

EPC Future

Exploring Spanish options



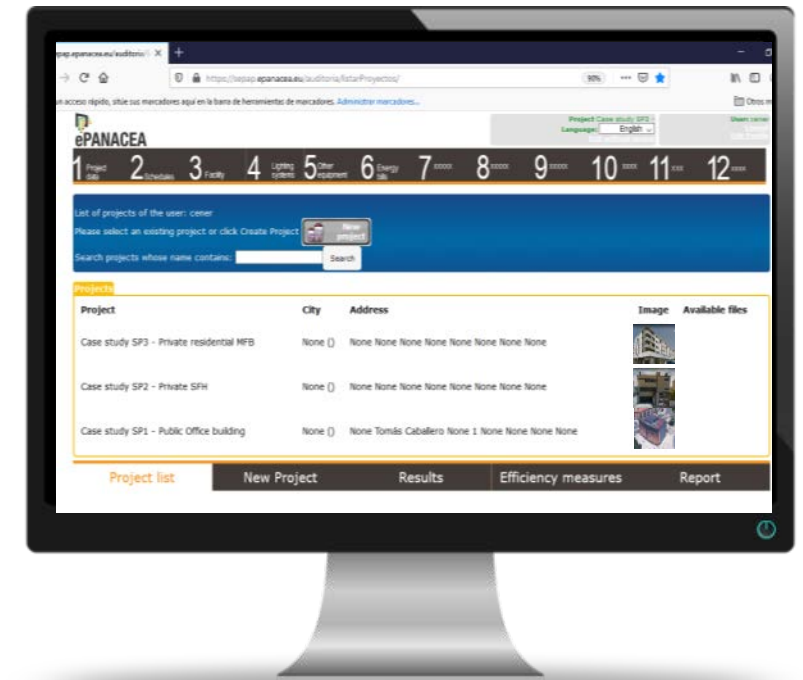
This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 892421

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ePANACEA's main goal

ePANACEA develops an innovative, holistic, and flexible methodology for Energy Performance Assessment and Certification of buildings. The methodology will cover relevant technical building innovations and will be integrated in an online Smart Energy Performance Assessment Platform (SEPAP).

<https://sepap.epanacea.eu>



Challenges

- Gap between calculation results and real consumption data.
- Lack of accuracy of the energy assessment results.
- Lack of user-friendliness from a **building users perspective**
- Lack of convergence across the European Union (calculation intervals, ratings, reporting requirements, etc.).
- Lack of proper protocols for inclusion of smart and novel technologies.
- Lack of trust in the market regarding EPCs and difficulty to access financial support for building renovation.

Task 3.1 Stakeholder Analysis

Results: user perceptions of EPC





Figure 2: word cloud of user perceptions of EPC

User friendliness

Reports

Energy performance certificate



Building ID: IES Plaza de la Cruz
Address: Cruz square (Pamplona)
Country: SPAIN
Year of construction: 1910
Last renovation: -
Gross floor area: 1 446 m²
Gross volume: 8 397 m³
Climatic Zone: Zone 'Continental'
Sea level: 425 m
Building use: Educational building
Date of Validity: 15/11/2030
Certifier name: Albert McGiber
Certifier signature: 
Heating system: Biomass boiler (50 kW)
Cooling system: -
Domestic hot water (DHW): Electric
Ventilation system: Mechanical ventilation
Solar: -
Photovoltaic: 15 kWp
Power storage: -
E-mobility charging: 22 kW wallbox

	PE _{tot}	PE _{nonren}	CO _{2eq}
A			
B			16,1 kg/m ² y
C			
D			
E	330 kWh/m ² y		
F			
G			116 kWh/m ² y

Primary energy PE_{tot} : Share of renewables

65%

35%

Recommendations and energy efficiency potential


	Primary energy PE _{tot}	Estimated investment
1 Thermal insulation of envelope: 4.000 m ² , 14 cm thermal insulation	110 kWh/m ² y	25 000 €
2 Solar hot water preparation: Installation of solar thermal system, 30 m ²	65 kWh/m ² y	6 500 €
3 Room thermostat: Installation of centralised room temperature control instead of decentral heat switches	35 kWh/m ² y	4 500 €

Current rating







330

Potential rating

35



Energy efficiency measures:

 building envelope	 cooling	 control systems or user behaviour
 HVAC	 dynamic envelope	 RES (e.g. PV, solar thermal, etc.)

Energy certificate

Administration oriented


Energy need

	Standard conditions*	Actual conditions**	Measured***
Thermal energy demand	154 kWh/m ² y	221 667 kWhly	120 kWh/m ² y
Space heating	145 kWh/m ² y	209 458 kWhly	110 kWh/m ² y
DHW	9 kWh/m ² y	14 774 kWhly	10 kWh/m ² y
Space cooling	-	-	-


Primary energy use

Building	330 kWh/m ² y	477 647 kWhly
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Smart readiness Indicator (SRI) + disaggregation




43%



Energy Savings & Maintenance



Comfort, Ease & Wellbeing




Grid Flexibility

Delivered Energy








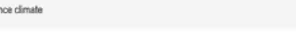
Building	206 kWh/m ² y	297.890 kWhly
Heating	156 kWh/m ² y	226.962 kWhly
Cooling	-	-
DHW	25 kWh/m ² y	35.677 kWhly
Ventilation	-	-
Lighting	6 kWh/m ² y	8.676 kWhly
Equipment / other services	19 kWh/m ² y	27.474 kWhly
RES use on-site	134 kWh/m ² y	193.764 kWhly

Comfort indicator



7,9

Partial energy performance indicators

Heat transfer coefficient [Weighted average]	U_Walls (W/m ² K):	0,54	
	U_Roofs (W/m ² K):	0,14	
	U_Floors (W/m ² K):	0,30	
	U_Windows (W/m ² K):	1,5	
	Envelope (W/m ² K):	0,59	
Solar Heat Gain Factor (SHGC)		0,54	
Efficiency of heating systems		0,5	
Efficiency of DHW systems		0,6	
Efficiency of cooling systems		0,4	
Efficiency of lighting systems		0,9	

* Calculated values under standard conditions (22°C indoor temperature) and reference climate
 ** Calculated values under actual conditions and climate
 *** Measured values under actual conditions and climate

ePANACEA Project: SP3_MFB Language: Spanish User: mapascual
Exit without saving Incomplete profile: Edit

1 Project data 2 Schedules 3 Facility 4 Lighting systems 5 Other equipment 6 Energy bills 7 SRI 8 xxxxxx 9 xxxxxx 10 xxxxx 11 xxx 12 xxxxx


Heating DHW Cooling Ventilation Lighting Dynamic Envelope Electricity eVehicle M&C

	Main functionality level	Additional functionality level in part of the building	Building share for main functionality level (100%=whole building)
Heat emission control	1 - Central automatic control (e.g. central t	-----	100.0
Emission control for TABS (heating mode)	1 - Central automatic control	-----	100.0
Control of distribution fluid temperature	1 - Outside temperature compensated con	-----	100.0
Storage and shifting of thermal energy	1 - HW storage vessels available	-----	100.0
Control of distribution			

User friendliness

Reports

Energy performance certificate



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Current rating: **330** Potential rating: **35**

G F E D C B A

Energy efficiency measures:

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Energy certificate

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Primary energy use

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Smart readiness Indicator (SRI) + disaggregation

SRI 43%

Delivered Energy

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Comfort indicator

7,9

Very poor (0 - 42) Good (6 - 48) Excellent (8 - 100)

Partial energy performance indicators

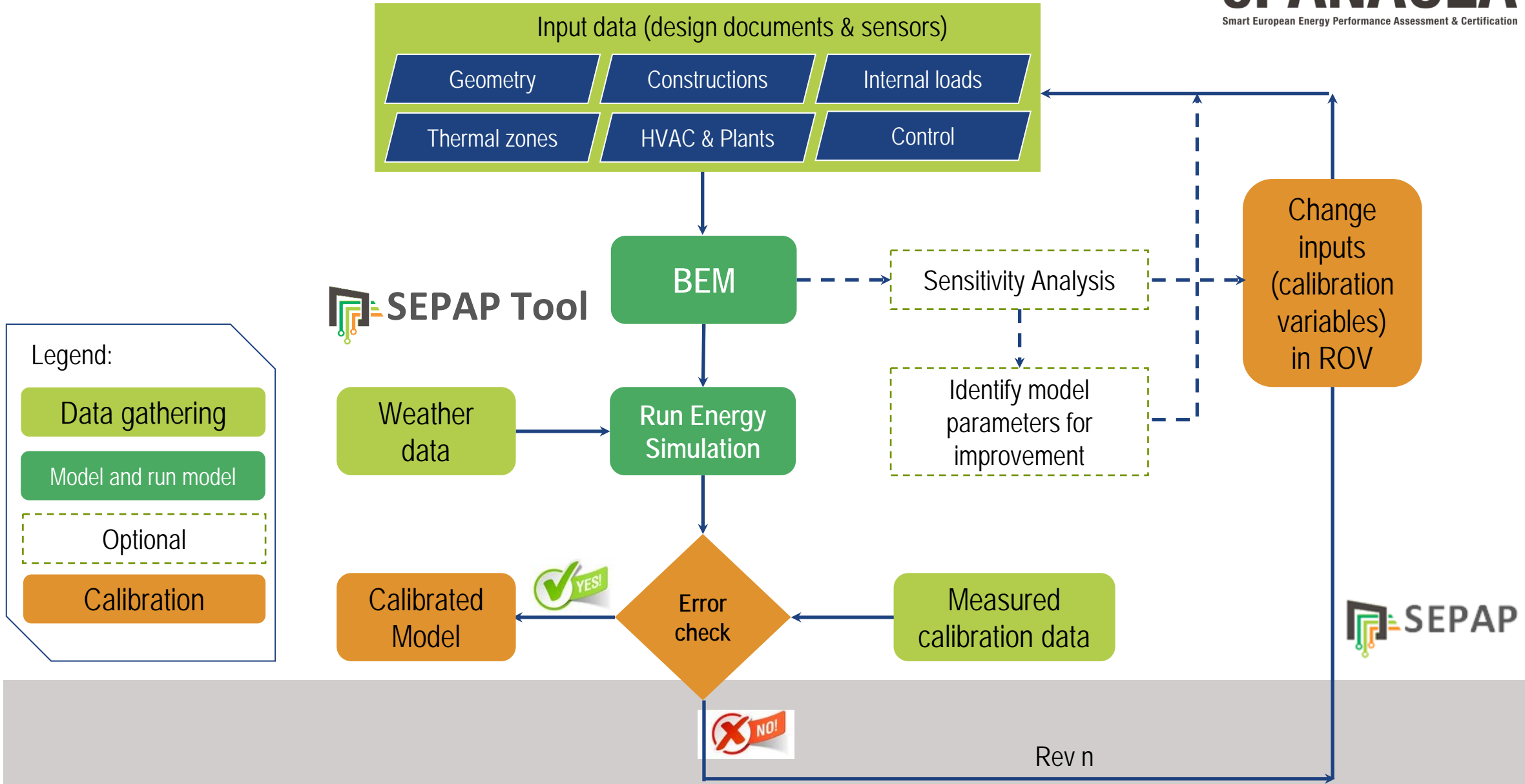
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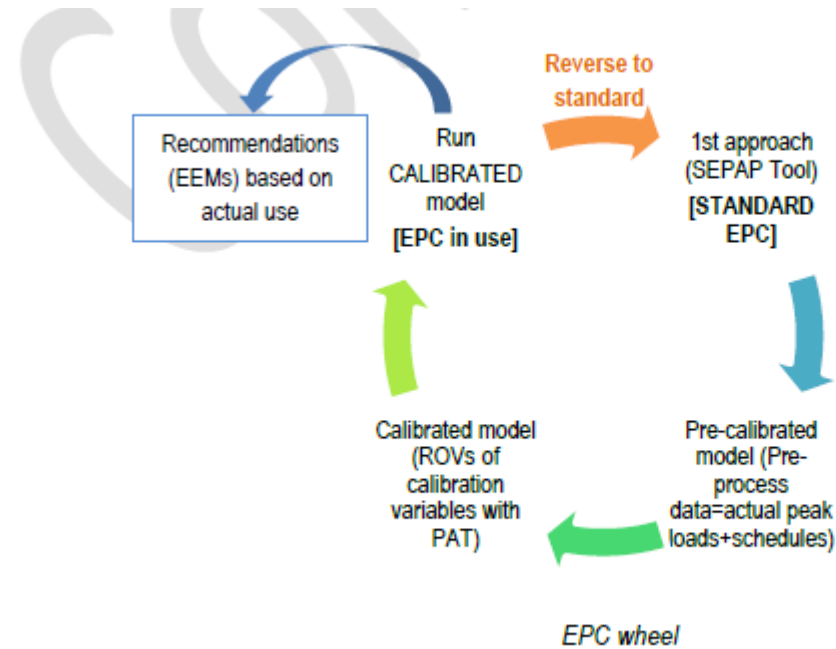
*** Measured values under actual conditions and climate

Method 3: Calibration methodology



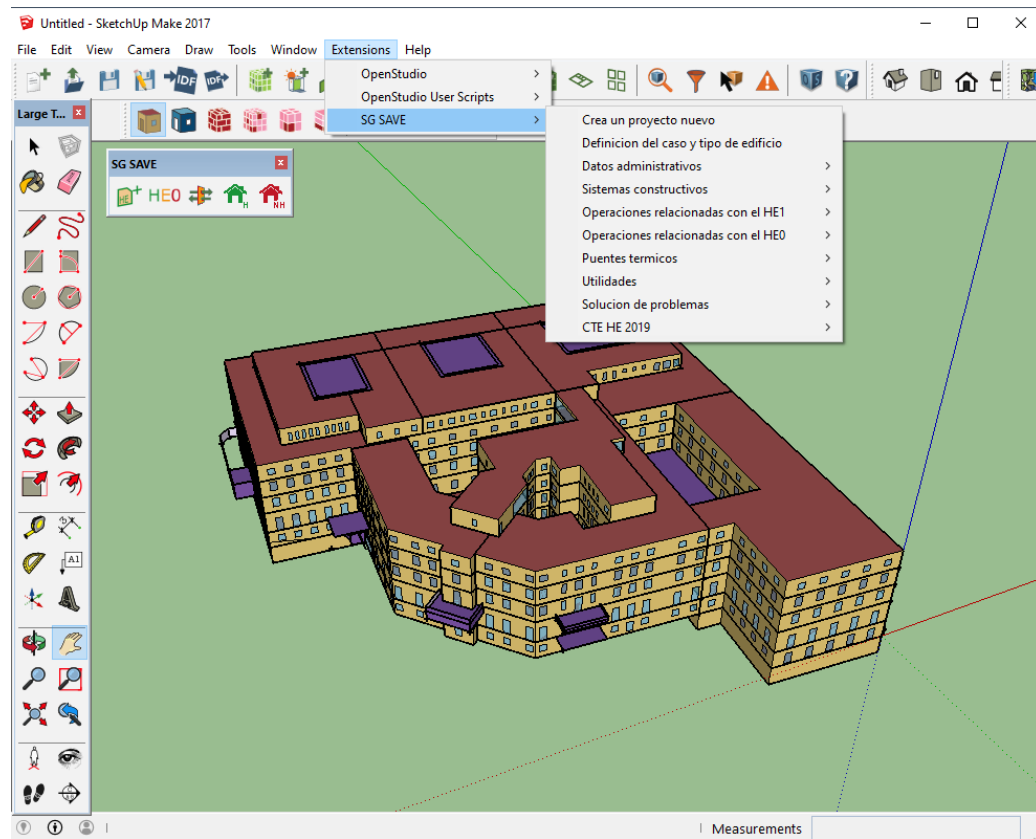
Next Generation EPC

Energy Performance Wheel



Implementing in SG SAVE

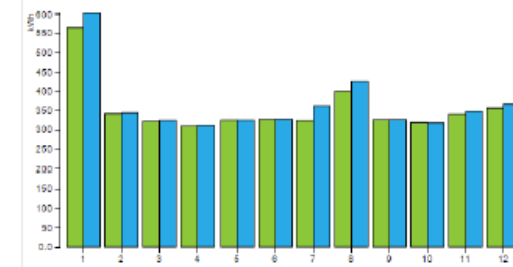
SG SAVE



3.2. Run pre-calibrated model:

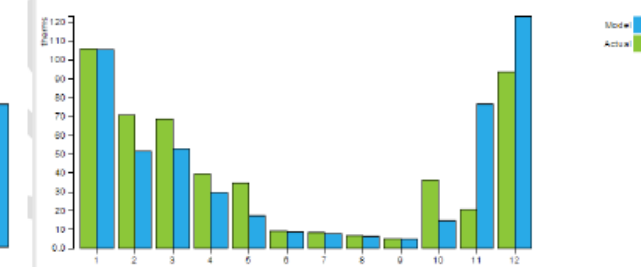
Electricity Consumption (kWh)

CV(RMSE) = 9.27
NMBE = -2.25

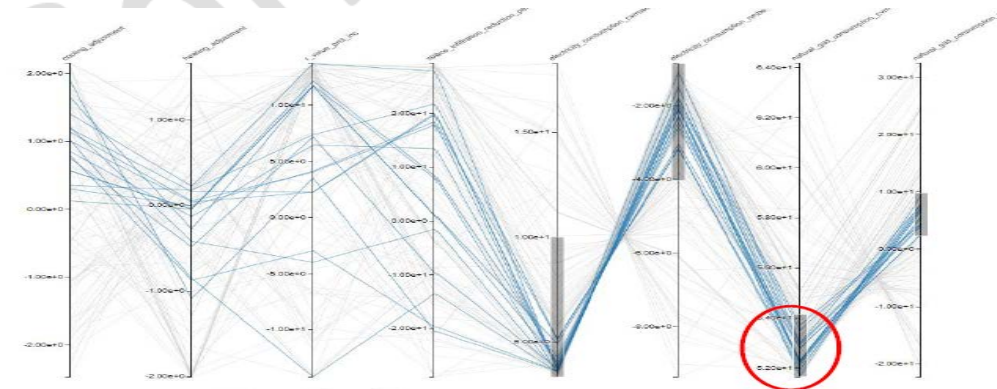


Natural Gas Consumption (therms)

CV(RMSE) = 33.79
NMBE = 0.14



Calibration report based on actual conditions of use



Additional indicators

Implementing in CE3X

Energy Performance Wheel

CE3X - res: C:\Users\mapas\workspace\interfazCex\noDistribuir\COAC\Anterior_3.cex

Archivo Librerías Patrones de sombra Resultados Complementos Ayuda Acerca de

Datos administrativos Datos generales Envolverte térmica Instalaciones Medidas de mejora Análisis económico

Facturas

Facturas Datos económicos Coste de las medidas Resultado

Definición de Factura Energética

Datos de la factura

Nombre

Combustible

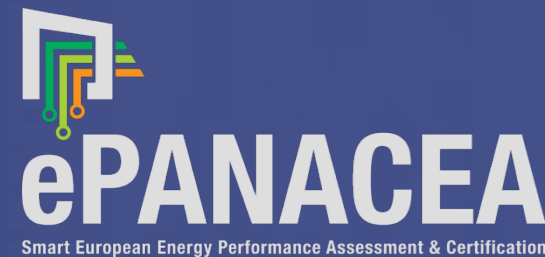
Consumo anual

Demandas satisfechas Distribución de consumos

<input type="checkbox"/> ACS	<input type="text"/> %
<input type="checkbox"/> Calefacción	<input type="text"/> %
<input type="checkbox"/> Refrigeración	<input type="text"/> %
<input type="checkbox"/> Otros	<input type="text"/> %

Añadir Modificar Borrar Cerrar

Thank you for your attention



For further information:

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 www.linkedin.com/company/h2020epanacea

 contact@epanacea.eu



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