

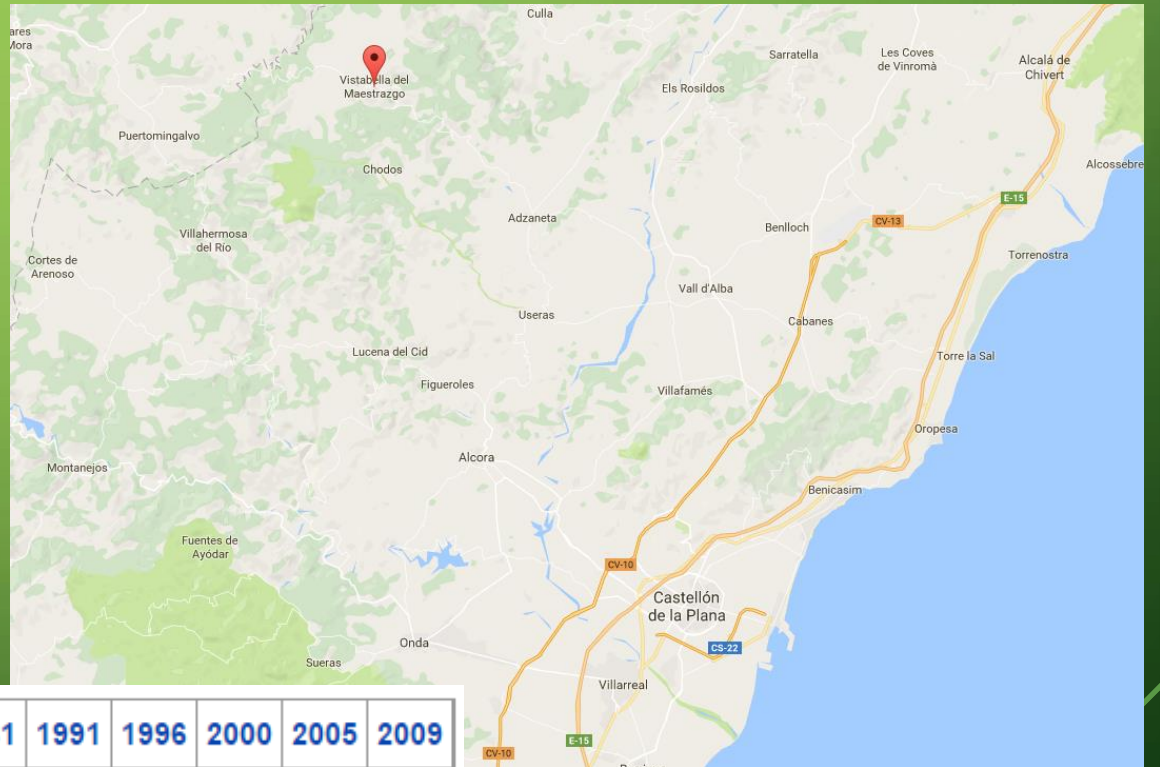
STUDY AND DESIGN OF RENEWABLE ENERGY INSTALLATIONS IN TORRE MARTINEZ. BUILDING ISOLATED WITHOUT CONNECTION TO ELECTRIC, POTABLE WATER AND SANITATION GRID

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VISTABELLA

- Population 369 inhabitants
- 78 % town
- 22% houses around territory
- 100 isolated houses
- Only 5% with connect to electric grid



1857	1877	1887	1900	1910	1920	1930	1940	1950	1960	1970	1981	1991	1996	2000	2005	2009
2.075	2.371	2.337	2.418	2.541	2.342	2.157	2.001	1.938	1.584	1.214	702	472	475	453	410	412

SURVEYS

- **Qualitatively: Couples, children, retiree, workers.**
- **Age: 5-10 & 30-65**
- **High and low renewable energy knowledge.**
- **Good perception about renewable energy.**
- **High cost of the installation.**
- **Easy maintenance.**
- **Rational use.**
- **Good alternative for traditional technology.**



TORRE MARTINEZ

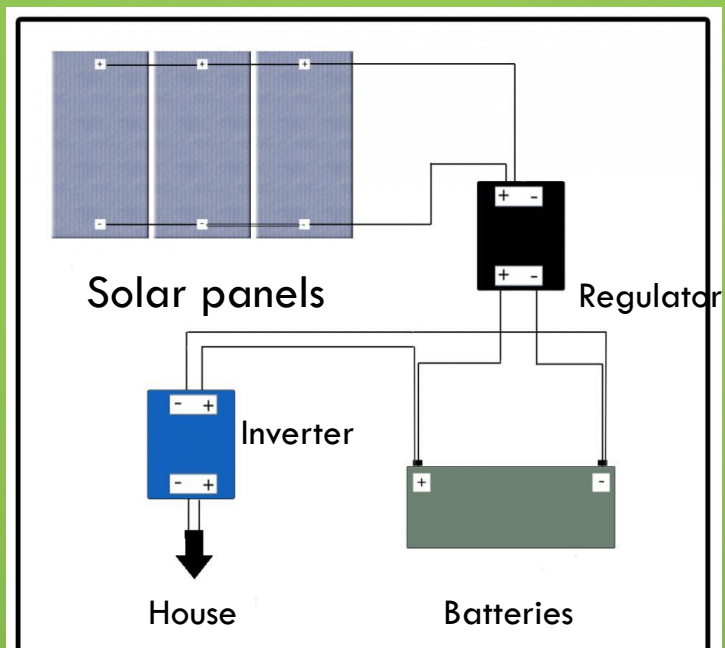
- Electricity
- Potable water
- Hydraulic pressure
- Wastewater treatment
- Heating



ELETRICITY

Appliance consume: 6,67 kWh/day
DC 48V AC 230V

instituto para la diversificación y
ahorro de la energía (IDAE)

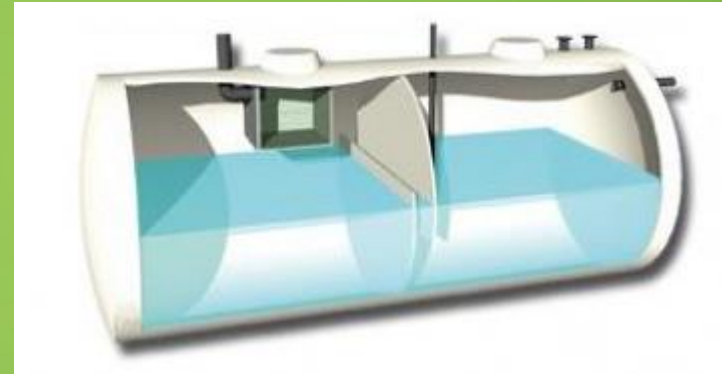


Component	Characteristics	Price with IVA (€)
Solar panel	A-300P	3,690.00
Regulator	Outback FM80	633.14
Batteries	Hoppecke 6 packs 2V 8 OPZS 800	8,940.00
Inverter	VFX 3048E	1,655.00
Solar panel structure	2 horizontal rails fixed to the roof by roof tile saver claws. The panels are attached to the rail using special staples	550.00
Protections	Magnetothermal Schneider electric 2 x 25A, 1 x 10A, 2 x 16A Differential Schneider electric 40 A	74.45
Corrugated tubes	PVC 16 mm diameter 112 meters	17.00
Wires	Diameter 1.5 mm 215 meters Diameter 2.5 mm 160 meters	100.00
Lights	LED 15 units	168.00
Switches	24 units FONTINI BF 18	153.60
Plugs	15 units FONTINI BF 18	109.50
Electrical boxes	0.8 x 0.8 meters 26 units	23.40
Installation	Labour	2,016.66

WATER



- Tank 20.000 liters
- Water savers 130 l -> 94 l per person.
- Inverse osmosi + 2 auxiliary tanks 200 l
- Non potable water: Toilet, washing machine, floor.
- Water pump 1 cv.
- Código técnico de la edificación (CTE)



WASTEWATER + BUDGET



Component	Characteristics	Price with IVA (€)
Tank	20.000 liters	6,899.86
Tank	2 x 200 liters	285.47
Water pump	1 cv	105.78
Osmosis machine	Professional Filter 800 GPD	511.09
	2 x Transparent filter holder 20 "	
	Sediment Filter 20 "20 microns polyps.	
	Sediment Filter 20 "Polyester 5 microns	
Tubes	Diameter 20 mm 30 meters	303.84
Water tap	6 units Toilet, sinks, washing machine, shower	115.00
Gutter	Gutter 32 meters 0.127 meters width Tube diameter 0.1 meters 46 meters	411.4
Sewage	Bioviana AC-P 6	2,300.00
Installation	labour	536.98
	TOTAL	11,469.42



HEATING

Average temperature in winter is 3 °C

Thermal load 141.23 W / hm2

Biomass boiler VIGAS 25 kw

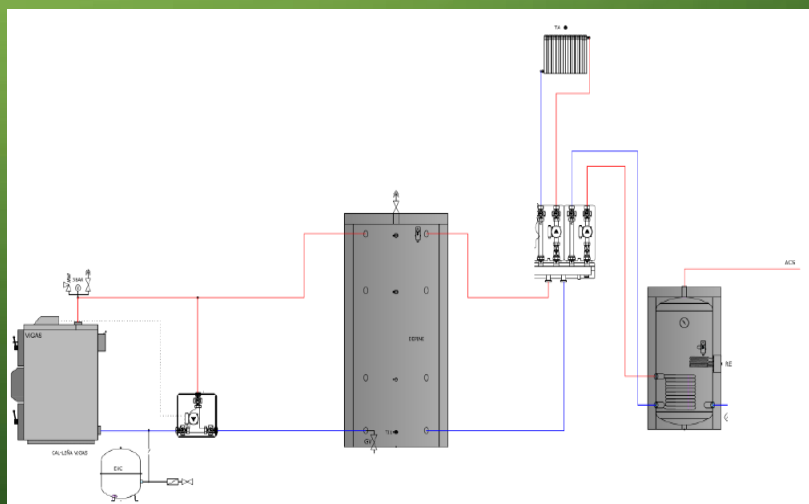
Wood

Inertia tank 800 l + hot sanitation wáter 150 l



Reglamento de instalacionstérmcas en edificios (RITE)

Component	Characteristics	Price with IVA (€)
Biomass boiler pack	Boiler VIGAS 25 S - Gasification boiler of 25 kW of gasification.	6,607.81
	3/4 "Honeywell Thermal Valve, Boiler Lift Feet, Ashtray and Ashtray	
	Return temperature rise unit with electronic pump	
	Depth sounder KYT	
	Safety group VIGAS	
	Tank EO Tank 800, 8 nozzles and insulation 100 mm. With instant production of hot water.	
Radiators	Radiators Orion HP 600 cointra. 2 x 5 elements, 1 x 8 elements, 6 x 10 elements	600.40
Tubes	Tubes 0.02 m diameters 60 meters	607.68
Installation	labour	421.30
	TOTAL	8,237.19



CONCLUSIONS

- The high price to connect to the traditional electric grid is a problem.
- Renewable energies are a cheaper alternatives.
- Renewable energies are a enough option, but are limited.
- Economic independence.
- You must to have some knowledge of these technologies, but not many.
- Dependence on climatic conditions.

“IF WE HAD ELECTRICITY AND WATER, MORE
PEOPLE AND ME WOULD BE LIVING THERE”

Gregorio, 2016

