DEVELOPING RENEWABLES
Renewable Energy that benefits all

Project summary

The RTD4EDC project provides recommendations and a synthetic and accessible information basis on lessons learned regarding the implementation of renewable energy technologies in emerging and developing countries, the impact of RTD&D in this perspective and the opportunities for EU industry.

WP 1

The role of EU RTD&D policy to increase implementation of renewables in EDCs

Amsterdam, November 2008, Final report

SIXTH FRAMEWORK PROGRAMME PRIORITY 3
Underpinning the economic potential and cohesion of a larger and more integrated EU

SPECIFIC SUPPORT ACTION

Project Acronym:	RTD4EDC
Project full title:	RTD&D to increase the share of renewables in emerging and developing countries with European technologies; Policy Assessment, Stakeholders opinions, Best-Practises & Recommendations
Contract number:	SSP6-CT-2006-044371
Start date of contract:	January 2007

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Management summary

The European Union is one of the frontrunners in developing pro-active policies in the field of energy security and climate change and in supporting the development of new clean technologies that can cut global emissions of greenhouse gases. Clean energy production and consumption technologies – and especially Renewable Energy Technology (RET) – play a crucial role in this transition towards a global 'low carbon' economy. RTD&D addresses the earlier phases in the innovation processes that can pave the way towards large-scale implementation of new technological products and systems.

The RTD4EDC project is focussed on the role of Research, Technological Development and Demonstration (RTD&D) in the implementation of renewable energy technologies in Emerging and Developing Countries (EDCs). This report presents the results of the general information gathering and desk study (work package 1 of the RTD4EDC project). Work package 1 concentrates on: Fact finding and summarising the relevant developments, policies and (program) activities related to the subject of the RTD4EDC study.

PART 1: Global developments & EU Policies and strategies
In this part of the report some key overall developments are identified in the field of RE technologies related to Emerging and Developing Countries.

Global developments

- **A paradigm shift** (new industrial revolution) is needed before low-carbon energy markets can be brought to maturity. The European Union is one of the frontrunners in developing pro-active policies in the field of energy security and climate change and in supporting the development of new clean technologies that can cut global emissions of greenhouse gases.
- Climate change cannot be controlled without efforts by **Emerging and Developing Countries.** Combined emissions of developing countries are projected to overtake those of the current industrialised world by around 2020. Combating climate change includes the implementation of intelligent and efficient energy systems in the growing economies of EDCs.
- There is general understanding that significant technology breakthroughs on a global scale will be needed to solve the problem, with a key role for **Renewable Energy Technologies** (RETs) in this transition towards a global 'low carbon' economy. RTD&D addresses the earlier phases in the innovation processes that can pave the way towards large-scale implementation of new technological products and systems.
- There is a strong need for making progress in the field of **global renewable energy policies** tangible. Global Renewable Energy Policies and Measures Database is in this respect a step forward. The Global Renewable Energy Review Arrangement as proposed could be an even more valuable instrument.
- **The role of the market** is crucial for successful implementation of RET in EDCs. Mobilization of private investment is important – and therefore an important the role of governments is to remove the obstacles for private investment.

EU Policies and strategies

The scope of this study is a complex mixture of different interrelated EU policy areas, such as: Energy Policy, Development Policy, Environment Policy and Research Policy. Some of the main developments in EU policy and strategies in this area are:

- **Sustainable Development;** The EU recognises that the most effective way to promote adaptation to and mitigation of climate change is to 'mainstream' these objectives into strategies for poverty reduction and/or sustainable development. Combating climate change is integral to the EU's commitment to help developing countries meet the Millennium Development Goals.
- **Strategic Energy Technology Plan;** The SET-Plan calls for reinforcement of international cooperation and for implementing a coherent and differentiated open innovation strategy in relation to developed, developing and emerging economies. Options for further engaging and cooperating with EDCs include:
  - Networking energy technology centres; Cooperation with developed countries will involve public interest research and long-term exploratory research.
  - Setting up large-scale demonstration projects on technologies with the highest potential in the local context;
  - Increasing the use of innovative financing mechanisms, such as the Global Energy Efficiency and Renewable Energy Fund;
  - Reinforcing the use of the Kyoto Protocol mechanisms, notably the Clean Development Mechanism for investments in emissions reduction projects, if the post-2012 international agreement on further CO2 reductions is reached.
- **Emission Trading System;** ETS and CDM are helping developing countries to move towards sustainability through the promotion of projects that reduce greenhouse gas emissions. CDM projects contribute to transfer of clean energy technology to EDCs.
- **Research Framework Programmes;** Today, Europe has strong technological leading positions in many RET-domains such as solar technologies, wind energy, geothermal, biofuels and small hydro technologies. Successive EU Research Framework Programmes have helped to provide this foundation.
- **S&T cooperation;** The EU RTD programmes are open to cooperation with research institutions in EDCs. However the actual participation by EDCs in these programmes is currently at a very low level.

PART 2: EU Programmes

There are a number of different EU Programmes related to RTD&D, RE technologies and EDCs

- **Intelligent Energy Europe** (IEE) - Access to IEE-2 for EDCs is urgently needed and will be mutually beneficial for EDCs and EU. In a global energy market – international partnerships are key for the build-up of strong strategic research and market positions. Organisations from EDCs can open local markets and can act as technology partner or supplier (e.g. solid biomass, biofuel).
- **COOPENER** projects involved a well-balanced participatory approach, most of them featuring in addition a south-south transfer of experience. From experience it became clear participation of local state or public bodies (e.g. energy agencies) is needed to create buy-in and local ownership of concepts and practices.
- **EuropeAid** - Since the transfer of 'energy' from DG TREN to EuropeAid and EC decision not to continue COOPENER as part of IEE-2, the role of energy has

changed. Priority will primarily be given to the important role of energy in poverty alleviation.

- **ENRTP**, executed by AIDCO, is the successor of COOPENER. The ENRTP has earmarked an amount of €804 million for the seven years between 2007 and 2013. Thus, through the ENRTP, the EU will have a large amount of dedicated resources for RET in EDCs. A clear disadvantage is the relative distance between AIDCO-F3 and the IEE-2 Programme. Building strong linkage between both programmes on the subject of RET is needed and essential for good imbedding of ENRTP in the EU energy S&T framework.
- **PRO€INVEST** is an EU-ACP programme that provides technical and financial support to organisations representing the ACP private sector in their mission of sustainable investment promotion.
- **Framework Programmes** - The EU Research Framework Programmes can be seen as the cornerstones of technology development at a European scale. The Seventh Framework Programme (FP7) supports RTD on technical, socio-economic and policy research both on individual technologies and on a system change towards a 'low carbon' economy. FP7 is open to any entity including those located in EDCs. Therefore it contributes to knowledge exchange and potentially stimulates the use of RE in EDCs indirectly.

PART 3: EU-EDC Partnerships

Bilateral agreements are successful as they can create critical mass, mobilise political forces and build local support structures, such as the set-up of the matching programmes by the EDC governments. Bilateral agreements can also play an important role in RTD&D cooperation. They create leverage and stimulate universities, research institutions and industry in to participate in the EU Framework Programme. This way they have access to allowing them to benefit from the results of co-operation with European institutions and industry.

- **EU Energy Initiative (EUEI)** for Poverty Eradication and Sustainable Development was launched at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. EUEI is an umbrella organisation that aims to ensure that people in developing countries obtain access to modern and affordable energy services as prerequisite for achieving the Millennium Development Goals.
- **ACP-EC Energy Facility** - The Energy Facility is a co-funding instrument through a "call for proposal" system and is demand driven. Projects that take place in ACP countries (Sub-Sahara Africa, Caribbean and Pacific) that are energy-related and could contribute to poverty alleviation are eligible.
- The **EU-China Partnership on Climate Change** provides a high-level political framework that will further strengthen cooperation and which sets out concrete new actions in the field of climate change.
- **EU-China S&T cooperation** has largely taken place through the Framework Programmes (FP). In FP5 and FP6 Chinese entities were already eligible for particular calls. FP7 in principle is open to any entity, whether located in the EU or third countries including China.
- **EU-India S&T cooperation** - An extended and dedicated institutional bilateral framework is in place with regard to cooperation in the fields of renewable energy, clean development and climate change considering the **EU-India Initiative on clean development and climate change** and the **EU-India Energy panel**.

List of Acronyms

ACORE	American Council on Renewable Energy
ADB	Asian Development Bank
AfDB	African Development Bank
AMKN	African Microhydro Knowledge Network
APEC	Asia Pacific Economic Cooperation
AREED	African Rural Energy Enterprise Development
APPCDC	Asia-Pacific Partnership on Clean Development and Climate
APRM	African Peer Review Mechanism
ASTAE	Asia Alternative Energy Unit
BIREC	Beijing International Renewable Energy Conference 2005
CDM	Clean Development Mechanism
CERs	Certificates of Emission Reductions
CHP	Combined Heat and Power
CO2	Carbon Dioxide
CPV	Concentrating Photovoltaic
CRED	Chinese Centre for Renewable Energy Development
CRESP	China Renewable Energy Scale-Up Program
CSD	Commission on Sustainable Development
CSP	Concentrating Solar Power
CTI	Climate Technology Initiative
CYTED	Science and Technology Development Program
DFID UK	Department for International Development UK
DGIS	Netherlands Directorate General of International Cooperation
EAP	Environmental Action Program
EBRD	European Bank for Reconstruction and Development
ECAs	Export Credit Agencies
EDC(s)	Emerging and Developing Countries
EEA	European Environment Agency
EGNRET	Expert Group on New and Renewable Energy Technologies
EGS	Enhanced Geothermal Systems
EJEDSA	Empresa Jujeña de Sistemas Energeticos Dispersos
EPA	Environmental Protection Agency
ESMAP	Energy Sector Management Assistance Program
(EU) ETS	EU Emissions Trading System
EU	European Union
EUEI	European Union Energy Initiative
EWEA	European Wind Energy Association
EWG	Energy Working Group
FDI	Foreign Direct Investment
FP	(EU Research) Framework Programme
GEF	Global Environment Facility
GHG	Greenhouse Gases
GMI	Global Market Initiative
GNESD	Global Network on Energy for Sustainable Development
GREFF	Global Renewable Energy Fund of Funds
GVEP	Global Village Energy Partnership
GW	Giga Watts
IA	(EIA) Implementing Agreement (Program)
IAP	International Action Program
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDB	Inter-American Development Bank
IEA	International Energy Agency
IIA	International Investment Agreements
IPO	Initial Public Offering

IPP	Independent Power Purchase
IREDA	Indian Renewable Energy Development Authority
JI	Joint Implementation
JPoI	Johannesburg Plan of Implementation
JREC	Johannesburg Renewable Energy Coalition
kW(h)	Kilowatt (hours)
MDGs	Millennium Development Goals
MFI	Micro Finance Institution
MIGA	Multilateral Investment Guarantee Agency
Mtoe	Million tons of oil equivalents
MW(h)	Megawatt (hours)
NEPAD	New Partnership for Africa's Development
NGO	Non Government Organization
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PPA	Power Purchase Agreements
PTC	Production Tax Credit
PV	Photovoltaic
RE	Renewable Energy
REEEP	Renewable Energy and Energy Efficiency Partnership
REIA	Renewable Energy in the Americas
REN21	Renewable Energy Network 21
REPIN	Regulatory Environmental Program Implementation Network
REPSO	Renewable Energy Program Support Office
RET(s)	Renewable Energy Technology(ies)
RTD(&D)	Research and Technological Development (and Demonstration)
SHS	Solar Home Systems
SMEs	Small and Medium Enterprises
S&T	Science and Technology
SWH	Solar Water Heating
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNF	United Nations Foundation
UNFCCC	United Nations Framework Convention on Climate Change
UNSO	United Nations Statistical Office
UNIDO	United Nations Industrial Development Organization
USAID	US Agency for International Development
USDOE	United States Department of Energy
VAT	Value Added Tax
WBCSD	World Business Council for Sustainable Development
WBG	World Bank Group
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization

1 Introduction

1.1 RTD4EDC project

The project is executed by a consortium of four partners based in Europe (Belgium/The Netherlands), and in Emerging and Developing Countries (Paraguay, South Africa and India). The project aims at providing:

1. Clear 'recipes' for future RTD&D activities for the European Commission, based on a better understanding of:
- the potential impact of EU RTD&D activities (relative to possible other policy options) on the share of renewables in EDCs;
- the relation of EU RTD&D activities with best and worst practices of implementation of renewables in EDCs;
- the possibilities of EU RTD&D activities in promoting EU renewables industry in EDCs.

2. Increased opportunities for the European renewables industry to export to EDCs due to:
- a better understanding of export potentials to EDCs;
- an increased awareness of the possibilities for implementing renewables in EDCs;
- (when implemented) RTD&D policy activities supporting the industries activities.

The strategic objectives addressed are:

1. To assess the role of Research, Technological Development and Demonstration (RTD&D) and to compare it with other options to implement modern renewable energy technologies in emerging and developing countries also in the context of the Johannesburg Renewable Energy Coalition and the EU Energy Initiative;
2. To identify best-practices, especially for capacity-building, technology transfer, training, etcetera in emerging economies and developing countries;
3. To quantitatively evaluate the export potential for EU renewable industry and propose specific policy measures to achieve this potential.

This report represents the results of the general information gathering and desk results (Work package 1).

1.2 Scope and approach of RTD4EDC Project

The RTD4EDC project focuses on the role of Research, Technological Development and Demonstration (RTD&D) in the implementation of renewable technologies in Emerging and Developing Countries (EDCs).

For executing the project, the project team will use the following methodologies:

- General information gathering and desk research;
- 35 In depth interviews with experts and stakeholders;
- Survey (sample of 200) for evaluation of export potential and effective RTD&D policies;
- Assessment of the role of RTD&D activities;

- Analysis of 75 best and worst practices;
- Confronting, integrating and synthesising of findings;
- Organisation of a workshop for validation of results and recommendations.

The main output of the project will include reports on the above-mentioned results, but also a website fully disclosing all gathered data, information and results.

1.3 Scope WP 1 report in context of the study

The project used multiple sources of input. This part of the study concentrates on:

- Fact finding and summarising the relevant developments, policies and (program) activities related to the subject of the RTD4EDC study.

Desk research is the starting point of the RTD4EDC project and includes: literature search, review of (meta-) evaluations, policy modelling and other studies or reviews on the effectiveness of RTD&D policy instruments and alternative policy options.

In the remaining work packages of the project we concentrate on opinion finding activities, strategic analysis and confronting, integrating and synthesising of findings. We consult policymakers and expert knowledge by means of in-depth interviews with key stakeholders and experts and complementary mechanisms, such as a survey.

The desk research includes various domains and communities of overlapping activities and sources of information:

- (EU) Policy on global development, for supporting emerging and developing countries;
- (EU) Policy on climate change;
- (EU) RTD Policy in the field of energy security and renewable energy sources;
- (EU) Policy on innovation, dissemination and the role of the European industry in global markets.

This is graphically described in the diagram below.

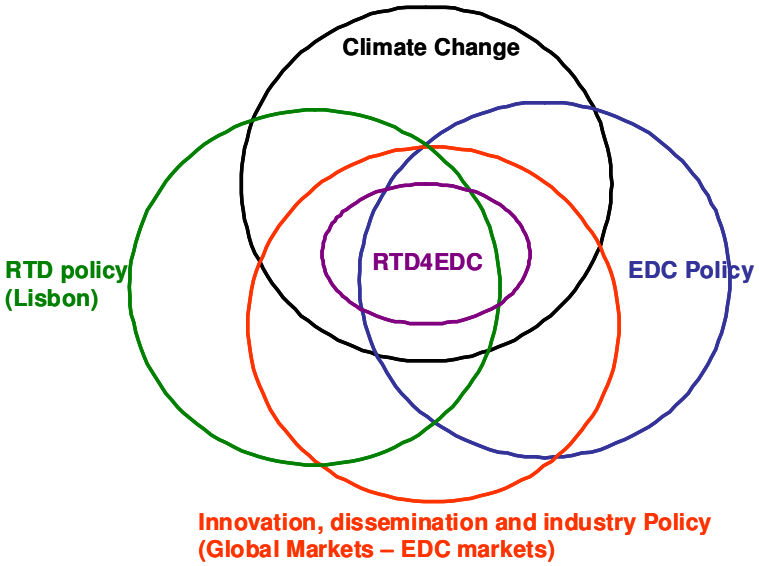

Figure 1: Illustration of the complexity of the scope of RTD4EDC

PART I: Global developments

2 Global developments

2.1 The Global playing field

The European Union is one of the frontrunners in developing pro-active policies in the field of energy security and climate change and in supporting the development of new clean technologies that can cut global emissions of greenhouse gases.

Energy security and access to reliable, affordable and clean energy are key issues on the global agenda, of paramount importance to economic growth and development, especially in emerging and developing countries.

A global transition to a 'low-carbon' economy is urgently needed to prevent climate change from reaching levels that could lead to irreversible and potentially catastrophic changes to the global environment. Climate change is an environmental problem and also poses a clear risk to economic development and international stability and security. Developing countries and the poorest populations are likely to be hit disproportionately (e.g. sea-level rise, floods, desertification, food insecurity, water scarcity, spread of diseases).

Clean energy production and consumption technologies – and especially Renewable Energy Technology (RET) – play a crucial role in this transition towards a global 'low carbon' economy. RTD&D addresses the earlier phases in the innovation processes that can pave the way towards large-scale implementation of new technological products and systems. A paradigm shift (new industrial revolution) is needed before low-carbon energy markets can be brought to maturity.

The world is facing a complex twin energy-related challenge to both ensure affordable energy in all countries and at the same time manage the associated environmental consequences. 80% of greenhouse gases are emitted through energy production or consumption. '*For environmental sustainability, we need a global energy revolution to completely change the way we produce and use energy'*, said William C. Ramsay (IEA) [1], and he presented a five-step global strategy towards a more secure and sustainable energy future:

1. Increasing investments
2. Create more efficiency in the energy system
3. Create more diversity
4. Create more transparency
5. And maintain the safety net

In the long term, there is general understanding that significant technology breakthroughs on a global scale will be needed to solve the problem, with a key role for Renewable Energy Technologies (RETs). The EU should actively promote and support energy research with EDCs and strengthen cooperative networks in RETs.
The main global players: EU, U.S. and Japan, are facing similar challenges as the emerging economies such as China, India and Brazil. In these emerging economies the

[1] IFRI: Shell Energy Scenarios to 2050, July 3, 2008 - Evolution of Global Demand and Supply International Energy Agency, Ambassador William C. Ramsay, Deputy Executive Director

economic growth opens a unique window of opportunities to develop and implement RET systems and European industry should actively participate in this play and commercialise their RETs by global market strategies.

If Europe falls behind in the intensifying global race to win low carbon technology markets, we may need to rely on imported technologies to meet our targets, missing out on huge commercial opportunities for EU businesses. Thus Europe must accelerate their RTD in low carbon technologies. A lot of benefits can be found in strengthening the strategic partnership with EDCs. Energy markets in EDCs are growing at much faster rates than in Europe (and investments are an excellent driving force of innovation), emerging economies offer advanced and cheap production systems, and a fast growing technological knowledge base. EDCs are interesting strategic partners in development of new low carbon technologies. Together we can catalyse a paradigm shift and new industrial revolution. In a carbon constrained world, the mastery of technology will increasingly determine prosperity and competitiveness. New energy technologies (in combination with smart financing concepts) can create a better world and contribute to broadening access to modern energy services globally – even for the poorest people.

2.2 The role of EDCs in Climate Change

Energy plays a strong role in sustainable development. A vivid description of the required transition towards a global low-carbon society in quantitative terms, has been given by Nicolas Stern, in report for the UK government. The analysis of Stern is included in the text box below. It clearly shows that EDCs have a key position in future Climate Change.

A new UN climate change agreement is needed to create a comprehensive global framework. Global emissions must be cut to at least half of 1990 levels by 2050 if we are to have a chance of limiting global warming to no more than 2°C above the pre-industrial level.[2] Combined emissions of developing countries are projected to overtake those of the current industrialised world by around 2020. Climate change cannot be controlled without efforts by EDCs, especially the emerging economies. Combating climate change includes the implementation of intelligent and efficient energy systems in the growing economies of EDCs.

Text Box: Nicolas Stern's analysis of the global CO2 emissions

The current trend of rapidly growing global emissions will need to be reversed. Successfully slowing down climate change is needed to avoid the worst impacts. Such a transformation of energy and development trends requires a massive shift in investment patterns. Policies and new market mechanisms will be needed to discourage investment in carbon intensive activities and technologies and reward investment in low or no carbon options. A mayor share of these investments in energy systems will be made in Emerging and Developing Countries (EDCs). Therefore, the role of EDCs in the global transition toward a 'low carbon' economy is a crucial one.

Leadership is needed from business as well as governments:
- *Current annual global emission flows are around 40-45 Giga tonnes of CO2 equivalent (GtC02-eq).*

[2] The EU is ready to cut its emissions to 30% below 1990 levels by 2020 if other industrialised countries agree to do likewise under a new agreement (in any case by at least 20%).

About 45% of current global emissions come from developing countries and this is set to grow. A 50% reduction in global emissions by 2050 equates to an aggregate annual flow of around 22GtC02-eq. As there will be around 9 billion people in 2050, this implies per capita emissions per year of about 2-2.5 tonnes CO2-eq;

- *Currently, US emissions are more than 20 tonnes of CO2-eq per person per year, Europe and Japan 10-15 tonnes, China 5 or more tonnes, India around 1.5 and most of Africa much less than 1 tonne CO2- eq per person per year;*
- *The consequence is that rich countries will have to take the lead and demonstrate strong cuts. Since around 8 billion people will be in currently developing countries, those countries will also have to be in the range of 2-2.5 tonnes CO2-eq by 2050, otherwise the world average for the total would be unachievable. The size of their economies will, we hope, grow strongly. This means that emissions per unit of output will have to fall very strongly in all countries by 2050 if we are to avoid dangerous climate change.*

With the most developed EDCs, further opportunities for strategic alliance building and (long-term) technological cooperation are needed. For the more developing and emerging economies of EDCs, key interest should lie in capacity building, technology transfer of energy technologies that match local needs and infrastructures and providing development support:

- Europe can help those EDCs to develop and grow in a more sustainable manner, while building new market opportunities for EU industry in these partnerships, including local public and private stakeholders and financial institutions;
- Long term partnerships and creating local capacity build-up (learning and education, knowledge transfer, building legal and governance system, improving infrastructure and making investments in energy systems and services) are excellent investments in our future, both seen from development and competitiveness perspectives. Also, as the Stern report has shown, making investments in intelligent energy systems in EDCs tomorrow is a smart investment to contribute to climate change reduction goals;
- Options for further engaging and cooperating with such countries include: networking energy technology centres; setting up large-scale demonstration projects on technologies with the highest potential in those countries; increasing the use of innovative financing mechanisms, such as the Global Energy Efficiency and Renewable Energy Fund and reinforcing the use of the Kyoto Protocol mechanisms, notably the Clean Development Mechanism for investments in emissions reduction projects, if the post-2012 international agreement on further CO2 reductions is reached.

Main themes in the global energy markets include market reforms (gas, electricity), the creation of 'green' markets, and new financial instruments (including energy subsidy reform and green tax reform). To accelerate market implementation of break-through low-carbon technologies, an open innovation model between EU and EDCs works best.

This open approach fits well with ongoing developments in EDCs[3]:

- In transition economies, energy market reform is part of the overall reform programme, from central planning towards more market-based economies. Furthermore, pricing reform is still necessary in many countries to achieve better environmental performance in the energy sector. Countries implementing

[3] EIA INTERNATIONAL ENERGY AGENCY - Making Energy Markets Work, Johannesburg paper 2002 - http://www.iea.org/textbase/work/2002/johannesburg/making.pdf

such reforms become more dynamic and transparent and in general show accelerated implementation of new technology systems;
- Developing countries are instituting reforms in order to make their market attractive to private and foreign investors to finance the expansion of their energy supply capacity;
- Providing equitable access to electricity has been more influential in shaping power sector reforms in developing countries, and especially in Africa. Subsidising electrification is widely accepted.

Also, in open innovation models, Europe can bring international cooperation and partnership on energy technology to a higher level. We can learn from how the ETS (Emissions Trading Scheme) catalyses the build-up of a global cap and trade system for carbon.

Text Box – Report of the ERA Expert Group 2008 - Opening to the world: International cooperation in Science & Technology

What is needed to improve the financing system?
Today's international financial arrangements can be seen as the first generation low CO2 instruments. Much can be learned from these instruments, but they need to be improved substantially. Industrialised countries have insufficiently succeeded in assisting developing countries in mitigation of climate change. Sufficient financial instruments to enable large-scale investments in renewable energy technologies in EDCs are often lacking. There is a gap between what is needed and what can be achieved with existing international financing instruments:

- *Financing under Global Environment Facility (GEF) is far from sufficient and carbon market is not guaranteed beyond 2012;*
- *International Finance Institutions existing portfolios, instruments (such as programmatic long-term financing, grant programs, output-based aid, risk guarantees, favourable lending and insurance) and carbon finance can be better aligned;*
- *Additional concessional finance may be needed to finance the incremental cost to make the portfolios climate friendly. The World Bank's new Investment Framework for Clean Energy and Development could serve this purpose.*

Improvements needed in financial instruments for EDCs:

- *Gaining critical mass – scaling up and better alignment of instruments to support affordable and reliable, clean modern energy services;*
- *New markets, new financial intermediaries, regional fine-tuning and risk reduction strategies are key actions required;*
- *CDM should not only pick low-hanging fruit, but should be scaled-up to enable effective technology transfer, CDM needs a longer time horizon for advanced technologies and improve private-public funding models;*
- *More integrated approaches are needed. Currently climate instruments are too fragmented.*

In addition to existing financing structures other resources should be considered by EDCs such as levies, risk reduction, fiscal regimes that favour renewable energy products for consumers, etc.
Private and public sector should closely work together to reinforce CO2 market instruments. First priority is to provide market stability and continuity beyond 2012. To maintain a value for carbon, clarity is needed on carbon permits and incentives in the developed economy markets. New – more substantial and stable – incentives for investments in low or no CO2 energy technologies are needed. Global CO2 market instruments should be the backbone, regional instruments can be built on top of this.

Business calls upon governments to create a long-term predictable and stable regulatory framework that triggers investment in clean energy technologies, especially in EDC countries. A policy framework will have to provide the conditions for substantial market incentives.

Essential elements in the low or no CO2 technology implementation are:

- *giving a price to CO2 emissions and/or internalising environmental externalities into the price of energy;*
- *providing incentives for taking the implementation hurdle;*
- *execution of research, development and dissemination of best practices to reduce the implementation and operational costs.*

An enabling environment is needed in developing countries to attract knowledge and funds for renewable energy. Key factors in the local energy context in favour for renewables seem to be:

- *energy sector reform (open markets);*
- *local capital market development and improved tariff structures (local currency funding,);*
- *sharing best practices and cross-regional (South-South) partnerships, as they are important for capacity-building and transfer of technologies;*
- *Regional banks, as they can play an important role in capacity building. Development of financial and insurance service companies;*
- *Changes in infrastructure, building and construction methods and logistic systems.*

2.3 Climate Change – policy framework

There are many networks, programmes, initiatives, activities and actors that play important roles in the international RET policy. The international arena is complex and action takes place on many fronts, including:

- the United Nations (UN) and its frameworks and multilateral organisations including UNFCCC (United Nations Framework Convention on Climate Change), UNDESA (United Nations Department of Economic and Social Affairs), UNDP (United Nations Development Programme) and UNEP (United Nations Environment Programme), UNSO (United Nations Statistical Office);
- G8 Gleneagles Commitment that focused on climate change, clean energy and sustainable development;
- partnerships, launched at the Johannesburg WSSD, such as the Renewable Energy and Energy Efficiency Partnership (REEEP), the Global Village Energy Partnership (GVEP), the Global Network on Energy for Sustainable Development (GNESD), the European Union Energy Initiative (EUEI), COOPENER, the external dimension of the EC programme "Intelligent Energy Europe, the Johannesburg renewable energy Coalition (JREC) and the Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT);
- the World Bank and regional development banks and organizations including the Inter-American Development Bank (IDB), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Organization of American States (OAS) and the Asia Pacific Economic Cooperation (APEC), etcetera;
- global energy networks such as Renewable Energy Network 21 (REN21).

These have promoted multilateral coordination, encouraged policy dialogue with EDCs, civil society and the private sector and contributed to a range of programmes and actions. As result of complex and overlapping relationships between these initiatives, it is not easy to describe and analyse the global developments. In the next subparagraphs we try to give the reader a first impression of important initiatives, from a European perspective (focussing on the policy and roles of the EU) with the remark that it is far from complete. In the next paragraph we will shortly illustrate the instruments implemented.

2.4 United Nations framework: UNFCCC

The political will to address climate change is growing. Over 180 nations, including all of the world's largest economies, are Parties to the UN Framework Convention on Climate Change (UNFCCC).

The Convention aims to stabilise the concentrations of greenhouse gases so as "to avoid dangerous anthropogenic interference with the climate system." All nations agree to take national policies and measures to combat climate change.

The Kyoto Protocol of the UNFCCC commits industrialised countries to binding targets to cut emissions to at least 5% below 1990 levels in the period 2008-2012. 168 countries ratified the Kyoto Protocol. However, some of the world's largest emitting nations either not obliged under the Protocol to reduce emissions by 2012 (e.g. China, Brazil, India, Mexico) or have not ratified the Protocol (e.g. USA).

The EU plays an active role in international policy. Key multilateral processes are executed via the UN Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and its Clean Development Mechanism (CDM) as well as through regional and bilateral cooperation with partner countries in all developing country regions. The political support of EU to the processes under the umbrella of UNFCC has been important – and contributed to the fact that the UNFCCC provides a strong international framework for multilateral policy on the adaptation to climate change and capacity building and for starting important international projects.

The UNFCCC and the Kyoto Protocol and institutions linked to them, such as the Global Environment Facility (GEF), are important channels through which the EU provides general support and financial assistance on climate change to developing countries. Since 2005 EU Member States are providing the bulk of the US$ 410 million promised annually. The EU is a major backer of the Kyoto Protocol's Clean Development Mechanism (CDM).

The 2005 European Consensus on Development commits Europe to supporting its partners' efforts to incorporate environmental considerations into development and to helping strengthen their capacity to implement multilateral environmental agreements such as the UNFCCC and the Kyoto Protocol. The EU also fully supports the early operationalisation of an Adaptation Fund to be financed mainly from a share of CDM revenues.

2.5 Gleneagles-Dialogue

Gleneagles Dialogue, officially referred to as the "Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development", was launched as a result of an agreement at the G8 Gleneagles Summit held in the United Kingdom in 2005[4]. The Gleneagles Dialogue 4th Ministerial Meeting was held in Chiba, Japan (14-16 March, 2008), with the attendance of environment and energy ministers of the world's 20

[4] First Ministerial Meeting in London (Oct. and Nov. 2005); the second meeting in Monterey (Oct. 2006) and the third meeting in Berlin (Sept. 2007). These Dialogues provide support to the political UNFCCC processes.

major greenhouse gas emitting nations as well as representatives of relevant international organizations, industries, NGOs and NPOs[5].

Figure 2: G8-Gleneagles-Dialogue, 'clean energy talks' in Berlin September 10, 2007.

Key conclusions of the **4th Ministerial Meeting in Chiba** include the subjects: technology, finance and the outlines of the post-Kyoto framework.

- The importance of improving energy efficiency was acknowledged, as one of the most effective means to immediately reduce GHG emissions, on a global scale including through cooperative sectoral approach, international partnership and domestic actions for each country. Moreover the importance was stressed to mainstream mitigation and adaptation into development policy and maximizing co-benefits in financial assistance;
- It is important to share a common long-term goal and understanding of the necessity to move toward sustainable low-carbon societies. This requires a long-term policy, which functions as a reliable and clear signal to the private sector. Developed countries will take the lead in combating climate change while ensuring the comparability of efforts among them. Developing countries will take measurable, reportable and verifiable actions with support from developed countries;
- Adaptation and mitigation are both important, and technology and finance are necessary ways to achieve them. Establishment of a global carbon market is crucial. Also, reaffirmed was the necessity to give appropriate incentives for preventing deforestation and forest degradation;
- The role of industry is underlined and a necessity of further scaling up and improving of CDM was noted. The effectiveness of sectoral approaches was

[5] The 4th meeting focused on the issues on Technology, Finance and Investments, and post-2012 framework in order to wrap up these past 2-year discussions and prepare a report to the G8 Hokkaido Toyako Summit.

discussed and initiatives for implementation of sector-based activities by business and the work of IEA were appreciated and challenges were pointed out to be addressed, including data collection and the future role of IEA.

Especially of importance for the RTD4EDC study are following findings and conclusions:

- The necessity of technology deployment and transfer to developing countries was acknowledged – as well as the importance of capacity building;
- The necessity of expanding and strengthening international cooperation and sharing road maps on technology RTD&D and deployment was shared;
- With respect of finance, the work of the World Bank and Regional Development Banks under the framework for clean energy and development was appreciated and they were asked to enhance these efforts. The initiatives by Japan, UK and US to create a new multilateral fund for climate change in collaboration with the World Bank were appreciated;
- Existing and new funds should be further coordinated and financial support for adaptation to the most vulnerable countries such as Least Developed Countries and Small Islands Developing States should be prioritized;
- Both the development of new technologies and the deployment of existing technologies are equally important.
- Cooperation between developed and developing countries, and between public and private sectors are essential;
- Future investment is needed on a large scale. A wide range of policies should be implemented in a clear and predictable way in order to mobilize private investment;
- It is necessary to deal with sustainable development and climate change at the same time.

2.6 Johannesburg World Summit - JREC

At the Johannesburg World Summit, initiatives were launched by the EU to promote sustainable water resource management and cooperation in the field of energy and development. The role of international environmental agreements was strengthened and new facilities were implemented or replenished, such as:

- Renewable Energy and Energy Efficiency Partnership (REEEP),
- Global Village Energy Partnership (GVEP), the
- Global Network on Energy for Sustainable Development (GNESD),
- European Union Energy Initiative (EUEI),
- Global Environment Facility (GEF) and
- Global Monitoring for Environment and Security (GMES) system to developing countries.

JREC (Johannesburg Renewable Energy Coalition)

JREC is a coalition of governments that seeks to contribute to the renewable energy related commitments made at the World Summit for Sustainable Development in Johannesburg in 2002. JREC should stimulate the use of renewable energy in developing countries and elsewhere. Membership of the coalition currently stands at 89

countries, of which half are African, Caribbean and Pacific (ACP) developing nations. The European Commission provides the JREC secretariat and co-chairs the coalition with the government of Morocco.

JREC aims at reaching political agreement on the key barriers, opportunities, and potential solutions for the full deployment of renewable energy sources and markets in a cost-effective way. JREC contributes in the development of international political consensus on a global strategic roadmap, and multi-annual action plan for the deployment of renewable energy sources worldwide.

Goals and Actions

JREC aims at enabling significant progress in the UN Commission on Sustainable Development (UN-CSD) decision making progress, by stimulation cross-sector and cross-regional dialogue amongst ministers, senior officials and other stakeholders on the political level that are pro-actively striving for an increase in the share of renewables in the global energy mix.

> UN CSD is the abbreviation for United Nations Commission on Sustainable Development and is a functional commission of the UN Economic and Social Council. The CSD has as a specific task the implementation of international institutional arrangements as defined in chapter 38 of Agenda 21, a key political outcome of the 1992 Rio Earth Summit. CSD regularly organizes World Summits on Sustainable Development, of which the 15th took place in 2007.

Initiators

JREC is a joint initiative of 88 governments including all European countries and governments from Africa, South America, the Caribbean, Asia and the Pacific.

A full list of members can be found at
http://ec.europa.eu/environment/jrec/pdf/jrec_members.pdf

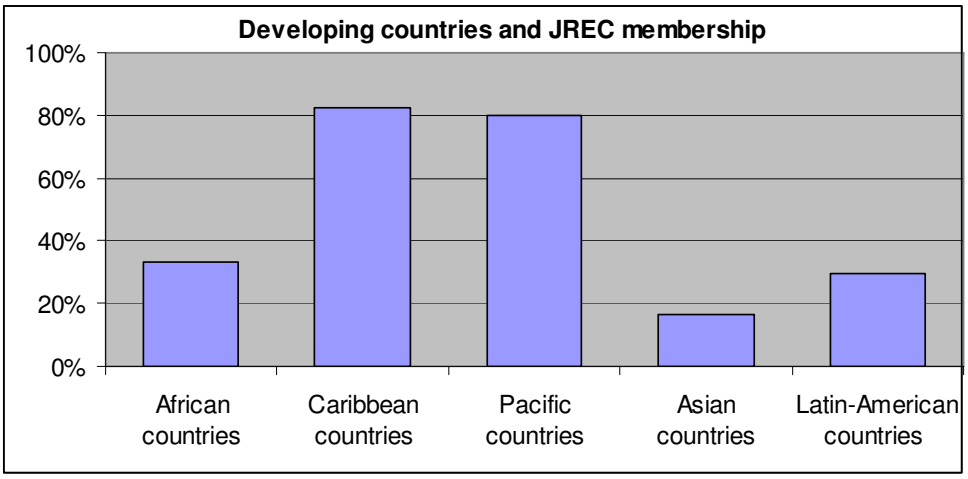

Figure 3: Developing countries and JREC Membership

Core managing actor of JREC is the JREC secretariat, which is responsible for organizing regular meetings, conferences and side events, and maintaining the JREC website. Special attention is given to facilitate the engagement of developing countries.

Relevant instruments used:

1. **High Level Platform**: JREC seeks to raise awareness among senior officials and ministers, business and finance associations on opportunities, mutual needs and services offered with regard to renewable energies worldwide. In this way JREC enhances coordinated action on international and/or regional level and ensures that political ambitions are adequately reflected in budgets of governments or public institutions. Organizing High Level Meetings is the core instrument for reaching JREC's main goals.
2. **The Global Renewable Energy Policies and Measures Database** provides information in a centralized manner in one format on policies and measures taken in the field of renewable energies categorized by country, technology or policy instrument. It is an online database that contributes to international dialogue on renewable energy by providing "unbiased information and analysis for the use by decision-makers, policy experts, researchers and industry, as well the broader public."

2.7 Global Renewable Energy Policies and Measures Database

The Global Renewable Energy Policies and Measures Database was launched at the 2005 International Renewable Energy Conference and is a joint effort of the International Energy Agency, JREC and the European Commission.

Objective

It was established in order to provide information in a centralized manner in one format on policies and measures taken in the field of renewable energies categorized by country, technology or policy instrument.

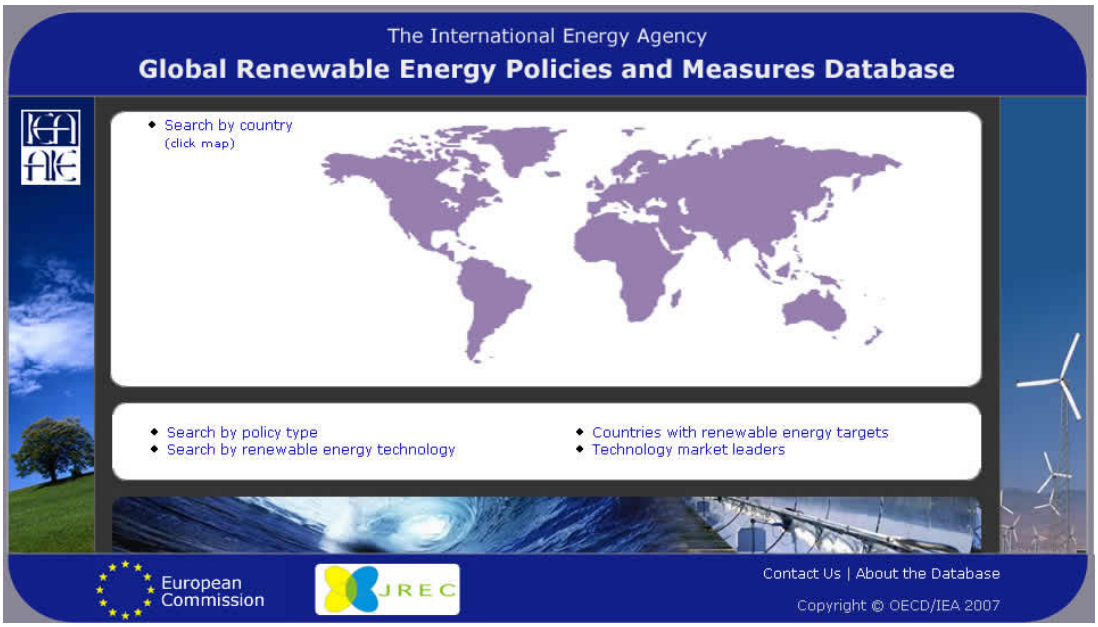

Figure 4: Global Renewable Energy Policies and Measures Database - screenshot

Database

The IEA's database of Climate Change Policies and Measures complements the IEA's analysis on climate change mitigation policy and practice. Since 1999, governments of the IEA's 26 Member Countries have reviewed and endorsed the more than 1400 policies listed, reinforcing the databases informative value and authority.

The Database features over 100 countries and offers renewable energy market and policy information in one format in one location for countries that together represent almost total global renewables supply. The Database is freely accessible online via the IEA website. Visitors can search for information according to country, policy instrument, renewable energy technology, renewable energy target and other criteria.

The on-line JREC Policies and Measures Database includes: Search engine access enables search by RES type, country with energy targets and policy Type (see below):

- 3rd Party Finance Bidding Systems Capital Grants
- Consumer Grants / Rebates Excise Tax Exemptions Fossil Fuel Taxes
- General Energy Policy Government Purchases Green Pricing
- Guaranteed Prices / Feed in Investment Tax Credits Net Metering
- Obligations Production Tax Credits Property Tax Exemptions
- Public Awareness RD&D Regional Policies
- Regulatory and Administrative Rules Rural Electrification Sales Tax Rebates
- Tax Credits Tradable Certificates Voluntary Programmes

The development of the database interface is still in progress and is likely to be extended with the possibility to search according to “technology market leader” and through a world map. It thus far does not allow for cross-dimensional search.

Search by policy type	**Search by renewable energy technology**	**Countries with renewable energy targets**	
3rd Party Finance	All technologies simultaneously	Australia	Lithuania
Consumer Grants / Rebates	Geothermal	Austria	Luxembourg
General Energy Policy	Hydrogen (from Renewables)	Belgium	Mali
Guaranteed Prices / Feed in	Offshore wind	Brazil	Malta
Obligations	Solar photovoltaic	Cyprus	Netherlands
Public Awareness	Bioenergy	Czech-Republic	New-Zealand
Regulatory and Administrative Rules	Geothermal Electricity	Denmark	Norway
Tax Credits	Hydropower	Estonia	Philippines
Bidding Systems	Onshore wind	Finland	Poland
Excise Tax Exemptions	Solar thermal	France	Singapore
Government Purchases	Biofuel	Greece	Slovakia
Investment Tax Credits	Geothermal heat	Hungary	Slovenia
Production Tax Credits	Ocean energy	Ireland	South-Africa
RD&D	Solar concentrating power	Israel	Spain
Rural Electrification	Waste (organic)	Italy	Sweden
Tradable Certificates		Japan	Switzerland
Capital Grants		Korea,-Republic-of	Turkey
Fossil Fuel Taxes		Latvia	United-Kingdom
Green Pricing			
Net Metering			
Property Tax Exemptions			
Regional Policies			
Sales Tax Rebates			
Voluntary Programmes			

Table 1: Global Renewable Energy Policies and Measures Database - oversight the policy types, technologies and countries included.

2.8 Global Energy Efficiency and Renewable Energy Fund (GEEREF)

Backgrounds

Within the context of the JREC, the EC in 2006 has set up an innovative global risk capital fund, to bring clean, affordable energy to people in developing countries and economies in transition: GEEREF (The Global Energy Efficiency and Renewable Energy Fund). This European risk capital fund is a public-private partnership that will mobilise private investment in energy efficiency and renewable energy projects in development countries. It will provide risk capital to investment funds specialising in small and medium-sized projects in these sectors. These investments will reduce CO2 emissions and air pollution, thus helping both to tackle climate change and to reduce pollution-related diseases and associated health care costs.

Goals

The objective of the GEEREF is to mobilise public and private finance for scaling up pilot schemes. This can help solving the financing grid-lock for economic renewable energy projects and businesses. It will furthermore "facilitate efficient co-operation amongst donors and commercial investors, including international finance institutions, and ultimately accelerate the global market uptake of sustainable, secure, and affordable energy technologies and the services they deliver".

Actions

- Co-financing of renewable energy and energy efficiency related investment funds. The share of funding will range from 25-50% for medium to high risk operations to 15% for low risk operations.
- Technical assistance through a dedicated fund that will make up 10-20% of the total budget size dependent on the need for technical assistance or capacity building. In that way it provides external expertise for project proposals, project management and business plans can be employed.

The GEEREF facilitating entity will bring together parties that together finance the fund itself, that is: the European Investment bank, the European Bank for Reconstruction and Development and private parties. Furthermore the GEEREF facilitating entity will manage the fund, which is contemporarily done by Triodos Bank in the Netherlands. Initially GEEREF facilitating entity will consist of internal EC personnel. In time however GEEREF should evolve into an autonomous entity having its own personnel and not being dependent of EC funding.

The European Investment Bank will contribute €80 million into GEEREF between 2007 and 2010 and additional pledges from other public investors have taken the fund to over €100 million. These investments are expected to attract risk capital of between €300 million and €1 billion for projects that will accelerate the transfer of greener energy technologies to developing countries and economies in transition.

The leverage affect of GEEREF is expected to be a factor 12 making total on-ground investment in Renewables 1.2 billion euros in the coming four years.

Involved Actors

As was stated GEEREF is basically a fund of funds, not directly interacting with projects or initiatives, but rather with existing funds and public finance organizations It will be organized as a Public Private Partnership and can be represented as follows:

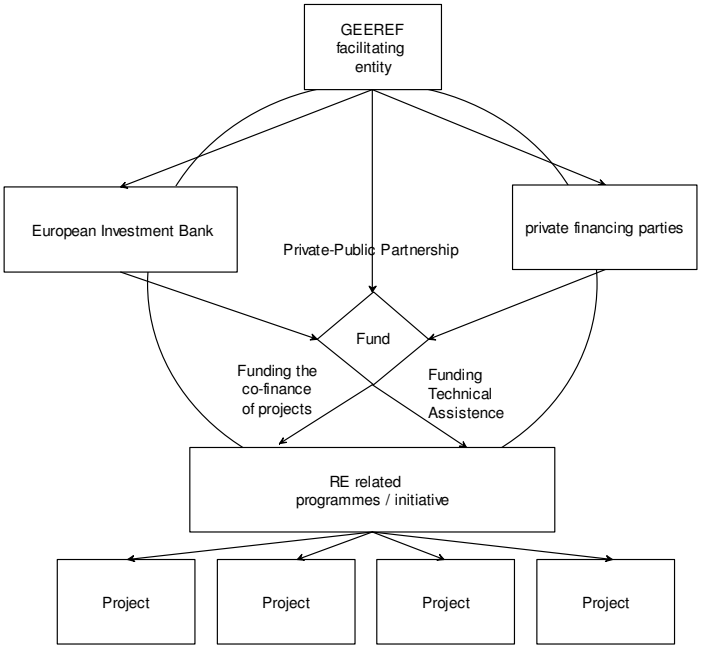

Figure 5: the organizational structure of GEEREF (source: the author)

Geographical Scope

Geographical scope of the activities will be sub-Saharan Africa, the Caribbean and Pacific Island States, Latin America, Asia, North Africa and other EU neighbouring countries. Focus of project funding in countries that have private sector engagement in their national policies is prioritized. Furthermore projects that have a budget under 10 million euros are prioritized since these are often disregarded by private investors.

Eligible technologies

"Given the focus on developing countries and transition economies, the emphasis will be placed on deploying technologies with a proven technical track record. Both experience and projections show that small hydro and biomass comprise a large part of investment prospects, with on-shore wind also offering significant potential. Photovoltaics possibly remain too costly for all but middle and high-income contexts. Energy efficiency projects will qualify in particular where similar financing barriers need to be resolved."

2.9 Global Renewable Energy Review Arrangement

Backgrounds

One of the main commitments of the WSSD 2002 in Johannesburg is "substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply […] and regularly evaluate available data to review progress to this end." (source: Johannesburg Plan of Implementation)

In 2006, the Governments of Austria, Denmark, Germany, Norway, Sweden, and the United Kingdom, ordered a study to develop possible options for developing an appropriate review mechanism to contribute to the lacking global evaluation as mentioned. JREC and the European Union offered to facilitate.

In February 2007 a draft discussion paper has been published that explores the possibilities of establishing a Global Renewable Energy Review Arrangement. The discussion paper is based on the activities and expertise of selected institutions including UNEP, UNDP, UNDESA, WB, IEA, REN21, REEEP, JREC, and others.

The remaining part of this section is based upon this paper and does not reflect any kind of official position. However it gives a good impression of the future shape of the arrangement.

Structure

Although the structure of the review instrument is not formalised yet, the discussing paper indicates that the instrument structure will consist of three layers all having distinctive tasks:

- political level
  - ***Ministerial level***, monitoring progress vs. MEAs and JPOI and linking with CSD15.
  - ***Senior officials preparatory meetings***, reviewing progress reports vs. MEAs and JPOI.
  - ***Conference secretariat***, organizing and facilitating meetings.
- Steering level, collecting and disseminating information, identifying gaps and opportunities, promoting actions and synergies, preparing progress reports. (peer reviewing)
- Implementation/executive level: global data collection, data analyses, and reporting.

Goals

The specific objectives of the Global Renewable Energy Review Arrangement are to:

- Provide governments and key stakeholders with accurate and complete information on the potential and current use of renewable energy, including on:
  - Good practices related to policies and measures (incl. programmes and projects).
  - Gaps and barriers.
  - Opportunities for accelerated development, transfer and diffusion of renewable energy technologies and services, energy efficient production and consumption.

- Promote participation in the review arrangement of all governments across all relevant policy areas, in particular key decision makers in the area of energy, environment, and economic and development policies.
- Pay due attention to the needs of developing countries.
- Promote concerted action at the international (multilateral, bilateral, etc.), regional, national and local level to increase the share of renewable energy, including:
  - Research, development and demonstration projects
  - Capacity building
  - Market-based public and/or private financing mechanisms.

Activities

The activities can be grouped into three categories:

1. Global Data Reporting:
   - **Data collection, verification and validation**, based on existing sources including on the share of renewable energy in the total energy mix, including untapped potential, planned and enacted policies (including targets set at the regional, national, and/or local level), programmes, projects and financing trends and opportunities.
   - **Reporting including online databases and regular progress reports** including on trends, market shares, fund flows, on the share of renewable energy in the total energy mix, including untapped potential, enacted policies (including targets set at the regional, national, and/or local level), programmes, projects and financing trends and opportunities.
2. Global Analyses
   - Identifying good practice and success factors, gaps, barriers, and opportunities to accelerated development and deployment of renewable energies, etc.
   - Scenario analysis to forecast development of renewable energies on a business as usual as well proactive policy scenarios. (based on existing initiatives).
3. Progress Review
   - High-Level Progress Review (UN Level on the basis of a 3-4 year cycle) – the review process should ultimately be presented at regular intervals at the UN level. The purpose of this review will be to identify and address gaps and means to overcome barriers, including guidance to international, regional, and national organisations. Such guidance may, where appropriate, include recommendations to strengthen and/or take on voluntary commitments or develop appropriate international agreements.
   - Other Periodic Progress Reviews—the review arrangement could also contribute to, and benefit from other high-level processes (e.g. building on the Renewables 2004, BIREC 2005, etc.)

2.10 The Voice of the market

The role of the market is crucial for successful implementation of RET in EDCs. Mobilization of private investment is important – and therefore an important the role of governments is to remove the obstacles for private investment.
The EC is implementing stakeholder engagement processes in the formulation and implementation of European research priorities. Common foresight and technology assessment exercises carried out in close collaboration between national organisations

and involving the participation of stakeholders and citizens, could help structure and enrich such an approach.

Global leading CEOs recommendations to G8 Leaders – July 2008.

'a responsible risk management approach requires political and business leaders to take action now'

World Economic Forum and the World Business Council for Sustainable Development (WBCSD) have facilitated a process to develop business perspectives on international climate change policy as part of the business community's contribution to the Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development.

The final report of this work 'CEO Climate Policy Recommendations to G8 Leaders' contains a clear set of consensus recommendations by over 80 CEOs (chief executive officers) of leading global companies regarding the structure of an environmentally effective and economically efficient long-term climate policy framework to combat climate change. Key conclusions and recommendations of the CEOs include:

- Climate change is not only a challenge, it is also an opportunity. A paradigm shift to a low-carbon economy by 2050 has the potential to drive forward the next chapter of technological innovation – *the green industrial revolution*.
- The Stern Review shows that delaying action will increase future costs to act. While uncertainties remain – applying a risk management perspective to the available information – the CEOs conclude that a reasonable approach is for all leaders of business and government to take action now.
- Strong leadership from all governments, particularly those of the major economies, is essential. A rapid and fundamental strategy to reach a low-carbon world economy is needed.
- The Bali Action Plan and its work program to negotiate a new international climate policy framework to succeed the Kyoto Protocol are essential. Leading global companies are willing to work immediately with governments to help this succeed - to ensure that a new framework to address climate change (including U.S., China and India) is in place by 2010. As this will enable industry to accelerate investments and emission reductions strategies. It should encourage all clean technology options to be considered. It should be pragmatic and focus on the most cost-effective emissions abatement possibilities in the short run, particularly in energy efficiency and forest conservation. It should stimulate the international market for products and services that can help the economy adapt to those impacts of climate change that now cannot be avoided.
- A well designed, market-based framework will stimulate flows of clean technology and private finance to DCs to support their economic growth. The emergence of a strong international carbon market will catalyse these new flows of private capital and clean energy technology to DCs in entrepreneurial and cost-effective ways. The new framework must create mechanisms that catalyse much greater volumes of portfolio and direct private sector investment.
- The new climate framework must enable research, development, demonstration and deployment of the next generation clean energy technologies and contain mechanisms to protect Intellectual Property Rights, by international agreements to protect the rights of technology owners.

- It should promote an international level playing field to support the rapid research, development, demonstration and deployment of all technologies that can lower GHG emissions and help adapt to climate change. In the near term it should encourage the wide-scale deployment of best available technologies that improve energy efficiency. Energy efficiency is projected by the International Energy Agency (IEA) to be the single largest potential contributor to carbon emission reductions in all of its scenarios.
- Policy measures are needed to stimulate markets and deployment and transfer of new and close-to-market clean technologies – including:
  - Government procurement targets for clean technology, services and products and rolling performance standards that can promote the turnover of old technologies
  - Development of incentives to encourage wider uptake of clean energy technologies such as purchase power agreements, mandatory targets, removal of import duties, development of common standards and green certificates.
  - Support for international multi-industry and multi-research centre initiatives to undertake shared investigations into the new knowledge and breakthrough technologies we still need
  - Stronger public-private coordination and funding to help advance potentially transformational technologies to market, including partnerships for large-scale demonstration projects.
- Technology transfer to developing countries. There is a need for more engagement in projects and programmes that invest in clean energy technology in DCs. Key to catalysing successful clean energy technology projects, lies within the governance arrangements of the DCs themselves. In CEO Climate Policy Recommendations to G8 Leaders 16 particular, effective contractual laws need to exist and be enforced. International development agencies can play a useful role in helping developing countries to develop enabling environments for expansion of clean technology projects and programmes.
- There is an urgent need for a steep increase in investment in RTD&D and deployment initiatives for next generation clean energy and fuel technologies.
- Development of new financial products or services that can help customers (corporate, government or individuals) overcome the high initial costs they often face in making lower emission choices.
- Until an international framework has fully evolved, the MDBs have an important role to play in helping to leverage private financial markets to support clean energy investments in developing countries.
- The design of the portfolio of new strategic climate investment funds, in particular the Clean Technology Fund.

‘Make markets work for climate – Amsterdam’

In developing countries with rapidly growing economies, energy consumption will more than triple by 2030. Global energy demand will continue to rise dramatically in the 21st century. At the Amsterdam ‘Make markets work for Climate’ conference, Claude Mandil, executive director of the IEA showed that the need for energy in developing countries is projected to increase by 50% by 2030, requiring investments of about US$10 trillion over the next 3 decades. Challenge is to meet global energy demand while combating climate change at the same time. Meeting the fast growing

energy needs of EDCs on the basis of low or no CO2 emissions is an urgent and challenging undertaking. A portfolio of current and emerging low or no CO2 technologies can avert the trend and lead to a more sustainable energy future. The way investments are made will be crucial in determining whether greenhouse gas emissions will rise proportionately.

A unique conference was organised on 16 and 17 October 2006 in Amsterdam by ABN Amro, the World Bank group, Shell, World Business Council for Sustainable Development, the International Emissions Trading Association, the Centre for Clean Air Policy and the Dutch government to find smart ways for enabling these investments. Objective of the conference was to support the collaboration of governments, business and financial institutions to Make Markets Work for Climate.

International co-operation is essential to address climate change and renewable energy options have a mayor role to play. Under the UNFCCC, industrialised countries have committed to take the lead to combat climate change and to assist developing countries to mitigate and adapt. However, it is clear that climate stabilisation requires mitigation effort from all of the world's largest emitting nations; this includes not only all OECD nations, but also rapidly industrialising emerging countries such as China, Russia, India and Brazil and developing countries. Without broad participation from nations in all regions, it is simply not possible to curb global emissions sufficiently to stabilise growth of carbon dioxide concentrations as required to limit climate change.
To provide incentives for developing countries, existing mechanisms to finance their mitigation efforts, such as Clean Development Mechanism under the Kyoto Protocol and the new Adaptation Fund under the UNFCCC, will need to be improved and expanded.

The Kyoto Protocol is an important first step. But emission reductions under the Protocol are far from sufficient to stabilise our climate. Already many market-based mechanisms have been successfully implemented, such as national and sub-national CO2 emission trading schemes, EU Emissions Trading Scheme, and the Kyoto flexibility mechanisms which allows countries to buy additional emission credits by investing in emission reduction projects in other countries (e.g. Clean Development Mechanism). But these individual country and regional initiatives only cover a small share of global emissions, and so will not be sufficient alone to seriously address climate change.

In a post-Kyoto framework, countries need to expand and improve these existing initiatives, as well as to foster greater inter-linkages amongst them. There is an urgent need to broaden participation, strengthen emission targets and extend the timeline of the existing market mechanisms beyond 2012. A new Grant Design of the post-Kyoto framework (after the current commitment period to 2012) poses a great challenge. Stern Report and OECD analysis learn that the costs of mitigation will be lower if we do not postpone large-scale investments in low or no CO2 technologies such as renewable energy.

"In order to make markets work for climate there is a strong need for long-term continuity in the carbon market beyond 2012. Governments need to create stable incentives for business to invest in clean energy technologies. Business is ready to

make those investments, but they need assurances that carbon will retain its value long term. We mustn't lose momentum. Leadership is needed now, from business as well as governments."

The conference underlined that coordinated strategies are needed for international financial institutions, private banks, private investors and governments. Business and governments have to stand shoulder to shoulder in shaping the much needed actions on climate change. The participants agreed that potentially profitable opportunities exist for investment in commercial technologies in developing countries, especially aimed at energy efficiency. An enabling environment is needed in developing countries to attract funds for clean energy. Attention should be paid to less-developed countries. They have difficulty profiting from the current CDM market and are unable to compete on the technology learning curve.

The conference highlighted the major role the market can play in developing an international climate policy that is both effective, efficient and provides incentives for developing countries to participate. A priority in enabling this international action on climate change is to establish clear market signals, by putting a global price on carbon (post 2012). Although these markets are not yet global, it is large and growing. The global carbon market more than doubled in 2007 from 2006 to $64 billion (Source: World Bank).

2.11 Lessons learned for RTD4EDC

- The European Union is one of the frontrunners in developing pro-active policies in the field of energy security and climate change and in supporting the development of new clean technologies that can cut global emissions of greenhouse gases.
- Climate change cannot be controlled without efforts by EDCs, especially the emerging economies. Combating climate change includes the implementation of intelligent and efficient energy systems in the growing economies of EDCs.
- Although JREC meeting have taken place regularly the main goal of fastening progress at CSD was not reached. JREC was not dissolved after CSD-15 since no agreement has been reached and no political declaration was presented. Therefore it must be concluded that the initial aims of JREC are not reached.
- There is a strong need for making progress in the field of global renewable energy policies tangible. Global Renewable Energy Policies and Measures Database is in this respect a step forward. The Global Renewable Energy Review Arrangement as proposed could be an even more valuable instrument.
- The role of the market is crucial for successful implementation of RET in EDCs. Mobilization of private investment is important – and therefore an important the role of governments is to remove the obstacles for private investment.

3 EU policy and strategies

The scope this study is a complex mixture of different interrelated EU policy areas, such as: Energy Policy, Development Policy, Environment Policy and Research Policy. This chapter gives an overview of these different policy areas without the intention of being complete.

3.1 Introduction EU policy

The European Union envisions a thriving and sustainable future economy, with world leadership in a diverse portfolio of clean, efficient and low-carbon energy technologies as a motor for prosperity and a key contributor to growth and jobs. A European Union that has grasped the opportunities lying behind the threats of climate change and globalisation and that it is ready to contribute to the global energy challenge, including increasing access to modern energy services in the developing world (SET-Plan 2007). The scenario how the energy technology landscape could evolve:

- By 2020 technology advances will enable the 20% renewable market penetration target to be met. We will see a sharp increase in the share of lower cost renewables (including them large-scale roll-out of off-shore wind and 2nd generation biofuels) and clean coal technologies in the energy system. Energy efficiency will be taken onto a new level, with the 20% reduction potential achieved, and efficient hybrid vehicles will be widespread;
- In the 2030 time horizon electricity and heat production should be well down the road to decarbonisation, with fully competitive renewable energy technologies, including mass market large-scale offshore wind, and extensive near-zero emission fossil fuel power plants. We should also see widespread fuel diversification in the transport sector, with mass markets for 2nd generation biofuels and the penetration of hydrogen fuel cells;
- For 2050 and beyond, a paradigm shift in the way we produce, distribute and use energy should be completed, with an overall energy mix largely comprising renewables, sustainable coal and gas, sustainable hydrogen, Generation IV fission power and fusion energy.

A paradigm shift is needed; mobilization of stakeholder groups and public interventions to support energy innovation is necessary and justified to overcome the structural weaknesses of the energy innovation system change. This route is characterised by long lead times due to the scale of the investments needed and inertia caused by existing technological and regulatory energy systems ('lock-in').

3.2 EU Sustainable Development policy - Göteborg and WSSD

Sustainable Development Strategy

The European Union (EU) established a Strategy for Sustainable Development (SDS) in May 2001. In endorsing this strategy, the Göteborg European Council recognised that the external dimension needed to be further developed. It also called on the Commission to consider the Union's contribution to global sustainable development

(contributing to EUs position in at the World Summit on sustainable development, Johannesburg in 2002). The aim is to integrate sustainable development into all EU policies and to establish a system to assess the economic, social and environmental (3p: people, planet, profit) impact of all major policy proposals of the Union. A strategy towards a global partnership for sustainable development[6] was started - to ensure that globalisation contributes to sustainable development. With initially, the specific economic activities set out by the EC as follows:

- within the framework of the World Trade Organisation (WTO), to improve the integration of developing countries into the world economy;
- to help developing countries benefit from the global trading system;
- to change the generalised system of preferences (GSP) to take account of sustainable development;
- to include sustainable development in the bilateral and regional agreements;
- to reduce the non-transparent use of the international financial system and to regulate it more efficiently;
- to encourage European businesses to be socially responsible ;
- to promote cooperation between the WTO and international environmental organisations.

The European Council of June 2006 adopted an ambitious and comprehensive renewed Sustainable Development Strategy. It builds on the Gothenburg strategy of 2001 and is the result of an extensive review process that started in 2004.
The renewed EU SDS sets out a single, coherent strategy on how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development. It recognises the need to gradually change our current unsustainable consumption and production patterns and move towards a better integrated approach to policy-making. It reaffirms the need for global solidarity and recognises the importance of strengthening our work with partners outside the EU, including those rapidly developing countries, which will have a significant impact on global sustainable development.

The strategy sets overall objectives and concrete actions for seven key priority challenges for the coming period until 2010, many of which are predominantly environmental:

- Climate change and clean energy
- Sustainable transport
- Sustainable consumption & production
- Conservation and management of natural resources
- Public Health
- Social inclusion, demography and migration
- Global poverty and sustainable development challenges

[6] Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, of 21 February 2002, entitled: "Towards a global partnership for sustainable development" [COM(2002) 82 final - Not published in Official Journal].

EU Action Plan on Climate Change in the Context of Development Cooperation

In 2004 the EU further underlined its commitment to help developing countries tackle climate change by adopting the EU Action Plan on Climate Change in the Context of Development Cooperation (2004-2008, preparations for a renewed commitment post-2008 are ongoing)[7].

This plan was adopted by the EU Council in November 2004, and has five strategic objectives – summarized in the Text Box below.

Text Box - Strategic EU objectives Climate change in the context of Development Cooperation:

- *Raising the policy profile of climate change, by:*
  - *putting climate change on the agenda of high-level consultations under EU development cooperation agreements;*
  - *preparing country- or region-specific briefs on climate change;*
  - *promoting exchange programmes between the EU and partner countries to foster mutual understanding.*
- *Support for adaptation, including:*
  - *supporting partner countries in preparing vulnerability and adaptation assessments and national adaptation programmes of action (NAPAs) for least developed countries;*
  - *developing guidelines for integrating climate change into development programmes – including measures to avoid maladaptation – based on consultation with all stakeholders;*
  - *supporting capacity-building in developing country institutions to prepare for and reduce the impact of climate change-related disasters.*
- *Support for mitigation and low greenhouse gas (GHG) development paths. Measures include:*
  - *Supporting pilot projects to strengthen the links between government ministries and the research community;*
  - *supporting partner countries to carry out research on low-carbon technologies and further develop local mitigation technologies;*
  - *supporting capacity-building for developing countries' participation in the Kyoto Protocol's Clean Development Mechanism (CDM).*
- *Capacity building. Measures include:*
  - *building individual and institutional capacity in impact prediction and vulnerability assessment;*
  - *identifying ways to support improved coordination between developing countries to prepare for climate change negotiations;*
  - *establishing knowledge banks to disseminate information and provide training for action on climate change.*
- *Monitoring and evaluation of the Action Plan. Measures include:*
  - *regular discussions on implementation of the Plan and encouragement of feedback from stakeholders;*
  - *preparation of a biannual evaluation report and, based on this, modification and updating of the Plan.*

As the world's largest donor of development assistance, the EU is strongly committed to supporting developing countries in the fight against poverty, the achievement of the UN Millennium Development Goals and the promotion of sustainable development.

[7] Communication from the Commission to the Council and the European Parliament - Climate change in the context of development cooperation [COM(2003) 85 final - Official Journal C/2004/76],

These strategies need to be owned and driven by developing countries themselves. The EU is an important donor of development aid and donates 55% of the total. [8]

The EU recognises that the most effective way to promote adaptation to and mitigation of climate change is to 'mainstream' these objectives into strategies for poverty reduction and/or sustainable development. A number of earlier dedicated instruments for RTD&D for RET have been ended (such as Coopener) and have been replaced by instruments that consider the 'science and society' issues in the broader context of the EDC society. Combating climate change is integral to the EU's commitment to help developing countries meet the Millennium Development Goals (see Text Box).

Text Box - Millennium Development Goals (MDGs)

At the 2000 Millennium Summit the international community adopted the Millennium Declaration , committing itself to a global project designed to definitively reduce the many aspects of extreme poverty. There are eight Millennium Development Goals (MDG):

- *eradicating extreme poverty and hunger;*
- *achieving universal primary education;*
- *strengthening gender equality;*
- *reducing child mortality;*
- *improving maternal health;*
- *combating HIV/AIDS, malaria and other diseases;*
- *ensuring environmental sustainability;*
- *developing a global partnership for development.*

The European Union (EU) made specific commitments to achieve these goals by 2015 (See: he EU contribution towards the Millennium Development Goals 9). Progress in achieving the MDGs must speed up and the new goals cannot be achieved simply by pursuing the same policies as before. For the EU's contribution to the UN Summit in September 2005 and with a view to speeding up progress towards the MDGs, the Council asked the Commission to draw up ambitious proposals for the 2015 target date, focusing on financing for development, policy coherence for development and the focus on Africa. The Commission's proposals basically aim to:

- *set new intermediate targets for growth in official aid budgets by 2010 with a view to achieving the overall target of 0.7 % of the gross national income (GNI) by 2015;*
- *speed up reforms that will improve the quality of aid;*
- *rethink the way that the EU, through its own model of sustainable development and its internal and external policies, influences the conditions for development;*
- *ensure that Africa is the number one beneficiary of these new approaches and seize new opportunities for partnership between the two continents.*

[8] In 2006 the EU allocated EUR 9.8 billion to official development assistance (ODA). The Commission is inviting the Member States to continue to increase their official aid budgets and to go beyond their Monterrey commitment. This commitment would generate an additional EUR 20 billion by 2010, enabling the target of 0.7% of GNI set by the UN to be reached by 2015.

[9] 12 April 2005 - Speeding up progress towards the Millennium Development Goals - The European Union's contribution, Communication from the Commission to the Council, the European Parliament and the Economic and Social Committee: - [COM(2005) 132 final].

The effectiveness of European aid can be increased by better coordination and harmonisation. The European Consensus on Development [10] presents a plan for concrete action. Common principles of development cooperation activities include ownership, partnership and participation of civil society.

A priority in 2005 was Africa, with the revision of the Cotonou Agreement , the implementation of the peace facility and the drafting of an EU strategy for Africa.

Text Box – Africa and the Millenium Development Goals

Many parts of sub-Saharan Africa lag far behind the rest of the world in reaching the Millenium Development Goals. In supporting these regions, the EU will focus on areas where the EU can bring in a pivotal position to lead international action, including:

- *Support to building Africa's governance: this can be done through financial support to the African Union (AU), twinning partnerships with its institutions, and by replenishing the Peace Facility for Africa to support African peacekeeping efforts.*
- *Building interconnecting Africa's regional infra- and trade networks. The Commission proposes to set up a Europe-Africa partnership on infrastructure and stimulating trade for sub-Saharan Africa. Trade cooperation has figured prominently for many years in EU-ACP relations, primarily through preferential access for their products to the EU market. In the Cotonou Agreement, ACP states and the EU agreed to launch negotiations for six regional Economic Partnership Agreements (EPAs), four of which are in Africa.*
- *Striving towards equitable societies, access to services, decent work and environmental sustainability. Together with its African partners, the EU will further develop participatory approaches for local, national and regional planning and budgeting of resources. Development should also include environmental sustainability. The EU will implement concrete policy measures to increase the importance of criteria such as environmental sustainability.*

European Consensus on Development

The year 2006 was marked by major changes EU's development cooperation approaches. Already, Community assistance and the quality of the aid provided was improved as a result of the reform of external aid initiated by the Commission in 2000. As a next step in 2006 the '**European Development Consensus on Development'** was brought into practice in all Community development programmes in all the developing countries. The European Consensus on Development was endorsed December 2005. In this document[11] the European Union reaffirms that the objective of its development policy is to reduce poverty worldwide in the context of sustainable development.

- Policy coherence for development is a central theme, in combination with the adoption of regional strategies. The Consensus stressed the need for stronger environmental mainstreaming across EC development efforts and for helping developing countries integrate environment into their development strategies.

[10] The European Consensus [Official Journal C 46, 24.2.2006], http://europa.eu/scadplus/leg/en/lvb/r12544.htm

[11] The European Consensus [Official Journal C 46/01 of 24 February 2006] - Joint declaration by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission on the development policy of the European Union, entitled. Chief objective is to reduce poverty worldwide in the context of sustainable development. The EU is seeking to meet the Millennium Development Goals (MDG), to which all the UN member states subscribe, by 2015, including to eliminate extreme poverty and hunger, to ensure environmental sustainability; and to set up a global partnership for development. To fight poverty implies achieving human development, the protection of natural resources and economic growth and wealth creation.

- The role of Community aid in promoting coherence between development policy and other EU policies, including the environment, is highlighted.
- This in combination with simplification of the EU external aid instruments and the setting up of a framework for increasing the effectiveness and for better evaluation of development cooperation. Programming documents - such country, regional and thematic strategy papers – must be consistent. For RTD4EDC it is important to note that energy is not treated as a subject in isolation. To meet the needs stated by partner countries, the Community concentrates its energy activities in combination with issues in other fields:
  - Trade, regional integration, rural development, agriculture, and food security;
  - Water systems, environment and the sustainable management of natural resources; infrastructures;
  - Governance, democracy, human rights and support for economic and institutional reforms; including prevention of conflicts and of state fragility;
  - Human development; and social cohesion and employment.

Text Box – The European Consensus on Development in more detail:

- *It defines a common framework of principles for development cooperation activities, including ownership and partnership, in-depth political dialogue, participation of civil society, gender equality and an ongoing commitment to preventing state fragility. Developing countries bear the primary responsibility for their own development, but the EU accepts its share of responsibility and accountability for the joint efforts undertaken in partnership.*
- *The type of aid provided will be tailored to the needs and context of each individual country. The Community's approach will be based on results and performance indicators. Most Community aid will continue to be provided as non-repayable grants, which are particularly suitable for the poorest countries and for those with a limited ability to repay.*
- *Local ownership, donor coordination and harmonisation, starting at the field level, alignment on recipient-country systems, and results orientation are core principles. Predictable aid mechanisms are important to enable partner countries to plan efficiently.*
- *The EU will promote better coordination and complementarity between donors by working towards joint multi annual programming based on partner-country strategies and processes, common implementation mechanisms and the use of co-financing arrangements. It will also foster consistency in development policy in a wide variety of areas.*

3.3 EU energy policy – Green Paper and SET Plan

Green Paper

Energy Security and Climate Change are two sides of the same coin. The need for a EU energy policy, including an external dimension, was highlighted in the Commission's Green Paper "A European Strategy for Sustainable, Competitive and Secure Energy'' of 8th March 2006. This Green Paper set out the three main EU objectives – sustainability, competitiveness and security of energy supply –and was confirmed in the Presidency conclusions of the European Council of 23-24 March 2006.

The EU Green Paper 'A European Strategy for Sustainable, Competitive and Secure Energy' focused on six priority areas:

1. Energy for growth and jobs in Europe: completing the internal European electricity and gas markets

2. An Internal Energy Market that guarantees security of supply
3. Tackling security and competitiveness of energy supply: towards a more sustainable, efficient and diverse energy mix
4. An integrated approach to tackling climate change
5. Encouraging innovation: a strategic European energy technology plan
6. Towards a coherent external energy policy

Key conclusions of the EU Green Paper, relevant for this study, include:

- The Community needs a real Community-wide debate on the different energy sources, including costs and contributions to climate change, to enable us to be sure that, overall, the EUs energy mix pursues the objectives of security of supply, competitiveness and sustainable development.
- Europe needs to deal with the challenges of climate change in a manner compatible with its Lisbon objectives. The Commission could propose the following measures to the Council and Parliament:
  - A clear goal to prioritise energy efficiency, with a goal of saving 20% of the energy that the EU would otherwise use by 2020 and agreeing a series of concrete measures.
  - Adopt a long-term road-map for renewable energy sources.
  - A strategic energy technology plan (SET-Plan) making best use of Europe's resources, building on European technology platforms and with the option of joint technology initiatives or joint undertakings to develop leading markets for energy innovation.
  - A common external energy policy. In order to react to the challenges of high and volatile energy prices, increasing import dependency, strongly growing global energy demand and global warming, the EU needs to have a clearly defined external energy policy and to pursue it, at the same time at both national and Community level, with a single voice. To this end the Commission proposes:
    - Identifying European priorities for the construction of new infrastructure necessary for the security of EU energy supplies.
    - Developing a pan-European Energy Community Treaty.
    - A new energy partnership with Russia.
    - A new Community mechanism to enable rapid and co-ordinated reaction to emergency external energy supply situations impacting EU supplies.
    - Deepening energy relations with major producers and consumers.
    - An international agreement on energy efficiency.

Given the severity of the threats for the European Union, the Commission in its Communication "*An Energy Policy for Europe*" proposes a strategic energy policy objective: by 2020, the EU will reduce its greenhouse gas emissions by at least 20% compared to 1990 levels in a manner compatible with its competitiveness objectives. In addition, according to the Commission Communication "*Limiting Climate Change to 2°C - Policy Options for the EU and the World for 2020 and Beyond*"[4], by 2050 global greenhouse gas emissions must be reduced by 50% compared to 1990 levels, implying reductions in industrialised countries of 60 to 80%.

It is needed to balance the goals of sustainable energy use, competitiveness and security of supply. To put them in an overall framework, the first Strategic EU Energy Review was published January 2007 (see below).

Development of a common approach and action plan to external energy policy

For the EU Council of June 2006, the Commission published "An external policy to serve Europe's energy interests". This Council encouraged the mainstreaming of energy into other Community policies and invited the Commission to reinforce the balance between internal and external aspects.

External Energy Relations – from principles to action (2006)
On 12 October 2006, the Commission adopted a Communication "External Energy Relations – from principles to action" for the Informal European Council in Lahti, Finland, on 20th October 2006. This recommended that the Member States and the Commission coordinate effectively in order that the EU speaks with one voice in external energy policy. It also highlighted the importance of developing closer contractual relations with the Union's neighbours and major energy suppliers, expending the EU's internal market for energy to neighbouring countries and signing up to specific agreements on Energy such as memoranda of understanding. It finally proposed the establishment of a Network of Energy Correspondents which would act as an early warning mechanism.

EU Strategic Energy Review 'Driving Investment in Clean and Secure Energy' (2007)
The EU Strategic Energy Review 'Driving Investment in Clean and Secure Energy' was published January 2007. The Review combines energy security and climate goals in Europe's policies. Markets can only make the right decisions to deliver them if governments give the right incentives and efficient frameworks. Europe should use its research and development funds strategically as part of broad market innovation incentives to drive energy and climate security goals worldwide. Six Steps are presented to an Integrated Energy and Climate Security Policy – a really integrated approach:

1. Pan-European coordination of regulation to ensure low carbon incentives are at the heart of liberalisation and unbundling, including incentives for investment in distributed energy infrastructure and grids; for saving energy not just sell more; for new entrants and innovation in all areas; for priority pan-European network projects for delivering energy and climate security (especially high volume renewables such as offshore wind, geothermal and large scale solar thermal)
2. A set of mandatory targets in the field of energy efficiency, car efficiency, renewables and zero emission power plants. Energy and climate policy must drive investment into zero and low carbon technologies; the timescale for this needs to be 2020, not 2030. A regulatory timetable is needed to provide investment certainty, setting out when policy instruments will be introduced to support the political objectives agreed at the March 2007 European Council:
    a. Stronger efficiency target: the Energy Efficiency Action Plan, if implemented with ambition, could set the global standard for new appliances, cars and buildings. The 20% target should be increased to 30% by 2020 to set a stretch target for innovation.

   b. Mandatory doubling of car efficiency
   c. Renewables targets for primary energy of at least 25%, including biofuels and renewable heat.
   d. Zero emission power plants
3. An energy security goal to reduce substantially the overall risks to the European economy resulting from price instability and potential supply disruption in imported hydrocarbons – including both demand and supply:
   a. providing clear metrics of how energy efficiency, renewables and CCS are providing tangible benefits;
   b. driving a more systematic and powerful approach to energy diplomacy and cooperation with suppliers in Central Asia, Middle East, North Africa and Sub-Saharan Africa – including instruments such as the Extractive Industries Transparency Initiative (EITI), and measuring risks of dependency on undemocratic regimes.
4. A common external energy and climate security policy to drive global cooperation. The world will not successfully cooperate to address climate change, if at the same time it continues to compete over dwindling fossil fuel resources. All major consumers have an interest in a predictable, rules-based approach to achieving energy and climate security together, but only a co-ordinated Europe has the weight to drive this process forward through cooperation with China, India, Japan and the USA:
      a. The EU should explicitly focus on developing mutual agreement between major energy consumers for a stronger legal underpinning for rules-based, transparent international markets for energy;
      b. EU bilateral relationships with major consumers should include stronger measures to increase energy efficiency, and drive forwards the development and deployment of new, efficient and low carbon energy technologies. This would include joint investment programmes and market coordination, not just upstream R&D spending; for example, subsidy removal from high carbon activities, standards harmonisation and tariff reduction. Bilateral agreements can drive effective and immediate action.
      c. EU R&D spending should be fully integrated into international cooperation on low carbon technologies.
      d. Exploration of new regional dialogues; for example, an EU-North Africa dialogue focusing on large scale, low carbon energy development in the region; such as solar thermal.
5. An ambitious 2020 Greenhouse Gas Emissions Reduction Target for Europe of at least 30% below 1990 levels.
6. Funding climate and energy security through the EU budget.

These six steps would generate the basis for Europe to effectively engage third parties in generating the political will to cooperate on the broad goals of achieving energy and climate security, and on specific areas of collaboration to shift global investment flows and technology development towards a low carbon economy.

SET-Plan

On 10th of January 2007 the EC presented 'Towards a European Strategic Energy Technology Plan'. The European SET-Plan (**Strategic Energy Technology Plan**) addresses the need for a dedicated approach to accelerate the development and deployment of cost-effective low carbon technologies. The first final version of SET-Plan was published 22 November 2007, 'A European Strategic Energy Technology plan (SET-PLAN) - Towards a low carbon future'.

SET-Plan's aim is to provide a dedicated European policy to accelerate the development and deployment of cost-effective low carbon technologies. SET-Plan has the objective of accelerating innovation in cutting edge European low carbon technologies. In doing so, it will facilitate the achievement of the 2020 targets and the 2050 vision of the Energy Policy for Europe.

The SET-Plan proposes to deliver the following results:
(i) a new joint strategic planning,
(ii) a more effective implementation,
(iii) an increase in resources, and
(iv) a new and reinforced approach to international cooperation.

SET-Plan envisions a vital role of energy technology: *'innovation in energy technology shapes society'*.

The SET-Plan calls for reinforcement of international cooperation and for implementing a coherent and differentiated open innovation strategy in relation to developed, developing and emerging economies. The SET-Plan promotes the development, marketing, deployment and accessibility of low carbon technologies worldwide. SET-Plan interest in EDCs lies most in offering help to EDCs to grow in a more sustainable manner, while building new market opportunities for EU industry and ensuring effective collaboration in accessing and developing resources. Options for further engaging and cooperating with such countries include:

- Networking energy technology centres; Cooperation with developed countries will involve public interest research and long-term exploratory research.
- Setting up large-scale demonstration projects on technologies with the highest potential in the local context;
- Increasing the use of innovative financing mechanisms, such as the Global Energy Efficiency and Renewable Energy Fund;
- Reinforcing the use of the Kyoto Protocol mechanisms, notably the Clean Development Mechanism for investments in emissions reduction projects, if the post-2012 international agreement on further CO2 reductions is reached.

The measures proposed in the SET-Plan (e.g. the Steering Group, European Industrial Initiatives and the European Energy Research Alliance) should bring about a reinforced international cooperation strategy. The EU should speak with 'one voice'.

Text Box – SET Plan: achieving the political vision

The vision is of a Europe with a thriving and sustainable economy, with world leadership in a diverse portfolio of clean, efficient and low-carbon energy technologies as a motor for prosperity and a key contributor to growth and jobs. A Europe that has grasped the opportunities lying behind climate change and globalisation and that is contributing to addressing the global energy challenge, including increasing access to modern energy services in the developing world.

Energy innovation faces entrenched 'locked-in' effects, such as network connection challenges, infrastructure investments, dominant market leaders, the regulatory frameworks. Moreover, the market take-up of new energy technologies is additionally hampered by the commodity nature of energy. The essence of the (SET-Plan) will be to match the most appropriate set of policy instruments to the needs of different technologies at different stages of the development and deployment cycle. The SET-Plan must embrace all aspects of technological innovation, as well as the policy framework required to encourage business and the financial community to deliver and support the efficient and low carbon technologies that will shape our common future.

To turn towards security and sustainability, Europe's energy system must rapidly progress on four main fronts:

- The efficient conversion and use of energy in all sectors of the economy, coupled with decreasing energy intensity;
- The diversification of the energy mix in favour of renewables and low-carbon conversion technologies for electricity, heating and cooling;
- The decarbonisation of the transport system through switching to alternative fuels;
- Full liberalisation and interconnection of energy systems, incorporating 'smart' information and communication technologies to provide a resilient and interactive (customers/operators) service network.

SET-Plan summarizes key EU technology challenges for the next 10 years to meet the 2020 targets (Achieving the 2050 vision):

- Make second generation biofuels competitive alternatives to fossil fuels, while respecting the sustainability of their production;
- Enable commercial use of technologies for CO2 capture, transport and storage through demonstration at industrial scale, including whole system efficiency and advanced research;
- Double the power generation capacity of the largest wind turbines, with off-shore wind as the lead application;
- Demonstrate commercial readiness of large-scale Photovoltaic (PV) and Concentrated Solar Power;
- Enable a single, smart European electricity grid able to accommodate the massive integration of renewable and decentralised energy sources;
- Bring to mass market more efficient energy conversion and end-use devices and systems, in buildings, transport and industry, such as poly-generation and fuel cells;
- Maintain competitiveness in fission technologies, together with long-term waste management solutions;

The essence of the European Strategic Energy Technology Plan (SET-Plan) will be to match the most appropriate set of policy instruments to the needs of different technologies at different stages of the development and deployment cycle. The SET-Plan must therefore embrace all aspects of technological innovation, as well as the policy framework required to encourage business and the financial community to

deliver and support the efficient and low carbon technologies that will shape our common future.

Actions/Content

A new generation of 'breakthrough' technologies needs to be developed. In addition system or paradigm changes are needed – including organisational and infrastructure redesign. Key EU technology challenges for first decade of SET-Plan, include:

- To bring 'next generation' RE technologies to market competitiveness;
- To achieve a cost-breakthroughs in energy storage technologies;
- To develop technologies and system conditions for commercialisation of (hydrogen) fuel cell vehicles;
- To elaborate alternative visions and transition strategies towards the development of the Trans-European energy networks and other systems necessary to support the low carbon economy of the future;
- Achieve breakthroughs in enabling research for energy efficiency: e.g. materials, nanoscience, information and communication technologies, bio-science and computation.

Based on the results of the consultation process, the Commission proposes to launch the following new priority initiatives, starting in 2008:

- European Wind Initiative: focus on large turbines and large systems validation and demonstration (relevant to on and off-shore applications).
- Solar Europe Initiative: focus on large-scale demonstration for photovoltaics and concentrated solar power.
- Bio-energy Europe Initiative: focus on 'next generation' biofuels within the context of an overall bio-energy use strategy.
- European CO2 capture, transport and storage initiative: focus on the whole system requirements, including efficiency, safety and public acceptance, to prove the viability of zero emission fossil fuel power plants at industrial scale.
- European electricity grid initiative: focus on the development of the smart electricity system, including storage, and on the creation of a European Centre to implement a research programme for the European transmission network.
- Sustainable nuclear fission initiative: focus on the development of Generation-IV technologies.

In general the conclusion can be drawn that these initiatives are focused primarily on Europe. The international dimensions and links to development are hard to find.

Structure

In recent years, the European technology platforms (ETPs) established in the energy field, have developed common visions, roadmaps and strategies. ETPs have played an important role in establishing the SET-Plan as they gave access to multi-stakeholder groups. The ETPs have provided critical mass to some degree and contributed to the implementation of European and national programmes.

Involved Actors

A new way of working at Community level requires an inclusive, dynamic and flexible means of guiding this process, defining priorities and proposing actions – a collective

approach to strategic planning. Decision-makers in the Member States, industry, and the research and financial communities have to start to communicate and take decisions in a more structured and mission-oriented way, conceiving and implementing actions together with the EC within a cooperative framework. We need a new governance structure. All stakeholder groups should participate:

- Industry - the private sector is at the forefront of these efforts. The new low-carbon industrial revolution represents new business opportunities. Suggested strategies include: building of strategic alliances (e.g. cross-sectoral), responding pro-active on the elaboration of global regulations and standards.
- Policy – regionally, nationally, EU and internationally - as a long term and stable policy framework is essential.
    - Member States have to deliver their contributions to the 20% targets agreed for 2020, and to put their energy systems on a pathway toward decarbonisation by 2050. Tax incentives and Community instruments implemented at national level, such as EPBD and Structural Funds are needed.
    - The EU Research Framework Programmes and Competitiveness and Innovation Framework Programme (CIP) should be better used to catalyse the actions of Member States and the private sector, taking them to new dimension by evolving towards a paradigm of steering and co-financing joint programmes rather than projects.
    - In open innovation models, Europe needs to bring international cooperation and partnership on energy technology to a higher level. An open global leadership model is needed. We can learn from ETS (Emissions Trading Scheme) catalyzing the build-up of a global cap and trade system for carbon.

In an initial phase, up to May 2007, the Commission has consulted with established advisory and stakeholder groups, such as the High Level Group on Competitiveness, Energy and Environment, the FP7 Advisory Groups, relevant European Technology Platforms and Member State groups. A series of expert workshops have been convened and reports of these events have been published.

EERA

European Energy Research Alliance (EERA) is founded on October 2008 by initiative of the leading research institutes in the European Union (EU). The Alliance is going to expand and optimise EU energy research capabilities through the sharing of world-class national facilities and the joint realisation of national and European programmes. This new Research Alliance will be a key actor of the EU Strategic Energy Technology Plan (SET Plan) and will contribute to accelerate the development of new low carbon technologies for EU to move toward a low carbon economy.

Geographical Scope

SET-Plan asks to reinforce international cooperation – to implement a coherent and differentiated strategy in relation to developed, developing and emerging economies. Still, the major part or SET-Plan is rather internally oriented to the European energy markets.

Network of energy correspondents

On 14-15 December 2006, the European Council approved the establishment of the Network of Energy Correspondents as an important tool for collecting, processing and distributing reliable information relevant to the security of energy supplies. The Network's first meeting took place on 10th May 2007 in Brussels.

The Network of Energy Correspondents should assist the EU's early response and reactions in case of energy security threats and prepare the ground for actions and decisions in case of an energy security crisis.

3.4 EU Emission Trading Scheme (CDM and JI)

In January 2005 the European Union Greenhouse Gas Emission Trading Scheme (EU ETS) commenced operation as the largest multi-country, multi-sector Greenhouse Gas emission trading scheme world-wide.

The scheme is based on Directive 2003/87/EC, which entered into force on 25 October 2003.

- Allowances traded in the EU ETS will not be printed but held in accounts in electronic registries set up by Member States. All of these registries will be overseen by a Central Administrator at EU level.
- DG Environment also provides its interpretation on the use of next phase allowances under Article 16(4), second sentence, of the Emissions Trading Directive.
- The European Environment Agency has published a technical report on the application of the Emissions Trading Directive by Member States. The report is based on information in Member States' annual reports under Article 21 of the Directive and covers the period from 1 January – 30 April 2005.

In summary, innovative RE and environmental technologies can stimulate competitiveness and decouple economic growth from environmental degradation at the same time, by switching to increased eco-efficiency in the use of natural resources. EU ETS (the EU Emissions Trading Scheme) is driving the global carbon market. EU has given strong support for the Kyoto Protocol's three flexible mechanisms:

- ETS international emissions trading,
- Clean Development Mechanism (CDM)
- and Joint Implementation (JI)

Emission-saving projects in developing countries are carried out under the CDM while those in industrialised countries are covered by JI. When projects in EDCs yield emission reduction credits – that can be bought by governments or companies in EU countries to help meet their emission targets.

Additional investment in CDM and JI projects is being spurred by the EU Emissions Trading System (EU ETS), which caps overall CO2 emissions from some 10,500 large emitters in energy-intensive industrial sectors and power generation in the EU. The system, launched in January 2005, is the cornerstone of the EU's strategy for meeting

its Kyoto targets cost-effectively. It has rapidly become the driving force behind the expansion of the global carbon market[12].

ETS and CDM are helping developing countries to move towards sustainability through the promotion of projects that that reduce greenhouse gas emissions. CDM projects contribute to transfer of clean technology to EDCs.

Text Box - CDM awareness build-up

The EU is helping to build developing countries' awareness and knowledge of the CDM as well as their capacities to identify and propose potential CDM projects. Under the ***SYNERGY*** *programme, for example, 13 capacity building projects have been carried out jointly between organisations in the EU and China, India, Latin America, Africa, the Caribbean and the Gulf. A new €4 million programme for enhancing CDM projects in African, Caribbean and Pacific (ACP) developing countries is in preparation.*

Promoting the CDM is also a specific objective of the ***EU China Climate Change Partnership*** *established in 2005. The* ***EU China CDM Facilitation Project*** *set up under the Partnership is the largest European funded project to support CDM. Launched in June 2007 and running until 2010, the €2.8 million project is providing direct support to the development of the CDM in China through research, capacity building, awareness raising, technical cooperation and training.*

More information about CDM can be found in Annex E.

3.5 EU research policy - European Research Area

'Energy' has been one of the key subjects for research at European level from its early start (energy research at European level has a tradition since the 1960s). Initially the research was coordinated under the European Coal and Steel Community and Euratom treaties, later replaced by the successive research Framework Programmes (FP). This European research complemented the energy research that was executed in national research programmes.

Today, Europe has strong technological leading positions in many RET-domains such as solar technologies (PV, CSP, passive solar), wind energy, geothermal, biofuels and Small Hydro technologies. Europe has a good scientific knowledge base in RET, building of capacity to apply new knowledge and promote innovation, and the involvement of scientists and institutions from partner countries, in particular developing countries. Successive EU Research Framework Programmes have helped to provide this foundation, especially through the International Science and Technology Cooperation Programme (INCO)[13].

[12] ETS enables companies exceeding individual CO2 emissions targets to buy allowances elsewhere and help reach the EU targets under the Kyoto Protocol in a cost effective way. Allowances are often bought from projects in emerging or developing regions, thus stimulating the use of renewables in these countries. EU Member States plan to buy over €3 billion of credits from CDM projects by the ETS until 2012.

[13] INCO - International Cooperation is one of the FP-activities under the heading "Specific activities covering a wider field of research", specifically aimed at cooperation with certain groups of third countries. (http://cordis.europa.eu/fp7/capacities/international-cooperation_en.html) - For more

The Seventh EU Framework Programmes and the second Intelligent Energy-Europe Programme (IEE-II) under CIP (Competitiveness and Innovation Programme) have increased average annual budgets for energy research (€ 886 million, as compared to the € 574 million of the previous programme).

Science and Technology Cooperation

Text Box - International S&T collaboration in the public sector

Europe is a strong centre of gravity for international cooperation in academically oriented activities. Much of the public cooperation, simply happens because scientists and engineers participate in scientific networks (publishing, conferences, etc) and share their experiences and knowledge with their colleague-scientists. A large proportion of international scientific collaboration, formal and informal, still takes place within the OECD area – for RET new models for multilateral cooperation which shows a growing participation by non-OECD countries as partners include programmes such IEA "Implementing Agreement" R&D programmes and more market oriented Eureka projects.
In order to understand the trends in global cooperation in science and technology it is useful to follow Georghiou (1998) and define four types of international cooperative activities:

- *Informal or involuntary cooperation (e.g. collaborative papers);*
- *Big science cooperation between nations and in one particular technological area (e.g. European Space Agency (ESA), European Organisation for Nuclear Research (CERN));*
- *Formal cooperative agreements (e.g. bilateral scientific agreements);*
- *Multinational collaborative programmes (e.g. Human Frontier Science Program, Intelligent Manufacturing Systems project).*

We live in a time of rapid globalisation and the innovation systems change rapidly as result of this. The RET innovation model of Europe is increasingly opening towards the world. Both for contributing to abating climate change – but also for reasons of remaining economic competitive, responding to global demographic, human resource and educational challenges, and for fighting poverty, creating stability and promoting political cooperation, dialogue and trust.

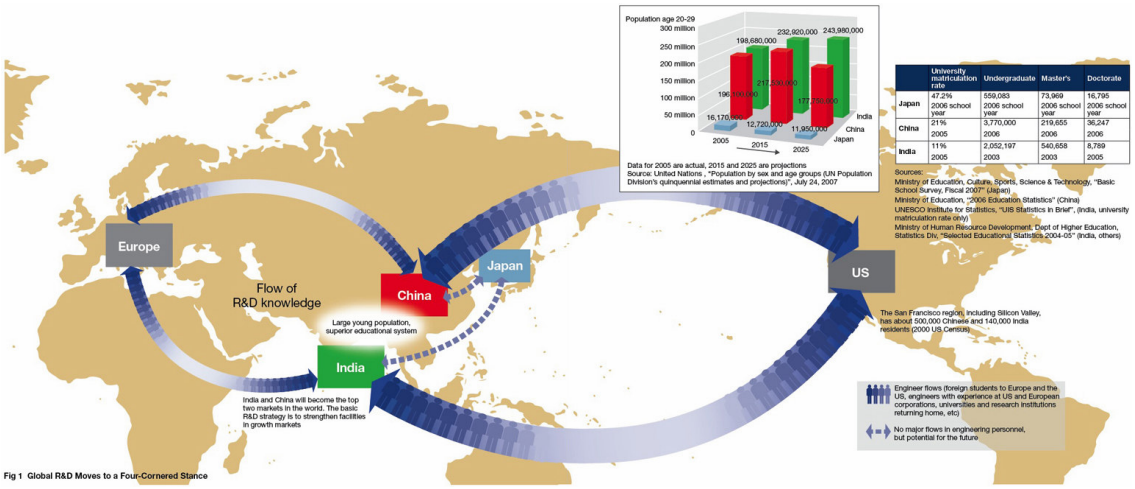

Figure 4: Global R&D Moves to a Four-Cornered Stance (Source: Prof Kazuhiro Asakawa, Keio University of Japan, Published in Nikkei Electronics Asia - April 2008)

information on international cooperation (INCO) activities please see the EUROPA INCO service or the CORDIS INCO Portal.

S&T cooperation is a more competitive than in the past – as all regions are seeking technological excellence in their scientific working relationships in the field of RET. There is a global competition for technological leadership in RET (strategic energy markets for the future) and emerging blocks such as Brazil, Russia, India and China (BRIC) show increasing interest and are moving toward top S&T positions themselves. Therefore, the R&T offer of the EU to cooperate with EDCs should be attractive and 'win-win'.

China and India may become centers for technological development surpassing Japan, creating a four-pole development stance together with current leaders, Europe and the US. It seems possible that a four-cornered global R&D stance - the US, Europe, China and India - might define the flow of intellectual capital in the future. Engineers on the cutting edge in these four key locales will swap the latest information and pioneer technological innovation.

In order to progress, ERA has to successfully interact with other parts of the world. The exchange and dynamics goes by two-way mechanisms. Knowledge generated in Europe is exploited and disseminated worldwide and will benefit from developments occurring elsewhere.

Text Box – ERA: Need for rapidly developing S&T RET cooperation agenda with EDCs

It is a relative new trend that European companies build new (large) S&T sites in emerging economies such as India and China. This challenge of emerging economies as favourable research and development locations has important implications – but risks and opportunities.

- *It can improve market access in emerging economies and can profit from the larger availability of scientific manpower (UNCTAD, 2005 and OECD 2006).*
- *Joint RTD&D activities in RET have the advantage to expand EU research networks and build new capacity in EDCs.*
- *On the other hand these new locations may in future offer new and tough innovation competition to EU locations. The economic growth of China and India is backed by a young population that educates and trains impressive numbers of scientists and engineers (– whereas Europe has an aging population and the number of S&T scientists is decreasing in many European countries).Recently, Indonesia published her new plans to strongly push renewable energy. Stung by high oil prices, Indonesia plans to tap more into renewable energies.*

Still it is important to realize that the earlier experiences from EDC-EU collaborations (such as China) learn that the build-up and dissemination of new RET technology has to overwin many hurdles. Often, to transfer a technology successfully requires more than transferring knowledge alone. In these cases, a multi-facetted strategy of technology diffusion is recommended, ensuring investments and technology transfer to local producers and service providers, in combination with training of engineers and users. Demonstration can catalyze that a new technology finds a smart way into the EDC market - attuned to the local culture and context of the emerging economy.

Interesting opportunities for expanding ERA exist in many EDCs. As example, Indonesia recently announced to implement an accelerated energy diversification, based on a larger share of alternative energy, including micro-hydro, geothermal and biofuel. In addition an Energy Saving Tax Force will stimulate to save energy in offices and households. President Yudhoyono of Indonesia announced to build new power plants to gradually end the power supply crisis in Java and Bali.[14]

[14] Ref: Agence France-Presse (AFP), 15 August 2008 – www.afp.com.

The EU gives priority to strengthening of the international dimension in European Technology Platforms and in Joint Technology Initiatives. The demographic trends in Europe coupled with an ambitious strategy of growth based on the Lisbon agenda provide a new context for considering international cooperation in S&T. No fortress Europe, but an open Europe - building open 'win-win' S&T relations with EDCs.

Many ERA subjects require an overall EU strategy inclusive to the relationship with EDCs – e.g. attracting and developing high quality researchers, improving infrastructures, sharing knowledge and setting S&T priorities.

ERA Expert Groups (EG) were set up for each of the six ERA dimensions identified in the ERA Green Paper. Seven ERA expert Groups have been installed, including EG 6: 'Opening to the world: international cooperation in S&T', whose work is of special importance for our RTD4EDC project. Also the other EGs[15] have executed relevant work.

Text Box - The Investigation Tasks of EG6

EG6[16] has carried out an in-depth investigation how ERA should open up towards the world by answering six crucial questions:

1. *How can the EC and Member States work together to:*
   a. *define priorities for international S&T cooperation in close coordination with the other dimensions of external relations;*
   b. *ensure the coordinated and efficient use of instruments and resources;*
   c. *speak with one voice in multilateral initiatives?*
2. *How can the EC and Member States work together to explore the potential of initiatives for international research programmes on issues of a global dimension, involving the Community, member states and third countries?*
3. *How should S&T cooperation with various groups of partner countries be modulated to focus on specific objectives? Should complementary regional approaches be explored?*
4. *How can neighbouring countries best be integrated into the European Research Area (ERA) as part of the European Neighbourhood Policy (ENP)?*
5. *How can the EU's bilateral S&T agreements be made more effective? Are there alternative or complementary instruments that can be used, such as joint calls for projects, involving where possible the member states?*
6. *How can common European agendas for S&T cooperation be promoted in multilateral organisations and agreements as well as with regional organisations?*

Research Programmes

Energy innovation is not just a matter of the execution of research projects. An adequate combination of 'push' and 'pull' forces is needed to accelerate the innovation processes. Therefore, for the development, networking and the take-up of energy technologies many instruments exist, including:

- Technology development instruments include the EU Research Framework Programme and associated initiatives (e.g. European Research Area Networks

[15] EG 1: Realising a single labour market for researchers; EG 2: Developing world-class research infrastructures; EG 3: Strengthening research institutions; EG 4: Sharing knowledge; EG 5: Optimising research programmes and priorities; EG 7: Rationales for ERA

[16] Opening to the world: International cooperation in S&T, Report of the ERA Expert Group 2008, DG Research, EUR 23325 EN, Directorate D – International Cooperation Unit D2 – Analysis and monitoring of research policies around the world, EC Office for Official Publications, 2008, ISBN 978-92-79-08968-8 - DOI 10.2777/15346

scheme), Risk sharing instruments (such as the Risk Sharing Finance Facility of the European Investment Bank), Joint Technology Initiatives.

- RTD&D cooperation and networks are further supported by mechanisms such as Eureka, Cost, EIA's Implementation Agreements (IAs) research programmes and the proposed new European Institute of Technology (EIT). From these instruments, Eureka is an instrument that is positioned relative nearest to the market (see Text Box example).
- Investments are supported by European Investment Bank, Structural Funds for innovation.

Text Box: European Institute of Technology

EIT will have its headquarters in Budapest. EIT is expected to play an important future role in enhancing the relations and synergies between innovation, research and education. The creation of an energy-related Knowledge and Innovation Community (KIC) may be envisaged by its autonomous Governing Board. The Community Competitiveness and Innovation Programme (in particular the Intelligent Energy-Europe programme) seeks to remove non-technological barriers that prevent market take-up. The newly installed European Institute of Innovation and Technology (EIT) will integrate fully the three sides of the "Knowledge Triangle" (Higher Education, Research, Business-Innovation) and will seek to stand out as a world-class innovation-orientated reference model, inspiring and driving change in existing education and research institutions.

- *The EIT has the ambition to become a 'flaghip for excellence in European innovation in order to face the challenges of globalisation' and 'boosting the EU's capacity to transform education and research results into tangible commercial innovation opportunities and bridging the innovation gap between the EU and its major international competitors.*
- *KICs will be selected by the Governing Board through contractual agreements based on competitive, transparent and excellence-driven innovation criteria for periods of seven to fifteen years in order to ensure mid- to long-term sustainability of the chosen partnerships. In its initial design KICs shall aim to be open to new members from Europe and beyond whenever these members add value to the partnerships. KICs can be open to approved partners from EDCs.*

(source: SET-Plan, http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0847en01.pdf)

Framework Programmes

The EU Research Framework Programmes can be seen as the cornerstones of technology development at a European scale. The Seventh Framework Programmes support RTD, socio-economic and policy research on system change towards 'low carbon' economies.

Developing countries participate in a number of EU climate research projects. A major increase in climate research funding is proposed for 2007-13. RET cooperation can unfold around different themes and countries and regions will lend themselves to cooperation in different ways. Many projects carried out under the EU RTD programmes concern global or regional climate change questions of relevance to developing countries. These Europe-led, EU research projects in general have strong international dimension that can benefit developing countries, e.g. contribute to the work of the Intergovernmental Panel on Climate Change (IPCC) on assessing climate change. The EU RTD programmes are open to cooperation with research institutions in third countries. However the actual participation by EDCs in these programmes is at a

very low level. According to a communication of the Commission[17] over recent years only about 125 researchers from African, Caribbean and Pacific (ACP) developing nations participated directly in a range of EU projects, and only part of them working on climate change-relevant issues such as food security, health and ecosystem management.

FP7 with respect to third countries aims at:

- Supporting European competitiveness through strategic partnerships with non-EU countries.
- Facilitating European universities, research institutions and firms to establish contacts with their partners in such third countries, thereby facilitating access to research environments outside Europe and promoting synergies on a global scale.

Renewable Energy is one of the main areas of interest for FP7. Relevant instruments used are:

1. **European Technology Platforms** (ETPs) have been set up in a number of scientific areas where Europe's competitiveness, economic growth and welfare depend on important research and technological progress in the medium to long term. They bring together stakeholders, under industrial leadership, to define and implement a Strategic Research Agenda (SRA) on strategically S&T that are crucial for Europe's future growth, competitiveness and sustainable objectives. In recent years, a number of European technology platforms (ETPs) have been established in the RET field: European Photovoltaics Technology Platform, Zero Emission Fossil Fuel Power Plants, and more recently (2007): Wind power, Biofuels and SmartGrids. These ETPs have developed common visions, roadmaps and strategies. The ETPs have give their input for setting up European Strategic Research Agendas and recommendations for implementation Europe S&T leadership models.
2. **INCO-NETs funding scheme** brings together stakeholders and policy makers on a bi-regional and bilateral basis and contribute to the identification of opportunities and constraints with regard to the evolvement of RE in particular geographical areas, identified as regions with a high market potential for RE. Bi-regional cooperation is strengthened by the establishment of "information points".
3. **Call for proposal system of FP7;** In general all calls within the are open to any legal entity including these for third countries. However specific international cooperation actions are a new feature of FP7 that apply particularly to the International Cooperation Partner countries. These actions are carried out through the call for proposal system of which specific SIC calls are part of. The number of SIC calls is not yet defined.

More information about FP7 can be found in Chapter 6.

[17] EU action against climate change - Working with developing countries to tackle climate change, ISBN 978-92-79-06576-7, European Communities, 2007

Intelligent Energy Europe

CIP (Competitiveness and Innovation Programme) is a relative new instrument that addresses non-technological barriers and provides support to accelerated investments and market uptake of innovative technologies.
The IEE-II (second Intelligent Energy-Europe programme) is very important to stimulate the markets for new energy technologies in Europe. As COOPENER no longer is included in IEE-II, focus of CIP with respect to energy is mainly on the EU markets. This situation needs improvement. In a world of new global competition, global markets and global challenges (such as climate change) – CIP is are advised to scale up the energy research (projects and networks) more to global scale, in co-operation with technology partners, suppliers, clients and/or regional partners.

IEE - COOPENER

One of the first vehicles for implementing the EUEI on the ground is the COOPENER programme, part of the prior version of Intelligent Energy Europe (IEE) programme, which is helping to strengthen developing countries' local capacities to use sustainable energy for alleviating poverty. Co-funding has been agreed so far for some 40 projects in Asia, sub-Saharan Africa and Latin America. The Asian projects include REEPRO, to promote efficient provision of sustainable energy services in Bangladesh and Indonesia, and RESIREA, which is examining the feasibility of rural electrification based on renewable energies in Vietnam, Laos and Cambodia.

More information about IEE and COOPENER can be found in Chapter 4.

3.6 Bilateral cooperation

With some strategic important countries a bilateral dialogue is maintained, that is specifically aimed at energy related issues.

The EU has stepped up its cooperation with both China and India in the field of climate change through the establishment in 2005 of the **EU-India Clean Development and Climate Change Initiative** and the **EU-China Partnership on Climate Change**. This intensified cooperation underlines the three partners' commitment to tackling climate change.

The Partnership with China is supported by a rolling work programme of collaborative projects. These are designed to build capacity and practical, scientific and technical knowledge of appropriate mitigation and adaptation options in the EU and China, for example through a joint research and pilot project for near zero-emission coal-fired energy generation. Under these Partnerships events and projects have been successfully implemented in both India and China on such issues as climate research, the Clean Development Mechanism and adaptation strategies, and many more are planned.

More information about bilateral cooperation with China can be found in Chapter 10 and about bilateral cooperation with India in Chapter 11.

Text Box – Development Co-operation Instrument

The geographic component of the Development Co-operation Instrument (DCI) provides assistance to developing countries in Latin America, Asia (including Central Asia) and the Republic of South Africa. The instrument is valid for the period from 2007 to 2013. The overall goal of the instrument is the eradication of poverty in partner countries and regions in the context of sustainable development, including pursuit of the MDGs, as well as the promotion of democracy, good governance and respect for human rights and for the rule of law. Co-operation is also intended to foster the sustainable development and help to ensure sustainable development including climate change and biodiversity. DCI intends strengthening the relationship between the Community and partner countries and regions.
The regulation establishing the DCI was adopted on 18 December 2006.
Source: /www.euroresources.org/guide_to_population_assistance/european_community/dci_1.html

EAEF

Promoting climate-friendly and 'clean' energy sources was a main focus of the **EC-ASEAN Energy Facility** (EAEF) cooperation programme which ran between 2002 and 2007 with EU funding of €21.5 million. Renewable energy and energy efficiency predominated among the 77 projects assisted. - *www.aseanenergy.org/eaef*

The EU's programme of cooperation with Asian developing countries for 2007-2010 has the promotion of sustainable consumption and production - with a special focus on small and medium-sized enterprises – as one of its two environmental priorities. The Multi-Annual Indicative Programme (MIP) covering the period 2007-2010 is to be read in conjunction with the Strategy Document 2007-2013 of the Regional programming. The Multi-Annual Indicative Programme (with total budget of 400 million Euro) focuses on three main areas of intervention:
(1) Support to Regional Integration;
(2) Policy and Know-How based Cooperation in:
    (i) Environment, Energy and Climate Change. This part will focus on two main activities:
    - regional intervention to promote "green growth" in Asia by financing projects that encourage Sustainable Consumption and Production (SCP) in Asian industries, with a particular focus on SMEs
    - Cooperation on Forest Law Enforcement, Governance and Trade (FLEGT), addressing illegal logging and enhanced forest governance.

    (ii) Higher Education and Support to Research Institutes;
    (iii)Cross-border Cooperation in Animal and Human Health; and
(3) Support to Uprooted People.

Projects in Asia that seek to improve energy efficiency or reduce greenhouse gas emissions, for instance, will qualify for funding under this programme, which has a total budget for environmental actions of €100 million.[18]

International action by high-level arrangements and alliances

ASEM6 (the 6th Asia-Europe Meeting)

[18] http://ec.europa.eu/europeaid/where/asia/regional-cooperation/documents/mip_0710_en.pdf

The Declaration on Climate Change by the Heads of State and Government from thirteen Asian nations, twenty-five European nations and the EC President (Helsinki September 2006), is stressing the Need for International Action and Climate Change Related Challenges, by intensify cooperation to combat climate change and enhancing international dialogue.

GCCA

In September 2007 the Commission proposed creating a **Global Climate Change Alliance (GCCA)** between the EU and the developing countries most vulnerable to climate change, in particular the Least Developed Countries and Small Island Developing States.

***ENP** European Neighbourhood Policy*

Another area of strategic importance are the neighbouring countries both in the Mediterranean. The European Neighbourhood Policy (ENP) was launched in 2004 and includes 16 neighbouring countries to the South (Algeria, Egypt, Jordan, Israel, Lebanon, Libya, Morocco, Syria, Tunisia, West Bank and Gaza Strip) and East (Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine) of the EU's borders. Its aim is to create an area of prosperity and co-operation around the Union through individual ENP Action Plans, without offering an accession perspective. In fact, it is often seen as an alternative to enlargement, but nevertheless misses out on the essential "carrot" to bring about painful reforms: the membership perspective - Neighbourhood Strategy.[19]

In July 2008, French President Nicolas Sarkozy has stepped up efforts to gain support for his idea of a 'Mediterranean Union' in a visit to Algeria and Tunisia. According to Sarkozy, five North African countries (Morocco, Algeria, Tunisia, Mauritania and Libya) and five member states (France, Spain, Italy, Portugal and Malta) are intended to be at the core of the initiative, which should be governed by a permanent council, similar to the Council of Europe. Its focus would be on organised crime and terrorism, sustainable development, illegal immigration and energy security.

South-South alliances

An interesting relative new strategy for EDCs is the building of solid South-South alliances in S&T, e.g. by coordination strategies through institutions of the Third World Academy of Sciences and the Consortium of Science, Technology and Innovation for the South (COSTIS).

ACP (African, Caribbean and Pacific Countries)

The Adaptation and Mitigation Strategies (ADAM) project - funded by the European Commission aims to improve understanding of the synergies, trade-offs and conflicts between adaptation and mitigation policies. Results will be relevant globally but will improve climate change projections for ACP countries in particular. The project, which includes China and India amongst its partners, started in March 2006 and will conclude in 2009.

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[19] Brussels, 4 December 2006 - COM(2006)726 final, Communication from the Commission to the Council and the European Parliamant on Strengthening the European Neighbourhood Policy, (SEC-2006, 1504 – 1512)

The CarboAfrica project - aims to quantify and predict the cycle of carbon and other greenhouse gases in sub-Saharan Africa in order to evaluate the region's potential as a global carbon 'sink.' Greater understanding is needed of photosynthesis and respiration by African ecosystems, which are subject to regular modification due to continual changes in land-use. The three-year project will be carried out in at least 11 countries: Benin, Botswana, Burkina Faso, Congo, Gabon, Ghana, Mali, Niger, South Africa, Sudan and Zambia.

More information about bilateral cooperation with ACP countries can be found in Chapter 9.

Brazil
The European Commission and Brazil have set up a dialogue on the environment and climate change dimension of sustainable development, and this will be strengthened under a recently launched Strategic Partnership.

South-Africa, South Korea, Mexico e.a.
With South Africa a forum on environment and sustainable development with a working group on climate change has been created. Regular dialogue on climate change also takes place with South Korea, and concrete initiatives for closer cooperation on climate change are under way with Mexico.

3.7 Lessons learned for RTD4EDC

- **Sustainable Development;** The EU recognises that the most effective way to promote adaptation to and mitigation of climate change is to 'mainstream' these objectives into strategies for poverty reduction and/or sustainable development. Combating climate change is integral to the EU's commitment to help developing countries meet the Millennium Development Goals.
- Research and Technological Development is essential for designing the innovative and forward looking solutions needed to make real progress on the seven key challenges.
- The EU RTD programmes are open to cooperation with research institutions in third countries. However the actual participation by EDCs in these programmes is at a very low level.
- Eurostat data shows that investment in research and development in terms of percentage of GDP stagnated between 2000 and 2005, at 1.9 % in 2005 in the EU-15 and 1.4 % in the EU-25, far from the EU target of 3 % of GDP by 2010.
- EU Emission Trading System (ETS) has rapidly become the driving force behind the expansion of the global carbon market.
- Many ERA subjects require an overall EU strategy inclusive to the relationship with EDCs – e.g. attracting and developing high quality researchers, improving infrastructures, sharing knowledge and setting S&T priorities.

PART II: EU Programmes

4 Intelligent Energy Europe (IEE)

4.1 General Introduction

A second Intelligent Energy Europe (IEE II) Programmes has been launched in 2007, with a significantly increased budget - about €730 million for the 2007-2013 period. The IEE programme is the EUs tool for funding action to improve these conditions and move us towards a more energy intelligent Europe.

The increased budgets for the Intelligent Energy-Europe Programme II is an important step in the right direction. Still, if we compare with the federal budgets for energy research in the US these numbers are still relatively small. For example, the US Energy Bill proposes an annual budget of $5.3 billion in 2008 and 2009, sharply up from the $3.6 billion dedicated in 2005.

Goals and Action

IEE II is a key element in the new energy and climate change package of the Commission to support the ambitious EU 2020 targets:

- 20% less greenhouse gas emissions
- 20% better energy efficiency
- 20% share of renewables in the energy mix
- 10% biofuels in transport fuel

The IEE programme is a part of the €3.6 billion Competitiveness and Innovation Framework Programme (CIP), which will run from 2007 to 2013. Altogether, €730 million are available to fund projects for the promotion of energy efficiency and renewable energy.

To date, 400+ European projects, 60 local/regional energy agencies and 60 large-scale events have been supported by the programme.

IEE II will bring a higher level of support under the ambitious energy and climate change objectives. Europe must become more competitive and innovative. Concrete solutions and substantial change are needed now, therefore the maximum support is increased to 75%.

Initiators and organisation

The Intelligent Energy Executive Agency (IEEA) – with more than 40 staff - was executing the prior IEE. A new organisation ‘Executive Agency for Competitiveness and Innovation’ (EACI) will manages the projects and events funded under the new IEE programme and disseminates the resulting know-how and best practices. From 2008, the EACI will also start managing the European Commission's SME support network and eco-innovation initiatives (which form parts of the new Framework Programme for Competitiveness and Innovation), and the Marco Polo programme. The remit of Executive Agencies is to help the Commission put EU programmes into action more efficiently and with improved results.

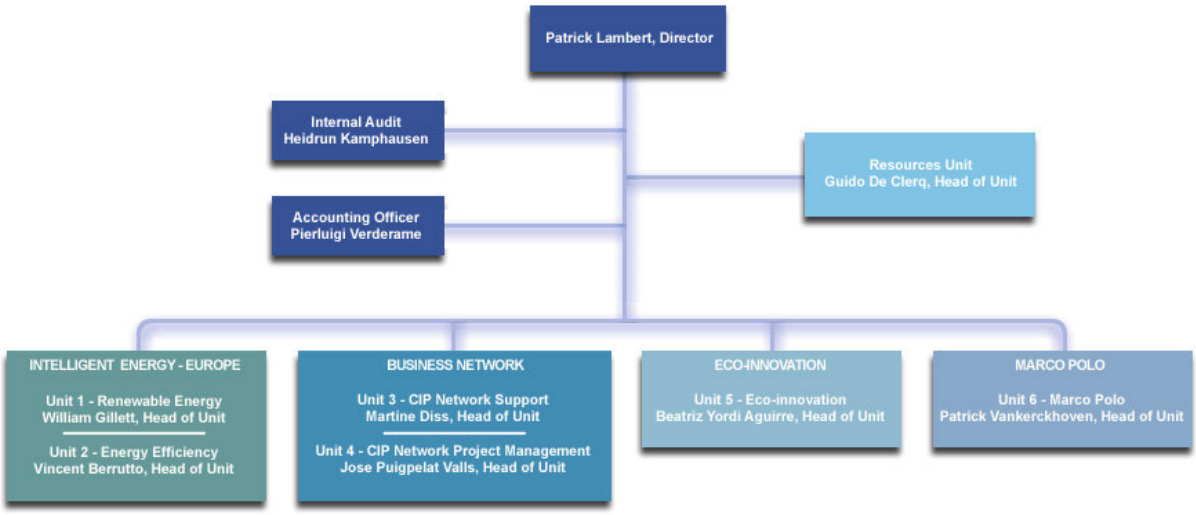

Figure 5: Organisation structure of the 'Executive Agency for Competitiveness and Innovation (EACI).

Actors Involved

Any public or private organisation from the EU, Iceland, Norway, Liechtenstein and Croatia can apply. At the moment, no Memorandum of Understanding has been signed to include EDCs in IEE II. Projects should fall within the scope of a Call. Projects should involve at least 3 partners from different countries.

Instruments

The 2008 IEE call for proposals is published in February 2008. Some € 50 million will be made available, supporting up to 75% of eligible project costs. The 2008 budget will be distributed as follows:

- IEE-supported projects: € 45 million
- New local/regional energy agencies: € 2 million
- Tenders, support for CEN/CENELEC standards, and Concerted Action: € 16 million.

4.2 Instrument 1: Funding of projects

Scope

Funding is available for: capacity building; building and spreading of know-how, skills and methods; exchanges of experience; development of market and intelligence; policy input; awareness raising and information provision; and education and training. Investments in "hardware" or RTD projects are not supported.

Objective

Intelligent Energy – Europe (IEE) is the European Union's programme for promoting energy efficiency and renewables. It supports financially international projects, events, and local/regional energy agencies, which promote the smarter use of energy and the growth of renewable energy sources.

Actions/Content

IEE I:

To date, 400+ European projects have been supported by the programme:

- SAVE: Energy efficiency and rational energy use.
- ALTENER: New and renewable energy sources.
- STEER: Energy in transport
- COOPENER: External component of the IEE Programme

In the context of RTD4EDC the COOPENER strand is most relevant. Running from 2003 until the end of 2006, COOPENER addressed the role of sustainable energy for poverty alleviation in developing countries. COOPENER actions are meant to be complementary and upstream of the support of other community development co-operation programmes. It provide funding for strengthening existing capabilities in developing countries so that those responsible are better placed to specify sustainable energy requirements and to establish appropriate legal frameworks/programmes, and financing arrangements to attract investment. COOPENER was shaped in the framework of the EU Energy Initiative for Poverty Eradication and Sustainable Development (EUEI) decided at the World Summit on Sustainable Development in September 2002. For further information see Chapter EUEI in this report.

Three fields of IEE-I (2003- 2006), namely SAVE (energy efficiency in buildings and industry), ALTENER (new and renewable energy sources) and STEER (energy aspect in transport), will continue in IEE-II. COOPENER will not be continued and the activities of the programme will be transferred and scaled up under the development activities of EuropeAid: ENRTP.

Within ALTENER– RE approaches are supported. ALTENER projects may include one or more of the following Key Actions:

- Electricity from renewable energy sources (RES-e), to support EU policy by tackling barriers to market growth and helping to achieve future renewable energy targets.
- Renewable energy heating/cooling (RES-H/C), to promote greater use of biomass, solar and geothermal heating and cooling, especially in buildings and industry.
- Domestic and other small-scale RE applications, to increase use of small-scale renewable energy systems in buildings, in line with the Energy Performance of Buildings Directive, and to promote use of small-scale stand-alone RE systems.
- Biofuels, to promote use of sustainable forms of biodiesel, alcohols, biogas and bioadditives to replace fossil fuels for transport applications and to contribute to achieving future EU targets.

As mentioned before,'COOPENER II' no longer is part of IIE II. It will be genuinely integrated into the development agenda and executed by AIDCO (the EuropeAid Co-Operation Office). Although there is a realistic risk that the link with EU energy policy is weakened – this transfer and scale-up can be seen as a success story. At the Berlin "Africa-Europe Energy Forum -Towards an Africa-Europe Energy Partnership" broad recognition was given to the fact that energy is an important element of poverty

alleviation. The Forum was organised in the framework of the EU Energy Initiative (see: www.energypartnership.eu/). Energy has thus an important role in a wider Europe-Africa dialogue. The Forum is an important step forward in the endeavour to shape a comprehensive partnership, aimed at improving energy security and reducing climate change and its negative effects, and thus contribute towards shaping a better world. To achieve this common goal, more is required than individual measures and isolated activities. The Forum paves the way for a launch under the Africa-Europe Energy Forum umbrella of a joint EU-AU Africa strategy.

Some of key outcomes were the following:

- The Africa-Europe Energy Partnership found broad support, with key challenges in the area of energy security, climate protection, development and the achievement of the Millennium Development Goals (MDGs).
- Climate change affects Africa particularly, even though the continent's contribution to worldwide greenhouse gas emissions is minimal. The Clean Development Mechanism (CDM) must be put to better use for Africa. Climate change impacts need to be considered in energy investment planning.
- Africa has vast energy resources, including renewable resources, which are waiting to be developed.
- Regional cooperation to the operator level is indispensable.
- Further sources of financing must be tapped:
  - Domestic financial resources, private-sector resources and donor resources are insufficient and must be increased.
  - A common understanding of an appropriate financial architecture, notably for regional projects, needs to be developed; risk issues need to be addressed. Investors' confidence should be strengthened.
  - More resources from the European Development Fund should be used to improve energy services, in line with the results of country-level negotiations and with the Paris Agenda. In view of the high demand, continuation of the Energy Facility seems required.
  - Need for coordination with other initiatives, in particular the AU/NEPAD strategy and the World Bank-led Energy Access Scale-up Plan. Anti-corruption standards need to be enforced and observed.
- Technology transfer and a focus on locally adapted and affordable technologies are crucial, for example regarding generation, distribution and end-use, improved stoves, efficient lighting (e.g. LED); one focal area must be capacity development.
- Access and pro-poor policy. Improving energy services is crucial both for meeting basic needs and for productive uses and income generation.
- Energy efficiency. Investment in efficient technology is extremely cost-effective. Increasing end-use efficiency and reducing energy wastage is a priority.

As follow-up, on 27 June 2007 the international roundtable “Business Perspectives on the Africa-Europe Energy Partnership” was held at the CCH Congress Centre Hamburg, Germany. The roundtable served as key-forum for discussing and exchanging views on three leading topics:

1. EU-Africa Energy Partnership: Energy Sector’s expectations and achievements
2. Market development and business opportunities in Africa
3. Financial tools & Public-Private partnerships opportunities

The participants of the Business Roundtable announced a series of recommendations for the future establishment of the Africa-Europe Energy Partnership.

4.3 Instrument 2: Support of local/regional energy agencies

Actions/Content

To date, 460 local/regional energy agencies have been supported by the programme. In the 2008 Call, some € 50 million will be available to co-finance projects for the promotion of energy efficiency and renewables, and the setting up of local or regional energy agencies.

4.4 Instrument 3: Events and information services and publications

Actions/Content

Events are a powerful means of communication. To date, over 60 large-scale events have been supported by the programme.

350 projects for a more energy-intelligent Europe
All IEE-support projects by theme with fact-sheets on individual projects can be downloaded on the website of IEE.
(http://ec.europa.eu/energy/intelligent/library/publications_en.htm).
The fact sheets are organised in following categories:

Renewable energy	Energy efficiency
• Electricity generation • Heat generation • Small-scale applications • Biofuels (September 2007)	• Buildings • Social housing • Innovative approaches in industry • Equipment and products
Horizontal cross-cutting projects	Transport
• Sustainable energy communities • Financing mechanisms and incentives • Monitoring and evaluation	• Better knowledge of local energy agencies • Policy measures for energy efficient transport
Developing countries	
• Energy services in sub-Saharan Africa *)	

**) 24 projects for sustainable energy services in Sub-Saharan Africa, Source: http://ec.europa.eu/energy/intelligent/library/doc/ka_reports/subsaharan_africa.pdf)*

The website offers a large list of additional events on energy efficiency and renewables, and the ELTIS website informs you of more local transport events.
(see: http://www.managenergy.net/events_diary.html).

4.5 Instrument 4: COOPENER

Goals

COOPENER is the external component of DG TREN's "Intelligent Energy Europe programme" and was running from 2003 until the end of 2006. It had a relative small total budget of 17 million Euros. COOPENER was found after the WSSD in Johannesburg and aims at supporting the strengthening of existing capabilities in developing countries "so that those responsible are better placed to specify their sustainable energy requirements and to establish appropriate legal frameworks and programmes for sound use of energy resources, as well as financing arrangements to attract investment."

Two target areas are specified within COOPENER:

1. Energy policies, legislation and market conditions for enabling poverty alleviation in developing countries to strengthen the existing local capacities in the fields of energy policy and regulations, to assist local, national or regional energy policy makers and regulators to create favourable market conditions for the provision of energy services.
2. Strengthening local energy expertise in developing countries to promote and support initiatives in developing countries, which will help to build a critical mass of human capital with up to date knowledge and expertise in energy policy making, energy regulations, energy planning and project financing.

Actors Involved

COOPENER was initiated by DG TREN and it is a demand driven instrument and requires local ownership. In general projects are carried out by a conglomerate of European and local partners. Cooperation and exchange of experience between these partners is highly encouraged.

The involved actors are governmental agencies, private sector, public bodies, universities, civil society.

Activities and projects

COOPENER worked with a "call for proposal" system on an annual basis. Each year a work programme was published that focussed on specific geographical areas. A list of projects can be found in the Annex B. A distribution of finished and ongoing projects differentiated by geographical area is presented in figure 4:

Call for Proposals	Sub-Saharan Africa	Central / Latin America	South-East Asia	Total ongoing projects (status 02/2007)
2003	14			14
2004	5	4		9
2005	5	3	5	13
Total:	24	7	5	36

Figure 6: distribution of COOPENER projects by geographical region

4.6 Lessons Learned for RTD4EDC

- Access to IEE II for EDCs is urgently needed. There will be mutually benefits when IEE II will be opened for EDCs. In a global energy market – international partnerships are key for the build-up of strong strategic positions. EDC can act as market, technology partner or supplier (e.g. solid biomass, biofuel).
- Major challenges from developing countries perspective comprise rising costs of technology such as power equipment and transmission lines, and the need for adequate financing schemes. Increased private investments are needed, in addition to donor support. Major challenges from European investors' point of view refer to sufficient available technical data, reliable grid conditions, attractive political framework (feed in law etc.) and also adequate financial incentives.
- There is a strong need for **capacity building** with regard to RE in the targeted countries in all relevant spheres: within governmental agencies, public bodies, educational bodies, end user level. The COOPENER projects included capacity building actions towards policy makers (for political and regulatory reforms) and communities.
- There is a general lack of energy and development experts both in the EU and locally which requires long term actions and efforts to enlarge the energy community both in Europe and Africa.
- There is a growing awareness that job creation, food security and improvements in social benefits (clean water, health, and education) are all dependent on the provision of modern energy services.
- Participation of local state or public bodies (e.g. energy agencies) is needed to create buy-in and **local ownership** of concepts and practices. All of the COOPENER projects involved a well-balanced participatory approach, most of them featuring in addition a south-south transfer of experience.
- Following the Nairobi recommendations, the 33 participating African countries suggested the following priorities for the EUEI:
    - Rural energy in general and rural electrification in particular;
    - Energy for households, biomass and substitutes;
    - Strategies and policies for the sector, both at national and at regional level;
    - Capacity building at all levels.

5 EuropeAid (AIDCO) and DG Development

5.1 General Introduction

Water and energy have always been at the core of the development of every society and this is even more valid today. That is why they constitute essential areas of cooperation when it comes to EU external assistance. Good quality infrastructure is a key ingredient for sustainable development. All countries need efficient transport, sanitation, energy and communications systems if they are to prosper and provide a decent standard of living for their populations. EuropeAid is strongly engaged in supporting infrastructure policies, investment and services in developing countries.

Since the transfer of 'energy' from DG TREN to EuropeAid and ECs decision not to continue COOPENER as part of IEE-2, the role of energy has changed. Priority will be given to the important role of energy in poverty alleviation. The EU proposes to work with developing countries towards creating the necessary conditions in the energy sector to achieve their national economic, social and environmental objectives, in particular by maximising energy efficiency, including more efficient use of fossil fuels and traditional biomass, and increasing the use of renewable energy.

The energy activities will be placed in a integrated strategy to promote good governance, human and social development, security and migration, natural resources, and more.

Goals and Actions

EuropeAid's core area of competence is aid delivery and it achieves this by using a set of financial instruments. EuropeAid ensures the quality of the aid it delivers as well as its effectiveness. Universal challenges – such as poverty alleviation, prevention of environmental degradation and consequences of climate change, require global co-operation and collaboration.

Activities of EuropeAid, include:

- EuropeAid promotes human and social development, covering social inclusion, employment, welfare protection and more in partner countries.
- EuropeAid provides direct economic support to partner countries, both at the macro- and microeconomic levels. This includes supporting national budgets, funding regional integration activities and micro-finance initiatives.
- Security is a basic human need and a fundamental prerequisite for sustainable development. That is why the EU helps partner countries to maintain law and order in times of peace and to rebuild stability in times of crisis. The 'Security and conflict' section will tell you more about this.
- EuropeAid works to promote broad-based rural economic growth, which ensures developing countries obtain equitable access to production methods, markets and services. People surviving at subsistence levels are the most vulnerable groups in the world. Access to clean drinking water and energy is also a constant challenge for many of the world's poorest citizens. Wild resources are a vital natural and economic resource and developing countries need assistance in protecting them.

EuropeAid umbrella

A whole set of activities are carried out under the EuropeAid umbrella. EuropeAid is a proactive player in the development field. Its activities cover a wide range of issues. The EuropeAid Co-operation Office is an organization of the European Commission.

Actors Involved

AIDCO - The EuropeAid Co-operation Office was founded on 1 January 2001. The mission of EuropeAid is to implement the external aid instruments of the European Commission which are funded by the European Community budget and the European Development Fund (EDF).

5.2 Instrument 1: European Development Fund (EDF)

Background

Articles 131 and 136 of the 1957 Treaty of Rome provided for its creation with a view to granting technical and financial assistance to African countries that were still colonised at that time and with which certain countries had historical links.

The first cycle of the EDF was designed for a period of five years and took effect in 1959. As it drew to a close, however, many of the overseas colonised territories had regained independence and new arrangements were necessary. In 1963, representatives of the EEC Member States and 17 African countries and Madagascar met in Yaoundé, Cameroon, to sign their first partnership agreement, that granted preferential trade arrangements. In addition, it was agreed to continue support via the EDF and the European Investment Bank (EIB). In 1969 the agreements made in the first Yaoundé Convention were renewed by the second Yaoundé Convention, founding the recognition of national sovereignty of all participating countries. The convention covered financial and technical assistance (through the EDF), investment and capital movements (through the EIB) and trade preferences. The structure established in Yaoundé remains the framework for many aspects of ACP-EU cooperation until today.

The second Lomé Convention was an attempt to rectify the inefficiencies created in Yaoundé and to address the various points of criticism it had been subjected to. As a result of the enlargement and in line with the more global development policy of the EC a group of African, Caribbean and Pacific countries joined forces to enter into negotiations. The Agreement was signed after 18 months of negotiations in February 1975 by the nine EC Member States and 46 developing countries (known as the ACP countries).

The relationship between the EU and the ACP group changed significantly during the 1990s. The Cotonou Agreement was signed in June 2000 by 77 ACP countries and the EU-15. It is designed to last for a period of 20 years and is based on four main principles: partnership, participation, dialogue and mutual obligations, and differentiation and regionalisation.

Objective

The European Development Fund (EDF) is the main instrument for European Community aid for development cooperation in the Africa, Caribbean and Pacific (ACP) countries and the Overseas Countries and Territories (OCT).

Actions/Content

The Cotonou Agreement introduced some important innovations:

- the introduction of a political dimension to EU-ACP development cooperation. This aspect of conditionality by Cotonou has been subject to some of its fiercest discussion and criticism. Respect for human rights, democracy and the rule of law have become so-called "essential elements" the violation of which can lead to partial or total suspension of development aid.
- the principle of participation: acknowledgement of the private sector and civil society as partners to foster economic development. Emphasis on regional integration within the ACP group and especially in Africa.
- establishment of the so-called Economic Partnership Agreements (EPAs) which are scheduled to take effect in 2008. Already the Caribbean region successfully concluded a complete EPA. EPAs are important instruments of development for the ACP States to assist in efforts of poverty reduction and enhancement of living conditions of their peoples.

Structure

The representatives of the 79 ACP states who, under the Cotonou Agreement, must be members of Parliament, meet their 79 European Parliament counterparts in plenary session for one week twice a year. The Joint Parliamentary Assembly (JPA) meets alternately in an ACP country and an EU country. The institution is governed by common, democratic rules.

Two co-presidents who are elected by the Assembly direct its work. Twenty-four vice-presidents (12 European and 12 ACP) who are also elected by the Assembly constitute the Bureau of the Joint Parliamentary Assembly, together with the two co-presidents. The Bureau meets several times a year in order to ensure the continuity of the work of the Joint Parliamentary Assembly and to prepare new initiatives aimed notably at reinforcing and improving cooperation. It also considers topical political questions and adopts positions on all human rights cases.

Three Standing Committees have been created in 2003 to draw up substantive proposals which are then voted on by the Joint Parliamentary Assembly. These Committees are:

- Committee on Political Affairs
- Committee on Economic Development, Finance and Trade
- Committee on Social Affairs and the Environment

The Assembly regularly forms exploratory missions. The members of the Joint Parliamentary Assembly are thus in direct contact with the situation on the ground in the various developing countries, which are signatories of the Cotonou Agreement.

Involved Actors

The ACP-EU Joint Parliamentary Assembly was created to bring together the elected representatives of the European Community (the Members of the European Parliament) and the elected representatives of the African, Caribbean and Pacific states ("ACP countries") that have signed the Cotonou Agreement. A substantial part of the work of the JPA is directed towards promoting human rights and democracy and the common values of humanity, and this has produced joint commitments undertaken within the framework of the UN conferences.

Key events and outcomes

The 14th ACP-EU JPA meeting (November 2007 in Kigali, Rwanda) adopted – amongst others - a resolution on the impact of foreign direct investment (FDI) in the African, Caribbean and Pacific States.

Geographical Scope

The 77 participating ACP countries

Centre for the development of enterprises (CDE)

CDE is an ACP (African, Caribbean and Pacific)/EU joint Institution created in the framework of the Cotonou Agreement. CDE's financial resources mainly come from the European Development Fund (EDF). Its objective is to ensure the development of professional ACP enterprises operating in the private sector. CDE operates in complementarity with the European Commission, the Secretariat of the ACP Group of States and the European Investment Bank in the framework of support to the private sector.

CDE's support to ACP enterprises and intermediary organisations are organised in the two-fold approach:

1. a structured (with 3-5 year term) approach via programmes for groups of enterprises and intermediary organizations (up to 2/3 of the budget);
2. ad hoc assistance to individual enterprises, intermediary organizations and service providers of the private sector.

Programme approach

- Primary objective
  - Identify and support the activities of the most promising private sector companies of few sectors with highest potential for economic and social development in ACP countries.
- Main advantages
  - buy-in by concerned companies & sectors via consultative approach with local coordination;
  - availability of in-depth knowledge of key sectors;
  - quicker and more effective response to the needs of enterprises;
  - achievement of synergies with other stakeholders in the sectors concerned – national authorities, regional institutions, international donors.
- Selection of sub-sectors with regard to :
  - comparative advantages;
  - sustainable growth potentials;

- innovation and emulation perspectives;
- partnership potentials and socio-economic merits (internal economic linkages, cumulated value-added, employment and productivity improvement).

Ad-hoc assistance
In spite of the CDE's more selective approach to ad-hoc requests from individual enterprises, the demand remains high. Hence, the Centre keeps on providing ad hoc assistance to individual enterprises, intermediary organizations and service providers of the private sector upon request.

5.3 Instrument 2: Private Sector Enabling Environment Facility (PSEEF)

Objective

To enhance the business enabling environment in ACP countries and regions through technical assistance in four specific areas:

- Improving legislation and institutional arrangements relating to the enabling environment
- Improving the financial sector enabling framework
- Reforming State Owned Enterprises
- Enhancing macroeconomic stability

Actions/Content

Amount: 20 Million € of which 2 million are earmarked for two Trust Funds with the World Bank, namely the Public Private Infrastructure Advisory Facility (PPIAF) and the Knowledge for Change Programme (KCP) - Starting date: April 3rd, 2006**.** Closing date: September 30th, 2009

Structure

The Facility is demand-driven and handling applications on a 'first come first served' basis. Applications are screened by the PMU and submitted for approval by the Validation Committee.

Eligible parties

Eligible are the ACP Group, ACP Governments (i.e. ministries and agencies), ACP Regional organisations **and c**ivil **s**ociety **o**rganisations

5.4 Instrument 3: PRO€INVEST

PRO€INVEST is an EU-ACP programme that provides technical and financial support to organisations representing the ACP private sector in their mission of sustainable investment promotion. PRO€ INVEST is a programme of the Group of ACP States and the European Commission for the promotion of investment and technology transfers in ACP countries. Its management has been entrusted to the Centre for the Development of Enterprise (CDE) under the supervision of EuropeAid Cooperation Office of the European Commission (EuropeAid). The programme was launched in 2002 and has a budget of 110 millions euros.

Objective

Promotion of investment and technology flows to enterprises operating within key sectors in the ACP States, by two-dimensional approach

a. Support to intermediary organisations and professional associations
b. Development of inter-enterprise partnerships.

Actions/Content

Budget of € 110 million for 7 years

Programme setup is under revision. Discussions on implementation modalities and type of activities are ongoing. More focus on capacity/institutional strengthening. It should better address Intermediary Organisations (IOs), problems and needs.

Support provided

A **large scale facility** for institutional strengthening support to Intermediary Organisations (IOs) and regional Organisations through the following activities:

- Public-private dialogue between IOs and governments;
- Assistance to IOs in improving their range of services to members;
- Development of networks between IOs in different countries and regions
- Promotion of investment and inter-enterprise co-operation agreements (I&ICAs)

For the large scale facility, with projects integrating one or more activities over a period of time, carried out by consortia of organisations and involving minimum budgets of EUR 500,000, intermediary organisations will be invited to submit their proposals after publication of a call for proposals in the second half of 2008. These applications will be evaluated according to the call for proposal guidelines and successful projects will be eligible to grant from the programme.

A **short term technical assistance facility** to support ACP IOs for the following activities:

- Preparation of proposals for large-scale interventions;
- Defining and facilitating direct technical assistance to the IOs whose needs have been identified and analysed, and other interventions aimed at capacity building, e.g. exchange of best practices.

Short term technical assistance will be delivered in response to a need-based concept document written by the applying ACP intermediary organisation. Concept papers will be reviewed and assistance will be delivered through service contracts established directly between the PRO€INVEST Management Unit and resource providers.

An **e-Community based portal** to include amongst others:

- Provision of information and IT-related capacity building of practical use to IOs;
- Assisting IOs to generate their databases and publish and disseminate information;
- Preparation of “how to” toolkits and manuals on best practice;
- Taking best practice (for example, on investment regimes) from other countries and adapting this to the specific needs of IOs in ACP states.

5.5 Instrument 4: ENRTP

Background

ENRTP, executed by AIDCO, is the successor of COOPENER. The ENRTP (Environment and sustainable management of natural resources including energy' thematic programme) is part of the EU's response to the increasing environmental pressures being experienced across the globe and the fact that two-thirds of the planet's key ecosystem services are being rapidly degraded or used unsustainably.
Environmental sustainability is MDG 7, and both environmental care and sustainable energy are crucial to many of the other MDGs. Support for the environment and the sustainable management of energy, water (and other natural resources) are two of the nine key areas for Community development cooperation.
It is recognised that developing countries need a long-term integrated approach to energy supply and demand, in which renewable energy and energy efficiency play a key role.
ENRTP is based on the geographical Development Co-operation and European Neighbourhood Policy Instruments (DCI and ENPI) setting out the policy objectives and budget headings for financing.

Objectives

The five priorities of the "Thematic Strategy Paper for the Environment and Sustainable Management of Natural Resources, including Energy **(ENRTP)** for the period 2007-2010" are:

1 - Working upstream in assisting developing countries to achieve MDG7 on environmental sustainability;
2 - Promoting implementation of EU initiatives and helping developing countries to meet internationally agreed environmental commitments;
3 - Promoting coherence between environmental and other policies and enhancing environmental expertise;
4 - Strengthening international environmental governance and policy development;
5 - Supporting sustainable energy options in partner countries.

Text Box - Priorities in the ENRTP program are:

- *Capacity building for environmental integration in developing countries*
- *Supporting civil society actors and consultative platforms*
- *Environmental monitoring and assessment with data gathering*
- *EU initiatives for sustainable development as: EU Water Initiative (see EUROFUNDING sheet), climate change, biodiversity, desertification, forests, illegal logging and forest governance, fisheries and marine resources, compliance with environmental standards (for products and production processes), sound chemicals and wastes management*
- *Sustainable production and consumption*
- *Poverty and the environment under new forms of aid delivery*
- *Strengthening expertise for the EU and promoting coherence*
- *Developing institutional support and technical assistance*
- *Creating a favourable legislative and policy framework to attract new business and investors in renewable energy and in efficient energy production and use*

Actions under Priority 5 (Energy) must be centred on the following countries and activities:
Proposals targeting specific energy producing countries in Africa, (northern and sub-Saharan African countries), in Central Asia, in order to help improve the management of their energy resources, including untapped renewable energy resources.

- *Algeria, Nigeria, Libya, Angola, Egypt in the area of advanced and environment friendly*

technology for gas and oil and renewable energy sources.
- *Mozambique, Ghana, Democratic Republic Congo and Ethiopia in the areas of renewable energy, including hydro power, sustainable biomass*
- *Turkmenistan, Kyrgyzstan, Tajikistan, Kazakhstan, Uzbekistan, reform in the energy sector, including in the area of energy pricing and promoting renewable energy and energy efficiency.*
- *Algeria, Egypt, Libya, Tunisia, Morocco, Jordan, Lebanon, Israel, occupied Palestinian territory, Syria, and Mauritania for bilateral and/or preferably regional activities on sustainable energy.*

Actions/Content

The ENRTP has earmarked an amount of €804 million for the seven years between 2007 and 2013. The indicative amount for the period 2007-2010 is €469.7 million, including €85.5 million for two new initiatives related to climate change and renewable energy. Thus, through the ENRTP, the EU will have a large amount of dedicated resources for RET in EDCs.

Priorities are:
- Capacity building for environmental integration in developing countries
- Supporting civil society actors and consultative platforms
- Environmental monitoring and assessment with data gathering
- EU initiatives for sustainable development as: EU Water Initiative, climate change, biodiversity, desertification, forests, illegal logging and forest governance, fisheries and marine resources, compliance with environmental standards (for products and production processes), sound chemicals and wastes management
- Sustainable production and consumption
- Poverty and the environment under new forms of aid delivery
- Strengthening expertise for the EU and promoting coherence
- Developing institutional support and technical assistance
- Creating a favourable legislative and policy framework to attract new business and investors in renewable energy and in efficient energy production and use

5.6 Lessons learned for RTD4EDC

- Since the transfer of ‘energy’ from DG TREN to EuropeAid and ECs decision not to continue COOPENER as part of IEE-2, the role of energy has changed. Priority will be given to the important role of energy in poverty alleviation.
- The European Development Fund (EDF) is the main instrument for European Community aid for development cooperation in the Africa, Caribbean and Pacific (ACP) countries and the Overseas Countries and Territories (OCT).
- ENRTP, executed by AIDCO, is the successor of COOPENER. The ENRTP has earmarked an amount of €804 million for the seven years between 2007 and 2013. Thus, through the ENRTP, the EU will have a large amount of dedicated resources for RET in EDCs.
- ENRTP - A clear disadvantage is the relative distance between AIDCO-F3 and the IEE-II Programme. Building strong linkage between both programmes on the subject of RET is needed and essential for good imbedding of ENRTP in the EU energy S&T framework.

- PRO€INVEST is an EU-ACP programme that provides technical and financial support to organisations representing the ACP private sector in their mission of sustainable investment promotion. Programme setup is under revision. Discussions on implementation modalities and type of activities are ongoing. More focus on capacity/institutional strengthening. It should better address Intermediary Organisations (IOs), problems and needs.

6 Framework Programmes

The EU Research Framework Programmes can be seen as the cornerstones of technology development at a European scale. The Seventh Framework Programmes support RTD, socio-economic and policy research on system change towards 'low carbon' economies.

6.1 Framework Programme FP7 (general)

Within FP7 international cooperation is particularly arranged within all four thematic themes: "ideas", "capacities","people" and "cooperation". This document is built up as follows. First the general features of international cooperation that apply to FP7 as a whole are outlined. Subsequently international cooperation within the four thematic themes is outlined.

Objectives of International Cooperation

To become more competitive and play a leading role globally, the European Community needs a strong and coherent international science and technology (S&T) policy with three objectives:

- support European competitiveness through strategic partnerships with non-EU countries in selected fields of science and by engaging the best scientists from such countries to work with and in Europe;
- enhance the production of knowledge and scientific excellence by enabling European universities, research institutions and firms to establish contacts with their partners in such third countries**,** thereby facilitating access to research environments outside Europe and promoting synergies on a global scale;
- address specific problems that third countries face, or that have a global character, on the basis of mutual interest and mutual benefit.

Eligible entities

FP7 is in principle open for any legal entity from anywhere in the world. Categories of eligibility:

1. Collaborative project consortium (>2 entities from EU25 or associated countries).
2. Consortium for indirect action concerning INCO partner countries (>3 entities of which 2 from different INCO countries)
3. Consortium for the coordination and support action and training and career development of researchers (at least one entity)
4. Consortium for investigator driven frontier research project (at least one entity from EU25 or associated country)
5. Sole entity (natural persons within the entity provide for scientific excellence, this form has been created to include SME's that are not legal persons)

Note that the eligible entities are particularly defined for each individual call.

6.2 Main funding schemes

Collaborative Projects (CP)

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. CP's are differentiated into (1) small and medium scale focused research actions and (2) large scale integrating projects.

- **small and medium scale focused research actions**: Targeting a specific objective in a sharply focused approach; they shall have a fixed overall work plan where the principal deliverables are not expected to change during the lifetime of the project.
- **large-scale integrating projects**: Larger scale actions, including a coherent integrated set of activities tackling multiple issues and aimed at specific deliverables; there will be a large degree of autonomy to adapt content and partnership and update the work plan, whereas appropriate.

Networks of excellence (NoE)

Support to a Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. The implementation of this Joint Programme of Activities will require a formal commitment from the organisations integrating part of their resources and their activities.

The funding scheme will support the long-term durable integration of research resources and capacities (researchers, services, teams, organisations, institutions) in fields of strategic importance for European research, through the establishment of a single virtual centre of research, in order to overcome demonstrable, detrimental fragmentation, thus strengthening European scientific and technological excellence on a particular research topic.

Coordination and Support Actions

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals.

Coordination or networking actions (CA)

Coordinating or networking actions will always have to be carried out by a consortium of participants, normally three from three different countries. The coordination or networking actions cover the following activities: the organisation of events - including conferences, meetings, workshops or seminars -, related studies, exchanges of personnel, exchange and dissemination of good practices, and, if necessary, the definition, organisation and management of joint or common initiatives together of course with management of the action.

Specific support actions (SSA)

Specific support actions may be carried out by a single participant, which can be based in any member state, associated country or a third country. Therefore there are no restrictions on the size of the consortium. Specific support actions can be: monitoring and assessment activities, conferences, seminars, studies, expert groups, high level scientific awards and competitions, operational support and dissemination, information and communication activities, support for trans-national access to research infrastructures or preparatory technical work, including feasibility studies, for the development of new infrastructures, support for cooperation with other European research schemes, the use by the Commission of external experts, management or a combination of these.

The objectives of specific support actions are: to contribute to the implementation of the Framework Programmes and the preparation of future community research and technological development policy or the development of synergies with other policies, or to stimulate, encourage and facilitate the participation of SMEs, civil society organisations and their networks, small research teams and newly developed or remote research centres in the activities of the thematic areas of the Cooperation programme, or for setting up of research-intensive clusters across the EU regions.

	Non-profit public bodies, secondary and higher education establishments, research organisations and SMEs	All other organisations
RTD activities	75%	50%
Demonstration activities	50%	50%
Coordination and support actions	100%	100%
Management, audit certificates etc.	100%	100%

6.3 International Cooperation within “Capacities”

The Capacities Programme will support a range of activities to strengthen **research capacity** in the European scientific community and **other regions of the world.**

- Dialogues, bringing together different stakeholders such as universities, industry, government, civil society and donors. (an example of an existing dialogue is the West Balkans Countries Platform)
- Information exchange activities with third countries and regions on the ICPC list

The objective of these activities is to enable the EU, third countries and regions to discuss current and future research priorities, to facilitate debate between the different stakeholders. The outcomes of these dialogues will provide intelligence for developing research policy, provide input to the respective FP7 specific programmes and inspire research topics for international cooperation, in particular in the Cooperation programme.

Specifically the objectives are threefold:

- To strengthen bi-regional and bilateral dialogues in scientific cooperation and assist in joint identification of topics for collaboration under FP7 thematic programmes. Activities will be established by means of INCO-NETs - platforms bringing together policy makers and stakeholders of an individual target region/country. The objective is strengthened by the establishment of FP7 “information points”.

- To network different stakeholders (such as universities, industry, government, civil society and donors) in order to strengthen research capacity. This activity will target countries, which have an S&T cooperation agreement with the European Community or are in the process of negotiating one. Examples include the development of information facilities in third countries to assist in identifying and building research partnerships between different types of research actors.
- To facilitate the development and implementation of a coherent European-level approach towards international S&T cooperation. The use of ERA-NETs will be particularly useful in reinforcing coordination between EU Member States, and Associated States targeting their S&T cooperation with third countries.

Other activities that apply to the work programme 2007/2008 include:

- **Attracting users from various countries and through networking**, Research Infrastructures contribute to integrating and structuring the scientific community. In many circumstances Europe's interests will be well served by participating in a facility overseas and vice-versa for third countries. The cost and complexity of large installations require international collaborations in order to share the financial burden and technological risks.
- **Research potential**; Under this activity, support can be provided to promote closer S&T cooperation between Europe and other regions in the world by improving research capacity in those other regions. One example is the cooperation between Europe and the Western Balkan countries which includes, amongst others, actions to support trans-national two-way exchanges of research staff in order to progressively include the West Balkan countries in the European Research.
- **Science in Society**; International dialogue will be supported on issues which relate to topics in the Science in Society programme with a strong international remit.

6.4 International Cooperation within "People"

The People Programme meets the need to foster both incoming and outgoing international mobility of researchers. There are two types of actions:

Career development/life-long training for EU researchers;

- **International outgoing fellowships at postdoctoral level and beyond** (with an in-built mandatory return phase): enable European researchers to be trained and acquire new knowledge within high-level third country research organisations. Promising European researchers will gain research training experience outside Europe and add different or complementary research competences at an advanced level to their experiences.
- **International re-integration grants***:* encourage European researchers, who have carried out research outside Europe for at least 3 years, to return to a Member State or Associated country in order to contribute to European research and to transfer the knowledge they have acquired in a third country.

International cooperation for and with researchers from third countries

- **International incoming fellowships for experienced researchers***:* for knowledge transfer with Europe, and enrichment of research collaboration. Researchers from third countries will be offered support to undertake research projects in Europe with

a view to enhancing the possibility of future collaborative research links with Europe.

- **Marie Curie host driven actions:** as a general rule (e.g. the Research Training Networks targeting doctoral candidates) all are open to third country nationals.
- **A partnership scheme***:* these grants focus on staff exchanges between several European research organisations and organisations from countries covered by the European Neighbourhood Policy, and countries with which the Community has S&T Agreements with the EU.
- **Support to scientific diasporas:** a new action to support the expansion of the successful pilot. Exercise to network European researchers abroad by means of European Researchers Abroad networks - the ERA-Link initiative. These activities will establish links between Europe and expatriate European researchers, promote collaborations with the European research community, as well as support networking activities of third country researchers in Europe.

6.5 International Cooperation in "Ideas"

The Ideas Programme aims to reinforce European activities in leading edge or 'frontier' research, providing support for individual teams rather than for multinational consortia. Individual international researchers will be encouraged to join with Europe-led teams, where they will bring specific expertise from outside Europe to enrich the research being undertaken. Full recognition is given to the need to associate top scientists from elsewhere in the world in reinforcing excellence, dynamism and creativity in European research.

Ideas within "international cooperation programme" refers mainly to the Euratom Programme

6.6 International Cooperation in "Cooperation"

The specific programme on **'Cooperation'** supports all types of research activities carried out by different research bodies in trans-national cooperation and aims to gain or consolidate leadership in **key scientific and technology areas.**

This general objective is being implemented through :

- **Collaborative research:** European Excellence :The bulk of EU research funding in FP7 will go to collaborative research, with the objective of establishing excellent research projects and networks able to attract researchers and investments from Europe and the entire world.
- Coordination between national research programmes (ERA-NET and ERA-NETplus)
- **Joint Technology Initiatives**: For a limited number of European Technology Platforms, the scale and scope of their strategic research agendas and the resources involved justify setting up long-term public-private partnerships in the form of Joint Technology Initiatives. These initiatives, will combine private sector investment and/or national and European public funding, including grant funding from the Research Framework Programme and loan finance from the European Investment Bank.

- **European Technology Platforms** (ETPs) have been set up in a number of areas where Europe's competitiveness, economic growth and welfare depend on important research and technological progress in the medium to long term. They bring together stakeholders, under industrial leadership, to define and implement a Strategic Research Agenda (SRA)
- Within "cooperation" like in "capacities" SICA's and calls in which involvement of entities form third countries is encouraged can be distinguished.
- Within cooperation activities are subdivided into ten thematic themes of which theme's 5 and 6 (energy and the environment, including climate change) are relevant for RTD4EDC.

Direct actions through the Joint Research Centre

The Joint Research Centre (JRC) provides scientific and technical support for EU policies. International cooperation is essential to carry out its mission.

Under FP7, the JRC aims to develop international collaborations in areas of strategic importance, e.g. global warming; sustainable development; external security; metrology; nuclear safety and safeguards (in the context of the Euratom Programmes); food security and global resources. It will also promote research cooperation with third country partners to ensure harmonized approaches to reference measurements, safety testing (e.g. for hydrogen storage), and detection (e.g. for GMOs in food and feed, in support of EU legislation and international agreements).An example of international collaboration is a dedicated activity with EU Candidate and potential Candidate Countries and the European Neighbourhood Policy Partner Countries (Southern Mediterranean and Eastern Europe), which will include specific instruments directed at promoting networking, knowledge transfer and training on complex EU policies.

Budgets

	Themes	December 2006 (*) in million euros
COOPERATION	Health	6100
	Food, Agriculture and Fisheries, and Biotechnology	1935
	Information and Communication Technologies	9050
	Nanosciences, Nanotechnologies, Materials and new Production Technologies	3475
	Energy	**2350**
	Environment (including Climate Change)	**1890**
	Transport (including Aeronautics)	**4160**
	Socio-economic Sciences and the Humanities	623
	Security and Space	Space 1430
		Security 1400
Total COOPERATION		32413
IDEAS	European Research Council	7510
PEOPLE	**Marie Curie Actions**	**4750**
CAPACITIES	Research Infrastructures	1715
	Research for the benefit of SMEs	1336
	Regions of Knowledge	126
	Research Potential	340
	Science in Society	330
	Coherent development of research policies	70
	Activities of International Co-operation	**180**
TOTAL CAPACITIES		4097
Non-nuclear actions of the Joint Research Centre		1751
TOTAL EC		50521

Euratom for nuclear research and training activities	2751

(*) *Decision of the European Parliament and of the Council of 18 December 2006.*

Tabel 3: Budgets FP7 (Relevant Issues for RTD4EDC are marked bold)

6.7 Lessons learnt for RTD4EC

- The EU Research Framework Programmes can be seen as the cornerstones of technology development at a European scale. The Seventh Framework Programmes support RTD, socio-economic and policy research on system change towards 'low carbon' economies.
- FP7 is open to any entity including these located in EDCs. Therefore it contributes to knowledge exchange and potentially stimulates the use of RE in EDCs indirectly.
- The Framework Programme is quite general in scope with regard to international cooperation. RE related activities in cooperation with third countries are not particularly defined.
- The extent to which FP7 is relevant for RTD4EDC is largely dependent on how the particular calls within the "cooperation" and "capacities" theme will be filled in. Until now no renewable energy related SICA-calls (Specific International Cooperation -calls) have been issued.

7 EUREKA and COST

7.1 EUREKA

The primary goal of EUREKA has always been to raise the productivity and competitiveness of European industry and national economies through its 'bottom-up' approach to technological innovation. Since its inception in 1985, substantial public and private funding has been mobilised to support the research and development carried out within the EUREKA framework. In the period 1989-1995 Eureka opened to Central and Eastern Europe. Since 1996 Eureka responded to the globalisation by new partnerships with countries in other regions, shaping the European Research Area, and improving complementarities with the EU Research Framework Programme.
EUREKA currently counts 39 full members. Several countries participate in EUREKA projects through a network of National Information Points (NIPs).

The affiliation known as Associated Country Status was initiated as part of EUREKA's strategy to enhance cooperation with countries outside of Europe judged to have scientific and research potential.

EUREKA Projects are market oriented. EUREKA operates bottom-up and the consortium partners have relative freedom in the execution of the project. A relative large share of SMEs participate in the consortia, together with research centres and large companies.

EUREKA 'Clusters' are long-term, strategically significant industrial initiatives. They usually have a large number of participants, and aim to develop technologies of key importance for European competitiveness, traditionally in ICT, biotech and production technology and, more recently also in energy. In the field of energy, there is the cluster EUROGIA (2004-2008) and its successor EUROGIA+ (2008-2013).
Clusters provide critical mass and cohesion between strong European consortia, sharing both the risk and benefits of innovation, focussed on developing and commercially exploiting new technologies. They play an important role in building leading positions of European industries in the world market.

Text Box: EUREKA example project

SOLARTECH, Eureka RE project to integrate technology for production of efficient solar cells for developing countries

EUREKA SOLARTECH partners integrate different forms of solar energy and combine the technologies into one self-sufficient energy source ideal for industrial use in remote areas or where energy costs are high. The new solar cell is designed to harvest thermal energy through heated water and hot air. The project was characterised by the development of new material for better coatings of photovoltaic panels and solar. Research includes aspects such as transparency, reflection, energetic conversion efficiency, utilization of solar concentrators, energy storage, integration and intelligent control of the system.

(Source: Eureka project sheet E! 2247 SOLARTECH -Harnessing the sun)

EUREKA Umbrellas are thematic networks within the EUREKA framework which focus on a specific technology area or business sector. The main goal of an umbrella is to stimulate strategic networking en to facilitate the generation of EUREKA projects in its own target area. Remarkably, there exist no specific EUREKA Umbrella's in the field of energy - although some Umbrellas are related (e.g. EUROENVIRON (1989-2010), LOGCHAIN+ (2006-2011)).

Text Box: EUREKA ENERGY CLUSTER

EUROGIA *is a EUREKA initiative for sustainable development and more secure energy supply towards a cleaner and safer future. EUROGIA was labelled in 2004 as The Eureka Energy Cluster. Its aim: to provide Europe with the necessary competitive and efficient technologies to better explore and produce conventional energies in order to:*

- *Satisfy today's energy demand and tomorrow's consumption growth*
- *Comply with Kyoto requirements,*
- *Create European added value to be exported worldwide.*

EUROGIA aims at a better positioning of the European industry to face a severe international competition on a global market, with a full concern for sustainable development.
After four years (and ninety participants from 11 countries were involved in 25 projects, with an investment totalling some 100 million euro) a new initiative with the scope more in new energy cluster was started. In 2007 EUROGIA+ was started as follow-up, and as result Calls for proposals have been opened to "new energies" in 2007.Since June 2008, EUROGIA+ has the support of 15 EUREKA member countries. ''Our ambition is to develop low carbon energy technologies' (see figure).

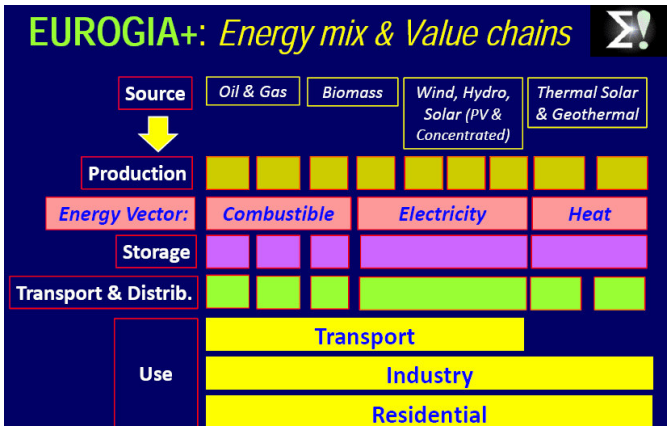

Figure 7: ENERGIA+ Energy Miox and Value Chains (www.eureka.be)

EUREKA co-operates with different international initiatives to create synergies and provide better services to its clients in the field of European standardisation, technology transfer, access to private financing, and scientific and technical research.

- ERA and Framework Programmes, Eureka provides flexible and market oriented synergy
- CEN – European Committee for Standardization
- IRC network – Innovation Relay Centres
- COST – European co-operation in the field of scientific and technical research

7.2 COST

COST is an intergovernmental framework for European Cooperation in the field of Scientific and Technical Research, allowing the co-ordination of nationally funded research on a European level. COST Actions cover basic and pre-competitive research as well as activities of public utility. The goal of COST is to ensure that Europe holds a strong position in the field of scientific and technical research for peaceful purposes, by increasing European cooperation and interaction in this field.

COST has clearly shown its strength in non-competitive research, in pre-normative cooperation and in solving environmental and cross-border problems and problems of public utility. It has been successfully used to maximise European synergy and added value in research cooperation and it is a useful tool to further European integration. Ease of access for institutions from non-member countries also makes COST a very interesting and successful tool for tackling topics of a truly global nature. Founded in 1971, COST is an intergovernmental framework for European co-operation in the field of scientific and technical research, allowing the co-ordination of nationally funded research on a European level. COST actions cover basic and pre-competitive research as well as activities of public utility.

The Member States participate on an à la carte principle and activities are launched on a bottom-up approach and complements the Community programmes.

COST has developed into a large framework for research co-operation in Europe. To date, it has launched almost 200 actions involving nearly 30,000 scientists from the 34 European COST members and 11 non-COST members.

COST has a geographical scope beyond the EU and welcomes the participation of interested institutions from non-COST member states without any geographical restriction. It anticipates and complements the activities of the EU Framework Programmes, constituting a “bridge” towards the scientific communities of emerging countries. It also increases the mobility of researchers across Europe and fosters the establishment of scientific excellence in nine key domains:

- Biomedicine and Molecular Biosciences
- Food and Agriculture
- Forests, their Products and Services
- Materials, Physical and Nanosciences
- Chemistry and Molecular Sciences and Technologies
- Earth System Science and Environmental Management
- Information and Communication Technologies
- Transport and Urban Development
- Individuals, Societies, Cultures and Health

As this list shows ‘Energy’ is not a priority field.
COST contributes to reduce fragmentation in research investments in Europe and to open the European Research Area to the cooperation on a world basis.

The increasing number of COST Actions reflects the success of COST within the European Scientific Community. COST Actions are new, innovative, and

interdisciplinary scientific networks of nationally funded research teams of at least five COST countries. They cover basic and pre-competitive research. The duration of an Action is generally 4 years.

A continuous COST Open Call to attract the best proposals for new COST Actions is used. The continuous call is thematically open and proposals playing a precursor role for other European programmes and/or initiated by early-stage researchers are particularly welcome. Applicants are invited to locate their topic within one Domain. However, interdisciplinary proposals not fitting readily into a single Domain are also welcome.

Proposals are assessed in two stages. COST funding covers the coordination costs. The funds provided by COST and obtained from the European Research Framework Programmes. The support to COST Actions is less than about 1% of the total value of the Actions. During the Sixth Framework Programme (FP6) with around EUR 20 million per year, more than 30 000 European scientists were involved in COST networking with their projects representing a total value which exceeded EUR 2 billion per year.

PART III: EU-EDC Partnerships

8 EUEI (European Union Energy Initiative)

8.1 General Introduction

The EU Energy Initiative for Poverty Eradication and Sustainable Development (EUEI) was launched at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. EUEI is an umbrella organization that aims to ensure that people in developing countries obtain access to modern and affordable energy services as prerequisite for achieving the MDGs, by:

- Promoting the importance of renewable energy for poverty eradication on the political level.
- Stimulating new resources (capital, technology, human resources) within the private sector, financial institutions, civil society and end-users.

The EUEI seeks to help end the limited access to energy services and heavy reliance on traditional biomass that are hallmarks of poverty in developing countries. Currently, 1.6 billion people do not have access to electricity, and 2.4 billion people rely on traditional biomass – wood, agricultural residues and dung – for cooking and heating. These fuels cause harmful indoor air pollution that leads to chronic health problems among women and children.

The EUEI is a catalyst for action. Through the Initiative, the EU is working with developing countries to create the necessary conditions in the energy sector to achieve their national economic, social and environmental objectives. This is being done in particular by maximising energy efficiency, including more efficient use of fossil fuels and traditional biomass, and increasing the use of renewable energy. The activities implemented under the EUEI are driven by the needs and priorities of the participating developing countries. Their ownership of activities is a key feature.
The Commission is active in all the geographical regions. For instance, the ACP-EU Energy Facility is a contribution under the EUEI to the financing of projects that deliver energy services to poor rural areas, and to leveraging other sources of funds.

Relevant instruments that are being used by the EUEI are:

1. A key result of the EUEI is the €220 million **ACP-EC Energy Facility**. This aims to attract investment to improve access to sustainable energy services for poor rural populations in the African, Caribbean and Pacific group of developing countries. The Facility also contributes to projects supporting better governance and management in the energy sector, and to facilitating investments in cross-border electricity interconnections. Some 75 projects have been selected for funding, with 40% of the funds supporting renewable energy. It includes demonstration projects, project aimed at the development of enabling environments (institutional capacity) and cross border energy related issues. Illegible entities include firms located within the EU.
2. **EU Partnership Dialogue Facility** (EU-PDF); The PDF seeks to facilitate the development of policies and strategies through dialogue between all relevant stakeholders. The PDF furthermore aims at building capacity and partnerships among entrepreneurs, NGO's and the public sector.

Specific attention goes out to energy efficiency in general, efficient use of fossil fuels and traditional biomass and an increase in the use of renewable energy. Although the use of renewable energy is mentioned as an important feature and integrated part of the means by which EUEI intends to reach its main goal, concrete goals with respect to the use of renewable energy have not been set.

Initiator

The 2002 WSSD in Johannesburg was the first major summit in sub-Sahara Africa. The summit meant a turning point for putting energy related to poverty alleviation on the political agenda internationally. At the summit it was confirmed that improved access to reliable, affordable and sustainable energy services is needed for the eradication of poverty and the specific objective set by NEPAD (The New Partnership for Africa's Development) of securing 35% of the African population access to energy within 20 years was adopted accordingly.

Four European Member States initiated EUEI, taking the role of facilitators on the country level (Austria in Ethiopia, Sweden in Tanzania, Denmark in Burkina Faso and Mozambique, Germany in the Caribbean) while the EC set up and took the role of facilitator of EUEI at the international level.

Actors Involved

When describing how EUEI is structured and operates one should note that basically two forms of activities can be distinguished that are carried out through EUEI:

1. awareness raising through political dialogue
2. facilitating projects through private-public partnerships (ppp)

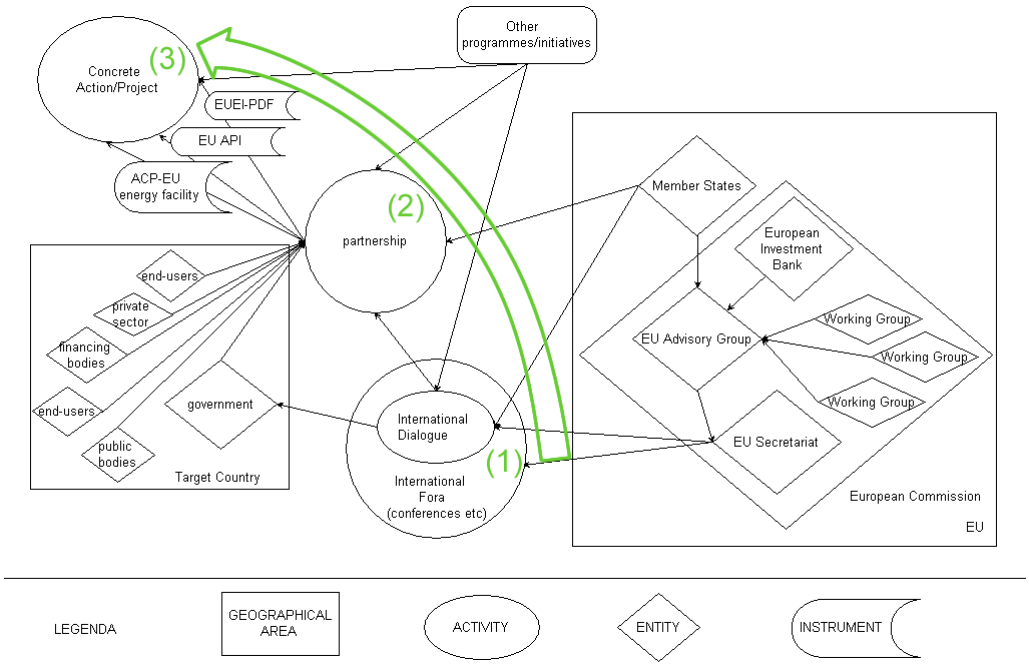

Figure 8 - EUEI structure: "dialogue (1) leads to partnership (2), partnership leads to action (3)" (represented as green arrow).

The EU Secretariat established in the Commission's Development Directorate to co-ordinate the Initiative. The Secretariat draws upon staff from both the Commission and Member States. The Secretariat facilitates and stimulates co-operation and synergy between EU donors, partner countries and regions, communicates with other donors and initiatives, participates in international forums, reports on activities, provides a promotional and communication role through a website and other promotional tools and provides a point of contact for the initiative. In principle the EU Secretariat is the executive body of EUEI.

The EU Advisory Group is made up of Member State and Commission officials and experts in energy and development. In principle the EU Advisory group is the forum on the European level, giving input to the secretariat, which transposes this input into subsequently international dialogue, partnerships and action.

Working Groups are identified as the need arises to aid development of appropriate activities. These working groups operate either in a virtual manner by electronic means, or in a physical manner by meeting and working together, developing thematic papers, concepts, proposing solutions and exchanging views and experiences.

The European Investment Bank (EIB) plays a role in the financing of ACP-EU Energy Facility. The facility is financed through the 9th European Development Fund (EDF9), a fund specifically aimed at financing development related projects and initiatives. Furthermore the bank gives input to the advisory group on the financial management of the facility.

Target Country

The basic element of EUEI is the public-private partnership (ppp). Partnerships are demand driven; The EUEI commissariat or EU Member State facilitates a partnership when a target government expresses the wish for cooperation within EUEI. Dialogue on international forums serves as a first basis for a partnership. Subsequently on the basis of this initial contact concrete projects are carried out through the various instruments (see section instruments). In these projects engagement of local partners is pro-actively strived for. Local partners include civil society, local financing institutions, NGO, public bodies, the private sector etc.

8.2 Instrument 1: International High Level Networking

Among the main goals of EUEI are (1) raising political awareness and (2) stimulating coherence and synergy among energy related activities. This implies that EUEI aims at an active cooperation with other initiatives. In this section the most apparent co-operations with other development and energy related activities are outlined.

Dialogue with FEMA (Forum of Energy Ministers of Africa)

At the EUEI meeting in Nairobi the participating African Energy ministers held a side meeting, in which the need for an African internal high level platform was recognised.

On the following international events, informal side meetings were organized between African energy ministers and the EUEI, resulting in the establishment of the Forum of African Energy Ministers (FEMA) in August 2005.

From the establishment onward FEMA has recognized the EUEI and the EU in general as one of their key dialogue partners and attends all relevant international conferences, including these specifically organized by EUEI.

Dialogue with other initiatives

EUEI furthermore has an ongoing dialogue with: New Partnership for Africa's Development (NEPAD), Johannesburg Renewable Energy Coalition (JREC), Global Village Energy Partnership (GVEP), Global Network on Energy for Sustainable Development (GNESD), Renewable Energy and Energy Efficiency Partnership (REEEP), Global Forum on Energy for Sustainable Development (GFSE) and UN Commission for Sustainable Development. The (informal) dialogues between EUEI and other initiatives seem to have limited effect.

8.3 Instrument 2: ACP-EU Energy Facility

Historical context

At the EUEI "Energy for Africa" conference, held in Nairobi in November 2003, energy related key priorities were identified, among them the need for adequate financing of the EUEI and greater involvement of the Commission and the Member States (EC 8566/04)

This resulted in the establishment of ACP-EU Energy Facility at June 2005. The ACP States are the 46 countries that are signatories of the Lomé Convention. "ACP" stands for "Africa, Caribbean, and Pacific."

Goals

The Energy Facility is a co-funding instrument through a "call for proposal" system and is demand driven. Projects that take place in ACP countries (Sub-Sahara Africa, Caribbean and Pacific) that are energy-related and could contribute to poverty alleviation are eligible.

Total budget is 220 million euros of which 10 million is allocated to the EU-API (EU Africa Partnership on Infrastructure), 198 million is funding for eligible projects and 12 million is being allocated to various support activities (monitoring and other overhead costs). The facility is funded through 9th European Development Fund, which is managed by the European Development Bank.

Actions

Call for Proposal Actions

- Component 1: Improving access to energy services. Component 1 is divided into two areas: (a) small scale projects and (b) infrastructure projects. (60% of the budget) Funding ceiling is 50% of total costs with a maximum grant of 10 million euros, minimal total project costs should be 0.2 million euros.

- Component 2: Creating or improvement of an enabling environment for the development of energy services for the poor. The development or implementation of sound national energy policies and strategies based on good governance principles. (20% of the budget) Funding ceiling is 75% of total costs with a maximum grant of 1.5 million euros, minimal total project costs should be 0.2 million euros.
- Component 3: Needs for improving cross border energy issues. Projects have been co-funded which leverage cross border energy actions. Actions could include preparatory activities. (20% of the budget) Funding ceiling is 50% of total costs with a maximum grant of 1.5 million euros, minimal total project costs should be 0.2 million euros.

Non-call actions

Non-call actions are all being carried out in the "EU Africa Partnership on Infrastructure" framework. These actions could be technical assistance, preparatory activities and capacity building. (possibly in cooperation with regional and continental institutions like NEPAD and FEMA) On 24-25 October 2007 a conference has taken place in Addis Ababa, on which the EU-African Partnership Steering Committee is inaugurated. The partnership is expected to be fully operational at the end of 2007.

Project Fund Allocation

A total of 75 projects have been co-funded out of 307 applications accounting for a total of 198 million Euro.

The following graphs show the distribution of granted funds differentiated by subsequently regions, technologies and these two combined for the call for proposals instrument.

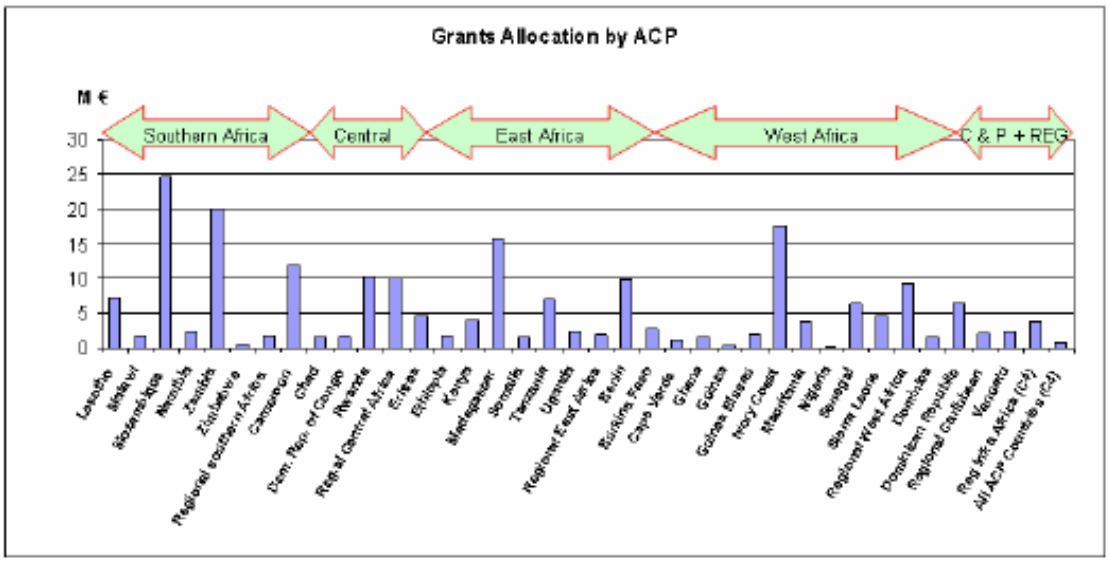

Figure 9: Grants allocated by EU-ACP EF differentiated by region (source: EU-ACP Energy Facility Newsletter)

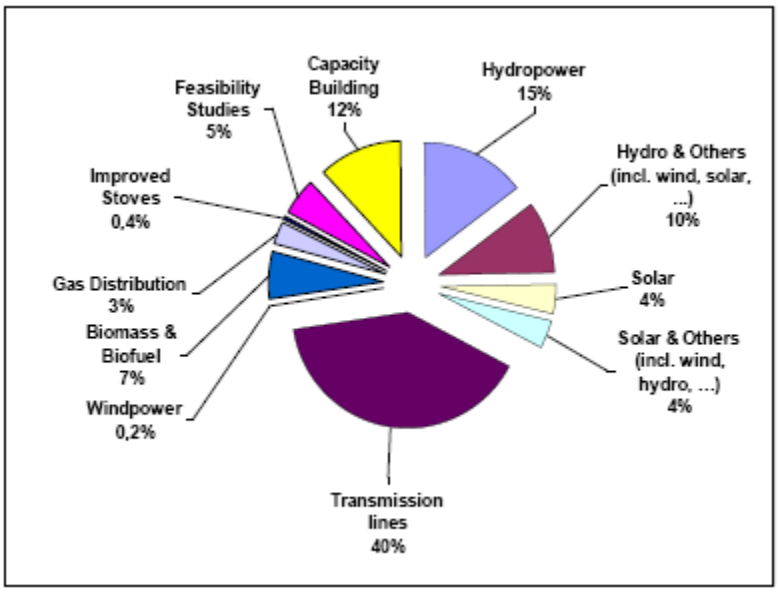

Figure 10: Grants allocated by EU-ACP EF differentiated by technology (source: EU-ACP Energy Facility Newsletter)

Looking at the differentiation by country it is quite remarkable that co-funding is very irregularly distributed among countries. Mozambique, Zambia, Madagascar, Ivory Cost and Cameroon account for over 45% of the budget. Another 6 countries and 2 sub-regions account for 29 %. This means that only 11 countries and 2 sub-regions account for 74 % of the budget or 147.5 million euros.

Looking at the technologies used within the countries one can see that 42 out of 75 projects were related to renewable energy accounting for 44% of the total budget. Most of them were carried out in East Africa (16) and accounted for 16% of the total budget.

In terms of financial efficiency it can be seen that small scale projects were most effective. Co-funding Costs per beneficiary are 22.6 Euro in small scale projects, whereas large scale infrastructural projects co-funding costs were 34 Euro/ beneficiary. This can probably be explained by the fact that small scale projects are restricted to single communities which lowers the transmission costs of energy as compared to the transmission costs in large scale projects.

List of Projects

A list of projects that are renewable energy related can be found in Annex A.

8.4 Instrument 3: EUEI-PDF (Partnership Dialogue Facility)

Historical context

At the EUEI “Energy for Africa” conference, held in Nairobi in November 2003, energy related key priorities were identified, among them the need for awareness

raising at the political level. This resulted in the establishment of EUEI-PDF that became operational in 2005.

Goals

The overall goal of the facility is "to promote dialogue on access to energy within and between partner countries, their regional organisations, EU member states and the European Commission. The PDF seeks to facilitate the development of policies and strategies through dialogue between all stakeholders." More specifically the PDF aims to support:

- Integrating access to energy services into national and regional policy and development strategies, for example national sectoral policies, Regional Strategy Papers (RSP), Country Strategy Papers (CSP), and Poverty Reduction Strategy Papers (PRSP),
- Supporting the development of appropriate policy instruments, legal, fiscal and regulatory structures to achieve national objectives for increased access to energy services,
- Integrating energy considerations into national sectoral policy for instance for water, education, health, agriculture, industry, transport, rural development, etc.,
- Supporting the development of appropriate institutional and service delivery models that can attract and make the best use of public and private resources,
- Facilitating the mobilization of the required investments from the private and public sectors,
- Capacity building for entrepreneurs, non-governmental organizations and the public sector,
- Facilitating dialogue between public and private stakeholders with the objective of building partnerships for access to energy.

Initiator

The EUEI-PDF was established by Austria, France, Germany, the Netherlands, Sweden and the UK in coordination with the commission and is managed by GTZ in Germany.

Actors involved

EC, Member States, Local and National Governments of Targeted countries, non-governmental organisations, private sector companies and trade associations

Activities

1. Financing activities that contribute to the defined goals. The budget is approximately 4 million Euros per year.
2. Key EUEI dialogue events with Africa:
   - Nairobi November 2003 "Energy for Africa".
   - Ouagadougou 26-29 October 2004.
   - Maputo 12-15 April 2005.
   - Brazzaville 11-15 July 2005.

Projects

In total 24 projects have been carried out through the facility of which 20 were geographically oriented and 4 thematically oriented.

The **geographically** oriented projects are differentiated as follows:

Central Africa	4
East Africa	4
West Africa	4
Southern Africa	4
Latin America and Caribbean	4

In 4 cases the projects that were undertaken specifically addressed policy aimed at Renewable Energy:

Dominican Republic	Development of a regional strategy for the energy use of plant oil in rural areas in the Dominican Republic and Haiti
Dominican Republic	Regional Workshop on the Use of Plant Oil / Biodiesel as a Source of Energy in Latin America and the Caribbean
Caribbean	Stakeholder Dialogue and Capacity Building for Wind Power Development in the Caribbean
Malawi	Development of a Biomass Energy Strategy (BEST) in Malawi

Additionally 4 thematic projects were initiated, none of them specifically addressing RE.

8.5 Cooperation with other initiatives

Under the EUEI the EC and the member states support a number of specific energy related programmes. Among others these are:

The Energy and Environment Partnership with Central America (EEP)

Historical context and initiation

The partnership was launched by the Ministry of Foreign Affairs of Finland, Comisión Centroamericana de Ambiente y Desarrollo (CCAD) and Secretaría General del Sistema de la Integración Centroamericana (SG-SICA) at the WSSD in Johannesburg in 2002.

The partnership is largely funded by the Ministry of Foreign Affairs of Finland since "We (the Finnish government) believe that this experience (on biomass energy generation) could be transferred to developing countries with similar resource base."

(Source: Speech of the Minister of Foreign trade and development of Finland, mr. Väyrynen at the Nordic Ministers Side Event at CSD 15, 10th of May 2007.)

Objective

The objective is promoting **renewable energies** in the region in order to contribute to sustainable development, the reduction of the emission of green house gases and fighting global climate change.

EC involvement

Example of a cooperational effort is the "European Union Meets Latin America on Renewable Energies"-forum that was held in Panama City on October 9 to 11, 2006, with more than 500 participants from Latin America, the Caribbean and Europe, besides the participation of the Ministers of Environment and Energy of SICA and other countries.

Pacific Island Energy Policies and Strategic Action Planning Project (PIEPSAP)

PIEPSAP was launched on the WSSD in Johannesburg 2002. In 2003 the Danish government decided to fund PIEPSAP in the context of EUEI. PIEPSAP is part of PIESD (Pacific Energy Partnership Initiative), which is a type II partnership and was also established at the WSSD in 2002.

Goals

PIEPSAP interventions aim at promoting smart investment in energy access, renewable energies and energy efficiency in response to demands from policy and decision makers for reliable, cost-effective models of sustainable energy supply.

PIESD aims:

- To increase availability of adequate, affordable and environmentally sound energy for the sustainable development of all Pacific Islanders.
- Accelerate the transfer and adoption of clean and renewable energy technologies.
- To assist with the implementation of the Pacific Islands Energy Policy (PIEP).

Actions

Actions include the preparation of national energy policies, strategic energy plans and energy legislation, support to regulatory activities, tariff and pricing studies for electricity, implementation of management information systems for power utilities, feasibility and project studies as well as support to the development of practical energy sector management mechanisms.

EC involvement

Although the Danish government was one of the initiators and founders of PIEPSAP, EU involvement within the programme is restricted to two so-called "EUEI-PIESD partnership projects", which involve funding and operational support for capacity

building. The partnership projects do not seem to be an integrated part of EUEI, nor are they carried out through the various instruments.

(source: communication of the Regional Energy Officials Meeting, Rarotonga, Cook Islands, 23-24 April 2007)

8.6 Lessons learnt for RTD4EDC

EUEI - Energy Initiative for Poverty Eradication and Sustainable Development (EUEI) was launched at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. EUEI is an umbrella organization that aims to ensure that people in developing countries obtain access to modern and affordable energy services as prerequisite for achieving the Millennium Development Goals. Some preliminary lessons are:

- EUEI budgets are rather limited and seem insufficient to meet the ambitions.
- Complex architecture of the initiative: there is overlap in nature of the instruments and lack of coherence in the EUEI.
- There is a limited geographical coverage, since the instruments are largely focussed on ACP countries.
- There is no clear definition of cooperation with other initiatives, although cooperation is mentioned as a priority in the all official documents of both the EUEI as a whole and the official documents of the instruments. In practice cooperation seems to be informal.

ACP-EC Energy Facility

- A strong demand for the Energy Facility is apparent, especially in the field of access to energy and renewable energy; project proposals outnumbered total budget.
- The interest for component 1 (access to energy) was unexpected high. 81% of the proposals referred to access to energy, accounting for 92% of the requested budget and 17% of co-funded projects was initiated by private sector actors.

9 EU-Africa Partnership

Historical context

Traditionally the relations between the EU and Africa have been conducted through two regional groupings: The ACP countries (see also: EUEI) and the African Countries of the Mediterranean. The first EU-Africa summit took place in 2000, where the EU launched a dialogue with the whole of the African continent in order to build a strategic partnership and to strengthen existing policies with regard to Africa.

9.1 EU-Africa Partnership on Infrastructure

The African Union Commission (AUC) in collaboration with the European Commission (EC) has launched the EU-Africa Partnership on Infrastructure, at the headquarters of the African Union in Addis Ababa, Ethiopia (October 2007). The Partnership aims at substantially increase EU investment in African infrastructure and delivery of transport, energy, water and telecommunication/ICT services. This will contribute to sustainable economic growth, promote regional trade, foster regional integration and reduce poverty.

The Partnership aims to interconnect the African continent and its different regions in four areas: transport, energy, water, and information technology and telecommunication networks. With regard to energy the partnership primarily aims at facilitating the development of access to sustainable energy services and to facilitate essential investment for generation, cross-border inter connections, grid extension and rural distribution.

The Partnership responds to development goals of the African Union and the NEPAD, including following financial instruments:

- The 10th European Development Fund (EDF, 2008-2013)
- An innovative instrument: the EU Infrastructure Trust Fund for Africa

The Partnership includes at the continental and regional levels:

- Harmonisation and implementation of international and regional agreements, regulations and standards for all modes of transport, energy, water and ICT
- Regional regulatory reform to encourage private investments in infrastructure and services;
- Improvement of cross-border infrastructures and trans-boundary resource management.

Meanwhile, at the country level, the partnership between Africa and the European Commission will increase the efficiency of national legislative and regulatory frameworks. The creation of internal demand is an important element to make African economies stronger and capable to become globally competitive. Stimulating regional demand requires supply side reforms such as breaking down barriers to the free movement of goods, creating a favourable climate for investment, and harmonising

rules and regulations within regional economies. Today, African nation still focus on national interests and this obstructs regional approaches and multiplies the need for investments and infrastructure. Africa has a huge infrastructure backlog.
The commission has created a European trust fund with the European Investment Bank to pull together into one vehicle European Commission grant funding, the bank's loan facilities and contributions from the 27 EU members.

Funding

Funding of the EU-API initiative is not yet fully defined. Proposed funding comes from intra-ACP resources, the 10th EDF and the EU Infrastructure Trust fund for Africa, that still has to be established. The latter is being financed by the European Commission and Individual Member States. Note that this funding structure is not yet formalized and therefore insecure. The trust would cover:

- Interest rate subsidies.
- Co-financing with the EIB (European Investment Bank), and AfDB (African Development Bank).
- Risk guarantee mechanisms (not already covered by existing instruments).
- Grants for project preparation and capacity-building.

Organizational structure

As was stated EU-API is in its preparation phase. Therefore it's structure in not yet clear. However some general principles and links that are to be established are clear:

- Subsidiarity Principle
- On a continental level NEPAD and the European commission will exchange information on a regular basis on the progress of i-STAP (Infrastructure Short Term Action Plan)
- Initiatives on a national level should underpin the activities of EU-API on the regional and continental levels

Initiatior

European Commission, NEPAD and (FEMA)

Actors Involved

NEPAD, EC, Member States, RECs, governmental bodies, public bodies, civil society, etc.

Activities

Activities are likely to be the (co-)financing of projects that address capacity building, actual infrastructure, awareness raising, coordinating activities etc.

9.2 European Development Fund (10th EDF, 2008-2013)

The European Development Fund has been the main financing instrument of ACP-EU cooperation since 1958. To a large extent, these procedures are now harmonised with the Financial Regulation applicable to the EU budget.

Objective

The European Commission plans to invest € 5,6 billion for regional infrastructure projects in Africa over 2008-2013 by the 10th European Development Fund (EDF, 2008-2013).

Actions/Content

A compromise to include a statement in the revised Cotonou Agreement by EU member states where reached. The EU maintains its aid effort to ACP Countries at least at the same level as that of the 9th EDF, not including balances. The final amount of the 10th EDF amounts to euro 22.682 bn or 0.02821% of EU/GNI.

Structure

The biggest of all issues is how the 10th EDF can help improve the quality and effectiveness of the EC's external assistance? A new structure and break-down of the 10th EDF is needed and this is implemented by the Financial Protocol (Cotonou Agreement). Recently the

Initiator

The EDF is inter-governmental in its funding. The EC manages the resources on behalf of the EU member states meeting in the EDF Committee. In December 2005, EU member states decided to continue funding of ACP-EU cooperation through the (10th) European Development Fund. An internal agreement between the EU member states and the Commission lays down the respective roles and responsibilities of the EU institutions.

Involved Actors

Implementation by DG RELEX services. DG RELEX works closely with other Directorates-General, notably EuropeAid, DGs Development and Trade and ECHO.

Geographical Scope

Africa. This excludes South Africa, which has its own € 980m funding arrangement with the EU.

9.3 Instrument 3: EU Infrastructure Trust Fund for Africa

EU Infrastructure Trust Fund for Africa is an innovative co-financing instrument. This brings together the EC, Member States, the European Investment Bank, and European Development Financing Institutions, who can pool their respective efforts and resources to directly co-finance relevant projects.

Objective

The Trust Fund provides grants that will attract and leverage additional funds from other donors and private investors.

Actions/Content

In the first six months, the Trust fund already has € 60 million from the EC, and € 27 million from contributing Member States. In addition, the EIB and other donors could commit resources in excess of € 250 million. To date, three projects have already been approved: the East African Submarine Cable System (EASSy), FELOU Hydroelectric System and the Ethiopia-Kenya Power Systems Interconnection.

9.4 Lessons learned for RTD4EDC

- There is a clear need for Africa-Europe Energy Partnership:
  - The Partnership is an excellent opportunity to also address the issue of poverty-reduction through improved energy access, especially in rural areas. Solutions for tackling energy/ power shortages in Africa need to be found.
  - The partnership also respond to the urgent need for climate change action.
  - The Africa-Europe Energy Partnership is also supported by FEMA (the Forum of Energy Ministers of Africa).
- EDCs (e.g. Africa) is in the process of establishing suitable (political, economic and legal) frameworks for private sector investment in energy infrastructure and technologies. As Africa's future energy supply will focus on an economically, politically and ecologically adequate energy mix, emerging African energy markets should offer business opportunities both in the fossil fuel sector and for renewable energy technologies. In particular, solutions for a decentralized energy supply (e.g. pico and small hydro systems) are to be promoted.
- EU-API is under preparation, no lessons can be learned yet.

10 EU-China Bilateral RE Related Linkages

10.1 General Introduction

China has become a powerful player in the last decade both economically as politically. It is the world's fourth economy in terms of GDP and third exporter. Since 1980 the Chinese economy has been characterized by annual growth rates of 8% and it accounts for 5% of the world's GDP in 2006 and that is expected to rise to 15% by 2030. The environmental impact of economic and industrial growth is meanwhile becoming more and more apparent.

Chinese Foreign policy has been traditionally characterized by strict non-interference. The last decade however, this position, as China takes a more pro-active and assertive role on the political world stage as a result of increasing economic power and demand, this becomes increasingly untenable. The Chinese government starts to recognise this, considering its pro-active role in the UN security council and increasing diplomatic commitments. China's more active role on the international political stage is also reflected in its cooperation with the EU.

The EU on the other hand offers the largest market in the world and is China's first export destination. It is home to a global reserve currency and it enjoys world leadership in key technologies and skills. The EU plays a central role in finding sustainable solutions to today's challenges, on the environment, on energy, on globalisation. It has proved capable of exerting a progressive influence well beyond its borders and is the world's largest provider of development aid.

The EU and China are mutually dependent and therefore the EU considers cooperation with China of key importance. Europe has an important and political interest in supporting China's sustainable development and successful transition to a stable, prosperous and open country. EU relations with China have developed from a relationship based mainly on trade issues to a partnership based on political dialogue and economic trade and sectoral relations. The cooperation programme is an important element of this relationship.

10.2 Historical Overview of EU-China Bilateral Cooperation

Diplomatic relationships with China started in 1975 when the first EC commissioner visited China. Subsequently a trade agreement was signed in 1978 that was expanded with a more detailed agreement on textile trade in 1979. In 1983 the first science and technology cooperation programme was established followed by the permanent settlement of an EC delegation in Beijing in 1988. In the years following bilateral bonds with China were frozen as a result of violations of human rights by the Chinese government and an arms trade embargo was invoked.

In years following the relationship normalized but the arms embargo stayed in place. In the period 1993-1995 relationships with China suddenly intensified considering the establishment of a European Commission in Hong Kong and officially defined cooperation in the field of the environment.

A landmark in EU-China relationships is a renewed bilateral political dialogue in 1994 and the subsequent EC Communication on China**, "A long-term policy for China-Europe relations",** which was the first official communication on EU-China relationships ever. Furthermore in 1994 the first sectoral dialogue was established namely the EU-China Energy dialogue.

From 1995-1998 political dialogue is established on the information society and human rights. In this same period S&T cooperation is for the first time institutionalized in the form the EU-China economic network (ECAN), a forum for scientific knowledge exchange that is still in place.

Another key event in the EU-China relationship is the publications of the EC Communication **"Building a Comprehensive Partnership with China"** and **"A Long Term Policy for China Europe Relations"** in 1998.

From 1998 onward nine EU-China summits have taken place, which have served as a vehicle to expand and intensify cooperation in various field including renewable energy. In this context six bi-annual EU-China energy conferences have taken place of which the sixth the last was held in Shanghai, 2006. The most important recent initiatives and developments in the field of RE are:

- EU-China Partnership on Climate Change and the associated Joint Declaration.
- EU-China Energy and Environment Programme
- Strategic Dialogue on Energy and Transport
- Science and Technology Agreement

The China-EU Science and Technology Year was launched (from October 2006 to September 2007), coinciding with the start of the EU's Seventh Framework Programme and the renewal of China's 11 Year Plan, which has a strong focus on science and technology. Under the S&T year, many activities took place in China and the EU to promote co-operation across all fields of science and technology. These activities included a wide range of conferences, workshops, seminars, forums and exhibitions.

10.3 EU-China Partnership on Climate Change

The EU-China Partnership on Climate Change provides a high-level political framework that will further strengthen cooperation and which sets out concrete new actions in the field of climate change. It was established during the most recent EU-China Summit in Beijing, 2005. The associated joint declaration on climate change includes a number of RE related points:

- Mutual commitment to CDM (Clean Development Mechanism)
- Practical co-operation on the development, deployment and transfer of low carbon technology, to enhance energy efficiency and promote the low carbon economy.
- Technical cooperation in the fields of:
  - Energy efficiency, energy conservation, and new and renewable energy.
  - Clean coal.
  - Methane recovery and use.
  - Carbon capture and storage.
  - Hydrogen and fuel cells.
  - Power generation and transmission.
- Co-operation in order to reach the following goals by 2020:

  - To develop and demonstrate in China and the EU advanced, near-zero emissions coal technology through carbon capture and storage.
  - To reduce significantly the cost of key energy technologies and promote their deployment and dissemination.
- Scientific cooperation in the field of the adverse ecological and socio-economic effects of climate change.
- Enhancing the scientific, technical and institutional capacity to predict climate change and its impacts.
- Research and development of clean and renewable energy.
- Awareness raising

In the context of the Partnership two action plans were established:

1. The China-EU Action Plan on Clean Coal to promote collaboration in the development of clean coal technologies in China.
2. The China-EU Action Plan on Industrial Co-operation on Energy Efficiency and Renewable Energies.

The main objectives of the action plans are to establish closer contacts and to support the efforts in China to promote industrial co-operation in order to increase the use of energy efficiency and the use of renewable energies in China.

10.4 EU-China Energy and Environment Programme (EEP)

Backgrounds

Established by an agreement between the European Community and the Government of the People's Republic of China signed on April 3rd, 2002, The EU-China Energy and Environment Programme (EEP) is a reflection of both sides' desire to further strengthen EU-China cooperation in the energy sector. The programme will run from 2003 until 2008.

Goals

The EEP aims to achieve the following:

- to foster the cooperation between Chinese and EU industries in China's energy markets.
- to strengthen the security of energy supply in both China and Europe.
- to protect the global environment in line with international objectives (in particular in the context of climate change), and to ensure sustainable development.

The EEP is designed to support these overall strategic aims. Within this context, the EEP is characterized by four components of which the first two are relevant for RTD4EDC:

1. Energy policy development (EPD)
   - **EU China Energy Policy Dialogue** ; high-level forums, workshops and conferences in the emerging topics or by facilitating networking between governments, the academic and business communities in Europe and China.
   - **Sino-European Research Activities**; facilitation of Sino-European research activities focusing on the economic impact of energy policies.

- Policy tools for efficient resource utilisation in municipalities.
- Training and dissemination tools for resource saving (sustainable) consumption behaviour.

2. Increasing the use of renewable energy (RE)
   - **Strengthening Policy Development Capacity**; Renewable energy policy development capacity in China by providing assistance to the drafting of the National Renewable Energy Promotion Law, and by supporting activities to develop technology-specific policy instruments for biomass, off-shore wind, and village power development.
   - **Biomass Resources for Rural Energy Provision**; Providing assistance to the Government of China in devising a national road map to introduce new biomass technologies, while addressing policy as well as capacity building issues. Feasibility and demonstration projects will be undertaken in selected provinces in cooperation with local authorities.
   - **Off-Shore Wind Energy Resources**; assisting the NDRC (National Development and Reform Commission) in conducting off-shore wind resource mapping and by assessing the feasibility of developing off-shore wind farms in South Eastern China.
   - **Rural Energy Support Training Centers**; The EEP Renewable Energy Component has worked in close cooperation with CRED (Centre for Renewable Energy Development) and with the NDRC Energy Bureau in order to define a training concept to help manage the existing and future Renewable Energy systems in an economically sustainable manner. Attention was particularly placed on schemes to develop productive uses of energy, and on ways to encourage the development in China of Rural Energy Service Companies.
3. (Improving energy efficiency (EE))
4. (Increasing the use of natural gas (NG))

Actors Involved

The Ministry of Commerce of the People's Republic of China (MOFCOM), The European Commission, the National Development and Reform Commission (NDRC), the Ministry of Science and Technology (MOST), the Energy Research Institute (ERI), and the China National Petroleum Corporation (CNPC).

Budget

Total budget of EEP is 42.9 million euros of which 20 million will be funded by the European Commission.

Workshops and Conferences

Various workshops and conference have taken place in the context of EEP.

High Level Strategic Dialogue on Energy and Transport

A Memorandum of Understanding establishing an "EU-China Dialogue on Energy and Transport Strategies" between DG TREN and the NDRC (National Development and Reform Commission) was signed on the occasion of the EU-China Summit on 5th

September 2005 in Beijing. The first meetings in the context of this dialogue took place in Brussels on 21st March 2006, with the energy discussions focussing on:

- Energy policies.
- Energy efficiency, energy savings and the environmental impact of energy.
- Technology co-operation and renewables.

Science and Technology Cooperation

A first official Science & Technology agreement went into force in 1998. The agreement was renewed in 2004. In 2005 at the EU-China summit in Beijing a Joint Declaration on EU-China research cooperation was signed. The accelerating S&T cooperation between the EU and China is accentuated by the declaration of a "EU-China Science and Technology Year" which runs from October 2006 to September 2007.

EU-China S&T cooperation has largely taken place through the EU's RTD Framework Programmes (FP). In FP5 and FP6 Chinese entities were already eligible for particular calls. FP7 in principle is open to any entity, whether located in the EU or third countries including China. Over 130 joint EU-China research projects have taken place accounting for over 900 million euros of project funding. (The number of projects relating to RE is not known.)

One of the problems that were mutually recognized in the context of the framework programmes was the problematic cooperation between Chinese and European scientists:

"Cultural background differences lead to difficulties to Chinese participants in their application for projects. Chinese scientists are not familiar with European practice. Information availability was another problem in China. The Framework Programme was not familiar to the mass Chinese scientists. So they could not get the programme information on time, which leaves few opportunities for them to try. In addition, very few Chinese scientists and European scientists know each other even they work in the same field. It was difficult for them to find partners and submit proposals jointly."

Therefore the China-European Union Science & Technology Cooperation Promotion Office (CECO) was established in June 2001. The office has the following tasks:

- To follow, study and analyze the EU science and technology policy as well as the development of the Framework Programme
- To publicise information on the China-EU cooperation policy, the Framework Programme and cooperation activities to S&T and industrial communities through web, publications, conferences, etc.
- To study the participation of EU member states and associated states in the Framework Programme and technical skills in project application, to establish partnership relations with relevant organizations in the EU Member States and Associated States.
- To assist Chinese research institutes, universities, enterprises and researchers finding European partners
- To offer consulting services and guidance to Chinese partners in project application

- To organise conferences and meetings and receive business visits within the framework of China-EU science and technology cooperation, according to the arrangements by the International Cooperation Department of MOST
- To keep a database with network offices and of interested Chinese scientists for quick dissemination of information, calls for proposals, etc.
- To link with National Contact Points for the Framework Programme in the EU Member States and Associated States.

Text Box - Example climate-relevant research projects

Projects funded by the EU that involve or directly benefit developing countries include the following:

- *The **TOCSIN project** is examining options for reducing greenhouse gas emissions in China and India, with a focus on key industries and technologies such as power generation, agriculture and transport. With the involvement of institutes in both countries, TOCSIN is also analysing the potential for enhancing technological cooperation between the EU and China and India, for instance on clean coal technologies and on widening the two countries' participation in the Clean Development Mechanism.*
- *The **Bioethanol For Sustainable Transport (BEST)** project (www.best-europe.org) was executed by a consortium between 30 institutions in seven European countries plus Brazil and China and was supported by FP6 with EUR 8 million out of a total budget of EUR 17.4 million. It aimed at demonstrating an extensive substitution of petrol and diesel to bioethanol, initiating a lasting and accelerating development of bioethanol fuel all over Europe through efficient ways of marketing and training, and paving the way for a market breakthrough for ethanol-fuelled vehicles. The objective was to reduce dependency on oil and greenhouse gas emissions through a fine-tuned method of market introduction. The strategy was to introduce vehicles and distribution lines at ten carefully chosen sites in an integrated public-private partnership of cities/regions, car manufacturers, fuel producers, fuelling stations and fleet owners combined with targeted marketing campaigns. Almost 9000 vehicles and more than 150 fuelling stations were planned to result from the project, which made it the largest demonstration of alternative fuelled vehicles supported by the Commission.*

10.5 Lessons learnt for RTD4EDC

China has become an important player on the international stage both economically as politically and is among the EU's most important trading partners. Therefore China and the EU are mutually dependent.

- The **EU-China Partnership on Climate Change** provides a high-level political framework that will further strengthen cooperation and which sets out concrete new actions in the field of climate change.
- **EU-China S&T cooperation** has largely taken place through the Framework Programmes (FP). In FP5 and FP6 Chinese entities were already eligible for particular calls. FP7 in principle is open to any entity, whether located in the EU or third countries including China. Over 130 joint EU-China research projects have taken place accounting for over 900 million euros of project funding. The number of projects relating to RE is not known.

11 EU-India Bilateral RE Related Linkages

11.1 General Introduction

India is one of the EU's largest trading partners and the EU is the largest source of foreign direct investments in India. Therefore it is a mutual interest for both the EU and India to maintain and enhance political cooperation in various fields.

India has experienced fast growth both economically as in terms of population India expects further growth in future. Subsequently the demand for energy is increasing. India still heavily depends on environmentally unfriendly coal burning for its energy needs, which has contributed to haze and pollution. India heavily relies on energy-intensive industries for their development. Therefore it is actively pursuing alternative energy resources, such as wind and solar, and hydro.

Bilateral cooperation between India and the EU has been evolving rapidly since the middle of the 90's.

11.2 Historical Overview of EU-India Bilateral Cooperation

The relationship between India and the EU goes back to the early 60's. India was among the first countries to set up a diplomatic relationship with EEC followed by bilateral agreements signed in 1973 and 1981.

In 1993 an agreement was signed in which a commitment to cooperation in various spheres was agreed. This agreement went well beyond cooperation in trade and economics. It enclosed energy and development issues. Together with the cooperation agreement a joint political statement was signed that forms the institutional basis of the EU-India relationship. The statement fixed annual ministerial meeting and opened up possibilities for a broad political dialogue.

In 1996 the EU has published an official communication called "the EU-India enhanced partnership". This document meant a large leap forward in intensifying the EU relationship with India. The communication, for the first time acknowledged the importance of India with respect to environmental and CO2 related issues, for which the ways were paved by the 1992 Rio Earth Summit. Among various sectors of specific interest cooperation in the field renewable energy technologies were mentioned.

In the years 2000-2008 nine EU-India summits took place, which resulted in a political declaration on a **strategic partnership** established in November 2004 at the fourth EU-India summit in The Hague. At the sixth EU-India summit Delhi (2005), agreement was reached on an extended and ambitious action plan. In this **Joint Action Plan** concrete cooperation was proposed in the fields of clean development, climate change and energy (among other fields of cooperation). Relevant outcomes for RTD4EDC were the establishment of an EU-India **Initiative on Clean Development and Climate Change** and a proposal to set up an EU-India energy panel.

11.3 EU-India Action Plan Support Facility Programme

At the 2nd of March 2007 the EC and India signed the Financing Agreement for the EU-India Action Plan Support Facility Programme (APSF). The Programme has been designed to implement the Joint Action Plan endorsed at the EU-India Summit of September 2005 in the framework of the EU-India Strategic Partnership adopted in November 2004.

"The EU-India Action Plan Support Facility Programme is a decisive instrument for providing a prompt and immediate support to sector policy dialogues between the EU and the Government of India and taking action in the main priority areas identified by the Joint Action Plan" (source: EC P&I/2007/006)

The APSF will provide support to:

- policy dialogues in the key sectors of environment (e.g. waste, climate change),
- energy (e.g. clean technologies, energy efficiency and renewable energies),
- education (Contemporary Study Centres),
- employment,
- labour issues and social policy (e.g. skills, training and employment issues),
- industry policy and business co-operation (e.g. investment opportunities, industrial standards, etc.).

APSF main activities include joint sector studies and research works, seminars and workshops, needs assessments, advice and technical assistance (capacity building), study tours and exposure visits. The APSF also includes specific actions for promoting the development of Contemporary Study Centres on both sides and supporting cultural exchanges. The APSF is going to be implemented over a **period of 4 years**, laying the foundation for further possible actions foreseen under the next programming period of EU-India Co-operation.

The APSF has a budget of 8 million euro and is funded by the EC.

The APSF will serve as a supportive framework for the EU-India Initiative on clean development and climate change, The EU-India Energy Panel and Science and Technology Cooperation Agreement.

11.4 EU-India Initiative on clean development and climate change

The initiative relies on a mutual commitment to implement voluntary practical measures and will be maintained through the successive EU-India Summits. In particular both the EU and India agreed to:

- Identify and develop ways of widening access and overcoming the barriers to dissemination of clean technologies;
- Increase funding and promote public-private partnerships for research and development of cleaner technologies;
- Promote adaptive research and development to suit the resource supply of both parties;

- Reduce the price gap between "cleaner" and "less efficient" technologies by seeking economies of scale;
- Hold experts' meetings on climate change, including on the Clean Development Mechanism (CDM) in 2005.

It was also agreed that the EU and India would cooperate in strengthening the implementation of the clean development mechanism (CDM) and to encourage companies to engage in CDM projects. Furthermore it was appointed that the issue of climate change would be incorporated and integrated in their respective sustainable development strategies. Finally both sides agreed to cooperate to enhance the scientific, technical and institutional capacity to predict climate change and its socio-economic impacts.

11.5 The EU-India Energy Panel

The EU-India Energy Panel has been established as part of the EU-India Strategic Partnership in June 2005.

Goals

Energy is of major significance for both India and the EU. Both sides recognise the need to work towards achieving safe, secure, affordable and sustainable energy supplies. Joint efforts in the development of more efficient, cleaner and alternative energy chains will be paramount.
In this context, an India-EU Energy Panel has been set up to coordinate joint efforts and discuss energy related matters of mutual interest.

Key events

Key events of the EU-India Energy Panel that took place, are:

- Inaugural meeting, June 2005
- 2nd meeting, April 2006
- 3rd meeting, June 2007

Instruments

The Energy Panel has set up Working Groups in the areas of:

- Energy efficiency and renewable energies;
- Coal and clean coal conversion technologies;
- Fusion energy including India's membership in ITER.
- Petroleum / natural gas

For the RTD4EDC project the working group on energy efficiency and renewable energies is most relevant. It will therefore be described below.

Working Group on Energy Efficiency and Renewable Energies

In March 2006 the first meeting of the working group took place in New Delhi. Growing demand for energy in future for both entities was acknowledges as was the mutual benefits that both parties could reap from cooperation. The meeting had an explorative nature and the action points agreed upon can be interpreted as a roadmap for future cooperation.

Involved Actors:
DG TREN , DG RELAX and senior officials of the Indian Ministry of Power.

Agreed action points for cooperation:

- Energy Efficiency:
  - Public awareness raising.
  - Standard setting for energy using products.
  - EU best available technologies.
  - Integrated approach in energy efficient building.
- Non-Conventional Energy Resources:
  - RTD&D on solar photo-voltaic, solar thermal (high temperature), biomass combustion and biomass gasification. (under FP7)
- Biodiesel:
  - Cultivation of jatropha.
  - Improved process of trans-esterification.
  - Impact of bio-diesel used by cars.
- Increasing efficiency of coal based power generation:
  - Clean coal technologies.
  - EU-India industry to industry contacts.
  - EU best practices on coal plant maintenance.
- Electricity Market and Integrated Grid:
  - Regulation of electricity markets.
  - Financing new grid interactions.
  - Various grid technologies.
  - Bilateral exchange of experts.
- Contracting of studies by EU to India under Strategic Joint Action Plan: The following three areas were identified for studies/projects with estimated cost of 300,000 Euros each:
  - Eco-design and standards for energy using products.
  - Assessment of potential of using bio-fuel in India.
  - Study on renovation and modernization of two thermal power plants to be identified.

Science and Technology Cooperation Agreement

Another notable and relevant feature of the bilateral cooperation between India and the EU is the Science and Technology Agreement that was signed in November 2001. The agreement is implemented by the DG Research and the Department of Science and Technology of the Indian Government. The Agreement was further materialized in the Joint Action plan for the Strategic Partnership established in 2004 in which concrete plans for action in the field of science and technology were integrated.

The agreement is operationalised by a Steering Committee that has had three meetings thus far. The meetings resulted in the recognition of S&T focus areas and the organization of several EU-India workshops. On the highest political level the importance of S&T cooperation was highlighted in the joint declaration of the 7th EU-India Summit in Helsinki 2006:

"The EU and India recognise the critical role of science and technology (S&T) in striving towards their respective knowledge-based economies and the mutual benefits of further strengthening joint research and S&T co-operation. The leaders look forward to the renewal of the EU-India S&T agreement in 2007. Both sides welcomed India's full membership in the ITER project."

In February 2007 the first EU-India Ministerial Conference on Science took place in New Delhi, which was another landmark in S&T cooperation.

Indian participation under FP6 has been relatively strong. Between 2002 and 2006 more than 80 projects were funded, that involved Indian researchers. These projects received more than €250 million of funding, with the Indian partners receiving more than €11 million. Remarkably, none of these projects addressed renewable energy related technologies or policies.

11.6 Lessons learnt for RTD4EDC

- India, economically is a very important partner for the EU and vice versa. Diplomatic contacts between the EU and India date back to the 70's. Therefore, more than is generally the case, renewable energy related policies, activities and cooperation cannot be seen separately, but should be placed in a broader political context.
- There is e clear need for supportive action. The bilateral science and technology agreements between the EU and India clearly show their impact on successful participation in EU RTD&D schemes. Still, the collaboration is based on cost sharing and a set of complex administrative rules, two huge hurdles to take in setting up projects with EU partners and creating access to the Framework Programme. Alignment of programmes and local assistance in developing joint proposals with EU partners is of crucial importance.
- An extended and dedicated institutional bilateral framework is in place with regard to cooperation in the fields of renewable energy, clean development and climate change considering the **EU-India Initiative on clean development and climate change** and the **EU-India Energy panel**.
- Cooperation consists of information exchange on management and governance of energy related issues as well as cooperation in the field of science and technology
- Cooperation in the field of RTD&D is enhanced by an agreement on science and technology cooperation, which allowed Indian scientists to participate in EU research projects. Today, opening of India research projects to EU scientists is uncommon.
- Indian participation under FP6 has been relatively strong. Between 2002 and 2006 more than 80 projects were funded, that involved Indian researchers. Remarkably, none of these projects addressed renewable energy related technologies or policies.

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ANNEXES

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Annex I: Environmental Directorate OECD and IEA

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Annex A: List of RE projects under ACP-EU Energy Facility

Country	Name of Applicant	Name project
Burkina Faso	N.V. Nuon	Solar energy for improved energy services in rural areas
Cabo Verde	Agua de Ponta Preta, Ltda	Servicio Energetico Sostenibile para poblaciones Rurales Aisladas mediante Micro-redes con energia renovables en la Isla de Santa Antao (Capo Verde)
Dominica	Commonwealth for Dominica	Preparation of geothermal based cross border electrical interconnection in the Caribbean
Dominican Republic	PNUD	Programa de electrificacion rural en Republica Dominicana basado en fuentes de energia Renovable
Dominican Republic	Consorcio Tecno DEAH, s.a.	Conversion de la biomasa a energia electrica en Mata de Palma, comunidad canera tradicional de la provincia de el seibo
Ethiopia	Plan UK	Community managed renewable energy programme for rural Ethiopia.
Ethiopia	Lay Volunteers International Association	HydroBioPower: livelihood improvement in rural area through collaborative development of renewable energy sources in Oromia and Southern Nations Regional States of Ethiopia
Ghana	Kumasi Institute of Technology, Energy and Environment	Facilitating the provision of sustainable energy and environment for rural development
Guinea	Ministère de l'Hydraulique et de l'Energie	Levée des obstacles au développement de la filière pico hydroélectrique en Guinée
Kenya	Arid Land Development Focus	Promoting use of sustainable energy in Wajir District
Kenya	Tana and Athi rivers Development Authority	Community based mini hydropower development in upper tana river basin for poverty alleviation
Madagascar	Zecca Prefabbricati	Aménagement hydro electrique du site de Befanaova sur la rivière Sahambano et projet d'electrification rurale dans la zone de Ihosy – Madagascar
Madagascar	Fondation Energies pour le Monde	Electrification rurale décentralisée par énergies renouvelables dans le sud de Madagascar
Madagascar	Electriciens Sans Frontières	Projet LEMENA: Mise en place d'un resau electrique local en zone rurale à partir d'une resource renouvlable
Madagascar	Centre de Coopération Internationale en Recherche Agronomique pour le Développement	Bioenergelec
Madagascar	GRET	Programme Rhyviere-Madagascar (reseau hydroélectrique villageois énergie et respect de l'environnement)
Malawi	Concern Universal	Msamala sustainable Energy Project
Mauritania	Tenmya	Projet d'initiatives locales d'électrification solaire (PILES)
Mozambique	Fundo de Energia	Improved acess to energy services in isolated rural areas of Mozambique by application of photovoltaic systems
Mozambique	Consejo Interhospitalario De Cooperación	Red de centros de servicios energeticos basicos alimentados con sistemas fotovoltaicos basados en la mejora de servicios sociales basicos y en desarrollo de capacidades locales y la autogestion energetica para comunidades rurales aisladas de Mozambique
Nigeria	Development outreach	Solar Energy Solutions for Motive power needs in energy poor niger delta communities

RDC	World Wide Fund for Nuture Belgium	Eco Makala: viabilisation durable de l'approvisionment en bois-energie des populations rurales riveraines de la ville de Goma
Regional: all ACP countries	E-Parliament	Energy access for the poor: improving energy governance by informing and engaging ACP Legislators
Regional: Caribbean	General Secretariat of the Organization of American States	Increasing the sustainability of the energy sector in the Caribbean through improved governance and management
Rwanda	Care Osterreisch	Community assisted Acces sustainable energy in Rwanda (CASE-RWANDA)
Tanzania	Mufindi Tea Company	Mwenga 3 MW hydro Power Plant
Vanuatu	Vanuatu Renewable Energy and Power Association	The answer is blowing in the wind - Improving acces to energy services for the communities of Futuna and Aneityum Islands (Vanuatu) using wind technology
Vanuatu	Malampa Provincial Council	Provision of renewable energy to 4 villages of North East Malekula Island, Malampa province using locally produced copra oil as biofuel
Vanuatu	Penama Provincial Government	Provision of renewable energy to 3 villagesi n Ambae Islands, Penama province, Vanuatu, using locally produced copra oil as biofuel
Vanuatu	Torba Provincial Council	Provision of renewable energy to two villages Vanualava Island, Torba Province (Vanuatu) using locally produced copra oil as biofuel.

Annex B: List of RE projects under COOPENER

In October 2005, the IEEA launched its database of IEE projects, covering SAVE, ALTENER, STEER, COOPENER and Horizontal Key Actions. In addition, descriptions of all projects dealing specifically with sustainable energy in buildings (start date of contracts January 2005) have been compiled in a single document.

The COOPENER projects focus on capacity building and training in developing countries. The underlying aim is to strengthen local policies and legislation and to encourage sustainable energy services for poverty alleviation and sustainable development. Links are drawn to the EU energy initiative for poverty alleviation and sustainable development in Africa, Asia, Latin America and the Pacific.

The COOPENER projects include:

Country/Region	Name of Applicant	Name project
Madagascar	l'université de Magdeburg (Allemagne) et l'état malgache	Poverty Eradication and Planning of Sustainable Energy (PEPSE)
West-Africa	Centre de coopération Internationale en Recherche Agronomique Montpellier - FRANCE	Biomass Energy Platforms Implementation for Training in Africa (BEPITA)
Keyna, Uganda, Tanzania	ESD (UK)	Mitigating Risk and Strengthening Capacity for Rural Electricity Investment in Africa (MIRREIRA)
Namibia, South Africa, Botswana, Zambia	INWENT (DE)	Integrated Southern Africa Business Advisory (INSABA) INSABA intends to provide an intensive knowledge base for users and producers of energy services.
Kenya, Tanzania, Uganda	IT POWER (UK)	Building capacity in renewables in the health, education and water sectors to help meet poverty reduction targets in sub-Saharan Africa (ENABLE)
Cameroon, Senegal	Centre Wallon de Recherches Agronomiques CRA-W (BE)	Removal of non technological barriers to encourage SME energy efficiency by the rational use of biomass (ENEFIBIO)
Cape Verde, Mauritania, Senegal, Gambia, Guinea Bissau, Burkina Faso, Mali, Niger and Chad	Instituto Superior Técnico IST (PO)	Energy for Poverty Alleviation in Sahel (IE4SAHEL) Goal is to contribute to poverty alleviation for a wide variety of energy users through the development and dissemination of appropriate and sustainable energy policies at a regional and national level in the Sahel regio.
Niger, Burkina Faso, Mali, Cameroon	IED (FR)	Improving the economic and social impact of rural electrification (IMPROVES-RE)
Kenya, Tanzania, Uganda, Senegal, Burkina-Faso, Mali	Free Energy Foundation (NL)	PROVEN in rural Africa aims to promote the replication of best practice approaches that have proven their effectiveness in the decentralised rural electrification using renewable energies in West- and East-Africa.
South Africa	ECN (NL)	Alleviation of Poverty through the Provision of Local Energy Services (APPLES)
Kenya, Tanzania, Uganda, Nigeria, Senegal, Mali, Ghana, Botswana, Swaziland, Lesotho, South Africa	ETC – ENERGIA Coordination Secretariat (NL)	Turning Information into Empowerment: Strengthening Gender and Energy Networking in Africa (TIE-ENERGIA)
Botswana, Ghana, Mali, Senegal,	RISOE (DK)	Development and Energy in Africa (DEA); The aims are to identify and examine the developmental impacts of energy

Tanzania, Zambia		innovations and actions linked to improving energy access and poverty alleviation and to use the information obtained to improve energy interventions through the energy policy makers and institutions in the countries concerned.
Niger, Senegal, Benin, Togo	L'Agence intergouvernementale de la Francophonie (AIF)	Appui à la mise en place de systèmes d'informations énergétiques nationaux (SIE-AFRIQUE II); The project aims at contributing to the elaboration of coherent and structured national energy policies in Sub- Saharan African countries by supporting the implementation of national energy information systems.
Niger, Senegal, Mali, Burkina Faso	ADEME (FR)	Mainstreaming Energy for Poverty Reduction and Economic Development into EU Development Assistance (MEPRED); The objective of MEPRED is to "mainstream" energy for poverty reduction and economic development into national development strategies and programmes, and specifically into EU development assistance activities.
South Africa, Mozambique, Zambia, Swaziland	Energy for Sustainable Development (INT)	Renewable and Efficient Energy for Poverty Alleviation in Southern Africa (REEPASA)
Angola, Cabo Verde, Mozambique, Sao Tome e Principe	MVV Consulting GmbH (DE)	Energy Efficiency Training of Trainers (EETT); The purpose of the project is to build capacities through the set- up of a training system for skilled human resources in the area of energy management in four sub-Saharan Portuguese-speaking African countries, which have a serious lack of qualified people in this area.
Tanzania, Uganda, South Africa	Chair for Environmental Architecture - University of Dortmund (DE)	Promoting Renewable Energy in Afrioca (PREA) aimed at reducing poverty by influencing energy policy and regulation, in Africa, through training and capacity-building of energy professionals and policy-makers, implementers, regulators, energy suppliers, academicians, consultants and other energy related professionals to enhance their skills in implementing Renewable Energy Technologies and Energy Efficiency (EE) in Buildings in Africa.
Sudan, Ethiopia, Benin, Niger, Senegal, Togo, Burkina Faso, Mali, Ghana, Mauritania, Tchad, Guinea Bissau, Ivory Coast	GRET	Réseau International d'Accès aux Energies Durables (RIAED); Contribute to poverty alleviation by improving and increasing the expertise available in sub-Saharan African countries. By improving the capabilities of experts in public institutions such as electrification agencies to whom the responsibility for designing regulatory frameworks and national energy infrastructure programmes has been delegated.
Senegal	ROBOTIKER (ESP)	Promotion of Microgrids and RES (Renewable Energy Sources) For Electrification in Developing Countries (MICROGRIDS); The main objectives of the project are the promotion and dissemination of the use of micro-grids with high content of RES (Renewable Energy Sources) for the electrification of villages far away from grid in Senegal.
Equador, Peru	CIRAD (FR)	Biomass Energy Platforms Implementation for Training in Latin America (BEPINET); The main focus of the project is capacity building in the field of biomass energy technology, in order to increase the implementation of biomass technology and facilitate the set up of policy options to boost the promotion of decentralised biomass production and biomass based energy generation.
Peru	NEN, Stichting Nederlands Normalisatie-instituut (NL)	Strengthening energy services legislation and market conditio for enabling sustainability and poverty alleviation in Peru (SAFENERGY PERU)
Bolivia, Paraguay	IT Power (UK)	Linking Income-Generating activities and micro-enterprises with Energy Services for the Poor in the Chaco Region (CRECER CON ENERGÍA)
Peru, Argentina, Mexico	Centro ABITA (Interuniversity Research Centre in Bioclimatic	Renewable Energies and Energy Effiency on the Built Environment (Habit@); Habit@ initiative proposes to integrate the technical innovative experience and know how

	Architecture and Technological Innovation for the Environment) (IT)	achieved by EU research Institutions with local actors in the field of sustainable and energy efficient policies in Latin America (Mexico, Peru and Argentina).

Annex C: List of RE projects under EUREKA

Text Box: Eureka Renewable Energy Project list

- *E! 4157 SOBOCON: Low Cost Production Process For Hydrogen Storage Material (Sodium Borohydride)*
- *E! 4151 LTDASOFC: Development Of A 1 Kw Direct Alcohol Low Temperature Solid Oxide Fuel Cell*
- *E! 4120 ECOTRAFO: Design And Development Of Ecological Power Transformers, With High Security Level And Improved Lifetime*
- *E! 4149 MEMSW : Manufacture And Estimation Of Multi-Crystalline Solar Wafer Using Residual Silicon*
- *E! 4117 HTH PUMP: High Temperature Heat Pump For Exploitation Of Low Temperature Geothermal Sources*
- *E! 4033 TRISAFON (DEF): Feasibility Study Of Mass Production Non-Si High Concentration Photovoltaic Systems*
- *E! 4018 CAMELINA-BIOFUEL: Development Of Technology To Manufacture Biofuels Using Camelina Sativa Oil As New Raw Material Base*
- *E! 3958 SOLAR HEAT PUMP: Development Of A Solar Heat Collector For The Complete Heat Supply Of A House In Combination With A Heat Pump*
- *E! 3944 RENEVOIL&FUEL: Development Of Technology For Processing Plant Oils And Spent Fats As Components Of Biodegradable Lubricants And Fuels*
- *E! 3935 EUROENVIRON UMEG: Utilisation Of Marc For Energy Generation*
- *E! 3812 FOTOINTEGRAL: Technological Development Of An Optima Roof Structure For The Integration Of Evalon Solar*
- *E! 3795 DSSC: Low Cost Super Cells - New Generation Low Cost Dye Solar Cells*
- *E! 3775 BIOUH: Development Of New Technology And Equipment For The Ultrasonic Pre-Treatment Of Various Biosolids*
- *E! 3703 SONIHYDRO: Development Of Novel Ultrasonically Assisted Technologies And Equipment For Hydrogen And Biofuel Production Processes*
- *E! 3650 BIOFIX: Use Of Carbon Dioxide From Flue Gas For Production Of Microalgae*
- *E! 3646 INELIN: Intelligent Electrical Installation*
- *E! 3545 TODAY: Mass Production Of Flat Concentration Pv (Photovoltaic) Modules For Cost-Effective Energy Generation*
- *E! 3460 PROGRESS: Development Of A New Manufacturing Process: From Silicon Ribbon Optimised Growth To Rear-Contacted Silicon Solar Cells*
- *E! 3414 BIOPOLY HEAT: Multifuel-Polygeneration For Distributed Heating And Cooling Applications*
- *E! 3403 ELECTROCON: Development Of A New Commutated Electronic Power Converter, With Great Versatility In The Transfer Of Energy*
- *E! 3362 SENSIC: Stability Of Advanced Lp-Cvd Zno Within Encapsulated Thin-Film Silicon Solar Cells*
- *E! 3314 NEPSOS: New Process For Solar Silicon*
- *E! 3246 HYDRODYNA: Harnessing The Dynamic Behaviour Of Hydro Turbines, Storage Pumps And Pump-Turbines*
- *E! 3163 MYCRYSTAL: Thin Film Silicon Solar Cells*

Annex D: EU markets for biomass feedstock production in EDCs

The European Commission is convinced that renewable energy in general, and biofuels in particular, have an integral role to play in Europe's future energy policy. Biofuels and Renewable Energy have a key role in tackling climate change. Renewable energy is the only energy source with the capacity to deliver big improvements in overall greenhouse gas emissions and security of supply over the next 15 years. Analysis of the European Commission concluded that in any serious European energy policy, renewable energy will have to come in from the margins and play a central role. (Andris Piebalgs, Energy Commissioner, Speech at the eBio General Assembly, Brussels, 25 January 2007)

10% biofuels target in 2020

The EC has proposed an ambitious minimum 10% target for the share of biofuels in each Member State in 2020. This target is backed by supporting measures. Next step will be to translate these policies into legislation. Member States will then need to make a National Action Plan showing how they will divide up their overall target between renewable energy in electricity; renewable energy for heating and cooling; and biofuels. Each Member State's biofuels target will have to be (at least) 10%. The reason is that biofuels can easily be transported and traded – giving each Member State more or less the same access to them. Moreover, biofuels are more costly than other forms of renewable energy. The EU biofuel target will be an enormous driving force for increased production of biomass feedstocks in EDCs and RTD&D of second-generation biofuels.

EU biomass and biofuels action plan

European Commission proposes an ambitious biomass and biofuels action plan and calls on Member States to do more for green electricity. The Plan outlines measures in three sectors: heating, electricity and transport. The Commission urges Member States to remove barriers to the development of green electricity. The administrative requirements should be reduced: clear guidelines, one-stop authorisation agencies, pre-planning mechanisms and simpler procedures are needed. Transparent and non-discriminatory grid access must be ensured and necessary grid infrastructure development should be undertaken, with the associated costs covered by grid operators.

The Biomass Action Plan - announces more than 20 actions; most of them will be implemented from 2006 onwards.

- For transport biofuels, they include promotion of “biofuels obligations”.
- reviews of how fuel standards could be improved to encourage the use of biomass for transport, heating and electricity generation;
- investment in research, in particular in making liquid fuels out of wood and waste materials;
- campaign to inform farmers and forest owners about energy crops.
- work on future EU legislation to encourage the use of renewable energy in heating.

Member States are using two main tools to implement the Biofuels Directive: tax exemptions and biofuels obligations.

1. Tax exemptions - Member States make a good deal of use of fiscal policy to promote biofuels. The energy taxation directive establishes the framework for the consequent tax exemptions. Member States can reduce taxes on biofuels or completely exempt them from taxes, without needing the Commission's prior approval (on fiscal grounds), as long as they respect certain strict conditions. The fiscal advantage granted to a fuel of renewable origin cannot exceed the difference between this fuel and an equivalent fossil fuel.
2. There is an increasing interest among Member States in the use of biofuel obligations, requiring fuel supply companies to incorporate a given percentage of biofuels in the fuel they place on the national market or face a penalty. Obligations are in force in France and Austria and will come into force in Slovenia in 2006 and in the Czech Republic and the Netherlands in 2007. The UK and Germany have announced them.

The Biomass Action plan announces support to developing countries by helping them to produce biofuels (market access conditions that are no less favourable than those provided by the trade agreements currently in force).

On the long term, countries with surplus biomass potential could develop into exporters of bioenergy (biofuels from biomass). There are several world regions that could have export potential, e.g. the FSU, Oceania, and East Africa. Studies prove invariably that the energy penalty of biomass transport by ship for 'raw' biomass is not an insurmountable problem. Biofuel is most promising, as the cost of electricity based on imported biomass could be high compared to conventional alternatives.

Supportive measures

"Flanking measures" to support this biofuel policy, include:

- First, the Commission will maintain the "balanced approach" to trade in biofuels, defined in the biomass action plan at the end of 2005. This means that policy should be designed so that European producers and third countries both benefit from the growing market for biofuels.
- Second, the Commission will propose the modifications to the fuel quality directive that are needed to accommodate a 10% share of biofuels.
- Third, the Commission will increase RTD support for the development of second-generation biofuels.
- Fourth, the Commission will review Member States' support systems for renewable energy. The focus will be on the electricity sector, but biofuels will also be covered.
- Fifth, the Commission will put forward, as part of its legislative proposal, a plan for an incentive/support system. This should encourage the use of second-generation biofuels; discourage the use of inefficient biofuel production systems and discourage the conversion of land with high biodiversity value, such as tropical forest, to grow feedstocks for biofuels.

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Policy Analysis:
CDM and biofuels - Can the CDM assist biofuel production and deployment? - S.J.A. Bakker, ECN-E--06-033, October 2006
http://www.ecn.nl/docs/library/report/2006/e06033.pdf

The Clean Development Mechanism under the Kyoto Protocol provides an opportunity to direct financing to projects in developing countries that reduce greenhouse gas emissions. This paper aims to evaluate the future potential of CDM for implementation of biofuel production and utilisation. This might contribute significantly to both goals of the CDM.

The current portfolio of over 800 projects includes several different renewable energy technologies, but no biofuel projects. This paper gives an analysis of the current state of affairs regarding CDM and biofuel. It also discusses the barriers and opportunities relevant to developing biofuel projects under the CDM.
Conclusions:

1. Biofuel projects are in principle eligible under the CDM. The most important barriers to further development of biofuel CDM project are establishing approved baseline and monitoring methodologies. Approval of baseline and monitoring methodologies are crucial.
2. From the five biofuel CDM projects up to PDD stage, it can be observed that 1) biomass sources are very different, 2) most projects are about biodiesel, 3) host countries are all in South/South-East Asia and 4) the claimed well-to-wheel GHG reduction is between 70 and 97%.
3. CER revenues will in most cases only cover part of the additional cost of biofuels compared to conventional fuels. Monitoring requirements may also be substantial. On the other hand, biofuel projects may be an opportunity to develop projects with strong sustainable development components, and as such contribute strongly to the twin-objective of the CDM.
4. CO2 abatement costs of biofuels are in general higher than current CER prices, which are in the range of 5-20 €/tCO2. Future CER price trends are uncertain due to uncertainties in the current and post-2012 international climate policy developments.
5. Sectoral CDM may improve the options to develop biofuel projects under the CDM.

Annex E: Clean Development Mechanism

CDM (Clean Development Mechanism) is a relative administrative but successful contribution to RES projects in some EDCs. The CDM has a dual goal:

- To help industrialised countries in achieving their GHG target under the Protocol.
- To assist developing countries in achieving sustainable development.

Currently the CDM market is taking off, with many projects coming on-line, CERs issued and methodologies approved. Renewable energy projects are popular under CDM. CDM is an important supportive mechanism to support RTD&D for renewables in EDCs. Today, especially India is a popular host country, while China and ASEAN countries are increasingly important.

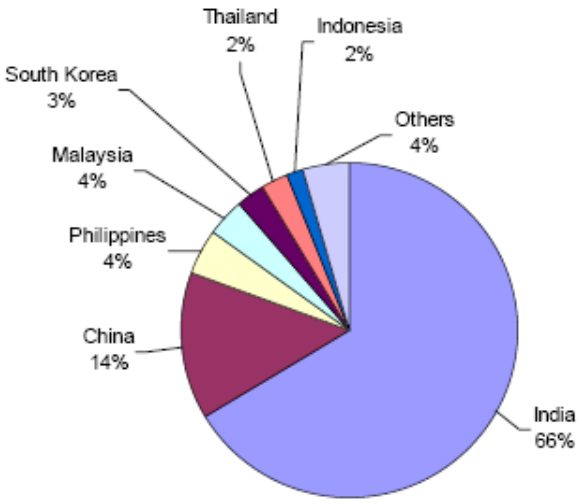

Figure ..: Host countries in Asia, based on number of projects (UNEP/Risø, 2006) [20].

CDM projects are required to go through an administrative project cycle, regardless of the scale and GHG reduction resulting from it. This puts a delay and financial burden CDM projects. Thus economies-of-scale are relevant. CDM projects are subject to a rather complex set of rules as laid down in the Marrakesh Accords (UNFCCC, 2001). It basically comprises two phases: project design and project implementation, subdivided into:

- Project Idea Note: first outline from project developer (not mandatory)
- Project Design Document (PDD): elaborate description of project, estimated GHG reduction, environmental and social impact, stakeholder comments, and including Baseline Methodology and Monitoring Plan.
- Project validation by a Designated Operational Entity (DOE) and comments on PDD.
- Registration of project by CDM Executive Board (EB).
- Implementation of the project.
- Monitoring by the project developer and verification by DOE
- Issuance of Certified Emission Reductions (CERs) by CDM EB.

[20] UNEP/Risø (2006): CDM project pipeline June 2006. www.cd4cdm.org (June 2006)

Annex F: World Bank

Efficient, affordable and clean energy supply is key to poverty reduction and economic growth. The World Bank supports developing countries' efforts to provide cleaner, stable electricity services to households and businesses through its financing instruments, policy advice, partnerships, and knowledge transfer.

At the Bonn International Conference on Renewable Energies in 2004, the World Bank Group made a commitment to accelerate its support for new renewable energy (i.e. solar, wind, biomass, geothermal, hydropower up to 10MW) and energy efficiency. We committed to increase our financial commitments for new renewable energy and energy efficiency at a growth rate of 20 percent per annum between fiscal years 2005 to 2009, compared to a baseline commitment of USD 209 million (equal to the average of the previous three years).

The World Bank Group has outperformed its Bonn commitment. From FY05 to FY07, WBG committed USD 1.8 billion for new renewable energy and energy efficiency compared to the Bonn commitment goal of USD 913 million for the same period and thus exceeded our target by almost 100 percent. The cumulative World Bank Group financial commitments to renewable energy and energy efficiency from FY90 to FY07 exceeded USD 11 billion, with a nearly steady increase in commitments from 2002.

As presented in the progress report on fiscal year 2007 (FY07), total World Bank Group (World Bank, IFC, MIGA as well as Global Environment Facility (GEF) co-financing and Carbon Finance), financial commitments for renewable energy, including hydropower of all sizes, and energy efficiency rose to USD 1.4 billion, reaching 40 percent of total energy commitments. This represents a 67 percent scale up in financing for renewable energy and energy efficiency from USD 860 million in FY06. The GEF has been an important partner contributing USD 128 million in co-financing for World Bank projects. In FY07, we supported 63 renewable energy and energy efficiency projects in 32 countries. Commitments for new renewable energy and energy efficiency were USD 683 million and USD 751 million was committed for hydropower projects greater than 10MW per facility.

The response of markets and the private sector will be critical for successfully increasing energy access and mitigating and adapting to climate change. The continuing focus of WBG efforts will be to support the engagement of the private sector and other partners in this effort, through diverse measures, including investment support, barrier removal, and competitive markets as sources of investment and solutions. The many lessons learned are being applied regionally, from country to country and from one sector to another. Among them are the following:

- Improve the policy and regulatory environment to reduce energy price distortions, mitigate regulatory risks, streamline approval processes, and increase transparency in decision making.
- Adhere strictly to good environmental and social management principles and ensure that all parties — from consumers and affected communities, to energy suppliers and financiers — benefit. Embed sustainability principles in executing agencies.

- Although economic viability may be compelling, financial viability, as well as market and consumer confidence, are sine qua non for project success and scale-up. Pay heed to quality and meet consumer expectations in service and value.
- Increase access to pre-investment and investment financing, and introduce risk management and credit enhancement instruments. Benefit from new instruments, such as those offered by the carbon markets.
- Introduce business models better suited to renewable energy and energy efficiency, including distributed generation. Be adaptable and take advantage of innate capacities within each country.
- Build capacity and increase knowledge among the domestic financial sector, industry, utilities, engineering, policy makers, and consumers. Support South–South knowledge exchanges.
- Facilitate access to improved technologies and strengthen the capacity to plan, design, construct, and integrate such technologies into the energy supply sectors.

Annex G: Results of the Sixth Framework Programme

Profile

FP6 is the European Community Framework Programme for Research, Technological Development and Demonstration. It is a collection of the actions at EU level to fund and promote RTD&D.

FP6 has seven thematic priority areas of research. They cover those areas where the EU in the medium term intends to become the most competitive and dynamic, knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion. General objective of international cooperation activities carried out under the current Framework Programme (FP6) is to help open up the European Research Area to the world.

Instruments, activities and results

Renewable energy research is part of priority 6: 'Sustainable Development, Global Change and Ecosystems'.

International cooperation activities focus on the mutually beneficial efforts of the Community and its Member States on the one hand and INCO target countries and other third countries on the other. The major areas of assistance are

1. third country participation in the various thematic programmes:

a) Eligible participants in FP6 are legal entities (for example research institutes, universities and industry including SMEs, but also natural persons) from any country in the world. As one of the measures to implement the international dimension of FP6, the thematic priority research is open to participation by organisations from third countries with substantial funding included.

b) Moreover, all SME actions are open to participation by organisations from third countries with funding included in the budget as well

2. funding researchers' mobility (Marie Curie actions):

a) Marie Curie Incoming International Fellowships (IIF): These aim at attracting top-class researchers from third countries to work in EU Member or Associated States with a view to developing mutually-beneficial research co-operation.

b) For developing countries, emerging and transition economies, support for fellows to return to their country of origin may be included. Duration of stays can be one to two years.

3. a dedicated programme for international scientific cooperation (INCO)

a) Specific measures in support of international cooperation cover specific international co-operation activities (INCO) with selected groups of countries (Developing Countries, Mediterranean Partner Countries, Western Balkan countries, Russia and the NIS (Newly Independent States of the former Soviet Union)) based on mutual interest and in support of Community external policy.

b) Conditions, thematic areas and budget details applying for the different groups of countries are specified in the work programmes.

Recognising the power of science to serve the decision-making process, the European Commission has launched its 'Scientific support to policies' (SSP) initiative under the

Sixth Framework Programme (FP6) for Research. The SSP projects relating to energy policy are described below:

1. Renewable Energy in Developing Countries: – RECIPES: Objectives: The RECIPES project aims to increase the use of renewable energy in developing countries, by bringing together stakeholders and providing them with sound guidelines for implementing renewables. In particular, the project will identify strategies and solutions that can be of mutual benefit for regional economies, local and European companies and the environment. The project will consider the current level of implementation of renewable technologies in developing countries, their technical potential and the associated costs and benefits, in order to produce practical recommendations for the increased use of renewable energy (www.energyrecipes.org).
2. World Energy Technology Outlook 2050 – WETO-H2: Objective of the WETO-H2 project is to produce a world energy and technology outlook up to 2050. The project assesses various technological developments that might occur in the next 50 years, also in the context of targets for greenhouse gas emissions. WETO-H2 will evaluate two long-term strategies for sustainability. A first WETO report – featuring an outlook up to 2030 – has already been published: ec.europa.eu/research/energy/pdf/weto_final_report.pdf
3. Case Study Comparisons and Development of Energy Models for Integrated Technology Systems – CASCADE MINTS: Objectives: to develop new energy models and to investigate the impacts of sustainable energy policies. The first part of the project focuses on modelling, scenario evaluation and the detailed analysis of the prospects of the hydrogen economy. The second part of the project aims to reach a scientific consensus among modellers on how various economic and energy policies might influence technological development. Main EU, Canadian, US, Japanese and global models will be reviewed and compared.
4. Energy Corridor Optimisation for the European Markets of Gas, Electricity and Hydrogen – ENCOURAGED: Objectives: In view of the importance of diversifying the EU's energy supply, the ENCOURAGED project assesses the optimum network and interconnection infrastructure for electricity, gas and hydrogen in neighbouring regions, such as North Africa, the Middle East, Central and Eastern Europe and Russia. These regions are expected to play a key role in energy supply in the coming decades. The project will evaluate the implications of a large European energy network, and strategic energy corridors.
5. Scientific Reference System on New Energy Technologies, Energy End-use Efficiency and Energy RTD – SRS NET & EEE; Objectives: This project aims to develop a Scientific Reference System capable of enhancing the quality and completeness of data on new energy technologies and energy end-use efficiency, by producing a database containing validated technical and economic information – including all energy technologies, to support energy RTD strategies in a wider context.
6. Dissemination of External Costs of Electricity Supply: Making electricity external costs known to policy-makers – MAXIMA
7. European Sustainable Electricity: Comprehensive analysis of future European demand and generation of European electricity and its security of supply – EUSUSTEL
8. The European Regulation Forum on Electricity Reforms – SESSA

All the information about FP6 is brought together and made available on the Internet at CORDIS, the COmmunity Research and Development Information System (http://www.cordis.lu/fp6/).

References

http://www.cordis.lu/sustdev/
http://ec.europa.eu/research/iscp/index.cfm
rtd-energy@cec.eu.int
rtdsustainable@cec.eu.int
rtd-transport@cec.eu.int
tren-energy@cec.eu.int

Annex H: DG Environment

Profile

Main role of the European Commission's Environment Directorate-General (DG) is to initiate and define new environmental legislation and to ensure that agreed measures are put into practice in the EU Member States. The Environment DG is based in Brussels and has around 550 staff.

Environment DG Mission statement: "Protecting, preserving and improving the environment for present and future generations, and promoting sustainable development."

Strategic Objectives for 2005 – 2009; Key elements of this programme include using cohesion policies to promote competitiveness and growth, while reducing economic disparities. Solidarity must extend to future generations through continued EU leadership on environmental protection including climate change and sustainable management of natural resources.

Environment Technology Action Plan (ETAP)

Stimulate development and implementation of clean-clever and competitive technologies. Since 2004, ETAP covers a spectrum of actions to promote eco-innovation and the take-up of environmental technologies. It includes priority actions along several lines:

- promoting research and development,
- mobilising funds,
- helping to drive demand and improving market conditions.

ETAP Acting Globally - Supporting Eco-technologies in Developing Countries, and Promoting Foreign Investment. ETAP recognises that investment in environmental and RE technologies can combine the potential of increasing employment and economic growth within the EU, with accelerating sustainable development at the global level, particularly in developing countries.

With economic growth, addressing detrimental social and environmental impacts from production activities is becoming increasingly urgent in many emerging and developing countries.

References

Energy for a changing world: http://europa.eu/press_room/presspacks/energy/index_en.htm
ETAP (http://ec.europa.eu/environment/etap/policy_en.htm)
EU WSSD site (http://ec.europa.eu/environment/wssd/index_en.html)

Annex I: United Nations, Commission for Sustainable Development (CSD)

Objective

Energy is central to achieving sustainable development goals. The Johannesburg Plan of Implementation (JPOI), adopted at the World Summit on Sustainable Development in 2002, addresses energy in the context of sustainable development:

- Develop and disseminate alternative energy technologies with the aim of giving a greater share of the energy mix to renewable energy and, with a sense of urgency, substantially increase the global share of renewable energy sources.
- Combine a range of energy technologies, including advanced and cleaner fossil fuel technologies, to meet the growing need for energy services.
- Accelerate the development, dissemination and deployment of affordable and cleaner energy efficiency and energy conservation technologies.

Instruments, activities and results

At its fourteenth session in 2006, the Commission on Sustainable Development (CSD) undertook a review focusing on identifying constraints and obstacles with respect to implementation in the area of energy, which forms part of a thematic cluster with industrial development, atmosphere/air pollution and climate change.

The fifteenth session of the Commission in 2007, will take policy decisions on practical measures and options to expedite implementation in the selected cluster of issues.

References

UN Division for Sustainable Development (www.un.org/esa/sustdev/sdissues/energy/enr.htm)
United Nations Environment Programme (www.unep.org/)

Annex J: Environmental Directorate OECD and IEA

Environmental Directorate OECD

The Environment Directorate of OECD provides governments with the analytical basis to develop policies that are effective and economically efficient, including through country performance reviews, data collection, policy analysis, projections and modelling, and the development of common approaches.

The International Energy Agency (IEA)

IEA acts as energy policy advisor to 26 Member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Founded during the oil crisis of 1973-74, the IEA's initial role was to co-ordinate measures in times of oil supply emergencies.

As energy markets have changed, so has the IEA. Its mandate has broadened to incorporate the "Three E's" of balanced energy policy making:

1. Energy security,
2. Economic development, and
3. Environmental protection.

Treaty objective of the IEA include to promote rational energy policies in a global context through co-operative relations, to improve the world's energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use and to assist in the integration of environmental and energy policies

Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major producers and consumers of energy like China, India, Russia and the OPEC countries.

The 26 Member countries of the International Energy Agency seek to create the conditions in which the energy sectors of their economies can make the fullest possible contribution to sustainable economic development and the well-being of their people and of the environment. Free and open markets are aimed at. IEA countries recognise the significance of increasing global interdependence in energy. They therefore seek to promote the effective operation of international energy markets and encourage dialogue with all participants.

IEA members' shared goals[21] most relevant for RTD4EDC project are:

- Diversity, efficiency and flexibility. Free and open trade and a secure framework for investment. Distortions to energy trade and investment should be avoided. Energy systems should have the ability to respond promptly and flexibly. This can require collective mechanisms and action.
- Environmentally sustainable provision and use of energy is central to the achievement of these shared goals. Renewable sources will have an increasingly

[21] Shared Goals» were adopted by IEA Ministers at their 4 June 1993 meeting in Paris.

important contribution to make. Development of economic environmentally acceptable energy sources need to be encouraged and developed. To the extent necessary and practicable, the environmental costs of energy production and use should be reflected in prices.

- Continued research, development and market deployment of new and improved energy technologies make a critical contribution. Energy technology policies should complement broader energy policies.
- International co-operation in the development and dissemination of energy technologies, including industry participation and co-operation with non-Member countries, should be encouraged. Co-operation among all energy market participants helps to improve information and understanding, and encourage the development of efficient, environmentally acceptable and flexible energy systems and markets worldwide. These are needed to help promote the investment, trade and confidence necessary to achieve global energy security and environmental objectives.

Instruments, activities and results

With a staff of around 150, mainly energy experts and statisticians from its 26 member countries, the IEA conducts a broad programme of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices. IEA studies energy-related developments in energy producing and consuming countries throughout the world and examines the global context for policy decisions. Growth in world energy demand, particularly in the Asia- Pacific region, is expected to accelerate due to the continued growth of rapidly developing economies.

IEA instruments include:

- The IEA's Technology Collaboration Programme, including technologies for renewable energy, electric power technologies and technology assessment methodologies.
- IEA Implementing Agreements (EIA-IAs) offer the framework for collaborative research projects. Renewable energy areas are covered by EIA-IAs (such as bioenergy, solar heating and cooling, wind turbine systems, advanced fuel cells). These important IAs will be explained in more detail in a subsequent paragraph.
- Energy sector surveys undertaken by the IEA include a lengthening list of non-Member countries.
- IEA hosts periodic multilateral technical-level meetings of experts from energy producing and consuming countries to promote understanding and communication.
- IEA and organises seminar/workshops on specific topics such as energy efficiency and regulatory issues with non-Member countries.
- IEA has implemented the Global Renewable Energy Policies and Measures Database (see description below)

The IEA has been mandated by its Member countries to provide analytical work on the energy dimension of climate change and the implications of the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol on the energy sector.

- Together with the OECD Environment Directorate, the IEA provides a Secretariat for the Annex I Expert Group (AIXG) on the UNFCCC, providing analysis of technical issues of relevance to the development of the Convention.

The IEA also undertakes work on options for the future evolution of the international climate change mitigation regime. The IEA participates actively in meetings (COP 8, COP 9, COP 10, COP11/COP MOP1, COP12/COP MOP2). The work programme covers areas, such as:

- emissions trading,
- project based mechanisms (CDM/JI),
- policies and measures, and
- international technology collaboration.

Implementation Agreements (IAs) / Technology agreements

Since its creation in 1974, the International Energy Agency (IEA) has provided a structure for international co-operation in energy technology research and development (R&D) and deployment. Its purpose is to bring together experts in selected technologies. Today, some forty active programmes exist, known as the IEA Implementing Agreements. Such international co-operation helps to eliminate technological risks and duplication of effort, while facilitating processes like harmonisation of standards. Special provisions are applied to protect intellectual property rights.

To encourage technology collaborative efforts to meet global energy challenges, the IEA created a legal contract – Implementing Agreement – and a system of standard rules and regulations. IEA Implementing Agreements are at the core of the IEA's International Energy Technology Co-operation Programme. An Implementing Agreement can be established by two or more IEA member countries subject to approval of the Committee on Energy Research and Technology (CERT) and of the Governing Board. There are two possible categories of participants in Implementing Agreements: Contracting Parties and Sponsors.

IAs allow interested member and non-member governments or other organisations to pool resources and to foster the research, development and deployment of particular technologies. For more than 30 years, this international technology collaboration has been a fundamental building block in facilitating progress of new or improved energy technologies.

The Implementing Agreements include RETs and many other energy related research subjects (such as efficient energy end-use, fossil fuel and fusion power).

Special sections are devoted to the various technology areas covered by the IEA's International Energy Technology Co-operation Programme. These pages can be visited via the links on the main IEA homepage labelled "Energy Technology", "Renewable Energy" and "Energy Efficiency". More than forty individual entries for each of the Implementing Agreements can also be accessed through a link to current programmes, including:

- Bioenergy: www.ieabioenergy.com
- Geothermal Energy Research Technology: www.iea.org/tech/gia/index.htm

- Hydropower Technologies and Programmes: www.ieahydro.org
- Ocean Energy Systems: www.iea-oceans.org
- Photovoltaic Power System (PVPS): www.iea-pvps.org
- Production and Utilization of Hydrogen: www.eere.energy.gov/hydrogenandfuelcells/hydrogen/iea
- Solar Heating and Cooling Systems: www.iea-shc.org
- Solar Power and Chemical Energy Systems (SolarPACES): www.SolarPACES.org
- Wind Turbine Systems: www.ieawind.org
- Advanced Fuel Cells: http://www.ieafuelcell.com
- Hybrid and Electric Vehicle Technologies and Programmes: www.ieahev.org
- Climate Technology Initiative (CTI): www.climatetech.net/about/index.htm

Effective dissemination of results and findings is an essential part of the mandate of each Implementing Agreement. The IEA Secretariat circulates the on-line OPEN Energy Technology Bulletin, which includes news of the Implementing Agreements' activities and output. The IEA also issues publications giving updates on the Implementing Agreements' major achievements over past months.

Lessons learned for RTD4EDC

IEA has a long history of a broad range of well-operating international co-operation mechanisms. Mechanisms of IEA are more and more focused upon climate friendly technologies, researching topics including renewable energies and carbon capture and storage technologies.

IEA has a longstanding experience in data collection and its ongoing efforts to involve non-IEA developing countries. Global review on the progress of Renewable Energy implementation in EDCs could make use and build on the IEA tools and processes, particularly because this would avoid introducing additional reporting schemes for governments and it would allow engaging the energy policy community.
Adequate provisions would need to be made to ensure that regional energy agencies are also involved and that their work in specific regions is properly accounted for (e.g. OLADE for Latin America).

EDCs are poorly represented in the IEA IAs. The mechanism of joining tasks in new and ongoing IAs is a smart route to connect EDCs to state of the art knowledge and research networks. EDC can apply to join specific tasks of interests.

Actions worth proposing to increase EDC participation in IAs:
- Clear targets should be set by IEA to increase EDC participation in IAs.
- The IA initiatives should be presented to EDCs at international high-level meetings and their participation should be actively strived for.
- The mechanisms tot join specific IA Tasks should be brought under the attention of EDC. DCs could be financially supported to make active participation in IAs possible. Participation in IAs is a simple and low-hurdle step to connect a to specific research networks and actions.
- The IAs – especially the RET oriented IAs - should make special information material for EDCs and invite them to join in

Annex K: ICPC countries

List of International Co-operation Partner Countries (ICPC)[1]

ACP *

- AFRICAN

- Angola
- Benin
- Botswana
- Burkina-Faso
- Burundi
- Cameroon
- Cape Verde
- Central African Republic
- Chad
- Comoros
- Congo (Republic)
- Congo (Democratic Rep. of)
- Côte d'Ivoire
- Djibouti
- Equatorial Guinea
- Eritrea
- Ethiopia
- Gabon
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Lesotho
- Liberia
- Madagascar
- Malawi
- Mali
- Mauritania
- Mauritius
- Mozambique
- Namibia
- Niger
- Nigeria
- Rwanda
- Sao Tome and Principe
- Senegal
- Seychelles
- Sierra Leone
- Somalia
- South Africa[2]
- Sudan
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

- CARIBBEAN

- Barbados
- Belize
- Cuba
- Dominica
- Dominican Rep.
- Grenada
- Guyana
- Haiti
- Jamaica
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and Grenadines
- Suriname
- Trinidad and Tobago

- PACIFIC

- Cook Islands
- Timor Leste
- Fiji
- Kiribati
- Marshall Islands
- Micronesia, Federal States of
- Nauru
- Niue
- Palau
- Papua New Guinea
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu
- Samoa

ASIA

- Afghanistan
- Bangladesh
- Bhutan
- Burma/ Myanmar
- Cambodia
- China[2]**
- India[2]**
- Indonesia
- Iran
- Iraq
- Lao People's Democratic Republic
- Malaysia
- Maldives
- Mongolia
- Nepal
- Oman
- Pakistan
- Philippines
- Sri Lanka
- Thailand
- Vietnam
- Yemen

EASTERN EUROPE AND CENTRAL ASIA (EECA)

- Armenia[3]
- Azerbaijan[3]
- Belarus[3]
- Georgia[3]
- Kazakhstan
- Kyrgyz Republic
- Moldova[3]
- Russia[2]**
- Tajikistan
- Turkmenistan
- Ukraine[2,3]
- Uzbekistan

LATIN AMERICA

- Argentina[2]
- Bolivia
- Brazil[2]**
- Chile[2]
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico[2]
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay
- Venezuela

MEDITERRANEAN PARTNER COUNTRIES (MPC)[3]

- Algeria
- Egypt[2]
- Jordan
- Lebanon
- Libya
- Morocco[2]
- Palestinian-administered areas
- Syrian Arab Rep.
- Tunisia[2]
- Turkey[4]

WESTERN BALKAN COUNTRIES (WBC)

- Albania[4]
- Bosnia-Herzegovina[4]
- Croatia[4]
- Former Yugoslav Republic of Macedonia (FYROM)[4]
- Kosovo[5]
- Montenegro[4]
- Serbia[4]

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*In the 'Specific international cooperation actions', Africa can also be considered as a region on its own, while the Caribbean countries can also participate with Latin American and the Pacific countries with Asia.

**For participation in the 'Specific international cooperation actions' each of Brazil, China, India and Russia may be considered individually as a region on its own. Thus, the required two or more partners can be located in these countries. However, in this case, at least two different partners from different provinces, oblasts, republics or states within Brazil, China, India or Russia are necessary.

[1] Up-to-date information on status of countries available at: http://cordis.europa.eu/fp7/who_en.html#countries

[2] Signed an agreement with the EC covering Science & Technology

[3] These countries are also part of the European Neighbourhood Policy (ENP).

[4] Until the country becomes associated.

[5] As defined by UNSC resolution 1244 of 10 June 1999.