



French know how
in the field of
SUSTAINABLE CITY



vivapolis

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CITIES: A COLLECTIVE ADVENTURE

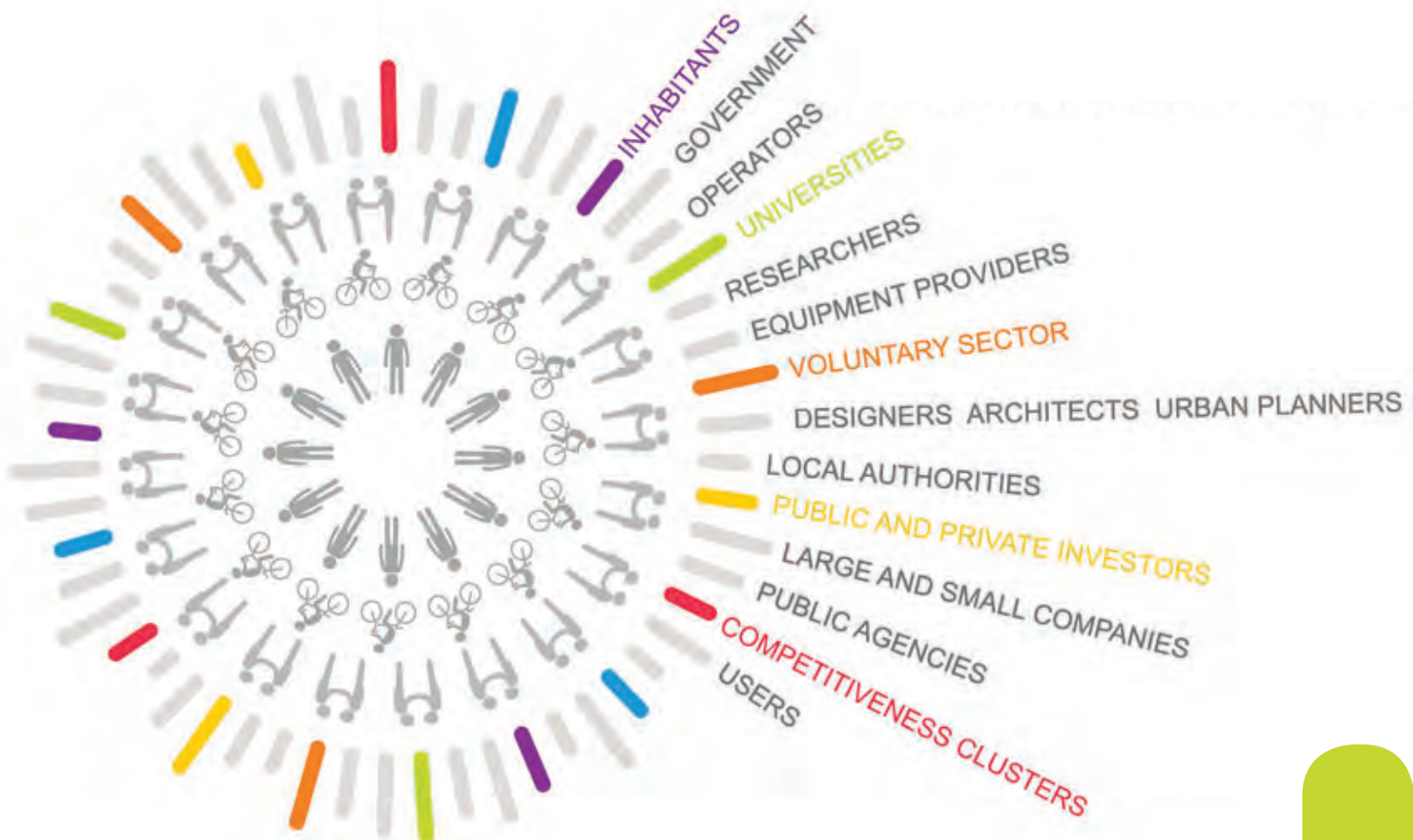
Living, imagining, consulting, producing, developing, integrating... There's no problem looking for words to express the human adventure a city represents. More than ever, modern urban environments aspire to progress through common projects and want to be attractive, both for economic activities, as well as for the people who live in them.

This attractiveness involves **quality of life** and **social cohesion** which are at the core of any urban project.

This objective is closely linked to **cities' environmental performances** which determine population's health and well-being, as well as **city's competitiveness** in terms of better management of consumption and waste in order to

achieve fair distribution of resources. To achieve this, cities must rely on progress provided by new technologies as well as on organising new methods of governance, adapted to their particular contexts.

Based on their experiences, **FRENCH CITY STAKEHOLDERS** - political and local technical leaders, investors, designers, equipment manufacturers, operators, businesses, national public actors and public agencies, universities and researchers - are mobilizing around a common vision with city dwellers and users: **VIVAPOLIS**.



VIVAPOLIS is the umbrella brand that brings together French stakeholders - both public and private - seeking to promote a shared ambition for sustainable urban development at international level. This process is being collectively developed and supported by the French public authorities and professional federations in the private sector.

THE VIVAPOLIS CITY HAS FOUR CHARACTERISTICS:

- ▶ **It places humans at the core of the project** by offering the best possible quality of life to citizens. It is a welcoming, mixed and multi-purpose city that provides: a place for living, working and leisure, all at the same time.
- ▶ **It seeks to optimise its performance** by consuming fewer natural resources and **optimising the integration of urban functions**; it thus seeks to make the urban territory more attractive, both for economic activities by increasing its competitiveness, and for the inhabitants by making the city more “desirable”:
 - **The performance of the services offered:** with regard to transportation, water distribution, energy, waste management, health, leisure activities, etc. These services are efficient and universally accessible, while being organised around intelligent and interconnected networks. They provide the best response to the needs of its citizens and are economically sustainable.
 - **The performance in terms of protection of the environment:** it offers a healthy environment, based on the sparing consumption of energy and natural resources, improving waste management, developing the circular economy, while bringing nature into the city.
- ▶ **It is based on strong and participative governance:**
 - Associating **all public and private stakeholders** with the local public authorities, in the design, financing and operation of the city i.e.: financial institutions, large and small enterprises, architects, town planners, consultancy firms, ministries and their respective agencies, public operators, universities and researchers, associations and NGOs, etc.;
 - Favouring a collaborative approach based on:
 - Consultation and shared governance in between the State, local authorities, inhabitants and companies;
 - Innovative contractual procedures: public-private partnerships, public service concessions, performance contracts, etc.
 - Pooling of expertise and know-how at both local and global levels
 - Exchanges and synergies between the city and the surrounding suburban and rural areas.
- ▶ **It adapts to the local features** geographical, climatic, historical and cultural, etc. Rather than being a model, it is actually an approach that can be adapted to the territorial contexts and local cultures.

THE 6 PLANS OF ACTION



Organise urban growth from a sustainable development perspective.

The city is a complex, living system with a high degree of inertia that makes it difficult to change course. Any specific action needs to form part of a shared global perspective in order to anticipate:

- ▶ A strong demographic pressure.
- ▶ Longer life expectancy and the ageing of inhabitants.
- ▶ An urgent need to reduce greenhouse gas emissions and the consumption of natural resources.

THE FRENCH APPROACH

Building a city that is appealing to its inhabitants, economically attractive and efficient in terms of environmental performance requires:

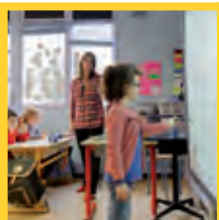
- ▶ The **planning, organisation and programming** of its development with a precise vision of the goals to be achieved in these different fields at a very early stage.
- ▶ The progressive implementation of this vision, by consulting and ensuring the participation of all stakeholders and by taking account of the **fundamentally important role of the local public authorities** throughout the process.
- ▶ The promotion of efficient and integrated services in terms of the mobility of people and the management of flows of energy, waste, water, etc. in the framework of a **systemic approach based on circular economy models**.



Ensure the resilience of urban territories.

Climate change, natural risks, technological accidents, pollution of the urban environment, social and economic divisions... such are the risks facing urban territories today. Cities are complex areas, characterised by eco-systemic interactions and interdependencies, and are therefore particularly vulnerable to disasters. Therefore, in addition to risk reduction measures, it is essential to develop genuine urban cultures of resilience based on:

- ▶ **Knowledge and forecasting of risks.**
- ▶ **Adaptation of the city to the effects of climate change and natural risks.**
- ▶ **The prevention and management of risks**, regardless of their origin, which must be integrated into the design of the city and its infrastructures.
- ▶ **Development of "compact cities"** in response to the current key issues such as: climate change, the dwindling of resources - especially fossil fuels, **reduced arable land availability**, the fragmentation of social links and the loss of biodiversity.
- ▶ **Urban renewal and the regeneration of real estate** through the regeneration of abandoned or uncultivated sites (ports, brownfield sites, fallow agricultural land and derelict sites, etc.). Saving agricultural land makes it possible to satisfy the needs for urban growth, on the one hand and to recreate natural areas in order to promote biodiversity, on the other.



Satisfy the needs of populations while saving natural resources.

Cities must be designed, built and managed to meet the fundamental needs of all their inhabitants.

- ▶ Cities must offer their inhabitants living conditions that protect their health, especially by allowing them to live in an environment with the lowest possible levels of pollution.
- ▶ **Energy availability** is a key factor in the economic competitiveness of the city and also for its inhabitants' quality of life.
- ▶ Cities must possess a diversified and satisfactory **housing supply**, combat makeshift or slum housing and adapt their housing to changes in the living circumstances of their populations.
- ▶ A feeling of **security** and the ability to come and go freely, are important aspects for quality of life.
- ▶ Cities must be open areas that create social links, **and public spaces have an essential role to play in this respect.**
- ▶ **Nature in the city** is an urban amenity factor and an environmental quality indicator.
- ▶ The inhabitants' quality of life also depends on their opportunities for **leisure and relaxation.**



Design sustainable business models.

The construction and functioning of a city requires the mobilisation of diversified and innovative funding. This must:

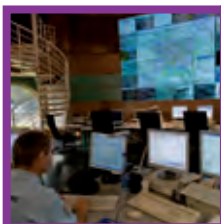
- ▶ **Be based on public and private initiatives and resources:** Public-private partnerships may also be a good option for the provision of equipment and infrastructure as well as for their operation and maintenance.
- ▶ **Be supported by new modes of governance for projects:** to satisfy the needs of economic stakeholders and the population, city dwellers and users must be listened to and involved at each stage of the projects. A permanent dialogue must be set up between the different stakeholders in the territory.
- ▶ **Involve all stakeholders, starting with the inhabitants and beginning at the design stage:** The city's ability to limit its consumption of natural resources while ensuring the best quality of life for its inhabitants, relies on the development of a circular economy between all economic stakeholders and involving the participation of inhabitants and users, with the need for each party to find something to their benefit.



Develop universally accessible, sustainable mobility with a low environmental impact.

Fluid, universally accessible mobility whilst producing little pollution is a key condition for attractive cities and their inhabitants' quality of life. If the satisfactory integration of this issue is envisaged at a city's design stage, the distribution of activities and management of urban planning may reduce the mobility «needs». The transport supply also plays an important role in facilitating mobility on a daily basis and in reducing its impact on the environment:

- ▶ The **development of urban public transport** must be prioritised.
- ▶ At a very early stage, the design of cities must also integrate the possibility of **developing “soft” transport modes**, particularly walking and cycling.
- ▶ The interconnection of different modes of transport via an overall planning scheme that integrates **multi-modality and the provision of information for users in real-time, will facilitate their access.**



Make the city more efficient by promoting innovation and the interconnection of networks and information systems.

A city is a complex ecosystem, whose optimal performance requires knowledge and the processing and exchange of a large amount of information, mostly in real-time. The use of innovative technologies, generally relying on new ICT enables sharing of this information and as long as access to it is made easy, it has the ability to improve residents' quality of life.

- ▶ The city's performance relies on its ability to consume the lowest possible amount of energy and natural resources whilst ensuring the best conditions for the development of economic activities and for its residents through **the use of intelligent networks.**
- ▶ **Geographical information systems are essential tools** that must be developed, regularly updated and made available to different stakeholders in the city.
- ▶ In order to anticipate and control the impacts of the city's development, **physical urban phenomena and their consequences, particularly on the environment,** must be understood and modelled.

FRANCE MAKES A COMMITMENT TO SUSTAINABLE CITIES

On the national scale the French State supports, guides and facilitates sustainable urban development along with local authorities by establishing a legislative and regulatory framework, by providing financial support, particularly for innovation or by developing tools and methods. The State is also involved at the European and international levels by promoting French expertise.

PLANNING TOOLS AND REGULATIONS FOR BUILDING SUSTAINABLE CITIES

The design of sustainable cities must be based on a strategic long-term vision. This vision must be structured on a cross-cutting approach to urban issues and be integrated into a broader territory. France has developed a set of laws and regulations that define the rights and duties of all stakeholders in sustainable cities in numerous fields (buildings, urban planning, waste management, conveyance of water, air quality, etc.).



► The thermal regulations for buildings defined at national level

The French Thermal Regulations (Réglementation Thermique) have been continuously improved since 2000 and their 2012 edition now imposes the BBC (Bâtiment Basse Consommation - Low-Energy Building) standard as the regulatory threshold for new buildings. For renovations, energy consumption must be reduced in relation to the existing levels.

► Mandatory planning tools for the definition of local objectives

Different documents invite the city designers to integrate aspects of sustainable development into their designs.

Strategic documents that define the rules for urban planning:

The SCOT (Schéma de Cohérence Territoriale - Coherent Territorial Planning Scheme), applies to large population centres or urban areas, the PLU (Programme Local de l'Urbanisme - Local Urban Planning Programme), which is more operational, is applicable at the municipal or intermunicipal level and promotes and controls development and building projects. SCOTs and PLUs ensure the consistency of urban policies, according to sustainable development principles i.e.: maintaining a balance between urban renewal and extension, the efficient use of space, ensuring a diverse range of functions and a social balance, managing travel needs and car traffic, respecting the environment, particularly with regard to preserving air quality and reducing noise pollution.

Thematic documents on key sustainable city issues:

The PDU (Plan de Déplacement Urbain - Urban Mobility Plan), which is a compulsory requirement in the biggest conurbations, concerns the organisation of transport modes, traffic and parking; the PLH (Programme Local de l'Habitat - Local housing Programme), which must be drawn up by communities with housing powers, defines the guidelines and programming for the construction of dwellings and also for helping citizens to access housing; the PCET (Plan Climat Énergie Territorial - Territorial Climate and Energy Plan), which is mandatory for public authorities with more than 50.000 inhabitants, is intended to limit greenhouse gas emissions and facilitate adaptations to climate change.



FINANCIAL SUPPORT FOR INNOVATION AND THE DEVELOPMENT OF SUSTAINABLE CITIES

► Investments for the Future Programme

The "Investments for the Future" (Investissements d'Avenir) Programme involves a significant commitment of €35 billion over ten years for **funding innovation in France, improving productivity, and increasing the competitiveness of companies**. The French government has defined five priorities designed to help France increase its growth potential: higher education and training, sustainable development, research, industry and SMEs and the digital economy. **The sustainable city is an overarching priority of the Investments for the Future Programme.**

<http://investissement-avenir.gouvernement.fr/content/action-et-projets>

► Support for innovation through demonstration

The Investment for the Future Programme supports the implementation of **demonstration projects**, which allow companies **to reduce their financial and technological risk-taking between the research phase and the mass production of new technologies**. In the framework of four programmes (with a budget of €2.45 billion) managed by ADEME (French Environment and Energy Management Agency), the following sectors are targeted: smart grids, vehicles for the future, circular economy, renewable, low-carbon energy and green chemistry. "Strategic roadmaps" have been drafted for each subject and act as a framework for Calls for Expressions of Interest, which are used to identify and select the projects to be implemented. Over 135 projects have already been launched on these topics.

www.ademe.fr / in the Research and Investments for the Future section





► Large-scale technical and urban innovation projects: The EcoCité approach

The EcoCité approach, sponsored by the French Minister for Regional Equality and Housing, has led to a new dialogue between the State and the local authorities to facilitate the transition towards more sustainable urban development. **19 major EcoCité operations are currently being developed and implemented**, with the aim of defining and implementing innovative and integrated projects to act as demonstrators of what the sustainable city of tomorrow will offer. These operations are financed by the “**Ville de demain**” (**City of Tomorrow**) fund within the Investments for the Future Programme (Programme d'Investissements d'Avenir), whose €750 M budget is managed by the Caisse des Dépôts. **The priority of this fund is to facilitate the emergence of urban innovation and demonstrator projects**, which offer a high level of environmental performance, based on an integrated approach to transport and mobility, energy and resources, urban organisation and housing. To date, nearly €300 M have thus been invested in support of the EcoCités programme: €200 M granted in 2011 for the co-financing of 12 dedicated public transport corridor (Transports en commun en site propre) projects; €94 M earmarked for 146 innovative projects in urban design, mobility, resource and energy management.

<http://www.territoires.gouv.fr/les-ecocites>

► Alternative mobility: calls for dedicated public transport corridor projects

The development of urban public transport and sustainable mobility actions helps to combat urban congestion and reduce air pollution by contributing to the modal transfer towards more responsible modes of transport. **€450 M** have thus been **committed to supporting projects sponsored by local authorities in metropolitan France** (excluding Ile-de-France region) **and in the French Overseas departments and territories**. The following types of projects may be subsidised: metro line project, tramway, tram-train, rapid transit bus, river or maritime shuttle, cable or rack-rail transport; **cycling-related investments; innovative sustainable mobility-related actions**. Applications are evaluated in light of the key sustainable development issues that have an impact on the **living environment** and **accessibility, air quality, efficient land management, energy transition** and **social cohesion**. The subsidy rate for projects that help to **improve access and services to high-priority districts in urban policy may be increased by up to 10%**.

<http://www.developpement-durable.gouv.fr/Le-deuxieme-appel-a-projets-TCSP.html>



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► Gathering, innovating and doing business: the City and Sustainable Mobility competitive cluster ADVANCITY

The role of the ADVANCITY competitive cluster - the only cluster for sustainable cities in France - is to allow companies, higher education and research institutions and local authorities to cooperate and **set up innovative collaborative projects**. The aim is to develop products or services that can be marketed in the medium term, thus generating business and creating employment: **help with setting up projects, presentations to public funding agencies and the networking of stakeholders** (companies, academics and local authorities). In six years, ADVANCITY has **approved nearly 400 projects**, 135 of which have been funded for a total investment of €400 M in research and innovation.

<http://www.advancity.eu>

<http://competitivite.gouv.fr/identifier-un-pole/annuaire-des-poles-20.html>



TOOLS AND METHODS FOR SUPPORTING AND FACILITATING THE DEVELOPMENT OF SUSTAINABLE CITIES

To assist local authorities in their sustainable development, the French State has developed or supported the creation of tools, methods and standards.

► Reference Framework for European Sustainable Cities (RFSC)

In 2009, France was commissioned by the European Union Member States to develop a decision-support tool dedicated to European cities and collectivities involved in the creation of territorial strategies and urban projects. After four years of work by a broad partnership led by France, with the active support of the European Commission and organisations representing local governments, this tool now exists in the form of: **the Reference Framework for Sustainable Cities (RFSC)**. This freely available web tool is designed to help cities promote and improve their sustainable urban development actions. The RFSC offers practical public policy evaluation and monitoring tools, in addition to a special forum on which cities can share their experiences.

www.rfsc.eu/





► The “Ecoquartier” (Eco-District) Label

A powerful instrument for ecological transition, this new labelling scheme is designed to encourage, support and promote sustainable development projects. The Ecoquartier (Eco-district) experiment shows the possible responses to the triple objectives of the French government planning and urban policies: the building of housing for all, ecological transition and territorial equality. Launched in 2008, the Ecoquartier approach promotes exemplary sustainable development projects. Local authorities made a massive commitment to the two calls for projects in 2009 (160 applications) and 2011 (394 applications), with over 500 of them joining the National Ecoquartier Club. Ecoquartier account for a significant proportion of French housing production, with over 200.000 dwellings planned for 2011, nearly 66.000 of which are social housing. The creation of the Ecoquartier label marks the end of the experimental phase of the strategy and launches the start of its consolidation and development throughout the entire country.

For further information: <http://www.territoires.gouv.fr/les-ecoquartiers>

► HQE Development, Certivéa and Cerway certification on the international stage

The HQE Association - a sustainable construction and planning platform created in 1996 - is a non-profit-making body with government recognition as a public-interest organisation since 2004. Its mission is to bring together stakeholders in order to think ahead and contribute to the development of regional excellence and professional practices. It works on the development of reference frameworks. HQE-Aménagement (Development) certification is one of these reference frameworks. This is a project management tool intended for urban development operations with sustainable development ambitions, covering territorial integration, environmental quality of urban development and also economic and societal aspects in the framework of the operations. The HQE-Aménagement certification process thus defines a framework for the performance of urban development operations that are integrated into their territory and for which the contracting authority ensures efficient governance and the feasibility of the programme.

Developed by a multi-stakeholder collective, the HQE-Aménagement certification was launched in 2010 and is designed to improve the practices of stakeholders in operational urban development. A third-party recognition scheme has also been developed by Certivéa since 2011 in order to certify this. The certification is also available internationally from Cerway.

For further information: <http://assohqe.org/hqe/>



► AEU2 - an ADEME tool “For successful sustainable development and planning”

AEU2 (Approche Environnementale de l’Urbanisme - Environmental Approach to Urban Planning) is a methodology to help local authorities and urban planning stakeholders integrate the principles and outcomes of sustainable development into their projects at the following levels: large territorial projects (SCOT - Coherent Territorial Planning Scheme), urban projects (PDU - Urban Mobility Plan, PLUI - Local Intermunicipal Urban Development Plan, PLU - Local Urban Development Plan), and development operations (ZAC - Designated Development Area, housing estates, districts undergoing renovation, business zones, etc.). This method revolves around four key stages (vision, ambition, transcription and implementation) and is based on two decisive principles (participation and evaluation), in order to systemically correlate sustainability criteria with the key environmental issues relating to the project and produce a set of possible solutions.

<http://www.urbanismedurable-ademe.fr>



► Local Agenda 21 projects

Local Agenda 21 projects allow territories and cities in particular to create a shared vision of the territory, which is translated into a strategy and integrated into public policies. Local Agenda 21 projects promote consistency between urban planning and development tools, social and cultural policies, etc. Local Agenda 21 makes the sustainable city an achievable goal. The requirement of broader governance, which underpins sustainable development and was strengthened in the “Grenelle” environmental consultation process and legislation, and implemented in Local Agenda 21 projects, makes involving the population with projects an essential element in making everyone aware of their responsibility for building the city of tomorrow, within inter-territorial relationships.

Through Agenda 21 projects, local authorities have acquired know-how that they can use to manage complex projects, involve stakeholders, host economic activities (conventional and/or collaborative), and also for local urban management (due to their experience of major urban projects and urban policy).

For further information: <http://www.developpement-durable.gouv.fr/-Agenda-21-et-demarches-locales-de-.html>



AT THE INTERNATIONAL LEVEL

France holds a strong position in the international debate in supporting territorial development and strengthening the role of local authorities, especially for the preparation of the post-2015 agenda and the United Nations Conference on Human Settlements (Habitat 3 Conference) in 2016, which will define the international urban agenda until 2036.

► Mobilising the competitiveness of French offer for export: VIVAPOLIS

Launched in September 2013, Vivapolis is an umbrella brand created in order to enhance French sustainable city specificities and to bring together all the French stakeholders – both public and private – seeking to promote a shared ambition for sustainable urban development worldwide.

The www.vivapolis.com website raises the profile of these stakeholders by offering them a shop window for promoting their expertise in urban sustainable development, in France and worldwide.

The Vivapolis process is collaboratively developed and supported by numerous stakeholders, including professional federations and consortiums (ADVANCITY, AFEP, AFEX, Club ADEME International, France GBC, PEEX, SYNTEC INGENIERIE), French government ministries (Minister of Foreign Affairs, Minister for Foreign Trade, Minister for Ecology, Sustainable Development and Energy, Minister for Regional Equality and the Minister for Industrial Renewal), in addition to public bodies and agencies (ADEME, ADETEF, AFD, CDC, CSTB, PFVT and UBIFRANCE).

<http://www.vivapolis.com>



► Relying on the network of local authorities in Europe: the URBACT European Programme

URBACT is a European exchange programme for sustainable and integrated urban development, for which France acts as the Secretariat. It allows cities to collaborate on developing solutions to major urban issues by asserting their key role in response to the increasingly complex challenges facing our societies. URBACT helps them to produce new, concrete and sustainable solutions that integrate the economic, social and environmental dimensions of urban development. This European programme, which forms part of the European cohesion policy, aims to make cities contribute to the goals of the Europe 2020 strategy (for intelligent, sustainable and inclusive growth), particularly by promoting the sharing and dissemination of good practices and the lessons learned from exchanges between all urban affairs professionals in Europe. URBACT currently includes 500 cities, 29 countries and 7000 active participants. URBACT is jointly funded by the European Regional Development Fund (ERDF) and European Union Member States and partners.

<http://urbact.eu/>



► Involving the whole of society in urban development aid: the role of the AFD and the French Urban and Territorial Partnership (PFVT)

The French Development Agency (Agence Française de Développement) is one of the main bilateral funding agencies in the urban field. It has developed innovative financial tools intended for local authorities. Between 2008 and 2012, it committed €6.26 billion to projects in the urban environment in foreign States.

www.afd.fr



► Promoting a common language for all stakeholders: France's international involvement in standardisation in the field of sustainable cities: ISO/TC 268 Sustainable Development in Communities

The French Urban and Territorial Partnership - (Partenariat français pour la ville et les territoires - PFVT) brings together around one hundred organisations with an active involvement in the urban cooperation field: the State, public bodies, territorial authorities, professionals, companies, research and training bodies and non-governmental organisations. Launched in 2011 on the initiative of the UN Executive Director for Habitat, the PFVT is a platform for discussions and for the promotion of French expertise in urban planning and development. It is jointly chaired by the Deputy Mayor of Chinon, the Ministry for Foreign Affairs, the Ministry for Regional Equality and Housing and the Ministry for Ecology, Sustainable Development and Energy. ADETEF is responsible for coordinating its Technical Secretariat.

<http://www.diplomatie.gouv.fr/fr/politique-etrangere-de-la-france/aide-au-developpement-et/partenariat-francais-pour-la-ville/>



► Promoting a common language for all stakeholders: France's international involvement in standardisation in the field of sustainable cities: ISO/TC 268 Sustainable Development in Communities

The International Standard Organisation (ISO) has launched a process of developing standards to encourage the development and implementation of overarching and global approaches to sustainable development on the territorial scale. It will include requirement standards and guide standards relating to Management Systems and other international standards. France chairs the international committee responsible for their development. The European Commission has entrusted French engineering with the task of coordinating a European think tank on the normative requirements for intelligent and sustainable cities and communities and proposing a harmonisation of the general principles and terminology. For France, AFNOR (French Association for Standardisation) plays a central role in this scheme and has introduced a new dimension by proposing an international standardisation scheme.

http://www.iso.org/iso/fr/home/standards_development/list_of_iso_technical_committees/iso_technical_committee.htm?commid=656906



BORDEAUX URBAN COMMUNITY



Ginko eco-district the riverbank / Vincent Bauza

Bordeaux offers to its 730.000 residents an ambitious sustainable future project. The city complies with European "Cit'ergie" certification requirements and is one of France's most active cities in the area of climate and energy.

Since 2010, Bordeaux has been taking part in the "Euratlantique" project, one of France's largest urban development projects, which includes three cities and both banks of the Garonne river. Set up to create space for 25.000 new residents and as many new jobs, "Bordeaux Euratlantique" promotes the eco-construction of buildings through the latest breakthroughs in terms of energy management technology. In the frame of this project, Bordeaux has installed in partnership with Bouygues Immobilier, a smart grid to optimise energy efficiency and reduce its carbon footprint, while maintaining high levels of comfort and environmental quality.

Bordeaux has set up several eco-districts recognised at national level for their environmental performance. The eco-district of Bassins-à-Flot for example, uses recycled water from the city's purification system for energy and it currently runs at 70% through renewable energy sources. The GINKO eco-district for its part, has a heating system that operates with 100% renewable energy, and has won numerous awards for its sustainability including: the **2009 prize for energy sobriety and renewable energy**, awarded by the French government in the context of the eco-district competition, and the **2011 prize for social and economic quality**, awarded by the SNAL (Syndicat National des Aménageurs Lotisseurs).

The city is focussing on the development of positive energy. In 2012, EDF Énergies Nouvelles invested 55 million euros to **create a solar power plant** in Bordeaux. With 60.000 panels over more than 20 hectares it produces the equivalent of 5000 homes' energy needs.

Bordeaux is also focussing on eco-experimentation in order to create sustainable energy resources. For example, the river Garonne functions as an estuary-current-power producer, but also as a site for study and experimentation.

Bordeaux is also investing great effort in projects to integrate nature into urban development. In fact, 55.000 hectares of green space have now been incorporated into the city's urban area in order to reinforce its nature capital.

The **Darwin ecosystem** is a perfect illustration of the ecological transition that Bordeaux wishes to introduce. This 20 million euros project is designed to use low energy construction, renewable energies, a zero waste policy, rainwater recycling and collection, promotion of eco-mobility, short supply chains and a circular economy, as well as sharing and pooling.

In addition to its ecological transition objectives, the city of Bordeaux is being transformed into a high-tech centre through the development of innovative technologies. In particular through its "Bordeaux Cité Digitale" (Bordeaux Digital City) programme which emphasises digital transition into the city of tomorrow with the introduction of OpenData and NFC (Near Field Communication).



Powered by French creativity



Strasbourg - the Danube / Photo credits Ministry for Regional Equality and Housing

Strasbourg is the capital of the Alsace region in the east of France and has a population of over 275.000 residents. As the seat of many European and international institutions, in particular the Council of Europe and the European Parliament, the city is considered as the legislative and democratic capital of the European Union.

Strasbourg Urban Community has undertaken to reduce its carbon footprint and has set ambitious targets for 2020, namely:

- ▶ To reduce greenhouse gas emissions by 30% as compared with 1990.
- ▶ To save 30% of its total energy consumption.
- ▶ To increase the renewable energies share of energy consumption from 20 to 30%.

In order to achieve its objectives, the city has implemented several measures, in particular the development of six eco-districts that are included in the Regional Climate Plan. These projects focus on the sustainable construction sector, with the development of model building and residential housing using innovative methods and efficient renewable energy systems. Many national and international companies are implicated in these sustainable urban development projects, that have great economic and ecological potential in the area of green innovation.

SUSTAINABLE MOBILITY

Strasbourg is one of the most innovative cities in terms of sustainable mobility and encourages the use of “soft” modes of transportation, as with EDF and Toyota partnership, which provided a fleet of 100 rechargeable hybrid vehicles for companies and local authority bodies. Strasbourg has been named France’s most “**bike-friendly**” city in France, due to its promotion of the use of bikes through its successful bike-sharing system called “Vélohop”. In addition, the city has also developed a long-term project designed to increase pedestrian walkways. As part of this project, Strasbourg’s historic centre, the “Grande île”, classified World Heritage site by UNESCO in 1988, has been transformed into a pedestrian’s priority zone. Finally, the city has the **number one tramway network in France**, covering 56 kilometres with six lines and 69 stations, serving 300.000 passengers each day.

Located close to Germany alongside the Rhine RIVER, **one of Europe’s busiest commercial rivers**, the city has a great tradition of cross-border cooperation, which is reflected in the “Deux Rives” project that includes the extension of the tram network to cross the Rhine River to Kehl (Germany) and increase cross-fluvial collaboration.



LYON Confluence district / Photo credits Ministry for Regional Equality and Housing

Grand Lyon aims to contribute towards reducing the impact of economic and human activities on the environment, in particular through the implementation of an ambitious Climate Plan. Located in the Rhône-Alpes region, it has a population of over 700.000 inhabitants.

The urban area appears as a territory of innovation and Smart City experimentation. In fact to date, six smart grid projects are in the process of being implemented or are undergoing tests in its area. In particular it is taking part, in the pilot-phase of the “GreenLys” project, developed in partnership with the City of Grenoble and supported by ADEME in the frame of the “investments for the future programme”. One of its objectives is to reduce the city energy consumption via the ERDF “Linky” communicating meters (i.e. smart electricity meters), which can receive and send data and instructions without the physical intervention of an engineer.

Grand Lyon strategy is designed to promote the creation and development of new companies and start-ups working on developing innovative projects, through integrated services. The city is for example, promoting transition to the “economy of tomorrow”, relying mainly on the dynamism of digital industries and eco-technologies (cleantechs). Its ambition is to become a **world-class region for the development of demonstration projects**.

Adopting an integrated approach, Grand Lyon favours eco-design and eco-rehabilitation of buildings. For example, the “NOVEA Lyon Sustainable City” programme, a public-private partnership with Veolia, supports the introduction of new sustainable city concepts in the Greater Lyon area. NOVEA is a real source of innovation and experimentation to enhance the local community.

Grand Lyon is also focusing on the promotion of **sustainable new forms of mobility** and more efficient transport. Major projects are currently underway, for example:

- ▶ **“Optimod’Lyon”** research project aims to improve urban mobility solutions for passengers and freight, by developing services able to provide extremely detailed information and manage traffic using Intelligent Transportation Systems (ITS),
- ▶ The **“Move in Pure”** system is designed to manage the recharging of electric vehicles, 100% powered by certified renewable energy sources,
- ▶ **“E-Partage”** project encourages vehicle sharing between companies and between employees (electric vehicles, motorcycles, bicycles...),
- ▶ **“Auto-lib”** electric car sharing service,
- ▶ **“Citylog”** and **“Freilot”** European projects, etc.

The **“Lyon Smart Community”** demonstration project is part of the Grand Lyon energy management strategy. It is being developed in the Confluence district in the heart of Lyon and comprises several components, in particular:

- ▶ The creation of a group of positive-energy buildings, developed in partnership with the Japanese NEDO organisation and French companies.
- ▶ A Community Energy Management System (CEMS) facilitating the district’s overall energy management. The CEMS uses detailed measurements of overall energy use throughout the Confluence district, in order to give urban stakeholders a global view – facilitating planning in terms of energy resources and requirements.
- ▶ Residential energy monitoring system. It comprises a set of energy measurement sensors, allowing each resident to monitor how much electricity, water and gas they are using in real time – and take action to optimise their consumption. The project also involves environmentally responsible renovation of existing buildings.

Lyon Smart Community will thus feature a relevant, complementary approach to the issues of energy efficiency, multi-modal solutions, individual responsibilities – and all the related control systems. The strength of the Lyon Smart Community demonstration lies in the combination of public and private stakeholder experience and know-how.



Grenoble, Bonne eco-district / Photo credits Arnaud Bouissou Ministry for Regional Equality and Housing and Ministry for Ecology, Sustainable Development and Energy

Located in the heart of the Alps, Grenoble with its population of over 150.000 residents, has an international reputation as a city of innovation and research. The city supports competitiveness cluster that emphasise innovative technology and new energy resources, such as "Tenerrdis" (new and renewable energy), "Minalogic" (micro and nano technologies) and several research and experimentation centres (photovoltaic energy, hydroelectricity, smart energy, etc.).

To achieve its sustainable development objectives Grenoble has developed an integrated approach based on three complimentary strategic areas, as follows:

- ▶ The development of demonstration projects at neighbourhood level.
- ▶ The renewal and redevelopment of existing buildings.
- ▶ The construction of HQE (High Environmental Quality standard) buildings.

The presence of the Société d'Économie Mixte / Mixed Economy Company (SEM), Gaz Électricité de Grenoble (CEG) / Grenoble Gas and Electricity and the Compagnie de chauffage intercommunale de l'agglomération grenobloise (CCIAG) / Grenoble Urban Heating Company represents a strong asset for energy planning and enables Grenoble to implement an ambitious energy saving strategy.

Indeed in 2008, Grenoble achieved a reduction in its CO2 emissions of 28.000 tonnes thanks to its urban heating unit in Villeneuve, which is the most powerful biomass heating unit in France.

Urban services also play a central role in the cooperative management of Grenoble's energy. In particular this includes:

integrated thermal electricity distribution networks, energy management, dynamic water resources management and the promotion of sustainable energy resources (hydro, cogeneration, biomass, photovoltaic ...).

INNOVATIVE PROJECTS:

Selected as part of first "Investment for the Future Programme", the **GreenLys project** is the largest smart grid demonstration project in France. This project in partnership with Grand Lyon, is designed to equip households in the cities of Lyon and Grenoble (it will involve 1000 residents in each city) with a new type of smart electricity installation. With almost 43 million euros investment over four years (2012-2016), the "GreenLys" project will test the deployment of an innovative power grid on a large scale. This project will help to identify and quantify the added value of the smart grids and to build up a system vision. The demonstrator will involve consumers and promote the use of renewable energy installations (photovoltaic, wind, cogeneration...), electric vehicles and Linky smart meters. This project is the fruit of collaboration between the following companies in particular: ERDF, Schneider Electric, GDF Suez, Alstom, GEG, Grenoble INP.

Bonne eco-district is a mixed development zone located right in the heart of the city centre, created on the site of a former military barracks with a fully renovated area of 8.5 hectares. The Bonne project has three main focus:

- ▶ encouraging the development of bioclimate strategies in buildings design,
- ▶ developing a new building strategy encouraging energy efficiency,
- ▶ establishing innovative energy management.

The ZAC de Bonne eco-district won the national "EcoQuartier 2009 Grand Prix", awarded by the French government. The Bonne project is integrated within the European Union Concerto-Sesac programme.



Powered by French creativity



The Louise Michel School in the Fort d'Issy eco-district, first public establishment build with timber frames and insulate with straw bales. Photo credits ISSY MEDIA

Located in the south-west of Paris, alongside the Seine, Issy-les-Moulineaux is a town that is famous for its economic dynamism and its production of cutting edge technologies. The city is located in the centre of the Val-de-Seine business district, France's largest telecommunications and media hub.

In 25 years, 40% of the city has gone through sustainable urban redevelopment. Issy-les-Moulineaux is a pioneer city that is committed to innovative infrastructure and projects that promote environmental preservation, making it a dynamic actor in the "Grand Paris" project.

Issy-les-Moulineaux is the first city in France with a smart grid network in operation. Development of the "IssyGrid" smart grid started in 2011 and will extend over a period of 5 years. It is the first pilot site in France with a smart grid to optimise energy management at a district level. Developed within Seine Ouest business district (almost 10.000 people within an area of 160.000 m²), it was extended this year to Fort d'Issy digital eco-district and will gradually be extended to the whole city. This project is developed by a consortium of ten companies as follows: Alstom, Bouygues Immobilier, Bouygues Telecom, EDF Commerce, ERDF, ETDE, Microsoft, Schneider Electric, Steria and Total. The IssyGrid management development will cover generation of renewable energies, consumption (housing, office buildings and shops), and storage (batteries) and overall optimisation. The grid will also include street lighting and electric vehicle recharging facilities. The implementation process, in progress, comprises three stages. Firstly, all types of energy consumption have been measured. Secondly, resources are being put in place for power generation (solar PV, cogeneration, etc.) and storage. Finally, energy generation/consumption/storage systems will be pooled and managed as an entity, in order to identify new ways to optimise energy use.

Several eco-districts are currently in the process of development within the city. Fort d'Issy for example, is a state-of-the-art eco-district and a leading example in terms of innovative urban services. The buildings were designed with a bioclimatic approach which avoids wasting energy. Hot water and heating are produced by geothermal means and waste is collected via an underground pneumatic system that eliminates noise and visual pollution, as well as smells, within the district. Finally, all the buildings are connected to fibre optic network.

In addition, Issy-les-Moulineaux is also focussing its efforts on:

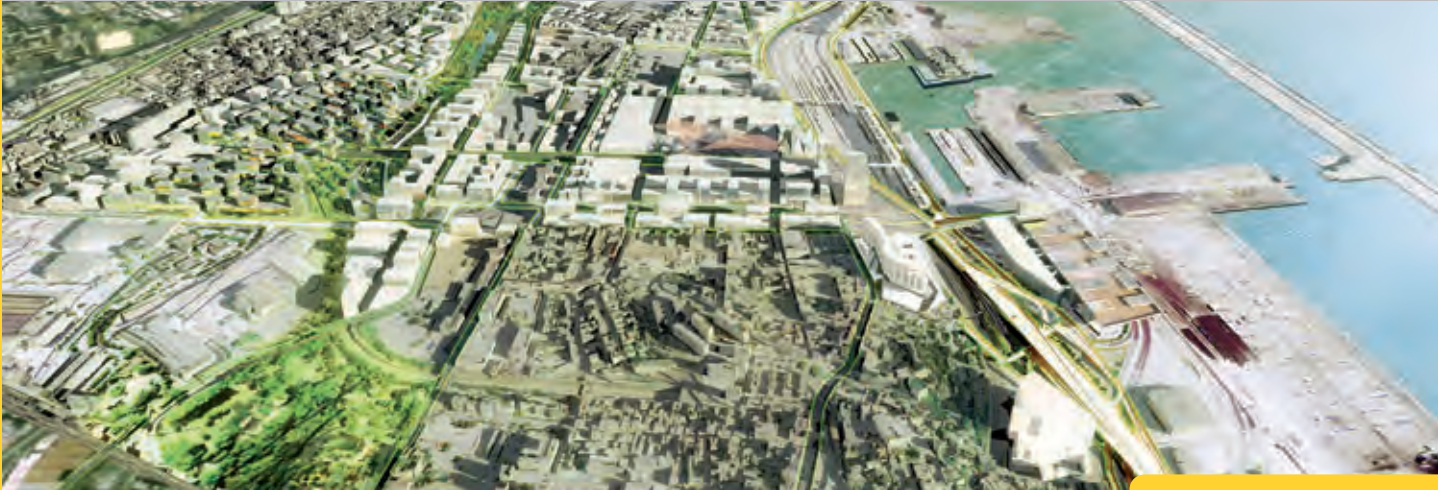
- ▶ Compliance with the HQE (High Environmental Quality) approach and renewable energies use in all current new constructions.
- ▶ Integration of public green spaces into all redevelopment projects.
- ▶ The promotion of soft modes of transport: pedestrians, cyclists and electric vehicles, through the installation of recharging stations in all public places.

Finally, Issy is also determined to increase citizens' participation in the city actions for example with the European project "Citadel on the Move", open data and crowd sourcing are being developed in order to promote the creation of "smart" public services, created by citizens themselves.

In 2008, Issy-les-Moulineaux was awarded by the European "Living Labs" label for its innovative ICT services and applications.



Powered by French creativity



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Launched over ten years ago in Marseille, the “Euroméditerranée” project is of international scope, involving the renovation of an area of 480 hectares in the heart of the city, between the commercial harbour, “Vieux-Port” and the train station.

“Euroméditerranée” is a 7 billion euro operation supported by the French government, the local authorities and the European Union. It is a matter of redeveloping the site as an attractive and influential hub connecting Europe and the Mediterranean. Labelled an “EcoCité” by the French government, “Euroméditerranée” represents a Mediterranean model of sustainable development, with:

- ▶ the implementation of renewable and innovative energy systems,
- ▶ the development of ICT companies,
- ▶ the promotion of low carbon transport (car sharing, etc.),
- ▶ the introduction of smart grids.

The “Euroméditerranée” project will aim, over the next 15 years, to acquire 2.000.000 square metres of housing, offices and shopping centres, as well as a 14 hectare park. This will provide accommodation for 30.000 residents.

With the doubling of the business district (with a total of 1.000.000 m² of office space), “Euroméditerranée” plans to attract new companies, thus permitting the creation of 20.000 new jobs.

EUROMEDITERRANEE STRATEGY

The “Euroméditerranée” development is based on five integrated principles:

- ▶ Bioclimatic conceptualisation to urban planning and architecture,
- ▶ a social mix that is functional and inter-generational,
- ▶ reduction of health (soil pollution and air quality) and natural (flooding) risks, climate management, biodiversity and urban quality,
- ▶ low carbon mobility,
- ▶ nature in the city (a regional project), which is a particular part of the energy strategy (a reduction in the urban heat island phenomenon).

By using a “low cost and easy tech” approach, “Euroméditerranée” promotes innovation and experimentation in new energies, preservation of the environment and integration in a difficult economic and social context.

The aim is to find the best compromise between environmental quality, technical and economic viability, as well as functionality. Like, for example, the “**boucle Thalassothermie**” project that aims to develop energy networks based on geothermal marine energy. This innovative system must be able to provide temperatures suited to the season (warm in winter and cold in summer) in all the buildings within the perimeter, through a network of heat pumps.



Construction site on Nantes Island - Photo Credits Vincent Jacques

Located on the Loire River, close to the Atlantic Coast, Nantes is France's sixth largest city, with a metropolitan district of almost 600.000 inhabitants. Nantes Métropole, an area famous for its attractiveness, is committed to a sustainable urban development strategy with a multi-sector approach.

Nantes is engaged in the construction of four eco-districts which will help in achieving the reduction objectives of the environmental impact of transportation of people and goods, and to offer a multi-modal alternative to the use of private vehicles.

The development of heat networks is one of the major focuses of Nantes public energy policy. These networks, fed by renewable energies, can in fact lead to a reduction in greenhouse gas emissions and thus limit increases in energy prices for a maximum number of residents.

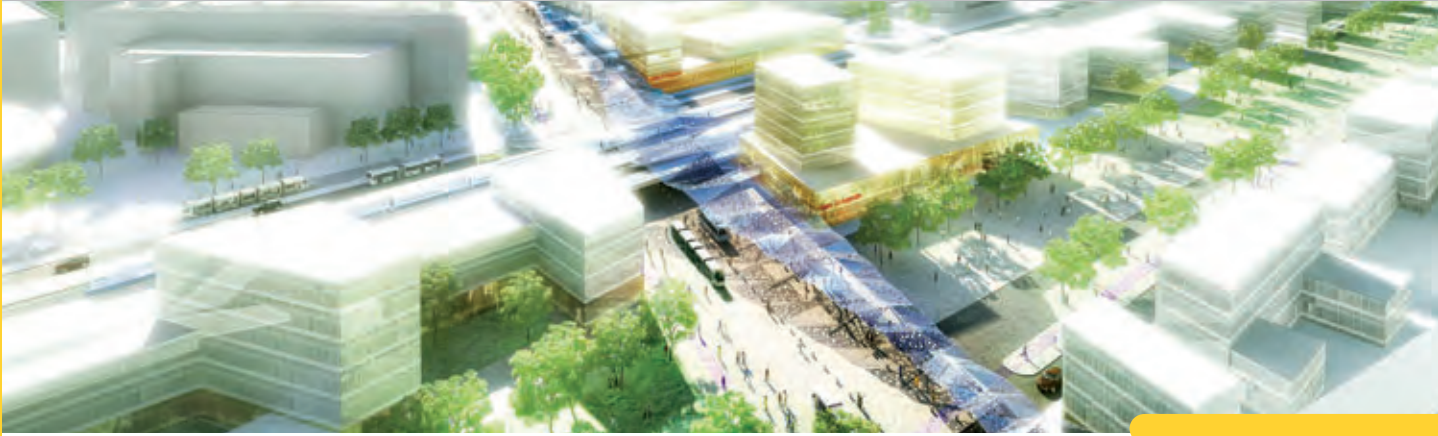
The city of Nantes also emphasises the preservation of urban biodiversity. The development of existing fauna and green spaces plays an important role in the city's development plans.

Moreover, during the last ten years, Nantes has developed a sustainable transport policy, with an emphasis on public transport and cycle tracks. The city's objectives are set out in the Urban Mobility Plan. The 2010-2015 plan, with targets for 2030, envisages a harmonious balance between private cars and more ecologically friendly

modes of transport: pedestrian, cycle or bus routes. For example, the latest project to date, the "Chronobus" (a high-tech public transport system), will enable to double the current size of Nantes' transport network. The system already guarantees that 95% of homes are within 300 metres of a transit stop. With four lines opened in 2012 and six more planned, the "Chronobus" will carry some 100.000 passengers each day.

An ambitious eco-district project is in the process of being developed on Nantes Island (Ile de Nantes). This project aims to provide approximately 1 million square metres of additional living space. It is also designed to revitalise a large area of brownfield sites. The conversion of these 350 hectares will provide accommodation for 20.000 residents in the heart of the city. Nantes Island redevelopment project will offer urban heating and cooling systems, public transport stations, composting units, and an advanced waste management system. A cycle route around the island and a photovoltaic power generation station are also integrated in this project. The redevelopment of Nantes Island constitutes one of the largest urban city-centre projects being undertaken in France to date.

Nantes has been awarded European Green Capital in 2013 and received the European "Civitas Award 2009" for its sustainable mobility policy. It also received a prize from the French government for its Prairie-au-Duc eco-district.



Multimodal transit hubs Nice Saint-Augustin Airport - Ministry for Ecology, Sustainable Development and Energy

Nice Côte d'Azur is a city of 550.000 inhabitants, which covers 120 kilometres of coastline and 40 kilometres of beaches, making it the second tourist destination in France.

The city is a leading example with regard to urban innovation in particular, in terms of services provided to users and at the local economic development level. It emphasises an integrated approach, bringing public and private stakeholders together in a perspective of better urban management and improve awareness of consumers' expectations. For example, with over 70 million bus passengers per year, the inhabitants take great advantage of "Autobleue," the first large-scale 100% electric car-sharing service to be launched in France.

SMART GRID PROJECTS

Two smart grid projects, supported by ADEME in the frame of the Investment for the Future programme, are currently in development in the territory:

► The "REFLEXE" (Réponse de Flexibilité Electrique - Electrical Flexibility Response) pioneering project is the fruit of collaboration between the Veolia Environnement, Alstom grid, Sagemcom groups, the French Alternative Energies and Atomic Energy Commission (CEA - INES) and Supélec engineering school. Driven by Veolia Environments' Research and Innovation Division, the "REFLEXE" project is planning to introduce a demonstration smart grid in the Provence-Alpes-Côte-d'Azur (PACA) region within three and a half years to optimise energy consumption management. What truly sets REFLEXE apart from other experiments is its "systemic" approach, which aims to bring all stakeholders and sources of electricity together under a single operational structure. The role of this platform, is to coordinate the various components of the system in real time, in order to maintain balance in the electricity grid.

► "Nice Grid" is the first French full-scale demonstration project of a smart solar district. The project aims at developing several micro grids with integrated renewable energy sources and electricity storage. The objective is to provide optimised energy management and increased energy autonomy to a region providing only 40% of the electricity it consumes.

ECO-DISTRICTS

Nice stands out through various eco-district projects, such as for example:

► Saint-Martin-du-Var eco-district is based on the development of an economic policy favouring a three-pronged strategy of Training-Research-Enterprise in line with local development. This project is part of the "Plaine du Var Valley" project which aims to become a global model in sustainable urban planning, with a particular focus on energy and carbon saving. This project has received the "Operation of National Interest" (Opération d'Intérêt National) label. The project implements the most advanced technologies in town planning, building and energy. Many companies are involved in this large-scale operation, in particular: Vinci, Suez Environnement, EDF, GDF, Veolia, Bouygues, Cisco, IBM, Orange Lab and Thales. Plaine du Var Eco-Valley was selected as one of the 13 EcoCities by the French Government in 2009.

► Cap Azur eco-district, in Roquebrune-Cap-Martin, has emphasised renewable energies and the limitation of energy needs in buildings. This project has, for example, served to test the effectiveness of an innovative sustainable solution for heat recovery from sewage water. A system enabling to recover the calorie from the waste water from the new municipal sewage treatment plant, to process heat. This project was awarded in the "Ecological Performance - Innovation" category in the French government's 2011 call for Eco-district projects.

Nice is the only French city to have won the "IBM Smarter Cities Challenge". It is in fact, the first city in Europe to use NFC (Near Field Communication) data communication technology.





Photo credits Arnaud Bouissou Ministry for Regional Equality and Housing and Ministry for Ecology, Sustainable Development and Energy

The City of Paris within “Grand Paris” conducts an ambitious policy to promote sustainable urban development. On the operational level, this has led to the deployment of different types of actions.

THE CLIMATE PLAN

In 2007, the City of Paris launched an ambitious Climate Plan (Plan Climat), which defines the broad guidelines and policy commitments designed to reduce all emissions from its territory and activities by 75% in 2050, compared to the 2004 levels. The Paris Climate Plan (Le Plan Climat de Paris) is updated every five years. The updating of the Climate Plan in 2012, provided an opportunity to evaluate the actions undertaken and to envisage the adaptations required in order to guarantee the achievement of the goals set in 2007. In the framework of its first Climate Plan (2007-2012), the City of Paris **renovated 15.000 occupied social housing units** in order to cut the energy consumption of these apartments by at least 30%. The city also launched in July 2011, **a public lighting performance contract** which will allow saving the equivalent of the energy consumption of the Greater Toulouse region by 2020. A major energy performance partnership contract has also been launched. The aim is to **renovate 100 schools over a two-year period**. The City of Paris has thus successfully experimented with a system that recovers heat from wastewater (calories originating from the sewers) at the Wattignies school. This €400.000 facility has been jointly funded by the CPCU (Compagnie Parisienne de Chauffage Urbain) and the Lyonnaise des Eaux companies and will cover approximately 70% of the school's heating requirements.

DEVELOPMENT OF LOCAL RENEWABLE ENERGIES

In the renewable energy field, Paris is implementing innovative projects associated with **geothermal energy, heat recovery and building insulation**. The city is seeking to reduce waste on a daily basis by installing composting units alongside residential buildings and combating urban “heat islands”. In addition, **10.000 m² of solar panels**

are being installed in urban development areas and on urban infrastructures. Within the framework of the POLIS European programme, the City of Paris and the Paris Urban Planning Agency (Atelier Parisien d'Urbanisme - APUR) have created the first solar power registry in Paris, which allows all inhabitants to identify places having the greatest solar potential to install solar panels, thus making ecological sustainability interactive and accessible.

MORE RESPONSIBLE WATER CONSUMPTION

Eau de Paris (Paris' public water utility) and its partners are collaborating on the installation of **water-saving kits** in order to reduce Parisians' water and electricity bills. **15.000 kits have been installed** in social housing managed by Paris Habitat, with the goal of reducing tenants' consumption by 15%. In public spaces, the consumption of non-drinking water has fallen by 30%.

BIODIVERSITY

A **Biodiversity Plan** (“Plan biodiversité”) was launched in November 2011 with the aim of improving the quality of life for Parisians. By 2020, an additional seven hectares of green roofs, including at least 15 terrace gardens and 40 ponds will be added to the 62 hectares of new green spaces provided for Parisians between 2004 and 2013.

MORE ENVIRONMENTALLY FRIENDLY FORMS OF MOBILITY

In the framework of its Climate Plan, the City of Paris has set itself the target of reducing traffic emissions in central Paris by 60%, as transport is the biggest source of atmospheric pollution in Paris. The City of Paris has thus launched a proactive policy that seeks to define a new type of mobility for the capital city: reduction of motor vehicle traffic, incentives to use cleaner vehicles, extension of public transport and their improvement, development of the “Pedestrian Paris” (“Paris Piéton”) programme, etc. In this context, the City of Paris successfully launched the Vélib' (self-service bicycles) operation five years ago, which makes a fleet of over 18.000 bicycles available to



users. These are spread out over 1.600 stations in Paris and in the 29 adjoining municipalities. The City of Paris is also promoting cycling via a new plan adopted in 2010, which envisages **700 km of cycle tracks by 2014**. Paris will continue to create cycle tracks until 2020, while developing adapted parking areas and encouraging companies to build bicycle garages for their employees.

Autolib', with 1.740 vehicles and 835 stations, is **the world's first large-scale, full electric car-sharing service in Paris**, covering central Paris itself and 53 municipalities within the Paris region. The "Bluecar" - a four-seater electric car - is equipped with a rechargeable lithium metal polymer battery, which can run for up to **200.000 kilometres** before needing to be replaced, and can store five times more energy than a traditional lithium battery. It is made exclusively from non-polluting materials and poses no risks to the environment. At the end of its life, the car is dismantled and all its components are recycled or reused.

The City of Paris is also supporting the development of transport networks throughout the entire metropolis and in the Paris Basin. The "New Greater Paris" (Nouveau Grand Paris) plan provides for the modernisation of the existing transport systems and the creation of a new automatic rapid rail transport system (métro): **the Grand Paris Express**. The Société du Grand Paris (SGP) has been appointed to design and execute this project which, by 2030, will lead to the construction of 72 stations and over 200 kilometres of track for a fully automatic (predominantly underground) rapid rail transit system requiring a total investment of €23 billion. The Grand Paris Express will consist of four new lines and the extension of an existing line. The Grand Paris Express is a flagship project.

ECO-DISTRICTS

Several eco-districts (éco-quartiers) are currently being constructed within the city. These include:

- ▶ The Clichy-Batignolles eco-district: a 54 hectare project consisting of 10 hectares of green spaces, 3.400 dwellings (50% of which will be social housing) and 38.000 m² of public facilities. Clichy-Batignolles is an exemplary operation in the application of the Paris Climate Plan, with unmatched performance levels within a densely populated city. In addition to prioritising mobility, housing, social diversity and accessibility for people with reduced mobility, etc., the project also places the emphasis on energy-efficient buildings, the use of renewable energies and the preservation of biodiversity. The vast majority of the heat source, for heating and hot water will be geothermal. It will be obtained by drilling a bore hole to an approximate depth of 650 m. Moreover an innovative pneumatic waste collection system (underground vacuum collection system) is being set up, which will help to cut waste collection traffic, while reducing pollution and noise. In addition to green spaces, the creation of grounds covering 10 hectares, landscaped gardens, the presence of green roofs and the cultivation of a variety of plants shall form an ecological

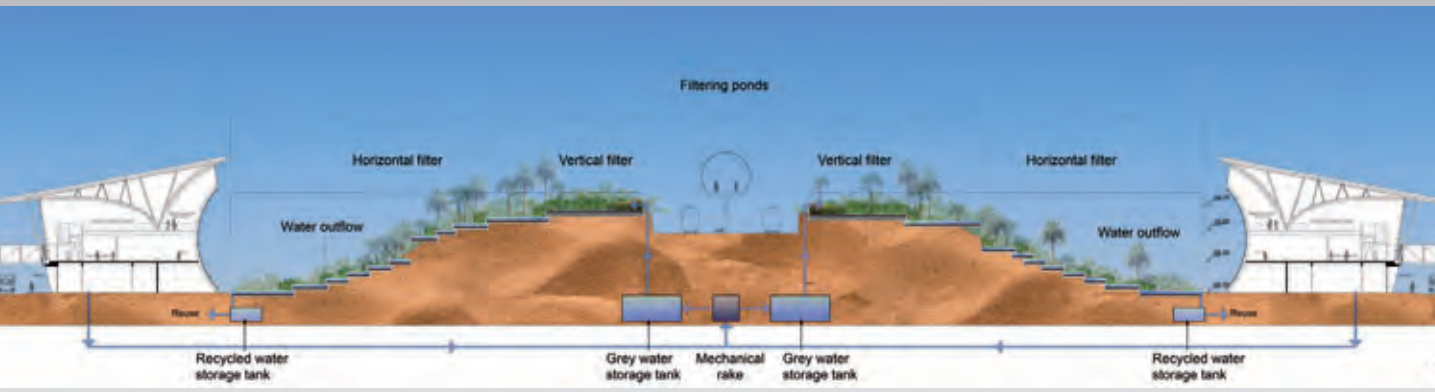
network that promotes biodiversity. The innovative and exemplary Clichy Batignolles project was the winner of the "New Urban Districts" (Nouveaux quartiers urbains) call for projects issued by the Ile de France region in 2010.

- ▶ The Claude Bernard Designated Development Area (ZAC) is one of the first 13 operations to be awarded the "Écoquartier" label. Its ultimate aim is to facilitate the creation of a diversified urban fabric, the revamping of public spaces and economic development. A special effort is being made to integrate nature into the city. Indeed, the project includes the planting of a "linear forest" on either side of the Paris ring road. This represents an ecological corridor to promote the development of flora and fauna, accompanied by the creation of a nature reserve covering approximately 8.000 m². The project will also place the emphasis on: the future recourse to deep geothermal energy that will save 10.000 tonnes of CO₂ per year; the removal of building site rubble by inland waterway transport; the requirement for operators to conform to certain "irreducible" limits in relation to energy performance (over 64% of areas thus qualify for the "BBC" low-energy housing label); shared management of car parks by offices, businesses and shops, which allows for a significant reduction in the number of places required.

STIMULATING AND SPEEDING UP TECHNOLOGICAL INNOVATION FOR SUSTAINABLE CITIES

Along with the implementation of these projects, Paris is also relying on innovation. Since 2010, the **Paris Région Innovation** laboratory, created by the City of Paris, has been building a reputation for implementing experimental programmes which have allowed Paris to develop unique expertise in the deployment of innovative **solutions**. In 2012 and 2013, two "**Energy Efficiency in buildings**" (Efficacité Energétique des Bâtiments) **calls for projects** were issued by the City, the Paris Région Innovation Laboratory and the Agence Parisienne du Climat (Paris Climate Agency). **38 innovative projects** were selected and are currently being tested in the capital city: photovoltaic roof tiles, automatic shutdown of electrical appliances at night, remote management of professional buildings, energy-efficient smart grid, etc. Each year, the City of Paris also supports innovative projects developed by SMEs and start-ups specialising in the green economy, by funding research and development projects, launching new products and services and creating jobs. In 2012, around a hundred companies were supported via financing tools and hosting offers, or by being put in contact with public buyers. **SMEs** have thus benefited from **financial support** amounting to a total of **€2 million**. The **Paris Innovation Amorce** fund has contributed to 40% of this funding. This fund, which is dedicated to Paris start-up companies, has been created in 2009 by the City of Paris and is managed by BPI France (Public Investment Bank). In addition, the city organises annual "**Grands Prix de l'Innovation**" (Innovation Awards) with a special "eco-activities" category.

ECO-MANAGEMENT OF GREY WATER FOR A 25 000 M² GARDEN AT JEDDAH INTERNATIONAL AIRPORT



Country: Saudi Arabia

City: Jeddah

Beneficiary: Jeddah airport

Client: GACA

Local partners: Ben Laden Company

French partners: ADPI, TN PLUS, Atelier d'Ecologie Urbaine, AR architectes

Status of the project: In progress

Funders / donors: GACA

THE PROJECT IN BRIEF...

Located in a desert area, this project aims to recreate an artificial area in the new terminal of Jeddah's King Abdulaziz airport designed to recycle water and air resources, in a country where water is a scarce commodity. The project is designed to be innovative and in keeping with ecological, as well as economic, imperatives.

CHALLENGES

The aim is to create an artificial area on the site, the purpose of which will be to recycle the available resources (water and air), and more precisely:

- ▶ Filter grey water from the airport terminal.
- ▶ Integrate the scarcity of water resources in a desert area.
- ▶ Not to generate any external negatives for the environment.
- ▶ Generate positive externalities (biodiversity).

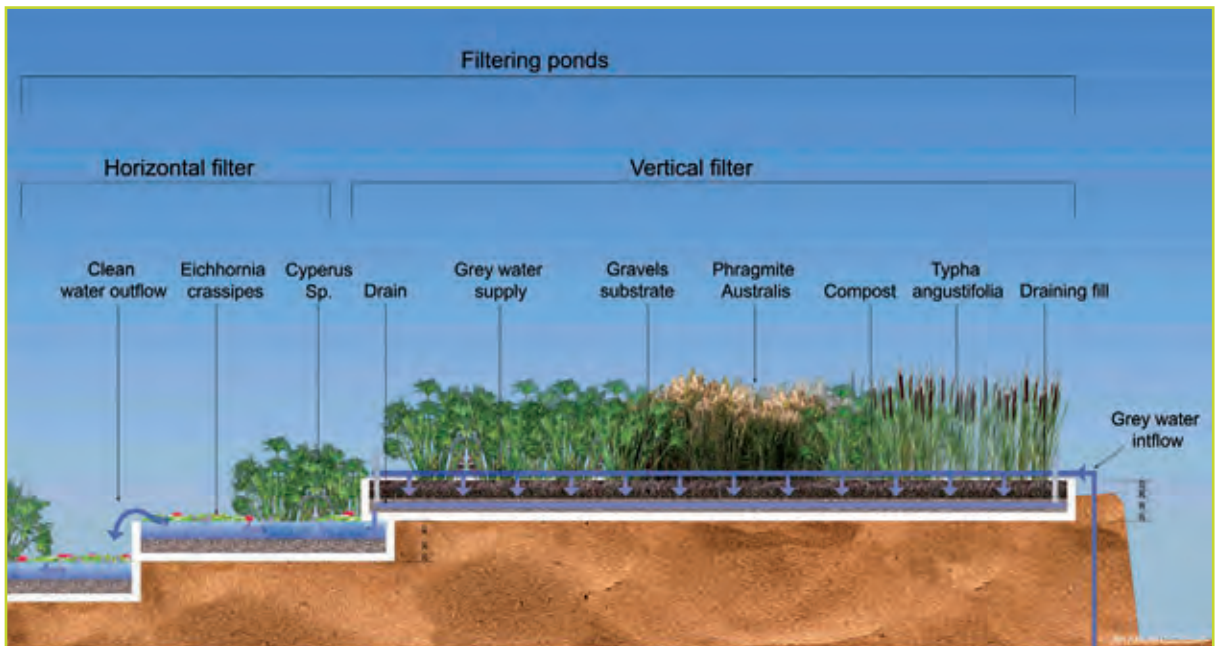
THE SOLUTION

For the new terminal of King Abdulaziz international airport in Jeddah, Saudi Arabia, the AR ARCHITECTES agency, specialists in the HQE® approach, designed, on a team basis with ADPI, TN PLUS and Atelier d'Ecologie Urbaine, landscaping developments based on the sustainable management of water, one of the targets for LEED certification.

HQE® considerations were integrated into the airport's functional programming phase, in continuity with the overall development of the site.

AR ARCHITECTES conducted a technical and sizing design study of a 25.000 m² garden designed to filter grey water from the terminal. Grey water will be brought to a storage tank designed to feed the first filters with small amounts of water. Then, between each filter, water flow will be by gravity. The system provides for delivery of this water (1000 m³/day) to a pre-treatment and regulation mechanism, and then it is pumped to the garden.

The project takes account of the very severe climatic context, which causes a loss of 30% of the input volume via evapotranspiration through the plants.



The garden is designed in the form of a cascade of tiered basins: **decontamination is carried out by the aquatic ecosystems** with phyto-purifying capabilities. This is carried out in stages throughout the succession of planted basins designed to work by percolation (vertical filters) or by translation (horizontal filters).

The first basins, with a vertical flow, planted with reeds, will act on the breakdown of organic matter and the retention of suspended sediment. The other basins, with a horizontal flow, will be planted with papyrus and water hyacinth.

THE PROJECT'S STRENGTHS

The garden is part of a full approach to sustainable development. Not only does the system treat grey water but it generates no environmental impact and even contributes to improving it. There is no effluent, no use of drinking water to keep the plants alive, it's a self-sufficient garden from the water resources point of view and the fact of it being a green space contributes towards the creation of a harmonious relationship with the new terminal and the restoration of biodiversity.

As the process is entirely natural, there is no need to use chemical products; upkeep and maintenance are therefore very low.

VUNG TAU, "THE SEA ECO-CITY"



Country: Vietnam

City: Vung Tau

Status of the project: Design

French partner: ARTELIA

THE PROJECT IN BRIEF...

The city of Vung Tau in Vietnam wished to equip itself with an integrated development plan incorporating all the requirements of a sustainable city, in order to promote harmonious urban development in particular in terms of the management of its port and coastal areas.

AREP Ville's ambition is to offer Vung Tau, an urban planning project based on the three pillars of sustainable development, while incorporating the city's specific problems and needs.

THE SOLUTION

► **Environment: anticipating an increase in sea level**

Whether on the island of Go Gang or on Vung Tau peninsula, the city's greatest environmental preoccupation concerns rising sea levels and their consequences for the city's development.

► **Facilitating mobility and eco-mobility**

AREP Ville is encouraging the development of a railway line to serve the coastal industrial areas and the port. This is consolidated by a proposal for a railway line to Go Gang Island to promote public transport journeys in what could become the future heart of the city. In addition, residents are encouraged to walk, use bikes and the boat bus.

► **Typology and urban density: controlling the use of space and identifying settlement projects**

Example of Go Gang Island: characterized by eight main areas including:

- the "heart of the city"
- the train station district.
- the three lake areas.
- the city centre sector.
- the port and arsenal district.
- the Esplanade area.
- the business district.

AREP Ville also defined the main bioclimatic principles required for urban planning (at district level) and the buildings for each area (housing...), the aim being to take the main climatic phenomena into account (monsoon wind, air humidity, sun) to promote comfortable conditions, both in the public area as well as in the interior spaces.

AREP

www.arep.fr


vivapolis

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STRATEGY FOR THE MANAGEMENT OF GREATER WUHAN SEWAGE SLUDGE: TOWARDS A CIRCULAR AND LOW CARBON ECONOMY



Country: China

City: Wuhan

Beneficiary: Municipality of Wuhan

Client: Municipality of Wuhan

French partners: Carbonium, Enviroconsult

Status of the project: Design

Funders / donors: DGTRESOR

THE PROJECT IN BRIEF...

Faced with unprecedented urban growth, the municipality of Wuhan is engaged in a vast and ambitious **programme to manage its effluent**. ARTELIA and its partners put forward the winning strategy by developing a complete plan for a circular economy on the Greater Wuhan scale.

CHALLENGES

The municipality of Wuhan in China has invested heavily in its infrastructure for the short-term treatment of 80% of its effluent (solid waste, sewage...). Bearing in mind its strong urban growth, the exemplary management of sewage sludge is rapidly becoming a **major issue for the community**.

THE SOLUTION

A study conducted by ARTELIA, in partnership with Carbonium and Enviroconsult, consists in developing a complete circular economy scheme on the scale of a large area:

- ▶ 11 million inhabitants.
- ▶ 16 sewage stations.
- ▶ 650 tonnes/day of dry matter produced.

The development of this strategy includes:

- ▶ Integrating Greater Wuhan region's development strategies.
- ▶ Regulatory analysis.
- ▶ The rethinking of the existing networks and utilities.
- ▶ The development of synergies.
- ▶ Technical, economic and environmental modelling.
- ▶ Feasibility studies for several projects identified as priorities.

Technical assistance provided by the French companies covers a global analysis of sludge generation over the whole area via a full diagnosis of the current situation: network, treatment processes, current sludge production, existing channels... It also covers processes used to treat these sludges and opportunities for their recovery by developing and analysing various strategic options.

The study is being funded by FASEP: French know-how is receiving great emphasis in the implementation of this project.



THE PROJECT'S STRENGTHS

The study was conducted in a collective manner with an approach that particularly integrated essential urban services, proposing a strategic vision for the management and treatment of sewage sludge in line with the French vision of a sustainable city.

In fact the study has the effect of **enhancing the attractiveness of the area, as well as its citizens' comfort and quality of life**, and doing so by directing the management of sewage sludge from municipal treatment plants towards a circular and low carbon economy.

The strategy proposed involves the **minimisation of potential pollution** (water, air, soil) linked to the management and treatment of sludge.

FEASIBILITY STUDY OF THE ECO-DISTRICT OF GAZIANTEP-SAHINBEY



Bioclimatic optimization of the central place

Country: Turkey

City: Gaziantep

Beneficiary: Gaziantep town hall

Client: Gaziantep town hall

Local partners: MAVI Consultants

French partners: MPO Energy, CFG Services, Viessmann, GDF-Suez group including: COFELY/ Tractebell, SOPREMA, France GBC (CSTB)

Status of the project: Design

Funders / donors: Treasury department-FASEP



THE PROJECT IN BRIEF...

BURGEAP produced the Territorial Climate Energy Plan (PCET) for the municipality of Gaziantep with support from the French Development Agency. This PCET contributed to **identifying the district of Sahinbey as a strategic development zone** and the Development Master Plan earmarked it as an eco-district in a context of strong urban growth and marked climatic constraints (continental climate with a great heat/water contrast between summer and winter).

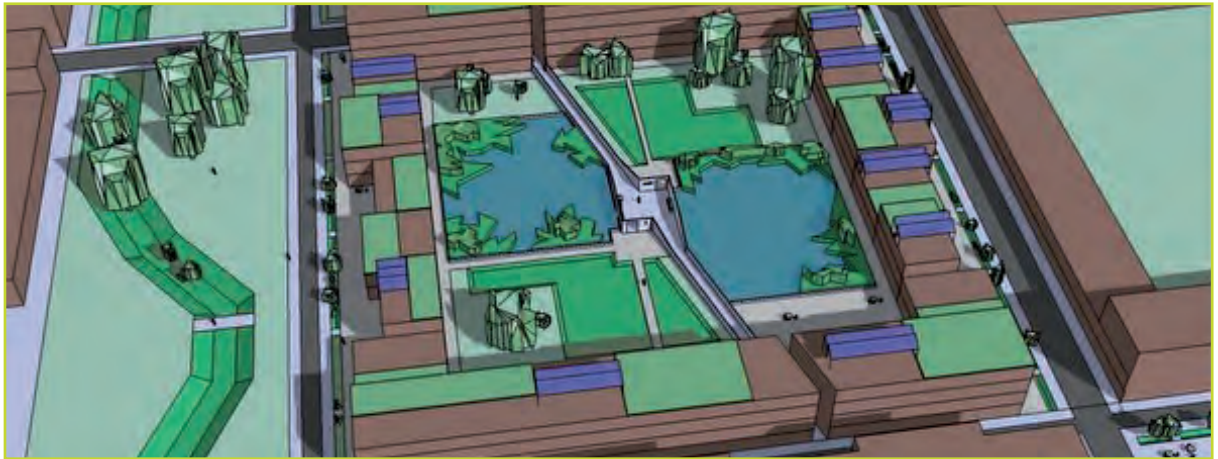
CHALLENGES

The aim of this feasibility study is to **support Gaziantep town hall from the energy and water points of view in the context of setting up an eco-district.**

The aim of the service is to provide technical assistance to the Municipality of Gaziantep in conducting energy/water engineering studies in Sahinbey eco-zone (MIA Zone).

More precisely, it is a matter of formulating the resources allocation then the design of the area in a manner that is as ambitious and relevant as possible from an environmental point of view (in particular: energy efficiency, production of renewable energy, the associated CO₂ emissions, sustainable management and consumption of water), and that is financially viable and socially equitable.

One of the main objectives is to achieve, as far as is practicable, **energy independence for the area linked to heating of buildings.**



Intensive and extensive management of waters

THE SOLUTION

A methodology based on identifying the challenges and opportunities in close consultation with the Municipality, the major directions of which can be emphasised as follows:

- ▶ Ten public buildings and almost 300 high energy performance dwellings.
- ▶ **A heating and cooling system powered by a biomass unit** recovering residues from local food and agricultural activities.
- ▶ Optimised management of roof surfaces incorporating:
 - Solar thermal systems (collective or individual).
 - Solar photovoltaic systems.
 - Planted terraces.
- ▶ A grey water recovery system.
- ▶ A greenbelt area.

After identifying the need / supply scenarios, BURGEAP will provide the Municipality with support in drafting the specifications.

The project is a result of the Town Hall's desire to create **a model eco-district that will be a true Turkish showcase:**

- ▶ Integrated environmental engineering: water, energy, CO₂, climatic comfort, etc.
- ▶ Greater sustainability: the project is part of a more global context since **it is the result of a "French style"** Territorial Climate Energy Plan (PCET) (supported by BURGEAP). At the level of the environment, the design makes use of Environmental Approach to Urban Development (Approche environnementale de l'urbanisme - AEU) principles in keeping with the site and encourages a reduction in greenhouse gas emissions, energy consumption and drinking water consumption. From an economic point of view, the approach is one of "overall cost" reasoning.
- ▶ Energy efficiency: effective systems, designed in synergy with the site's resources and consumptions, shared effectiveness with a desire to develop a heating and cooling network, financial savings associated with these shared systems.
- ▶ Effective water management: mutualisation of treatments, alternative environmentally friendly management, recycling of grey water.
- ▶ Quality of the living environment: recreational spaces, climate quality of the surroundings...
- ▶ To be conducted by leading international stakeholders (cf. Club d'Entreprises).

TAGHAZOUT BAY INTEGRATED TOURIST RESORT



Taghazout Municipality (Morocco)

Country: Morocco

City: Taghazout

Beneficiary: SAPST, "Société d'Aménagement et de Promotion de la Station de Taghazout" (Company for the Development and Promotion of the Resort of Taghazout).

Client: SAPST

Local partners: Moroccan Government, Wali (Prefect) of the Souss Massa Draâ region, municipalities of Taghazout and Aourir, decentralised Government, investors.

French partners: Cap Terre (Assistance with Sustainable Development Project Management), INTERSCENE (landscape), Kilo (architecture), CERWAY / Cerqual (HQE certification)

Status of the project: Design

Funders / donors: The SAPST has 4 shareholders:

- ▶ CDG Développement : Caisse de Dépôts et de Gestion (majority shareholder with 35%, public bank equivalent to the French CDC).
- ▶ SMIT: Moroccan touristic engineering company (Ministry of Tourism, 30%).
- ▶ Alliance Immobilier (20%).
- ▶ Sud Partners (15%).

THE PROJECT IN BRIEF...

The "Taghazout Bay" scheme, promoted by SAPST, Société d'Aménagement et de Promotion de la Station de Taghazout (Company for the Development and Promotion of the Resort of Taghazout), is located on an attractive site in Agadir urban area.

Located between an internationally recognised small surfing village, used by connoisseurs since the 1960s and the small town of Aourir, the transition point between Agadir urban area and the rural environment, it comprises a bay with 6 km of coastline and a beach free of facilities. This project to develop a vast tourist area was given HQE-A certification by CERWAY.

CHALLENGES

▶ The 615 hectare site is designated as a Tourist Development Zone in Nord d'Agadir's Coastal Urban Development Plan (SDAULT). The programme includes tourist establishments, two 18-hole golf courses, a medina, surfing, golf, tennis and football academies, public and private facilities, a reserve and an argan cooperative and residential housing.

The programme, the ground-plan and the design are fully consistent with environmental and socio-economic objectives, as well as the site and area's challenges.

This project embodies the search for a new tourist development model and is part of a national and regional tourist and socio-economic development strategy. It is one of six tourist resorts planned under the Azur Plan, the Moroccan tourism strategy to 2020.

A development agreement commits SAPST and the Moroccan government to the implementation of this project, SAPST embodying the public desire to make this project a success.

THE SOLUTION

This project is evidence of the overall management of an area development plan. SAPST implemented the national policy and presented local stakeholders with a choice of resource allocation, design and concerted development.

By engaging in an HQE-A certification strategy, SAPST wished to valorize its efforts while ensuring that the strategy was well-coordinated and controlled, and that most of the central and decentralised public stakeholders concerned by the project were mobilised both at national and local level. This will also help ensure that the project's objectives are maintained over time up to delivery of the site.

HQE-Aménagement (Development) certification is differentiating because it is the only certification scheme in the world to:

- ▶ Have such a wide field of application that is adaptable and flexible, depending on the type of project.
- ▶ Make a link between a project and the communities' expectations, taking upstream phases into account.
- ▶ Highlight the link between area planning and urban resource allocation/design.

THE PROJECT'S STRENGTHS

The project is characterised by the following elements:

- ▶ An extremely low plot ratio (9.6%).
- ▶ Respect for the public character of the beach and the development of access points.
- ▶ Absence of structures on the coastal strip.
- ▶ A central Medina creating polarity for users of the resort and inhabitants of Agadir urban area designed to valorize local craftsmanship.
- ▶ Low building heights.
- ▶ Qualitative, non-aggressive and multi-modal process of highways and various network.
- ▶ Creation by the Government of a bypass.
- ▶ Varied programming and a multi-use site intended for tourists and locals, for use throughout the year, including residential.
- ▶ Preservation of 80 ha of argan trees and the establishment of a cooperative.
- ▶ Preservation and development of continuity of access to hinterland villages, minimisation of earthworks.
- ▶ Reuse of 4000 m³ of stones on the site without external input.
- ▶ Planting of 500.000 plants 95% resulting from seeds of the 30 species present on the site, grown in a nursery in Agadir.
- ▶ The design of the golf courses envisaging 50% less water consumption (water from the purification plant built on the boundary of the resort).
- ▶ A significant contribution to the development of the municipalities in which it is located.

NOUADHIBOU FREE ZONE - OPERATIONAL MASTER PLAN AND MULTI-ANNUAL DEVELOPMENT PLAN



Country: Mauritania

City: Nouadhibou

Beneficiary: Nouadhibou Free Zone Authority

Client: Nouadhibou Free Zone Authority

Local partners: support from the Mauritanian Caisse des Dépôts et de Développement (CDD) fund.

Status of the project: In progress.

Funders / donors: Mauritanian Government

THE PROJECT IN BRIEF...

The town of Nouadhibou is located on the northern Mauritanian coastline, on a protected bay, the waters of which are extremely rich in fish. Its activities are mainly port activities: the export of iron ore, fishing and logistics.

In order to stimulate the area's dynamics from an economic, social and urban point of view, the Mauritanian government made Nouadhibou bay a Free Zone, covering 1000 km² (600 km² on land). Created at the start of 2013, it is intended that it should become a significant centre within the sub-region.

Egis' mission is to provide the Free Zone with an Operational Master Plan (SDO) and a Multi-annual Development Plan (PDP).

CHALLENGES

- ▶ To realise its ambitions, the Free Zone needs both a vision and a specific implementation plan. The mission's challenge is therefore to **supply a document that is both strategic and very operational.**
- ▶ The study spectrum is wide: it is a matter of simultaneously considering the development of varied economic sectors (mining, fishing, tourism, etc.), proposing an urban development scheme and types of habitat, programming infrastructure and equipment, developing a land strategy and phasing investment over time.

From the technical point of view, water is a major stake. The question is as much the management and development of wetlands as the provision of water in a Sub-Saharan climate and the prevention of pollution, with a population that could multiply by four by 2030, reaching 400.000 inhabitants.

Diversification of the energy mix and space management are also issues among others.

THE SOLUTION

The service being provided by Egis is an overall economic and urban development study envisaging the sustainable development of the free zone.

In order to address the problems in all their complexity, Egis is making integrated use of a wide range of skills: programming, urban design, urban engineering, specialist technical expertise (port, airport, energies, etc.), economic, financial and regulatory, as well as social and environmental strategies, illustrating the added value of Egis' My City service.

It is the skilful coordination of this expertise, the fact that the project benefits from different strategies, that makes the response so relevant.

THE PROJECT'S STRENGTHS

An ecological approach is being developed. It envisages positive interactions within the urban system:

- ▶ The distribution of activities is closely studied. Urban sprawl is controlled, the development proposed is attractive and offers quality of life.
 - ▶ The transport system is clear and permits effective logistics flows as well as keeping living areas peaceful. Public transport is well developed.
 - ▶ The remarkable natural sites are preserved and placed at the service of development.
- ▶ A greenbelt provides protection from the wind, at the same time improving the living environment and the development of urban market gardening.
 - ▶ Water supplies are diversified thanks to desalination. Waste water is treated to avoid pollution and in part reused for irrigating planted areas.
 - ▶ All energy potentials are exploited.
 - ▶ Projects are accurately sized and the best implementation arrangements are sought. Phasing over time means that development of the zone is progressive and robust.





Country: Philippines

Beneficiary: Philippines

Client: Philippines Government

French partners: Matière® company

Status of the project: In progress

THE PROJECT IN BRIEF...

Quick-build metal bridges had their moment of glory during the Second World War and up until the sixties. They were used as temporary structures, on building sites, in the wake of natural disasters or in areas of conflict.

Today they represent an advantageous solution for developing countries.

CHALLENGES

► Demand still exists, especially in emerging countries and the technique is coming to the fore again, thanks to improvements in the quality of steel and the means of handling and connecting them. They find their latest expression in the «Unibridge®» concept.

In 2009 the Philippines government ordered 418 Unibridges®.

THE SOLUTION

Unibridge® is a modular metal bridge prefabricated in France. It has been designed for different types of loading corresponding to different international regulations and can be single or multi-lane. It has a deck made either from steel with an anti-skid coating, or concrete.

All the structural parts are placed below the deck, thus preventing any risk of collisions between vehicles and structure.

Unibridge® bridges are structures composed of basic 1 metre by 11.40 metre boxes that can be juxtaposed horizontally to increase the structure from one to two traffic lanes, or fitted end to end to vary the span. Assembly is via the «launching nose» principle which offers a dual advantage: rapid installation and zero risk of theft. Of relatively modest weight (a little over 11 tonnes), the basic sections can be transported in a 12 metre sea container, without freight surcharge and do not require the use of heavy lifting equipment.

A few days is all that's needed for a team of six people to assemble a bridge, the bearing capacity of which meets the main international standards applying to permanent structures.

THE PROJECT'S STRENGTHS

Unibridge® is an answer to the great need in emerging countries for structural, modular and resilient development, as well as to maintenance and climate constraints that are sometimes extreme.

Given the ease and speed with which it is installed, Unibridge® can be used in emergency situations, as a temporary or permanent structure. Its earthquake resistance makes it particularly suitable for use in seismic zones.

UNIBRIDGE® KEY WORDS:

- ▶ **Reuse:** The product can be reused, is easy to dismantle and transport, is designed to last and the materials used have virtually total recycling potential.
- ▶ **Industrialisation:** The bridge is standardised, manufactured via methods that permit the industrialisation of tasks, a reduction in tedium and rationalisation of yield and handling.
- ▶ **Zero defect:** The welds are factory checked and the mass produced parts are identical and interchangeable, with a zero defect logic.
- ▶ **Limitation of carbon emissions:** Despatch by container from the Fos-sur-Mer factory promotes loading / unloading operations at the time of shipment, and less carbon emissions.
- ▶ **Modularity:** The extreme modularity of the process leads to a wide range of uses.
- ▶ **Durability:** One lane to start with, two lanes subsequently if traffic demands it.
- ▶ **Resistance in seismic zones.**
- ▶ **Environmentally friendly:** The large span the process copes with, means that the aquatic environment and biodiversity can be respected, limiting or eliminating supports in the river.
- ▶ **Ease of implementation:** Installation is facilitated for local, even non-skilled, labour and no welding is necessary on-site.



THE BRAZILIAN STATE OF RIO GRANDE DO SUL'S AIR CLIMATE ENERGY PLAN



Country: Brazil

City: State of Rio Grande do Sul

Beneficiary: Rio Grande do Sul's Secretary of State for the Environment (SEMA) and Rio Grande do Sul's Environmental Protection Foundation (FEPAM).

Client: FEPAM, Dgtresor

Local partners: Engebio (Directorate general of the treasury)

French partners: Voltalia, Asconit

Status of the project: finished in 2011

Funders / donors: Directorate general of the treasury (FASEP funding) and ADEME (technical support)

THE PROJECT IN BRIEF...

Rio Grande do Sul (RS)'s Air Climate Energy Plan (PACE) is the fruit of unprecedented cooperation between France and Brazil which permitted transposition of the methodologies used in the Regional Climate Energy Plan developed by ADEME and the Regional Climate, Air and Energy Roadmap (SRCAE) resulting from the new French regulatory framework ("Grenelle de l'Environnement"). This project also promotes recognition of Air Climate and Energy themes in planning and regional development policies.

THE SOLUTION

The PACE is based on an Air Climate Energy diagnosis of RS State and of its main urban areas:

- ▶ Greenhouse gas and air pollutant inventory.
- ▶ Renewable energy potential.
- ▶ Audit of the air quality network.
- ▶ Vulnerabilities to climate change.
- ▶ Analysis of public policies.

On the basis of this diagnosis, consultation workshops conducted with local stakeholders were used to identify guidelines and recommendations for environmental actions per sector of activity:

- ▶ Energy production.
- ▶ Passenger and goods transport.
- ▶ Agriculture and animal husbandry.
- ▶ Waste/sanitation.
- ▶ Management of forests/biodiversity.
- ▶ Industrial and service activities.

This diagnostic and planning tool is a lever to **encourage sustainable development in RS State and its public spaces.**

It can also be used to meet the requirements of federal and state policies concerning climate change.





The final report concerning the Air Climate Energy Plan for RS, presented to the Secretary of State for the Environment and ADEME in June 2011 (Source: Enviroconsult 2011).

THE PROJECT'S STRENGTHS

- ▶ Inspired by French methodologies, this project helped equip RS State and its urban spaces with tools to face the **challenges linked to a sustainable city**, while also focussing on local Brazilian realities.
- ▶ The PACE is first and foremost a strategic document that can be used to **plan urban growth** while bearing in mind issues to do with sustainable development, in particular those linked to environmental quality and territorial coherence.
- ▶ The section in the PACE concerning vulnerability and adaptation to climate change emphasised the elements essential for the resilience of RS's urban areas. In addition, the PACE's areas of sectoral strategic focus can be used to **confront environmental issues**, while meeting urban populations' needs in terms of housing, water, air quality and nature in the city, etc.
- ▶ Sustainable mobility is also at the heart of the PACE strategy, which promotes the development of public transport, alternative fuels, soft modes of transport and railways and rivers for the transport of passengers as well as goods, in **order to ensure significant modal transfer in urban areas**.
- ▶ Finally, the PACE's work envisaging the consolidation of environmental monitoring networks in urban environments, in particular the air quality monitoring network restructuring programme, are all elements to **make the city more efficient**.
- ▶ The PACE also means that commercial **exchanges and a sharing of know-how can be intensified between French companies and Brazilian stakeholders concerning sustainable cities**, in particular in the areas of sanitation and waste management technologies.
- ▶ The PACE has finally given birth to a **guide to good environmental practice** intended for RS's municipalities, inspired by ADEME's teaching guides, so that issues to do with sustainable cities are conveyed throughout the whole of the State's urban fabric.

MONITORING AIR QUALITY IN ABU DHABI



Photo credits Laurent Caillierez / ADEME

Country: United Arab Emirates

City: Abu Dhabi

Beneficiary: EAD - Abu Dhabi Environment Agency

Client: EAD - Abu Dhabi Environment Agency

Local partners: NILU, Abu Dhabi Envirozone

Funders / donors: local

THE PROJECT IN BRIEF...

Abu Dhabi Environment Agency (EAD), a government agency, was set up in 1996 to protect and manage biodiversity, to guarantee a quality environment and to promote sustainable development in the Abu Dhabi emirate.

In this context, EAD has introduced a system to monitor air quality composed of 25 ambient air monitoring stations, supplied by the French Environnement S.A. company and its local partner Envirozone in Abu Dhabi.

These stations monitor the main pollutants as well as dust and noise throughout the whole of the Abu Dhabi emirate.



www.environnement-sa.com

www.ead.ae/ar/

THE SOLUTION

The information collected by these air quality monitoring stations is one of the tools used by EAD to provide the government, companies and the community with decision making support to help them incorporate environmental considerations into their modes of organisation and development, without compromising Abu Dhabi's growth.

EAD is also involved in investigating ambient air in the town of Masdar City, an essential project in terms of the development of renewable energies and clean technologies.

A FRENCH TEAM AT THE SERVICE OF AIR QUALITY

French companies have long and recognised experience in this area.

The equipment making up this turnkey ambient air quality measurement system is designed and manufactured in France by Environnement S.A., a French company, which works in collaboration with numerous partners.

In fact, upstream and downstream expertise is provided by internationally recognised French companies (Aria Technologies, Enviroconsult, Cairpol, Iseo,...) and relies on French R&D in this area thanks to the Central Laboratory for Air Quality Monitoring, INERIS (French national Institute for Industrial Environment and Risks) and ADEME (French Environment and Energy Management Agency).

SUBSOIL ENERGY STORAGE IN AN ECO-DISTRICT



Country: The Netherlands

Beneficiary: Inhabitants / companies

Domestic partners: City of Amsterdam

Status of the project: In operation

Financing agencies / sponsors: City of Amsterdam
/ GDF SUEZ

THE PROJECT IN BRIEF...

An innovative and efficient solution (40% energy savings), for supplying heating and air conditioning to one of Amsterdam's new eco-districts.

CHALLENGES

Overhoeks is a new district of Amsterdam being built on the banks of the river IJ. Its name originates from the Overhoeks tower which overlooks the banks of the river. A former Shell Research site, Overhoeks has been transformed into a **multi-purpose residential, work and recreational area**. More than 2200 apartments and penthouses are envisaged, in addition to 130.000 m² of office space, a range of hotels and restaurants, the new film museum and the Oever park.

The aim of the Amsterdam Smart City initiative was to make Amsterdam an exemplary city in terms of energy use. The COFELY (GDF SUEZ group subsidiary) design has answered adequately to this challenge.

THE PROJECT'S STRENGTHS

- ▶ GDF SUEZ has built **three power plants** equipped with five pairs of heat/cold storage facilities at different locations on the site. Thanks to the sustainable and long-term energy storage, Cofely can provide air conditioning in summer and heating in winter. The Dutch subsidiary of GDF SUEZ Energie Services has created the entire facility (storage shafts, distributing stations, heat pumps and boilers) and is responsible for all maintenance and operation of the power plants for 15 years.
- ▶ Shell has chosen the district as the site for its new technology centre for research into the development of biofuels and cleaner fossil fuels, whose useful energy will also be supplied by Cofely in the Netherlands. In addition to conventional cooling, process cooling systems will also be required. The energy provision must thus be flexible and adapted to the variations in demand.
- ▶ The Overhoeks energy system also **offers aesthetic** benefits with almost invisible power plants, compared to the traditional facility.



Country: Norway

City: Oslo

Beneficiary: City of Oslo

Client: City of Oslo

Local partners: PROXLL, electrical installation company

Status of the project: in progress since 2012

Funders / donors: City of Oslo

THE PROJECT IN BRIEF...

Making street lighting smart. Such was Oslo's request in the context of an international call for tenders launched in 2011.

Streelight Vision was selected due to its complete response to these technical and financial issues and its expertise in this area, acquired through numerous projects in France and abroad.

CHALLENGES

- ▶ The city of Oslo has committed itself to reducing its energy consumption with the aim of becoming **one of the cities with the lowest energy consumption per resident in the world.**
- ▶ Among its strategic projects is the **reduction of energy consumption by 50%** as well as a reduction in the maintenance costs (cars and lorries to maintain the network) of the urban lighting network.

THE SOLUTION

The solution proposed by Streetlight Vision was adopted by the city, following an international call for tenders launched in July 2011.

The project was implemented in 2012. Since, Streetlight Vision has been supplying continuous support to the city of Oslo and will continue to do so for the next three years.

Following implementation of Streetlight Vision's solution, Oslo now benefits from the following advantages:

- ▶ Drastic energy savings for its urban lighting network (70.000 lights and 750 electrical boxes).
- ▶ Significant maintenance savings, thanks to automatic breakdown detection.
- ▶ Improvement of lighting in sensitive areas, and thus improved security.
- ▶ Option of using the public lighting network as a backbone network to install and control electric vehicle recharging stations, environmental sensors, information panels and other measuring and traffic control equipment.

The city of Oslo now has the capability of deploying the use of Streetlight Vision's Centralised Management software to control the whole of the public lighting network as well as any other electronic devices installed in the street (environmental sensors, electric vehicle recharge stations, traffic measurement, etc.).

NEW ORLEANS: SAVING, REBUILDING AND EXPANDING A SUSTAINABLE TRANSPORT SYSTEM



Country: USA

City: New Orleans, Louisiana

Beneficiary: City of New Orleans

Client: New Orleans Regional Transit Authority

Status of the project: In progress

Funders / donors: Local authorities (New Orleans Regional Transit Authority) + Government (federal funds)

THE PROJECT IN BRIEF...

In August 2005, hurricane Katrina struck the city of New Orleans, causing many deaths and significant material destruction. Management of its transport systems, both in terms of the management of the crisis and in terms of reconstruction, gave rise to real reflection concerning their operation, their role and their effectiveness.

CHALLENGES

Transdev first of all evacuated many residents from New Orleans at the height of the storm and during the flooding that followed.

The storm destroyed 200 buses and many kilometres of tram lines and, in February 2008, only 19% of the buses that existed prior to Katrina had been replaced. There were 75% less users, using half the original routes with a system experiencing difficulties in serving residents who remained or who had returned.

THE SOLUTION

In October 2008, the Regional Transit Authority (RTA) chose to join with Transdev in meeting the short-term challenge, as well as implementing a long-term vision.

The RTA recognised the need not just to rebuild, but also to **redefine its public transport system** both as a mobility solution and as a dynamic of economic development, rejuvenation of the district, environmental performance, a solution to congestion and more generally, a creative force to improve the quality of life of the region's residents.

Transdev therefore started with the implementation of a systemic approach which led to a **project containing environmental, economic and social applications**. Different elements, such as public policies, procedures and technologies developed during this project were combined to construct, enlarge and improve a sustainable transport system. In addition, its stakeholders were also involved at all stages of the project.





Improvement of the public transport system in the context of urban renewal and future growth:

- ▶ Reconstruction of the tram system infrastructure and the 31 trams damaged during the storm.
- ▶ Receipt of a TIGER grant of 45 million USD for the French district extension which will affect the many disadvantaged residents among the 70.000 who live along the Loyola corridor, poorly served by the existing transport system.
- ▶ The development of the community, following the expansion of the tram system, up to now has generated 2.7 billion dollars of new development along the corridor, including new apartments, co-ownership and hotels, etc.

A customer oriented system

- ▶ Timetables of neighbouring transport networks synchronised to provide better mobility in the region.
- ▶ Launch of a website offering improved features such as journey planners, service announcements, etc.
- ▶ Development of a new attractive branding system.

A programme to improve the service:

- ▶ Development of clear performance indicators and a transparent reporting system designed for all stakeholders and staff concerned.
- ▶ Implementation of an overall environmentally friendly programme.
- ▶ Improvement of maintenance and safety procedures leading to a dramatic improvement in performance.

A community strategy:

- ▶ Partner of the «Saint-Bernard Project», a non-profit association dedicated to the reconstruction of houses for residents who cannot obtain assistance from federal programmes. Eight years after hurricane Katrina, over 100.000 structures remain in a state of dilapidation. Transdev's employees are working as volunteers to rebuild these houses.
- ▶ Transdev organises regular «community meetings», public hearings and local outreach activities to involve all citizens in the development and improvement of the public transport system.

www.transdev.net/fr/

www.norta.com

www.veoliatransportation.com

DRINKING WATER FOR EVERYONE IN NAGPUR



Country: India

City: Nagpur

Beneficiary: Nagpur Municipal Corporation

Client: Nagpur Municipal Corporation

Local partners: OCW (Orange City Water), joint venture between Veolia Water India and Vishvaraj Environment Ltd

French partners: ESSEC Business School and IRENE (Institut de Recherche et d'Enseignement sur la Négociation en Europe)

Status of the project: in operation

THE PROJECT IN BRIEF...

The first public-private partnership in the water sector for an entire city in India, won by Veolia Water India and its local partner, which must carry out the construction of a water treatment plant, the rehabilitation of five others and the improvement of the whole distribution network, to make Nagpur a model city in terms of access to drinking water for the greater part of its population.

CHALLENGES

The Nagpur project concerns the rehabilitation and adaptation of the production and distribution of water and the management of the service for twenty-five years.

Signed in 2011, the contract specifies the provision of a 24/24h drinking water service to homes, for the 2.7 million residents of the city of Nagpur (Maharashtra State), a third of whom live in slums.

Access to drinking water for all is Orange City Water's principal undertaking in Nagpur.

The challenge is one of size because the initial situation is very precarious:

- ▶ a maximum of 12 hours per day supply,
- ▶ poor water quality,
- ▶ leaking mains (60% losses).

It's also a challenge at multiple levels:

- ▶ technical: connecting all the homes to the water supply,
- ▶ management: training local teams,
- ▶ social: integrating the slums areas (1 million people), offering an inclusive service, at an acceptable cost and for different types of water use.

THE SOLUTION

This considerable project will see the construction of one water treatment plant and the rehabilitation of five others.

It is also set to permit the restoration and development of the whole existing distribution network of 2500 km of pipes and mains.

THE BENEFITS

Access to drinking water, 24 h / 7 days a week.

In 2018, water available to each resident will be 130 litres per day, as against 90 litres currently, and barely 10 in the slums.

In addition, the renovation of the entire network will help optimise production and conserve a resource that is already scarce.

Currently, over 50% of production is lost due to leaks as a result of poor infrastructure.

Finally, and above all, the benefit in terms of public health is essential. It is estimated that in India, 21% of communicable diseases are linked to the insanitary nature of the water consumed.

SPECIFIC FEATURES OF THE FRENCH OFFER

- ▶ Effective solutions adapted to the context.
- ▶ Strong partnership between OCW and the municipal public authorities and with the NGOs and the education centres, raising awareness among users, study of the population's needs and expectations and anticipation of the impact, by research bodies.
- ▶ Creation of shared value (for the company and for residents).

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ELECTRICITY FROM SEWAGE SLUDGE IN HONG KONG



Country: China

City: Hong Kong

Beneficiary: Hong Kong Government

Client: Hong Kong Government

Local partners: Veolia Water, Veolia Environmental Services, Leighton Asia

French partners: Vasconi architecture consultancy

Status of the project: in operation

THE PROJECT IN BRIEF...

The design, construction and operation of a sewage sludge recovery plant, located in the west of the Hong Kong new territories, were entrusted to **Veolia Environnement**.

CHALLENGES

The transformation of waste produced by the community into a recoverable resource is one of this project's challenges. The transformation of residual sludge into electricity is in fact a response to energy supply problems in an urban area that is developing fast, as well as an answer to the constraints of managing waste streams.

THE SOLUTION: AN EFFECTIVE SITE OPEN TO THE GENERAL PUBLIC

The site treats all the sludge produced by Hong Kong's eleven treatment plants. With a processing capacity of 2000 tonnes per day, the plant can produce 20 MW of electricity.

The wastewater produced is also treated on-site using advanced processes so that it can be recycled. Therefore discharge of effluent into the sea is avoided.

As a response to the Hong Kong Government's wish to open the plant to the general public on a permanent basis, the French Vaconi consultancy put forward an "avant-garde" architectural concept, with a visitors' tour for the purpose of education and an ecological garden incorporating the region's specific biodiversity. The building's shape is inspired by the sea, at the front of the site, thus creating perfect integration into the landscape.

THE PROJECT'S STRENGTHS

These are model facilities, from both energy and environmental point of view. At full capacity, the energy produced by the plant will exceed its own needs and the surplus electricity can be transferred to the public grid.

The site is therefore fully independent in terms of electricity. A sea water desalination unit is also being used to produce up to 600 m³ of drinking water per day for the site's needs.

The interests are multiple:

- ▶ An integrated and comprehensive approach to the area (constraints / challenges / strengths).
- ▶ Recovery of waste as a resource.
- ▶ The unit's integration into the site.
- ▶ Raising the population's awareness to environmental concerns.



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