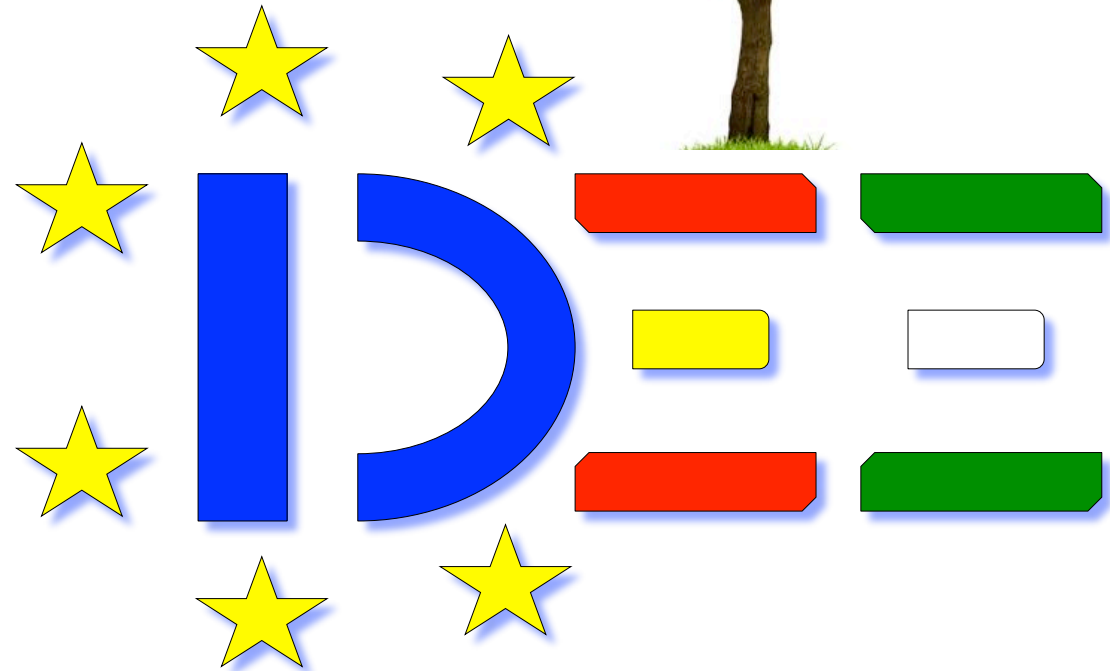


Smart Campus Project

The university more **alive** than ever



University of Málaga



Institute of Domotic and Energy Efficiency

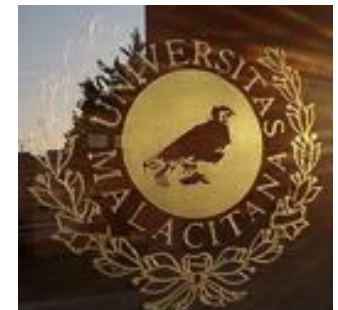
General Data of UMA

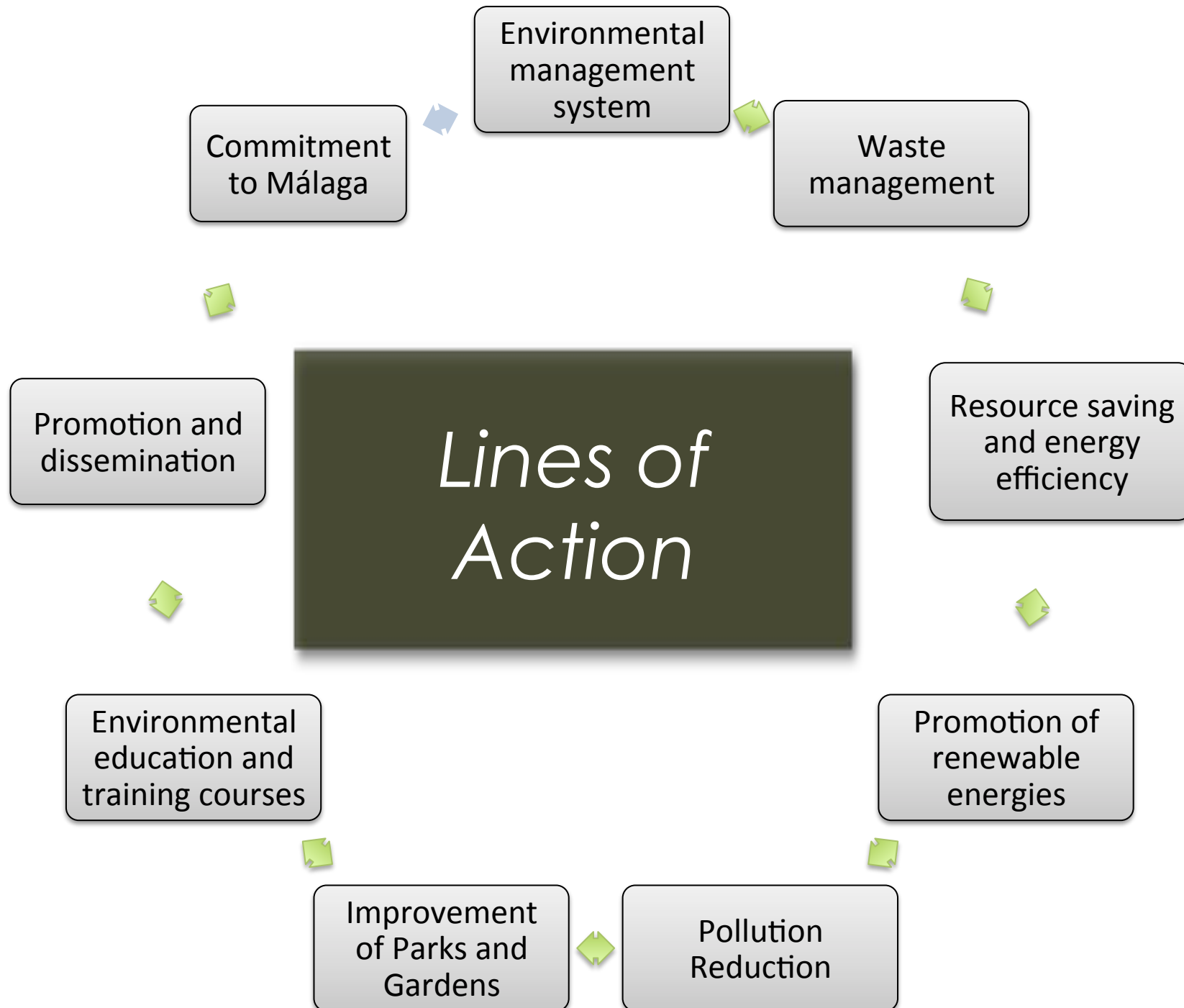
University community of about 42,000 members:

- 38.000 Students,
- 2.335 Professors and Researchers and
- 1.894 Administration and Service Staff.

With 20 University Buildings:

- 12 Faculties,
- 8 Technical Schools and
- 3 affiliated centers





Environmental management system

ENERGY

Centralized System of Electric Consumption.



Real-time Information



Control of anomalies
and energy leaks



Decision making and
definition of saving
plans

Environmental management system

www.sga.uma.es

SOSTENIBILIDAD 



INICIO

SGA -

EDUCACIÓN Y DIVULGACIÓN -

ECOCAMPUS -

DIMENSIÓN SOCIAL -

OPORTUNIDADES -

COLABORACIONES -

BLOG



Huerto Docente



Semana Verde



Actividades anuales



Material Reutilizable



Proyecto Islas Verdes



Waste management

Selective collection



Control sheet



Vicerrectorado de Infraestructuras y Sostenibilidad, Universidad de Málaga

Hoja de Control : recogida de puntos limpios

Código de edificio:

Mes/año: /

Valor: 1/4 1/2 3/4 lleno

1/4 1/2 3/4 lleno

1/4 1/2 3/4 lleno

1/4 1/2 3/4 lleno

Señalar cada día con cruces el nivel de llenado de los contenedores al ser recogidos

Día	Vidrio	Plástico/lata	Papel/Cartón	Orgánica
1				
2				
3				
4				
5				
6				

REGISTROS DEL MES 2011/3

Edificio: 209. Biblioteca General. Año: 2011. Mes: Marzo.

Alta rápida:

Día 4 Vidrio Plástico/lata Papel/cartón Orgánica

Día	Vidrio	Plástico/lata	Papel/cartón	Orgánica	
1	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Modificar
5	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Modificar
14	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Modificar
31	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Modificar
Total:	1 2 1 0	1 2 1 0	2 2 0 0	2 2 0 0	
Volumen:	0.2	0.2	0.15	0.15	m ³
Peso:	39.2	13.0	7.5	43.65	kg

Resource Saving and Energy Efficiency

BUILDINGS

Energy Certification level A in building of Engineering School



Data of a normal building:

CO ₂ generated	2.132.363,00 Kg/year
Energy consumption	4.118.880,30 Kwh/year
Price of energy consumption (without VAT)	537.036,09 Euros/year
Price of energy consumption (with VAT and Power)	766.460,85 Euros/year

Data of Engineering School building

Efficiency factor	0,39 (Level A)
CO ₂ generated	831.621,57 Kg/year
Energy consumption	1.606.363,32 kwh/year
Price of energy consumption (without VAT)	209.444,07 Euros/year
Price of energy consumption (with VAT and Power)	379.902,27 Euros/year

Savings produced

CO ₂ not ejected into the atmosphere	1.300.741,43 Kg/year
Price saved on billing	386.558,58 Euros/year
Energy Produced	1.007.660,00 kwh/year
Percentage on global consumption	62.72 %

Price of Energy considered	0,130384 Euros/kwh
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Resource Saving and Energy Efficiency

BUILDINGS

Energy Certification level A in building of Engineering School.



Annual expected water consumption in m³

In the building	24168
In gardens (in winter zero m ³)	7700
Total	31868

Final consumption in m³ in the year

13200

Savings produced in one year

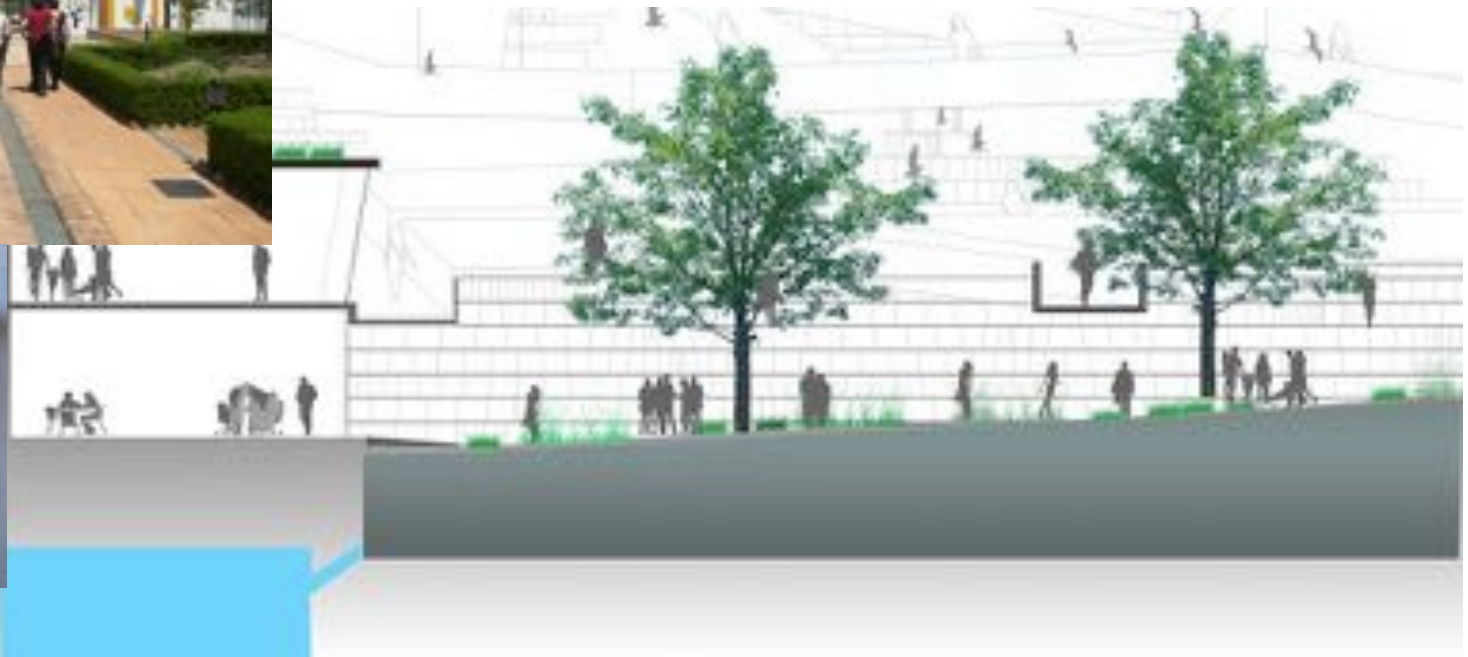
In m ³ of water	18668
In euros (1.362 euros/m ³)	25.425,82€



Resource Saving and Energy Efficiency

WATER

- Fresh Network Project.
- Irrigation water reuse system of the Botanical Garden.



Promotion of Renewable Energies

Alternative energies

Thermal and photovoltaic solar panels

Green roofs over buildings

Geothermal energy

Trigeneration

Increase Energy Efficiency

Decrease primary energy consumption and polluting processes

Smart City 20x20x20

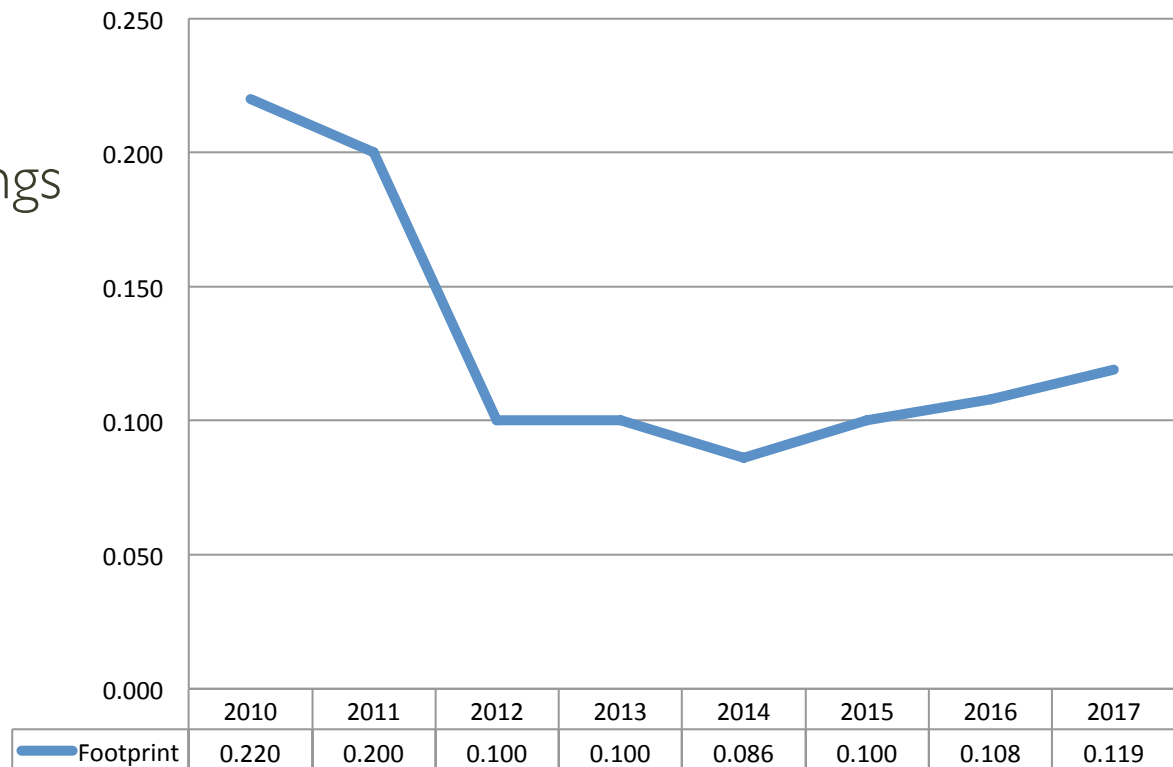


Pollution Reduction

Ecological footprint

Pollution indicator. Amount of equivalent hectares per person and year that are necessary to correct the amount of CO₂ that we generate. The parameters studied are:

- Water consumption
- Construction of buildings
- Electrical consumption
- Waste generation
- Mobility



Pollution Reduction

Atmospheric pollution

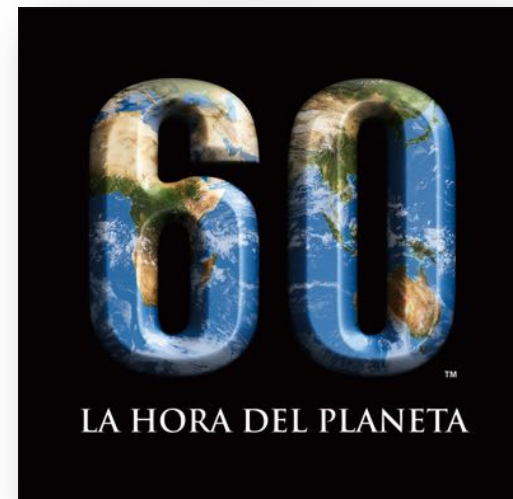
- Promotion of public transport: subway and bus
- Bike lane throughout the Campus
- Use of electric car and solar chargers



Pollution Reduction

Light pollution

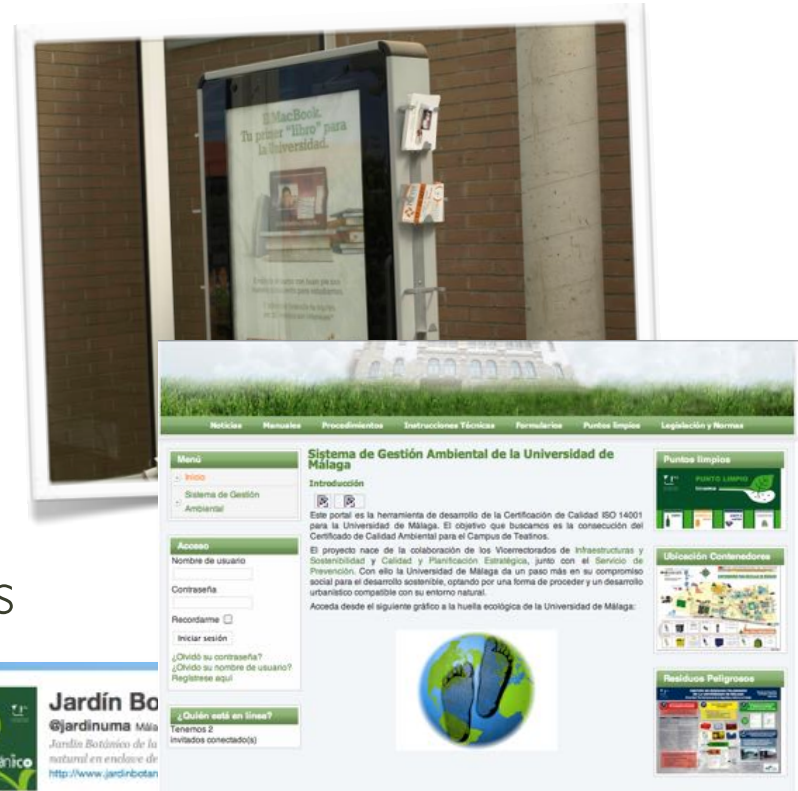
- Study plan of luminaires by zones for the reduction of light pollution
- Participation in "Earth Hour" for energy saving



Sostenibilidad y Proyectos Ambientales

Dissemination and promotion

- The promotion is the key to reach the university community and the whole society.
- All actions on sustainability are reported through the platforms:
 - Web
 - Brochures and Informative panels
- In addition, the use of social networks is encouraged as a means for dissemination and reflection.

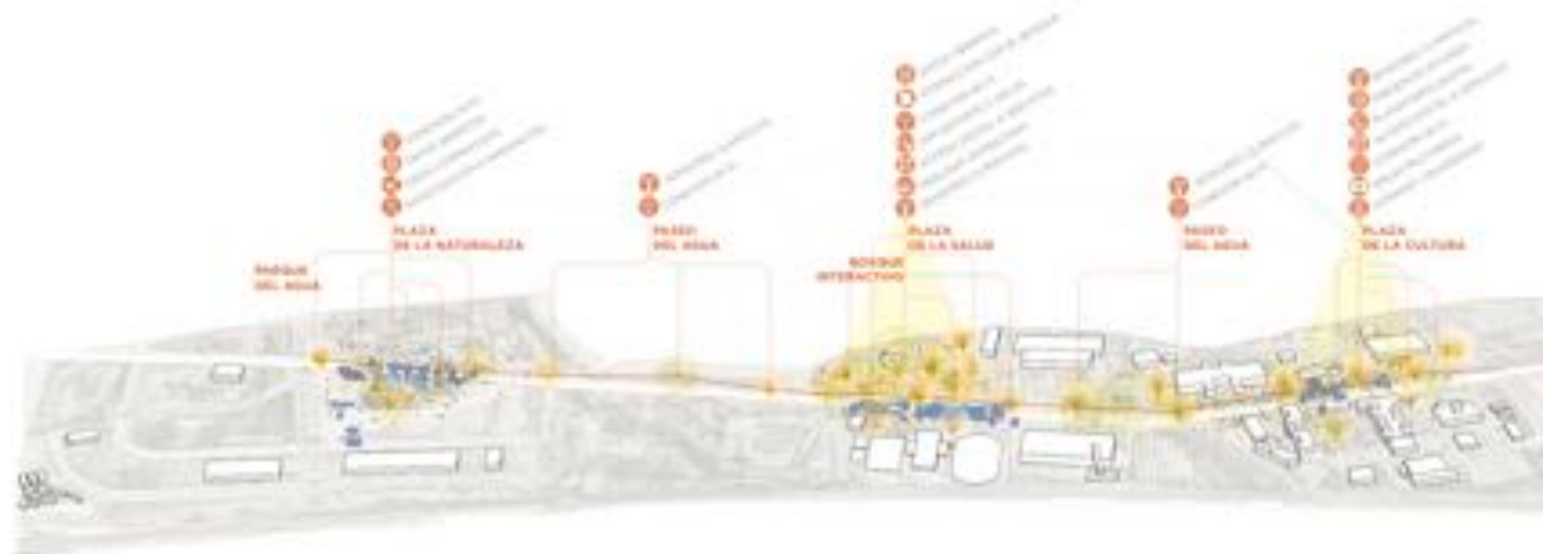


Future: Campus Eco-Tech UMA



CAMPUS TECNOLÓGICO

-  PARQUE EXPERIMENTAL
-  SENSORES INTELIGENTES
-  WI-FI
-  APPS
-  REALIDAD AUMENTADA
-  PLATAFORMA DIGITAL



Future: Campus Eco-Tech UMA



ECOLÓGICO

- CREACIÓN MICROCLIMAS
- COMFORT URBANO
- PAISAJE
- REGULACIÓN DE AGUA
- BIOREMEDIACIÓN
- ENERGÍA

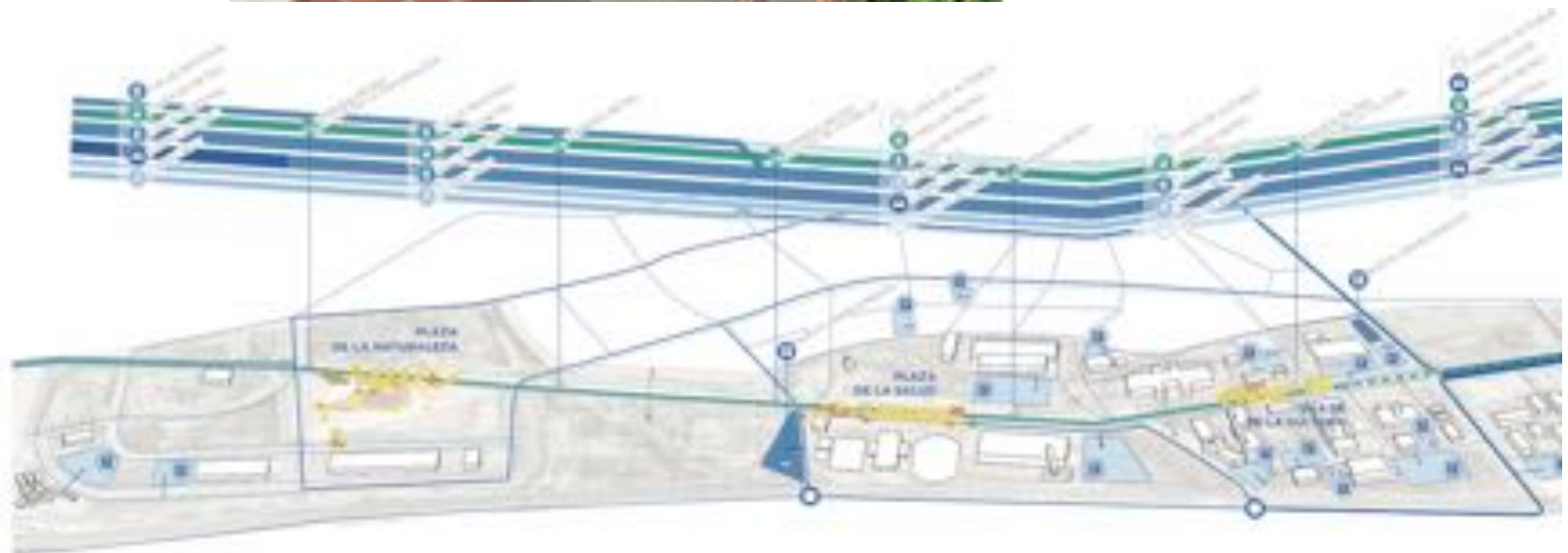


Future: Campus Eco-Tech UMA



PLAN URBANO

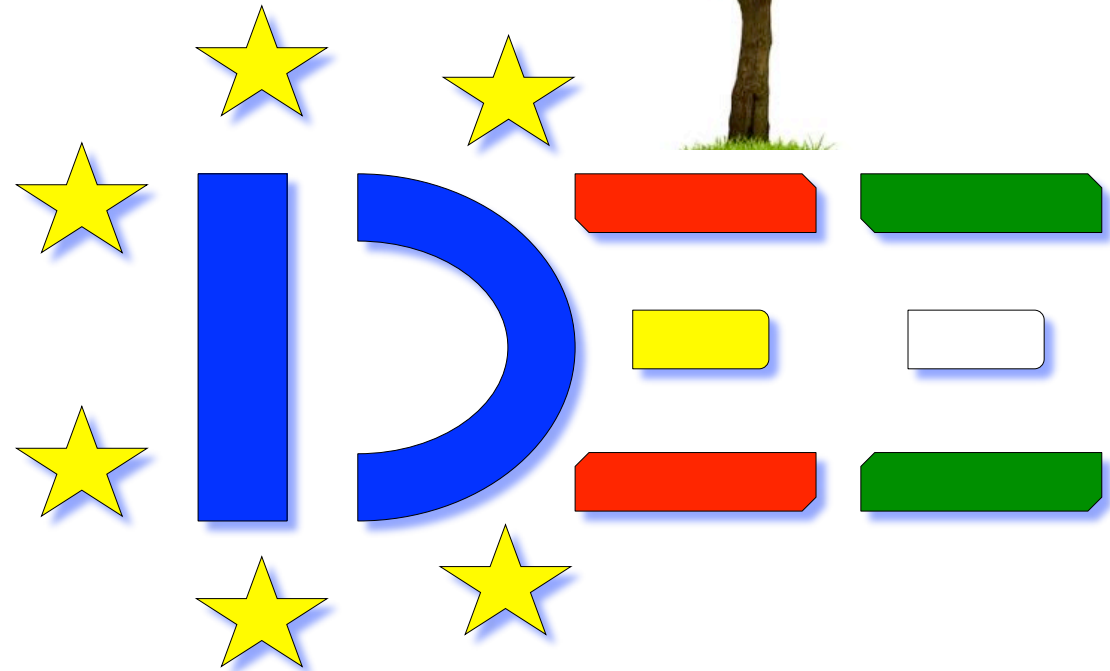
-  INTEGRACIÓN EDIFICACIÓN
-  CONECTIVIDAD URBANA LONGITUDINAL Y TRANSVERSAL
-  MOVILIDAD ALTERNATIVA
-  RED DE APARCAMIENTOS DISUASORIOS
-  INTEGRACIÓN TRANSPORTE PÚBLICO
-  CONTINUIDAD ESPACIO PÚBLICO



Thanks for
your attention



University of Málaga



Institute of Domotic and Energy Efficiency