RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

The Experience in Castilla y León

Rafael Ayuste & Puy Domínguez

Ente Regional de la Energía de Castilla y León (Spain)

Final Project Meeting, Brussels – 25 October 2016

Co-funded by the Intelligent Energy Europe Programme of the European Union

Castilla y León, SPAIN

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

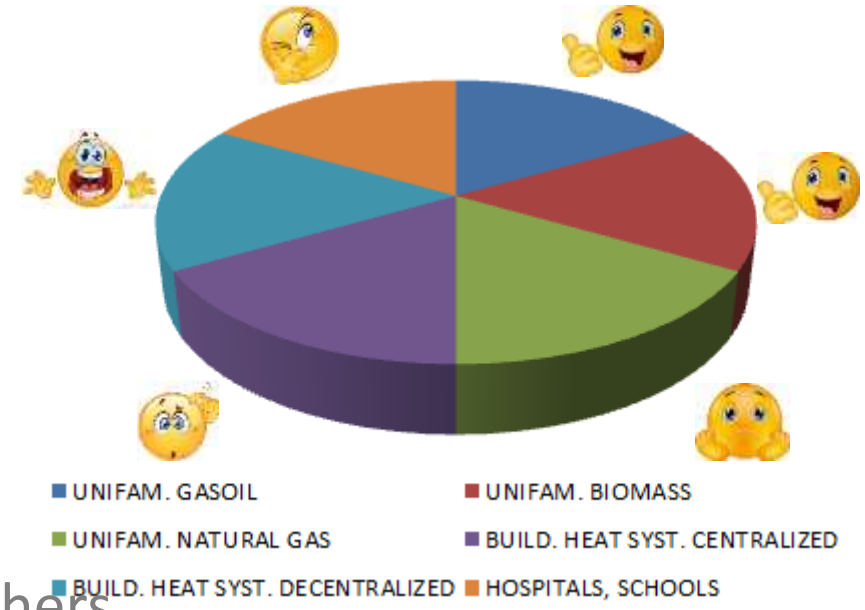
Castilla y León in figures

- Third bigger European region: 94.226 km^2 18,6% of Spanish territory.
- Population: 2,5 M inhabitants (5,34% of Spanish population)
- 96,2% of the regional territory is rural
- 60% of the small and medium municipalities in Spain
- Industry: agro-food, automotive, chemical, energy, ….

Co-funded by the Intelligent Energy Europe Programme of the European Union

The starting point…

- **Planinng and promoting experience**
  - Bioenergy (2011), Solar (2001), wind (1999), Energy efficiency (2011) Plans developed
  - EREN is the owner (or co-owner) of almost 100 RES installations.
- **Original data**
  - Fossil fuel statistics divided by provinces.
  - An biomass consumption figure for Castilla y León
  - Biomass and solar energy potential evaluated
  - Population statistics, NO data from industry
- **A double challenge….**
  - T O S E G M E N T A T E.
  - Quantitative and qualitative analysis and useful for others

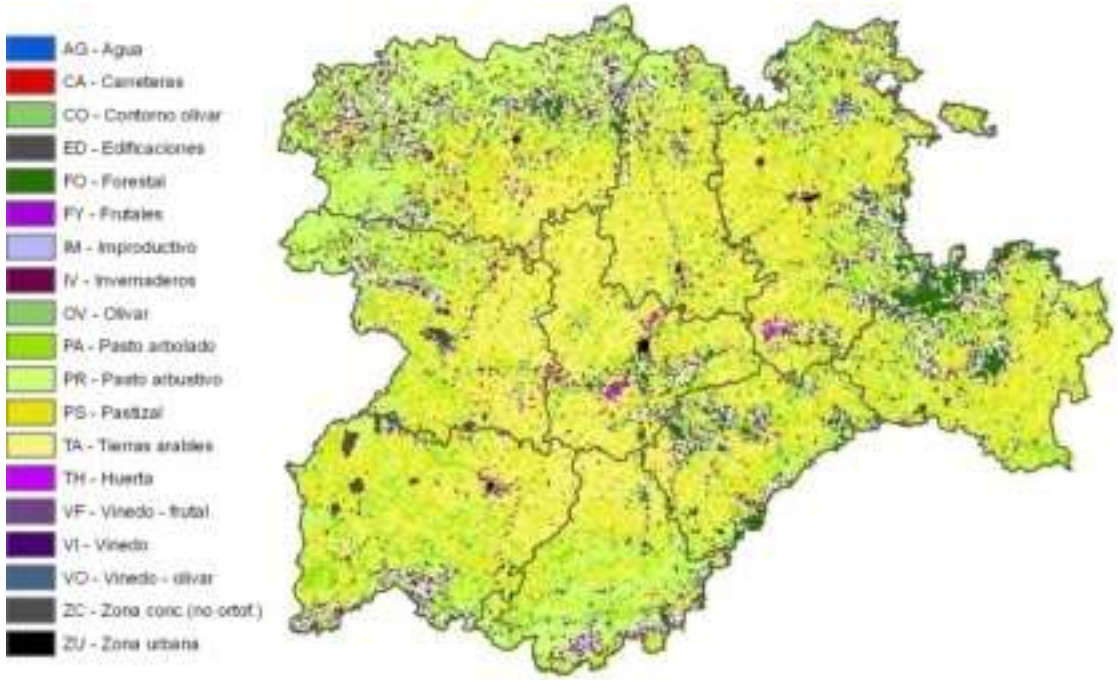


Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results The supply…

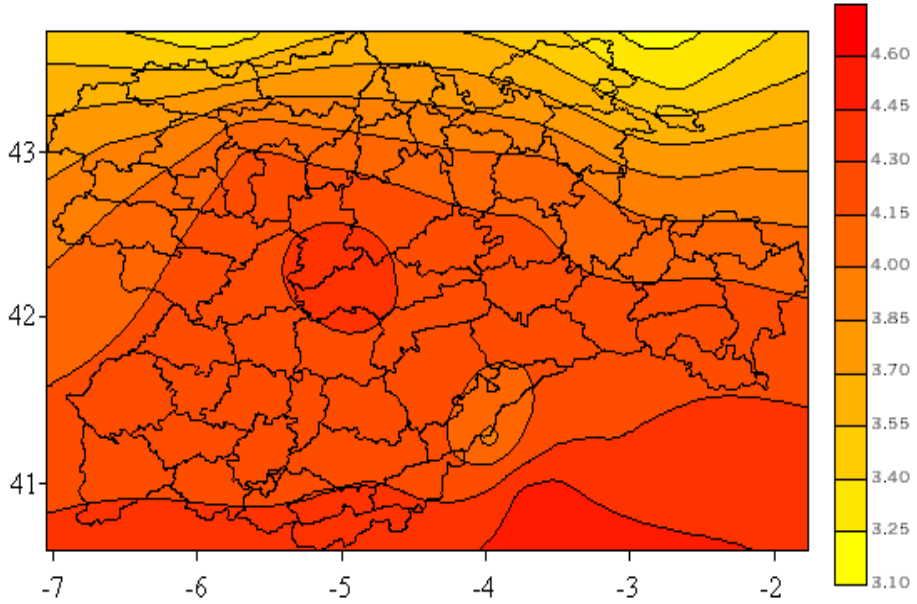
RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

- **Biomass supply**




CASTILLLA Y LEÓN REGIONAL BIOFUEL DEALERS DATABASE

- **Solar supply**



Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results: The energy demand quantitative

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

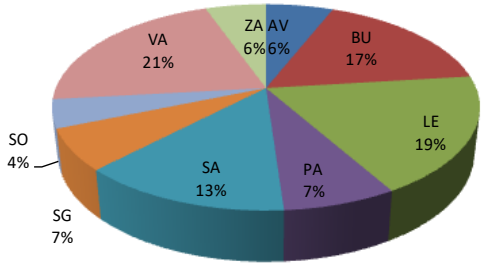
- **Methodology**

  1st To count different types of buildings

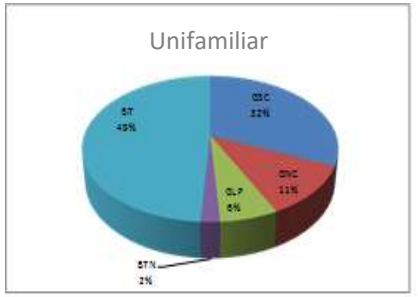
  2nd To assign energy, economics etc. to each building.

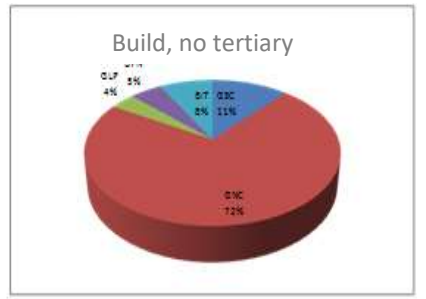
- **Results**

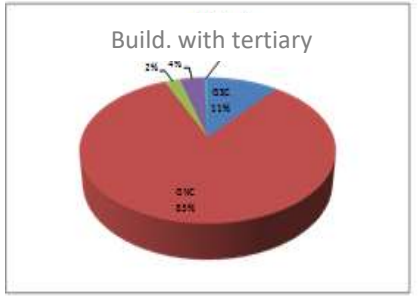
By province

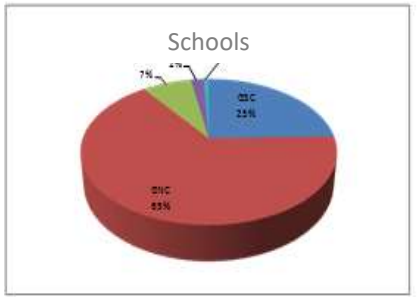


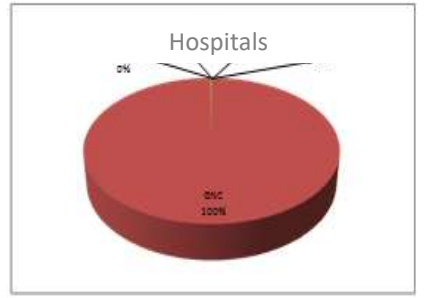
By building











Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results: The energy demand quantitative

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

- **Dec. 21st Heat sector picture**

	Gasoil	Natural Gas	Butane & Propane	Traditional biomass	Unifamiliar	Buildings	Schools, Hospitals & offices	Total
Heat Demand (GWh/yr):	2.461	5.814	901	2.783	5.240	6.429	290	11.958
CO2 emitted (ktn CO2/yr):	862	1.627	254	81	942	1.796	86	2.824
Exploitation costs (M€/yr)	102	193	31	240	332	225	9	565
Fuel consumption costs (M€/yr):	160	278	57	44	201	324	15	540
O & M Jobs (th of people):	0,73	1,36	0,22	1,90	2,54	1,61	0,06	4
Fuel supply jobs. (th. Of people):	0,27	0,16	0,10	0,39	0,60	0,30	0,02	1
Value of the existing heat systems (M€'0):	980,49	1.198,97	198,05	515,10	1.476,18	1.345,58	70,85	2.893

Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results: The energy demand qualitative

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

Problematic / Key / Opportunity			
Group	Subgroup	Buildings asoc.	Population asoc.
Associated with all renewables	No knowledgment of technology	639.298	2.609.211
	Untrusty to professionals and installers	209.248	764.054
	Decrease investment and O & M costs	418.497	1.528.109
	More needs of R & D & i	250.440	1.014.333
	No thermal renewables in industry	215.025	922.578
Associated with several renewables specifically	Space problems, architect compatibility	860.160	3.358.739
	District heating specific problems	54.009	444.914
	Biofuels specific problems	817.502	2.948.795
	Some problems due the difficult of certain type of installations	115.502	427.249
Associated with legislation		2.136.536	10.608.969
Associated with fossil fuels	General	1.334.239	7.828.454
	Specific of some fossil fuel	772.643	3.763.914
Associated with consumer culture	Centralization, group of proletarians, etc	197.370	4.023.647
	Public image, environmental conscience	268.401	2.745.337
Absence of enough financiation		414.191	2.462.597

Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results: Cost – benefit analysis (1/2)

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

ETR - SCENARIO QUANTIFICATION (Situation at 2030)

Type of buidings	1.- Residential buildings decentralized with natural gas			.....			12.- Residential buildings centralised with gasoil		
Escenarios	Equilibr.	Optimist	Tendenc.	Equilibr.	Optimist	Tendenc.	Equilibr.	Optimist	Tendenc.
1.- Don't to do anything	87,0%	80,0%	98,0%	.....	.....	.....	19,0%	10,0%	25,0%
2.- Pellet bioiler for a %	0,0%	0,0%	0,0%	.....	.....	.....	16,0%	15,2%	15,0%
3.- Pelet boiler for all	1,0%	2,0%	0,0%	.....	.....	.....	0,0%	0,0%	0,0%
4.- Geother mal system	0,0%	0,0%	0,0%	.....	.....	.....	1,0%	1,0%	1,0%
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10.- Aerothermal system	4,0%	8,0%	0,0%	.....	.....	.....	0,0%	0,1%	0,0%
11.- Solar thermal for DHW	0,0%	0,0%	0,0%	.....	.....	.....	33,5%	35,4%	32,0%
12.- Solar thermal for DHW and geothermal for all	0,0%	0,0%	0,0%	.....	.....	.....	0,0%	2,0%	0,0%
13.- Solar photovoltaics for DHW	1,5%	1,5%	0,0%	.....	.....	.....	0,0%	0,0%	0,0%
14.- District heating + Solar thermal for DHW	0,0%	0,0%	0,0%	.....	.....	.....	0,0%	0,0%	0,0%

Co-funded by the Intelligent Energy Europe Programme of the European Union

Our results: Cost – benefit analysis (2/2)

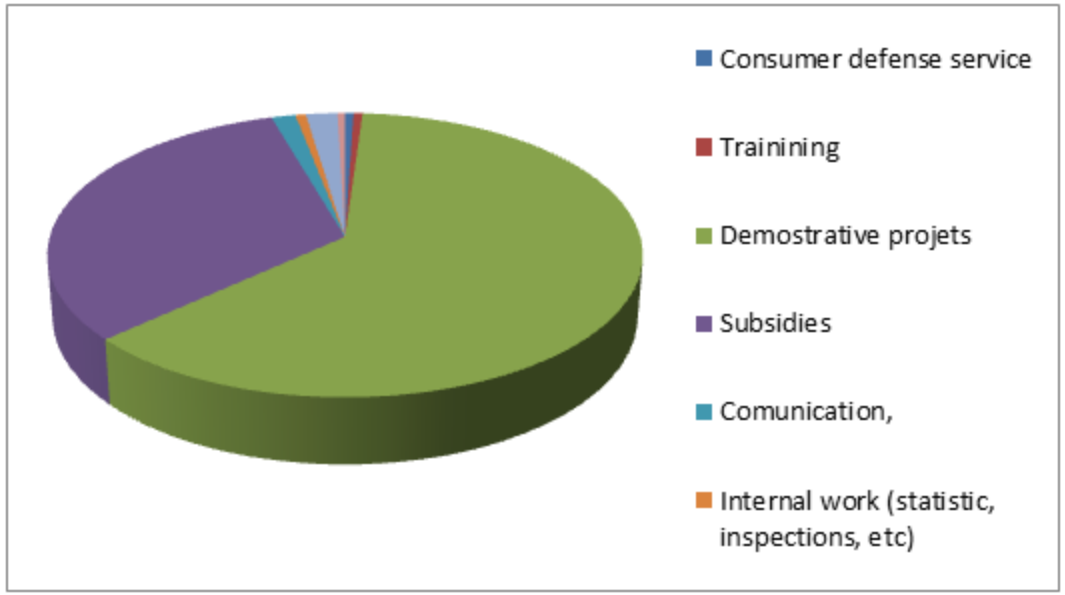
RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

	Initial	Tendential	Optimistic	Balanced
	2015	2030	2030	2030
FINAL energy consumed (GWh/yr):	14.696	12.252	11.406	11.842
Biomass installed power (MW)	0,00	60,11	137,41	104,90
Geothermal installed power (MW)	0,00	0,88	4,24	2,74
Aerothermal installed power (MW)	0,00	7,01	27,01	16,70
Photovoltaics installed power (MW)	0,00	9,15	29,91	26,05
Solar thermal installed surface (th of m2)	0,00	8,79	17,99	14,06
CO2 emitted (th of tn/yr):	2.957,6	2.310,2	1.916,1	2.027,4
SOx emitted (th of tn/yr):	1,3	1,1	1,2	1,1
Particles emitted (th of tn/yr):	51,5	39,8	33,4	37,2
Ashes emitted (th of tn/yr):	64,5	52,1	47,3	50,8
Investments costs (M€):	0,0	56,9	120,9	92,1
Operation and manteinance costs (M€):	575,8	698,5	596,2	647,0
Fuel costs (M€):	549,3	718,8	631,2	622,4
Exploitation costs (O & M & Fuel.) (M€):	1.125,1	1.417,3	1.227,5	1.269,4
Investment associated work (th of people):	0,00	0,23	0,47	0,37
Operation and manteinance associated work (th of people):	4,38	6,05	7,14	6,59
Fuel (or elec) consumption associated work (th of people):	0,95	1,60	1,84	1,76
Total associated work (th of people):	5,33	7,88	9,45	8,73

Co-funded by the Intelligent Energy Europe Programme of the European Union

Policy and strategies. Our ETR budget

Actuations categories	Regional Administration foreseen budget (k€)			
	2016-20	2021-25	2026-30	2016-30
Consumer defense service	151	198	144	493
Trainining	232	161	130	523
Demostrative projets	47.884	6.600	4.625	58.609
Subsidies	17.482	10.348	2.500	30.330
Comunication,	642	690	64	1.395
Internal work (statistic, inspections, etc)	229	214	152	595
Virtual technological centre and R&D projects.	841	712	278	1.831
Support to local production	211	222	0	433
Total	67.461	18.923	7.892	93.776



Co-funded by the Intelligent Energy Europe Programme of the European Union

The Country Governance Committees in Castilla y León Region

- All stakeholders in the region: > 80 members
- 5 CGCs meeting were taken place:
  1. Introduction of project and goals + divided in 5 specific groups (solar, biomass, geothermal, energy demand and monitoring)
  2. Only focus on biomass as Castilla y León has a Bioenergy Plan from 2011. First mapping of thermal demand.
  3. Last version of demand maps and Cost benefit analysis with CGCs contributions.
  4. First proposal of strategy measures and CGCs contributions
  5. Final measures adopted in the "Castilla y León Thermal Renewable Strategy."
- Feelings :

1. Acknowledgment from participants of being possible to discuss with all the stakeholders, specially from different technologies together.
2. Stakeholders ask for continuation of CGCs meetings.
3. Innovative way to elaborate a regional plan, bottom –up in an administration

Co-funded by the Intelligent Energy Europe Programme of the European Union

Last Country Governance Committee in Castilla y León Region

RES H/C SPREAD
RES Heating and Cooling Strategic Actions Development

Co-funded by the Intelligent Energy Europe Programme of the European Union

What's next?

- 5 on-line Forum has been established in order to continue the CGCs work: solar, geothermal, biomass, energy demand and follow up & monitoring.
- At least one physical meeting with CGCs will take place per year until the end of the regional H/C plan by 2030.
- CGCs will continue be dynamic: new members could be incorporate, instead of others relegated.
- The plan called "Regional Thermal Renewable Strategy", will be integrated in the Regional Energy Efficiency Strategy of Castilla y León.
- Leading the new Vice Presidency on Thermal Renewables in FEDARENE.
- Foreseen regional adoption by end 2016 (Board of Regional Ministers).
- Once it will be published in the oficial bulletin, the plan implementation will be reviewed anually by the "follow up & control" CGCs, who will be informed once per year of the advancements.
- The "Regional Thermal Renewable Strategy", will be annually provided with resources (human & economical).
- New EU projects opportunities will take into account with stakeholders.
- Synergies with other EU related projects at regional, national or European level.
- Support for municipalities interested in the Global Covenant of Mayors.

Co-funded by the Intelligent Energy Europe Programme of the European Union

Thank you for your attention!

Ente Regional de la Energía de Castilla y León
Av enida Reyes Leoneses, 11
24008- León (Spain)
www.energia.jcyl.es

Rafael Ayuste, EREN
ayucupra@jcyl.es

Puy Domínguez, EREN
dompermi@jcyl.es

Co-funded by the Intelligent Energy Europe Programme of the European Union