

# Renewable energies in the University of Cadiz

## Research and transfer for local development

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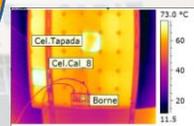
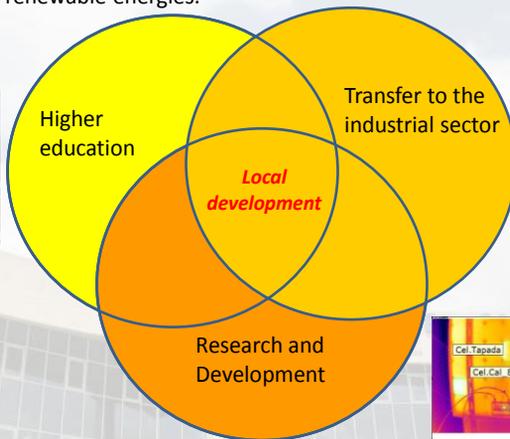
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*Professor of the University of Cadiz*



### Renewable energies in the University of Cadiz

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The University of Cadiz has been working, for many years, in environmental sciences, sustainability and renewable energies.



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### HIGHER EDUCATION IN RENEWABLE ENERGIES:

- Degree courses, in different faculties offer modules about renewable energies.
- Graduate degree studies offer masters and specialist courses from the University-Enterprise Foundation of the Cadiz University, called FUECA.
- Professional courses for local companies and professional local people to update their qualification.

### NEW STRUCTURE CREATION: UNIVERSITY-ENTERPRISE PROFESSIONAL TRAINING CENTER

Solar Energy Training Center, called CEFITES. For technological adaptation of professionals and local companies from other sectors with employment problems, such as ship construction and building construction.

This center has four partners: University of Cadiz, Free Trade Zone of Cadiz, FUECA and IGFOTON (SPIN-OFF company founded from Cadiz University)



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### RESEARCH AND DEVELOPMENT:

- Several research groups work in different aspects of renewable energies. (more than ten groups)
- Some examples of research work by this group of the University of Cadiz: Photovoltaic systems, Semiconductor material for PV applications, selective layer for solar collector, solar hot water installations, biohydrogen, biogas, biomass for energy applications, geothermal, tidal power, electric generation hybrid system (RE and hydrogen), fuel cells for electric vehicles and wind power (wind farm, energy storage, etc...).



### R&D IN RENEWABLE ENERGIES FROM THE COOPERATION BETWEEN UNIVERSITY AND ENTERPRISES

- This cooperation is made by different programs: National, Regional Government, and EU Programs. During the last 20 years 500 R&D projects about renewable energy and sustainability have been executed.
- A lot of technical contracts between University of Cadiz and various companies, by way of the Transfer Office of the University, are signed every year. This office is called OTRI.
- Technological Base Enterprises created from the University as Spin-Off companies. Thus a real case in this presentation I will speak about IGFOTON group as a spin-off in solar energy and its influence in the local development.



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### IGFOTON GROUP. ONE EXPERIENCE OF TRANSFER FOR A LOCAL DEVELOPMENT

-IGFOTON group born as the spin-off IGFoton Ingenieros from the experience of Solar Energy Laboratory .

-Today IGFOTON group are several technological companies working in different sectors of the solar market. Thus the lines of work of every small company of the group are:

-**IGFoton Ingenieros**: specific training in solar technologies for engineers and specialist workers and Efficiency energy management..

-**INOMA Renovables**: Industrial project, installations and specialist maintenance. This is a bigger company of the group.

-**HELIOTRÓNICA Sistemas**: New electronic product for solar applications. Main business line: products of low cost for little installations in developing countries.

-**SUNSAFER**: Product commercializing development by group enterprises, and other manufacturers.

-**DRAGO SMART ENERGY** : Smart grid installations. Economical European Group with a partner of Czech Rep.

-**GUATENERGY**: Solar energy applications in Central America. With a local partner

For more information: [www.grupoigfoton.es](http://www.grupoigfoton.es)



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### IGFOTON GROUP AND ITS COOPERATION WITH THE UNIVERSITY

-IGFOTON participates in a new experience between the industrial sector and the university, in order to improve the innovation and the technical evolution in solar energy applications. This experience was called CEDIES.

CEDIES is an experimental campus for local industries and the university in a new model of development.



Some projects of different local solar companies

### TECHNOLOGICAL DEVELOPMENT AIDS LOCAL INDUSTRIAL SECTOR

-Different R&D projects are focused on developing new products or services in order to open new business paths for local companies. For example:

\* Inverter hut for PV installations. New product for a local company manufacturer of construction hut for works.

\* New maintenance procedures for a local company dedicated to ship construction sector.



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### SOCIAL BENEFITS OF THE COOPERATION BETWEEN UNIVERSITY AND LOCAL INDUSTRIAL SECTOR

- High qualification employment may be created in the influence zone of these activities
- This experience will reinforce the local industrial sector focused on the new green energy sector. Cadiz Bay will be an important reference in the years to come.
- The University of Cadiz promotes the creation of new technological companies by university students and entrepreneurial professor.
- The university can be a development motor for a new green economy model. From know-how, and R&D activities.



### ACADEMIC BENEFITS OF THE COOPERATION BETWEEN UNIVERSITY AND LOCAL INDUSTRIAL SECTOR

- New real practice in different local companies for students of the university
- Cooperation of different companies in R&D project with the university. Such as CENIT, PROFIT programs
- Execute degree projects, and doctoral thesis applied to the industrial problems. Such as PROYECTA initiative



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### THE WEAKNESS OF THE ANDALUSIAN RENEWABLE ENERGY SECTOR

- The growth of the renewable energies sector have been majority supported by speculative business.
- Renewable energies (solar and wind power) have been more financial business than technological activity. Thus the majority of solar technology in Spain have been imported.
- Insufficient investment to guarantee long term development.
- Small industrial structure for the innovation. We need an innovation culture for our sustainable development..

### CHALLENGES IN ANDALUSIA FOR DEVELOPMENT OF RENEWABLE ENERGIES

- Promotion of cooperation between companies and universities.
- More aid for innovation and development of new products. It's necessary to develop own technology.
- Support of small and medium renewable energy installations rather than big installations. Decentralized generation.
- Growth of volume of exportation to external markets.



During the next years we need a reasonable, non speculative development .



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### NEW GREEN DEVELOPMENT MODEL CONCLUSIONS

- Based on know-how transfer from the university and research center to the renewable energy industrial sector.
- The creation of Spin-OFF companies is a very good efficient way for a quick transfer to the industrial sector.
- EU energy policy guarantee a very important development of renewable energy sector.
- The future employee will have to be very well qualified, not low cost and poorly qualified worker, this employee would have to be the minority
- Development of new technologies and products compatible with the environmental care.
- Many new markets for renewable energies in the world must be dealt with. Our new model must be able to export green products and services focused on new energies and their management.
- Developing countries are a very interesting opportunity. The green energy-water binomial is vital for humanity in the new millennium. From the University of Cadiz with the cooperation of spin-off group IGFOTON, we believe in this way:



Aquiculture with renewable energy. Coban. Guatemala  
University of Cadiz with IGFOTON cooperation. AECID finance



Drinkable water with renewable energy and nano-filtration. Cadiz. Spain  
University of Cadiz with IGFOTON cooperation. Andalusian Water Agency finance



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**THANK YOU VERY MUCH FOR YOUR ATTENTION !**

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