



Report 3 – Portugal

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1 Introduction

In Portugal, the energy strategy has focused in recent years around three strategic objectives: security of supply, environmental protection and the promotion of competitive markets. The promotion of renewable energy was thus assumed as a key policy for the strong ability to contribute to the achievement of three strategic objectives.

Our country has taken a leading role in the development of renewable energy, which has been recognized in Europe and worldwide. This policy is allowing us to diversify sources of supply and strengthen the supply of energy based on natural resources that Portugal has: sun, water and wind.

We are also contributing to a gradual reduction of our energy dependence from abroad to meet the national targets for reducing greenhouse gases.

The level of market development of renewable energy has brought new companies of small-medium sized industry, who brought dynamism to the business of power generation.

The great engine for the rapid increase of renewable energy in recent years has been the wind power. In late 2004, Portugal had 537 MW installed in this technology, and currently it has over 3,374 MW, ie in about 4 years the installed wind power has multiplied by 6 in the country, and it is estimated to exceed 5,000 MW even when completed the installation of power already allocated. In terms of hydropower, the National Plan on Dams which includes strengthening the capacity of dams and the construction of eight new dams has been launched. This investment will allow Portugal to better exploit its hydro potential, approaching the level of utilization of water resources that in other European countries.

In addition, it will allow the sustainable development of wind energy, as the combination wind-hydro is crucial for the stabilization and the economic and operational efficiency of the Portuguese electricity generating system. Apart from wind and water, Portugal promoted other renewable energy sources, developing projects in virtually all technologies, with key initiatives in promoting solar energy, biomass, biogas, wave energy, geothermal energy and biofuels.

1.1 Companies in the sector of Renewable Energies

The business area of business for renewable energy is related to a particular source of energy, being able to serve as the production of energy or technology components, equipment or services.

The following table shows some of the largest companies operating in Portugal, according to the energy sector.

Ref.	Energetic Sector	Entities	Place
1	Solar	BONGÁS-Energias, S.A.	Aveiro
2	Solar and wind	EDP RENOVÁVEIS	Oviedo, Spain
3	Windpower,, hydropower and Solar	GENERG	Lisboa
4	Solar	MARTIFER SOLAR	Algés
5	Biomass	PORTUCEL	Aveiro
6	Wind power	VENTINVESTE INDÚSTRIA SGPS, S.A.	Oliveira de Frades
7	Wind power	CENTEOL S.A.	Guarda
8	Solar	DONAUER SOLAR SYSTEMS	Lisboa
9	Wind power, Solar, wave energy, Cogeneration and Biomass	EFACEC	Porto
10	Solar	GDF Suez Energia Portugal	Bragança
11	Hydropower	HIDROCENTRAIS REUNIDAS	Lisboa
12	Wind energy	MOINHOS DO OESTE – PRODUÇÃO DE ENERGIA ELÉCTRICA, LDA.	Arruda dos Vinhos
13	Wind energy	PROEF- ENERGIAS RENOVÁVEIS	Trofa
14	Wind energy	SSE Renewables Portugal	Lisboa
15	Wind energy	VESTAS	Lisboa
16	Solar	VULCANO	Aveiro
17	Wind energy and Solar	SIEMENS	Lisboa
18	Solar	SCHNEIDER ELECTRIC	Lisboa
19	Solar, wind energy, hydrogen	Selfenergy	Porto Salvo

20	Solar	Jayme da Costa S.A.	Pedroso
21	Solar	Luságua – Serviços Ambientais S.A.	Lisboa
22	Solar, wind energy	Sotecnisol SA..	Camarate
23	Solar	Lobosolar, Energias Renováveis, Lda.	Évora
24	Solar, wind energy	FF Solar	Aljezur
25	Wind energy	Megajoule	Moreira da Maia

Table – Some of the biggest industries of renewable energies in Portugal

1.2 Installed Energy Capacity (MW)

In 2008, the National Renewable Energy Sectors represented 51% of the total installed electricity capacity. Between 2005 and 2008, the installed capacity of renewable energy recorded an average annual growth of 10%. Between 2005 and 2008, Portugal has increased by about 2,000 MW installed capacity in renewable energy, representing an increase of 31%, reaching in 2008 an installed capacity of 8,300 MW.

Wind energy has contributed 92% to increase the installed capacity of renewable energy, reflecting the importance that this sector has assumed in the national mix of renewables. Additionally, there is the growth of solar photovoltaics since 2005 due to the entry into operation of large plants for electricity generation and from 2007 the entry into force of the scheme Microproduction.

From 2008 there was an increase in installed capacity in the water sector at 7 MW, due to the entry into operation of new small hydro plants (SHP).

	Hydric 10MW	- Hydric≤ 10MW	Bio- mass	Wind	Geothermic	Photovol- taic	Total RE- NEWABLES
1995	7.962	492	988	16	42	1	9.501
1996	14.207	658	959	21	49	1	15.895
1997	12.537	638	1.036	38	51	1	14.301
1998	12.488	566	1.022	89	58	1	14.224
1999	7.042	589	1.237	122	80	1	9.071
2000	11.040	675	1.554	168	80	1	13.518
2001	13.605	770	1.600	256	105	2	16.338
2002	7.551	706	1.732	362	96	2	10.449
2003	15.163	891	1.663	496	90	3	18.306

2004	9.570	577	1.797	816	84	3	12.847
2005	4.737	381	1.976	1.773	71	3	8.941
2006	10.633	834	2.001	2.925	85	5	16.483
2007	9.927	522	2.140	4.037	201	24	16.851
2008	6.780	516	2.133	5.757	192	41	15.419
2009	8108	901	2.376	7577	194	160	19.316

Table – Production of Electric Energy from Renewable Sources (GWh). Source: DGGE

	Hydric 10MW	- Hydric 10MW	≤ Biomass	Wind	Geothermic	Photovoltaic	Total RENEWABLES	Electric Energy TOTAL
1995	4.032,42	246,38	359,00	8,28	8,80	0,34	4.655,22	9.689,00
1996	4.036,00	248,00	345,00	18,41	8,80	0,43	4.656,64	9.810,00
1997	4.130,00	245,00	351,00	29,16	8,80	0,53	4.764,49	9.865,00
1998	4.051,00	247,00	351,00	53,00	18,00	0,65	4.720,65	10.989,00
1999	4.035,00	257,00	441,00	57,00	18,00	0,93	4.808,93	11.167,00
2000	4.037,00	266,00	441,00	83,00	18,00	1,17	4.846,17	11.280,00
2001	4.050,00	281,00	441,00	125,00	18,00	1,34	4.916,34	11.405,00
2002	4.061,00	294,00	479,00	190,00	18,00	1,51	5.043,51	11.620,00

2003	4.061,00	298,00	459,00	268,00	18,00	2,07	5.106,07	12.018,00
2004	4.321,00	307,00	475,00	553,00	18,00	2,70	5.676,70	13.114,00
2005	4.493,00	323,00	476,00	1.063,00	18,00	2,99	6.375,99	13.899,00
2006	4.524,00	324,00	488,00	1.699,00	30,00	3,40	7.068,40	14.962,00
2007	4.524,00	329,00	492,00	2.464,00	30,00	14,50	7.853,50	15.794,00
2008	4.524,00	333,00	492,00	3.030,00	30,00	58,50	8.467,50	16.412,00
2009	4.524,00	352,00	578,00	3.668,00	30,00	115,20	9.207,00	18.103,00

Table - Installed Capacity of Central Electricity Production from Renewable Sources (MW). Source: DGGE

	2004	2005	2006	2007	2008	2009	
SOLAR - Energia térmica		20,2	21,9	23,0	24,7	29,2	36,9
FOTOVOLTAICA - Energia eléctrica		0,3	0,3	0,4	2,1	3,3	13,8
GEOTERMIA - baixa entalpia - Energia térmica		1,0	1,0	10,0	10,0	10,0	10,0
GEOTERMIA - alta entalpia - Energia eléctrica		72,2	61,1	73,3	172,9	165,1	158,2
BIOMASSA - Energia térmica		1.540,0	1555,6	1.565,8	1.591,1	1.586,9	1.543,6
RESÍDUOS INDUSTRIAIS/LIXOS - Energia térmica/eléctrica		1.133,9	1191,8	1.180,2	1.245,6	1.190,0	1.459,7
BIOGÁS - Energia térmica/eléctrica		6,3	11,6	10,7	17,5	25,1	26,

						8
EÓLICA - Energia eléctrica	70,2	152,5	251,6	347,2	495,1	651,6
HÍDRICA - Energia eléctrica	872,6	440,1	986,2	898,6	627,5	774,8

Table - Renewable Energy Solutions in Energy Balance (1000tep).Source: DGGE

1.3 Professionals working in the area of Renewable Energy

Professionals working in the fields of Renewable Energies are from several areas of knowledge such as:

- Electrical Engineer - development of projects and works to rationalize the methods and means of production and distribution of electricity
- Mechanical Engineers - Study, develop, investigate, design and project components, machinery, equipment, facilities and mechanical and thermal systems, using conventional or renewable energies, supervises or works in phases of manufacturing, assembly, operation, inspection, quality control and maintenance of all types of facilities and may also have the responsibility for the management, coordination and advice on various types of activities mentioned above.
- Technical installer of solar thermal systems - to plan, organize, coordinate and execute the installation, maintenance and repair of solar thermal systems, according to the rules, safety regulations and applicable rules of good practice. These professionals are holding a press card specialist, issued by Geology - Directorate General for Energy and Geology.
- Electricians - to coordinate and perform the installation, maintenance and repair of electrical systems, according to the rules, safety regulations and applicable rules of good practice. These professionals are holding a press card specialist, issued by Geology - Directorate General for Energy and Geology.
- Renewable Energy Technician - Coordinates, plans, organizes and executes the installation of renewable energy systems.

According to the study developed "Macroeconomic Impact of Renewable Energy Sector in Portugal " by the APREN (Association of Renewable Energy) and by the Agency De-
 loitte, the direct employment generated by renewables in 2008 was approximately of
 2,400 new jobs. Arising from the expected growth for the sector, prospects are that by

2015 the industry gives employment to about 5,800 workers, representing a growth of over 140% between 2008 and 2015.

	2008	2012	2015
Direct Job	2,400	4,800	5,800
Indirect Job	33,700	43,000	55,000
Total Employment	36,100	47,800	60,800

Table - Employment generated by the Renewable Energy Sector (Jobs)

Next table shows the number of employees each of the companies in question has:

Ref.	Entities	N° of employees
1	BONGÁS-Energias, S.A.	59
2	EDP RENOVÁVEIS	489
3	GENERG	62
4	MARTIFER SOLAR	290
5	PORTUCEL	2 331
6	VENTINVESTE INDÚSTRIA SGPS, S.A.	-
7	CENTEOL S.A.	-
8	DONAUER SOLAR SYSTEMS	140
9	EFACEC	4000
10	GDF Suez Energia Portugal	250
11	HIDROCENTRAIS REUNIDAS	24
12	MOINHOS DO OESTE – PRODUÇÃO DE ENERGIA ELÉCTRICA, LDA.	-
13	PROEF- ENERGIAS RENOVÁVEIS	-
14	SSE Renewables Portugal	1
15	VESTAS	83
16	VULCANO	1000
17	SIEMENS	1233
18	SCHNEIDER ELECTRIC	-
19	Selfenergy	13
20	Jayme da Costa S.A.	110
21	Luságua – Serviços Ambientais S.A.	169
22	Sotecnisol S.A.	223
23	Lobosolar, Energias Renováveis, Lda.	-
24	FF Solar	-
25	Megajoule	4

Table 6: number of employees per enterprise.

1.4 Nature of Private Enterprise or state enterprises? Name?

Of all firms chosen for analysis we have dissociated the following according to their public or private nature, ie it belongs to the public or private sector.

Ref.	Entities	Nature
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1	BONGÁS-Energias, S.A.	Private
2	EDP RENOVÁVEIS	Consortium
3	GENERG	Private
4	MARTIFER SOLAR	Private
5	PORTUCEL	Private
6	VENTINVESTE INDÚSTRIA SGPS, S.A.	Consortium
7	CENTEOL S.A.	Private
8	DONAUER SOLAR SYSTEMS	Private
9	EFACEC	Private
10	GDF Suez Energia Portugal	Private
11	HIDROCENTRAIS REUNIDAS	Private
12	MOINHOS DO OESTE – PRODUÇÃO DE ENERGIA ELÉCTRICA, LDA.	Private
13	PROEF- ENERGIAS RENOVÁVEIS	Private
14	SSE Renewables Portugal	Private
15	VESTAS	Private
16	VULCANO	Private
17	SIEMENS	Private
18	SCHNEIDER ELECTRIC	Private
19	Selfenergy	Private
20	Jayme da Costa S.A.	Private
21	Luságua – Serviços Ambientais S.A.	Private
22	Sotecnisol SA..	Private
23	Lobosolar, Energias Renováveis, Lda.	Private
24	FF Solar	Private
25	Megajoule	Private

Table – Public or private nature of the enterprises.

1.5 Constitution year and Capital of each company

Ref.	Entities	Established year	Capital (€)
1	BONGÁS-Energias, S.A.	1948	1.000.000
2	EDP RENOVÁVEIS	2007	4.361.540.810
3	GENERG	1988	5.000.000
4	MARTIFER SOLAR	2004	15.000.000
5	PORTUCEL	1953	767,500,000
6	VENTINVESTE INDÚSTRIA SGPS, S.A.	-	-
7	CENTEOL S.A.	-	-
8	DONAUER SOLAR SYSTEMS	-	-
9	EFACEC RENOVÁVEIS	2007	41.641.416
10	GDF Suez Energia Portugal	2008	-
11	HIDROCENTRAIS REUNIDAS	-	-
12	MOINHOS DO OESTE – PRODUÇÃO DE ENERGIA ELÉCTRICA, LDA.	2003	25.000
13	PROEF- ENERGIAS RENOVÁVEIS	-	-
14	SSE Renewables Portugal	-	-
15	VESTAS	2009	6.000.000
16	VULCANO	-	25.000.000
17	SIEMENS	1911	70.000.000
18	SCHNEIDER ELECTRIC	-	-

19	Selfenergy	2008	400.000
20	Jayme da Costa S.A.	1916	2 050 000
21	Luságua – Serviços Ambientais S.A.	1991	2.500.000
22	Sotecnisol S.A.	1970	2.070.000
23	Lobosolar, Energias Renováveis, Lda.	2000	30.000
24	FF Solar	1989	23.000
25	Megajoule	2004	5.000

Table – Year of Foundation and social capital of the analysed enterprises

1.6 Historical mission of the analysed Enterprises

Historical presentation of the economic development of some companies previously analyzed.

1.6.1 BONGÁS-Energias, S.A.

On January 18, 1948, the firm Duarte & Pimentel, Ltd was founded, headquartered in Aveiro with the social object of Representations and their own, referring to the beginning of its activities 1st of January, with two partners and the share capital of PTE 40,000.

The constitution of this society was essentially to carry out the representation of two businesses in the district of Aveiro, at the time, SACOR and CIDLA and, consequently, in the promotion and marketing of their products, especially the gas that was still almost at the initial stage.

Granted the status of a central agency so it has developed its activities in the areas of fuels, lubricants, propane and butane gas and, incidentally, appliances (stoves and cookers) as it was necessary to have the means to encourage the sale of gas. From 1948 to 1960, with the passage of time several changes to the social composition and its portfolio of businesses and products have been incorporated.

In 1961, the most relevant and of great importance change occurs for the development of the Firm, with the total redesign of their bodies, followed by the change of name to Bongás - Sociedade Central de Combustíveis de Aveiro, Lda. Being faithful to the representations that had been granted there was then a rapidly escalating business of the firm, particularly in household appliances, thanks to the dynamism and business acumen of one of the partner-managers, several amendments having been made to the Social Pact, and significant increases of their capital as well as the acquisition of land for the headquarters of the firm and land for construction of new warehouses.

In 1977, related to all this, Bongás, along with another partner, formed the VULCANO - Luso Ibérica Termo Domésticos Lda, later changed to VULCANO - Termo Domésticos S.A., which was majority shareholder, for the manufacture of water heaters under Robert Bosch's patent, initially serving up one of its warehouses for installation of equipment, but acquiring the land attached to their premises, where the plant has been implemented with the covered area of 2,000 m².

As a result of this, the headquarters of Bongás and their offices were transferred to this place to facilitate the proximity of management and the continued use of the computer system, already deployed for some time and used by these two companies.

In 1988, Robert Bosch, which has always accompanied with some expectation the development of VULCANO, did not hide its satisfaction, and has become interested in acquiring the company and all facilities, including those used in Bongás in its own affairs, which came to materialize.

In 1989, fruit of the sale of VULCANO and facilities, the opportunity arises to build the new headquarters (offices, shops and warehouses), a plot of 19,000 m² area, where even today Bongás continues to develop its business.

2000 Alteração nos órgãos sociais, do objecto social da forma jurídica para sociedade anónima e da denominação para BONGÁS – Combustíveis de Aveiro, S.A.

From 1991 to 1994, the acquisition of existing businesses that allowed the incorporation in Bongás, of three more Gas Stations (Estarreja Vagueira and Gafanha da Nazaré) as well as Estarreja and Murtosa municipalities, at the level of Gas business, adding up to that already held in Aveiro, Oliveira do Bairro, Ílhavo and Vagos. In 1996, the opening of two new gas stations reinforced its presence in the market, in this business area.

In 2000, the change in the corporate bodies, the social object of the legal form to a limited company and the name Bongás – Combustíveis de Aveiro, SA

In 2003, there was the Inauguration of the fifth Bongás Petrol Station in Avanca, with Galp flag, thereby strengthening the market presence.

In 2004 - Integration, by merging, of the company Repgás - Derivados do Petróleo, Lda. e Transbongás - Transportes Bongás, Lda. na Bongás - Combustíveis de Aveiro, S.A.

This company proceeded, by division, the creation of two new companies - BongásGest - Serviços de Gestão Empresarial, S.A. and Bonimo - Imobiliária, S.A.. Thus, with all

these three enterprises, and the Globalpetróleos - Derivados do Petróleo, S.A. (which was already established in 2002), concluded its project to create a Business Group with the formation of BONG - SGPS, SA, that now holds and explores, thus seven Fuel Gas Stations and all the logistics required for their activity .

In 2005, there was the Inauguration of the seventh station of Bongás, in Vale de Cambra, the fifth with the Galp flag, strengthening the presence and market coverage.

In 2007 the new business area BONGÁS TECNOLOGIAS was launched in the market, being this one of the strategic objectives of the Group Bongás. This business unit is dedicated to providing efficient solutions in terms of energy and environmental issues, highlighting the solutions in the areas of renewable energy, climate control, consulting services and energy audits and water recycling.

In 2008, Bongás presents another business in the energy market, the AdBlue through the new AdBlue By Bongás. The ambition is to become a leading national supplier of AdBlue at national level, providing end customers a better quality of service.

In 2009 Divestment of activities to Galpenergia Gas Pipeline and alteration of the social domination of the company to Bongás - ENERGIAS SA

In 2010, with over 60 years in business and growth, although over the years it has gone through several major changes, the Group is part of the Bongás Energy Market in the segments:

- Renewable Energy solutions and Environment (Renewable Energy solutions, Energy Efficiency, Climate and Environment)
- Gas
- Service Stations
- Bulk Fuel and Lubricants

1.6.2 EDP RENEWABLE SOLUTIONS

EDP Renováveis is the world's fourth largest operator in the wind sector. Between 2005 and 2007, the installed capacity quadrupled, and is one of three companies worldwide with the largest growth in the sector. The main shareholder of EDP Renováveis is EDP Group, the largest Portuguese industrial group and a leading European energy company. Today it is the third largest energy operator in the Iberian Peninsula, with activities at the production, distribution and marketing of electricity and gas, both in Portugal and

Spain. In addition to its leadership position in the Iberian Peninsula, EDP also has a significant presence in the electricity sector in Brazil and, through EDP Renováveis, in the USA.

1.6.3 GENERG

The Group GENERG gathers a group of companies that are responsible for the construction and operation of hydroelectric production of electricity from renewable sources, enhancing national indigenous resources.

Its shareholders are the Lusenerg (57.5%) company that adds an important set of institutions in Portugal (FUNDAÇÃO ORIENTE, FUNDO NOVENERGIA, FLAD-FUNDAÇÃO LUSOAMERICANA PARA O DESENVOLVIMENTO and PARTEX) and GDF-SUEZ (ELECTRABEL) (42.5%), being established in 1988, enhancing the legislative opening that allowed the entry to the sector of electricity generation of independent entities.

The Group GENERG has a total portfolio of 750MW, of which 469.5 MW already in operation: 436.5 MW wind, 33MW hydro and 7MW solar already in operation.

The year 2008 was marked as the starting year of the projects entered into the contest of the new 1200MW wind, won by the consortium with Exceptional Merit EÓLICAS DE PORTUGAL, where GENERG will hold a 20% share of wind power and also for the 25MW of TALAGUEIRA obtained in the second lot of competition for allocation of new wind power.

1.6.4 PORTUCEL

1953 - Start-up of Companhia Portuguesa de Celulose in Cacia, with the production of unbleached pulp from pine, a project led by Eng Manuel Santos Mendonça (grandfather of current Chairman of the Board of Directors, Pedro Queiroz Pereira);

1957 - Companhia Portuguesa de Celulose becomes a pioneer in the world to produce bleached eucalyptus sulphate;

1964 – Start-up of Socel - Sociedade Industrial de Celulose, SARL, in Setúbal, plant dedicated to the production of bleached eucalyptus pulp;

1965 - Constitution of Inapa, Indústria Nacional de Papéis, S.A. aiming to build a factory of fine papers for printing and writing, contiguous to Socel Setubal, Beginning of paper production at the MP I Inapa from the pulp suspension from the Socel.

Beginning of marketing of paper produced from pulp of Eucalyptus globulus in Europe;
Constitution of Portucel - Empresa de Celulose e Papel de Portugal EP, company resulting from the nationalization of the pulp industry; Start of MP II Inapa initiating the production of a wider range of roles; Start-up of Soporcel - Sociedade Portuguesa de Papel, SA with the start of the pulp mill in Figueira da Foz;

Controlling of 42.8% of Soporcel by Wiggins Teape Group (important group in the European paper industry); Restructuring of Group Inapa with the constitution of Papéis Inapa, SA;

MP III of Papéis Inapa comes into operation, positioning the company as a major sector in the Iberian Peninsula;

Start of the first paper machine (PM I) of Soporcel;

1993, February - Constitution of Portucel - Empresa de Celulose e Papel de Portugal SGPS SA, a holding company that now controls the number of companies that comprise Portucel Group;

1993, June - Constitution of Portucel Industrial - Empresa Produtora de Celulose SA, a company dedicated to the producing and marketing of bleached eucalyptus pulp, featuring two units: Cacia and Setúbal;

First phase of privatization of 44.3% of Portucel Industrial; The Soporcel Factory in Figueira da Foz first uses eucalyptus fiber with PCC (precipitated calcium carbonate), an additive that allows obtaining a greater role opacity, whiteness and uniformity;

Acquisition of 100% stake in Inapa Papers, Portucel Industrial SA by giving rise to Portucel - Empresa Produtora de Pasta e Papel, SA; MP II from Soporcel comes into operation as an example of advanced technology in the sector; Portucel - Empresa Produtora de Pasta e Papel, S.A. acquired the entire share capital of Soporcel - Sociedade Portuguesa de Papel, SA, giving rise to the present Portucel Soporcel, one of the largest producers of uncoated fine paper in Europe;

2003 – Beginning of second phase of privatization of Portucel, SA; Acquisition of 67.1% of Portucel, by Semapa Group SA, thus becoming a decisive and structuring of the Portuguese economy;

2006, February - announcement of the investment in new paper mill in Setubal that the Group will assume a leadership position in the European uncoated woodfree paper (UWF);

2007, October - Signing of the contract for the purchase of the new paper machine to install in the industrial complex in Setúbal.

2008, January - Construction of the new paper machine Setubal.

1.6.5 JAYME DA COSTA

The group Jayme da Costa had its genesis with the formation of the company Jayme da Costa - Mechanics and Electricity SA (hereinafter Company) founded in 1916 by Artur Augusto dos Santos, Joaquim Mendes da Costa and Artur Nogueira Martins, initially with the company name of "Santos, Costa & Nogueira, Lda. It had its headquarters at Rua dos Correeiros, No. 14 - 20, Lisbon, and its activity was the manufacture and sale of electrical equipment for low and medium voltage industrial motors and other equipment.

On April 3, 1916, the partner Jayme da Costa, who was to play a major role in the development of society, joins the company. On July 6, 1918, the company name was changed to "Jayme Coast Limited".

On August 12, 1921, following the growth of the business, it is set up a company in Porto, Rua Trinta e um de Janeiro, No. 110, with the corporate name of "Jayme da Costa & Company Limited", being a member majority society "Jayme da Costa, Limited. " On August 15, 1927, the subsidiary head-office from Porto - "Jayme da Costa & Company Limited - is incorporated into the parent company.

On 28 August 1972, "Jayme da Costa, Limited " is transformed into a limited company, adopting the name that endures to this day - "Jayme da Costa - Mechanics and Electricity, SA.

After the revolution of April 1974 which led to the downfall of the previous regime and despite democratization and social instability, natural in these processes, the Company continued its development strategy. It continued to be one of the most important suppliers of the national electricity companies, grouped in the current EDP - Energias de Portugal. However, in the first half of the 80s, the country's economic situation was quite onerous. Several adjustments have become necessary, including assistance from the International Monetary Fund, imposing very restrictive policies, both in terms of public finances, both in terms of household disposable income.

At this time, the Company entered into a process of progressive decline in turnover and profitability. Until late 1988, the Company has accumulated losses arising from an inap-

propriate structure from the business, and liabilities, including with employees, suppliers, banks, social security and state.

1.6.6 SIEMENS

1876 - Provision of a continuous furnace with heat regeneration, source Siemens, for the glass industry in Marinha Grande, installed by Eng. Boistel and Gally.

1885 - Siemens equipments are disclosed and settled in Portugal by Emilio Biel, trustee of electrical equipment. The first occurred in the electrical installation Warehouses Andersen (Porto).

1895 - Siemens engines are fitted in the trams of the Company Carris, in Oporto. The official start with the first installations.

1905 - A Companhia Portuguesa de Electricidade Siemens Schuckertwerke, Lda., precursora da actual. Siemens, S.A., inicia as suas actividades em Lisboa, com delegação no Porto.

1905 - The Portuguese Company of Electricity Siemens Schuckertwerke Ltd., a forerunner of the current. Siemens, SA begins its activities in Lisbon, with a delegation in Porto.

1913 - Fornecimento de equipamentos para a central hidroeléctrica de Santa Rita (Fafe) e para a central termoeléctrica de Massarelos (Porto). A criação da Siemens, Lda. Companhia de Electricidade.

1913 – Supply of equipment for the hydroelectric station in Santa Rita (Fafe) and the power station Massarelos (Porto). The creation of Siemens Ltd. Electricity Company.

1926 - Instalação de central hidráulica para a fábrica de tecidos de Fafe.

1930 - Supply of power cables to the plant of Tagus (Sacavém). - Installation of a power plant with four gas engines and alternators of 150 KWA, switchboard and armored cables underground network of municipal services in Póvoa do Varzim. The firm contribution to the electrification of the country.

1934 - Establishment of Siemens S.A.R.L. and pass of the business premises to Rua Augusta. Introduction of the business of electrical appliances.

1946 - Electrificação e sinalização da Linha ferroviária de Cascais (25 km de extensão). O relançamento da electrificação e o desenvolvimento industrial. 1952 - Electrificação e sinalização da Linha ferroviária de Sintra (27 km de extensão).

1946 - Electrification and signaling of Railway of Cascais (25 km long). The relaunch of electrification and industrial development.

1952 - Electrification and signaling of Railway of Sintra (27 km long).

1955 Fornecimento de 24 carruagens automotoras para o Metropolitano de Lisboa. **1956** Electrificação da Linha ferroviária do Norte. Linha com cerca de 330 km de extensão.

1955 - Supply of 24 self-propelled carriages for the Lisbon Metro.

1956 - Electrification of the north line railway. Line with about 330 km.

1961 - Siemens begins selling lamps and lumi Osram through the acquisition of Enae (National Company for Electrical Appliances).

1962 - Opening of new premises of the Headquarters, at Avenida Almirante Reis, 65, Lisbon.

1964 - Siemens started factory work in Portugal through the acquisition of MOTRA-Electrical Equipment Co. Ltd., a manufacturer of motors and transformers before under the license of Siemens and owned by Enae.

1965 - Participation of Siemens SA in the hydroelectric project of Cabora Bassa dam.

1969 - Creation of a new line in the factory of Sabugo for the production of computer memories.

1971 - Launch of a New Factory in Évora, a manufacturer of relays (telecommunications equipment). The company totaled 1304 workers in various units.

1973 - Purchase of Indelma - Electro-Mechanical Industries Co. Ltd., in Seixal, a producer of wire harnesses for automobiles and electrical switchboards.

1975 - Presença activa no fornecimento de cablagens e quadros eléctricos, como por exemplo para a central termoeléctrica de Sines.

1975 – Active Presence in the provision of wiring and electrical panel, for example for the power station at Sines.

1976 – **Shareholder** Siemens AG transfers 32' DM to cover all the losses accumulated since April 1974. Start of production of vacuum cleaners in the factory of Sabugo (formerly MOTRA).

1979 - Installation of the first CT in the Clinic of All Saints in Lisbon.

1980 - Start of production of color televisions in Sabugo Factory (formerly MOTRA).

1981 - Start of production of fan heaters in Sabugo - the "handy".

1982 - Opening of the Delegation of Coimbra, providing support and business support of medical solutions.

1984 - Start of production of the telephone exchanges EMS in the Factory Sabugo. Modernisation in Europe: investing in new technologies.

1987 - Contract for replacement of the telephone network by digital equipment to be supplied by Siemens EWSD technology and delivery of the first digital central office in Portugal. Inauguration of EMPTEL, Factory of Public Digital Switchboards.

1988 - Acreditação dos Laboratórios da Fábrica de Transformadores.

1988 - Accreditation of Laboratories of the Factory of transformers.

1989 Opening of the new headquarters "Dois Moinhos", in Alfragide.

1990 - Signing of contracts with CP to supply 40 units for electrical quad rail line from Sintra and 30 electric locomotives.

Signing of contracts with CTT and TLP for the implementation of the first mobile network. Constitution of ANFEI - National Association of Industrial Electronics Training. Signing of the contract to supply the coal handling system and low voltage panels from the central Ribatejo.

1992 - Constitution of the plant in Seixal, Factory of Breakers and Electrical Boards, and integration at Siemens, SA

1994 - Siemens Nixdorf Informations-System is now part of Siemens, SA
Opening of new premises of the delegation in the Northern Freixieiro in Matosinhos. Signing the contract to supply "turnkey" of combined cycle power plant at Tapada do Outeiro and lay the first stone in the following year. Electrification of the Beira Alta. Delivery of Macau Airport. The new hospital in Leiria, in operation, the first draft "turnkey" project held by Siemens in Portugal in the hospital area. Towards excellence and innovation, under the sign of digitization, software and high technology

1995 - Siemens, SA becomes the first company in Portugal to join the Eco-Management and Audit Scheme (EMAS) in the Factories of Relés and Indelma. Delivery to Portugal Telecom the line EWSD number two million. Provision of 38 triple units to the Metropolitan of Lisbon (Series ML 95).

1996 - Signing of the contract for the supply of EWSD central to Cape Verde Telecom. Constitution of Siemens Semiconductors, SA, Vila do Conde; signing of the investment agreement worth 560 million euros for the backend plant. The opening of this unit occurred two years later. The 10 active tilting trains are equipped with the CP power systems and Siemens traction control (consortium Fiat / Siemens). Start of R & D activities in the area of optical transmission.

1997 - Primeira instalação nacional de radiologia digital para o Hospital de Viseu. Contrato com TV Cabo para fornecimento “chave na mão” da rede CATV. Arranque do International Training Center (ITC) em telecomunicações.

1997 - First national installation of digital radiography for the Hospital of Viseu. Contract with TV Cabo to supply "turnkey CATV network. Start the International Training Center (ITC) in telecommunications.

1998 - Start of the activities of tantalum capacitors Factory in Évora and signing the contract with an initial investment of 50 million. Participation of Siemens SA in Expo '98, as sponsor and supplier of equipment and services with a broad meaning of technology. Maintenance of buildings and the Oceanarium and Cultural Centre of Belém. All Units of Siemens SA certified by the ISO 9000 series standards. First contract with Vodafone Portugal (Telecel) - Coverage of the Algarve with Microwave technology. Implementation of the new national numbering plan for PT.

1999 - Signing of the contract to supply 38 new units for the Lisbon Metro. Signing a contract with EDP / CCPE for the construction of two groups for reversible 106MVAT for the plant Venda Nova II. Supply of traction substations of the railway line south and of Sines. Installation of the first integrated solution for clinical information systems PI-CIS and the digital imaging PACS in Hospital Divino Espírito Santo, in Ponta Delgada. Siemens wins the contract to supply IP backbone to PT. First contract for managing services business for multi vendor networks (CGD). National computerization of Courts.

2000 - Signing of the contract to supply 34 electrical multiple units of new generation (CP2000) to CP. Start of operation in Tapada do Outeiro. Delivery of Funchal Airport. The first Portuguese company to make the transition to the new ISO 9001:2000. First contract with ONI – Transmission Network SDH.. Siemens signs contract with PT for migration from PSTN to VoIP network

2001 - Signing of new contracts as the Group PT - Portugal Telecom for New Generation Networks, the provision of ADSL solutions and deepening of market leadership in IP backbone. Fusion activities of Divisions Cerberus and Landis & Staefa at Siemens Building Technologies enterprise. Award of contract to provide two sets of 800MW for the combined cycle plant in Ribatejo and signing of contract for long term maintenance of the Central Tapada do Outeiro. Transfer of new products (Nxair, and NxairM NxairP) for Factory Corroios. Electrification of the railway line from Beira Baixa (Mouriscas-Castelo-Branco). Certification of Environmental Management System from Siemens SA for the Sales departments and Services by the norm ISO 14001. Creation of

the development center of digital microelectronics. Gigabit Network FEUP (largest European network in number of network terminations). Development of Number Portability for fixed and mobile networks in Portugal and other countries.

2002 - One million mobile phones sold

2003 - Siemens, SA globally recognized with first place in "Top + Regions Award, rewarding the excellence of its management and exceptional results.

2004 – Supply of integrated solutions to nine of the ten stadiums for the Euro-2004, including installation and operation of the Passenger Terminal ANA/Euro-2004; Portech Learning platform for the formation of consortia for research and application of emerging technologies within the EFP

2005 - Beginning of the activities in the wind energy sector.

- IPTM award to the consortium participated by Siemens to provide the VTS system (System for Maritime Traffic Control).

2007 - marked presence in the Algarve International Circuit of solutions for fire detection, access control, CCTV (including runway), sound diffusion and video walls. Active participation in the success of the consortium "Wind of Portugal"

2008 - Completion of the delivery of 25 locomotives LE4700.

Participation in the *Dolce Vita Tejo* (security services, air conditioning, centralized technical management and solutions for electrification). Beginning of the Construction of Combined Cycle central in Pego, which will drive energy efficiency above 58 per cent, which will put it as one of the most efficient plants in the world. Factory of Sabugo, the world's leading producer of transformers from Siemens SILF for wind farms;

2009 - Signing EMEF protocol, which aims at developing and building national capacities and project them in foreign markets, thereby contributing to the sustainability of the Portuguese railways. Participation in the Colombo Towers project with several electrical stations solutions.

2010 - First tests of the Plant of Combined Cycle of Pego. Signing of memorandum of understanding with the MOBI-E (a Portuguese entity responsible for the development of electric mobility in Portugal) for solutions for charging electric cars.

1.6.7 VULCANO

1977 - Vulcano started its activity in Cacia, Aveiro, March 17, 1977. Dedicated to the manufacture and marketing of gas in boilers to Portugal, basing its operation on a licensing agreement with Robert Bosch for the transfer of the technology used by the German company for production of its boilers.

1983 The company introduces the brand Vulcano in the Portuguese market.

1985 – in only two years, Vulcano brand becomes the market leader in water heaters in Portugal.

1988 - Vulcano is the 2nd Company to obtain the Certification of Quality System. With the acquisition of majority stake by the Bosch Group, the plant becomes part of the Vulcano division of Termotécnica Bosch, which transfers to Portugal existing skills and equipment beginning a process of specialization within the Group.

1992 - Vulcano Termodomésticos SA reaches European leadership of gas water heaters.

1993 - Creation of a Centre for Research and Development (R & D) that allowed Vulcano to go showing successive innovations in the market worldwide. Vulcano becomes an undisputed market leader, recognized as the most technologically evolved, and this is the result of a successful strategy of investment in Research & Development.

1994 - Vulcano develops and introduces the first intelligent heater on the market, with electronic ignition for batteries. This innovation results in a total revolution in the heaters and allows the company to consolidate the leadership of domestic and European markets. This release is accompanied by other developments, since the new automatic water polyamide until later, well-known boiler CLICK.

1995 - Benefiting from synergies in the development of gas-burning appliances (water heaters), the Vulcano Termodomésticos SA started in 1995 producing a new type of gas boiler wall; it now constitutes an important part of the business.

1999 - Vulcano produces over 1 million domestic boilers.

2000 – it is released the water heater's most advanced in the market, using a worldwide innovation and exclusive, patented by Vulcano: world's smallest hydro giving rise to new Click HDG heater.

2001 – one more page in written in the history of the market for water heaters. After several years of research and development, Vulcano brings to market a new dimension of compact water heaters, which reduces by about 27% the size of the device.

2002 - European market leader since 1992, and the third largest producer of water heaters, Vulcano SA Termodomésticos becomes the Competence Center with World responsibility in Bosch Group of the water heater, being under its tutelage the design

and development of new devices as well as its manufacturing and marketing.

2003 - Strengthening of the technology leadership by launching the Sensor Plus heater with remote control and the World One with a capacity of 24 l / min (only for U.S. market). Also in 2003, Vulcano obtained the Quality Certification to ISO 9001-2001 and the updated Environmental Certification according to ISO 14001. This certification is the recognition of the use of the highest standards of quality, harmonious and participatory in the middle where the Vulcan is inserted, and total compliance with environmental standards.

2004 - The reduced size of the unit are now standard of Vulcano, and it is in this year we launched the new mural boiler gas, Babystar also compact format.

Vulcano is now certified by APCER - Portuguese Association of Certification, in accordance with the quality management system with the international standard ISO 9001:2000. At the level of Technical Assistance, strict criteria were defined in the quality service, creating and implementing the concept of Certified Care.

2005 - Vulcano revolutionizes again the market by presenting a new range of compact water heaters, with fully renovated design. The Vulcano combines this release with a set of actions, including forcing educational leadership also in safety aspects. Vulcano decides to invest in a new area of business: Solar Energy. It is a bet on the environment and renewable energy in anticipation of once more to the legal requirements and the needs of society.

Also concerned with environmental concerns, Vulcano brand launches the new range of gas boilers murals: the Greenstar. This boiler uses the technology of condensation, which allows the efficiency and simultaneously reduce emissions of CO₂ and NO_x emissions to the environment. We obtained this year's EMAS registration, which is the European Eco-Management and Audit Scheme established by Regulation (EC) N° 761/2001 of 19 March and aims to evaluate and improve the environmental performance of organizations. Vulcano shows that it is a company that ranks among the best in this regard. 3.6 million Euros are invested in Research and Development, about 2.5% of turnover from Vulcano and four times the national average.

2006 - Vulcano's Click HDG e Click heaters wins the 2006 international award for industrial design 'iF', one of the most prestigious competitions worldwide in industrial design. Faithful to the policy of investment in Research & Development, Vulcano launches the second generation of vented heaters, in compact form: Click! Vented Compact. Also in 2006, it is introduced in the market the wall gas boiler, Lifestar,

which provides more comfort to the user with versions up to 28-30kW in hot water and boiler control through its digital LCD display.

These innovations are inserted into two aspects: comfort (more power, ease of handling and control) and security (vented versions, with diagnostic mode display, fault codes, among others).

These and other innovations have ensured over the years the Vulcano market leadership in hot water.

2007 - The corporate name of Vulcano Termodomésticos SA was changed to BBT Termotecnologia Portugal SA on February 1, 2007, thereby aligning it with the name of the Group. In 2007, we commemorated the production of 1 Million Vulcan Boiler (Lifestar) and 15 Million Vulcan Heater (Vented Click! 14 liters).

Vulcano reinforces its investment in the area of solar, launching a new range of solar solutions. New products were also introduced in the market such as storage water heaters - ranges PrimeAqua and EasyAqua - and the thermo emission devices - ranges home automation, digital and electronics.

2008 - The corporate name of BBT Termotecnologia Portugal SA was changed to Bosch Termotecnologia SA on January 1, 2008, establishing a clear identification as part of the Group.

2009 - Vulcano launched a range of thermostatic water heaters: Vented Sensor, Sensor Green, Underwater Sensor and Sensor HDG. The Vulcano's thermostatic heaters allow you to select the water temperature, are compatible with solar systems and ensure maximum stability of water temperature. This electronic innovation additionally allows gas economy.

Vulcano has renewed its identity with the aim of reinforcing their values and market positioning. Pioneering, confidence and citizenship are the milestones of the new strategy of marketing and communications of the company.

In 2009, Vulcano has also launched in the Portuguese market a new wall condensing boiler, Aquastar Green of Vulcano. The condensation technology allows more efficiency and simultaneously reduces the emission of CO₂ and NO_x into the environment. In the field of renewable energy, the Ministry of Economy and Innovation, launched the Program of incentives for the Use of Renewable Energies. Vulcano was the first brand to enter this program which aims to create conditions that allow individuals to benefit

from the acquisition, installation, maintenance and assurance of solar thermal equipment in residential buildings, through several banks with preferential terms.

2010 - Vulcano launched a new range of air conditioning solutions, that marked the entrance of the brand in this market. Vulcano added, this way, a new business providing solutions to their central heating and water heating, with a view to integrating climate control solutions for a total thermal comfort of home. Later this year, Vulcan launched a new condensing mural boiler, more efficient and environmentally friendly: Lifestar Green.

1.6.8 LOBOSOLAR ENERGIAS RENOVÁVEIS, LDA.

Lobosol, Energias Renováveis Ltd, was born in 2000, within an industrial group, whose core business was the manufacture of mechanical components, electromechanical, plastic, semi-conductors, of which we emphasize the manufacture of photovoltaic modules. Every business unit in the area of photovoltaic Wolf Group, which is included in Lobosol is involved in the development of hundreds of projects since 1994, both nationally and internationally. The vast portfolio in Portugal and in several European countries of photovoltaic systems in operation is only possible due to technical knowledge and experience of technical staff who owns this business unit.