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INRES

Insular regions cooperating for maximising the environmental and economic benefits from research in Renewable Energy Sources

Seventh Framework Programme – Capacities (Regions of Knowledge)
Support Action

Work package 2 (Regional Assessment and Mapping) Deliverable 2.2 (3 Cartographic Competences Schemes including regional partner profiles)

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1. Introduction

The RES sector is an important industrial branch for the project regions Canary Islands, Crete and Samsø. The further development of the sector is a central matter for these three island regions and represents one of the main pillars for developing the regional economies and contributing to economic growth. Research and technological development goes hand in hand with economic growth, advanced technological applications and innovation can boost the growth of industrial sectors through cost-cutting, higher performances levels. Consequently, the further development of the RES sector and energy efficient concepts support the implementation of a sustainable energy model and lead to increased competitiveness at both national and international level.

The present report provides the first results obtained through the data gathering process, i.e. the *Cartographic Competence Scheme (CCS)*, one for each of the three regions. The CCSs give a complete picture on the regional public and private key players involved in the RES sector with different knowledge backgrounds. The specific role of each target player is identified as well as the type of activities performed. In specific, according to the triple-helix structure the following three profile types are considered:

1. Public bodies (administrative at region/island level);
2. RTD performers (both public and private);
3. Industrial players.



The objective is to identify at least a total of 20 profiles, considering the size of the island regions. The data gathering procedure followed a common approach in all three regions. Concrete instructions were given for carrying out the information collection in order to validate the collected data and facilitate the subsequent analyses. The three CCSs are structured along two axes:

- Overview on the regional contexts including geographical information and information related to the industrial, research, training and innovation environment together with performance indicators;
- The three profile typologies of regional key players (public bodies, RTD, industry).

The identified key players will be involved in the further data collection and will be the basis for elaborating the following reports and studies, i.e. the Regional RES-ID Cards and the cross-regional Comparative Analysis, the latter being a key document for setting the framework for initiating future concerted policy and research strategies.

The data collection for each profile type was conducted by the relevant project partners representing the political, scientific and industrial community. INNOVA was responsible for the overall completion of the report, the single CCS' elaboration was under the responsibility of the following partners:

- Canary Islands: *DOBONTECH*
- Crete: *CANDIA*
- Samsø: *BS*

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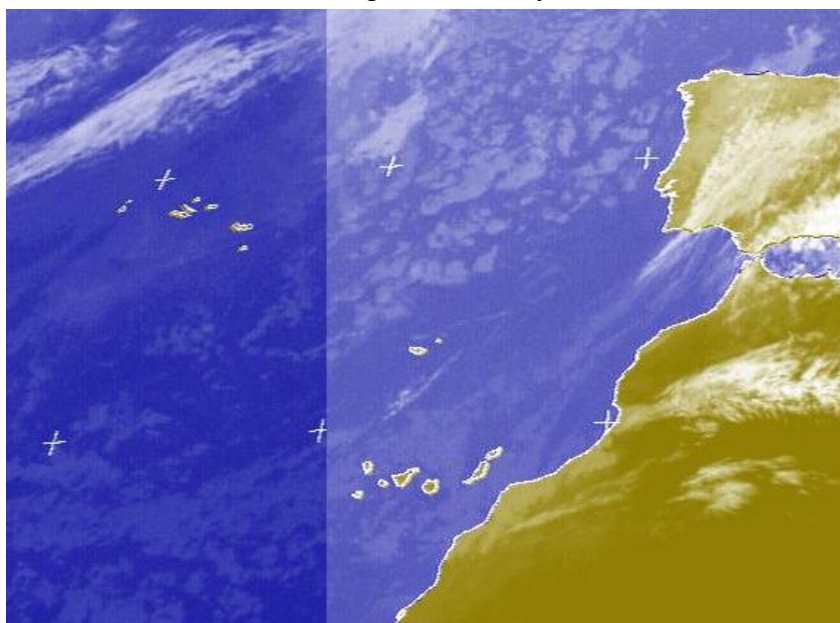
Cartographic Competence Scheme – Canary Islands

2.1. Overview on the regional context

Geography

The Canary Islands are located in the Atlantic Ocean, at the northwest coast of Africa, in front of Mauritania; between the latitudes 27°39' and 29°25' and the longitudes 13°20' and 18°10' west from Greenwich and around 1.000 km far away from Spain.



Satellite Image of the Canary Islands



The Archipelago is formed of 7 islands and 6 small islands of which just one (La Graciosa) is inhabited.

Canary Islands



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Its subtropical geographical location, the trade winds and the influence of marine currents temper the temperatures at the coast, the seasonal contrasts and the contrasts between day and night. At the coastal regions the temperatures fluctuate between 20 and 25 degrees centigrade all along the year. Humidity depends on the respective heights of the islands and the orientation of their slopes. The most drought and plain one are Fuerteventura and Lanzarote. Annual precipitation differs a lot from an island to another, ranging from 660 mm in La Palma (the most wet) to 140 mm in Lanzarote and Fuerteventura.

The most abundant rainfall comes with the tropical wind, from the southwest and west, caused by Atlantic storms coming from south Azores. They appear mainly in winter and specially in high areas of the south coast, although many years can pass without feeling their presence.

Due to the latitude of their location and the proximity of the anticyclone of the Azores, the Canary Islands are affected, almost all the year, by the trade winds.

These trade winds change their intensity depending on the movement of the anticyclone of Azores along the year. In summer, great part of spring and autumn, the frequency of the trade winds is very high, reaching around 90-95% in summer. As these winds are very regular and of moderate mean speeds, they are ideal for wind energy use.

Demographic and socioeconomic indicators

Traditionally, the economy was based on agriculture and commerce, but since the sixties the service sector has grown enormously due to tourism which is nowadays the main economic activity. Industry remained in a second position with the construction industry as its main motor and followed by food and water, gas and electricity production. Due to the specific characteristics of the Canarian economy (remoteness, fragmented territory, small size of the market, etc.) the industrial sector size in the Canaries is perceptibly smaller than the national average rate.



The incidence of the different sectors reflects the absolute predominance of the service sector (75%), followed by the construction industry (13,9%), industry (8,5%) and agriculture (2,6%). These data correspond to the end of 2006. The present economic crisis has changed the panorama as the construction sector has been seriously affected by this situation. In the first semester of 2009, the actual unemployment rate has reached 25% of the population.

The population in the Canaries has experienced a great augmentation this last century, arriving at the beginning of 2008 to 2.075.968 inhabitants.

The Canaries has become a well known tourist destination, especially for the Europeans living in the main land who are attracted by its weather conditions and the possibility of enjoying sun and beaches all over the year. About 10 million tourists come every year to the islands.

Particular energetic characteristics of the Canaries, adoption of different RES in the region

The Archipelago presents, from an energetic point of view, some particular characteristics, such as:

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- Its geographical fragmentation and its distance to the large continental centres of energy consumption and production;
- Total lack of conventional energetic resources that result in the dependence on oil importation;
- Shortage of drinking water. This is the reason why an important percentage of the electric energy generated (20%) is used for water pumps and desalination, in order to satisfy own necessities and those of the great number of tourists visiting the islands every year.

All these circumstances lead to a particular energetic strategy in the Canaries which indicates the necessity of improving the indigenous energetic resources, the renewable energies, trying to achieve these aspects:

- To assure the energy supply;
- To minimize the vulnerability of the energy supply by diversifying the sources;
- To promote the rational use of energy;
- To reduce the external energy dependence enhancing the use of new energy sources;
- To guarantee a stable and sure energy offer;
- To minimize the energy cost in the different production sectors;
- To contribute to the environmental protection and conservation.



Electric energy delivered to the grid per island in the Canaries (GWh)¹

Año	Gran Canaria	Tenerife	Lanzarote	Fuerteventura	La Palma	La Gomera	El Hierro	Canarias
1.985	1.020,72	794,24	49,16	147,59	80,71	13,14	6,56	2.112,12
1.990	1.594,02	1.253,91	293,94	143,78	103,68	22,35	10,84	3.422,52
1.995	2.065,04	1.691,40	386,92	228,23	149,04	33,23	16,61	4.570,47
1.996	2.128,61	1.761,06	405,48	258,54	149,10	33,67	17,29	4.753,75
1.997	2.254,22	1.899,19	444,47	272,14	155,20	36,36	19,47	5.081,05
1.998	2.385,35	2.046,16	487,12	293,12	171,13	40,33	21,18	5.444,39
1.999	2.544,88	2.201,96	543,91	309,77	183,17	44,56	22,28	5.850,53
2.000	2.720,37	2.367,53	594,66	341,58	198,06	47,14	22,99	6.292,33
2.001	2.836,87	2.547,23	608,11	418,85	193,92	50,76	26,20	6.681,94
2.002	2.893,88	2.697,63	658,23	456,36	196,09	54,83	27,07	6.984,09
2.003	3.134,63	2.949,44	716,98	496,05	216,02	61,67	29,28	7.604,07
2.004	3.359,00	3.144,99	771,14	533,99	234,36	63,66	32,90	8.140,04
2.005	3.439,84	3.358,47	807,96	591,02	237,68	63,93	35,24	8.534,13
2.006	3.566,47	3.536,25	840,86	651,20	251,64	66,68	36,99	8.950,09

These data correspond to the energy actually injected in the electric grids by all power generation plants (thermal power plants, renewable energies, cogeneration plants, etc.).

One special characteristic of the Archipelago is that each island has an isolated electrical grid, except for Lanzarote and Fuerteventura that are interconnected. The electrical system is thus composed by six isolated grids: two large grids in Tenerife and Gran Canaria islands (the most populated islands), one

¹ Energy Statistics of the Canaries (2006). Government of the Canaries. General Directorate of Industry and Energy

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medium size grid (Lanzarote and Fuerteventura islands) and three small grids (El Hierro, La Gomera and La Palma islands).

As well as in the rest of Spain, the electric energy production in the Archipelago has grown every year, but at a growth rate higher than in the rest. Nevertheless, the wind energy contribution to the annual electric demand in the Archipelago was just of 3,85% in 2006. New wind power plants installation has been stuck during more than 10 years because authorization for new wind power is carried out through a Canary Island Government call for tenders. This call for tenders has been declared null and void by the Canary Islands Supreme Court and the new one has suffered many delays during the administrative procedures.

The total wind power installed in the Canaries by the 31st December 2006 was 139,7 MW. 125,7MW correspond to wind farms injecting all their energy to the electric grid, while 11,6 MW correspond to wind farms with associated consumptions, where the generated energy is consumed in the associated installation and the exceeding one is injected in the grid. There is just one off-grid wind park in the Archipelago with an installed wind power of 0,2 MW.

The wind energy installed in the Archipelago per islands is shown in the following table.

Total wind power installed in the Canaries (kW)

Year	Tenerife	La Palma	La Gomera	El Hierro	Gran Canaria	Lanzarote	Fuerteventura	Total
2006	36.680	5.880	360	100	76.295	8.775	11.610	139.700



Due to the fact that the wind penetration levels in small and medium electrical grids, as are those of the Canaries, are conditioned by fundamental parameters such as voltage and frequency, the authorised wind power to be connected to the islands electrical grid is limited. To avoid these limitations and to make use of the enormous wind potential of the islands, one of the necessary actions is to find alternatives for energy storage in isolated systems.

The use of solar energy has also been enhanced during the last years, although its increase has not experienced the rate of wind energy use. Several governmental measures have favoured the installation of solar thermal panels for domestic use and of photovoltaic systems connected to the electrical grid.

Since 1997, the Procasol programme has aided the solar thermal installations in the Archipelago.

The solar thermal surface installed in the Canaries by 31st December 2007 is estimated in 82.347 m². This is an estimation because only surface data of panels installed under subsidies from local and national institutions can be statistically collected. There are other installations operating but they are not included in the referred data.

The total photovoltaic power installed in the Archipelago was by 31st December 2007 of 27.153 kWp (kilowatt-peak). In 2006, 94% of the total power installed corresponded to photovoltaic connected to

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the grid, while 6% belonged to off-grid installations. In 2007, 99% correspond to grid connected installations and the rest to off-grid.

Number of companies/ employees operating in the RES sector



The RES sector is composed by around a hundred of companies, most of them Micro SMEs (less than 10 employees) and the activity mostly developed lies in the installation, promotion, manufacturing, engineering and R&D. Installers of solar systems (both, photovoltaic and low thermal, although some of them also include small wind systems) form the bulk of the companies. Some companies are also promoters of Renewable Energy Systems, specially in the Wind and Photovoltaic sectors. The rest of companies work usually in the engineering area. There are only five manufacturers in the sector: two of them are dedicated to the manufacturing of photovoltaic modules and three to solar thermal collectors.

Research, training and innovation environment

In 2007, the rate of R&D expenditure represented in the Canaries the 0,58% of the GDP, less than the Spanish and European average. The differences between the investments in R&D between the public and the private sector are significant, standing out the minor weight of the last one. This limited investment in R&D is explained due to the importance of the service sector in the economy and the small size of the enterprises, as well as their low technological level.

The public R&D system consists of institutions working mainly in basic and applied research, being the main agents both universities, the one of la Laguna and the one of Las Palmas de Gran Canaria (placed in the most populated islands, Tenerife and Gran Canaria respectively) and the research centres included in them as well as the government centres, such as the Technology Institute of the Canary Islands.

The rate of innovative enterprises in the Canaries is less than the total in Spain, although there has been an important growth in the last period in the industrial enterprises as well as in those of the service sector. It is a significant symptom the lack of technology parks in the Canary Islands, although this is one of the issues being tackled recently by the administration.

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2.2. Regional key players

In the following the regional key players involved in the RES sector are listed. These actors are divided according to their different backgrounds: Regional authorities, Research institutions and Industrial players.

2.2.1. Public bodies



Administration/Agency	Consejería de Empleo, Industria y Comercio del Gobierno de Canarias. Dirección General de Energía
URL	http://www.gobiernodecanarias.org/cicnt/temas/industriayenergia/energia/
Director/Responsible	D. Adrián Mendoza Grimón
E-Mail	industria@gobiernodecanarias.org
Address	C/ León y Castillo, nº 200 Edf. Servicios Múltiples III Planta 4ª 35071 Las Palmas de Gran Canaria
Phone	+34 928 899 400
Brief organisation profile	<p>The General Directorate of Energy functions are the direction, coordination, review and resolution on industry, energy and mines issues, and in particular the following:</p> <ul style="list-style-type: none"> a) General layout and planning of the energy sector; b) Developing and monitoring policy initiatives in the areas of fuel, electricity, renewable energies, rational energy use and energy efficiency within the competence of the Autonomous Community of the Canary Islands; c) Development, approval and coordination of plans and programs for improving the energy sector; d) The proposal for conducting tenders related to generation facilities and transmission of electricity or other energy facilities that could be subject to a tendering procedure; e) Promotion and encouragement of activities aimed at diversification and energy saving and energy audits; f) Advisory and regulatory action regarding the programs, policies and affairs of the European Union in their interest to Canary energy aspects; g) Assisting the management of programs to promote research and technological development in energy.

Administration/Agency	IDAE - Instituto para la Diversificación y Ahorro de la Energía
URL	http://www.idae.es/
Director/Responsible	Enrique Jiménez Larrea
E-Mail	comunicacion@idae.es
Address	C/ Madera, 8 - 28004 Madrid.

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Phone	+34 914 564 900
Brief organisation profile	<p>Instituto para la Diversificación y Ahorro de la Energía (Institute for Diversification and Energy Saving) is a state-owned business entity that reports to the Ministry of Industry, Tourism and Trade through the State Secretary for Energy.</p> <p>The two main poles guiding the institution's activity are achieving the targets set by the 2007-2012 Action Plan under the Spanish Energy Saving and Efficiency Strategy and those of the Renewable Energy Plan for 2005-2010. Thus, as well as jointly coordinating and managing the measures and funds destined for these plans in conjunction with the autonomous regions, the IDAE also runs activities to increase public knowledge and awareness, it provides technical advice, and runs and finances example technology innovation projects with potential for replication.</p> <p>The IDAE's strategic objectives also include running training programmes and awareness campaigns to help build a new energy model able to guarantee the quality and security of Spain's energy supply, and thereby bolster the competitiveness of the country's businesses, promote sustainability and respect for the environment.</p>



Administration/Agency	Agencia Canaria de Investigación, Innovación y Sociedad de la Información
URL	http://aciisi.itccanarias .
Director/Responsible	Juan Ruiz Alzola
E-Mail	
Address	Las Palmas de Gran Canaria C/ Cebrián, nº 3 35003 Las Palmas de Gran Canaria
Phone	+34 928 379 900
Brief organisation profile	<p>The Canarian Agency for Research, Innovation and Information Society (ACIISI) is the organ of the Government of the Canary Islands created with the main aim of:</p> <ul style="list-style-type: none"> ▪ Encouraging research and scientific and technological development . ▪ Boosting innovation within the productive system. ▪ Establishing business telecommunications infrastructure and services in the information society. <p>The ACIISI is the specific political response, at regional level, to the relaunched Lisbon Strategy. In fact, it has been conceived as an effective instrument to develop a strong knowledge-based economy in the Canary Islands taking into account their singular characteristics associated to their status as outermost region of the European Union.</p> <p>The main mission of the ACIISI consists on providing coordination and consistency of public policies to promote research, innovation and information society, given its relevance to all sectors and citizens of the Canary Islands.</p> <p>The ACIISI embody its political engagements into annual action programmes. The Program of the ACIISI for 2009 contains a set of measures covering more</p>

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	<p>than 21 activities organized in two categories:</p> <p>1. Direct management actions, such as:</p> <ul style="list-style-type: none"> ▪ Promotion of technology parks ▪ Training of managers for innovation ▪ Strengthening the regional network of Enterprises Promotion Units ▪ Extension of broadband and Digital Terrestrial Television (DTT) ▪ Development of structural projects, with deep impact in the system ▪ Technical and administrative support to RTD groups <p>2. Public calls for subsidies, oriented to:</p> <ul style="list-style-type: none"> ▪ Incorporate innovative personal to enterprises, build and consolidate clusters, develop RDT projects, support to research staff in specific training and organization of congresses and events of scientific nature, among others
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Administration/Agency	Agencia Insular de Energía de Tenerife
URL	http://www.agenergia.org
Director/Responsible	Manuel CENDAGORTA-GALARZA
E-Mail	agenergia@agenergia.org
Address	Edif. Euclides. Parque Eólico-Polígono Industrial de Granadilla-38611 Granadilla de Abona, Tenerife
Phone	+34 922 391 000
Brief organisation profile	<p>In order to encourage saving measures and energy efficiency in the island of Tenerife, the Island Council, within the program "Energy Smart" of the Sixth Framework Program of the European Commission has promoted the creation of The Insular Energy Agency of Tenerife (ATSI).</p> <p>The ATSI directs its activities primarily to citizens of Tenerife island, as well as councils, schools and various public and private institutions, willing to implement improvements in energy management as well as awareness campaigns, training activities etc..</p> <p>These activities are conducted as own projects, contracted by other entities or as support to others initiatives which are related to the foundational purpose of the Agency.</p> <p>Among the services offered by the AIET there are:</p> <ul style="list-style-type: none"> ▪ Design and development of promotion activities in energy, awareness campaigns, training activities and publications related to the rational use of energy and renewable energy ▪ Advice ▪ Organization and participation in events on energy: exhibitions, information stands, workshops, lectures, conferences, etc... ▪ Development of technical and educational projects, Energy Planning and Audits.

Administration/Agency	Agencia Local Gestora de Energía de Las Palmas de GC
URL	http://www.algelpgc.es/

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Director/Responsible	Néstor Hernández López
E-Mail	
Address	Edificio Polivalente II, 3º Campus Universitario de Tafira 35017 - Las Palmas de Gran Canaria
Phone	+34 928 459 585
Brief organisation profile	<p>The overall objective of the Local Agency for Energy Management of Las Palmas de Gran Canaria is to be a municipal instrument for energy planning and management, in order to encourage saving and energy efficiency and the deployment of renewable energy, promoting development and implementation of more sustainable energy model at local level.</p> <p>The main functions to be developed by the Agency include the following:</p> <ul style="list-style-type: none"> ▪ Awareness of local authorities, enterprises and citizens on the scarcity of energy resources and the need for a rational and compatible use with economic and environmental aspects. ▪ Promotion of the use of renewable energies. ▪ Implementation of policies and actions for energy saving and promotion of a rational use of energy.

Administration/Agency	Mancomunidad del Sureste de Gran Canaria
URL	http://www.surestegc.org/
Director/Responsible	José Rafael Sánchez Ramírez
E-Mail	mancomunidad@surestegc.org
Address	Los Cactus (Pol. Ind. Arinaga), N° 70 35118 – AGÜIMES Gran Canaria
Phone	+34 928 182 896
Brief organisation profile	<p>The Commonwealth of Municipalities in the Southeast of Gran Canaria, consists of the municipalities of Agüimes, Ingenio and Santa Lucía, with an estimated population of 114.000 inhabitants.</p> <p>Since its foundation, the Commonwealth of the Southeast has been working to improve the quality of life of its citizens.</p> <p>Among the achievements of the Commonwealth the great advances in hydraulic carried out should be highlighted. However, the effort has not been limited to tackle severe water problem the population suffered from, but also focused on solving other issues of interest to the development and improvement of quality of life of the county, such as energy and waste management.</p> <p>In addition to the actions undertaken on the sewage treatment and waste among others, the Commonwealth of Municipalities has signed the accession to the Charter of Aalborg, undertaking a commitment to develop the Local Agenda 21 in each municipality, a basic instrument for achieving sustainable development of the community.</p>

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2.2.2. RTD performers

Organisation/Department	Instituto Tecnológico de Canarias, SA. División de Investigación y Desarrollo Tecnológico
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	http://www.itccanarias.org/
Director/Responsible	Gonzalo Piernavieja Izquierdo
E-Mail	gpiernavieja@itccanarias.org
Address	Playa de Pozo Izquierdo, s/n. 35119, Santa Lucía Las Palmas
Phone	+34 928 727 500
Brief organisation profile	<p>The Canary Islands Institute of Technology (ITC) is a public company of the Canary Islands Regional Government attached to the Regional Ministry of Industry, Trade and New Technologies with a staff is 189 employees (most of them graduate personal).</p> <p>Its main goal is to promote the industrial development of the region, fostering Research, Development and Innovation in emerging technological fields, in close collaboration with regional SME, the regional government, the regional administration and institutions, the universities, other R &D centres and public and private companies.</p> <p>The ITC activities are organised in the following 3 divisions:</p> <ul style="list-style-type: none"> ▪ The Central Management Division ▪ The Research and Technology Development Division (RTD Division) ▪ The Business Innovation Management Division <p><u>RTD DIVISION</u></p> <p>Its main objectives are: a) to encourage the industrial development of the Canary Islands in the fields of renewable energies and water treatment technologies, b) to promote the implementation of renewable energy systems in the Canary Islands, and c) to contribute to the internationalization of Canarian SME transferring the technology developed in the Canary Islands to developing countries (focusing on North western Africa and Latin-America).</p> <p>ITC is one of the responsible agencies for the execution of the energy and renewable energy policy of Canary Islands Government Projects. ITC develops and transfers technology in the renewable energy and water technology sector and participate as partner and as coordinator in several energy related projects under different EU Programmes or Initiatives.</p>
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy Water energy Bioenergy

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Offered services	The ITC offers different services in the field of renewable energies such as organizing training, giving advice for the implementation of wind and solar installations and making studies of wind and solar potential in the Archipelago among others.
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Organisation/Department	Instituto Tecnológico y de Energías Renovables S.A
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	http://www.iter.es/
Director/Responsible	Manuel Cendagorta-Galarza
E-Mail	icarsac@iter.es
Address	Pol. Ind. de Granadilla, s/n C.P. 38600 - Granadilla de Abona - Santa Cruz de Tenerife
Phone	+34 922 391 000
Brief organisation profile	<p>Instituto Tecnológico y de Energías Renovables S.A., ITER, was founded by the Cabildo Insular de Tenerife, the island's administrative authority. It was aimed to cover the need of starting a new research field in the islands to reduce the exterior energy supplying dependence and allow a cleaner and sustainable development.</p> <p>To fulfil this aim, its objectives are to promote research activities and technological development related with the use of the renewable energies, as well as other interests aspects for the regional social-economical development: subterranean hydro resources, seismic-volcanic prediction and surveillance, environmental control, and development of communication and information technologies.</p> <p>Entrusted activities in its social purpose:</p> <ul style="list-style-type: none"> ▪ To implement and promote renewable energies applied researches ▪ To develop technological systems for renewable energies uses. ▪ To coordinate energy D&R projects in the Canary Islands. ▪ To create the needed infrastructure for the development of local research activities, engineering and industry. ▪ To develop results for the local industry and export the know-how to other countries and archipelagos. ▪ To promote the relation with the scientific community at national and international level. ▪ Scientific personnel training in all renewable energies fields. <p>ITER main activities are:</p> <ul style="list-style-type: none"> ▪ Electricity generation from Renewable energies (photovoltaic solar energy and wind energy). ▪ Research and development projects related to renewable energies, environment and new technologies.
Research areas	<p>Solar energy</p> <ul style="list-style-type: none"> - Solar energy - Wind energy <p>Wind energy</p> <p>Water energy</p>



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<ul style="list-style-type: none"> - Water energy - Bioenergy - Geothermy 	<ul style="list-style-type: none"> Bioenergy Geothermy
Offered services	

Organisation/Department	Universidad de Las Palmas de Gran Canaria/ Grupo de investigación en INGENIERÍA MECÁNICA (GIIM)
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.ulpgc.es
Director/Responsible	Jaime Gonzalez Hernandez
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Address	INGENIERÍA MECÁNICA. Edificio Departamental de Ingenierias. 35017 Tafira Baja
Phone	+34 928 45 12 63
Brief organisation profile	<p>The University of Las Palmas de Gran Canaria (ULPGC) has nine colleges and research centers and about 150 research groups spread across all areas of knowledge, putting together some 1.000 researchers and about 1.000 graduate students. Furthermore, it has a Science and Technology Park.</p> <p>The most important research fields are the Cybernetics, Telecommunications, Medical Technology, Oceanography, Marine Farming, Renewable Energies and Environmental Conservation. The ULPGC has managed (2004 data) 102 R & D competitive calls for an amount of 5,3 millions.</p> <p>The research group "Research Group in Mechanical Engineering (GIIM)" was recognized as such by the ULPGC in 2002, when research groups were officially created and when research quality requirements were established for new members willing to be accepted. However, most people working on the GIIM "Wind Power" research line started their teamwork since 1986.</p> <p>The group members working in the field of wind energy and its applications are assigned to two different areas of knowledge: Mechanical Engineering and Electronic Technology. This has enabled the group to address a wide range of projects that complement both subjects. One of the main work lines of the group focuses on research, development and innovation of the whole wind energy use process using the Canary Islands as a testing "laboratory". This line covers studies, analysis and wind energy planning, as well as design, analysis and development of wind machines for specific applications, and configuration of renewable energy systems for solving specific problems in the archipelago.</p>
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Wind Energy (On shore) Water Energy (small hydro: wind-hydro energy production)
Offered services	

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Organisation/Department	UNIVERSIDAD DE LA LAGUNA
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.ull.es
Director/Responsible	Eduardo Domenech Martínez
E-Mail	rector@ull.es
Address	C/ Molinos de agua s/n. 38071 La Laguna. SPAIN
Phone	922319451
Brief organisation profile	<p>The University of La Laguna, whose central office is located in the Tenerife city for which it is named, carries out all of the activities assigned to it by law throughout the archipelago. According to its statutes, the University of La Laguna is a public institution that is a legal entity with its own capital resources, acting independently in accordance with the Spanish Constitution and Law and whose purpose is to provide higher education as a public service. Its activity is founded on the principle of academic freedom which allows professors to teach what they see fit and researchers to carry out studies and research that respect the Law, while at the same time guaranteeing the freedom of speech, the right to spread knowledge and artistic, humanistic, scientific and technical production and creation.</p> <p>Pursuant to the organic law regulating universities the University of La Laguna is democratically organised so as to ensure that its governance and that of the different centres includes the participation of the different sectors that form the academic community. Today the University of La Laguna has 25,000 students, 1,700 professors and 800 administrative and service employees. Currently this public institution is made up of more than 26,000 people, between the student body, the teaching staff and the administrative and service employees.</p> <p>The university offers 56 official undergraduate and graduate degrees divided in 28 licenciaturas (a four or five year degree offered in Spanish universities), 16 diplomas (a three year degree), a technical degree in architecture, 6 technical engineering degrees, and 5 engineering degrees. In addition, there are various postgraduate degrees including 41 masters (postgraduate degrees requiring a minimum of 500 class hours) and expertos (postgraduate degrees requiring a minimum of 250 class hours) and 33 doctorate programmes in all different fields, five of which have received the Seal of Excellence from the Spanish Ministry of Education and Science.</p>
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar Energy Bioenergy
Offered services	Master in Renewable Energies

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2.2.3. Industrial players



Company	DOBON'S TECHNOLOGY, S.L.
URL	www.dobontech.com
Director/Responsible	Julián Monedero Andrés
E-Mail	jmonedero@dobontech.com
Address	C/ San Juan Bautista 48, 38002 Santa Cruz de Tenerife - Spain
Phone	+34 922 28 03 54
Brief organisation profile	<p>Dobontech is a research, development and innovation company, specialised in Renewable Energy, Energy Audits and Energy Certification. Dobontech is devoted to develop innovative and competitive products for practical applications and reaching technology transfer agreements with the industry.</p> <p>The company is also provider of professional technological consultancy services, engineering and supplier of custom designed systems. Dobontech participates in International Consortiums, promoting Research and Technological Development projects, where some of Dobontech technology is tested or implemented. Companies, Universities and Institutions from different countries are included among our clients and partners in technological projects.</p>
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	R&D, Engineering and consultancy
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy Wind energy Water energy
Adopted technologies (e.g. in production processes and buildings' construction)	<ul style="list-style-type: none"> ▪ Two-axis Sun Tracking System (TETRA-TRACK®) ▪ Controlled Atmosphere Concentrator (CAC) ▪ Concentrator of Reflexive Cavities (CRC) ▪ Custom designed Renewable Energy products.

Company	CONSTANTE SOLAR, S.L.
URL	www.constante.es
Director/Responsible	Carlos Pérez
E-Mail	cperez@constante.es

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Address	Vía de Servicio Portuaria nº22, Oficina-6, Dársena Pesquera, 38180 Santa Cruz de Tenerife – Spain.
Phone	+34 922 591 927 / +34 922 591 926
Brief organisation profile	<p>Constante Solar is a solar thermal collector manufacturer founded in April 2006 and has an engineering department with expertise in the field of Solar Thermal Energy.</p> <p>This technical team is in constant interaction with the problems of adaptability of the systems in everyday life plots, a fact that encourages the involvement of the company to provide specific technical solutions, through continuous R & D & I.</p> <p>The company main activities are:</p> <ol style="list-style-type: none"> Thermal Solar Collector Manufacturing Low Temperature, Equipment and Systems for Solar Thermal Energy Facilities. Realization of projects, studies, consultancy, energy audits, training courses and programs and calculations. Design and Manufacture of Components: finned tubes with selective surfaces by ultrasonic welding or by mechanical attachment fittings own patent. Research and Development in the test laboratory and the solar platform, for the constant improvement of product development.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturer
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy
Adopted technologies (e.g. in production processes and buildings' construction)	<ul style="list-style-type: none"> ▪ Flat Plate Thermal Solar Collector (CPPs): Different models that allow designers (Architects and Engineers) to carry out building integrated designs such us: Siding on roofs, facades type in blinds, awnings, pergolas, etc.. All made of materials specially selected to withstand extreme outdoor conditions with high resistance to saline climates. ▪ Double Effect Heat Exchangers: European Patent. Energy harvesting system for multifamily dwellings where facilities are projected with inertia tanks. Its double effect, direct exchange or by thermosiphon effect, increase their performance by 35% over traditional systems.

Company	R&LB ENGINEERING CONSULTING, S.L.
URL	www.luisbarber.com
Director/Responsible	Luis Barber Doreste

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E-Mail	luisbarber@coiic.es
Address	Avda. Marítima del Norte 10, Edificio Fayna, 35003 Las Palmas de Gran Canaria Islas Canarias - Spain
Phone	+34 928 36 13 36
Brief organisation profile	<p>R & LB Engineering is a multidisciplinary consulting which includes specialists in various fields knowledge. The performance of the Consulting is focused on the one hand, the development of all types of industrial projects and feasibility studies, analysis of supply and demand, lower costs, optimizing processes and procedures, diagnosing, establishing models for land management and business, etc..</p> <p>Moreover, the collection, processing, analysis and optimization of information form a second line of action, which together with advice on correct and efficient use of Information Technology and Communications in different economic sectors, from the perspective of Information Systems enables the company to design novel solutions to various problem situations.</p> <p>To meet the diverse needs of the demand, the company works closely with specialist expertise and partnerships with consultancies and universities of different countries enabling to work in a large environment.</p>
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Engineering and consultancy
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy Wind energy
Adopted technologies (e.g. in production processes and buildings' construction)	<p>The company develops for rural electrification in isolated nuclei, in which the transport of electricity by conventional means is not profitable, hybrid wind and photovoltaic power prototypes reinforced by a diesel generator that supplies electricity stored in batteries supplied to the villages.</p> <p>This system, already in use, is innovative computer control electronics which can be run from anywhere using remote control to achieve optimization of resources produced. The production of such energy efficient and intelligent use of it is what brings the suitability of this equipment. The remote-system is responsible for maintaining optimal parameters and allows remote maintenance.</p>

Company	AMMETRONIC 96 S.L.
URL	www.ammetric96.com
Director/Responsible	Agustín Padilla Cabrera

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E-Mail	apadilla@ammetric96.com
Address	Tesejerague nº3, T.M. Tuineje, Fuerteventura, 35629 Las Palmas de Gran Canaria - Spain.
Phone	+34 928 87 21 85 / +34 629 47 35 95
Brief organisation profile	<p>AMMETRONIC 96 S.L. was created in 1996 in order to provide a complete service in the field of renewable energy and wind power exclusively. The core activity of the company is focused on the installation and maintenance of all systems that make up a wind farm, from the mechanics and hydraulics, to the electrical and communication facilities. We also have equipment and qualified personnel for the development of the activity of maintenance facilities and technical solutions and electrical installations, overhead lines, underground LV / MV and processing centers.</p> <p>We have over 10 years offering the opportunity to generate energy as ecologically as possible, taking care of our environment and energy benefits that nature provides us.</p> <p>Today the company employs 26 workers and has open job centers in all the Canary Islands</p>
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Installer
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Wind energy
Adopted technologies (e.g. in production processes and buildings' construction)	Ammetric96 has a mobile laboratory for analysis and testing of cables in electrical networks, troubleshooting, among other services, mainly for maintenance work on electrical installations in LV / MV.

Company	ASE RENOVABLES S.L.
URL	www.aserenovables.es
Director/Responsible	Tunte Cantero Artiles
E-Mail	tcantero@aserenovables.es
Address	C/Pamochoamoso nº 7 2C, 35004 Las Palmas de Gran Canaria - Spain.
Phone	+34 928 24 23 61 / +34 928 24 23 67
Brief organisation profile	ASE RENOVABLES, S.L. is an installation company included in the Special Canary Area (ZEC), which specializes in renewable energy installations. Within this broad sector, the company is mainly engaged in the solar



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	<p>thermal, photovoltaic and wind energy. It is also engaged in work efficiency and energy saving in energy intensive. In addition to drafting, construction supervision and technical advice, we also perform the necessary arrangements with relevant government agencies and to deliver turnkey photovoltaic installations. Our technical team currently consists Engineering, Industrial Engineering Technicians and telecommunications technicians in Occupational Hazard Prevention, draughtsmen and skilled installers. We are also approved by the Industry Government General Direction of as an installation company in all categories of the industry specialist in electrical and thermal installations in the building.</p>
<p>Role in the RES sector</p> <p>a) Technology supplier and service provider (manufacturer, distributor, installer, etc.)</p> <p>b) Technology end-user</p>	<p>Installer</p>
<p>Technology areas</p> <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	<p>Solar energy</p>
<p>Adopted technologies (e.g. in production processes and buildings' construction)</p>	<p>Grid connected turn-key PV installation, including monitoring and administrative management. Corrective and preventive maintenance of these facilities.</p>

Company	DAC INSTALACIONES 2005, S.L.
URL	www.grupodac.info
Director/Responsible	Daniele Solmi
E-Mail	daniele@grupodac.info
Address	Carretera general subida a Valle San Lorenzo 202, Arona, 38627 Santa Cruz de Tenerife - Spain.
Phone	+34 922 721 722/ +34 647 428 138
Brief organisation profile	<p>DAC Group is an association of multidisciplinary business enterprises, composed by engineerings and installers, whose bond of union is the concern with the advice and the performance of different types of technical installations.</p> <p>Among the services provided, we can highlight the realization of feasibility studies, processing of government grants, drafting and implementation of projects, implementation and maintenance of all facilities related to energy saving, using the best technologies, such as: solar thermal, photovoltaics, hot water facilities, sewage purification, air</p>

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	<p>conditioning facilities, natural gas LPG, etc.</p> <p>Our ability to work is based in providing technical and commercial services, continually analyzing the market in research and finding the best products we can provide for the best technical commitment.</p> <p>We have a range of approved installers specializing in different technical fields, which are well equipped and properly updated to the current regulations.</p>
<p>Role in the RES sector</p> <p>a) Technology supplier and service provider (manufacturer, distributor, installer, etc.)</p> <p>b) Technology end-user</p>	<p>Installer, distributor.</p>
<p>Technology areas</p> <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	<p>Solar energy</p>
<p>Adopted technologies (e.g. in production processes and buildings' construction)</p>	<p>In cooperation with the manufacturer SONNENKRAFT from Austria, the company is implanting in the Canary Islands solar thermal inertia accumulation stratification modules to increase energy efficiency and instant hot water, avoiding large accumulation of Hot Domestic Water and avoiding high costs of diesel for the legionella prevention.</p>

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2. Cartographic Competences Scheme – Crete

3.1. Overview on the regional context

Geographical and Territorial Analysis

Crete is located to the southern end of Europe, it is the closest European Region to the equator and almost equidistant from mainland Europe (110 km), Asia (175 km) and Africa (300 km). These geographic characteristics of the island provide Crete with a unique chance to play a key role in the international scene.

Crete is Greece's largest island and the fifth largest in the Mediterranean basin. It covers an area of 8.336 km², which is 6.3% of the total area of Greece. The terrain of the land stamps from mountainous capacities with trace about the 50% of the total area and create inter-se fertile flats area (22., % of the total). However, Crete reveals more than the average of the country agricultural land (37,8%) and rangelands (53,1%) but a few forest (only 4,5%). The greater part of the agricultural land is situated to the prefecture of Heraklion (44%) and the least to the prefecture of Chania (17%), which however is the second extension (28,5% of the total land). The water potential of the Region is limited and it is of unequal parts allotted.

Crete is the 13th Region of Greece and it is divided in four Prefectures (Heraklion – 2641 km², Chania - 1823 km², Rethimnon - 1496 km² and Lassithi - 2376 km²), 68 municipalities and 2 communities. The biggest cities are Heraklion, Chania, Rethimnon (which are capitals of the respective Prefectures), Agios Nikolaos (capital of Lassithi Prefecture), Sitia, Ierapetra. The main cities of the island (Heraklion, Chania, Rethimnon, Ag. Nikolaos, Sitia) dispose considerable infrastructures (ports, airports etc). Tourism is the most dynamic activity in the island (in 2009 the arrivals reached 3,5 millions).



Crete's population is 601.000 inhabitants (5,5 % of Greece's population). The population of Crete is distributed: 42% urban, 12% semi-urban and 46% rural.

Employment and Labour Force

The percentage of the labour force in Crete is progressively reduced, due to the modernization of the models of production, in the regional economy and the massive activation of women in the labour market. Service activities, such as tourism, transportation services and education dominate the regional economy, accounting for over 62% of total employment and producing 78,2% of the regional value-added. The employment by economic activity is approximately: Primary sector 37,8%, Secondary sector 12,5% and Tertiary Sector 49,7%

The unemployment percentage is about 7,7% (the lowest among the Greek regions in 2004) mainly influencing women. The low employment percentage is due to the very active tourist sector, a fact that explains the big increase of unemployment during the "non-tourist" months (November to March).

Most companies operating in Crete are SMEs. In total, 48.223 enterprises were registered in 2002. Of those, only five firms employed more than 250 employees (mainly hotels and coastal shipping companies), while 47.691 employed 1 to 10 persons.

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Economic Analysis

General information: The economy of Crete, which was mainly based on farming, started changing visibly during the 70's. While there is still an emphasis on farming and stock breeding, due to the climate and the terrain of the island, there is a drop in manufacturing and a big increase on the services industry (mainly tourism related). All three sectors of the Cretan economy (agriculture, processing-packaging, and services) are directly connected and interdependent. Crete has an average per capita income, which is close to 100% of the Greek average.

The contribution of Crete to the total GNP of Greece reaches 5,3% of the total GDP of the country (31% of which in the primary sector, 13% in the secondary sector and 56% in the tertiary sector) and 80,1% of EU25 average GDP per capita in 2003. 50% of Crete regional GDP is produced in the prefecture of Heraklion.

During 2003, R&D expenditure accounted for 0,86% of GRP, a considerably larger share than the national average of 0,63% and second only to Attica's 0,93%, with universities and PROs (public research organizations) accounting for 97,2% of total regional expenditure.

The above elements underline the dominant role of the primary and tertiary sector in the Cretan economy. At the same time the tertiary sector progressively increases, its contribution to the formation of the regional income, in a way that primary and secondary sector reduce their traditional role in the economy of the inland.

The degree of networking and interlink between the private and public research sectors is low. Most enterprises are SMEs with relatively low turnover. Furthermore, there are large sub-regional imbalances between north and south. Urban concentrations and mass tourism activities dominate in the north of the island, in contrast to the south which has a rural population and is dominated by agriculture. Agriculture, despite its significance for the regional economy, is marked by small and dispersed landholdings focused mainly on olive trees and wine production.

Key indicators of Crete's economic structure and development



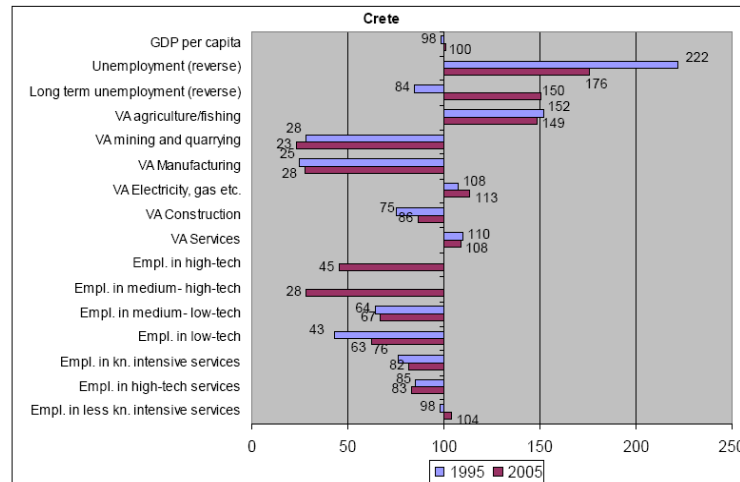
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Source: Eurostat.



Primary sector: Crete is one of the most fertile areas of Greece. Due to the temperate climate of the island, there is a big increase in cultivating in greenhouses. The Cretan agricultural products, after being processed, consist in the main part of the exports of the island. Another big source of income for the farmers is stock farming. Crete has one of the biggest concentrations in Greece of goat and sheep kept for their meat, wool and milk.

Secondary sector: The processing-packaging industries in Crete mainly process agricultural products or manufacture products that support the agricultural production. The main export oriented sectors of the Cretan industrial units are involved with bottling of table water, excavation and processing of marble, production of plastic-based materials (greenhouse coverings, water pipes, packaging material, package film, raw materials for the industry), manufacturing of cultivating machinery (tillage and spraying machines), and manufacturing of folk arts and crafts (leather products, ceramics, textile works, and knitwear). There are also some export-oriented enterprises in fields like car spare-parts, hospital equipment, orthopedic products, plant hybrids, biotechnology products and software products. These enterprises have taken advantage of the specialized knowledge of the scientists and technicians of the island.

RES related enterprises in Crete: The fast development of the Solar panels (for hot water) local industry has contributed to the economic development of the region, producing new jobs, increasing exports, promoting and enhancing local research and innovation in the sector. Local companies producing boilers for biomass, private companies which draw and produce innovative small RES systems (e.g. wind generators for dwellings), companies dealing with the necessary infrastructures for RES plants, represent the dynamic sector in the Cretan economy creating new jobs and producing profit for the economy and development.

Tertiary sector:

Trade: Crete has a flourishing commercial activity. There are a lot of shops that cater to the tastes and demands of the tourists that visit the island every year. There is also the potential for co-operation with foreign companies, from companies whose products can get a high demand in the markets abroad.

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These include, but are not limited to, leather goods, jewellery, furniture, paints, building material and equipment, medical equipment.

The tourist product of Crete: Crete is known as a “sun and sea” destination. Its main competitive advantages are the island’s climatic conditions, its archaeological sites (Knossos, Festos, Eleftherna, etc), Monasteries, Museums, places of historical interest, diverse natural resources from high mountains to long beaches, crystal blue waters combined with a wide range of activities (cultural events, winter and sea sports, etc) as well as high quality accommodation establishments ranging from all categories of hotels to self-catering units.

Crete attracts mainly high quality tourism. As a result, it is considered as the Greek tourist destination with the highest pricing policy (20% higher than the country’s average).



Energy Sector in Crete

Today there are three conventional power plants in Crete (using oil) which produce the biggest part of the necessary electricity. Another one is under construction which will gradually replace one of the already operating power plants. There is also a viable study (and will soon be in activation) about introducing natural gas in the Cretan system (the newest operating power plant in Lassithi and the planned new one will use natural gas instead of oil).

Renewable Energy Sources in the region of Crete

Crete is on the forefront of extensive applications of innovative systems of Renewable Energy Sources and Rational Use of Energy and it disposes on Action and Implementation plan for the RES (wind, solar-thermal, photovoltaic, small-hydro, agricultural biomass and reverse pumping –storage system). The total cost of RES and RUE investments is more than 200 M EURO.

- **20 wind parks** of 148,72 MW total capacity are in operation providing almost 13% of the electricity in Crete, while more new wind parks are under construction.
- **Reverse pumping–storage systems**, which will permit the maximization of penetration of intermittent Renewable Energy Sources in the electricity system of Crete, facilitate the management of the conventional electricity production system and replace the expensive gas turbines’ use during the peak hours, are under study and implementation.
- More than 8,9% of the island’s total energy demand is provided by biomass mainly derived from residuals of the large scale olive production processed on the island and used in thermal energy applications in olive oil mills, green houses, hotels, houses and small manufacturing units.
- **2 biogas combined heat and power** plants are in operation.
- **50 photovoltaics installations** (1MW installed capacity) are integrated in lighthouses, small hotels for ecological tourism, residential housing. New PV installations are under construction.

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- There are more than 345.000 m² – total surface – of **solar thermal collectors** – central and distributed – for water heating, installed in hotels, industries and residential housing, as well as, **two solar cooling/air-conditioning systems** (hotels). **20 new pilot central solar heating systems**, of 8.450 m² total surface, are under installation. Almost 1,8% of the total energy demand is satisfied by solar collectors. **2 solar air conditioning systems** are in operation in hotels.
- There are two small **hydroelectric plants** of 0,6MW, as well as, several **passive solar systems** and **bioclimatic dwellings** (50 operating systems).
- **SHALLOW GEOTHERMY**: 5 installations of **shallow geothermy** are in successful operation
- **PILOT PROJECTS**: Electricity production by solar thermal plants
- Through the National Operational Programmes (Developmental Law, Greek Operational Programme of Competitiveness, New Law for PV etc.) a big number of investments have been realized in the sector of **RES, Rational Use of Energy and Energy Saving** especially in hotel units and small industries.

In 2001, the **Region of Crete and its Regional Energy Agency** have been honoured by the European Commission with the **first award** for the **Best Regional Renewable Energy Partnership** (in the framework of **2001 Campaign for Take-off Awards**), for the existing RES plants in Crete and its successful integrated programme **“Large Scale Deployment of Renewable Energy Sources in Crete”**.

Research Profile



The scale and sophistication of technological services in Crete is at a high level compared with other Mediterranean regions (with higher levels of public R&D in GDP than most such regions in Spain and Italy). Following 20 years of investments by the public sector, the Region of Crete boasts of significant infrastructure for research and technology, while its results have repeatedly won international acclaim, particularly through participation in EU Research & Technology programmes.

During 2003, the R&D expenditure accounted for 0,86% of GRP, a considerably larger share than the national average of 0,63%, with universities and PROs (public research organisations) accounting for 97,2% of the total regional expenditure. Crete receives 18% of the expenditure allocated to public research centres and 8% of that is allocated to higher education institutes (HEIs) in Greece. However, this R&D performance is significantly below the European average, and much lower than the Barcelona targets, particularly with regard to the private sector.

Crete has a number of international quality research and academic institutes, state subsidised but with significant income from national and EU competitive programmes.



Additionally, the European Network and Information Security Agency (ENISA) which is the EU response to security issues of the European Union is also located in the city of Heraklion at the Science and Technology Park of Crete premises.

Specific strengths of the supply side include:



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1. Biotechnology and Biomedicine with emphasis in Molecular Biology & Genetics, Genomics, Enzyme Technology, Medical Ophthalmology and applications of Laser and Technology in Medicine and Art. The Institute of Molecular Biology and Biotechnology (IMBB, FORTH) (www.imbb.forth.gr) is the largest Biotechnology Institute in the country with more than 150 researchers and technical personnel. IMBB participated in the largest European projects of mapping and sequencing of DNA of experimental organisms (e.g. *Drosophila melagaster*, *sacharomyces cerevisiae*).
2. Information and Communication Technologies with emphasis in Computer Science, Robotics, Vision systems, Teleworking and Telemedicine. The Institute of Computer Science (ICS) (www.ics.forth.gr) of FORTH is the leading organisation in the area. During the last 5 years, some very dynamic companies have been established in the area (FORTHnet SA, a spin-off of FORTH is the best example).
3. Laser Technologies. The Institute of Electronic Structure and Laser (IESL) (www.iesl.forth.gr) is a European Laser Facility and Training Centre for European scientists. IESL developed laser technology for industrial, medical and art applications.
4. Energy Technologies with emphasis in wind, solar-thermal photovoltaic and other renewable energy sources, where Crete has great potential for growth due to the growth of power demand and to favourable climatic conditions. Renewable Energy Sources' development and energy innovation is a comparative regional development advantage. The Regional Energy Agency of Crete (www.crete-region.gr), being active since 1994 onwards, promotes and implements regional energy policy and programming, action and implementation plans for RES and RUE, energy innovation, renewable energy sources, rational energy use and energy saving, sustainable transport, educational energy programmes and projects, investors' support and information, promotion-raising awareness-dissemination, climate change and adaptation campaigns, international and Mediterranean cooperation in the energy sector, European and national projects and programmes, demonstration projects, energy data bases, coordination of energy interventions in other sectoral policies, etc.
5. Marine Biology, with substantial contribution to the fish farming and to the fishing policy within the country. The Institute of Marine Biology of Crete (www.imbc.gr) is one of the leading institutions in Marine Biology and Biotechnology in the Mediterranean, providing technological support to the fast growing sector of fish farming.
6. Tourism and related business: Crete is an established destination with a high profile and (mostly) good image, with very strong customer loyalty from some market segments and towards certain products. Also, there are a number of high quality hotels and sophisticated (local) tour operators/destination handlers. Although there are no research organisations on Crete devoted to tourism, the majority of research bodies have undertaken tourism research in some form or other, or have developed technologies which could be used as the basis of specialist tourism products, or have ideas of their own for tourism products using their specialist knowledge.

In contrast to these strengths, there are major weaknesses. The impact of the supply side to the regional economy has been almost minimal, with the exception of FORTH (Foundation for Research and

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Technology Hellas). Generally, technology transfer and promotion of innovation is weak. Support systems for new technology-based firms are almost non-existent and there have been no direct foreign investments in the high-tech area.



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3.2. Regional key players

In the following the regional key players involved in the RES sector are listed. These actors are divided according to their different backgrounds: Regional authorities, Research institutions and Industrial players.



3.2.1. Public bodies

Administration	GREEK MINISTRY OF DEVELOPMENT
URL	www.ypan.gr/index_uk_c_cms.htm
Director/Responsible	Minister: Kostis Hatzidakis General Secretary for Development (Energy): K. Mousouroulis Special Secretary for International Energy Policy: Elisabeth Typaldos-Loverdos General Secretary for Research and Technology: Filippos Tsalidis Special Secretary for Competitiveness: Elefterios Stavropoulos
E-mail	Grammatia@ypan.gr gek@ypan.gr energy-int@ypan.gr
Address	
Phone	
Brief Organisation profile	<p>The Ministry of Development was created through the amalgamation of the Ministry of Industry, Energy & Technology, the Ministry of Commerce and the Ministry of Tourism. The organisational structure (Departments) of the present Ministry is as follows:</p> <ul style="list-style-type: none"> ▪ Department of Energy and Natural Resources ▪ Department of Industry ▪ Department of Commerce ▪ Department of Research and Technology ▪ Department of Consumer Affairs ▪ Department of Competitiveness <p>Mission of the Ministry of Development:</p> <ul style="list-style-type: none"> ▪ Development of policy for the energy sector and exploitation of mineral resources, implementation of this policy as well as supervision of all bodies concerned with energy and minerals in Greece. Formulation of national Energy policy, including RES and RUE. ▪ Development and implementation of national policy for scientific research, technology and innovation (including energy). ▪ Implementation of government policy for industry, planning and supervision of industrial activity in the public sector. Promotion and encouragement of industrial activity in the private sector. Implementation of policy in the area of quality in industrial production and supervision of entities active in the industrial sector. ▪ Development and implementation of government policy in the sectors of commerce and consumer affairs. ▪ Guaranteeing the solvency of insurance companies and the insurance products provided by them.

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	<ul style="list-style-type: none"> ▪ Drafting of policy on corporations (S.A.). Control and registration of Greek and European trademarks – administration of the Trademark Court (commercial and industrial ownership). ▪ Development of consumer protection policy (including energy) and carrying out technical inspections. ▪ Formulation of the national reports on the penetration of RES and RUE in the country according to EU decisions and Directives (compulsory national targets). ▪ Management of the Operational Programme for Competitiveness (including Energy, Energy innovation, Renewable Energy Sources, Energy Saving and Rational Energy Use)
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Administration	PUBLIC POWER CORPORATION S.A.
URL	www.dei.gr
Director/Responsible	Mr. Athanasopoulos, President and Managing Director
E-mail	info@dei.com.gr
Address	30 Chalkokondyli St. 104 32 ATHENS
Phone	+30 210 5230301-10
Brief Organisation profile	<p>The Public Power Corporation was established in 1950 with the aim to map out and implement a national energy electricity policy, which through the intense exploitation of domestic energy resources (lignite, water) would make electricity available for all Greek citizens.</p> <p>Since 01.01.2001, PPC operates as an S.A. company, listed on the Athens and London Stock Exchanges on 12.12.2001.</p> <p>Today, PPC S.A. is the largest power generation company in Greece, providing electricity to approximately 7.4 million customers. PPC is the sole company with a owned power transmission system in Greece, which today is administrated by an independent company HTSO SA (Hellenic Transmission System Operator SA).</p> <p>PPC owns 93% of the installed power capacity in Greece, generated by lignite, fuel oil, hydroelectric and natural gas power plants, as well as by aeolic and solar energy parks. At the same time, PPC owns the country's two large lignite mines in Ptolemais and Megalopolis, generating approximately 56% of the required power supply (2nd largest lignite power generator in the EU). During 2007 a total of 63.4 lignite million tons were mined.</p> <p>Today, PPC fully covers the country's rapidly increasing power needs (from 88 Kwh per capita in 1950, it reached 5,163 KWh in 2007).</p> <p>The deregulation (liberalisation) of the energy market of Greece (February 2001) saw the granting of power generation licenses to other companies and private bodies. Thus, responsibility for power transmission was taken over by an independent company which was set up for that purpose, HTSO SA (Hellenic Transmission System Operator SA). Similarly, the overall control of the Greek Power System (Power Generation, Transmission, Distribution) has now been taken up by RAE (Regulatory Authority for Energy). Recently the responsibility of the operation of the local transmission networks was given to another</p>

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	<p>independent organisation. For the time being the above concern the mainland's system, as for the islands the Power Transmission System Operator is still the PPC., PPC is the largest business in Greece in terms of assets. In 2007 the Company recorded revenues amounting to 5.15 million Euros and pre-tax profits amounting to 276 million Euros. Total electrical power is generated by the 98 PPC power plants, is transmitted via 11,750 km high voltage lines and distributed to consumers via a 214,000 km-long network.</p> <p>MARKET SHARE 99.7 % of the Greek electricity market</p> <p>MARKET NETWORK 249 offices for network services and 154 sales stores throughout the country</p> <p>PPC has successfully undertaken some initiatives and actions concerning the promotion of Rational Use of Energy (e.g. replacement of electric lamps with energy efficient ones). There are plans for the installation of domestic electronic electricity meters.</p> <p>PPC also is highly activated in RES plants in Greece and particularly in Crete where is already the owner of two wind parks. It is also the buyer (according to signed official contracts) of the electricity produced by private producers through the photovoltaic technology, wind energy, hybrid (water – aelic) systems.etc.</p>
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Administration	Regulatory Authority for Energy
URL	www.rae.gr
Director/Responsible	
E-mail	info@rae.gr
Address	132 Pireus Ave. 11854 ATHENS
Phone	+30 2103727400
Brief Organisation profile	<p>The Regulatory Authority for Energy (RAE) is an independent administrative authority, which enjoys, by the provisions of the law establishing it, financial and administrative independence. RAE was established on the basis of the provisions of L. 2773/1999, which was issued within the framework of the harmonisation of the Hellenic Law to the provisions of Directive 96/92/EC for the liberalization of the electricity and energy market.</p> <p>New competences and duties were assigned to RAE with respect to electricity and natural gas sectors by the Electricity Law 3426/2005 and the Gas Law 3428/2005, in alignment with the relevant provisions of the EC Directives 2003/54 and 2003/55:</p> <ul style="list-style-type: none"> ▪ Monitoring the operation of all sectors of the energy market (Electricity, Natural Gas, Oil Products, Renewable Energy Sources, Cogeneration of Electricity and Heat etc.). ▪ Participation in the pre-parliamentary legislative process through recommendation to the Minister of Development of the appropriate measures related to compliance with competition rules and to the overall protection of the consumers in the energy market. ▪ RAE issues a report every two years on security of supply both for electricity and natural gas, which is published and submitted both to the Minister of Development and the Commission, pursuant to the provisions of laws 3426/2005 and 3428/2005. ▪ Advice, with respect to the enactment of the secondary legislation, with the exception

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	<p>of the Electricity Grid Operation Code, the Power Exchanges Code, the Distribution Network Operation Code, where RAE enjoys the right of a consenting opinion.</p> <ul style="list-style-type: none"> ▪ Advice, with respect to the terms and conditions for access to the transmission and distribution networks. Approval of the methodologies for the access tariffs to electricity transmission and distribution networks. The tariffs for third party access to electricity networks are approved by the Minister of Development after RAE's consenting opinion. ▪ Advice, under the form of a simple opinion, in the procedure for the approval of electricity retail tariffs with the exception of access tariffs. ▪ Participation in the process for the granting and revocation of licences for the discharge of electricity activities. Monitoring of the exercise of the activities undertaken by licensees and access to information. ▪ Imposition of financial sanctions, particularly fines to the violators of the primary and secondary energy legislation. ▪ Cooperation with Regulatory Authorities of other countries, international Organisations and the European Commission. ▪ Reporting on an annual basis to the Commission on market dominance, predatory and anticompetitive behaviour on the basis of the appropriate information submitted by the Competition Authority. ▪ Law 3054/2002 assigned specific responsibilities to RAE regarding with the organisation and operation of the oil products market. ▪ RAE is responsible for the licensing of all forms of RES (Production license). ▪ RAE proceeds also to awareness public campaigns for energy saving and RES. ▪ Especially for Crete (and the islands): RAE determines the annual increase of the total Wind Parks' capacity, which the existing electrical system can safely absorb. Based on this it calls for investments strictly up to the determined capacity. ▪ RAE is also the responsible body for licensing PV plants in Greece and also the one to decide which investments should proceed to "exception of licensing" (small PV, etc.).
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Administration	General Secretariat for Research and Technology (GSRT)
URL	www.gsrt.gr
Director/Responsible	
E-mail	contentmaster@gsrt.gr webadmin@gsrt.gr
Address	Mesogeion Av. 14-18, 115 10 Athens - GREECE, P.O.Box 146 31
Phone	+30 210 6911122 +30 210 7752222



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Brief Organisation profile

The General Secretariat for Research and Technology (GSRT) of the Ministry of Development:

- Supports through its programmes, the research activities of both the country's scientific research institutes and those of its productive industry, focussing on areas that are important for the national economy and for the improvement of the quality of life (including energy).
- Promotes the transfer and dissemination of advanced technologies throughout the country's productive sector, thus ensuring early utilisation of the results of research activity (including energy).
- Contributes to the reinforcement of the country's research manpower.
- Represents Greece in relevant institutions of the European Union, thus bringing the country's research and technology activities into line with the requirements of the international community.
- Promotes cooperation with other countries and international organisations on research and technology issues.
- Establishes new institutes and technological centres in support of sectors of high priority for the development of the Greek economy (including energy).
- Supervises underwrites the fixed costs of, and otherwise provides support for 21 of the country's best-known research and technological centres (including energy).
- Supports the dissemination of research and technology information throughout the country and internationally by means of advanced IT systems and networks.
- Encourages activities aimed at raising awareness of the general public about research and technology issues.

GSRT participates actively in the national operational program "Competitiveness" (guided by the Greek Ministry for Development) especially in the sectors Research and Technology, Energy and Energy/Innovation.

GSRT in cooperation with the Greek Ministry for Development is also responsible for several National energy programmes mainly those who promote Innovation (including energy innovation).



Centre for Renewable Energy Sources (CRES)

CRES was founded in September 1987 as a public entity, supervised by the Ministry of Development, General Secretariat of Research and Technology. The Centre for Renewable Energy Sources (CRES) is the Greek organisation for Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (ES). CRES has been appointed as the national co-ordination centre in its areas of activity.

Its main goal is the research and promotion of RES/RUE/ES applications at a national and international level, as well as the support of related activities taking into consideration the principles of sustainable development. Working in the state of the art of technology development, CRES implements innovative projects and significant activities for the promotion and market penetration of new energy technologies.



In the framework of its mission, CRES:

- is the official consultant of the Greek government on matters of RES/RUE/ES in national policy, strategy and planning;
- carries out applied research and develops innovative technologies which are both technically/economically viable and environment-friendly;
- organises, supervises and carries out demonstration and pilot projects, to promote the above technologies;
- implements commercial RES/RUE/ES applications in private sector energy projects,

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	<p>local authorities, professional associations, etc.;</p> <ul style="list-style-type: none"> ▪ provides technical services and advice, in the form of specialised know-how and information, to third parties; ▪ disseminates technologies in its areas of expertise and provides reliable information and support to interested organisations and investors; ▪ organises and/or participates in technical and scientific seminars, educational programmes, specialised training courses, meetings, etc.
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Administration	Hellenic Ministry for the Environment, Physical Planning and Public Works (MINENV)
URL	www.minenv.gr
Director/Responsible	
E-mail	service@dorg.minenv.gr
Address	17 Amaliados st. 115 23 ATHENS
Phone	+30 2131515000
Brief Organisation profile	<p>The Greek Ministry for the Environment, Physical Planning and Public Works has a coordinating mechanism for Sustainable Development, in order to stimulate the participation and promote the cooperation of all the Greek Ministries and Bodies and finally to integrate sustainability into their actions and activities.</p> <p>Targets of the Ministry are:</p> <p>Strengthening of the role of Development Planning and Environment's protection</p> <p>Decentralization of the integrated planning towards the reduction of regional inequalities and the progressive decentralization of responsibilities from the capital to the Regions and Municipalities.</p> <p>The coordination of land planning and environmental planning.</p> <p>Development of necessary infrastructure for the viable operation of "Thematic Parks" (Industrial, Technological, Stock Breeding, Agricultural Cultivation Parks)</p> <p>The protection and re-establishment of the architectural, cultural and environmental identity of cities and villages for a better quality of living standards</p> <p>The rational and integrated use of natural resources</p> <p>The contribution to the development of environmental education, information and the creation of environmental and ecological consciousness</p> <p>The cooperation with Bodies, Organisations and Movements towards Ecology and environmental protection actions and projects</p> <p>In cooperation with other Greek Ministries a new Law was established (Law 3661/2008) concerning: "Measures for the buildings' energy consumption". This Law was harmonized to the Guidelines of the Directive 2002/91 (16.12.2002): "Energy efficiency in buildings" of the European Parliament. This new Law among others included and completed the previous (since 1979) Law related the thermal insulation of Buildings.</p> <p>MINENV is responsible for controlling and approving the Environmental License of the big plants of all kind in Greece. It determines the Environmental conditions under which all the big investments (including energy production: conventional and Renewables) must operate and provides the first necessary environmental approval in the long procedure of</p>

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	<p>licenses an investment must get in order to be able to operate legally.</p> <p>Bioclimatic establishments were favoured by MINENV's Action Plan: "Energy 2001" for Energy Saving in the Buildings sector but also the Ministerial Decision 21475/4707/2008 about the "Determination of measures for CO2 emissions' reduction through the improvement of buildings' energy efficiency". For example, MINENV established several architectural competitions for best "energy saving" domestic and commercial buildings.</p> <p>The "National Program for the reduction of Greenhouse gas emissions and Climate Change (2000-2010)" developed by MINENV determined the national targets and obligations (according to the general targets of the EU) as well as the measures and proposed actions for them to be achieved. This program was developed with the cooperation of the Greek Ministry for Development.</p>
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Administration	Organisation of Sitia Development (OAS) - Crete
URL	http://www.sitia-oas.gr
Director/Responsible	Mr Nikos Petrakis
E-mail	oas@sit.forthnet.gr
Address	5, Antheon Street 72300 Sitia , Crete , GREECE
Phone	+30 28430 23590 +30 28430 25341
Brief Organisation profile	<p>Sitia Development Organisation (OAS s.a.) is a development enterprise owned and run by 4 Municipalities of Sitia District: Sitia Municipality, Makrigialos Municipality, Itanos Municipality and Lefki Municipality.</p> <p>OAS's target is the support to the local municipalities for an integrated, balanced and ecological development. One of its main priorities is the promotion of Renewable Energy Sources, mainly Wind, Solar and Biomass (which potential is huge in Sitia District). They were the first in Crete and Greece to install a "private" wind generator, which was very successful especially for promotion and demonstration reasons. The public and the local authorities and decision makers became this way familiar with the new technology. Today OAS participates as co-owner in two Wind parks.</p> <p>OAS's systematic work and initiatives, during its 20years' operation, has contributed greatly to the development of Sitia, as the first center of RES (mainly wind energy) in Crete, Greece and the East Mediterranean, with many local, regional and national benefits:</p> <ul style="list-style-type: none"> ▪ Creation of 20 permanent and more than 200 temporary new jobs during the study and creations of RES plants ▪ Modernisation of technological background of the local scientists and engineers ▪ Development of the local enterprises and economic life ▪ Economic benefits for the Municipalities as 2% of the Wind Parks' profits are given to them ▪ High publicity has gained by the area as many international TV channels and Press have visited the wind parks of Sitia, students and scientists from all over the world have studied and learned from their operation

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	OAS's high experience can be exploited for the information of local communities, maximising the local acceptance and activation of Municipalities towards promotion of RES plants and formulating "Municipal Energy efficiency plans" in the framework of the "Covenant of Mayors" procedure.
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Administration	Region of Crete - Regional Energy Agency of Crete (REAC)
URL	http://www.crete-region.gr
Director/Responsible	Dr. Nikolas Zografakis
E-mail	enrg_bur@crete-region.gr
Address	Kountourioti Square 712 02 Herkalion Crete
Phone	+30 2810 224 854
Brief Organisation profile	<p>The Region of Crete is the regional administration for the island of Crete. Its areas of activity are the planning, programming, coordination and implementation of the policies for the economic, social and cultural development of Crete. The Regional Council and its President the General Secretary of the Region are the head of the Region of Crete.</p> <p>Through the general decentralization of competences (previously all gathered in the Ministries) to the Greek Regions, the Region of Crete was able to establish public bodies providing services crucial for energy and innovative investments, without the difficulties and time delays of the past (when everything was responsibility of the Ministries). Some of these bodies are:</p> <p>The Directorate of Planning and Development, which is responsible for the implementation of the Greek Developmental Laws and the subsidies of investments (including energy and innovation)</p> <p>The Directorate for Environment and Physical Planning, which is responsible for the environmental licencing and controlling of investments and activities (including energy investments)</p> <p>Among the other developmental targets of the Region of Crete, one important one is energy and environment. The Region of Crete disposes an integrated regional energy policy (unanimously approved by the Regional Council), which is successfully under implementation. This policy not only faces the shortage of electricity power in Crete, but also introduces intensive measures for RES and Rational Use of Energy development and applications, as well as, the introduction of new energy technologies in Crete's insular energy system.</p> <p>The Regional Energy Agency of Crete (REAC) was founded in December 1993 and its areas of excellence are: Energy, Environment, RES, Energy Saving, Rational Use of Energy and European and International Co-operation. Sustainable Energy Communities and Covenant of Mayors are preferential activity fields.</p> <p>REAC has achieved very important results, since its creation:</p> <ul style="list-style-type: none"> ▪ An energy strategy and policy for the Region of Crete has been elaborated and promoted (adopted unanimously by the Regional Council). ▪ An Action and Implementation plan for the wide introduction of RES in the energy system of Crete has been elaborated and promoted. ▪ Strong networking with regional and local Authorities, universities, market actors, professional associations, NGOs, etc.



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	<ul style="list-style-type: none"> ▪ Energy innovation is also a very highlighted sector for REAC. Strong cooperation has been established with Technical Universities and Institutes, with Developmental Organisations, with the Foundation for Research and Technology, with innovative companies and scientists, etc. ▪ Co-operation with Greek Public Power Corporation for the replacement of 300.000 electric bulbs in the Region of Crete (PILOT PROGRAMME) ▪ More than 45 European competitive projects have been (or are) realised. ▪ REAC participates actively in many National and European networks. The cooperation among the Greek, European and Mediterranean islands is a preferable area of activity for REAC, as most islands have the same characteristics (more or less) and face the same difficulties and obstacles towards their sustainable development. ▪ Many meetings, workshops and conferences have been organised all around Crete and in mainland. ▪ Educational activities have been developed (4 special energy educational projects among others), editions have been realised (proceedings of workshops etc.) and databases have been created. ▪ Many Energy leaflets and brochures have been published and distributed to target groups and public. ▪ REAC is an official European partner of the Sustainable Energy Europe Campaign. ▪ In 2001, the Region of Crete and its Regional Energy Agency have been honored by the European Commission with the first award for the Best Regional Renewable Energy Partnership (in the framework of 2001 Campaign for Take-off Awards), for the existing RES plants in Crete and their successful integrated programme “Large Scale Deployment of Renewable Energy Sources in Crete”. <p>The Region of Crete – Regional Energy Agency of Crete is a supporting structure for the implementation of the “Covenant of Mayors” in the Cretan municipalities.</p>
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Administration	Greek Ministry of Economy and Finance
URL	www.mnec.gr
Director/Responsible	Mr. Yannis Papathanassiou (Minister)
E-mail	hellaskps@mnec.gr
Address	Nikis 5-7, Athens, 101 80
Phone	+30 210 333 2402 +30 210 333 2406
Brief Organisation profile	<p>One of the five (5) General Secretariats of the Greek Ministry of Economy and Finance is the <u>General Secretariat for Investments and Development</u> (G.G.E.A.):</p> <ul style="list-style-type: none"> ▪ Participates in the planning and monitors the application of the Investment Incentive Laws in order to help the successful realisation of private investments. ▪ Secures the implementation of the aims linked to Community Support Framework (C.S.F.), Cohesion Fund and Community Initiatives. ▪ Recommends measures for the acceleration of regional convergence and cohesion. ▪ Secures the sound management and maximum utilisation of the national and community funds as well as the observance of the legality and regularity principles. ▪ Supports the Public Investments Programs by introducing measures and institutes



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	<p>that guarantee the effective use of national funds.</p> <ul style="list-style-type: none"> ▪ Furthermore G.G.E.A supervises the Paying Authority and the C.S.F. Management Organisation Unit (M.O.U. S.A.). <p>The Greek Ministry of Economy and Finance enhance energy investments (RES, RUE, Energy Saving, Energy-Innovation) through subsidies diversified according to the technology (wind parks, photovoltaics, geothermal plants, biomass, solar thermal, hybrid systems) and location of the investment and under the rules of the Greek Law for Development. Special interest is being given for the investments related to tourism (the big “industry” of Greece and an important energy consumer). One of the eligible categories of energy investments for subsidy is the renovation of hotels which includes energy related interventions. Another eligible category is building new hotels (or tourist dwellings in general) using modern, energy efficient technologies and systems in their design and operation. The same is valid for the creation of new enterprises or the modernisation of existed ones.</p>
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3.2.2. RTD performers

Organisation/Department	Foundation for Research and Technology - Hellas (FORTH)
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.forth.gr
Director/Responsible	Prof. Vassilios Dougalis Vice-Chairman of the BoD of FORTH Vice-Director of the Central Administration of FORTH
E-Mail	central@admin.forth.gr
Address	Vassilika Vouton P.O. Box 1385 GR - 711 10, Heraklion, Crete, Greece
Phone	+30 2810 391500-2
Brief organisation profile	<p>The Foundation for Research and Technology - Hellas (FORTH), established in 1983, is one of the largest research centers in Greece with well - organized facilities and highly qualified personnel. It functions under the supervision of the <u>General Secretariat for Research and Technology</u> of the <u>Hellenic Ministry of Education, Lifelong Learning and Religious Affairs</u> and consists of seven Research Institutes located throughout Greece: Heraklion, Rethymnon, Patras and Ioannina. The Foundation's headquarters are located in Heraklion, Crete. The research and technological directions of the Foundation cover major areas of scientific, social, and economic interest, such as: Computer Sciences, Molecular Biology, Lasers, Telecommunications, Medical Engineering, Microelectronics, Robotics, Biotechnology, Materials, Chemical and Biological Engineering, Applied and Computational Mathematics, Biomedical Technologies, Bioinformatics as well as Historical and Cultural Studies. Over the years, FORTH has become one of the top European research centers, thanks to its high impact research results and its valuable socioeconomic contribution.</p> <p>Science and Technology Park of Crete (STEP-C) is an initiative of the Foundation for Research and Technology, in support of the diffusion of the technical knowledge (know-how) accumulated within the Academic Community and Research Institutes, in order to create a third development pole in Crete, next to the agriculture and the tourist industry. The development of STEP-C during the early 90's was supported by the European Union as well as by the local and central government funds. STEP-C has developed one of the first 'Resort Office' prototypes in Europe, introducing an integrated concept for working and relaxing in an environment that promotes creativity, encourages commitment to new technologies and offers ample opportunities for all year-round enjoyment.</p> <p><u>Research Institutions:</u></p> <ul style="list-style-type: none"> ▪ The Institute of Molecular Biology and Biotechnology, with products available in the Greek and the international markets, with applications in agriculture and medicine. ▪ The Institute of Electronic Structure and Laser, applications in medicine and art works conservation, microelectronics and environmental

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	<p>technology.</p> <ul style="list-style-type: none"> ▪ The Institute of Computer Science: the activities of this institute were conducive to the foundation of FORTHnet (major Internet Service Provider for the whole of Greece, with a market share of around 30%) ▪ The Institute of Applied and Computational Mathematics: active in particular in the production of geographical information systems and regional development applications. ▪ The Institute for Mediterranean Studies: based in Rethymnon, focused on art and the humanities including archaeology, ethnomusicology, language.
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	No research is conducted in the five mentioned areas. However, FORTH deals with development policies in the RES sector and therefore was considered as important actor to be included in the analysis.
Offered services	Research

Organisation/Department	University of Crete (UoC)
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.uoc.gr
Director/Responsible	Prof. Ioannis Pallikaris Rector
E-Mail	secretary@rector.uoc.gr
Address	Gallos University Campus 74100 Rethymnon Crete, Greece
Phone	+30 28310 77900
Brief organisation profile	<p>The University of Crete, a public University situated in the two cities of Rethymno and Heraklio, was established in 1973 and started functioning in the academic year 1977-78. The seat of the University is in Rethymno. The University consists of 5 Faculties and 17 Departments, has 23,502 students (13,911 at the undergraduate level and 9,591 at the postgraduate level) and 714 teaching and research staff members (559 permanent and 155 temporary). It is a University known, both nationally and internationally, for its innovative approach to education, it's considerable research activity and dynamic character in international cooperation.</p> <p>The University Campus in Rethymno is 150 hectares in size, located about 4 km from the city of Rethymno is the area of Gallos. Three of the Faculties of the University - the Faculties of Philosophy, Education and Social Sciences - are located at this Campus, along with many of the University's Administrative Services and the Central Library. The University in Heraklion, is</p>

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	<p>based on two campuses and it is about 80 km east of Rethymno.</p> <p>At the Knossos Avenue Campus there are 3 of the 7 Departments of the Faculty of Sciences and Engineering. Specifically, these are the Departments of Mathematics, Computer Science, and Applied Mathematics. A number of Administrative Services and a branch of the Library are also housed at the Knossos Campus, which is 4 km south of Heraklio, very close to the archaeological site of Knossos. Over the next several years, the Departments at the Knossos Campus will gradually relocate to the Campus at Voutes.</p> <p>The University Campus at Voutes, some 10 km southwest of the city of Heraklio, houses 4 of the 7 Departments of the Faculty of Sciences and Engineering, which are the Departments of Physics, Chemistry, Biology, and Materials Sciences and Technology. Also located at Voutes are the Faculty of Medicine complex and the University Hospital. Two branches of the University Library, with services for the relevant disciplines, operate at Voutes. The Foundation for Research and Technology Hellas (FORTH), with which the University collaborates closely, is located close by.</p>
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy
Offered services	Education and Research

Organisation/Department	Technological Education Institute-Crete
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.teicrete.gr
Director/Responsible	Prof. Evangelos Kapetanakis President
E-Mail	info@staff.teicrete.gr
Address	P.O. Box 1939 IRAKLIO Crete, Greece, GR 710 04
Phone	+30 281 0379328
Brief organisation profile	<p>The Technological Education Institute-Crete is a Higher Education establishment with a central campus in Heraklion and 3 branches. The student population exceeds 15.000. There is a permanent teaching staff of 230 and over 500 temporary teaching staff are also employed according to annual requirements. Research and education projects also employ around 100 contract staff. TEI-C is quite active in research and applications concerning the primary sector and in renewable energy resources. The TEI offers modern education in fields that are in a great demand.</p>



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	<u>Schools</u> <ul style="list-style-type: none"> ▪ Applied Technology ▪ Management and Economics ▪ Health and Welfare Services ▪ Agricultural Technology ▪ Center of Modern Languages and Physical Education <u>Branches</u> <ul style="list-style-type: none"> ▪ Branch of Chania ▪ Branch of Rethymnon ▪ Branch of Lasithi
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Wind energy Solar energy Bioenergy
Offered services	Education and Research



Organisation/Department	Hellenic Centre for Marine Research (HCMR)
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.hcmr.gr
Director/Responsible	Dr. C. Papaconstantinou Vice President of the Board of Directors of the HCMR Director of the Institute of Marine Biological Resources
E-Mail	pap@ath.hcmr.gr
Address	Gournes Pediados P.O.Box 2214 P.C. 71003 Heraklion Crete Greece
Phone	+ 30 2810 337806
Brief organisation profile	<p>The Hellenic Centre for Marine Research (HCMR) was formed in 2003 from the former Institute for Marine Biology of Crete (IMBC) and the Athens-based National centre for Marine Research. The new centre employs 400 split between the two locations and enjoys international acclaim in research and technological know-how in the niches of marine species inventory, aquaculture, sea-water quality 48 monitoring, depth measurements, environmental management, molecular biology to improve genetic materials, etc.</p> <p>HCMR aims to carry out scientific and technological research, and</p>

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	<p>experimental development, dissemination and implementation of produced results, especially in the fields of study and protection of the hydrosphere, its organisms, its interface with the atmosphere, the coast and the sea bottom, the physical, chemical, biological and geological conditions that prevail and regulate the above mentioned systems with:</p> <ol style="list-style-type: none"> a) the production of products and supply of services b) the support of decision-making concerning the general public, the economy and culture c) their economical exploitation either by the HCMR and/or by its employees or by third parties. <p><i>For the accomplishment of its aims the HCMR:</i></p> <ol style="list-style-type: none"> a) plans and carries out scientific and technological programs, projects and elaborates relevant research studies b) promotes the development of relations and cooperation with international organisations, AEI (Institutes of Higher Education) and relevant national and international Research Institutes as well as legal and physical parties c) promotes scientific expertise on the aforementioned d) contributes towards educating, informing and general awareness of the public e) provides scientific and technological information through the appropriate website f) provides products and offers services relevant to its research interests g) represents Greece in international organisations with relevant activities. <p><u>Cretaquarium</u></p> <p>The Cretaquarium is the dreamchild of the Hellenic Centre for Marine Research and is thus supported by the knowledge, the expertise and the innovation that Greek marine scientists have developed in the last 20 years.</p> <p>The HCMR aquarium in Crete is situated in the place called Thalassocosmos, a site of marine science and aquaculture, a meeting point where science, discovery and recreation are equally accessible. The aquarium has therefore been designed to serve the needs of a wide range of visitors and user groups. The main objective of every aquarium is to acquire know how on species management, the monitoring of the physiochemical parameters of their existence, the planning of special programmes, the promotion of new species and everything relevant to field of the marine biology.</p>
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Water energy
Offered services	Research



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Organisation/Department	Technical University of Crete
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.tuc.gr
Director/Responsible	Prof. Joachim Gryspolakis Rector
E-Mail	rector@central.tuc.gr
Address	Agios Titos Square Chania Crete Greece 73132
Phone	+30 28210 37001
Brief organisation profile	<p>The Technical University of Crete was established in 1977 in Chania Crete and admitted its first students in October 1984. Today, the Technical University of Crete comprises 5 academic engineering departments, the Department of Production Engineering and Management, the Department of Mineral Resources Engineering, the Department of Electronic & Computer Engineering, the Department of Environmental Engineering and the Department of Architectural Engineering, assisted in their curriculum by the Sciences Department, all of which have set very high objectives.</p> <p>The Campus is built on a panoramic location in Kounoupidiana, Akrotiri, 7 km northeast of the city of Chania, with a total area surface of 290 hectares. Off campus, the Department of Architectural Engineering is located at the former French School in Halepa whereas the Rectorate and the rest of the administration offices are located in the heart of the old city of Chania in the Venetian complex of the old barracks and prison.</p> <p>The mission of the Technical University of Crete is to develop modern engineering specialties, to place emphasis on research in fields of advanced technology as well as to establish close cooperation with the industry and other production organizations in Greece. 57 laboratories with excellent equipment, high technology infrastructure and brilliant staff members and 125 faculty staff members with international academic careers testify to the high quality of the educational and research work conducted at the modern facilities of the campus. This profile ranks the Technical University of Crete amongst the most prominent research institutions in Greece.</p> <p>The future goals of the Technical University of Crete include the further enhancement of basic sciences covered in the curriculum of the Departments, so that future engineers can benefit from the best possible quality of education and the best researchers in engineering-related fields may be challenged to work for this Institution.</p> <p>The Technical University of Crete is particularly active in conducting basic and applied research. The research and development projects, managed by the Research Committee, are funded by the European Union, the General Secretariat for Research and Technology, the Ministry of Education, the Region of Crete, local administration organizations and many private businesses. A large number of TUC undergraduate and postgraduate students are employed in these projects; in this way, they benefit from the best</p>

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	possible training and they familiarize with conducting research.
Research areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy Wind energy Water energy Bioenergy Geothermy
Offered services	Education and Research

Organisation/Department	Mediterranean Agronomic Institute of Chania
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.maich.gr
Director/Responsible	
E-Mail	info@maich.gr
Address	Mediterranean Agronomic Institute of Chania Alsyllo Agrokepiou, PO Box 85 Chania 73100 Crete, GREECE
Phone	+30 28210 35000
Brief organisation profile	<p>The Mediterranean Agronomic Institute of Chania, Greece, established in 1985, is a constituent Institute of the International Centre of Advanced Mediterranean Agronomic Studies - CIHEAM (intergovernmental organisation).</p> <p>The activities of MAICH:</p> <ul style="list-style-type: none"> ▪ Contribute to the resolution of contemporary agro-food, environmental and developmental problems through its cooperation with the private and public sector. ▪ Participate actively in the realization of the research and development policy by taking part in the actions proclaimed either by the E.U. Community Support Framework for Research or by the national implementing bodies of the Community Support Framework. ▪ Be involved in regional and local development as well as in environmental protection through innovative actions by participation in E.U. initiatives or financial instrument such as INTERREG, LIFE, etc. ▪ Implement Euro-Mediterranean Partnership Cooperation programs (MEDA). ▪ Coordinate research networks in European and Mediterranean countries that address high priority topics (uses of the Mediterranean flora, endogenous production methodologies compatible with organic farming, etc.). ▪ Cooperate constructively with the private and public sector through the

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	<p>provision of specialized services such as: Internationally accredited chemical analysis on a) residuals in olive oil, fruits, vegetables, b) Analysis and detection of Genetically Modified Organisms, c) Analysis of soil, plant tissues and water.</p> <ul style="list-style-type: none"> ▪ Apart from its laboratory based services, MAICH undertakes assigned projects to analyze specialized research questions and special developmental studies of local interest. Finally, MAICH provides complete support for the organization of international conferences with its' own facilities and internal services. <p>MAICH offers the following postgraduate programs:</p> <ul style="list-style-type: none"> ▪ Business Economics and Management ▪ Geoinformation in Environmental Management ▪ Horticultural Genetics and Biotechnology ▪ Food Quality Management and Chemistry of Natural Products ▪ Natural Products and Biotechnology ▪ Sustainable Agriculture
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Bioenergy
Offered services	Education and Research

Organisation/Department	Mediterranean Agronomic Institute of Chania
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.maich.gr
Director/Responsible	
E-Mail	info@maich.gr
Address	Mediterranean Agronomic Institute of Chania Alsyllo Agrokepiou, PO Box 85 Chania 73100 Crete, GREECE
Phone	+30 28210 35000
Brief organisation profile	<p>The Mediterranean Agronomic Institute of Chania, Greece, established in 1985, is a constituent Institute of the International Centre of Advanced Mediterranean Agronomic Studies - CIHEAM (intergovernmental organisation).</p> <p>The activities of MAICH:</p> <ul style="list-style-type: none"> ▪ Contribute to the resolution of contemporary agro-food, environmental



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	<p>and developmental problems through its cooperation with the private and public sector.</p> <ul style="list-style-type: none"> ▪ Participate actively in the realization of the research and development policy by taking part in the actions proclaimed either by the E.U. Community Support Framework for Research or by the national implementing bodies of the Community Support Framework. ▪ Be involved in regional and local development as well as in environmental protection through innovative actions by participation in E.U. initiatives or financial instrument such as INTERREG, LIFE, etc. ▪ Implement Euro-Mediterranean Partnership Cooperation programs (MEDA). ▪ Coordinate research networks in European and Mediterranean countries that address high priority topics (uses of the Mediterranean flora, endogenous production methodologies compatible with organic farming, etc.). ▪ Cooperate constructively with the private and public sector through the provision of specialized services such as: Internationally accredited chemical analysis on a) residuals in olive oil, fruits, vegetables, b) Analysis and detection of Genetically Modified Organisms, c) Analysis of soil, plant tissues and water. ▪ Apart from its laboratory based services, MAICh undertakes assigned projects to analyze specialized research questions and special developmental studies of local interest. Finally, MAICh provides complete support for the organization of international conferences with its' own facilities and internal services. <p>MAICh offers the following postgraduate programs:</p> <ul style="list-style-type: none"> ▪ Business Economics and Management ▪ Geoinformation in Environmental Management ▪ Horticultural Genetics and Biotechnology ▪ Food Quality Management and Chemistry of Natural Products ▪ Natural Products and Biotechnology ▪ Sustainable Agriculture
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Bioenergy
Offered services	Education and Research

Organisation/Department	National Agricultural Research Foundation (N.AG.RE.F.)
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.nagref.gr www.nagref-cha.gr

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Director/Responsible	
E-Mail	agres@nagref-cha.gr
Address	Agrokipio, Chania Crete Greece 73100
Phone	+30 28210 - 83410
Brief organisation profile	<p>The National Agricultural Research Foundation (N.AG.RE.F.) is the national body responsible for agricultural research and technology in Greece, functioning as a Legal Private Entity sponsored by the Ministry of Agriculture. It was established in 1989 under the Decree 1845/1989 entitled "Development and Exploitation of Agricultural Research and Technology". It is also in charge of research for technological improvement and development in agricultural, forest, and fish production, it is also concerned with topics of veterinary, management of marine resources, soil science, land reclamation, processing and preservation of agricultural products, as well as agricultural economy and sociology.</p> <p>N.AG.RE.F. is administered by an eleven member Administrative Council, whereas the planning of its scientific and research activities is carried by the Scientific Council. The Foundation includes a specialized scientific staff of significant research capacity with modern laboratory and field infrastructure at their disposal. N.AG.RE.F. supports and coordinates initiatives for development suggested by the Ministry of Agriculture, the agricultural cooperatives, product distributors, producers' groups etc. New scientific knowledge and technical innovations are directed towards creating a dynamic and competitive agriculture which is protective of the environment and capable of providing excellent and inexpensive nutrition for the people.</p> <p>N.AG.RE.F. strives for constant improvement in competitiveness of Hellenic agricultural products in the international market. Moreover, it works to symmetrically upgrade the quality of life in the Greek countryside, with the aim of reversing migration and preventing the degradation of our unique environment.</p> <p>The Institute for Olive Tree and Subtropical Plants of Chania, which belongs to N.AG.RE.F. has commenced its activities in 1962 as a small agronomic station.</p> <p>Today, after continuous improvements and extensions, and development in structure and staffing, it is considered to be amongst the best agronomic research Institutes in the country. This is confirmed by the reward of Athens Academy in December 2001.</p> <p>Thus, the Institute today, with modern equipped laboratories and significant human resources is able to contribute in the execution of general and particular projects of national or European agricultural research. Furthermore, the Institute provides technical support to farmers, cooperatives, municipalities and organises various educational activities (seminars, symposia, conferences, e.t.c.)</p> <p>The Office for Farmer Support covers the requirement of modern agriculture for food safety and protection of human and environmental resources. The implementation of Best Agricultural Practices in the conventional and organic farms of the Institute will be a guide for knowledge transfer to farmers.</p>

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Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Bioenergy
Offered services	Research



3.2.3. Industrial players

Company	Corissia Group Hotels (S.A.)
URL	www.corissia.com
Director/Responsible	Mr. Iosif Tsiledakis – President - Managing Director
E-Mail	info@corissia.com
Address	GR-73007 Georgioupolis, Chania, Crete
Phone	Telephone: +30 28250 83010 -19, Fax: +30 28250 61389
Brief organisation profile	<p>The Corissia Group Hotels are divided in two main hotels (Corissia Beach Hotel and Corissia Princess Hotel) with many buildings around a wonderful green park, and are set in the peaceful village of Georgioupolis in the unspoiled western part of Crete. The Corissia Beach Hotel has 77 rooms and the Corissia Princess has 65 rooms. Corissia Group Hotels is opened for the whole summer period.</p> <p>A system of shallow geothermal has been installed for space heating and cooling as well as for heating of water (hot water for use, swimming pool - spa).</p>
Role in the RES sector <ul style="list-style-type: none"> a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user 	Technology end-user

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Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Geothermy (Shallow)
Adopted technologies (e.g. in production processes and buildings' construction)	Exploitation of the Shallow Geothermal technology and adaptation to the local conditions and needs for <ul style="list-style-type: none"> ▪ Space Heating ▪ Space Cooling ▪ Hot Water for Use ▪ Hot Water for Swimming Pool - Spa



Company	Mechatron (S.A.)
URL	www.mechatron.gr
Director/Responsible	Mr. Vasilis Georgoudakis – Managing Director
E-Mail	vgeo@mechatron.gr
Address	I & B str., Industrial Area of Heraklion, GR-71601 Heraklion, Crete
Phone	Telephone: +30 281 0390850, Fax: +30 281 0390851
Brief organisation profile	<p>Mechatron is a modern and innovative (SPIN-OFF) company, which has been established in 2000, aiming to the development and implementation of high-tech products and applications in the field of mechanical, electrical, electronic and software engineering.</p> <p>In the past they have been specialised in hybrid energy systems (PV, small wind turbines and gensets) and for the time being they are specialised in the design and manufacture of a specific Sun Tracker for Photovoltaics (adopted to local conditions).</p>
Role in the RES sector <ul style="list-style-type: none"> a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user 	Technology supplier (Manufacturer)
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar Energy (Photovoltaics)
Adopted technologies (e.g. in production processes and	Exploitation, amelioration and adaptation of the sun trackers technology in order to design and manufacture a specific Sun Tracker for

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buildings' construction)	Photovoltaics installed in Greece (Crete).
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Company	C. ROKAS SA
URL	www.rokasgroup.gr
Director/Responsible	Mr. Hristoforatos Dimitrios – General Director
E-Mail	info@rokasgroup.gr
Address	3 Rizariou Str., 15233 Halandri, Athens
Phone	Telephone: +30 210 8774100, Fax: +30 210 8774111
Brief organisation profile	Rokas Renewables holds a leading position in the sector of Renewable Energy Sources in Greece, with total installed capacity 200.3 MW. Specifically in Crete, Rokas Renewables has R.E.S. installations of 21.6 MW in Wind Parks and 171.6 KW in Photovoltaics in Crete. Since 2004, Rokas is a subsidiary company of the Iberdrola Renewables Company. Besides its leadership in the Renewable Energy Sources sector, Rokas has been a leader in the sector of electromechanical equipment, namely in the construction and installation of lifting and handling equipment. Rokas was one of the first companies which installed wind parks on the island of Crete, therefore it has long-time manufacture and operation experience of Wind Farms. Additionally, it is the first company which installed a Photovoltaic Park in Crete (2001).
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology supplier (Installer – Constructor and Operator)
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar Energy (Photovoltaic Park) Wind Energy (Wind Parks)
Adopted technologies (e.g. in production processes and buildings' construction)	In the energy sector, Rokas has constructed a number of Wind Farms, either on behalf of the Public Power Corporation (PPC) or for its own, being today the leading Renewable Energy Sources producer in Greece. Rokas has also installed the first Photovoltaic Park in Crete.

Company	Municipal Enterprise for Water Supply and Sewage of Heraklion
URL	www.deyah.gr

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Director/Responsible	Charis Papamattheakis
E-Mail	deyah-cp@otenet.gr
Address	1 Vironos str., 71202 Heraklion, Crete
Phone	Telephone: +30 2810 314571, Fax: +30 2810 315060
Brief organisation profile	The Municipal Enterprise for Water Supply and Sewage of Heraklion aims to the construction, maintenance, exploitation, management and operation of the municipal water & sewage network as well as the waste water treatment plant. The waste water treatment plant (1997) – which serves almost 164.000 citizens – comprises anaerobic fermentation plant for the sewage sludge which produces biogas since February 1998.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology end-user
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy (Biogas)
Adopted technologies (e.g. in production processes and buildings' construction)	The waste water treatment plant produces also biogas by the anaerobic fermentation of sewage sludge. Biogas is used for: <ul style="list-style-type: none"> ▪ the production of electricity (covering part of the needs for unit's electricity) ▪ space heating by the rejected heat of the biogas to electricity regenerator (cogeneration) ▪ heating of the anaerobic fermentor (35°C)

Company	A & M Humerianos (Alexandros & Miltos Humerianos)
URL	-
Director/Responsible	Miltos Humerianos – Managing Director
E-Mail	info@villacreta.com
Address	Malades, 71500 Heraklion, Crete
Phone	Telephone: +30 2810 881312, Fax: +30 2810 881172
Brief organisation profile	A & M Humerianos is a machinery manufacture company which is specialized in the manufacture of biomass burners - boilers. It is an innovative company which owns patents for specific machinery inventions and innovations e.g. biomass boilers.
Role in the RES sector	Technology supplier (Manufacturer)

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a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy (Biomass)
Adopted technologies (e.g. in production processes and buildings' construction)	<p>A & M Humerianos designs and manufactures specific biomass boilers for heating a)houses, b)hotels, c)greenhouses, d)factories and e)country houses. In Crete, the biomass burners – boiler use mainly the olive kernel produced as by-product by the extraction of olive oil from olives. Over 500 olive mills around Crete produces heat by exploitation of olive kernel. The specific biomass boilers – burners can also use waste wood etc.</p> <p>The bigger models – mainly for greenhouses – have been tested and certified by the National Institute of Agricultural Development of Crete.</p>

Company	Moevenpick Resort & Thalasso Crete (Ex Candia Maris)
URL	www.moevenpick-hotels.com
Director/Responsible	Atzoletakis Evaggelos – Technical Director
E-Mail	eatzo@tee.gr
Address	72 Andreas Papandreou str., 71414 Gazi, Heraklion, Crete
Phone	Telephone: +30 2810 377000, Fax: +30 2810 250669
Brief organisation profile	<p>Moevenpick Resort & Thalasso Crete is a luxury hotel located very close to the city of Heraklion. The hotel has 285 rooms and suites as well as 6 separate Bungalow buildings holding 59 rooms and suite units.</p> <p>A very big solar thermal system and a sea geothermal system have been installed for water heating (hot water for use, swimming pool, spa etc.), space heating and air conditioning. Additionally, there is in operation a complete Building Management System (BMS) and a desalination unit.</p>
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology end-user
Technology areas - Solar energy	Solar Energy (Solar Thermal) Geothermy (Shallow)

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<ul style="list-style-type: none"> - Wind energy - Water energy - Bioenergy - Geothermy 	
Adopted technologies (e.g. in production processes and buildings' construction)	<p>The hotel combines the operation of a solar thermal system (1980m2) and a sea geothermal system. These systems are used for:</p> <ul style="list-style-type: none"> ▪ Space Heating ▪ Air conditioning – Cooling ▪ Hot water for use ▪ Hot water for swimming pools, spa etc.

Company	Terra Maris
URL	www.maris.gr
Director/Responsible	Atzoletakis Evaggelos – Technical Director
E-Mail	eatzo@tee.gr
Address	Hersonissos, 70014, Crete
Phone	Telephone: +30 28970 27110, Fax: +30 28970 27119
Brief organisation profile	<p>Terra Maris is a luxury hotel in Hersonissos Crete. The hotel has a total of 141 rooms and suites.</p> <p>A big solar thermal system and a sea geothermal system have been installed for water heating (hot water for use, swimming pool, spa etc.), space heating and air conditioning. Additionally, there is in operation a complete Building Management System (BMS).</p>
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology end-user
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar Energy (Solar Thermal) Geothermy (Shallow)
Adopted technologies (e.g. in production processes and buildings' construction)	<p>The hotel combines the operation of a solar thermal system (1100m2) and a sea geothermal system. These systems are used for:</p> <ul style="list-style-type: none"> ▪ Space Heating ▪ Air conditioning – Cooling ▪ Hot water for use ▪ Hot water for swimming pools, thalasso spa etc.

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Company	AGGELAKIS S.A.
URL	-
Director/Responsible	Ioannis Aggelakis – Owner
E-Mail	agel-ae@otenet.gr
Address	GR-71500 Karteros, Heraklion, Crete
Phone	Telephone: +30 2810 380516, Fax: +30 2810 381747
Brief organisation profile	Aggelakis S.A. is in business of cutting, packing and distributing of meat. The company operates as a wholesale dealer of meat to the butchers' shops, supermarkets etc. Aggelakis S.A. has installed a big Photovoltaic Park within the company area. The PV park provides the company with electricity covering part of the total needs for electricity.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology end-user
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar Energy (Photovoltaics)
Adopted technologies (e.g. in production processes and buildings' construction)	Aggelakis S.A. has installed a Photovoltaic Park in order to cover part of its needs for electricity. The installed capacity of the PV Park is 135 KW and it was installed in 2001. The surplus of the produced electricity is sold to the Public Power Corporation.

Company	ATRION Hotel
URL	www.atrion.gr
Director/Responsible	Mr. Giannis Theodorakis – Shareholder (Civil Engineer)
E-Mail	info@atrion.gr
Address	9 Chronaki Street, GR-71202 Heraklion, Crete
Phone	Telephone: +30 2810 246000, Fax: +30 2810 223292
Brief organisation profile	ATRION Hotel is a modern – minimal style – hotel in the heart of Heraklion and it has 60 rooms and suites. It was fully renovated in 2004 and it has a new conference center and business facilities.

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	ATRION hotel uses two Biomass Boilers, producing hot water for space heating and hot water for use, which are burning olive husks all year round.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology end-user
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy (biomass)
Adopted technologies (e.g. in production processes and buildings' construction)	The hotel uses biomass boilers which are burning olive husks. Olive husk is a local biomass product and these boilers are totally adapted to this feedstock. The biomass boilers are used all year round and the hotel has no other system for central heating or for production of hot water. They have integrated this biomass system from the initial construction of the hotel (1984) and they have renewed and upgraded the biomass system during the 2004 renovation. The hot water produced by the boilers is used for: <ul style="list-style-type: none"> ▪ space heating ▪ showers ▪ kitchen ▪ laundry

Company	Kipriotakis Solar Systems
URL	www.kipriotakis.gr
Director/Responsible	Georgios Kipriotakis – Owner
E-Mail	info@kipriotakis.gr
Address	D - L str., Industrial Area Heraklion, GR-71601 Heraklion, Crete
Phone	Telephone: +30 2810 381300, Fax: +30 2810 380631
Brief organisation profile	KIPRIOTAKIS Solar Systems is in the field of manufacturing solar heaters and boilers having as a goal the quality of the product and the long duration of use. Their solar systems are certified and the company intends to enlarge the certifications gained.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.)	Technology supplier (Manufacturer)

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b) Technology end-user	
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar Energy (Solar Thermal) Bioenergy (biomass)
Adopted technologies (e.g. in production processes and buildings' construction)	KIPRIOTAKIS Solar Systems designs and manufactures: <ul style="list-style-type: none"> ▪ Hot Water Solar Systems ▪ Pellet Stoves It is an innovative company which adapted the relevant technologies designing and manufacturing products ideal for the regional conditions.

Company	OLYMPIC SUN
URL	www.olympicsun.gr
Director/Responsible	S. Perakis – Owner
E-Mail	olympicsun@hotmail.com
Address	Mouzouras Gr-73133 Chania, Crete
Phone	Telephone: +30 28210 63131, Fax: +30 28210 63053
Brief organisation profile	OLYMPIC SUN has dealing with alternative energies since 1978. It specialises in the assembly of solar, thermal, photovoltaic and wind energy systems. Their main manufacturing activity is the solar thermal systems which are certified.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology supplier (Manufacturer)
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar Energy Wind Energy
Adopted technologies (e.g. in production processes and buildings' construction)	Olympic Sun manufactures: <ul style="list-style-type: none"> ▪ Solar hot water systems (open and closed loop) ▪ Solar systems for swimming pools Olympic Sun markets also: <ul style="list-style-type: none"> ▪ Mono and polycrystalline solar photovoltaic modules for electricity between 10 and 80 Watts ▪ Accessories for Photovoltaic systems

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	<ul style="list-style-type: none"> ▪ Wind generators for electricity between 300 and 800 KW, for power, pumping, solar/wind systems
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Company	HELIOOTHERMA KYPROS – K. MAVROMATIS
URL	-
Director/Responsible	Mr. Sotiris Nikolaidis – Supervisor (Mechanical Engineer)
E-Mail	solarcy@gmail.com
Address	Ø str., Industrial Area of Heraklion, GR-71601 Heraklion, Crete
Phone	Telephone: +30 2810 381600, Fax: +30 2810 381007
Brief organisation profile	HELIOOTHERMA KYPROS – K. MAVROMATIS has been manufacturing solar energy systems for 35 years (first manufacturing company in Crete). It specialises in the production of hot water solar systems implementing also specific studies of solar systems for big hotels, having great part of Cretan market.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Technology supplier (Manufacturer)
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar Energy
Adopted technologies (e.g. in production processes and buildings' construction)	HELIOOTHERMA KYPROS – K. MAVROMATIS manufactures and markets <ul style="list-style-type: none"> ▪ hot water solar systems for households ▪ solar systems for big hotels – implementing also specific studies according to the needs and the local conditions

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3. Cartographic Competences Scheme – Samsø

4.1. Overview on the regional context

Samsø is an island that lies in the very centre of Denmark. As seaways have been replaced by railways and motorways the island has declined to the periphery in the country. The island has two main ferry-connections. To the European continent there is a one hour sail trip and to the island of Sjælland (Kalundborg - Copenhagen) sailing takes two hours.

In Denmark, as in the rest of Europe there has been a tendency towards urbanization. Samsø suffers the consequences of this development. In the forties the island had about 7.000 inhabitants. This development is not just an “after-the-war” industrialization incident. As illustrated in the following table, population in general in Denmark has increased by 7% during the last twenty years, while population on Samsø has decreased by 10%.



Population index

	Denmark	Samsø	
1989	100	100	100
1999	104	97	97
2009	107	90	90

Migration has had its influence on population distribution. Samsø lacks institutions of vocational and higher education. Generations of young people leave the island around the age of 18 and few of them return after finishing their education. The table below shows the distribution of inhabitants amongst age-categories for the island and Denmark as a whole. The table clearly shows that the generation between 20 and 30 years is “missing”. Inhabitants younger than 50 are underrepresented on Samsø: The generation between 30 and 40 slowly returns to the island, while there is an overrepresentation of elderly outside the labour market. About 40% of the population takes part in the labour market against 50% in Denmark.

Distribution of population amongst age categories

Age	Denmark	Samsø
0-9	12%	9%
10-19	13%	12%
20-29	11%	4%
30-39	14%	9%
40-49	15%	14%
50-59	13%	17%
60-69	12%	17%
70-79	7%	10%
80-89	3%	6%
90 and over	1%	1%

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The distribution of the population has its influence on the economy as well. As average income, a household in Denmark has about € 57.000,- it is only € 47.000,- on Samsø. 10% of the children are living in poor families while this figure is just three percent in Denmark as a whole. In the 90ties, unemployment rates on the island were about 5%-points higher than unemployment in other parts of the country. During the last ten years unemployment rates have reached normal levels. In May 2009 unemployment in Denmark as well as on Samsø lies around 3%. In the 90ties, unemployment in winter was around 10%-points higher than in summer. In the last few years unemployment in winter has been only slightly above summer rates. One of the reasons for success in local economy has been investments in the renewable energy area.



Employment on Samsø is quite different from the rest of Denmark. The following table illustrates the distribution of employees among private sectors.

Employment among sectors on Samsø

Sector	Denmark	Samsø
Primary sector	3%	19%
Nutrition industry	2%	3%
Other industry	13%	4%
Construction	7%	9%
Trade and tourism	19%	19%
Transport	6%	11%
Private service	16%	11%
Public service	36%	43%

The table marks that employment is strongly dependent on agriculture. There is no mining or fishing on the island. Employment in industry hardly exists and transport (ferries) is also an important sector. Public service is a large sector, probably the result of three private schools that attract pupils from other parts of Denmark.

The importance of agriculture can easily be seen while driving around the island, but Samsø also has a partly protected natural brackish water area, where bird-life is very rich. There are small woods and moor as well. People live rather dispersed, though internally on the island there is also a development towards centralization in the main population centre on the island Tranebjerg.

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4.2. Regional key players



In the following the regional key players involved in the RES sector are listed. These actors are divided according to their different backgrounds: Regional authorities, Research institutions and Industrial players.

4.2.1. Public bodies

Administration/Agency	Samsø Municipality
URL	www.samsøe.dk
Director/Responsible	Robert V. Rasmussen
E-Mail	kommune@samsøe.dk
Address	Kommunekontoret, Søjtofte 10, Tranebjerg, 8305 Samsø, Denmark
Phone	+45 6980 8989
Brief organisation profile	The island of Samsø has its own municipality, one of the absolutely smallest in the country after the recent great reorganisation of municipalities. The council consists of 11 members and the total budget is around 50 million EUR.

Administration/Agency	Central Denmark Region
URL	www.regionmidtjylland.dk/Om+regionen/English
Director/Responsible	Bo Johansen
E-Mail	kontakt@regionmidtjylland.dk
Address	Regionshuset Viborg, Skottenborg 26, Postboks 21, 8800 Viborg, Denmark
Phone	+45 8728 5000
Brief organisation profile	Central Denmark Region is one of five administrative units in Denmark. The primary responsibility of Central Denmark Region is healthcare. Furthermore, the region will ensure and coordinate regional development in areas such as nature, environment, business and tourism.

Administration/Agency	Danish Energy Agency
URL	www.ens.dk
Director/Responsible	Ministry of Climate and Energy
E-Mail	ens@ens.dk
Address	Danish Energy Agency, Amaliegade 44, 1256 Copenhagen K, Denmark
Phone	+45 3392 6700
Brief organisation profile	The Agency is responsible for the whole chain of tasks linked to the production, transportation and utilisation of energy, and the impact on the climate. The task is to ensure the legal and political framework for reliable,



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	affordable and clean supply of energy in Denmark. The Danish Energy Agency was established in 1976.
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Administration/Agency	Ministry of Climate and Energy
URL	www.kemin.dk
Director/Responsible	The minister
E-Mail	kemin@kemin.dk
Address	Stormgade 2-6, 1470 Copenhagen K, Denmark
Phone	+45 3392 2801
Brief organisation profile	The Ministry of Climate and Energy works to establish a society with a stable and efficient energy supply, capable of dealing with the effects of climate change.



4.2.2. RTD performers

Organisation/Department	Aalborg University / Dept. of Development and Planning
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.plan.aau.dk
Director/Responsible	Eskild Holm Nielsen
E-Mail	ole@plan.aau.dk
Address	Fibigerstrade 13, room 65, 9220 Aalborg O, Denmark
Phone	+45 9940 8429
Brief organisation profile	The field of the Department includes development and planning in a broad sense, and thereby it reaches from the social science aspects of development (technological, environmental, international and administrative aspects) to physical planning, sector planning, land management, and to technical subjects such as road engineering, road safety, surveying and mapping.
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy Water energy Bioenergy Geothermy
Offered services	Teaching, PhD programme, research.

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Organisation/Department	Technical University of Denmark / Electrical Engineering
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.elektro.dtu.dk
Director/Responsible	K. Stubkjar
E-Mail	krs@elektro.dtu.dk
Address	DTU-Elektro, Technical University of Denmark, 2800 Kgs Lyngby, Denmark
Phone	+45 4525 3914
Brief organisation profile	DTU-Elektro performs research and education at an international level within electronics and systems and related fields. DTU-Elektro focuses on methods and principles for the development and implementation of electronic systems for specific application areas.
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy Water energy Bioenergy Geothermy
Offered services	Education, research, PhD programme



Organisation/Department	Technical University of Denmark / Risø DTU
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.risoe.dtu.dk
Director/Responsible	Henrik Bindslev
E-Mail	bipe@risoe.dtu.dk
Address	Risø National Laboratory for Sustainable Energy, Technical University of Denmark, Frederiksborgvej 399, P.O. Box 49, 4000 Roskilde, Denmark
Phone	+45 4677 4001
Brief organisation profile	Risø is the National Laboratory for Sustainable Energy at the Technical University of Denmark. Risø carries out scientific and technical-scientific research that can provide Danish society with new opportunities for technological development and takes responsibility for the results to be used.
Research areas <ul style="list-style-type: none"> - Solar energy 	Solar energy Wind energy Water energy

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<ul style="list-style-type: none"> - Wind energy - Water energy - Bioenergy - Geothermy 	Bioenergy Geothermy
Offered services	Research, education, PhD programme

Organisation/Department	Aarhus School of Engineering
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.iha.dk
Director/Responsible	Ove Poulsen
E-Mail	ase@iha.dk
Address	Ny Munkegade, Bygning 1521, 8000 Aarhus C, Denmark
Phone	+45 8942 5503
Brief organisation profile	Århus School of Engineering (ASE) is a joint partnership between Århus University through its Faculty of Natural Sciences and the Engineering College of Århus (IHA). ASE represents all engineering studies in Århus, bachelor as well as master studies and associated PhD programs within the engineering sciences.
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy Water energy Bioenergy Geothermy
Offered services	Education, research, PhD programme

Organisation/Department	Technical University of Denmark / Energy-DTU
In case of <i>SME</i> : role in the RES sector (manufacturer, distributor, installer, etc.)	-
URL	www.energi.dtu.dk
Director/Responsible	Hans Larsen
E-Mail	bir@mek.dtu.dk
Address	EnergyDTU



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Phone	Technical University of Denmark
Brief organisation profile	Nils Koppels Allé, Building 403, 2nd Floor
Research areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy Wind energy Water energy Bioenergy Geothermy
Offered services	Education, research, PhD programme

4.2.3. Industrial players



Company	BATEC
URL	www.batec.dk partly in English, Spanish and Italian
Director/Responsible	Emanuel Brender
E-Mail	admin@batec.dk
Address	Danmarksvej 8, 4681 Herfølge
Phone	+45 56275050
Brief organisation profile	Batec started in the first energy crisis of 1973. The firm produces components for solar collectors and has manufacturing plants in Denmark, Germany, Egypt, Uganda and Uzbekistan.
Role in the RES sector <ul style="list-style-type: none"> a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user 	Production and construction of fluid solar absorbers. Batec produces and coats copper tubes and strips as well as constructs complete absorbers.
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Fluid solar energy.
Adopted technologies (e.g. in production processes and buildings' construction)	Production and coating of copper tubes and strips. Construction of fluid based solar collectors.

Company	Nibe
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URL	www.nibe.com partly in english and German
Director/Responsible	Gerteric Lindquist
E-Mail	info@nibe.se
Address	Järnvagsgatan 40, 28521 Markaryd, Sweden
Phone	+46 4337300
Brief organisation profile	Swedish company, that pretends to be market-leader in Scandinavia in the field of heating industrial plants and private houses. Manufactures elements for heating-systems as well as complete heating-solutions.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing of elements for electric heating applications Production of heating systems such as heat-pumps using geothermic heating or electricity Production of wood burning stoves
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy Geothermy
Adopted technologies (e.g. in production processes and buildings' construction)	Heating pumps, stoves



Company	Bagers Tømrer
URL	n.a.
Director/Responsible	Arne Bager
E-Mail	arne@arnebager.dk
Address	Storegade 2a, 8305 Samsø
Phone	+45 8659 3811
Brief organisation profile	Carpenter
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of insulation material in construction.
Technology areas - Solar energy	Insulation

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<ul style="list-style-type: none"> - Wind energy - Water energy - Bioenergy - Geothermy 	
Adopted technologies (e.g. in production processes and buildings' construction)	Passive house solutions

Company	Tranebjerg Tømrer
URL	www.toemrercarl.dk
Director/Responsible	Carl Rasmussen
E-Mail	carl@toemrercarl.dk
Address	Industrivej 1
Phone	+45 8659 0087
Brief organisation profile	Carpenter
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of insulation material in construction.
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Insulation
Adopted technologies (e.g. in production processes and buildings' construction)	Passive house solutions

Company	Besser Tømrer og snedkerforretning
URL	n.a.
Director/Responsible	Hardy Thomsen
E-Mail	n.a.
Address	Besser Hovedgade 11
Phone	+45 8659 1811
Brief organisation profile	Carpenter

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Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of insulation material in construction.
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Insulation
Adopted technologies (e.g. in production processes and buildings' construction)	Passive house solutions

Company	Hårmark Tømrer- og snedkerforretning
URL	n.a.
Director/Responsible	Carsten Jørgensen
E-Mail	n.a.
Address	Byvejen 8, 8305 Samsø
Phone	+45 8659 0458
Brief organisation profile	Carpenter
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of insulation material in construction.
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Insulation
Adopted technologies (e.g. in production processes and buildings' construction)	Passive house solutions



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Company	Brdr. Stjerne K/S
URL	www.brdrstjerne.dk
Director/Responsible	Ole Hemmingsen
E-Mail	info@brdrstjerne.dk
Address	Besser Smedegade 7. 8305 Samsø
Phone	+45 8659 1700
Brief organisation profile	Plumber
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of heating and ventilation solutions
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy, bioenergy, geothermy
Adopted technologies (e.g. in production processes and buildings' construction)	Solar heating solutions, heat pumps, bio-heating and geothermal central heating systems

Company	Kelds VVS
URL	n.a.
Director/Responsible	Keld Nielsen
E-Mail	n.a.
Address	Marsk Stigsvej 24, 8305 Samsø
Phone	+45 8659 2020
Brief organisation profile	Plumber
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of heating and ventilation solutions
Technology areas - Solar energy	Solar energy, bioenergy, geothermy

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<ul style="list-style-type: none"> - Wind energy - Water energy - Bioenergy - Geothermy 	
Adopted technologies (e.g. in production processes and buildings' construction)	Solar heating solutions, heat pumps, bio-heating and geothermal central heating systems

Company	Arne Ditlevsen
URL	www.arneditlevsen.dk
Director/Responsible	Arne Ditlevsen
E-Mail	n.a.
Address	Tranevej 11, 8305 Samsø
Phone	+45 8659 0269
Brief organisation profile	Plumber
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Sales and installation of heating and ventilation solutions
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar energy, bioenergy, geothermy
Adopted technologies (e.g. in production processes and buildings' construction)	Solar heating solutions, heat pumps, bio-heating and geothermal central heating systems

Company	Danstoker
URL	www.danstoker.dk
Director/Responsible	Jan Enemark
E-Mail	info@danstoker.dk
Address	Industrivej Nord 13, 7400 Herning
Phone	+45 9928 7100
Brief organisation profile	Danstoker has produced boilers since 1935 and has during the last



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	decades specialized in RES use.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing of bio energy boilers and heating-waste recovery boilers
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy
Adopted technologies (e.g. in production processes and buildings' construction)	Heat exchange trough gasses and damp: co-generation engines. Bio heating, waste energy boilers.



Company	Siemens
URL	www.powergeneration.siemens.com
Director/Responsible	Jukka Pertola
E-Mail	post.dk@siemens.com
Address	Borupvej 16, 2750 Ballerup
Phone	+45 9942 2222
Brief organisation profile	Siemens is a world-wide concern that produces and designs light-bulbs (OSRAM), produces electricity transport equipment for the public grid as well as water, wind and fissile driven power plants. We have cooperated with the wind-turbine department that was started in Denmark as the company BONUS and was recently taken over by Siemens.
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing and design of wind-turbines.
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Wind energy
Adopted technologies (e.g. in	One-piece blades and variable speed wind turbines.

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production processes and buildings' construction)	
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Company	Passat
URL	www.passat.dk
Director/Responsible	Niels Martin Christensen
E-Mail	passat@passat.dk
Address	Vestergade 36, Ørum, 8830 Tjele
Phone	+45 8665 2100
Brief organisation profile	Manufacturing of boilers
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing of bio energy boilers and accumulation tanks
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Bioenergy
Adopted technologies (e.g. in production processes and buildings' construction)	Automation of bio heating plants



Company	SolarVenti
URL	www.solarventi.dk
Director/Responsible	Hans Jørgen Christensen
E-Mail	info@solarventi.dk
Address	Fabriksvej 6, 8881 Thorsø
Phone	8696 6700
Brief organisation profile	Design and manufacturing of air-to-air solar energy systems
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing and development of air-to-air heating and ventilation systems.

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Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Solar Energy
Adopted technologies (e.g. in production processes and buildings' construction)	Solar powered air-based ventilation and heating solutions

Company	NRGi
URL	www.nrgi.dk
Director/Responsible	Benny Hebsgaard
E-Mail	nrgi@nrgi.dk
Address	Dusager 22, 8200 Århus N
Phone	+45 87390404
Brief organisation profile	Electricity supplier, that has development different side products
Role in the RES sector <ul style="list-style-type: none"> a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user 	Electricity supplier Counselling of private households and enterprises in energy saving Renewable Energy Solutions for enterprises Sales of Bioenergy systems and heat pumps Financing of RES solutions
Technology areas <ul style="list-style-type: none"> - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy 	Bioenergy, geothermy
Adopted technologies (e.g. in production processes and buildings' construction)	Heating pumps, geothermal plants, central heating plants

Company	PelIX
URL	www.pellx.dk
Director/Responsible	Søren Rasmussen
E-Mail	pellx@pellx.dk
Address	Ejbydalsvej 242, 2600 Glostrup

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Phone	+45 4492 3414
Brief organisation profile	Manufacturing of bioheat products
Role in the RES sector a) Technology supplier and service provider (manufacturer, distributor, installer, etc.) b) Technology end-user	Manufacturing of bio heating boilers, stoves and burners. Manufacturing of solar energy panels.
Technology areas - Solar energy - Wind energy - Water energy - Bioenergy - Geothermy	Solar energy Bioenergy
Adopted technologies (e.g. in production processes and buildings' construction)	Integration of bio heating in central heating plants or combination with solar energy

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4. Conclusions

The three Cartographic Competence Schemes revealed a total of 68 key players, three times more than initially agreed on in the Technical Annex. Almost half of these players (33) are coming from the industrial community, being both technology suppliers and technology end-users. Furthermore, 17 research institutions have been identified in the three regions that can be considered key players in the RES sector. These institutions do perform research in at least one of the five identified RES sectors Solar energy, Wind energy, Water energy, Bioenergy and Geothermy. Finally, 18 public administrations are included in the three CCSs, a comparable high number when considering that political decision making should normally be concentrated in few responsible institutions. This relatively high number is also based on the fact that national administrations have been included in the analysis since these players are important actors in the RES theme with strong influence on the sector development at national level and thus, also at island level.

The data collection was conducted according to the template that was initially elaborated by INNOVA. In this way, the subsequent analyses and elaboration of reports are much facilitated. Project partners followed a systematic process for gathering data by implementing two methods: working meetings (direct inquiries and interviews) and telephone inquiries. This procedure guaranteed the presentation of a complete picture of the regional RES players in the three island regions.

As next step the Regional RES-ID Cards will be elaborated for each region. The listed key players will be the basis for setting up these ID Cards. An assessment on the regional state-of-the-art in the RES energy field will be performed, identifying regional core competencies and analysing current research agendas. Among the main issues to be included will be also information on the innovation policy management and available funding resources for the RES sector, existing energy plans, available RES technologies, and a SWOT analysis for each region assessing core competencies and shortcomings with regard to the regions' capacity to produce and transfer innovative RES technologies for the most efficient use.

Finally, the regional CCSs and the RES-ID Cards will set the basis for elaborating the regional Comparative Analysis. This latter analysis will highlight common strengths, weaknesses, opportunities and threats as well as strategies and priorities on which to build on in the future for reaching concerted research strategies and implementing common RTD policies related to the RES field.