

# EMPOWER

## Monitoring energy usage and environmental impact in Santander's municipal buildings

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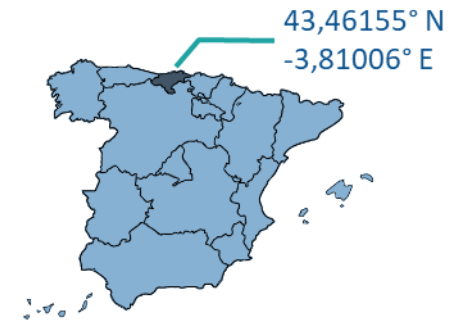
Energy monitoring Technical Workshop

# Santander as a glance

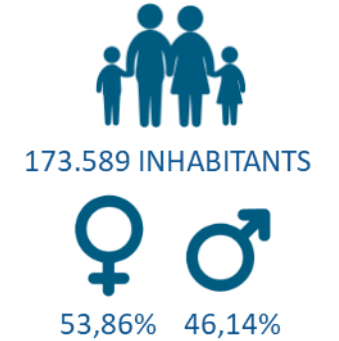


- Situated in the North Coast of Spain, Santander is the capital of Cantabria Region
- Santander has about 173.000 permanent inhabitants spread in around 33 km<sup>2</sup>
- Lively economy based on the service sector
- Municipality is focusing efforts to drive economy in new directions based on the innovation and knowledge

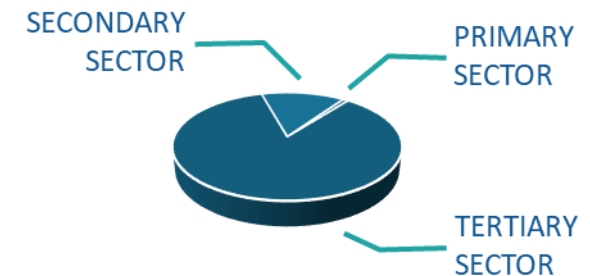
## LOCATION



## POPULATION



## EMPLOYMENT DISTRIBUTION



# Smart city projects

Santander is nowadays an international reference within Smart Cities:

- Active participation in European research projects: Santander urban laboratory
- Development of different city initiatives: efficiency in public services



# Energy situation in municipal buildings

- More than 200 municipal buildings

## Municipal schools



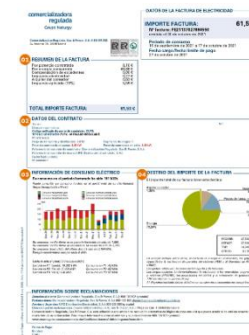
## Sport facilities



## Other municipal facilities



- Paper electricity & gas bills

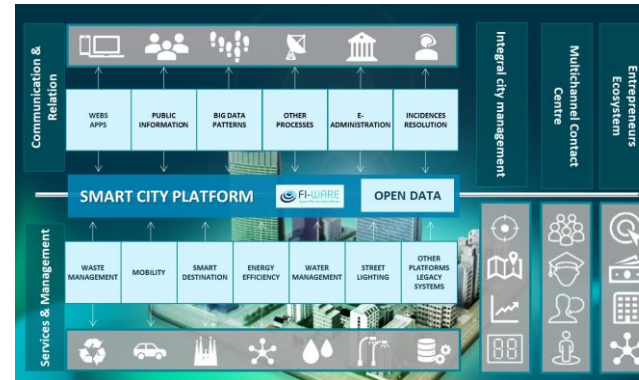


# Energy monitoring tool for municipal buildings

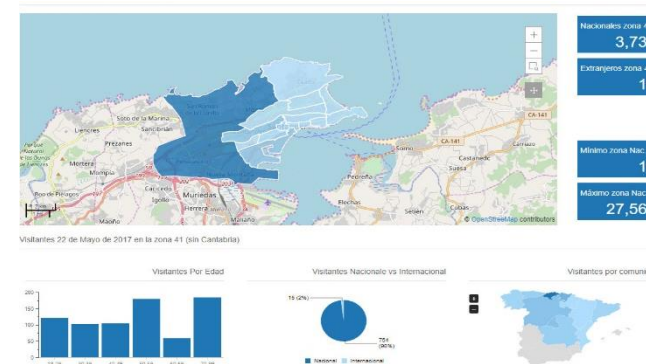
- Energy data (digitalisation)

Electricity data		Gas data
Monthly invoices	Smart meters	Monthly invoices

- Integration into Santander Smart City Platform



- Dashboard definition: Municipal managers & technicians



# Evidences of success: electricity & gas



# Evidences of success: electricity (I)

SAN TANDER Smart City Energía

Menú Principal > Energía Electricity

Consumo edificios públicos

Dependencia: COLEGIOS

Periodo: Anual Mensual Diario Horario

Inicio: 01/2015 Fin: 12/2021

CONSUMO COLEGIOS DE ENERO DE 2015 A DICIEMBRE DE 2021

Nº colegios:	31	Total m <sup>2</sup> :	67.910,01
Consumo total KWh:	5.706.171,5	KWh/m <sup>2</sup> :	84,02
Toneladas de CO <sub>2</sub> :	2.276,76	Kg CO <sub>2</sub> /m <sup>2</sup> :	33,52

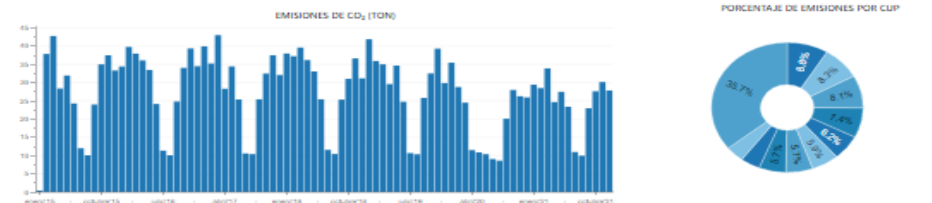
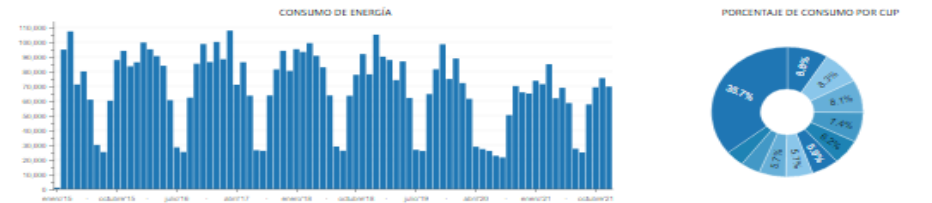


Tabla de datos

Mostrar 10 registros

Código CUP	Tipo	Nombre de Dependencia	Consumo (KWh)	CO <sub>2</sub> (Tons)	KWh/m <sup>2</sup>	Kg CO <sub>2</sub> /m <sup>2</sup>	Detalle
ES0027700033302001RR	COLEGIOS	COLEGIO M <sup>a</sup> SANZ DE SAUTUOLA	500.231,00	199,59	109,32	43,62	
ES0027700030896001DS	COLEGIOS	COLEGIO NUEVA MONTAÑA	471.428,00	188,10	136,29	54,38	

Consumo Dependencias

Dependencia: Todas

Periodo: Anual Mensual

Inicio: 01/2021 Fin: 12/2021

INFORMACIÓN SOBRE COSTES

Coste Medio Diario (€): 8.761,86

Coste Total (€): 3.189.317,3

COSTE DURANTE EL PERIODO

PERCENTAJE DE COSTE POR DEPENDENCIA

INFORMACIÓN SOBRE CONSUMOS

Consumo Medio Diario (kW/h): 47.955,14

Consumo Total (kW/h): 17.455.674,04

CONSUMO DURANTE EL PERIODO

PERCENTAJE DE CONSUMO POR DEPENDENCIA

Tabla de datos

Mostrar 10 registros

Buscar:

Código Cup	Dirección	Fecha	Coste (€)	Variación (%)	Consumo (kW/h)	Hist. Coste	Detalle
ES002748000001863XY	PS CANALEJAS, 85	01/2021	242,79	-2,05	226,00		

# Evidences of success: electricity (II)



Menú Principal > Energía Electricity

**Consumo Dependencias**

**Facturas Invoices**



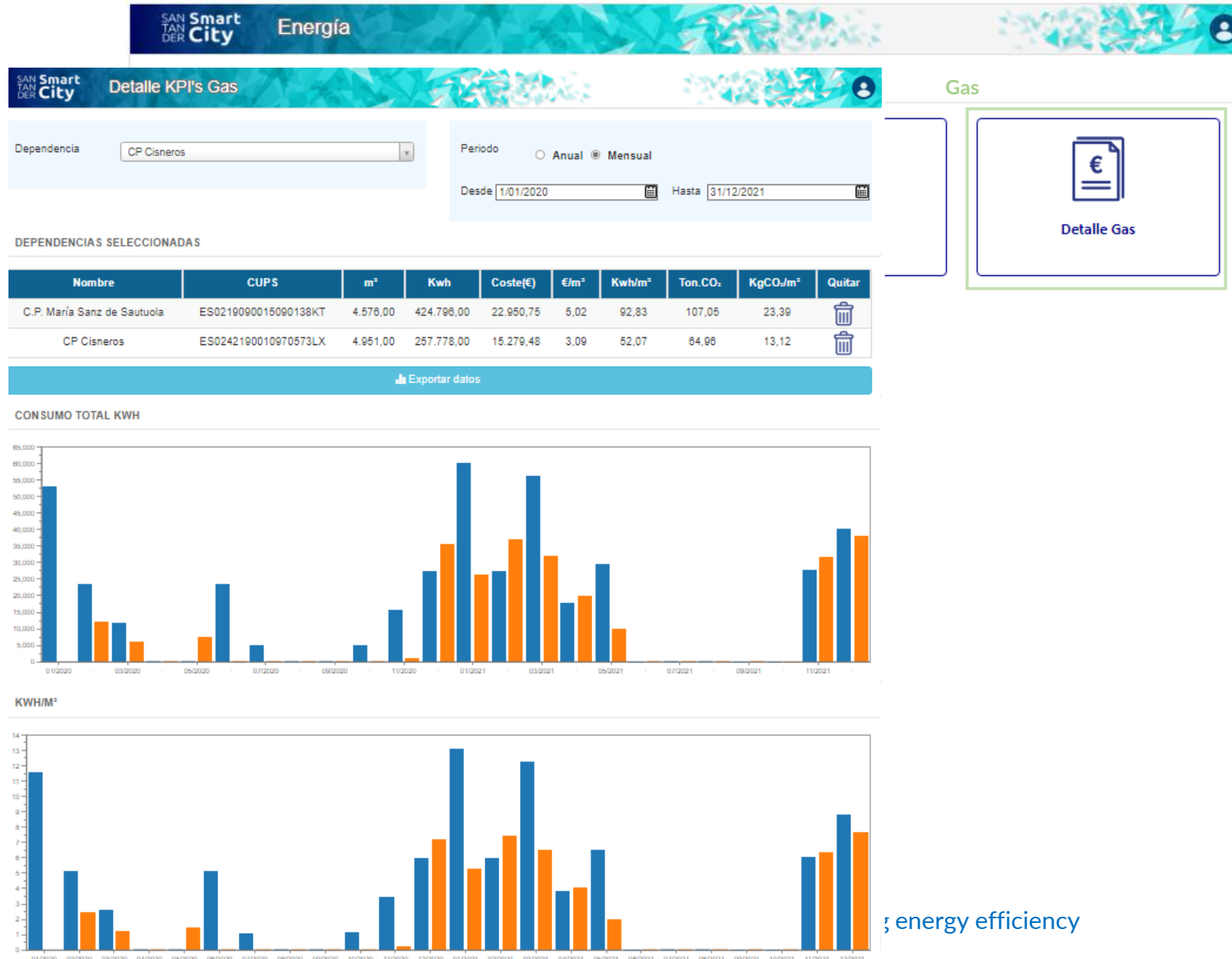
FACTURA ACTUAL: Seleccione fecha de la factura actual (2021, enero)  
COMPARAR FACTURA: Seleccione fecha de la factura a comparar (2020, enero)

Fecha Desde:	Fecha hasta:	Fecha Desde:	Fecha hasta:
31 de diciembre, 2.020	31 de enero, 2.021	31 de diciembre, 2.019	31 de diciembre, 2.019
Coste (€): 1.299,65	Consumo (Kwh): 5.392	Coste (€): 1.640,3	Consumo (Kwh): 5.392
-20,76% Variación mensual		-31,77% Variación mensual	

- 2020, junio
- 2020, julio
- 2020, agosto
- 2020, septiembre
- 2020, octubre
- 2020, noviembre
- 2020, diciembre
- 2020, enero



# Evidences of success: Gas



# Main Benefits

- Digitalization of energy data (no more paper invoices)
- A tool has been made available to:
  - monitor energy usage & environmental impact at different levels (buildings) and over different time periods
  - make benchmarking among buildings
  - make invoice management more user-friendly
- In-depth monitoring thanks to hourly data (electricity):
  - unwanted latent consumption
  - off-hour consumption

# Main challenges

- Technical and bureaucratic aspects impacted by coronavirus situation

## Next steps

- Based on available historical data:
  - Assess savings achieved (consumption, costs & CO<sub>2</sub> emissions) after applying Energy Efficiency measures
  - Improve decision making for future actions

## How replicable is the Good Practice

- Energy monitoring is a common need to other cities/public bodies
- Data collection, integration and visualization will depend on each entity



Thank you!