
Agencia Andaluza de la Energía
CONSEJERÍA DE INNOVACIÓN, CIENCIA Y EMPRESA

# BOOSTING GREEN ELECTRICITY IN 11 EUROPEAN REGIONS
# PROJECT: RES-e REGIONS

CONTRACT Nº: EIE/04/234/S07.38605

## WORKPACKAGE 3: ANALYSIS OF RES-e CONNECTED TO THE GRID IN 11 MUNICIPALITIES IN ANDALUSIA

**October 20th 2005**

**INDEX**

# 1. INTRODUCTION

Municipalities/local governments have a key role to play in the market penetration of RES-e in their different roles:

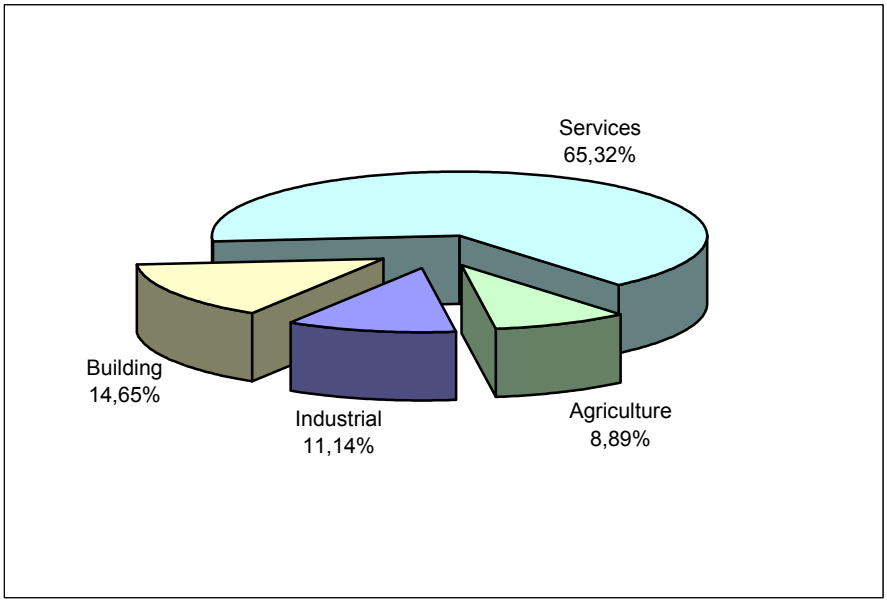
- As owners and operators of public buildings and facilities (especially office buildings, schools, homes for retired, sports facilities, service buildings, public lighting installations etc.) which could function as role models and be used for production of green electricity
- As authorities (often responsible for building/planning permissions
- As first contact points for citizens and SMEs (especially in rural areas)
- As important electricity consumers (and therefore potential users of green electricity)
- And sometimes as (co)owners of municipal energy companies (e.g. electricity, district heating etc..)

That is why a special effort will be made to report and motivate local administrations and political decision makers-with the objective of transforming (some of) them from "obstacles" into "drivers" of the RES-e development, specifically in their role as multiplicators and authorities. All activities relating to public buildings will not only promote the production and use of green electricity but will also make reference to energy efficiency and RES heat (integrated solutions).

# 2. SITUATION IN ANDALUSIA

The Autonomous Community of Andalusia is the most Southern region in Europe enclosing 776 municipalities distributed in 8 provinces. The total extension is of 87.597 $km^2$ with a population of 7.687.518 inhabitants, what supposes an average density of 87,8 $hab/km^2$, similar to the value of the national average although inferior to the 114 $hab/km^2$ of the European Union.

From a socioeconomic point of view the activity rate in the community is calculated in 54,09%, with a rate of unemployment of 15,99%. The employed population is in to majority way in the tertiary sector, followed by the secondary and primary sectors respectively (in a lesser degree), as follows:




**Employment rate by sectors**

The energy policy of the Andalusian Regional Government (Junta de Andalucía) is established in the Andalusian Energy Plan 2003-2006 (PLEAN), with a projection up to the year 2.010. It was approved by the Governing Board of the Regional Andalusian Government (Meeting of Andalusia) through Decree 86/2003 of 1st April and its objective is "to obtain an Andalusian energy system: sufficient, efficient, rational, renewable and respectful with the environment."

It is the strategic planning and coordination instrument of sectorial policies in the area of energy infrastructures, the promotion of renewable energies, as well as actions carried out in the areas of energy saving, efficiency and diversification that are developed in the period considered.

The Andalusian Energy Plan, in agreement with National and European politicians are paying special attention to energy saving and efficiency.

Following on this line, the PLEAN objectives are as follows:

- To obtain a primary energy saving of 4,07% (775.000 ktoe) in the year 2006, with a further saving of 7,5% (1.550.000 ktoe) for the year 2010.
- To outline the path so that the 15% of the total demanded energy by the Andalusian people in 2010 comes from renewable energy sources, obtaining a significant number of this percentage (10.6%) in 2006, so PLEAN objectives would be fulfilled for upcoming years.
- Promoting Renewable energies and energy saving and efficiency.

The implication of each Renewable technologies in the fulfilment of these objectives is outlined in the following table:

| | Situation in Andalusia at 31/12/2000 (parametric) | Situation in Andalusia in 2006 (parametric) | Situation in Andalusia in 2010 (parametric) |
|---|---|---|---|
| Solar Thermal ($m^2$) | 130.552 | 411.552 | 1.046.552 |
| Solar Photovoltaic (kWp) | 3.618 | 10.500 | 23.801 |
| High Temperature Solar Termal (MW) | 0 | 100 | 230 |
| Wind (MW) | 146,2 | 2.700 | 4.000 |
| Hydro special regime (MW) | 78 | 102 | 128 |
| Hydro ordinary regime (MW) | 476 | 476 | 476 |
| Electricity generation from biomass (MW) | 51 | 164 | 250 |
| Thermic uses of biomass (ktoe) | 638 | 643 | 649 |
| Biofuels (ktoe) | 0 | 90 | 210 |

**Source: SODEAN (Society for the Energy Development of Andalusia), Consejeria de Innovación, Ciencia y Empresa, Junta de Andalucía.**

The energy system proposed in the Andalusian Energy Plan (PLEAN) contributes in a very important way to the fulfilment of the obligations set by the European Union in the Kyoto Protocol, more specifically in the reduction by 8%, with respect to 1900, of gas emissions causing the green house effect during the period 2008-2012, in the European Union.

## 3. PREPARATION OF THE STUDY

For the setting up of the project, it has been selected a sample of 11 municipalities of diverse size, distributed by the whole Andalusian geography. It is underlined the following table with the selected municipalities, pointing out the province to which they belong, as well as the population and the main economical activity:

| Municipality | Province | Nº Inhabitants | Main activity |
|---|---|---|---|
| Albolote | Granada | 14.862 | Trade, repairing of motor vehicles, motorcycles and autocycles and consumers domestic goods |
| Carmona | Seville | 26.558 | Agriculture, stock-farm, hunting and silviculture |
| Cartaya | Huelva | 14.767 | Agriculture, stock-farm, hunting and silviculture |
| Écija | Seville | 38.472 | Manufacturer industry |
| Lebrija | Seville | 24.677 | Agriculture, stock-farm, hunting and silviculture |
| Lucena | Córdoba | 39.259 | Manufacturer Industry |
| Motril | Granada | 55.078 | Agriculture, hunting and silviculture |

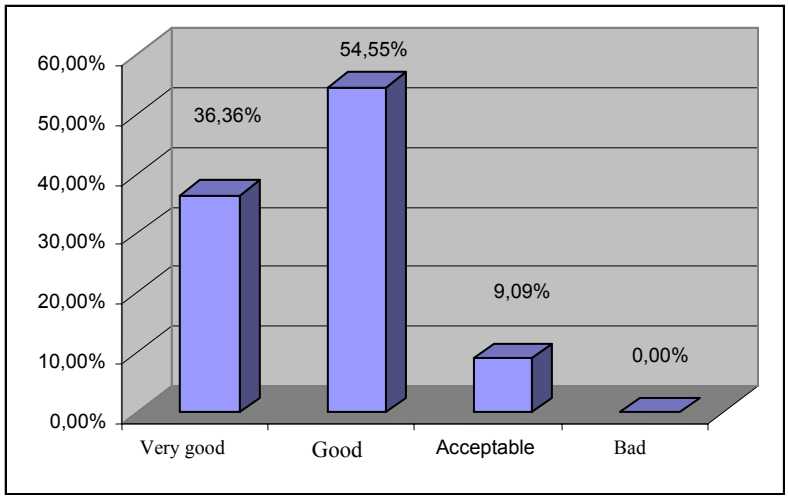
| | | | |
|---|---|---|---|
| Pozoblanco | Córdoba | 16.759 | trade, repairing of motor vehicles, motorcycles and autocycles and consumer domestic goods |
| Rota | Cádiz | 26.691 | Public administration, defences and public social security |
| Sanlúcar of Barrameda | Cádiz | 62.662 | Agriculture, stock-farming, hunting and silviculture |
| Úbeda | Jaén | 33.511 | Trade, repairing of motor vehicles, motorcycles and autocycles and consumer domestic goods |

**Source: Andalusian Statistical Institute**

On this same line, the survey model in the Annex is the result of the contacts kept up with the Andalusian selected municipalities and whose purpose is getting a further knowledge and understanding of its content. In fact, there have been a favourable reception on the part of the municipal authorities in charge of energy matters as it is highlighted in the obtained results.

## 4. RESULTS

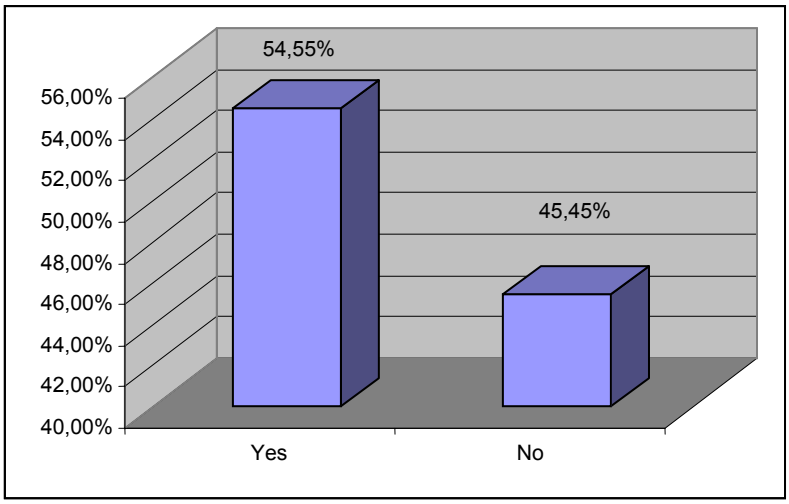
Before the position of the valuation of the municipal technicians of the electricity generation coming from Renewable Energy Sources, in any case there has been a negative disposition, standing out that more than 90% of the surveyors had a good or very good opinion about it.




**Technicians´opinion on Renewable Energies connected to the grid**

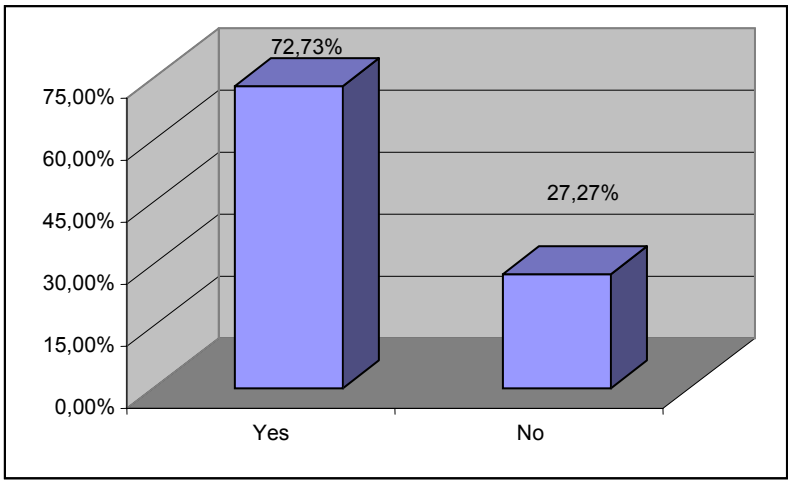
Also, 100% of these municipalities assure that it should be increased the quota of Renewable Energy Sources in Andalusia, although it should be appropriate to the helps for this type of energy and to optimize the current consumptions.

Moreover, these eleven municipalities coincide in their interest in the implementation of Renewable Energies connected to the grid in their municipalities, although only 54,55% of the cases have made some evaluation on the energy situation and potential users of Renewable energies connected to the grid.




**Municipalities with evaluation on their energy situation**

In 72,73% of the municipalities exists some strategy or municipal energy plan with some objective for Renewable Energies, although in some cases it is still in a "design phase."

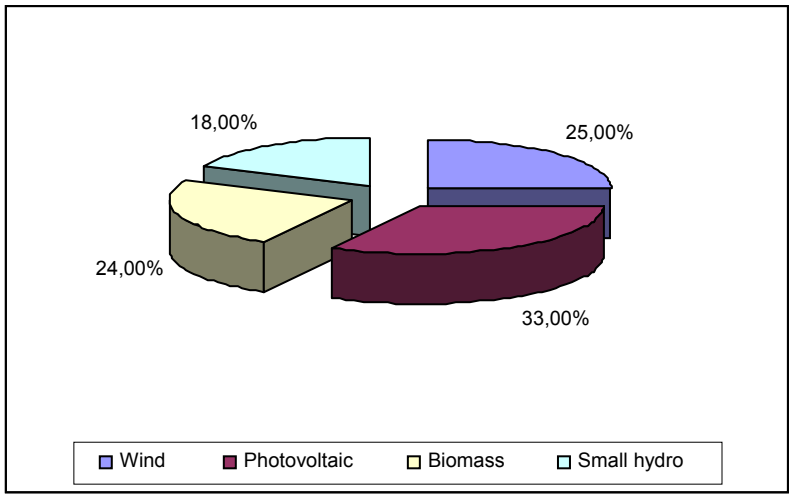



**Municipalities with Municipal Energy Plan**

As for the knowledge of RES-e, in general terms, the information is not accurate, rather quite generic, and most of the municipalities coincide in the following points:

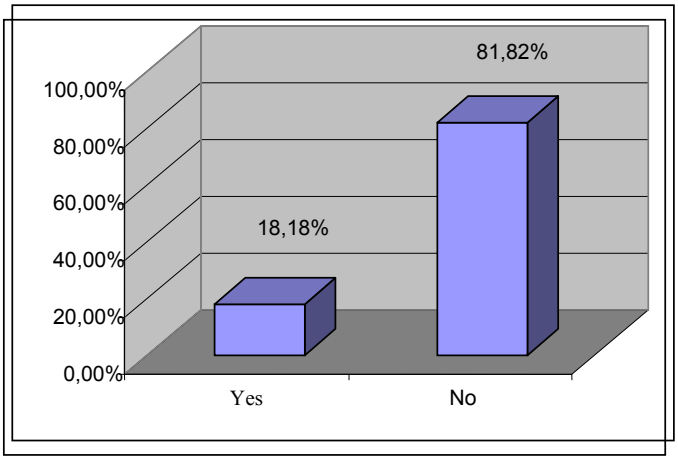
- **Wind**: This type of energy is known by most of the municipalities but most have the opinion that it is not very implemented due to the landscape and fauna impact caused on the area.
- **Photovoltaic**: The most known type of renewable energy.
- **Biomass**: This type of energy is not very well-known and they have the opinion of being more expensive than the other ones.
- **Small hydro**: it is an unknown and a type of energy only applicable to specific and concrete areas.

Certain disparity /difference among these municipalities exist when it is made the election to choose the most interesting Renewable Energies connected to the grid:

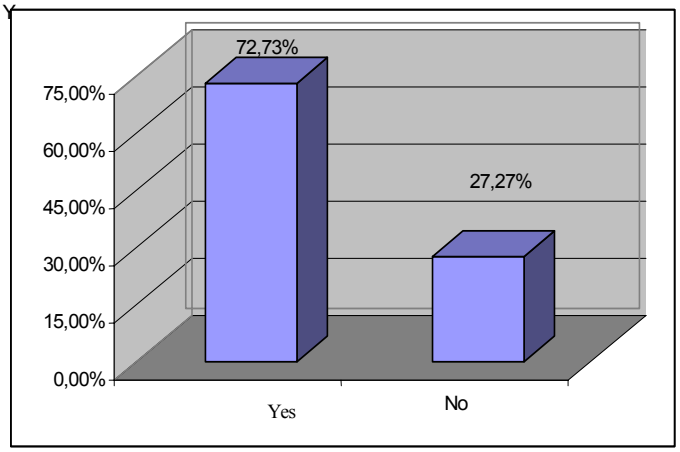



**Valuation of Renewable Energy connected to Net**

However, only 18,18% of these municipalities have implemented RES-e installations, although 72,73% of them have planned to carry out this kind of installations in the future.

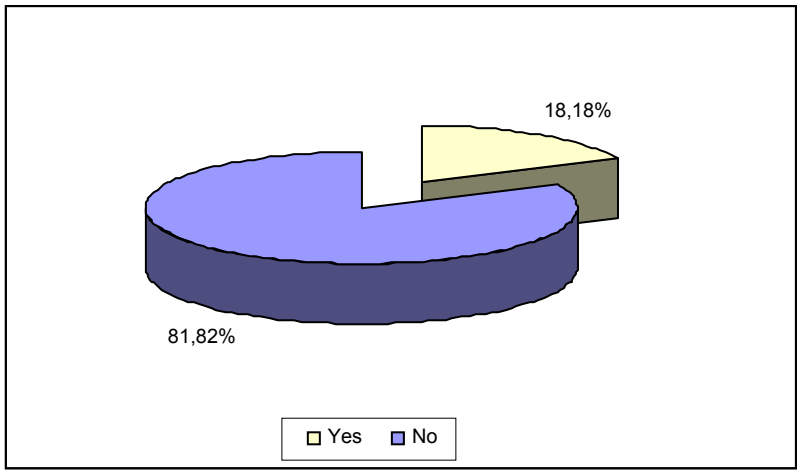



RES-e installations connected to the grid in municipalities



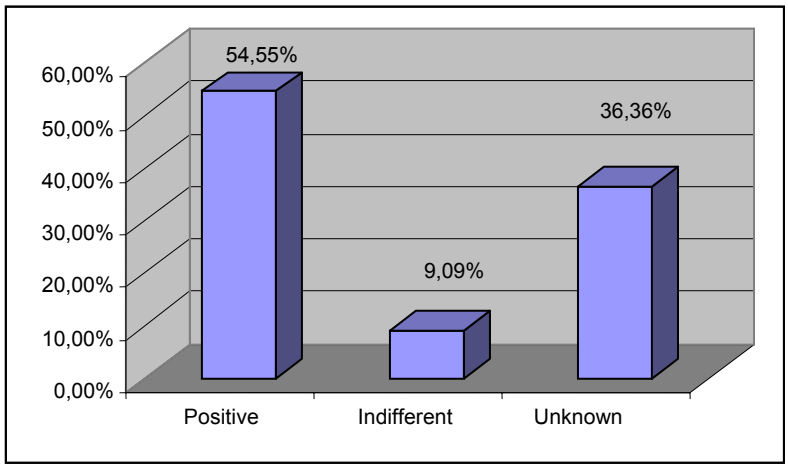

RES-e installations in the future

By the same line of preserving the environment, it has been made an analysis to study which of these municipalities have thought of the purchase of green electricity for public buildings. The result has been highlighted in the following illustrated graphic:



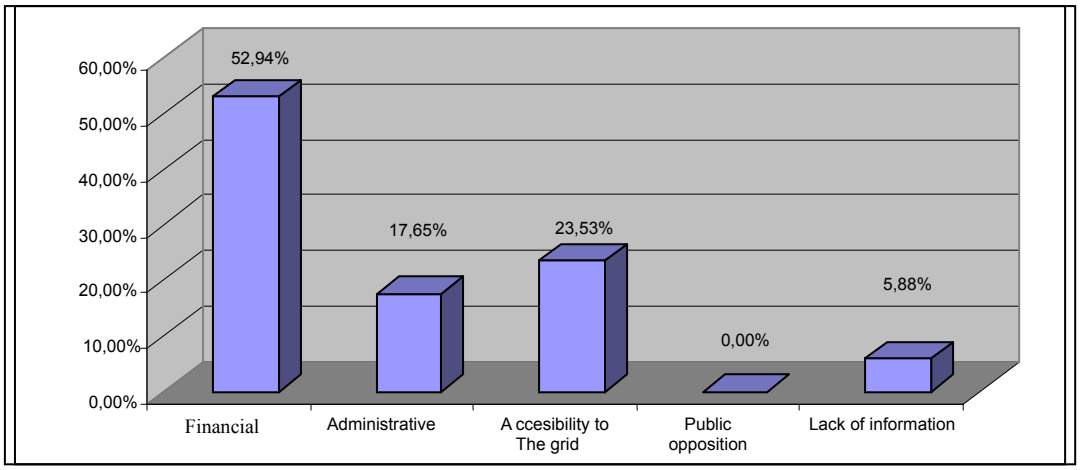

**Position of purchase of green electricity for public buildings**

In addition to the knowledge municipal technicians have about RES-e, it has been made a poll to the population to know further about the understanding they have on RES-e. As a result, most of them (54,55%) think this type of energy is positive, though a quite high percentage (36,36%) admits that this type of energy is quite unknown for them:




**The population's opinion on Renewable Energies connected to the grid**

As for the biggest obstacles for the development of RES-e connected to the grid, most of the studied municipalities coincide in the financial obstacle.




**Obstacles in Renewable Energies connected to the grid**

By ending and as a conclusion of this study, it could be state that most of the analysed municipalities have in common the following points:

- All municipalities have a very good opinion on the generation of electricity by Renewable Energy Sources, though in most of cases, evaluations on the potentials users of Renewable Energies connected to the grid have not been carried out .
- Among the different Renewable Energy Sources, Biomass is the most unknown since they have a great confusion about this type of energy, mainly because their knowledge on this type of energy is quite confusing.
- All the municipalities want to receive concrete information (implemented technology, financing, etc.) on each one of the Renewable Energies connected to the grid, by means of a supply of information given by municipal Technicians.
- From this study, it is demanded the necessity of a “Guide of Renewable Energies Connected to the Grid” which would be useful and a reference for further studies on this energy issue.

# *ANNEX: MODEL OF SURVEY*

| | |
|---|---|
| 1 | What is your opinion on the electricity generation coming from FER-e ? |
| 2 | Should the quota of FER-e be increased in next years in our region/country? |
| 3 | Is there any interest in FER-e installations in your municipality?. Has it been made some evaluation of the energy situation and the potentials from FER-e connected to the grid? |
| 4 | Is there any strategy or local energy plan?. In affirmative case, is there any objective for FER?, and for FER-e connected to the grid? |
| 5 | Do you know the different FER-e connected to the grid technologies and what is your opinion about them?:<br>Wind<br>Photovoltaic<br>Biomass<br>Small Hydro |
| 6 | Are there any FER-e installations in your municipality? |
| 7 | In affirmative case, which one?, is the city council directly involved in these installations?, what is your opinion about them? |
| 8 | In negative case, why not?. Would you be in favour of these kind of installations?, what kind of technology through? |
| 9 | Have been planned to carry out this kind of facilities in the future? |
| 10 | Have been thought about to buy green electricity for public buildings? |
| 11 | What do you think about citizens´ opinion in your municipality on FER-e connected to the grid?, positive, negative or indifferent? |
| 12 | What do you think are the biggest obstacles for the development of FER-e connected to the grid?<br>a) Financial?<br>b) Administrative procedures?<br>c) Accessibility to the grid?<br>d) Public opposition?<br>e) Others? (which ones?) |
| 13 | What type of helps should have been for the promotion of FER-e connected to the grid ? , should they be for the evaluation of potentials from FER-e or otherwise, for the setting up of specific installations?, what type of training do you think would it be available?, some promotional activities, advice, training etc? |
| 14 | For example, what do you think of a short training (for example half day) for City Councils representatives and local actors? |
| 15 | What do you think of a Guide on “FER-e in Municipalities”?, What would be its content of interest?, Would you be interested in giving your opinion on a draft of this guide? |
| 16 | Would you be interested in receiving advice on FER-e in your municipality? |
| 17 | Would you be interested in participating in a competition on FER-e in your municipality? |