



# Solar Energy for small municipalities in the Andalusian province of Huelva

Pol Arranz-Piera (Trama TecnoAmbiental, S.L.)  
on behalf of Diputación de Huelva (Huelva Provincial Government)



EXCMA. DIPUTACIÓN PROVINCIAL DE HUELVA



Solar Energy for small municipalities in the Andalusian province of Huelva

### Objectives

- Accompanying measures
- Experiences
- PV installations
- DHW applications

Objective: CREATE A RATIONAL USE OF ENERGY CULTURE AMONG CITIZENS



¿HOW DO WE DO IT?



REALISING DEMONSTRATIVE SOLAR ENERGY INSTALLATIONS IN PUBLIC BUILDINGS



Solar Energy for  
small municipalities  
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100% RENET

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## ¿HOW TO CREATE AWARENESS AMONG CITIZENS?



- PRODUCING CLEAN ENERGY LOCALLY
- DISSEMINATION OF BENEFITS, REDUCTION OF GREENHOUSE GAS EMISSIONS...
- RELATING ENERGY GENERATION TO RATIONAL USE OF ENERGY
- ACCOMPANYING MEASURES FOR SENSITISATION AND EDUCATION
- MONITORING AND FOLLOW-UP BY THE PROVINCIAL GOVERNMENT



Example: PROJECT 100% RE-NET

## General framework for RES integration

Innovations



High social impact



Many agents are needed:

- architects
- engineers
- planners
- installers
- sociologists
- politicians
- scientists
- and users / consumers

... and most especially in public buildings

- Notorious, large observability
- Dissemination and educational character, pilot experience

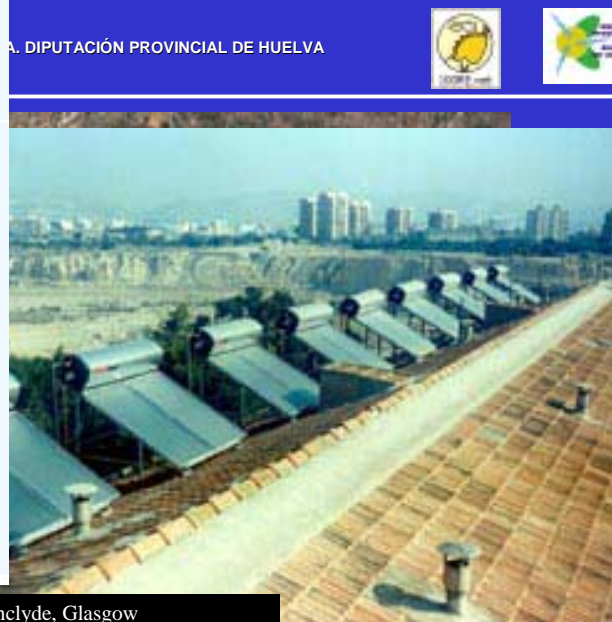
Initial stage: fundamental role of the Administration  
+ motivated users

Pending: motivation of the private sector at a  
larger scale (capitalisation, financing)

## General framework for RES integration

- Integration Projects , NOT only installations
- Integration must be pursued at three levels:
  - Managerial → definition of responsibilities, mid and long-term technical monitoring
  - Social use → social accompanying measures
  - Physical → architecture and construction

Without integration at the three levels,  
RISK of discredit of RE technologies



Font: University of Strathclyde, Glasgow

Integration ?



Projecte d'integració – San Felices (PAERA)

## Integration ?



Projecte d'integració – Centre Mediambiental de Son del Pi

## Integration ?

## Projecte d'Integració - IES Arnau Cadell Secondary and High School

real time  
visualisation  
software  
(intranet and  
internet)



# Integration ?

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## 100% RE-NET: PROJECT CHARACTERISTICS

- 14 rural municipalities addressed
- GC PV installations of 5 kWp, at least one in each municipality
- Monitoring will be shown in [www.100re.net](http://www.100re.net)
- Accompanying measures for rational use of energy in local schools etc.

Each installation gives the following benefits:

- Yearly expected energy production: 7.000-7.500 kWh
- Annual CO2 savings: 3.360-3.600 kg
- Annual income: 2.950-3.161 €/año  
(feed-in tariff for 2005: 0,4215 €/kWh)

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### PV INSTALLATIONS ON PUBLIC BUILDINGS

Different types of buildings :

- Town hall (2)
- Cultural Centre (2)
- Sports centre (3)
- Old people's home (1)
- School (3)
- Local government (2)
- Public parking (1)
- Municipal building (3)
- Civil service centre (1)

### ACCOMPANYING MEASURES

#### SENSITISATION CAMPAIGN LOCAL INSTITUTIONS



Objective: REACH A MAXIMUM OF LOCAL INSTITUTIONS AND CITIZENS



¿HOW?



- SEMINARS IN PRIMARY AND HIGH SCHOOLS
- EXHIBITIONS IN LOCAL FAIRS
- VISUALISATION OF MONITORING RESULTS

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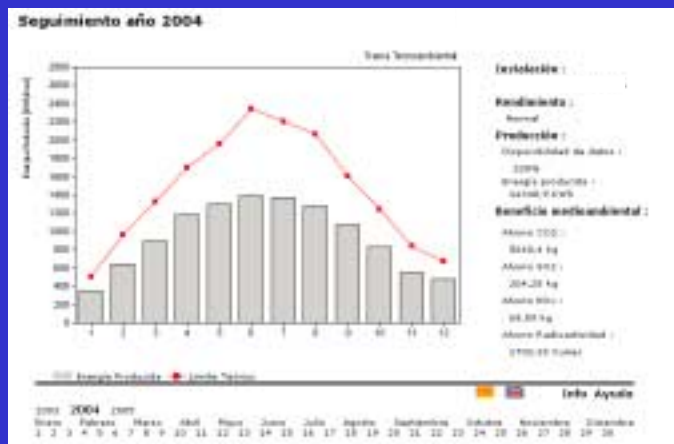
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### ACCOMPANYING MEASURES

#### VISUALISATION OF MONITORING RESULTS IN INTERNET



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## EXPERIENCES FROM 100% RENE IN HUELVA

1. Satisfactory performance of PV installations to date
2. Delay due to administrative and political problems between municipalities and provincial government
3. Difficulties in explaining differences between PV and DHW, grid-connected and stand-alone PV
4. Bad coordination between local installers and utility
5. Bad coordination by the regional government for authorisations (some took 1,5 years!!)
6. Not always interest by some civil servants
7. High interest by local actors in schools etc., good feedback

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## SAN SILVESTRE DE GUZMÁN, CASA CONSISTORIAL



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DHW applications

### PAYMOGO, CENTRO CULTURAL



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DHW applications

### ALMONTE, CASA CONSISTORIAL



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## DHW APPLICATIONS

- MAINLY TOURISTIC APPLICATIONS IN COASTAL AREAS
- TOTAL SOLAR COLLECTOR SURFACE (installed): 6.387 m<sup>2</sup>
- GOOD CLIMATIC CONDITIONS, RADIATION AND HIGH TEMPERATURES, FAVOURING LOW COST SMALL COMPACT UNITS FOR HOUSEHOLDS
- CAMPAIGNS FOR RESIDENTIAL APPLICATIONS IN RURAL AREAS: LOCAL FAIRS, SCHOOLS ETC., SYNERGIES WITH PROJECTS LIKE 100% RENET

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## Solar DHW systems DIFFUSION

OBJECTIVES FOR THE PERIOD 2000-2010 IN ANDALUSIA

<i>Installations</i>	<i>m2</i>
2000-2006	301.000
2006-2010	635.000
TOTAL	936.000

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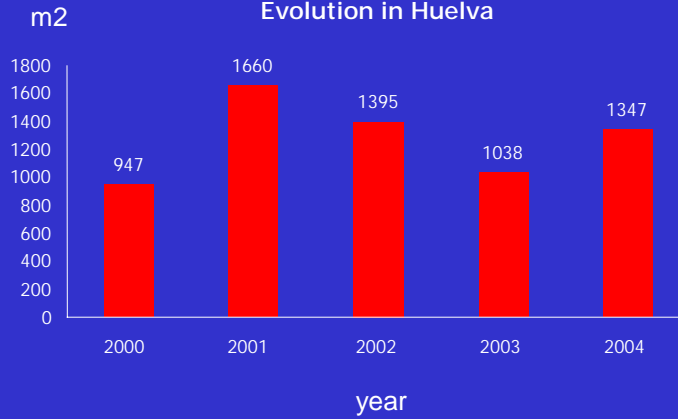
Accompanying measures

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Solar DHW systems DIFFUSION:  
Evolution in Huelva



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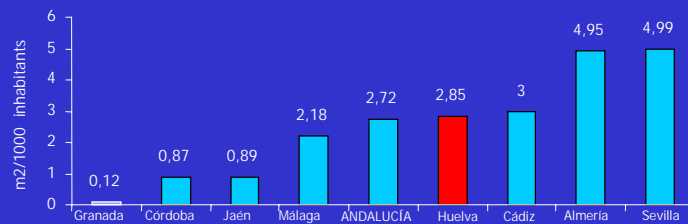
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Solar DHW systems DIFFUSION :  
Comparison of provinces in Andalusia





**Merci pour votre attention**

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