


The Energy Challenge:

Access and Security for Africa and for Europe

Africa-EU Energy Partnership

CO-CHAIRS AND PARTNERS

African Union Commission

European Commission

Austrian
Development Cooperation

Federal Ministry
for Economic Cooperation
and Development

Ministry of Renewable Energy and
Public Utilities, Republic of Mauritius

PREFACE: MEETING THE ENERGY CHALLENGE

The energy challenge will be at the centre of the 21st century. How can we meet the needs of those whose future seems bleak, because they have no electricity? Where will the energy come from to power economic development and a rising standard of living? Can we avoid wars over energy? Will our use of energy degrade our planet?

Africa and Europe, because of our historical ties and geographical proximity, have embarked on a common voyage, to meet the energy challenge hand in hand. Thus, African and European Heads of State and Government agreed in Lisbon in December 2007 to launch the Africa-EU Energy Partnership (AEEP), as one of the eight strategic partnerships comprising the Africa-EU Joint Strategy. The AEEP is a long-term framework for structured political dialogue and cooperation between Africa and the EU on energy issues of strategic importance, reflecting African and European needs. Through the Partnership, Africa and Europe will work together to develop a shared vision and common policy answers, and to stimulate specific actions to expand access to energy, to achieve greater energy security and to maximise the contribution of renewable energy and energy efficiency.

The Partnership will strengthen the existing Africa-EU dialogue on access to energy and energy security, at the local, national, regional, continental and global levels. The AEEP aims at mobilising increased financial, technical and human resources in support of Africa's energy development, and at scaling up European and African investments in energy infrastructure and in energy interconnections within Africa and between Africa and the EU.

Let us bring all our efforts together to make this partnership an efficient framework to address these questions and challenges of common concern, and to achieve save and secure energy for citizens in both, Africa and Europe.

Dr. Elham M.A. Ibrahim
Commissioner for Infrastructure and Energy,
African Union Commission

Andris Piebalgs
Commissioner for Development,
European Commission

THE AFRICA-EU ENERGY PARTNERSHIP

The Africa-EU Energy Partnership (AEEP) is a long-term framework for structured political dialogue and co-operation between Africa and the EU on energy issues of strategic importance, reflecting African and European needs. Through the Partnership, Africa and Europe work together to develop a shared vision and common policy answers, and to stimulate specific actions that address the energy challenges of the 21st century.

The overall objective of the AEEP is improved access to reliable, secure, affordable, cost-effective, climate friendly and sustainable energy services for both continents, with a special focus on achieving the MDGs in Africa.

In order to achieve its overall objective, the AEEP will focus its efforts on concrete, realistic, visible targets to be attained by 2020, as agreed by the First High Level Meeting of the AEEP held in Vienna on 14–15 September 2010. Specific initiatives will focus on five priority areas:

- energy access;
- energy security;
- renewable energy and energy efficiency;
- institutional capacity building; and
- scaling-up investment.

AEEP initiatives contribute to existing national, regional and continental energy objectives and strategies in Africa, and will take into account the necessary social and environmental standards.

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First Ministerial High Level Meeting, Sept. 2010, Vienna

Governance Structure

African and European leaders meet at EU-Africa Summits to set the agenda for joint relations. The summit held in Lisbon in December 2007 adopted the Joint Africa-EU Strategy comprising of eight strategic partnerships of which the AEEP is one.

Joint Expert Groups and African and EU Implementing Teams which select Co-Chairs have been set up to guide implementation. The energy partnership so far has jointly met in Brussels, Cairo, Vienna, Addis Ababa and on Mauritius.

The AEEP's Co-Chairs are Austria and Germany for the EU, and, the African Union Commission and Mauritius on the African side.

In order to better identify needs and gaps, the AEEP has "mapped" ongoing and planned energy programmes. This document summarises conclusions on energy needs, and on the priorities for future action.

OUR ENERGY NEEDS: ENERGY SECURITY, ENERGY ACCESS

Energy Security

All countries face the challenge of assuring secure, reliable energy services in the coming decades. Almost all countries in Africa and Europe have experienced interruption of some form of energy supply in recent years. Many African and European countries are heavily dependent on energy imports, notably for transport fuels.

Tension in oil and gas markets, changing rainfall patterns, expanding demand, as well as internal technical, managerial and financial problems, have caused crisis in the availability of fuels or electricity. The necessity to reduce green house gas emissions in order to fight climate change is a growing constraint on energy sector development.

Diversification of energy supplies, with more use of local (often renewable) energy sources, is the principal tool to increase energy security. Sharing technology and resources between Africa and Europe could make a major contribution.

Figure 1: Indicator of reliance on fossil fuel imports

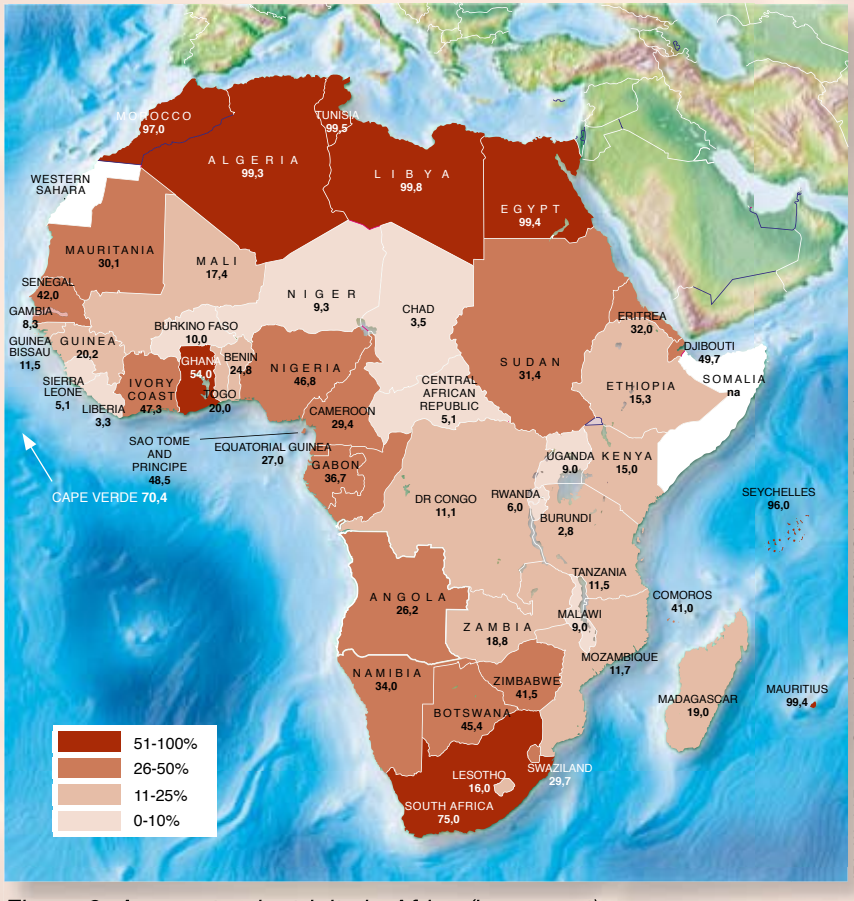
Access to Energy Services

Many countries in Africa are working to extend **access to modern energy services**, including **safe and sustainable cooking fuels**, to their entire population.

Indeed, insufficient energy infrastructure and lack of access – to electricity, to motive power, to transport fuels, or to improved cooking – constitute major barriers to sustainable development objectives, as expressed in national plans as well as in the Millennium Development Goals.

In many African countries, less than 10% of rural populations have access to electricity. The majority of African households depend on traditional methods of wood or charcoal use for cooking, and suffer indoor air pollution induced health problems. The majority of schools and clinics in rural Africa lack modern energy services. Productive activities in rural areas are severely handicapped by lack of energy services.

African countries and Regional Economic Communities (RECs) have set ambitious targets with respect to access to modern energy. Meeting these targets will require both infusion of private and public resources, and use of innovative models to make energy service provision economically viable, in poor sparsely populated areas.



IEA, World Energy Outlook (2009), UNDP/WHO (2009), GTZ (2010)

Figure 2: Access to electricity in Africa (in percent)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Human ingenuity allows us to transform energy sources (hydropower, fuels, solar energy, …) into **energy services**, for example:

- **Cooking** is vital for human life, since most of our food cannot be eaten raw.
- **Refrigeration** helps store food and is necessary for vaccinations.
- **Transportation** is the life blood of trade.
- **Mechanical power** is used to saw wood, grind food, pump water or form metal.
- **Communication and information services,** using telephones and computers, are of growing importance in modern life.


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Table 1: Energy services for productive use

Expanding access to energy will require: centralised and decentralised solutions; replication of existing "success stories" as well as development of new and innovative technical and institutional models for energy service delivery; efficient use of fossil fuels as well as rapid expansion of renewable energy sources.

Sustainable energy

Assuring energy security and access to energy is a great challenge. It is also a great opportunity: a clean and efficient energy sector is an essential requirement for sustainable development in both Africa and Europe.

- **Economic progress**. Affordable and reliable energy will help power continued economic development, in Europe and Africa. Building and running new energy systems – using local and renewable energy sources - will create jobs. Providing energy services to all will create new business opportunities for African entrepreneurs.

- **Social progress**. Expanding access to modern energy services will be key to improving essential social services: lighting and refrigeration equipment in health centres; computers in schools; pumps for water supply; phone service for businesses. Improved communication will contribute to political integration. Furthermore, safe cooking will avoid thousands of unnecessary deaths.

- **Protection of the environment**. Sustainable energy systems, particularly renewables, will help combat environmental problems caused by use of energy: deforestation; water, air and indoor pollution; climate change.

OUR ENERGY BUILDING BLOCKS: WHAT WE WILL DO

While unmet energy needs are great, the available energy resources are more than sufficient, and our combined will to overcome difficulties is even greater.

At the First High Level Meeting of the Partnership on 14 September 2010 in Vienna, Austria more than 300 high-level representatives thereof more than 20 African and European Ministers, Deputy Ministers and Commissioners endorsed political targets to be achieved by 2020 in the following areas:

Energy access

As a contribution to the African objective of achieving a continent wide rate of access to modern and sustainable energy of around 50%, which means additional 250 million people, Africa and the EU will take joint action to:

- **bring access to modern and sustainable energy services to at least an additional 100 million Africans**, focusing on sustainable models: to provide energy for basic services (health, education, water, communication); to power productive activities; and to provide safe and sustainable energy services to households.

Energy security

Africa and the EU will take joint action to improve energy security by:

- **doubling the capacity of cross border electricity interconnections**, both within Africa and between Africa and Europe, thus increasing trade in electricity while ensuring adequate levels of generation capacity;
- **doubling the use of natural gas in Africa**, as well as **doubling African gas exports to Europe**, by building natural gas infrastructure, notably to bring currently flared gas to market.

Renewable energy and energy efficiency

Africa and the EU will take joint action to increase both energy efficiency and the use of renewable energy in Africa by:

- building **10,000 MW of new hydropower facilities** taking into consideration social and environmental standards;

- building **at least 5,000 MW of wind power capacity**;
- building **500 MW of all forms of solar energy capacity**; and
- **tripling the capacity of other renewables**, such as geothermal, and modern biomass;
- **improving energy efficiency in Africa in all sectors**, starting with the electricity sector, in support of Africa's continental, regional and sectoral targets.

In order to reach these targets, Europe intends to put its weight and experience behind development of Africa's energy sector. European actions within the framework of the AEEP will complement Africa's own efforts, as well as the support from Africa's other development partners. Appropriate joint action will be taken in the following domains:

Policy and planning

Infrastructure that produces and uses energy – for instance dams, power stations, power lines, refineries, buildings, trains, trucks – is costly and long-lived. Market forces do not adequately take account of important public priorities for energy: energy security, access to energy, environment, etc. Energy infrastructure requires careful planning, as well as facilitating private investments, based on sound policies.

African and European leaders have drafted major policy documents on energy. For instance, ECOWAS leaders and West African utilities analysed their current and future needs, and determined that linking West African electricity grids together was the best road to meeting growing needs. This regional policy on electricity has laid the foundation for the West African Power Pool. African and European policies need to evolve and adjust to changing realities, in particular to attract more private investment.

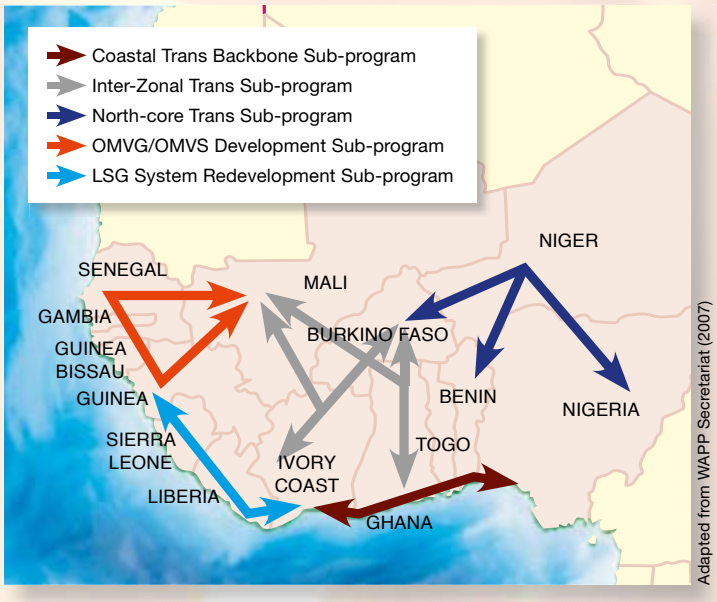

Figure 3: Implementation Road Map of the West African Power Pool (WAPP)

Major infrastructure investments: Integrating regions, linking continents

Sharing and trading energy resources – through infrastructure such as gas and oil pipelines, power lines, storage and shipping facilities – is the most cost effective way to expand energy services and assure their reliability. For Africa and Europe regional and intercontinental integration of energy systems is a high priority. Integration is often a necessary step in harnessing variable energy sources such as wind or water power. Flows of electricity, gas and oil between Africa and Europe are already playing a major role in energy security, as well as in economic development.

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Zambezi substation in the Caprivi region, Namibia

Thus, in both Africa and Europe, physical and economic integration of energy markets is progressing, both through the building of energy infrastructure and through increased convergence in legislative and regulatory frameworks in the energy sector. The groundwork – both infrastructure and regulatory mechanisms – is being laid for regional power pools in Africa.

The building of energy infrastructure to tie Africa together and to link Africa and Europe must be accelerated. For instance, the EU-Africa Infrastructure Trust Fund is supporting the construction of the Caprivi interconnector, a key 400 MW 1250 km power line in Namibia strengthening the South African Power Pool. To attract more investment and to make energy affordable, conducive framework conditions should be established, technical standards must be harmonised, and appropriate tariffs should be adopted.

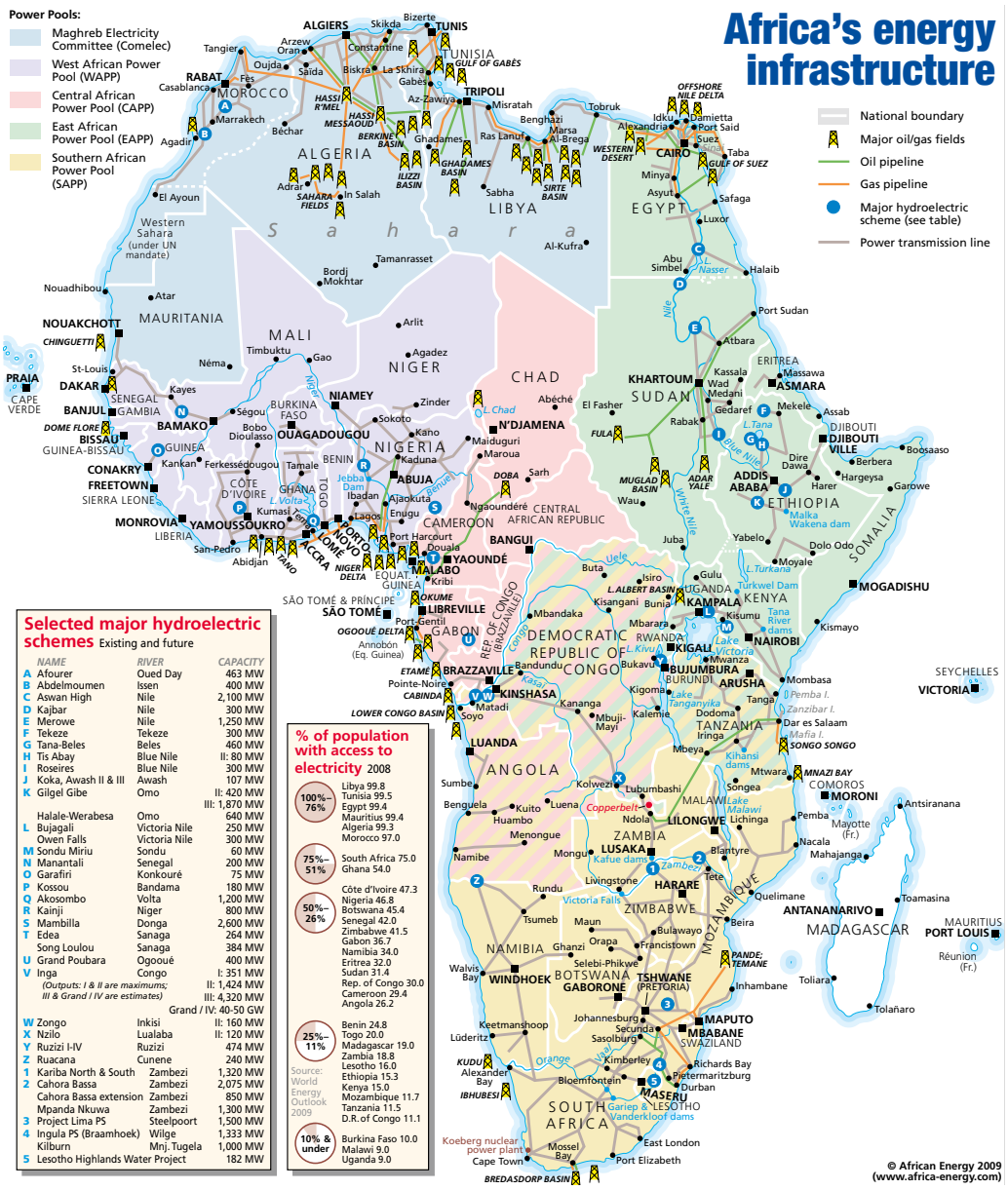


Figure 4: Infrastructure Map 2009, Africa Energy

Mobilising for access to energy services

Since modern energy services are essential for development, many African countries and regions have adopted ambitious objectives for increasing access to energy, particularly in rural and peri-urban zones.

Region (Regional Economic Community)	Cooking	Motive power	Electricity
West Africa (ECOWAS)	100% improved cooking: including approximately 20% with LPG	60% of rural population with access to motive power, for productive activities and basic services	66% of the population
Central Africa (CEMAC)	80% of the population have access to improved household fuels (LPG or improved cook stoves)		50% of the population
East Africa (EAC)	At least 50% of the EAC population has access to modern energy services		
	Improved cooking for 50%	Access to mechanical power for productive uses for all communities	100% individual service in urban areas. 100% village level service - schools, clinics, hospitals, and community centers – in rural areas

Table 2: Access targets for the year 2015 in three regional strategies

Improvements in technology, innovative financing mechanisms and new institutional structures are all contributing to bringing universal access closer to reality.

EU official development assistance (ODA) is already playing a major role. For instance, the first ACP EU Energy Facility has contributed over € 180m of financing to energy access projects in 36 African countries, leveraging more than double of this amount. The second Energy Facility was replenished with € 200m in new financing under the 10th European Development Fund (EDF).

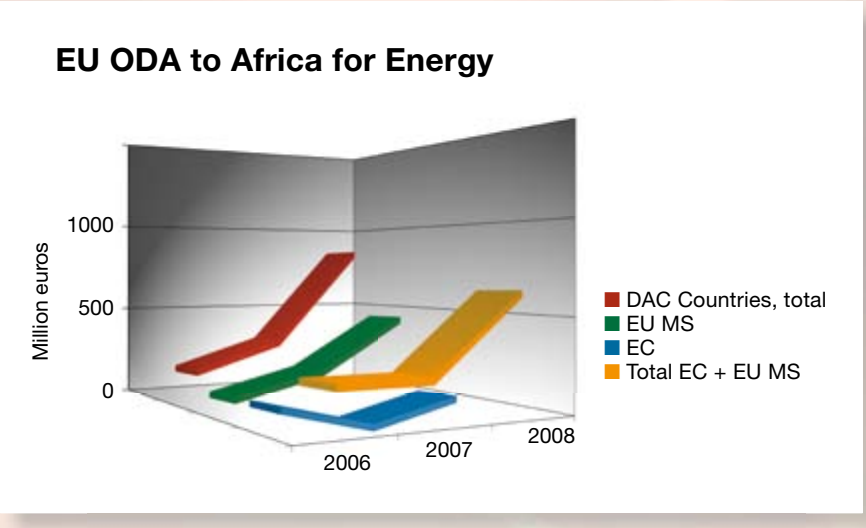


Figure 5: EU official development assistance (ODA) for energy in Africa

Progress in energy access must be greatly accelerated, to power economic growth and a rising standard of living for Africa's growing population. To increase the resources brought to energy access investments, public action must aim at attracting private operators.

Diversifying energy sources: Renewable energy and energy efficiency

Despite Africa's huge energy riches, for the majority of Africans, energy consumption is limited to traditional use of wood for cooking. Meeting the combined energy security and energy access challenges will require harnessing these riches, notably renewable energy sources that are impervious to the volatile energy markets.

Hydropower. Only 7% of Africa's huge hydropower potential (1,750 TWh, roughly the total consumption of France, Germany and Italy) is currently used. This cheap and clean energy source could meet all of Africa's power needs for years to come, while respecting world environmental standards.

The EU is supporting construction of the 250 MW Bujagali hydropower facility in Uganda.

Photo: KfW

Bujagali hydropower facility, Uganda

Photo: GTZ Kenya

Olkaria Geothermal Plant, Kenya

Geothermal. Only 1% of Africa's geothermal potential is exploited, in Kenya and Ethiopia. This clean reliable energy source could make a big difference, notably in East Africa.

For instance, the Olkaria Geothermal Plant in Kenya is currently being expanded, with support from the EU.

Biomass. The many forms of biomass can meet a variety of energy needs: cooking, power, transport fuel. Considerable amounts of unused biomass waste could be converted to energy. Use of Africa's vast agricultural potential for energy requires careful consideration of impact on food production and water resources.

The Mauritius dual fired bagasse coal power plant has shown how use of biomass can support energy, agriculture and environment objectives.

Photo: Mauritius Sugar Producers' Association (MSPA)

Belle Vue bagasse coal power plant, Mauritius

Photo: GEC/Wind Power Works

Zafarana Wind Farm, Egypt

Wind. Wind energy is fast becoming a major source of energy across the world. Africa-Europe electricity interconnections would allow making better use of variable wind resources, thus supporting the development of the wind energy industry in Africa and in Europe.

For instance, Egypt has an installed capacity of 425 MW of wind power and plans to increase to 850 MW by 2010 and 3,000 MW by 2020.

Solar power. The sun's energy can be harnessed through photoelectric cells, concentrating solar power plants and solar water heaters. These technologies are rapidly becoming cost effective, and could be widely applied in sun-rich Africa.

Photo: GTZ Ethiopia

Solar photovoltaic cells in Ethiopia

Energy efficiency. Across the planet, people are learning how to get more and better services out of less energy. The potential savings in Africa, estimated at up to 40%, could make a rapid contribution to easing power crises. In fact, Africa uses more energy per unit of economic output than all other regions (see figure 6). Rapid savings can be obtained at low cost, for instance by using modern high performance light bulbs and refrigerators.

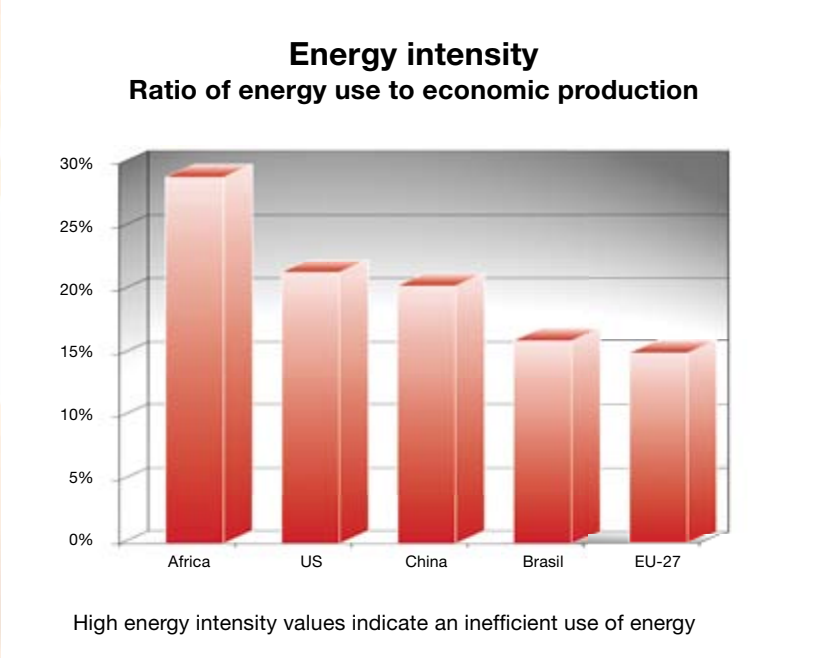


Figure 6: Energy intensity compared across regions

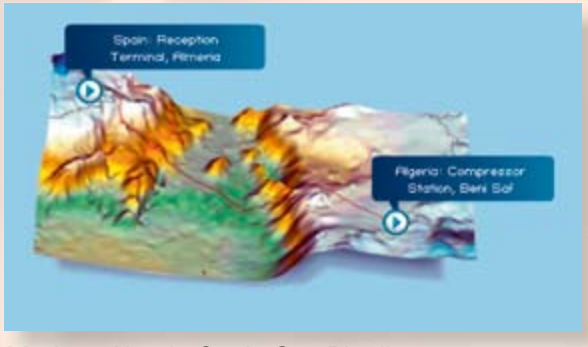
To harness the potential of renewable energy and energy efficiency, energy policies and policy tools must aim at diversifying energy supplies by using local energy sources and at making the most efficient use of available energy.

Within the framework of the AEEP, an "Africa-EU Renewable Energy Cooperation Programme" will be launched. Based on Africa's and Europe's shared interest in accelerated use of renewable energy resources and in reducing dependency on fossil fuels, the programme will mobilise human, technology and financial resources to spur innovation in Africa. The programme will help build a significant new area for industrial trade and business cooperation between Africa and Europe.

Photo: Centre for Energy Efficiency and Conservation, Kenya Association of Manufacturers

Energy engineers conducting an energy audit

Reduction of gas flaring and venting



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Medgaz Algeria-Spain Gas Pipeline

Natural gas, the cleanest burning fossil fuel, is a precious resource. Nevertheless, approximately 50 billion m^3 per year of African natural gas is literally going up in smoke, because infrastructure is lacking to capture the gas.

Africa and Europe will work to dramatically reduce flaring, by building natural gas infrastructure to bring currently flared gas to market. The captured gas will both help meet energy needs in Africa and be exported to Europe.

The Medgaz gas pipeline now under construction, a 210 km link between Algeria and Spain that will allow the transport of 8 billion m^3 per year, is an example of infrastructure that will facilitate trade in natural gas.

Based on data from the "Global Gas Flaring Reduction Partnership", The World Bank Group (2006)

Figure 7: African countries flaring gas

An enabling environment for private investment

The key to meeting energy needs is to attract private capital for the massive private energy sector investments needed to assure our energy future. AEEP efforts will focus on lifting barriers to private investment in the energy sector, and on building capacity for Private Public Partnerships. The EU will intensify efforts to facilitate cooperation among African and European private sector investors, with particular focus on attracting European and international investment to Africa. Africa will make efforts to improve the profitability and viability of its power utilities, for instance through more efficient management, optimal tariffs or more precisely targeted subsidies.

Developing cooperation between private and public sectors is a priority of the AEEP. To increase investment, it is necessary to reduce institutional bottlenecks, develop and complete feasibility studies as appropriate, improve procurement processes and introduce medium term, multi-year budgeting, rather than piecemeal short-term project budgeting. The African Development Bank, with support from the Commission on Effective Development Cooperation with Africa, is establishing a facility to strengthen the role of small and medium-sized enterprises, and to stimulate the market for decentralised, renewable energy.

Photo: Helmut Viertel

Strengthen the role of small and medium size enterprises

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Develop and complete feasibility studies

Developing institutional and technical capacity

Without adequate capacity, no amount of investment will be sufficient to meet the energy challenge. Institutional and human capacity must grow, in step with growing energy systems.

Capacity building for national, regional and continental institutions in Africa could focus on information systems, databases, planning, standardisation, etc. As an example, the Regional Centre for Renewable Energy and Energy Efficiency, established in Cairo, will aid in formulating and disseminating policies in support of renewable energy and energy efficiency and will provide a platform for the regional exchange on policy issues and technological questions.

Dialogue

African and European countries have recognized the need for more effective dialogue and cooperation, notably on energy access and energy security. The Africa-EU Energy Partnership will further strengthen these goals. Dialogue will be broadened to include civil society, the private sector, research organisations, as well as the UN System and Africa's other development partners.

The key to making best use of Africa's and Europe's complementary resources is deepened and broadened dialogue at multiple levels, both political and technical. To this end, the AUC and the EC will organise high level meetings on the main issues confronting us: energy security, access to energy and financing for infrastructure.

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EC-AUC College-to-College Meeting, June 2011, Brussels

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First High Level Meeting of the AEEP, September 2010, Vienna

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Ibrahim (AUC) and Oettinger (EC), September 2010, Vienna

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