Tarragona Smart Mediterranean City Strategy

The Legacy of the Mediterranean Games 2017
This document reflects the commitment of the city in compliance with the approved strategic plans. These plans comprise the Pla d’Acció per a l’Energia sostenible (Sustainable Energy Action Plan), Pla d’ Mobilitat Urbana Sostenible (sustainable urban mobility plan), Pla d’Ordenació Urbanística Municipal (Regional Planning Programme) and the Pla estratègic Tarragona 2022 (Strategic Plan Tarragona 2022)

The city fixes these plans to its commitment to the project Tarragona Smart Mediterranean City and to the horizon of hosting the XVII Mediterranean Games in 2017.

Josep Fèlix Ballesteros
Mayor of Tarragona
1. Introduction

(Excerpt from) Located on the Mediterranean coast, Tarragona geographically is in North-eastern Spain, and covers a populated area in Southern Catalina, with great transport connections that put Barcelona by train only 50 minutes, the French boarder by car just under 3 hours, and Madrid using the ultra modern high-speed rail link (AVE) only 2 and a half hours.

The city opening to the Mediterranean, with 14 km of coastline, provides a mild and temperate climate all year round, with an average annual temperature of 17 °C and 2,700 hours of sunshine each year. Rainfall is low and concentrated in autumn and spring.

The city has 134,085 inhabitants; it is the centre of a 30 km area where over 500,000 people live.

Tarragona is the capital of the province of Tarragona, an area of land crossing the Mediterranean axis and the Ebro Valley whose sea port has become a strategic crossroad. The city of Tarragona holds both regional and national levels of administrative offices.

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<th>Tarragona Geographical Data</th>
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Tarragona is the most populated city of the province and has all kinds of services. This gives a wide power of investment and talent attraction exerted mainly within a radius of 30 km where 502,000 people live.

The GDP of Tarragona reached 5.602,3 Million EUR, with regard to economic sectors, services (formed, among others, by trade, real estate and business services, hotels and financial intermediation) has the greatest share in Tarragona reaching 62.1%, followed by industry and construction with 37.6%. Services along with the importance of the industry based in chemical and energy establishes Tarragona as the capital of the second area of economic development of Catalonia just behind Barcelona.

Regarding the commercial sector, Tarragona is the second largest main municipality of commercial area of Catalunya, with a total potential market overcome only by Barcelona, thanks to both spending of the inhabitants and the effect of tourism in their area of influence.

Tarragona will be the future Mediterranean Corridor node.

The road network comprises the Mediterranean highways (AP-7 and A-7), the Northern highways (AP-2 and A-27).
the latter in construction), the C-32 (Pau Casals), the T-11 and National Roads that link the rest of the state, the N-241, N-240 and N-340. In particular, Barcelona can be accessed by taking either the AP7 or the C32. In the case of the port the internal accessibility is guaranteed by the Transverse Axis, a direct link without traffic lights on the road network, and the traditional access of the Llevant Dock and Serrallo.

Regarding air communications, 45 minutes away there is the international airport Barcelona-El Prat and only 7km from Tarragona is Reus Airport which has national and international connections.

In the area of rail transport, Tarragona has two stations. The first having regional and southern long distance railway connections, and the high speed ‘Euromed’ (Barcelona- Alacant) stop. The second station, ‘Camp de Tarragona’ belongs to the AVE (High-speed) network. In addition, the European Commission has declared the Mediterranean Corridor railway as a priority to connect southern Spain with France and, Tarragona will be one of its nodes.

The Port of Tarragona is a pioneer on the Mediterranean coast in use of rail and leading direct rail access to all the docks. The Port of Tarragona is leader in the Mediterranean and is established as one of the entrances and exits of goods from and to Europe. It ranks in fifth place of Spanish ports, maintains trade relations with 150 countries worldwide and works to strengthen its relations with the emerging Asian market. The Port of Tarragona is the gateway to the world.

Regarding all of this, it is clear that the growth prospects of the Port of Tarragona in the coming years remain very favorable due to planned investments for both the Port Authority and by private licensees. Private investment has increased from 3.85% to 88.69% in the last five years.

The Rovira i Virgili University is acknowledged as an Excellence International Campus by the Ministry of Education.

Tarragona is a university city, the Rovira i Virgili University offers a prospectus of 40 degree courses and around 50 masters in various disciplines that are taken by more than 14,000 students. It is a research university which has an outstanding international visibility and is ranked third in Spain due to the impact of its scientific production assessed by International Standards.

In 2010, the URV achieved the distinction of “Campus of International Excellence” by the Ministry of Education for the project “Campus of International Excellence Southern Catalonia”, the Campus includes the research institutes, university hospitals and the system of technological centres and scientific and technological Parks promoted by the University and focused on the main socioeconomic sectors: chemistry and energy, nutrition and health, tourism, enology, heritage and culture and numerous companies from the territory.

Tarragona has a centre of innovation in chemicals around the new “Tarragona Science and Technology Park”, based on a quality academic environment; it’s where the Chemical Technology Centre of
Catalonia and the Catalan Institute for Chemical Research work. The secondary knowledge and research area is in culture and heritage, where the protagonists of the Institute of Catalonia Classical Archaeology (ICAC) and the Institute of Human Paleoecology and Social Evolution (IPHES). To these we must add the Pere Virgili Hospital Research Institute, the newly created Institute of Energy Research of Catalonia (IREC) specializing in energy savings and renewable energies and various technologies and innovation centres.

The city also has a full range of secondary education. Their success is explained by the collaboration between intermediate and higher level centres with companies, business associations and guilds.

Tarragona is fast becoming a logistics hub with the Logistics Activities Area (ZAL) in the Port. The chemical park in Tarragona generates 40,000 jobs.

The Tarragona industrial parks are well connected, equipped with modern services and there is space available to accommodate new businesses. Located in these industrial areas are companies that enjoy good locations and excellent communications. There are, among others, Repsol, Iberia BIC SA, BASF, Bayer, Dow Chemical Ibérica, Clariant, E.On Generation, Carburos Messer, CLH, TPS Tarragona Port Services SL, Cementos SA Branch, Prime Steel AG, Carbonell Figueras SA, DHU Ibérica, Pompeyo Ormos or Aarus Maritime.

The Port of Tarragona and its development as a logistics hub has become a vital driving force for the industry of Tarragona, therefore, logistics and intermodal transport have achieved a leading role thanks to the outstanding Intermodal Centre "del Camp" and the Area of Logistics Activities (ZAL) in the port. The synergies between the port and chemical industry must not be underestimated. The enlargement of the Chemical Pier at the Port of Tarragona, and the expansion of the esplanade and mooring line will allow exponential growth in terms of chemicals traffic. The Port of Tarragona is reaffirmed as the gateway to the Mediterranean that brings the chemical industry to the world.

During the past year has intensified its position as a hub port for agricultural goods, energy products, and pulp. From the strategic view of traffic diversification, the new container terminal located on the dock of Andalusia will be ready to handle 1.5 million containers annually.

The Port of Tarragona guarantees flexibility in the inspection process with the new building of the Border Control Facilities of Healthcare Goods. It also provides quality and speed in its port operations through its maritime terminals specific references of bulk and liquids, containers and vehicles and their service manuals for pilotage, towing and mooring.

A vital element for the city is the largest chemical cluster in southern Europe, which accounts for 25% of the activity of this sector in Spain. According to estimations made by the Association of Chemistry of Tarragona (AEQT), the chemical park in Tarragona generates up to 40,000 jobs and has an output of 15,000 million EUR. In addition, the energy sector generates over 60% of electric power in the region of Catalonia.
2. Tarragona Smart Mediterranean City

(Excerpt from) Along the centuries the Mediterranean has been the cradle of important civilizations representing one of the most extraordinary samples of human culture, genesis of democracy and site of important artistic expressions that found in the urbs of Tarragona one of its main spots. Named by Julius Caesar: “Cologne Urbs Triumphalis Tarracenensis”, its vestiges have been declared by the UNESCO World Heritage Site.

The vision:

The Mediterranean city as an emerging region in a global polyhedral world.

Besides having one of the greatest flora and fauna, as well as a huge diversity of landscapes, a part from being a gifted region with unique ecosystems, the Mediterranean region is marked by its relation with other local communities and for the development of several economic activities that interact with its own history, landscape and surroundings.

The known as Arab Democratic Revolution opened a hopeful process of political reforms along the southern shore of the Mediterranean heading the road for democracy, freedom and fundamental human rights, in an uneasy path that requires complicity and active collaboration from the European governments and institutions, as well as from its Civil Society. This political process is determinant for regional stability and security, and it opens at the same time new perspectives for economic and social development for the countries of the Southern Mediterranean.

In these countries it is expected that the economic development will interact very dynamically with processes of demographical transition marked by urbanization and social mobility with an emerging middle class, together with the creation of an entrepreneurial network of small and medium companies, a high-quality University, women’s empowerment, professional skills, middle and high skilled technicians, and the influence of the new information and communication technologies.

During the next decade the Mediterranean region is called to occupy the position it deserves in terms of global economy, being able to keep the world’s attention, this time not for its social inner tensions and for the complexity of its internal relations, but for its growth, its potential and its cultural wealth, in a process that is definitely going to be marked by the environmental care and new policies of energy efficiency and saving, the use of the new technologies, innovation, knowledge and creativity determining higher levels of quality of life, a greater social cohesion and a more open and participatory city governance.

Information and communication technologies (ICTs) are already playing a decisive role in the process of socio-economic transformation of the Mediterranean, from the perspective of economic development, entrepreneurship, job creation and for the increasing number of research and ICT-based Euromediterranean projects. All these factors invite us to understand these technologies as a powerful tool to empower local communities that will spread processes of knowledge sharing, coordination of strategies, transformation of social, political, economic innovation as the Arab Democratic Revolution suggests.

As it happens with the global and polyhedral architecture of the world, these development processes will place cities as

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2 Declaration of Tarragona on Mediterranean Smart Cities, Tarragona, No. 8th, 2012
the main protagonists. Its capacity of attracting talent and investment are going to be the engines of their world positioning. Thanks to its growing economy and dynamism, cities have nowadays become international agents in which economic, political, technological and cultural changes are constantly taking place. These changes have huge global repercussion, especially in the Mediterranean where rigid classical structures enforce the city as an axis for new relations of power. Programs, concrete actions, global vision and strategic planning are characteristic assets of the cities’ activity. Once again, the Mediterranean city is going to be the next protagonist of our reality and of the opportunities of our future generations.

**The mission:**

Make the Mediterranean smart cities a powerful growing engine capable of transforming the region

(Excerpt from³) The called Process of Barcelona, opened with the Euromediterranean summit in 1995, initiated a framework that further on would be inherited with renewed vigour by the Union for the Mediterranean in 2008, aware that Europe, in the current context of economic and financial crisis, demands a determined bet from political Euromediterranean institutions for countries in the south shore of the Mediterranean, in order to face with best guarantee to success the future of a global economy and a more stable regional context.

The cities of the Mediterranean, are called to be the center of this transformation process, catalysing from a proper smart city management, the known as smart cities, the technological leap, based on the possibilities that offer the new technologies, as well as a new conception of energy applied to new sources of production, efficiency and energy saving. These are cities in motion that will become poles of economic attraction and investments, but also of talent, research, innovation and creativity.

**What does „Smart City“ mean?**

Definition from: Strategic Implementation Plan (SIP) of the European Innovation Partnership on Smart Cities and Communities, 14.10.2013:

“Smart cities should be regarded as systems of people interacting with and using flows of energy, materials, services and financing to catalyze sustainable economic development, resilience, and high quality of life; these flows and interactions become smart through making strategic use of information and communication infrastructure and services in a process of transparent urban planning and management that is responsive to the social and economic needs of society”

As an alternative to the global model of smart city, the Mediterranean cities are characterized by their will of democratic coexistence and cohesion in open societies together with the need of implementing economic transformation processes, that bearing in mind environmental requirements, allow people to enjoy a better quality of life and a wide range of cultural identities and expressions.

The needs and the good practices in terms of water use, the mobility in a limited and densely populated coast territory, the diversity of uses and the prominence of the public space in people’s coexistence, the Mediterranean diet and the promoting of healthy living habits, the dependence on

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³ Declaration of Tarragona on Mediterranean Smart Cities, Tarragona, No. 8th, 2012
an intense energy use with its high environmental cost, the coexistence within a rich and diverse historical heritage or the artistic and cultural pole of attraction determine the character of the cities on the Mediterranean rim and their vocation to find in the design of an own smart city pattern the answer to the important challenges that the current economic and environmental crisis situation is posing.

3. Implementation

3.1 Citizen involvement

The recognition and exercise of social, cultural and political rights are among the principles on which democratic societies are based. Citizen’s participation and the association movement are therefore essential for development and social cohesion of the society.

Good governance practice must strive for citizens’ involvement in the entire process of planning, monitoring, implementing and subsequently evaluating public action.

Such participation should take place through a range of bodies, from school councils to municipal advisory councils.

In the light of this awareness, the Tarragona city administration detected the need to build a culture of citizen participation at all possible levels. For all this, it is essential to promote the use and application of new technologies, both for management and for participation channels.

What will we do?

Incorporate citizen participation in the cities development processes

The participation process has to be developed beyond mere public information. We shall provide mechanisms for citizen participation in all plans and programs that affect the development of the city. We endeavor to implement sessions with active participation, like presentations, discussions, working groups etc. in the course of planning processes or definition of programs.

(PLA 2022, 7.2.5)

Participation processes will be included in the different areas of the City administration in order to define new actions and consider proposals for improvement. These participative processes should be both internal and external, so that the City Council can take into consideration all viewpoints involved.

(PLA 2022, 7.2.3)
Using social networks as elements of citizen participation

We will use social networks as a tool for citizen participation in projects, initiatives, activities and other events in the city. This will strengthen the presence of the city administration in social networks, providing content about the city and informing about channels of communication and citizen’s participation.

(PLA 2022, 7.2.4)

We aspire to create a participatory space on the Tarragona web site, where citizens can review and discuss the various projects, initiatives and challenges of the city.

(PLA 2022, 7.2.7)

Case Study – Participation process in the establishment of the strategic plan PLA 2022

Prior to drafting the Strategic Plan Tarragona 2022, the city council promoted a process of internal participation encouraging politicians and technical services to participate in the process.

Initially, workshops have been held with the participation of a delegation of the Catalan government and the municipality’s technical services respectively, where the challenges, the strategic lines and the vision were defined.

In subsequent workshops appropriate measures to address the challenges have been defined in more detail.

The participation process extended the focus from social politics to urbanistic and economic aspects.

(PLA 2022, 1st document).

Key Performance Indicators

- Number and type of the participating events
- Degree of citizen participation in projects or initiatives proposed in
- Through social networks
- Number of citizens participating in events

3.2. Water

As stated by the slogan of the 6th World Water Forum in Marseille “The time for solutions”, it is necessary to become aware of the preponderant role that water is going to play in the challenges that mankind has to assume. Water, as a first need element for the cities and which is at the same time tightly related to the environment, appears as a key agent within the smart cities. That’s why investments made in the improvement of water cycle management will surely bring enormous benefits to the citizens and for the environment. It has been proved that new technologies can offer, also in the case of water, solutions to problems in its urban managing that can not only provide with a greater control of its sanitary quality and his consumption, but can also simplify and reduce the environmental and thus economic cost of its managing processes.

The use of sensors and telecommunication systems multiply the possibilities of obtaining and collecting data, some of them commonly discarded so far, that provide with information about uses and requirements of the water supply. Advances in learning to read this type of information, that would later be analyzed, would allow to extract conclusions that offer the technicians, almost in real time, exhaustive knowledge on the scope and the impact of processes and offer them the possibility of a more accurate control of the needs of the supplied population.
We can state that water is definitely a key agent in the series of transformations that lead towards a city which has the tools to improve the efficiency, and which promotes the responsible use of resources and the respect for the environment.

**Optimization of water management**

Efficient management in the collection, treatment, storage and distribution of water for human consumption also offer many opportunities for implementing cost-saving measures and efficient use of resources. Tarragona is already working on reuse oriented wastewater with good practices in consumption and utilization of water table water for irrigation or street cleaning solutions.

**What will we do?**

**Responsible water consumption**

Responsible consumption raises the implementation of the system of water meters. As a new technology that not only allow access to individuals, companies and administrations to insightful information about your water consumption, but also provide the necessary support for individualization (customization) of awareness raising, savings and dissemination of good practice. In the same vein, the sensing of the irrigation of parks and gardens will be a new tool to detect leaks, automatically adapt to the weather conditions and optimize water consumption to the actual needs of the moment.

**Raise awareness of water as an integral element of Mediterranean ecosystems**

Water as part of the ecosystem of a Mediterranean city: A couple of illustrative examples are the use of the coastline, especially the beaches, as space for leisure or control episodes of torrential rain. For one, Tarragona and has a control system water quality on the beaches, which are complemented by a multi-platform service information through
displays at street (COWAMA) and through an application for smart phones called iBeach. This service can be used for the dissemination of information of all kinds on the coast of the city environment, including water quality of each beach, sea state, access to the beaches, points of aid or the presence of jellyfish among many others.

With regard to the torrential rain also it has a system to predict with some advance episodes of torrential rain and flood water and, using this information, caution and issue warnings to the population to avoid incidents in rivers, streams or places where there is usually danger of flooding.

Case Study - Vertical Garden

Tarragona has the largest vertical garden in Europe with an area of 3,200 square meters, in the future cultural complex of Smart Parc Tabacalera. The garden, 185 meters long and 18 meters tall, stands out for the applied technology as the project has been designed under criteria of sustainability and is pioneer in the use of wastewater for grass irrigation. In fact, the system will allow saving of 26,000 liters of water daily. Besides the plant elements that cover the front, the ‘Smart Parc Tabacalera’ also includes a horizontal garden of 8,000 square meters. It is expected to be a reference site for students of the water recycling.

The frontage of the building includes a large screen of 100 square meters designed for the broadcast of major events such as concerts, movies or soccer matches.

Case Study - Water management for public parks

A new telemetry system for water supply has been installed, with counters that provide detailed information on the consumption, and facilitate data and examples for awareness raising and dissemination of best practice in public irrigation. In line with this measure there are plans to install a wider network of sensors which allow for leak detection and the adaption of the irrigation system of parks and gardens to weather conditions.
3.2. Mobility

Excerpt from Tarragona on Mediterranean Smart Cities, Tarragona, No. 8th, 2012

Mobility is a crucial issue for any Mediterranean city given its high impact in the quality of life in particular but also in the environmental care. The density of population and the diversity of needs in the urban framework turn management of mobility into a true challenge.

A smart conception of the city will have to include an efficient and integrated management of the different aspects of mobility itself (parking, public transport, individual mobility, traffic control,...); allowing the interaction between a mobility managing system and other strategic issues of the city (for example, the atmospheric pollution control or the organization of events in the city).

Cities are working on shaping a new model of control center which will integrate all the data collected from mobility sensors (parking, system of public transport, state of the traffic, etc.), being at the same time able to generate services like an efficient managing of parking, public transport, city traffic (by a real time acting over traffic lights, for instance) or the redesigning of routes for certain services as collection of urban waste or buses, for example. There is also a strong effort being done in developing technological solutions related to environmental and social aspects of mobility as the reduction of the local environmental impact, for example; but also in the creation of new fuels, electrical and hybrid vehicles, promotion of a more responsible mobility (optimization of public transport and its coordination with parking facilities with a deterrent effect, car pooling services for big companies, use of alternative means of transport, etc.).
What will we do?

Promote sustainable urban mobility modes

Pedestrian traffic (57%) is the most frequent urban traffic mode in Tarragona whilst bicycle traffic (0.1%) is the rarest. The latter is due to the topology of the city with medium – high inclinations of the principal traffic ways on the one hand and a lack of bicycle infrastructure on the other. Currently Tarragona has only 10.1 km of bicycle lanes. In order to consolidate the high acceptance of pedestrian traffic in the city, we will further extend our network of comfortable and safe sidewalks and pedestrian areas.

We give priority to the development of an appropriate bicycle infrastructure, in order to further increase the proportion of the zero emission modes in Tarragona’s urban traffic. The promotion of bicycle use is also an import element of the city’s recreation offer and thus increases the attractiveness of Tarragona for tourists.

We will strengthen the network of bicycle lanes and hiking trails outside the covered areas of Tarragona in order to promote bicycling and walking for both, leisure and occupational mobility, between districts and neighboring municipalities.

(PLA 2022, 6.4.4; PMUS 2.3)

The bicycle use in the city center will be promoted by the implementation of additional lanes and bicycle racks, campaigns to encourage citizens to perceive the bicycles as a routine transport means and by revision and improvement of the of the municipal ordinances related to bicycle traffic.

(PMUS; 2.2.-2.5)

In order to promote public transport and reduce individual traffic in the city center, park and ride areas will be increased at the radial highways and other neuralgic spots of Tarragona.

(Pla 2022, 6.4.2)

Improve traffic connections between Tarragona and surrounding areas

On the connections between Tarragona and destinations in the surrounding area, Individual car traffic (80%) is the most frequent traffic mode. In urban traffic the proportion is significantly lower (34.5%). The high rate of individual traffic on the connecting routes is due to the lack of frequency and synchronization of the public transport with the schedules of connecting means of transport (High Speed Train, interurban trains, air traffic) and the working hours of the employers of the surrounding areas respectively.

In order to efficiently reduce individual car traffic it is necessary to increase the acceptance of public transport and other sustainable concepts on the connecting routes. The highest priority has been identified on the following routes: Tarragona with Cambrils, Valls, el
Vendrell, **high-speed rail link** Camp de Tarragona

*(PMUS, 3.7)*

**Promote vehicles with sustainable Drive Concepts.**

The topology of Tarragona with 56% of the principal traffic ways having medium (6-12%) or high (>12%) inclinations sets limits to soft mobility modes and will lead to an increase of motorized means of transport.

In order to avoid emissions of greenhouse gases, we encourage the purchase or rental of **electric vehicles** like cars, bicycles or roller type segway. To promote the implementation of these transport systems we will install various public electric charging points and engage the corporate sector.

*(PLA 2022, 6.4.5)*

It is proposed to promote electric vehicles and car sharing.

For EVs used in the municipal fleet a system shall be implemented, that is inspired by car sharing or rental. Recharging stations will be installed in the municipal car parks where the EVs are provided. It is also proposed to raise campaigns and promotion of rational use of cars, such as Car-Pooling. Finally we proposes a study on the implementation of charging stations and deployment of EVs in Tarragona.

*(PMUS, 4.5)*

**Key Performance Indicators**

- Total area of park and ride car parks
- Km of hiking trails outside the covered area
- Number of public charging points for EV
- Number of EV circulating in Tarragona. Target for municipal fleet in property until 2018: 6 EV. *(PMUS 4.5)*
- Area of streets converted in traffic calmed zones or pedestrian areas. Target for 2018: 10,000m². *(PMUS)*
- Km of new bicycle lanes. Target for 2018: 40km *(PMUS)*
- Bicycle racks installed. Target for 2018: 350 bicycle racks for 1,750 bikes *(PMUS, 2.2)*
- Quality control plan for the public transport services of Tarragona implemented *(PMUS)*
3.3. Energy efficiency

Beginning of the 21st century, the crisis in which most countries find themselves has shaken up the main structures on which growth has been leaning on. Experts of all over the world have already warned that this traditional growth pattern, born in the second industrial revolution, carries irreversible consequences for the environment and subsequently, for people. Thus, there have been initiated policies to stop the deterioration of natural resources that our environment is suffering.

Tarragona’s vision in the field climate change:

In 2020 Tarragona has reduced its contribution to climate change and the city hall acts as the promoting organ via the implication of stakeholders to make the municipalities consumption more efficient, and its practices more exemplary and sensitive towards the climate change. (PAES)

By July 2008 the price of the oil barrel had achieved its historical maximum of 147 US Dollars. Reserves of fossil fuels are running down fast. Going back to previous growth levels using the same pattern of generation-consumption of energy would require the exploitation of minor oilfields, something that would raise the price of the barrel above 150 US Dollars. As a conclusion, the energetic scheme that has withstood the economic growth during the last century is now agonizing. The same arguments applied to the model of growth of cities and big urbs, is also suitable for the model of intensive fossil fuel consumption. Keeping on with this model would make cities inhabitable for their citizens both from an economic and from a quality of life point of view. The definition of a smart city contains the integration of measures designed to achieve a gradual change from the use of fossil fuel energy to the use of alternative energies. There are more efficient electrical systems that generate less pollution. New objectives have been set on energy saving. With them, industry, services and citizens are changing their pattern of intensive consumption of energy restating by this the philosophy of the Covenant of Mayors, driven by the European Union, where there was an agreement on the commitment of a 20% reduction of the current energy consumption by the year 2020. There is a shared conviction that these changes will have a strong impact in the economic growth of the Mediterranean region. The reduction of the energy costs improves competitiveness in all sectors and also in domestic economy. Moreover it opens new alternative economic activities both for companies and for the services sector.
What will we do?

Demonstrate good practice cases to trigger a societal change of behavior towards the reduction of greenhouse gas emissions

Public buildings offer an excellent opportunity to demonstrate good practice examples of energy efficiency measures aiming to encourage citizens to follow the line within their range of influence.

The visibility of such projects benefit from the outstanding perception of public buildings in the city landscape and from the commitment of the city council to a sustainable energy policy.

In the first line, we will tap the potential of the structural reduction of energy demand.

In order to quantify the potential, we will study the energy efficiency of public installations with high energy consumptions, like Sports and swimming facilities, Theatres, Schools etc.

(PAES, 1.1)

For the reduction of the thermal energy demand, efficient insulation of the envelope of public buildings will be studied under cost-savings aspects.

(PAES, 1.1.7)

We will implement energy efficient HVAC equipment (e.g. geothermal heat pumps, condensing boilers, digital controllers for HVAC systems etc.) in the course of new built and refurbishment projects.

(PAES, 1.1.1-1.1.6)

The electricity demand for street lighting will be reduced by retrofitting of street lighting with low energy lamps, like e.g. LED or high pressure sodium vapor and by the use of state-of-the-art efficiency features, like digital programming, remote control and presence sensors to adjust the light level to the current demand.

(PAES, 1.1.8.; 1.1.9)

The demand of the interior lighting of public buildings will be reduced accordingly by energy efficient lamps (e.g. LED) and the installation of programmable controllers and presence sensors in order to adapt the lighting to the needs.

(PAES 1.1.10)

The remaining demand will be supplied by efficient or renewable generation technologies.

In existing installations, we will control the correct function of solar thermal installations and meter their energy production in order to verify if it is compliant with the design parameters. In new solar thermal installations, performance monitoring will be a binding requirement.

(PAES, 1.31.)

In order to control the compliance with our energy strategy, an energy manager will be assigned, who is responsible for the energy management on the municipal level and the coordination of the counterparts of other administrations and public entities

(PAES, 1.3.5.)
Promote local energy generation in order to provide a cost-effective energy supply

Local energy initiatives by companies, citizens and public authorities can make an important contribution to the transition of Tarragona’s energy infrastructure towards a sustainable and cost-effective energy supply. Both social and technical factors are here at play:

Local energy initiatives are best suited to create public support through the direct involvement of businesses and citizens in planning, implementation and financing. The main motives are the need to control soaring energy costs and the desire to make a contribution towards the establishment of a sustainable society. In technical and economical terms, decentralized energy production may increasingly compete with centralized energy production as result of the cost reduction and efficiency improvement of small-scale generation and local waste heat use.

We will implement efficient generation technologies in large installations, e.g. cogeneration of heat and power in combination, if appropriate, with renewable energy sources like biomass or solar energy.

(PAES 1.3.3)

For the renewable generation of electricity, the installation of photovoltaic panels and micro wind turbines on public ground and public buildings will be studied.

(PAES 1.3.4)

The Tarragona waste incineration service SIRUSA was built on initiative of the Commonwealth of the Camp de Tarragona Urban Waste Incineration, integrated by the town councils of Tarragona, Reus, Salou, Cambrils, Vila-seca, Valls and Constantí. Sirusa has achieved the ISO 14001:2004 certificate of environmental management that guarantees the fulfillment of the regulation as for the environmental management and policies of prevention.

About 400 t of waste are treated daily in the furnaces to produce electricity with a peak power of 7.4 MW in a condensing turbine. However, there is no use made of the condensing heat, which is currently dissipated by fans with a total load of 0.4 MW.

Both, thermal heat and electricity shall be deployed locally within the scope of the national regulations.
We promote the construction of an integrated district heating and cooling (DHC) grid that will supply thermal energy to the districts PP9 and 10, the area "les Gavarres", the facilities of the Mediterranean games 2017 and other commercial and residential districts in the range of the grid. Appropriate companies will be invited to tender.

**Establish a program of environmental education in schools and raise awareness of citizens**

We will encourage the schools in the city to include a stable program of environmental education activities, particularly in relation to recycling and reducing the use of water and in relation to measures for saving energy at the household level (Pla 2022; 6.6.1). Case Study: Street lighting An outstanding example of the new street lighting is the City Hall, where the previous system of halogen lamps has been replaced by LED screens, enabling energy savings of 60%. Additionally the system provides the ability to change the color combinations for important dates.

**Case Study - Insulation of school building**

A pilot project for the insulation of public buildings has been carried out in the César-Augusto-School. It involves the injection of an innovative insulation material (BASF) between the outer facade and the interior walls of the classrooms that maintains the temperature in winter and reduces the heat in summer. This measure doesn’t only improve the comfort of students and teachers, but also results in energy savings of 35% as recently confirmed by an energy audit.

**Case Study - Street lighting**

An outstanding example of the new street lighting is the City Hall, where the previous system of halogen lamps has been replaced by LED screens, enabling energy savings of 60%. Additionally the system provides the ability to change the color combinations for important dates.

**Key Performance Indicators**

- Final energy consumption per energy carrier (COM)
- Renewable Energy generation including, Solar thermal, PV and biomass (PAES)
- Share of local energy production to overall final energy consumption (COM)
- Number of schools with environmental education programs (PLA 2022)
- Energy consumption per economic sector (COM)
- Final energy consumption per capita (COM)
- Energy Efficiency of Tarragona’s buildings
3.4. Health and Mediterranean diet

In coherence with their tradition, the Mediterranean smart cities, aspire to identify themselves with a healthy living style promoting the practice of healthy habits and the Mediterranean diet all which results in a better quality of life and the well-being of their citizens.

In the process of the transformation of cities, cities themselves have to become a conducive environment to the developing of technological solutions that provide improvement in the field of healthcare services. These solutions have to show that technology is, and must be regarded, as a main ally in the care of peoples welfare together with innovative health polices committed to the physical activity as a path to well-being.

The privileged resort in where Tarragona is found, particularly significant in the definition of the Mediterranean living style, facilitates the developing of outdoor activities, and allows the creation of urban surroundings that promote the practice of sports and physical activity, making these habits close enough as to integrate them in the citizen’s everyday activity. This circumstance should enforce social networks and even strengthen social cohesion.

The application of new technologies to the healthcare sector together with the use of sensors for many activities that until now were controlled manually will bring many possibilities of incorporating new control methods and should turn innovation into an axis of development in health community policing.

What will we do?

Look at Tarragona as a Living Lab

In the context of the project Tarragona Smart Mediterranean City, a line of work will begin the process for the city of Tarragona to become a Lab, linking physical activity as a means of living quality and health. We can understand a Living Lab as a real environment in which innovative technological solutions are tested. The aim is to improve the quality of services provided to citizens and at the same time stimulating an innovative environment in the city. We intend to integrate this new Living Lab the international circuit and global reference network; actively participating in the network of innovative cities in health policy related to the practice of physical activity, both on Catalan, Spanish and international levels.

Create urban environments that facilitate healthier life styles

In the field of health, the Tarragona Smart Mediterranean City project will be developed in different lines of work aimed at improving lifestyle and health of the community. A first line of work will focus on the design of urban environments that facilitate healthier life styles, benefitting from the culture of ‘Mediterranity’, active sports, changing the paradigm of mobility, facilitating pedestrian practices and behaviors that positively affect their quality of life. Another line of work will be designed to promote the emergence of innovative projects and incorporation of
new technologies in the hospital environment and health.

3.5. Tourism and cultural heritage

Tourism is a major economic sector for the Mediterranean, strongly related to its tangible and intangible cultural heritage (archaeological findings, a great diversity of landscapes, a diet related to a healthy life, a culture of outdoor activities with its own identity...). Tourism is a largely varied field regarding both the services offered as much as the agents involved (Public Administration, big international companies, small and medium enterprises rooted in the territory, tourists, citizens).

Given the importance of information and its exchange for the tourism industry, information and communication technologies (ICTs) have entered this field and are radically transforming it. Advertising, transport, accommodation, leisure or catering sectors are already taking advantage of the immediateness, visibility and interactivity that ICTs are offering. From the smart cities point of view, the next challenge will be to integrate all these (ICT & Tourism) processes in a concrete geographic frame (local or regional). In other words, it is necessary to find answers to questions such as: What can we expect from a touristic smart city? What skills have to be developed by a smart city to be an ideal scenery to satisfy the touristic sector?

For all what has been said before, it is necessary to emphasize in the interactions (in terms of information flows) between the wide range of agents involved (purchasing, sales, assessment, queries, opinions, etc...), for a further global analysis that is able to keep them stimulated. In this sense, tourist sites are regarded as Ecosystems of Digital Business, comparing them to the natural ecosystems in which different living creatures develop their interactions in a certain physical frame. In the same way that it is considered desirable the diverse and multiple interaction within a natural ecosystem, the aim here is to achieve a similar reaction in the case of a smart city, which is understood as Touristic Digital Ecosystem.

What will we do?

Unlock ICT potentials to provide better services to tourists

ICT is one of the main tools for the active promotion of tourism in Tarragona. We must promote a multi-platform system (web, social networking, smart phone applications ...) to facilitate real time tourist information in the fields of catering, hotels, leisure tour operators, heritage, cultural events among others.

Improve the brand management of Tarragona and its international projection

We must take advantage of the Mediterranean Games as a privileged window for promoting tourism in the
countries around the Mediterranean basin, facilitating exchanges with other cities, joint organization of activities and cultural events.

The possibilities offered by the incorporation of information and communications technology in the context of so-called Smart Heritage for the conservation and management of archaeological heritage, enable the development of new evaluation forms of heritage, promoting models of cultural industries focused on the virtual reality and historical recreation that affect the growth and diversification of the productive fabric of the city.

The eigenvalues of the Mediterranean lifestyle should allow to incorporate sustainability and respect for the environment as one of the assets of the tourism industry in our territory. The beaches in this regard will be the ideal stage for the development of new environmentally efficient tendencies.

Case Study - Sea water Service platform

An information service on sea water quality in real time has been implemented. The service platform provides information through screens on the street and through the iBeach application for smartphones, which also includes details sea conditions, accessibility at each beach or the presence of jellyfish, among other things.

Foto: www.aqualogy.net

Key Performance Indicators

- Number of visitors to cultural heritage and museums
- Overnights in all types of accommodation
- Visitor satisfaction
4. Final Words

The city of Tarragona with a time horizon set in Summer 2017, when it will be hosting the 2017 Mediterranean Games, encouraged by the processes of democratic transition initiated by the Arab Democratic Revolution and given the real possibilities of economic and social development that the Mediterranean region is foreseeing aware of the leadership that the cities will have in global transformations,

Invites other Mediterranean cities to join Tarragona in the process of protocolarization and establishment of the good practice in designing smart cities that, based on fair democratic government policies, will create an open, tolerant, innovative, social atmosphere for an economically and environmentally sustainable development. The strategic incorporation of new technologies and the coexistence based on social cohesion, social and cultural creativity, respect and valorization of historical heritage and healthy living habits will come from the tools provided by the local public diplomacy, from the university, from corporations and also from civil society; by creating strategic synergies between local governments, universities and centres of knowledge, technology corporations and citizenship to provide with the Olympic spirit and values, making the Mediterranean cities a powerful engine for the region’s peace and development.
Glossary

POUM – Pla d’Ordenació Urbanística Municipal de Tarragona (Regional Planning Programme)

PMUS – Pla d’ Mobilitat Urbana Sostenible de Tarragona, 28.09.2012 (engl.: SUMP sustainable urban mobility plan)

PLA 2022 – Pla estratègic Tarragona 2022 (engl.: Strategic Plan Tarragona 2022)

SIP - Strategic Implementation Plan of the European Innovation Partnership on Smart Cities and Communities, 14.10.2013:

RES – Renewable Energy Sources

PAES – Pla d’Acció per a l’Energia sostenible de Tarragona, 30.11.2009 (engl.: Sustainable Energy Action Plan SEAP)

PMCCC – Pla Marc de Canvi Climàtic de Catalunya

SIRUSA – Serveis d’Incineració de Residus Urbans S.A. (Engl.: Municipal Waste Incineration Service plc.)

PP – Plan Parcial (engl.: partial land development plan)

HVAC – Heating, Ventilation, Air Condition

COM – Covenant of Mayors