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Ministério da Economia e da Inovação

PART III. NATIONAL REPORTING GUIDELINES FOR CSD-14/15 THEMATIC AREAS

B. ENERGY

Government focal point: M. Luisa Basilio

Responding ministry/office: Ministry for Economy and Innovation/ General Directorate for Geology and Energy

PORTUGAL

Portugal is heavily energy dependent. More than 80% of its total primary energy consumption is imported and the largest proportion is oil products. This means that the greatest domestic energy policy concern is associated with the security and diversification of its supply at the lowest cost, reducing dependence on oil and diversifying energy products. There is a significant renewable energy potential, where hydro energy potential and biomass use have been significantly exploited. Increasing the use of the potential of renewable energy sources (RES) is an essential cornerstone of a policy for sustainable development. However, technological, economic and environmental factors, as well as some social and institutional barriers make it difficult to exploit the full extent of this potential.

In 2003, 83,5% of energy supply was dependent on external resources, with 59,3% of the total primary energy consumption covered by imported oil. Natural gas is successfully penetrating the energy mix after 1997, representing 10,3% of total primary energy consumption in 2003.

Hydro has been a relevant source of electricity production, with a 34,4% share of the total gross electricity production in 2003, but very dependent of climate conditions. Wind and geothermal energy have become increasingly important: in 1997 these accounted for a gross electricity production of 25 and 51 GWh, respectively, while in 2003 these figures had increased to 468 (+ 1772%) and 90 (+ 76,5%) GWh, respectively.

Primary energy consumption registered strong growth in the period 1990-2003 (3,0% per year), although not so high in the latest years. However primary energy consumption per capita, from 1,78 to 2,46 toe/capita between 1990 and 2003, still is the lowest per capita consumption among the EU15 member-states (average of 3,76 toe/capita).

Final energy consumption is important in order to understand the main factors underlying certain trends, necessary for defining and applying an energy policy oriented towards energy conservation and sustainability.

Final energy demand registered strong growth in the period 2000-2003 (2,8% per year), mainly due to consumption of oil products (1,9% per year for oil, 30,8% per year for natural gas and 4,5% per year for electricity). At the same period a decreasing of -18% per year was registered for coal.

Indicators as Final Energy Demand per capita and Final Energy Intensity can assess productivity, efficiency and sustainability of the Portuguese economic system. In 2003, Final Energy Demand per capita was 1,75 toe/capita (1,18 toe/capita in 1990) and the Final Energy Intensity was 186 toe/M€95 (162 toe/M€95 in 1990).

In 2003, the main sectors of economic activity presents the following shares on Final Energy Demand (excluding the use as feedstocks and non-energy use of oil) were: 29,7% for Industry (35,4% in 1990), 38,0% for Transport (30,7% in 1990), 16,6% for Residential (20,8% in 1990) and 12,4% for Services (6,7% in 1990). Transport and Services sectors accounted more than half of energy consumed by economics activities. Industry has succeeded to increase its energy efficiency by improving its specific consumption.

The Portuguese Energy Policy considers that there are four domestic policy priorities with links between energy and the environment:

- ◆ Diversification of primary energy sources;
- ◆ Increase in energy efficiency in the various sectors of economic activity;
- ◆ Use of clean technologies;
- ◆ Greater exploitation of renewable energy resources.

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1. Decision-Making: Strategies, policies, programmes and plans, legislation, policy instruments and the regulatory framework; involvement of Major Groups

- *Access to electricity and other energy services, through either grid extension or decentralized energy technologies, in both urban and rural areas, including main programme objectives, impacts and progress;*
- *Efficient use of energy in the household and commercial sectors through, e.g., introduction of improved cook stoves or liquefied petroleum gas (LPG) for cooking, minimum energy performance standards for appliances and lighting, energy efficient building codes, and metering.*
- *Improved efficiency in energy supply (e.g. energy generation, transmission and distribution).*
- *Policies to facilitate the transfer of modern energy technologies, such as export promotion policies or establishment of an enabling environment for investments, including their objectives, the types of financing available and other incentives provided to facilitate technology transfer.*
- *Reform or restructuring of the energy sector within the last ten years to improve the functioning of energy markets.*
- *Legal and regulatory frameworks related to overall energy policies that have been adopted.*
- *The use of economic instruments, including pricing and tariff reform.*
- *Participation of private companies in the electricity sector, their impact on electricity services and their involvement (e.g. generation; transmission; distribution).*
- *Major Groups¹ participation in energy decision-making, whether at the national or community level.*
- *Women's participation in needs assessments or planning and policy formulation related to energy at the local and/or national levels; other means.*
- *Programmes designed to increase the share of renewable energy in the national energy supply mix, including information on their goals and targets.*
- *Measures and programmes adopted to improve fuel efficiency for transport vehicles. Such as vehicle fuel efficiency standards; vehicle inspection and maintenance programmes; introduction of cleaner fuels; any other.*
- *Existence of nuclear energy programme and information on nuclear materials transported within or across national boundaries; national programmes that ensure nuclear safety; arrangements in place for public review and hearings.*

A. GENERAL INFORMATION

Since the last report in 2002, there have been many positive actions in Portugal's energy sector looking for a sustainable development. Important political decisions have been taken with the adoption of guidelines and objectives for the **Portuguese Energy Policy** through Resolution of Council Ministers n° 63/2003, 28th April, which are based in three strategic goals - energy security, national competitiveness and sustainable development.

These strategic goals led to the following objectives of energy policy:

- **Liberalisation of the energy markets**
- **Reduction of energy intensity**
- **Reduction of the energy bill**
- **Improvement of the quality of service**
- **Security of energy supply**
- **Diversification of the types and sources of energy and use of domestic energy**

sources

- **Minimisation of the environmental impact**
- **Improvement of national productivity**

¹ Major Group consists of: Women; Business and industry; Local authorities; NGOs; Children & Youth; Indigenous People; Workers & Trade Unions; Scientific & Technical Communities; and Farmers.

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Portugal faces the challenge of improving the competitiveness of its economy in a context of globalisation and enlargement of the EU to new countries. As a EU cohesion country, Portugal has used EU subsidies for the development and modernisation of its energy sector. One way to achieve better competitiveness is to liberalise the energy market and implement an efficient regulation. Having in mind that one of the objectives of market enlargement is to rationalise investment, a common approach to security of supply policy is particularly important. The oil prices are already totally liberalised. Renewables and energy efficiency are assumed as a key priority.

Considering the liberalisation of the energy markets, the Portuguese Government is working on the reform of the energy sector in order to restructure the sector and to improve the functioning of energy markets with a gradual but total liberalisation, through new regulatory frameworks to the three sectors – Electricity, Oil and Natural Gas. A 1st draft of this new legislation was already under public consultation, and its review is under preparation.

The electricity market in Portugal, while it has developed significantly since the last report, remains largely regulated and is still dominated by **EDP**. There are several initiatives to induce electricity market competition within Portugal. Increasing physical interconnections with Spain improves competition and security of supply. Therefore, the government put great emphasis on creating the Iberian Electricity Market (MIBEL), which increase the necessity for a consistent approach to electricity and natural gas policy between Portugal and Spain and its preparation is ongoing.

Natural gas contributes to reduce Portugal's high dependence on imported oil through a successful penetration in the energy mix. It will continue to diversify energy supply and enhance security of supply. The dominant player in the gas market is **Galp Energia** through its subsidiaries: (i) **Transgás** – the supply and transmission company, but also sells gas to consumers with an annual consumption exceeding 2 mcm, and (ii) **GDP Distribuição (GDPd)** - has a stake in all the six regional distribution companies. In addition, GDPd has set up autonomous gas distribution units since 2004, called Unidades Autónomas de Distribuição de Gás (UADs), to serve small towns.

Natural gas was imported to Portugal, mainly, via pipelines from Algeria, under long-term take-or-pay contracts (TOP). The remaining LNG was imported from Nigeria. The imports from Nigeria had been delivered through the Spanish terminal at Huelva. However, Portugal's first **LNG terminal** was commissioned at the end of 2003 in **Sines**, and commercial activities started in January **2004**, with imports from Nigeria, and were based on new long-term take-or-pay contracts. The construction of **underground storage** with an initial capacity of 165 mcm is under way in salt caverns in **Pombal – Carriço**. The first two cavities with a capacity of 90 mcm were commissioned in 2004. The site allows for the construction of up to 10 cavities.

Another challenge for Portugal is the climate change issue. Following its ratification of Kyoto Protocol in 2002, the Portuguese Government approved the Climate Change National Programme, which considers a set of policies and measures to the energy sector, including policies and measures put in place by the European Union. Considering the creation of MIBEL a consistent approach is also essential in climate change mitigation from the viewpoint of competitiveness, noting the close economic integration between the two countries.

In November 2004, the Government adopted an Action Program to Reduce the Oil Dependency in order to reduce up to 20% the energy intensity and reduce the oil dependency until 2010.

The program establishes a set of measures to the main activity sectors of the Portuguese economy, such as: energy, transport, industry, residential and services.

The energy efficiency measures are as follows:

Energy sector

- **increase the energy production by using renewable sources;**
- **liberalize the energy market in order to obtain higher efficiency;**

Transport sector

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- promote the use of public passenger transport;
- stimulate the increasing use of energy efficient passenger cars;
- create fiscal measures and develop logistic infra-structures in order to increase the energy efficiency of this sector;
- diversify the energy sources by promoting the use of natural gas, electricity and bio fuels.

Industry sector

- stimulate technology innovation and the improvement of processes, using biomass and solar thermal energy;
- support cogeneration and micro-generation to replace oil consumption.

Residential and Service sectors

- increase the energy efficiency of buildings;
- promote the use of efficient electrical and thermo-electrical equipments, and increase the energy efficiency by the final consumer;
- promote the use of solar thermal energy.

B. SPECIFIC PROGRAMMES AND PLANS

B.1 – ENERGY EFFICIENCY POLICY

B.1.1 - Industrial Energy Efficiency Policies

The Regulation on Management of Energy Consumption (RGCE) establishes goals for energy intensive companies to progressively reduce their specific energy consumption. RGCE requires companies to audit the plants energy consumption, twice a decade and to meet their targets on energy savings. The main industrial sub-sectors covered have been Pulp and Paper, Chemical Industry, Non-Metallic Minerals, Wood and Cork, Textiles, Food and Beverages.

The measures carried out in the most recent plans submitted by the enterprises are energy management systems and cogeneration projects, although typical measures of energy efficiency in industry, like thermal insulation and heat recovery systems are still being implemented..

Since August 2003 till the end of 2004, 96 energy audits reports, corresponding to energy savings of 18 ktoe per year (6% of the energy consumption of the industrial plants), were submitted to DGGE.

B.1.2 - Residential/Commercial Sector Energy Efficiency Policies

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Efficiency labelling applies to refrigerators, washing machines, dryers and washer-dryers, household air-conditioners, electric furnaces for household use and ballasts for fluorescent lighting. The manufacturers support the cost of the test procedures and labelling systems.

The Regulations on Energy Systems and HVAC in Buildings (RSECE) that sets the rules for calculating the size of energy systems for acclimatization in order to achieve high degrees of energy efficiency have undergone a revision process that started in September 2002 and was concluded by the end of 2004.

The new version of the regulation represents a 25% improvement in minimum energy performance requirements relative to the previous version. The new version adds strict indoor air quality requirements as well as maintenance requirements and periodic inspections during the lifetime of the systems fully in line with the new EU Directive 2002/91/CE (Energy Performance on Buildings)

The Regulation on the Characteristics of the Thermal Behaviour of Buildings, in force since 1991 was updated in the end of 2004, in order to establish higher thermal requirements than existing standards in new residential buildings, but is still waiting for Government approval.

All of the Regulations above indicated is expected be approved soon by the Government.

B.1.3 - Transport Energy Efficiency Policies

The Resolution of the Council of Ministers nº 63/2003 also includes the development of energy efficient and cleaner transport systems through the diversification of energy consumption and through the concept of sustainable transport. Some action has been taken to promote the use of alternative transport fuels, namely natural gas, LPG, electricity and bio-fuels.

Testing of fuel efficiency and emissions

The mandatory periodic inspections of vehicles aims at controlling safety, energy efficiency and environmental impact of the road transport sector.

The car labelling creates a consumer information system about fuel economy and CO₂ emissions for new vehicles.

Progress on alternative fuels

A series of pilot projects have been carried out since 2001, mainly by municipalities as well as public and municipal enterprises aiming at the introduction of vehicles using alternative fuels in their fleets.

The promotion of alternative fuels, namely natural gas and bio-fuels, is being carried out and several pilot projects aiming the introduction of vehicles fed with alternative fuels (electricity, natural gas or bio diesel) in their fleets, have been implemented. There are incentives addressed to the renewal of fleets of road transportation as public service, through the MAPE. These incentives are aimed at the use of less polluting vehicles, through the support of the over cost of purchasing new vehicles, burning natural gas or using electricity.

There are more than 30 000 vehicles using LPG and some tens use either natural gas or electricity. The vehicles using bio-diesel are usually pilot-projects.

The EU Directive (2003/30/EC) on the use of bio-fuels in the transport sector has not yet been transposed to the Portuguese legislation, but it will soon be issued. This requires that bio-fuels should reach a 5,75% share in the total sales of petrol and diesel for transport use by 2010.

Modal shifts

In Oporto, in the North of the country, an underground railway system started operation in 2003. The Government is studying the development of a new high-speed railway link connecting Portugal to the European high-speed network.

B.1.4 – Promote the use of Cogeneration

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Co-generated electricity, principally in the industrial sector, accounted for 1 300 MW of capacity and produced 4,5 TWh of electricity in 2003. Over half the power production comes from oil, the remainder is split nearly equally between natural gas and biomass.

Of this amount, co-generators sold about 2,2 TWh to the national grid company at a tariff determined by the government. The tariffs paid to the producers are a function of performance of the undertaking and of criteria for availability; an environment premium is added if thermal efficiency of the plant is at least equal to the most efficient in each category. In 2002, the average tariff paid to co-generators amounted to €66/MWh produced.

The government expects cogeneration to increase considerably, to around 2 000 MW of power installed by 2010 and the Measure to Support the Harnessing of Energy Potential and Rationalisation of Consumption (MAPE) provides support to the installation of cogeneration units.

Cogeneration in Portugal has developed greatly thanks to highly favourable government established feed-in tariffs and there are a significant opportunities to improve the environmental performance of some existing plants through the introduction of newer equipment and through switching fuel from oil to natural gas.

B.2 – RENEWABLES POLICY

Portugal has sufficient renewable resources in terms of quantity to justify an endeavour to exploit them with a view to minimising its energy dependence. However, the strong importance of hydro component creates a big variability of renewables contribution to electricity generation, because there are large annual variations in the hydrologic conditions.

Traditionally, the renewable sources which have made the greatest contribution to the total consumption of primary energy in Portugal are hydropower and biomass, particularly forest products, although there has been a large increase, more recently, in the use of wind power.

The Portuguese government promotes independent power production of energy based on renewables to diversify energy sources, to reduce Portugal's significant dependency on imported fuels and to improve the environment. Furthermore, the government seeks larger economic benefits by developing an industrial cluster to generate jobs and to create a new export industry.

Portugal is committed with important targets towards the use of renewables. It has the third most aggressive target for renewables in Europe, with an ambitious goal of 39% of the electricity production, by 2010, that should be produced from renewable energy sources.

In line with Portuguese goals were established important policies and measures, which represent strong economic efforts, as:

- an attractive feed in tariff for wind power installations until 4500 MW
- additional diversified feed in tariffs for other renewables (hydro, biomass, solar, waves – until 500MW)

Renewables are promoted mainly via guaranteed feed-in tariffs, where the environmental benefits resulting from the use of renewable energies for electricity production were internalised and direct subsidies. The Transmission System Operator – REN - has an obligation to buy energy from renewable electricity generators. The purchase price is based on fixed feed-in tariffs for each renewable. Once a construction permit has been provided for an installation, the feed-in tariff is guaranteed and the level is increased in pace with inflation. Financing for the remuneration exceeding the electricity market price is collected directly from the consumers as a part of their end-use tariffs. In Portugal, municipalities are given 2.5% of the turnover of the renewable electricity plants established in their territory. Therefore, investors in Portugal have not encountered much local resistance for renewable energy projects.

The feed-in tariffs have been effective in terms of capacity increases. In 2003, the wind power installed or have already been initiated the licensing procedures, represents 31,2% of the 4500 MW indicative target for wind capacity by 2010.

The Measure to Support the Harnessing of Energy Potential and Rationalisation of Consumption (MAPE) provides support to the use of renewable energies. MAPE provides soft loans with zero interest rate up to 40% of the eligible investment excluding large hydropower for the period 2001-2006.

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MAPE supports also solar thermal applications in industry and services. Solar energy availability in Portugal can exceed 3 000 sunshine hours per year in some areas. The objective of the Solar Hot Water for Portugal Programme (AQSpP) is to reach 1 million m² of installed solar collector capacity by 2010. This involves increasing the annual solar collector sales 30-fold. In addition to households, which are the major market with 66% share, new installations are expected also for pre-heating in industrial processes (25%) and in the services sector (9%), for example in sport facilities, hospitals and hotels. One of the obstacles for the programme is overcoming the “bad reputation” solar collectors got in Portugal in a programme in the 1980s when problems were identified in all stages of the process including manufacturing, installing and end-use. These will be addressed by long warranty periods of six years for the equipment, introducing a certification process for the installers and by extensive information dissemination. The installation of solar collectors is also promoted by providing subsidies covering 20-40% of the investment cost, tax exemptions for households, accelerated amortization for the companies investing in solar equipment, and the reduced VAT of 12%. A specific “observatory” has been established to monitor the programme.

In addition, the irregular geographical distribution of the resources may limit the zones of possible exploitation (as in the case of geothermal energy, wave or tidal power) or be easier to exploit in locations of lesser need (use of solar heating which is more available in hot areas).

2. Capacity-Building, Information and Research & Technologies

- *Efforts to establish new, or strengthen or reform existing national and local institutions responsible for national programmes on energy for sustainable development.*
- *Training or other capacity-building activities undertaken to strengthen energy planning, management of energy efficiency or development of new and renewable sources of energy.*
- *Launching of public information campaigns and educational programmes to raise awareness of energy efficiency and environmentally sound energy systems.*
- *Networking between centers of excellence on energy for sustainable development that has enhanced information sharing, capacity-building and technology transfer.*
- *Internet websites related specifically to the issues contained in these Energy Guidelines, provide homepage addresses (URL).*
- *Efforts to promote increased research and development of various energy technologies: renewable energy; energy efficiency; advanced energy technologies, including cleaner fossil fuel technologies; any other.*

The Ministry of Economy and Innovation in charge of energy policy does not have an energy R&D strategy or programme. In the national science research, development and technology policies driven by the Ministry of Science and Higher Education, energy R&D is not regarded as a priority. However, energy is a core area of R&D activity of the National Institute for Engineering and Industrial Technology (INETI), which depends on the Ministry of Economy and Innovation.

INETI proposes projects for public funding based on an evaluation of the priority needs of government energy policy. Energy efficiency, namely buildings and optimisation of the efficiency of energy conversion processes and renewables (wind and solar thermal and photovoltaic) are some of INETI key priorities.

The Department of Renewable Energies (DER) of the Institute for Engineering, Technology and Innovation (INETI) of the Ministry of Economy and Innovation, participates regularly in training and dissemination actions related to the use of renewable energies and of the rational use of energy in buildings, generally in cooperation with various bodies such as the national Directorate-General for Energy and Geology (DGGE), national (ADENE) and regional energy agencies, the Portuguese branch of the International Solar Energy Society (SPES), and various professional organisations.

DER and the Department for Energy Engineering and Environmental Control (DEECA) within INETI, regularly participate in multilateral and bilateral projects and cooperation schemes with similar institutions and Universities of other regions, mostly from Europe (European Union

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co-funded projects and networks), Portuguese-speaking African countries and central- and south-American countries (e.g. CYTED Programme). Cooperation within the International Energy Agency and European normalisation bodies should also be mentioned.

The Ministry of Economy and Innovation supports the majority of the operation of DER and DEECA within INETI, this including support to the design of measures, regulations and norms by the Portuguese State, R&D, and services to the private sector (e.g. lab trials and product certification). All this mostly in the fields of resource assessment and technology of solar thermal and photovoltaic energy, wind energy, wave energy, use of biomass and biofuels; of cleaner coal and gas technologies; and of rational use of energy in buildings.

Internet websites

www.ineti.pt - Department of Renewable Energies of INETI
Departamento de Energias Renováveis do INETI

www.spes.pt - Portuguese branch of the International Solar Energy Society
SPES - Sociedade Portuguesa de Energia Solar

3. Financing

- *Specific measures taken to establish an appropriate enabling environment conducive to attracting investments in the energy sector: pricing/subsidy reform; fiscal and financial incentives; power purchase agreements; other arrangements.*

A - ENERGY TAXATIONS

1. Excise taxes are generally higher than minimum levels set in EU legislation. In June 2002, the government increased the general VAT from 17% to 19%, and in July 2005 from 19% to 21%. This VAT rate applies to LPG, gasoline and automotive diesel. Electricity and natural gas are subject to 5% VAT rate; heating oil and diesel for agriculture purposes are subject to the reduced VAT of 12%.
2. Tariffs of natural gas (Fixed Term and Variable Term) for domestic sector are quarterly proposed by Local Distribution Operators to DGGE – General Directorate for Geology and Energy - and for approval by Secretary of State for Industry and Innovation, taking into account several parameters, where the more important are the oil basket (FOB Breakeven price), the €/USD exchange rate, the high calorific value and the inflation rate. In the future, after liberalization of gas market, is supposed this approval comes to be committed to the Regulatory Entity (ERSE). For industry tariffs are established between the different parts involved. VAT at 5% is applied on the bill.

B - FINANCIAL INCENTIVES

1. Financial incentives for projects on energy efficiency, renewable energy and conversion of consumption to natural gas are included in a package of financial incentives in force since October 2001 to 2006 called MAPE (Measure to Support the Harnessing of the Energy Potential and Rationalization of Consumption) within the Incentives Programme for the

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Modernization of Economic Activities (PRIME) under the Community Support Framework, which total budget is €8.1 billion for the period from 2000 to 2006.

PRIME's specific energy sector objectives are:

- Ensuring continuous energy supply at affordable prices.
- Reducing import dependency and fostering the development of local energy resources by using new and renewable energy sources.
- Reducing oil dependency and diversifying primary energy sources and supply origins, principally by promoting the use of other fuels such as natural gas.
- Fostering energy conservation and rational energy use and reducing energy intensity in all sectors thus contributing to the reduction of the energy bill and import dependence.
- Reducing the environmental impact of energy production and use.
- Increasing the effectiveness and efficiency of energy products and services.

This type of projects can also be financed through the System of Incentives *for* Modernizing the Enterprises (SIME), another incentive system under PRIME.

2. Measures to promote efficiency at municipal level

The municipalities have an important role to play in the achievement of energy policy objectives, namely, the local energy agencies, that are able to implement energy efficiency measures through actions in energy management and the use of endogenous energy resources by selecting the most suitable technologies for the different patterns of consumption.

The creation of several local energy agencies was supported under the Save Community Programme.

3. Transports

In 2000, a 40% vehicle tax exemption was introduced for vehicles using exclusively LPG, natural gas or renewable energy. In 2001, the level of the exemption was increased to 50% for vehicles using exclusively LPG or natural gas. For vehicles with hybrid engines that use conventional fuels and LPG, natural gas, electricity or solar energy, a 40% reduction of vehicle tax is provided. Lower taxes on LPG and natural gas as compared to gasoline and diesel for road vehicles provide an incentive to use these fuels. New legislation where tax exemptions for bio-fuels are foreseen is in preparation.

MAPE Programme provides subsidies for the renewal of the public transport fleet with less polluting vehicles. The Programme pays a maximum of half of the additional cost of purchasing new gas or electricity-driven vehicles as compared to the cost of conventional vehicles. It is under consideration to extend the support to bio-fuel-driven vehicles whenever the mixing of bio-fuel in conventional fuel necessitates modifications to the engine and feeding system, is under consideration.

4. **Cooperation**

- *Cooperation with neighbouring countries in energy trade and/or interconnection of electricity or gas networks, including through transnational pipelines; nature of such cooperation.*

At bilateral level, Portugal has developed several support initiatives with developing countries on energy area. The Portuguese-speaking African countries are the main receivers of assistance from Portuguese institutions. More specifically, public administration authorities and scientific/academic institutions were valuable partners in the transfer of knowledge and technologies in some projects that were co-financed by public, private and European institutions.

The main actions were related with:

- development and implementation of Energy Policies

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- Training and workshops on energy planning, technical energy regulations, clean and renewables technologies, energy management, institutional organization and Energy/Environment issues
- cooperation on oil issues

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