

The Future of Nuclear Power in Portugal

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1. INTRODUCTION

This paper is an update of the document entitled “Nuclear technology and energy in Portugal” prepared for the IAEA Workshop: "Steps for Conducting Nuclear Power Plant Technology Assessments" which took place in Vienna on 17 - 20 November 2008. This paper advocated the start of a public dialogue on nuclear energy in Portugal irrespective of an eventual future decision. Although high placed public and private sector figures up to the level of the President of the Republic have spoken on the need for such a dialogue, no movement has taken place. The prospects for a nuclear energy programme in Portugal have been further affected by the recent economic crisis. This crisis has particularly affected the Portuguese economy with has a low per capita GDP by European standards and is too dependent on export oriented industries with a weak technology base. Entrepreneurs and government have become more concerned with short term measures.

Knowledge of nuclear power technologies and economics remain very low in the country. However, a positive decision would bring substantial benefits since it could make Portugal a net exporter of electricity to energy hungry Spain. Furthermore, some of the targets of the Energy Policy of 2005 are not realistic. Several attempts to start the planning in the country of a NPP, beginning in 1957 have been dwarfed by a variety of reasons.

2. ENERGY POLICY IN PORTUGAL

Primary energy needs are supplied by 80-85% of imports which constitutes a heavy burden on a fragile economy. The Energy Policy in Portugal remains the one approved in October 2005. It aims at liberalizing the energy markets, at encouraging the efficient use of energy and at promoting renewable resource based energies. The use of nuclear energy is not contemplated. This policy is backed by USD 38b of investment over 5 years. It is planned that 45% of the electricity consumed in the country by 2010 will be based on renewable resources. Some components of this policy are not considered too realistic or economic by OECD's IEA.

It is unlikely that the new administration empowered in October 2009 will change the outlook for Nuclear Energy in the country. On the contrary, since the ruling party does not have a majority in parliament, it will be forced to make alliances with parties which are staunchly antinuclear.

Many steps have been taken towards the liberalization of energy markets. These have included the creation of two large competing players in the natural gas and electricity sectors and the development of a single operator for the transportation of both natural gas and electricity. Portugal has taken an innovative approach to the unbundling of the gas and electricity transportation assets and placed them, along with natural gas storage and the Sines LNG terminal, in one regulated entity, Redes Energéticas Nacionais. Another important step has been the implementation of the Iberian Electricity Market in 2007. Similar arrangements are presently being developed in the natural gas market.

3. PLANS AND IMPLEMENTATION FOR RENEWABLE ENERGIES IN PORTUGAL

Portugal is now among the leading IEA member countries in terms of both hydro and wind power penetration and is at the forefront of ocean power development. Historically, Portugal is highly dependent on imported fossil fuels. A renewable energy policy, therefore, is considered by the government as an important instrument for achieving broader policy goals of energy security, sustainability and competitiveness. Whether the expressed targets are realistic, affordable and regularly monitored and updated as necessary, is a concern of the IEA.

Environmental assessments of new projects should continue to be subject to the broadest possible public analysis and a greater examination on how the costs of renewable energy are distributed through existing cost recovery mechanisms is needed.

Significant growth in renewable energy capacity over the past four years has played a large part in aiding Portugal in meeting its Greenhouse Gas obligations. Furthermore, the government recently set a new more demanding target such that power generation from renewable sources is to supply 45% of gross electricity consumption by 2010, an increase on the previous target of 39%.

Other new and ambitious targets for renewable energies include a wind power capacity target of 5 100 MW and 5 575 MW of installed hydropower capacity by 2010.

Progressive policies have also been adopted for biofuels and micro-generation. The legislation authorizing such micro-generators to buy/sell to the network at commercial prices, although cumbersome, has increased the participation of such generators in the electricity market. In July 2009 there were 3110 micro generators certified with a total output of 11 MW.

The government has also developed a set of policies and measures with the aim of reducing energy consumption, particularly in buildings, industry and transport sectors. A buildings' energy certification system became mandatory in July 2007, higher construction standards have been imposed, and motor vehicle taxes have become a function of GHG emissions. A National Action Plan for Energy Efficiency was enacted in 2008 and it targets an increase in energy efficiency equivalent to 9.8% of total final energy consumption by 2015. The plan is made up of a broad range of programmes and measures and pays particular attention to transport and industry, the largest consumers of energy.

Renewable energies (wind, hydraulic, renewable thermal and solar) represented in 2008 27% of total electricity consumption or 33% of total production going to the public network.

At the end of 2008 the capacity of wind power connected to the network was 2640 MW of which 590 MW refer to the new installations in 2009. Still under construction but to be soon ready are three wind power parks with respectively 222 MW , 112 MW and 102 MW besides 15 other smaller parks. Wind power attained in 2008 18% of electricity supply, up from 12% in 2006.

Part and parcel of the energy policy is the emphasis placed on solar energy which has been considerably hyped by the government and media. Total installed capacity at the end of 2008 was 56, 5 MW and during that year 38, 1 GWh of solar based electricity was produced at a high cost, representing only 0.07% of total consumption. The government plans to increase the installed capacity to 700MW.

Hydroelectric potential, by far the largest producer of renewable energy in the country, is only used by 46%. At the end of 2008 production was 4800 MW. The government plans to increase this production to 7000 MW, which would represent 70% of the potential, in line with EU average. This target is not considered realistic because of environmental considerations.

The much hyped experimental plan using wave energy with a capacity of 2.25 MW(e) , little more than the energy produced by a single windmill., in the north of the country uses an Australian technology. The cost of energy produced, undisclosed, is undoubtedly very high. It continues to suffer from considerable operational problems.

4. EUROPEAN UNION INITIATIVE 20-20-20

According to this initiative, the EU should increase the weight of renewable energies in the mix, reduce the carbon dioxide emissions and improve energy efficiency by 20% in each count until 2020. To reach those targets, Portugal will have to increase the share of renewable energies to 45% in 2010 and 59% in 2020. This means reaching 2800 MW in hydropower, wind power to 8500 MW and solar power to 700MW, a formidable task.

5. RESEARCH AND DEVELOPMENT

Portugal remains heavily dependent on imports for technology in the energy sector. Public funding for energy research and development, as a percentage of GDP, remains the lowest among IEA member countries. A formal national energy research and development strategy has not been developed, and co-ordination among relevant ministries and stakeholders in the sector leaves room for further improvement. The sector needs clearer leadership and closer co-operation between the different ministries, relevant research laboratories and the private sector.

6. ITN. INSTITUTO DE TECNOLOGIA NUCLEAR

The ITN continues to be the sole institution in the country dealing with nuclear technologies and is devoted mostly to education and training on applications of nuclear technologies. Its readiness to develop capabilities to enacting the legal regulatory framework for nuclear power generation and the capacity to implement it remains questionable.

7. THE PORTUGUESE SOCIETY OF PHYSICS

The Portuguese society of Physics took an active role in this year's session of the European Physics Society. The session prepared a position paper on the future of the nuclear option, which was adopted by all European members of the Society. The paper concluded that "No one source will be able to fill the need of future generations for energy. The nuclear option, incorporating recent major advances in technology and safety, should serve as one of the main components of future energy supply. There is a clear need for long-term research, development and demonstration programmes as well as basic research into both nuclear fission and fusion and methods of waste incineration, transmutation and storage. Ways must be found to inform the general public on how to assess relative risks rationally. Everybody participating in the decision making process needs to be well informed about energy issues. It is an important task of European science and research to ensure this".

Based on the position above and under the umbrella of the Portuguese Society of Physics, it was planned to establish a National Association for the Promotion of Nuclear Energy in Portugal. Detailed bylaws were prepared. This association was to be open to the business and academic communities, media and other interested parties to initiate a public debate on nuclear energy. This proposal is in line with the recommendations made in our 2008 paper. The constitution of this association has not met much success in attracting members either from the business community be them users and providers of energy. If no development takes place until the year's end , the idea will be dropped.

8. CONCLUSION

The outlook for nuclear energy in Portugal in Portugal remains in the short term quite dim despite declarations from public and private sector personalities and several conferences and seminars. There are no conditions even to start a public dialogue on this subject.