

ORGANISATION FOR THE
PROMOTION OF ENERGY TECHNOLOGIES



OLA:
Results of activities 2003-2005

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Ever-increasing energy consumption is one of the greatest challenges facing Europe and the world today. Most consumption is derived from fossil fuels - much of it imported from outside Europe, depleting natural resources and contributing to global climate change, through increased greenhouse gas emissions. When the EU signed the Kyoto Protocol, it promised to reduce these emissions by 2012, by 8% in comparison to 1990 levels. To meet this commitment, significant changes of behaviour are required now, both in terms of energy supply and demand management.

The Organisation for the Promotion of Energy Technologies (OPET) Network, established by the European Commission, seeks to enhance sustainable energy production, distribution and consumption (excluding nuclear energy) by promoting the use and exchange of information on new technology in the marketplace. The resulting efficient knowledge transfer benefits all European citizens, supporting and implementing European policy priorities at EU, Member State and regional levels, accelerating innovation of renewable energy sources (RES) and the rational use of energy (RUE).

The OPET Network was restructured in 2002 around a series of Thematic Consortia to provide an integrated and comprehensive view of on-going research and to further innovative technologies deployment. The CO-OPET partners in cooperation with each Thematic Consortium have issued a Consortium brochure, which provides a summary of the promotion and dissemination actions undertaken between 2003 and 2005 in emerging sustainable energy technologies, aimed at the valorisation and integration of R&D results, pointing the way towards more intelligent energy use in Europe.

The OPET Thematic Consortia:

- Buildings
- Electricity generation from renewable energy sources (RES-e)
- Combined heat and power / District Heating (CHP/DH)
- Clean fossil fuels (CFF)
- Energy issues in transport
- New energy technologies in the Mediterranean region (MEDNET)
- Modern and clean energy and transport technologies in Latin America and the Caribbean (OLA)
- Early market introduction of new energy technologies (EMINENT)
- and
- CO-OPET, support to the OPET Network

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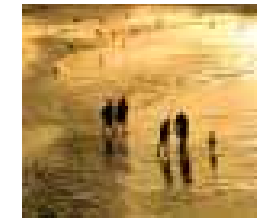
Technology transfer between Europe and Latin America and the Caribbean presents great political and technical challenges. Their population is more than 550 million, growing at 1.5% annually. Latin America stretching from Mexico to Chile, and the Caribbean covering more than 20 million km² (one seventh of the total world land surface) contain enormous natural resources including energy. Political will is required to eradicate the acute poverty from which many Latin American and Caribbean regions suffer.

OPET Latin America (OLA) aims to promote clean and efficient European energy generation technologies and transport applications in Latin America and the Caribbean.

This project offers excellent technical opportunities to the European renewable energies sector. Europe is the world leader and European companies have very promising opportunities for technology development in the large and growing Latin American and Caribbean markets.

The OPET OLA project encourages:

- promotion and investment in RES technologies
- science and technology
- co-operation between organisations and professionals in Europe and the countries involved in the project
- dissemination of R&D activities



The Thematic Consortium:

International

EREC-European Renewable Energy Council
INSULA-International Scientific Council for Island Development of UNESCO

Portugal

AREAM-Madeira Energy Agency
STCP-Porto Public Transport Company
INESC- Porto Institute of Engineering and Computer Systems
IST-Lisbon Technical Institute from Lisbon

Italy

FAST-Federation of Scientific and Technical Associations,

Greece

LDK ConsultantsEngineers and Planners

The Netherlands

New Power

Norway

SINTEF-Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology

Spain

Agencia Valenciana de la Energía (AVEN - Valencia)
Ente Vasco de la Energía (EVE - Basque Country)
Institut Català d'Energia (ICAEN-Catalonia)
Sociedad para el desarrollo energético de Andalucía (SODEAN - Andalusia).

The Consortium coordinator, the Spanish Institute for the Diversification and Saving of Energy (IDAE), has demonstrated experience in developing co-operation and has coordinated a strong project consortium with different experience over a range of sectors and geographical areas.

Great potential for Latin America & Caribbean RES



The renewable energy potential reported during the projects for all countries is very great due to geology and geography.

The region possesses locations with:

- Wind power potential among the largest in the world
- High and constant solar intensity
- Geothermal resources
- Great potential for wave power
- Small hydropower plants
- Many opportunities for more efficient biomass resource use.

Although renewable energies and energy efficiency are part of most national energy policies, very few implement a legal and institutional promotional framework. Main policy energy drivers are:

- Fossil resources exploitation to balance the public sector accounts
- Extending provision to the whole population mainly by network expansion
- Short-term demand side management policies and scarcity avoidance programmes
- Enhancing system reliability and encouraging private sector financing.

This project strengthened capacity-building in energy and transport organisations (governmental and private) in Latin America and the Caribbean, taking advantage of European expertise and R&D results. The European Commission has previously provided support through the Synergy programme and other OPET contracts (Mercosur and the Andean Pact).

The OLA project has suggested steps fundamental to future action. Renewable energy policy must be integrated into a national energy policy and must be associated with implementation planning and effective instruments, measures and programmes, often demanding public financial resources.



The 1997 Kyoto Protocol has led to legally binding measures in thirty eight industrialised countries aiming to return their greenhouse gas emissions to an average over the period 2008-2012 of 5.2 percent below 1990 levels averaged. With the recent ratification of the Kyoto Protocol by the Russian Federation, the Protocol entered into force on February 16, 2005.

The Clean Development Mechanism (CDM) is one of the three Kyoto Protocol flexibility mechanisms, aiming to direct private and public sector investment into emissions-reduction projects in developing countries.

CDM projects give rise to great expectations in many Latin American countries and willingness to implement policies to create a framework to capitalise on international climate change agreements for the development of these projects. The CDM is an excellent opportunity to attract investments and transfer technology into mitigation projects to be integrated into the national sustainable development plans.

Certified Emissions Reductions



One result is the identification of huge potential for generating Certified Emissions Reductions (CERs). The main Latin American and Caribbean countries have leading positions but in most cases, further work is needed to develop the institutional and technical frameworks.

The most important barriers include:

- Complex and expensive approval process for the implementation of CDM projects
- High transaction costs for CER transfer
- Specifically Up-front cost financing
- Additional testing
- Dealing with uncertainties in estimating baselines.



Increased regional geopolitical stability, active tourism promotion and the appreciation of the Euro are some of the main drivers that have led to an increase of 5.8 % in 2003 and of 11.1 % in 2004 in South and Central American and Caribbean international tourism.

Tourism makes high demands on primary resources such as drinking water and energy. Within the context of the recent regional energy shortages, the incorporation of energy efficient technologies and the use of renewable energy sources in the development of the tourist industry are imperative, promoting energy savings and self-sufficiency and mitigating energy crises.

The RES option is of particular interest in tourism development linked to the enjoyment of nature in exceptional surroundings. Applying good practice in day-to-day management and using automatic control can yield significant savings with only a small outlay.

The main barrier to project implementation in Latin America and the Caribbean is the bank credit provision which, when available, has high and volatile costs. Nevertheless, the tourism sector has investment available for energy efficiency and renewable energy technologies.

Best Practice



The wide diffusion of successful cases of integration of energy efficient technologies and renewable energies in the European tourism sector was among the main results of the OLA project. Examples include the Green Hotel project (AREAM Madeira; Portugal), the Biosphere Hotels project and the cogeneration development in hotel buildings on the Spanish Mediterranean coast.

The renewable energy implementation opportunities in Chilean hotels have been demonstrated, with a viability study for hot water supply in a rural hotel in the IXth Region using solar thermal and biomass technologies.



Brazil Clean Energy Technologies (CET)

In a much diversified country that is still facing deep development problems (for instance, exemplified by electricity supply enhancement to rural areas as a pre-condition to social and economic development), there is great potential for these technologies. The country has immense oil, gas and hydropower resources and renewable energy sources. Excellent research centres are well established and are complemented by manufacturers encouraged by a very large CET market.

The present Government prioritised sustainable development, renewable energies and energy efficiency, with the present PROINFA Program implementation. By the end of 2006, Brazil will have 3,300 MW generated from new wind, small hydropower plants and biomass. European companies, agents and promoters certainly have good opportunities in several areas, some within the project scope.



Analysis Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for:

- Transport
- Waste to energy
- Power from biomass
- Distributed generation
- Fuel cells
- Cogeneration
- Clean Development Mechanism

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Workshop and Regional Seminar

The results were presented during the National Workshop and Regional Seminar in Rio de Janeiro (24th - 25th February 2005). More than one hundred and eighty decision makers and representatives from the government in the energy field participated.

The inaugural and closing sessions were led and chaired by the Energy and Climate Change Advisor of the Brazilian Ministry of Environment, Alexandre Betinardi, the FIRJAN Environment Manager Luis Augusto Azevedo, the INESC PORTO Associated Professor Joao Tomé Saraiva and the OLA Project Manager, José Gil.

<http://www.proyectoola.net/index.php?id=9>

Chile Eliminating Barriers to Renewable Energies and Energy Efficiency

Chile is rich in mineral deposits, natural forests, sea resources, and renewable energy sources.

The potential is very high due to its geology and geography.

Chile is rich in geothermic and biomass sources, unutilised small and medium-sized water power sources, wind energy and solar radiation. Energy policy is promoting and facilitating investment, mainly private of national and foreign origin, in order to meet the growing energy requirements associated with sustained economic growth.

The National Rural Electrification Program and the recent modification to the Electricity Act (to eliminate barriers to power generation from renewable energy sources) are two promising results creating a stable regulatory framework for clean energy development.

Rural electrification:

The Programme of Rural Electrification (PER) created at the end of 1994, is part of the government strategy to overcome poverty with the goal of 90% electrification coverage rate in 2006, by grid extension and renewable distributed generation with renewable energy sources.

Tourism:

The National Service of Tourism (SERNATUR) and the National Commission of the Environment (CONAMA) have programmes for sustainable tourism promotion in rural areas. The principal governmental institutions involved in Latin American and Caribbean energy efficiency promotion have demonstrated their interest in these technologies for tourism sector development.



Analysis Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for:

- Renewable energy technologies
- Cogeneration
- Energy efficiency in buildings
- Renewable energies in isolated hotels
- The Clean Development Mechanism

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Workshop

The results were presented at a National Workshop in Santiago de Chile (28th January 2005).

Around one hundred and twenty actors from the Chilean and the European energy sector gathered together to discuss technology transfer possibilities.

The inaugural and closing sessions were led and chaired by Jaime Bravo, in charge of Energy Efficiency and Environment, National Energy Commission, Chile, Camillo Sanchez Housing Ministry, and the OLA Project Manager, José Gil.

<http://www.proyectoola.net/index.php?id=9>

Argentina and Uruguay Clean and Modern Energy and Transport Perspectives

Argentina is favoured by rich natural resources (primarily natural gas, hydropower and oil). Within their energy policy aiming towards sustainable development, the Government of Argentina through the Secretariat of Energy has so far enacted a Wind and Solar Energy Act and a Resolution for Demand Side Management. Several donor-for state-funded programmes have been launched in the areas of rural electrification, energy efficiency and liquid biofuels for transport.

Uruguay has no fossil fuel resources and relies heavily on imports to meet its energy needs. Politically, Uruguay has expressed its preferences for wind power promotion and solar power. UTE (the state-owned electricity utility) and the National Directorate for Energy (DNE) have been awarded a GEF grant to implement a six year Energy Efficiency Project.

Rural electrification: Argentina

Despite the relatively high overall rate of electrification (95%), the substantial numbers of the rural population remaining without electricity services motivated the Government and the World Bank to implement simple off-grid hybrid applications in the PERMER framework. Since 1999 a total of 3,050 rural customers, 1,333 of these with individual or collective PV systems, are served by the PERMER.

Alternative fuels: Argentina

There is a high percentage of natural gas use penetration in fishing fleets.

The Secretariat of Agriculture, Fisheries and Food has elaborated a National Program for the introduction of liquid biofuels for transport.

A juridical framework has been created for the production and use of the liquid biofuels, not only to reduce oil dependency but to diversify and support agricultural activity.

The law already approved by the Senate, has a goal of 5% of bioethanol and 5% of biodiesel blending in gasoline and diesel that is placed on the market after 2008. The stable fiscal incentives framework will benefit the liquid biofuels producers.



Tourism: Argentina

The sector, supported by the Secretariat of Tourism of the Republic of Argentina, is analysing the sectoral energy saving potential to draw up an Action Plan.

Analysis Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for:

- An overview of the energy situation
- A profile of the renewable energy technologies
- Specific tourism sector opportunities for RES and RUE
- Uses of liquid biofuels for transport in both countries

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Workshop

The results were presented at a national workshop (21st to 22nd February 2005) More than one hundred and forty decision makers and Government representatives discussed technology transfer possibilities between the European Union and Argentina and Uruguay. The inaugural and closing sessions were led and chaired by Ms. Alicia Baragatti from the Energy Secretariat of Argentina, Álvaro Bermúdez from the National Directorate of Energy in Uruguay, Mario Wittner from IRAM, Argentina, Ms. Sophia Niokolakaki from LDK Consultants, Greece and José Gil from IDAE.

<http://www.proyectoola.net/index.php?id=9>



Bolivia & Ecuador

Bolivia

Rural electrification: a key issue

Bolivia is one of the South American countries that is energy self-sufficient and has great hydrocarbon sector export potential.

Rural electrification:

Paradoxically, Bolivia's rural area electrification ratio is still very poor at under 25% and rural families are to a large degree natural biomass dependent.

The Government and international organisations are committing funds for financing rural electrification projects, managed by the Vice- Ministry of Electricity and Alternative Energies and handled by the rural beneficiary municipalities.

Renewable energy sources are an important component. Committed funds from of all these institutions for 2003-2007 will provide electrification to more than 214,000 rural users.

Ecuador

Leading promotion of RES in Latin America

Ecuador has important renewable and non-renewable energy resources of which oil, as the biggest national export, is the most significant. To optimise natural resources management, Ecuador is implementing a framework to promote energy from renewable sources as a feed utilising tariffs promoting power from RES and a National Plan to produce and consume bioethanol. Besides renewables, the great potential of hydropower, biomass and solar energy must be taken into account.

Rural electrification:

The National Council for Electricity (CONELEC) is responsible for the Electrification Plan, which will integrate RES as an electrification option for isolated areas.

Alternative fuels:

An ambitious program for anhydrous ethanol production and use in the national blending of transport fuels is planned with the objective of replacing 10% of the gasoline consumption in transport.



Analysis

Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for:

- An overview of the energy situation
- A renewable energy profile
- Energy efficiency technologies

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Workshop

The workshop took place in La Paz, Bolivia (20th-21st January 2005).

The inaugural and closing sessions were led and chaired by the Vice-Minister of Services and Public Works from Bolivia, Carlos Romero, the Executive Director of the Renewable Energies Information Centre, Ms. Alba Gamarra and the OLA Project Manager from IDAE, José Gil. From the 24th to 25th January 2005, the OLA Project moved to Quito, Ecuador for their national workshop.

The inaugural and closing sessions were led and chaired by the Minister of Energy and Mines from Ecuador, Ángel Eduardo López, the Executive Secretary of OLADE, Diego Pérez, the Executive Director of the Renewable Energies Information Centre from Bolivia, Ms. Alba Gamarra and the OLA Project Manager from IDAE, José Gil. More than a hundred and thirty people including Government representatives participated in each seminar.

<http://www.proyectoola.net/index.php?id=9>

Caribbean

The Caribbean islands present a large opportunity area of special interest for the RES European industry, including the energy efficiency and transport sectors. The particular island conditions make these territories privileged locations for integral energy sustainability strategy development. Furthermore, Caribbean islands cannot be considered alone but as parts of a larger market. The Cuban sugar industry constitutes the basis for RES electricity generation and has an enormous ethanol production potential from sugar cane wastes fermentation. Large rubbish dumps near Havana and other large Cuban cities have been a major environmental problem over a long period. Their degasification and energy exploitation is an important objective where European experience can act as a reference point, especially as there is a great potential to generate Certified Emissions Reductions (CERs) in the implementation of this project under the Clean Development Mechanism.

In Cuba, the Development Programme of National Energy Sources, the Protection of the Environment Act, and the Electricity Saving Programme constitute a renewable energy development framework.

Rural electrification:

Since the region has relatively high electricity coverage, off-grid renewable energy systems for rural electrification would apply only exceptionally.

Alternative fuels:

The main Mexican and Cuban institutions involved in transport fuels are developing concrete demonstration fishing fleet projects using liquid biofuels.



Analysis Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for:

- Analysis of biomass potential for power generation and transport
- Wind energy
- Mini-hydropower
- Special attention to tourism sector RES and RUE technologies.

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Seminar

The National Seminar for the Caribbean region was held in Havana, Cuba. (15th -17th November 2004). More than eighty representatives from the Government and the private sector participated.

The inaugural and closing sessions were led and chaired by the Vice-Minister of Ministry for Science Technology and Environment (CITMA) of Cuba, Ms. América Santos, the Vice-Secretary of Insula UNESCO, Cipriano Marín, the President of the European Renewable Energy Council, Arthouros Zervos, the Director for Innovation and Energy (CITMA) Alfredo Curbelo and, the OLA Project Manager from IDAE, José Gil.

<http://www.proyectoola.net/index.php?id=9>

Mexico

Mexico has a leading regional position in energy efficiency promotion, as well as a great potential to maximise renewable energy sources use. In these two areas, the Government, represented by the National Commission for Energy Saving (CONAE), has been developing for more than fifteen years, numerous programmes and projects. A wide range of successful projects provide excellent examples:

- Regulatory development for electronic equipment and devices,
- Energy efficiency programme implementation in different sectors,
- Promotion of cogeneration and renewable energies,
- Wind power development plan,
- Studies to increase energy valorisation from farm waste.

Mexico is a very active country in renewable energy project promotion under the Clean Development Mechanism.

Rural electrification:

Large rural electrification programmes have been developed since the nineteen-seventies. The National Energy Balance states that nearly 53,000 rural electrification systems and 431 water-pumping systems were installed in Mexico between 1991 and 2000 with a total capacity of 3.2 MW. The Renewable Energy Program for Agriculture, currently operational, aims to install 200 PV water pumping modules.



Analysis Renewable Energy and Energy Efficiency Market

The Consortium analysed the markets and market actors for :

- An overview of the energy situation
- Analysis of the potential and barriers for renewable energy sources
- A specific study on energy derived from farm wastes
- Study of potential and barriers for RUE technologies

<http://www.proyectoola.net/index.php?id=10>

Dissemination National Workshop

More than 500 energy field actors both public and private, participated in the OPET OLA National Workshop in Mexico City (3rd- 4th February 2005) The workshop's success, which had a high media profile, confirms Mexico's leading position in the development of energy efficiency promotion in Latin America. A great potential exists for renewable energy source use. The Government, through CONAE, has been supporting numerous programmes and projects in these two areas for more than fifteen years.

The inaugural and closing sessions were led and chaired by the General Director of CONAE (the Mexican National Commission for Energy Saving, Carlos Domínguez Aedo and the General Director of IDAE, Javier García Brea. Fernando Elizondo Barragán, the Mexican Energy Secretary, gave the keynote address.

<http://www.proyectoola.net/index.php?id=10>





Conclusions

Many opportunities present themselves in Latin America and the Caribbean for European industry to transfer renewable and energy efficiency technologies to the region, since there are enormous renewable energy resources and an international framework supporting sustainable development policies.

In many cases, renewable energy policy and actions are diluted in several institutions without any coordinated policy.

Opportunities have been increased by the Kyoto Protocol (in force since 16th February 2005) and the possibility of using the Clean Development Mechanisms (CDMs). The CDM is an excellent opportunity to attract investments and transfer technology into mitigation projects to be integrated into the national sustainable development plans.

“Energy Access for All” is one of the main objectives of energy policy in Latin American countries. Rural electrification programmes are widely implemented, supported with financial and technical resources, local and international. The European experience and use of renewable energy should be widely promoted.

With new international oil price scenarios, many opportunities are open for countries with high fossil fuel dependency for the use of liquid biofuels for transport. National programmes are implemented in Brazil and new laws and programmes are being planned in Ecuador, Brazil, Cuba and Argentina. There are also demonstration initiatives in other countries such as Mexico and Bolivia.

With the approval of the *EU Promotion of the use of biofuels and other renewable fuels for transport Directive*, expectations in Latin America and the Caribbean are growing not only for the use of liquid biofuels for transport but for exporting biofuels to the European Union.

Tourism makes high demands on primary resources such as drinking water and energy. Coupled with recent energy shortages in Argentina, Cuba, Chile, Mexico among other countries, the incorporation of energy efficient technologies and the use of renewable energy sources in the development of the tourist industry are imperative, promoting energy savings and self-sufficiency and mitigating energy crises.

Applying good practice in day-to-day management and using automatic control can yield significant savings with only a small outlay.

The OPET OLA project has been considered by local stakeholders to be very positive. However, the underlying notion of the local stakeholders is that Latin American- Caribbean- EU (LAC-EU) co-operation is infrequent and distant.

Follow-up actions that could be developed remain very uncertain because of the limited co-financing possibilities of the European OLA partners and local institutions.

Recommendations

Consequently, it is recommended, in order to promote modern technologies in renewable and energy efficiency, cooperation with Latin America and the Caribbean should be ongoing within three types of programmes:

1. Energy Policies to improve the legislative framework and to remove non-technological barriers. This could be undertaken in programmes similar to Synergy or the present COOPENER within the Energy Intelligent Europe programme.
2. Technological transfer through dissemination actions in the present Framework Programme and the future 7th Framework Programme for RTD and Demonstration.
3. International cooperation within bilateral agreements between the European Union and the countries and organisations in the regions and through initiatives to alleviate poverty.



The OPET Thematic Brochures: Results of activities 2003-2005

The collection comprises 8 brochures and covers the following technological topics:

- **Energy Technologies in the Building Sector**
- **Energy Technologies for the Generation of Electricity from Renewable Energy Sources**
- **Combined Heat and Power Generation (CHP) and DHC (District Heating and Cooling) Technologies**
- **Clean Fossil Technologies Within the Energy Market**
- **New energy technologies and efficiency measures in transport**
- **Mediterranean Cooperation for New Energy Technologies**
- **Modern and Clean Energy and Transport technologies in Latin America and the Caribbean**
- **Accelerating Market Introduction of Promising Early Stage Technologies for Transport and Energy**

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