Charter and several have reached the target of net zero emissions. The anticipated energy consumption will fall by 25 percent if all hotels implement these measures, with the largest savings from the large urban hotels.

Full case study: www.energie-cities.org

**Objectives**

- Develop local initiatives through exchange of experiences, knowledge transfer and the organization of joint projects
- Strengthen local roles and skills in energy efficiency, the promotion of renewable and decentralised energy sources and protection of the environment
- Influence the policies and proposals made by the European Union institutions in the field of energy, environmental protection and urban policy

## II. INDUSTRIAL DEVELOPMENT

**1. Multi-functional Platforms in Mali**
***-Submitted by Youth***
As part of a decade-long initiative of the United Nations Development Programme (UNDP) and United Nations Industrial Development Organization (UNIDO), the multi-functional platform project provides decentralized energy to rural villages in response to requests from local women's associations in Mali. The small size and dispersed locations of villages in Mali make off-grid decentralized mechanical and electric energy supply the only viable option. The multifunctional platform is a 10-horsepower diesel engine that was purposefully designed to take into account multiple end uses for energy in rural economies. Different combinations of end-use equipment are possible, according to seasonal and daily requirements, and different modules can be acquired over time to meet changing needs. For instance, one platform can simultaneously run a mill rated at 150 kilograms per hour, a water pump with a capacity of one to eight cubic meters per hour, and a battery charger, as well as provide electrical power for 135-180 25-watt light bulbs. Mounted on a steel chassis, it can power various agro-processing machines, such as a corn mill or oil press, and power tools such as saws and welders, thereby spurring small-scale industrial development.

The Programme has taken advantage of the traditional gender-based division of labor in which women perform the tasks of grinding, hulling, and collecting firewood and water, by requiring that the platform be owned and managed by women's associations. Training is then provided in areas of literacy, bookkeeping, management and maintenance, resulting in women becoming energy entrepreneurs and selling energy to men. Women can also use the energy for income-generating activities, including oil extraction, production of food pastes and shea butter, and soap manufacturing. Women have also saved between two and six hours of time per day, and the attendance and performance of school-age girls has increased since they no longer must stay at home as much to help their mothers. In 350 Malian villages with platforms, women's average annual income has tripled from US$34 to US$101. Men benefit from the use of electricity for hand tools and creation of jobs as operators and repair artisans.

Full case study: Engineers Without Borders, Canada, http://www.ewb.ca/content/en/index2.shtml

**Objectives**
- Provide de-centralized and sustainable energy supply to Malian villages
- Free women from arduous, repetitive, and time consuming tasks for better quality of life and ability to pursue income-generating activities and education
- Aid women's associations in obtaining credit
- Train women in management and maintenance and provide them with numeracy, literacy, and entrepreneurial skills
- Spur small-scale industrial development

**Lessons Learned**
- A minimum level of expected use is required to make investments affordable
- Initial feasibility evaluations need to accurately assess the financial, economic, social and technical feasibility of installation, and develop village-specific methodologies
- Institutional capacity must be strengthened to compensate for overall weakness of the financial system in rural areas
- Capacity building is particularly needed regarding the ability to make decisions based on timely and accurate information, to implement those decisions, and to track progress on the expected results
- Need to tighten up the legal framework in rural areas, where the concept of formal individual ownership is not the norm due to problems with banks requesting collateral for initial credit

- Establishment of supply zones and replying to requests in geographically circumscribed areas, rather than those scattered over vast distances, reduces high transport and communication costs

**2. Sugar Energy Boosts Rural Development**
***-Submitted by Farmers***
The sugar industry carries great potential to meet renewable energy needs and produce biodegradable by-products. Bagasse, the residue of sugar cane crushing after the extraction of the juice, can be used as a substitute for paper and plastic. India currently produces about 270 millions tons of sugar cane annually, about 50-55 % of which is utilized for the manufacture of crystal sugar, generating over 40 million tons of bagasse annually. The rest of the sugar cane is diverted for the production of jaggery (uncrystallized sugar) which uses 790 kilowatt-hour units, out of which only about 30-35 kilowatt-hour units are required for the production of crystal sugar, with the remainder available for outside sales. The sugar factories have become the focal point of Indian rural development and have contributed to growth in the local economy, including better living standards and increased education and health benefits.

**Objectives**
- Produce cleaner, renewable energy
- Support production of biodegradable products
- Increase development of rural areas
- Improve employment in rural areas

**3. Progress in Tripartite Collaboration over Employment Transition**
***- Submitted by Trade Unions***
A March 2005 agreement between the Government of Spain and the country's two central trade union and employer organizations has created the first ever tripartite social dialogue to strengthen compliance and identify opportunities and adverse impacts associated with the Kyoto Protocol. A 'Dialogue Table' has been established to monitor and assess all related projects, with a specific mandate to prevent, avoid or reduce the potentially adverse social effects that might result from compliance with the Kyoto Protocol, in particular those related to competitiveness and employment. It provides a model for governments to assess and address social and employment impacts of measures to mitigate or adapt to climate change by considering specific employment transition measures to care for workers and communities displaced by these changes, including participation in decisions relating to climate change and sustainable energy usage.

**Objectives**
- Protect against the adverse impacts of initiatives taken to comply with the Kyoto Protocol
- Ensure that government, trade unions and employer organizations all participate in assessing and examining possible adverse impacts of projects taken with the view to meeting Kyoto targets, and come up with possibilities for prevention/mitigation
- Protect workers against unemployment due to projects taken in order to meet Kyoto targets and ensure adequate strategies in place for employment transition
- Ensure competitiveness in industry

**4. Collaboration on Sustainable Renovations Creates Jobs in Germany and Belgium**
***- Submitted by Trade Unions***
German unions and their national organization, the DGB, are collaborating with Government, environmental NGOs and employer federations in a programme to renovate buildings and contribute to

climate protection measures while creating sustainable jobs. Partner organizations under the Alliance for Work and Environment aim to renovate 300,000 apartments, create 200,000 jobs, reduce CO2 emissions by 2 million tons per annum and lower heating bills for tenants, landlords and the State by about $4 billion, through reduction of unemployment costs and increased income taxes. The use of advanced heating technologies and renewable energy improves the insulation of buildings, and thousands of jobs are created in the construction, heating, sanitation and air-conditioning sectors, as well as in building services. Financing for the programme is provided by the Government of Germany, which will spend up to $1.8 billion in the next five years. In addition, $8 billion will be available through credits at favorable rates of interest. In September 2005, the Minister for Environment and Pensions of Belgium agreed to a plan proposed by the FGTB Belgian Union Centre to establish an energy conservation fund for the housing sector, to aim for goals comparable to those being achieved in Germany.

**Objectives**

- Decrease carbon emissions through the use of renewable energy and increased energy efficiency
- Renovate and improve buildings to promote renewable energy use in the construction industry
- Increase energy efficiency and improve insulation for buildings
- Create employment in the construction, heating, sanitary and air-conditioning sectors as well as in building services
- Lower heating bills through increased efficiency

**5. Development of Wind Energy Industries in India**
***-Submitted by Local Authorities***
Where local governments have encouraged the production of renewable energy, their communities have realized economic benefits and secured their energy supply, further attracting new industrial development that is not reliant on nonrenewable energy sources. In Tamil Nadu, India, a State-run programme to promote the development of renewable energy resulted in the production of over 650 turbines for wind power generation at a total investment of over $2 billion. That investment, primarily from the private sector, has been fostered through a programme of State-sponsored education, research and financial incentives. The development of wind energy has given rise to new local enterprises, including those specializing in the design and construction of wind energy equipment.

**Objectives**

- Promote development of renewable energy
- Foster new local enterprises

## III. AIR POLLUTION/ATMOSPHERE

**1. Shell: Searching for Sustainable Solutions to Indoor Air Pollution**
***- Submitted by Business & Industry***
“Breathing Space,” The Shell Foundation’s Household Energy and Health Programme, explores market-based approaches to decrease the number of people affected by indoor air pollution, which currently kills more than 1.6 million people per year. Pilot projects in partnership with NGOs have been exploring viable business models in preparation for a self-financing market-entry and distribution strategy for cleaner stoves and fuels. Currently the project is set to target 3 million households in India and Guatemala, with the aim of reaching 10 million households by 2008. The most successful pilots have combined centralized component production, quality control and supply-chain management with decentralized installation and

assembly of products. Partnerships with local social service providers fostered links among communities, social marketing and awareness-raising. Successful interventions made products available through local market mechanisms and involved entire communities. Intervention was limited where non-participating households continued to create air pollution that affected their neighbors. Involvement of all sectors of the community allowed for locally appropriate solutions, by assessing local needs and identifying suitable interventions particularly the involvement of women. The women in the Indian village of Khanav, south of Mumbai, have turned their community into a "smokeless village" by starting up a self-help group, which lends money to village households so that the 300-rupee (US$7) cost of an improved stove can be paid back over months. The village hall is being turned into a workshop for handicrafts where women, who spent their time collecting firewood and cooking, can use saved time to increase their incomes.

Full case study: http://www.wbcsd.org/includes/getTarget.asp?type=DocDet&id=16163

**Objectives**

- Reduce the number of people affected by indoor air pollution
- Provide cleaner stoves and cleaner fuels to poor rural households
- Reduce the time women spend collecting firewood and cooking
- Raise the income of poor villages
- Save time through more efficient cooking methods
- Provide a viable business model for market entry and distribution for cleaner stoves and cleaner fuels

**Lessons Learned**

- The most successful pilots have combined centralized component production, quality control and supply-chain management with decentralized installation and assembly of products, linked to a network of social service providers (such as local NGOs) which provide the link to communities, social marketing and awareness raising.
- Successful approaches need partnership action, starting with national level collaboration and agreement on policy, but they must also maintain the commercial integrity of the supply chain by keeping it separate from whatever facilitation process is used to get the product to the end customer.
- Interventions must be locally appropriate and available through (local) market mechanisms. It is important that programmes involve communities, and especially women, in assessing local needs and identifying suitable interventions.
- There is increased recognition of the value of micro-credit, particularly where interventions with large up-front costs are being considered.

**2. Developing Advanced Atmospheric Modeling Tools**
***-Submitted by Scientific & Technological Communities***

There continues to be a great deal of progress in developing advanced atmospheric modeling tools, ranging from the local to the global scale. Notable examples include the United States Environmental Protection Agency's Community Multi-scale Air Quality modeling system, and the Regional Air Pollution and Simulation (RAINS), and Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) models from the International Institute for Applied Systems Analysis, which allow the user to examine the costs and effectiveness of different emissions control strategies, and to design emission control strategies that simultaneously meet air quality targets and limit the emissions of greenhouse gases. A wide array of ecological and biological/epidemiological models is likewise continuing to be developed for studies of air pollution impacts.

**Objectives**

- Develop better atmospheric modeling tools
- Reduce air pollution
- Examine and assess different emission control strategies
- Limit greenhouse gas emissions

**3. The Clean Air Initiative**

***- Submitted by Local Authorities***

The Clean Air Initiative (CAI) advances innovative ways to improve air quality in cities by sharing knowledge and experiences and bringing together cross-cutting expertise in urban development, transport, energy reform, environmental management and health.

The Clean Air Initiative for Asian Cities was established to enhance scientific knowledge and understanding of urban air quality, promote awareness of impacts and solutions, promote the use of economic incentives and other market-based instruments, promote public-private partnerships, promote institutional and regulatory strengthening of relevant agencies, promote the use of cleaner fuels and vehicles, improve the planning and operation of public transport, integrate transport, air quality and urban development policies, advance the introduction of cleaner technologies for energy generation and industrial protection.

CAI-Sub-Saharan Africa aims to develop cities ensuring that the poor achieve a healthy and dignified living standard while addressing environmental degradation. CAI-Sub-Saharan Africa focuses on the larger cities of Sub-Saharan Africa that have experienced sustained levels of urban growth over the last several decades. In Sub-Saharan Africa, technical standards for vehicle performance and emissions and vehicle inspection are non-existent, fuel quality is low and public transportation is both undersupplied and unaffordable for many residents. The impact of vehicle emissions such as particulates and lead on the health of residents is a particular problem due to significant pedestrian traffic and large numbers of street vendors. The CAI has placed the phase-out of leaded gasoline as priority due to the significant risks it poses to human health, in particular children whose digestive system readily absorbs lead and whose clothes and toys more readily soiled through play in which the lead accumulates. Risk of absorption is exacerbated by malnutrition and hence predominately affects the poor. The CAI works with the private sector, in particular the oil and automobile industry, local transporters, and mechanics as well as local associations and community groups. The CAI recommendation was endorsed by both national governments and the oil industry.

Full case study: www.cleanairnet.org

**Objectives**

- Improve air quality in cities and thus provide a better standard of living
- Promote public-private partnerships in improving air quality
- Promote awareness and enhance scientific knowledge
- Promote involvement of the private sector through market mechanisms and economic incentives
- Promote the use of cleaner fuels
- Promote the use of renewable energy
- Improve public transport
- Promote energy-efficient cars
- Encourage the strengthening of regulatory agencies
- Develop a framework for integration of air quality, urban planning and transport policies

- Promote regional cooperation on air pollution, sharing experience and expertise in order to develop successful policies and introduce new technologies that decrease air pollution

**4. Youth Bike to Raise Awareness in Europe**

***- Submitted by Youth***

For the past 15 years, European Youth for Action has organized an annual bike tour that runs for two months, covers 6,000 kilometres, and reaches out to thousands of individuals to talk about air pollution and climate change. It connects different environmentally active people and groups on their way to Ectopia. The festival connects young people from all over Europe in learning about, exchanging experiences in, and spreading information about environmental, political and social justice issues, as well as promoting functional models of a sustainable community. The bike tour is an eco-mobile community in the same vein, horizontally organized and based on consensus decision-making. While learning patience and tolerance with each other, participants are made aware of the harmful effects of cars on local air pollution and the ecological impact of their daily choices, and are encouraged to reduce, reuse and recycle.

Full case study: http://www.eyfa.org

**Objectives**

- Make young people aware of the harmful causes and effects of air pollution and climate change
- Make young people aware of the ecological impact of their daily choices
- Connect young people from all over Europe in order to facilitate exchange of views and experiences, increase tolerance between nations, and spread information on environmental, political and social justice issues
- Provide a functioning model of a sustainable community based on participation, democratic consensus and the reduction of waste, reusing of products, and recycling
- Encourage young people to participate in diverse groups, strengthen confidence and encourage activism in their communities on social and environmental issues

**5. Bioethanol in Brazil**

***-Submitted by Farmers***

In Brazil, bioethanol has been used as a commercial liquid fuel for many years, with the Government being the first to initiate the promotion of bioethanol through the PROALCOHOL Programme in the 70s. The federal government, through subsidies to farmers and maintenance of low prices aimed to absorb the constant surplus in energy production and prevent dependence on foreign oil imports. In the last two years, with rising oil prices and search for cleaner and renewable energies, the government has re-focused on bioethanol and flexi-fuel cars, which can be powered by both conventional fuel and ethanol or a blend in any combination. Consumers can power their cars at regular stations from ethanol, blended fuel and ethanol or regular fuel, but with the rise of oil prices conventional fuel is losing market share. In May-June 2005, flexi-fuel vehicle sales in Brazil overtook sales of gasoline cars for the first time.

**Objectives**

- Use cleaner energy and reduce air pollution
- Decrease greenhouse gas emissions
- Absorb sugar surplus
- Employ rural labourers
- Prevent dependence on foreign oil and rising oil prices
- Export bioethanol

**Lessons Learned**

- Consumers will choose bioethanol and flexifuel cars at competitive prices if they are readily available. The government should hence ensure through subsidies competitive prices for biofuels and bioethanol and ensure its availability through the normal distribution chain.

## IV. CLIMATE CHANGE

### 1. Implementing Improvements in Systematic Climate Observations

***-Submitted by Scientific & Technological Communities***

As the Global Climate Observing System (GCOS) works to improve global climate observations, a second major thrust in its programme of activities is its Regional Workshop Programme. The COP (Conference of the Parties to UNFCCC, the United Nations Framework Convention on Climate Change) invited GCOS in its decision 5/CP.5 to establish this programme in order to help developing countries identify and address gaps and deficiencies in their climate observing systems and, more generally, build capacity to undertake the systematic observations needed to address climate change and its potential consequences. The first regional workshop was held in Apia, Samoa in August 2000 for the Pacific Island countries, in October 2001 Kisumu Kenya hosted the workshop for 25 countries in Eastern and Southern Africa, San Jose, Costa Rica held the third workshop in March 2002 for Central America and the Caribbean, Singapore held the fourth for East and Southeast Asia in September 2002, and the countries of the Mediterranean Basin, Eastern and Central Europe held their workshop in November 2005.

In each region, GCOS has facilitated the development of Regional Action Plans. These plans, which have been endorsed at the regional level, contain project proposals based on the highest priority needs in the region as identified in GCOS regional workshops. CGOS works with a four-part workshop strategy. First, the acquirement of a basic understanding of the deficiencies in the particular region and identification of a regional partner with whom to work; for instance, the Drought Monitoring Centres of Nairobi and Harare are the GCOS's partners in Eastern and Southern Africa. Second, workshops are held to build consensus on what needs to be done by bringing together national climate change coordinators, directors of national meteorological and hydrological services and observing system experts. Third, a regional Action Plan is identified and detailed with the regions themselves taking the lead in addressing needs for training, analyses, continuing operations, infrastructure, and/or hardware procurement. The fourth phase is implementation, which involves obtaining necessary resources.

Some projects in the Action Plans have begun to be implemented; however, there is a considerable disparity between the resources needed to implement projects and the resources currently available. Resources are needed for capital improvements, training of personnel, and continuing operations, especially in the least developed countries. If developed countries wish to ensure the proper functioning of global networks, they will need to do more to assist developing countries. For its part, the COP, in Decision 11/CP.9, has urged developed Parties in a position to do so to support the priority needs identified in the Second Adequacy Report and Regional Action Plans, especially in the least developed countries and small island developing states.

Full case study: http://www.wmo.ch/web/gcos/gcoshome.html

**Objectives**

- Improve climate observing systems

- Help participants understand the UNFCCC guidelines for reporting on systematic observations
- Identify national and regional needs and deficiencies for climate data (including needs for assessing climate impacts, conducting vulnerability analyses, and undertaking adaptation studies)
- Improve links between national climate change coordinators and national meteorological and hydrological services
- Initiate development of Regional Action Plans for improving climate observing systems

**Lessons Learned**

- As a small secretariat, GCOS must rely on collaboration with regional organizations, which enables GCOS both to utilise existing regional expertise and to develop relationships with those most capable of carrying out the priority actions identified at workshops
- Action Plans cannot be implemented without the necessary resources
- Funding, particularly for least developed countries, is necessary in order for regional Action Plans to be implemented
- Multiple sources of funding are necessary
- Proposals may need to be directed toward a consortium of funding organizations and donor countries, with each member of the consortium requested to fund that portion that best relates to its mandate or interest

**2. The EU Biofuels Directive**

***-Submitted by Farmers***

The EU biofuels directive, adopted in 2003, promotes the use of a minimum percentage of biofuels to be marketed and distributed in order to reduce import dependency and greenhouse gas emissions. Biodiesel, made from processing rapeseed oil and other vegetable oils, is widely available globally, particularly in France and Germany. Bioethanol, which can be made from processing maize, sugar cane and beet, wheat, potatoes and a variety of other starch and sugar crops, is also widely used. In 2003, German farmers planted about 460,000 hectares of oilseed rape to produce about 650,000 tons of biodiesel. There are also currently about 2,000 biogas plants in Germany, the majority operated by farmers. Their total output is approximately 255 megawatts, and will soon meet 5.5% of Germany's total energy needs. Besides commercial fertilizers and food waste, biogas plants increasingly process energy crops such as cereals, maize and grass. Biofuels, in pure form or in a blend, can be used in existing motor vehicles and use the current distribution system, with its attendant cost reductions for the community. In Sweden, 200 buses and 200 vehicles are working with ethanol as fuel, and in France it is mixed with isobutylene to yield ethyl tertiary butyl ether, which is then blended with traditional fuel.

**Objectives**

- Lower greenhouse gas emissions
- Provide a market for European farmers
- Decrease dependency on imported energy
- Lower cost of distribution of fuel to the community

**3. Supportive Government Framework Allows for Trade Union Input into Kyoto Mechanisms**

***- Submitted by Trade Unions***

A decision by the Government of Belgium in July 2005 ensures that social and sustainability criteria are considered when funding 'flexible mechanisms' for meeting its Kyoto commitments. It has instituted a tendering strategy that involves trade unions in monitoring investments, specifically to ensure compliance with the principles of the relevant ILO conventions. A call for submissions issued from a technical committee comprised of government, employers, NGOs and trade unions make social criteria a

prerequisite for approving projects and follow-up procedures to ensure that they benefit development in the local communities. To ensure a balance between economic, environmental and social criteria, project documentation must include a letter of social responsibility, in which the project promoter(s) pledge(s) to respect the principles of the OECD's guidelines for multinationals, the eight ILO basic conventions, Convention 155 on Occupational Health and Safety, and Convention 169 on Indigenous and Tribal Peoples. Social sustainability evaluation criteria include such areas as employment (including quality of employment and compliance with labour standards), equality, and access to essential services such as energy services. Economic sustainability includes employment and skills development. Finally, promoters must ensure involvement of all affected organizations to ensure the project is implemented properly, including free and democratic local trade unions or an international trade union organization, local or international environmental organizations, and local and indigenous communities.

**Objectives**

- Ensure that projects funded under flexibility mechanisms to meet Kyoto commitments are socially and environmentally responsible
- Increase compliance with ILO labour standards
- Involve all affected communities in implementing projects

**4. Climate Alliance**

***-Submitted by Local Authorities***

The Climate Alliance of European Cities with Indigenous Rainforest Peoples is Europe's largest thematic network with a membership over 1300 European cities and municipalities in 14 countries. Joining cities adopt the 1990 Climate Alliance Manifesto and 2000 Climate Alliance Declaration, in which they commit to reducing greenhouse gas emissions, dispense with the use of tropical timber, and support the indigenous peoples of the Amazon in their efforts to conserve the tropical rainforest. The Climate Alliance's Secretariat facilitates exchange of experiences, promotes the cooperation of European cities with indigenous peoples, offers best practice guidelines and joint actions, and represents the interests of local authorities committed to climate protection at EU and international levels. Climate Alliance has developed and disseminates to its members a structured strategic framework defining cross-sectoral tasks for political and institutional integration and climate protection, a range of actions at local levels to reduce greenhouse gas emissions from a wide range of sectors including a greenhouse gas inventory for the city or municipality, the monitoring of individual measures, and a set of progress indicators.

Full case study: www.climatealliance.org

**Objectives**

- Promote and facilitate cooperation between European cities and indigenous peoples
- Promote awareness of and facilitate initiatives to protect rainforests
- Disseminate experiences and best practice management of local initiatives in urban planning, transport, recycling and public awareness that decrease energy consumption, increase energy efficiency, use renewable energy, and mitigate the effects of climate change