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Nice Riviera Metropolis – Territory of Urban Innovations

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Nice is the 5th most populous city in France located in the South of France on the Mediterranean coast and at the foot of the Alps. Being the administrative capital of the Alpes-Maritimes department of the Provence-Alpes-Côte d'Azur, Nice is well connected with other cities of the French Riviera and the principality of Monaco, as well as international locations through its airport. Nice is second-most popular tourist destination in France, attracting visitors with its rich history, architecture and beautiful waterfront.

Even though tourism has been traditionally an important sector for the local economy, Nice is now turning toward development and support for other promising areas such as healthcare innovation, biotechnology, renewable energy, ICT solutions, among others. It is expected that it will not only diversify the economic base, but

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also contribute to the city's sustainable development and better life quality for its residents. By bringing together all the local stakeholders and creating a favourable environment for innovation, Nice has become one of leading smart cities. Equally important goal is to be an exemplary 'Green City of the Mediterranean'.

Urban planning framework

The main land use and planning principles of Nice are explained in the 'Plan Local d'Urbanisme' (PLU)[1] adopted in 2010 as a guiding document for the city's future development. PLU's contains a special section called 'Planning and Sustainable Development Project' *('Projet d'Aménagement et de Développement Durable'* or PADD) dedicated to goals and projects for sustainable development categorized into four major areas:

- Preservation and Enhancement of the Urban Landscape and the Environment ('*préserver et valoriser un paysage et un environnement exemplaires*')
- Housing and Living Together ('*se loger et vivre ensemble'*)
- Improved Mobility and Transport Alternatives ('*mieux circuler et se déplacer autrement*')
- Nice - International Metropolis ('*affirmer Nice comme métropole internationale*')

Urban development projects and their coordination are subject to strategic and regulatory frameworks formulated at all governance levels. Similarly, funding comes from local and regional budgets, national funds, the European Union, as well as private investments. As in other cities in Europe and worldwide, there is a visible trend of cooperation between public and private partners.

[1] http://nicecotedazur.org/habitat-urbanisme/les-documents-d-urbanisme-en-vigueur/nice-plu-new

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Source: http://www.nicecotedazur.org/kiosque/view/perimetre-metropole

In 2011, Nice and other 48 municipalities in Alpes-Maritimes united in a metropolitan structure called 'Métropole Nice Côte d'Azur' to work on common objectives and joint coordination of urban planning. This type of governance allows for coherence in development strategy, the synergy of policies and more efficient management of shared projects in the region. Recognizing the need for a vision of development encompassing the entire metropolitan area, Métropole Nice Cote d'Azur is engaged in formulation of the 'Plan Local d'Urbanisme métropolitain' (PLUm)[2] providing a roadmap up to 2030. Until the end of 2017 citizens could participate in the design of PLUm and additional public inquiry on the final draft will be held in each commune.

[2] http://www.nicecotedazur.org/habitat-urbanisme/plu-m%C3%A9tropolitain

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The plan is due to be approved at the end of 2018 – beginning of 2019.

The 'Green City of the Mediterranean'

All projects carried out in Nice must take into account sustainability and environmental protection. Specific environmental targets have been set up to which the city is committed.

In 2010, France adopted the 'Grenelle II Law' to specify at national level what actions and legal regulations should be undertaken to mitigate and adapt to climate change. Among the provisions, the law makes it mandatory for local authorities of communities with over 50.000 inhabitants to prepare local climate and energy plans. The City of Nice and the Metropole Nice Cote d'Azur decided to jointly develop the 'Plan Climat-Energie Territorial de la Metropole Nice Cote d'Azur 2012 – 2017' (PCET)[3]. In accordance with the national law, and specifically the objective named as 'Factor 4' ('*Facteur 4*'), the plan follows an ambitious target of curbing GHG emissions by 75% by 2050 (compared with 1990 levels) to minimize the impact of the territory on the climate. The plan also aims for to reduce vulnerability to risks associated with the impact of climate change by implementation of adaptation measures.

'Energy Transition Law for Green Growth', adopted in 2015, defined additional national targets:

- to cut GHG emissions by 40% by 2030 (compared to 1990);
- to halve the national energy usage by 2025;
- to reduce the share of fossil fuels in energy production by 30% (compared to 2012);
- to reduce the share of nuclear energy in electricity production by 50% by 2030;

[3] http://www.nicecotedazur.org/environnement/l-%C3%A9nergie-et-le-climat/plan-climat-energie-territorial

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- to increase the share of renewables to 32% by 2030

In addition to these regulatory frameworks at the metropolitan and national levels, being a signatory to the Global Covenant of Mayors for Climate and Energy – a global network of local and regional authorities, Metropole Nice Cote d'Azur is committed to achieving European Union objectives of the '2020 Climate and energy Package': 20% reduction of CO2 emissions, 20% share of renewable energy, 20% increase in energy efficiency by 2020.[4]

Regarding planning of concrete actions for sustainable development, Metropole Nice Cote d'Azur formulated 'Agenda 21' (2013-2018) program including 62 actions across 5 strategic axes:

- Combating climate change
- Preservation of biodiversity, resources and the environment
- Social cohesion and solidarity between territories and generations
- Quality of life, wellbeing and self-development for all
- Responsible production and consumption[5]

Sustainable urban mobility and public spaces

In a strive to meet the emissions reduction targets and reduce negative impact of transport on environment and health, the development of urban transport network is to provide citizens with more options, better infrastructure and easier access to alternatives modes to the use of private cars. The city wants to turn public spaces into more cyclists and pedestrian friendly, and at the same time expand its public transport offer.

[4] https://ec.europa.eu/clima/policies/strategies/2020_en

[5] http://www.nicecotedazur.org/environnement/agenda-21

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Nice has been investing heavily in construction and extension of tramway lines linking areas of strategic importance to the city's development. First line of Tramway de Nice opened in 2007 in U shape that connects northern part, city centre and eastern part of the city. The second line, which is currently under construction and due to be opened in 2018, will run from the west to the east and connect the airport, the business district and the city centre.[6] The new line, including 20 stations, is expected to carry up to 200,000 passengers per day and ease the traffic problem on heavily congested roads. As a result the number of cars entering the city daily will be reduced by 20,000 and overall traffic decreased by 5.3%. It is estimated that the West-East public transport corridor will contribute to reduction of urban air pollution by 15-17% and of ambient noise by up to 50%. The construction, future operation and maintenance of the West-East tramline are carried out with respect of various aspects of sustainable development, in accordance with the objectives of the metropolis. Sustainable development criteria and environmental impact were considered in purchases of the rolling stock, furniture and other equipment. Furthermore, 2,400 new trees will be planted along the route, 77,000m2 platform will be covered by turf creating, and new green spaces will be added creating a "green ribbon" along the line. The lighting and air-conditioning will be optimized to minimize energy consumption.[7] These environmental standards will also be implemented in the construction of future tramway lines. Two other lines are currently under consideration. It is planned that the third route, to be opened by 2020, would start at the airport and go up north through the Plaine du Var, creating a new structural axis and crossing all the key districts of Nice that are parts of the 'Eco-Valley' – a major urban development project discussed in more detail below.

[6] https://www.nice.fr/fr/nice-2020/la-ligne-ouest-est-de-tramway?type=projects

[7] For more information on sustainable development aspects of the tramway construction and operation, see: http://tramway.nice.fr/ligne-ouest-est/projet-ouest-est/fil-vert-du-tramway/

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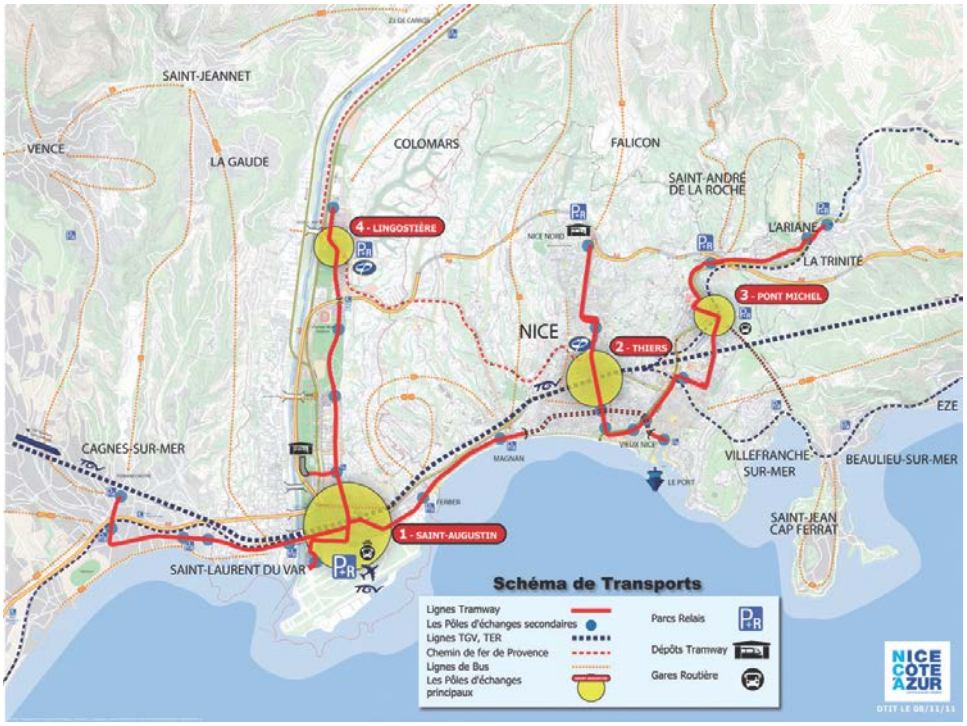
In 2017, the Metropole Nice-Côte d'Azur in partnership with the University Côte d'Azur (IMREDD), Lignes d'Azur and Alstom opened a 'Nice Tram Connect' challenge addressed to start-ups and all citizens. They were invited to propose new smart applications and other solutions applying digital technologies and making use of the city's open data with an aim to improve tram services.[8]



Source: http://tramway.nice.fr/schema-des-transports/

The tramway network is one of core elements of a broader multimodal strategy of the metropolis. The Nice Côte

[8] http://nicetramconnect.bemyapp.com/

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d'Azur 'Transport scheme at horizon 2030' is organized around four multimodal stations combining various transport modes and serving as interchange hubs: Pont Michel, Gare Thiers, Lingostière (tramway, bus, *Chemins de Fer de Provence*, relay parking, bikes) and the Nice-Saint-Augustin-Airport hub (tramway, hi-speed trains and local railways, buses, access to the airport, relay parking, and bicycle stands).[9] Introducing the scheme the city aims to achieve better coherence and connectivity between different transport networks.

Source: Wikimedia Commons/ivypecanha

Among other options offered as alternatives to private cars, there are 'Velobleu' bike-sharing and 'Autobleue' electric car-sharing systems. The first 90 stations of Velobleu were deployed in 2009. Since then, the service has grown to include 175 stations with 1,750 bicycles and is still expanding.[10] Autobleue e-car sharing extends to nine Métropole Nice Côte d'Azur municipalities and currently serves around 9,500 subscribers. There are 140

[9] http://www.ecovallee-cotedazur.com/key-stakes/installation-and-transport/transport

[10] http://www.nicecotedazur.org/deplacement/le-v%C3%A9lo-bleu/le-r%C3%A9seau

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vehicles and 68 stations located across the territory.[11] Nice is gradually expanding the number of charging points for electric vehicles.

Source: Wikimedia Commons/Myrabella

Sustainable mobility efforts have been accompanied by closing some of street spaces to car traffic and making them accessible to pedestrians, cyclists and trams only. For example, Place Massena in the city centre, Place Garibaldi and Place Rossetti are now shared by pedestrians and trams. Waterfront promenades were also given a makeover, for example, the Quai des Etats-Unis where more space is now dedicated to pedestrians and cyclists due to reduction of road lanes to two, removal of parking spaces and construction of a bike path instead.[12] Additionally, trees and plants were planted to separate the road, cycling and pedestrian pathways. The entire Nice's iconic historical site, the Promenade des Anglais, is about to be refurbished. The city allocated 16 million euros to the project that runs in 2015-2020. It includes widening of the bicycle path, installation of new sidewalk

[11] http://www.nicecotedazur.org/deplacement/l-auto-bleue

[12] https://www.nice.fr/fr/nice-2020/le-quai-des-etats-unis?type=projects

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lining and street furniture, LED public lighting, and greenery to separate road and the promenade as well as reduce the traffic noise.

To provide more green space, in 2013, Nice inaugurated the Promenade du Paillon, a 12 hectares park forming a 1.2 kilometers long "green axis" stretching through the heart of the city. The Promenade du Paillon connects the Museum of Modern Art and Contemporary Art (MAMAC) to the Théâtre de Verdure and the Promenade des Anglais and can be used for organization of large scale public events.[13] The city is also planning to open 3 hectares park in Le Ray future eco-district. The project will also include construction of new housing, modernization of local school and creation of sport facilities.[14]

Source: Wikimedia Commons/SarahVstk

Eco-Vallée – eco-exemplarity and the 'city of the future'

[13] http://en.nicetourisme.com/nice/38254-promenade-du-paillon

[14] https://www.nice.fr/en/actualites/le-futur-quartier-du-ray?type=articles

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Eco-Vallée (Eco-Valley) is the largest of urban development projects in the Nice metropolitan area (it covers a territory reaching beyond the city's administrative boundaries and including surrounding communes). Located at the Western edge of the city and stretching along both banks of the Var River, Eco-Vallée is an 'Operation of National Interest' of the French state and a site for urban experimentation. The Eco-Valley initiative is coordinated by the Public Urban Development Agency called EPA Plaine du Var. Founded in 2008 and presided by Christian Tordo, Deputy Mayor of Nice, the EPA includes representatives of the state, regional and local authorities, business and academic institutions like the Nice Côte d'Azur Chamber of Commerce and the Nice Sophia Antipolis University, and other experts.[15]

An area of 3000 hectares at the Eco-Valley's Southern part has been designated as the ÉcoCité Nice Côte d'Azur (EcoCity Nice Côte d'Azur) that will showcase sustainable development solutions and set an example for the 21 century city model.[16] The ÉcoCité is based on public-private partnership of the Nice Côte d'Azur and the EPA Plaine du Var, local companies and SMEs, large ICT enterprises such as IBM, Orange, CISCO, or Demetech, energy and urban service providers EDF, GDF Suez, and Veolia, and real estate actors such as Cogedim. ÉcoCité Nice Côte d'Azur -"Tomorrow's city" program is based on ambitious plan to better organize transportation and make it more sustainable (new North/South tramway line, car sharing with 100% of electric vehicles and 1,500 charging stations in 2018), increase the use of renewables (geothermal and solar) and move toward energy autonomy in the area, create the Nice-Saint Augustin Aéroport multimodal hub as an example of the use of innovative technologies (high energy performance, intelligent parking system, real time passenger information system),

[15] http://www.ecovallee-cotedazur.com/the-eco-vallee/epa-plaine-du-var-organization

[16] http://www.ecovallee-cotedazur.com/key-stakes/eco-exemplarity/the-ecocite-nice-cote-d-azur

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establish Urban Surveillance Centre for prevention and risk management, deploy smart grids (Nice Grid and Reflex). [17] The ÉcoCité includes projects in Grand Arénas business district, Nice Méridia urban technopolis, La Baronne- Lingostière food and horticulture platform and Saint Laurent-du-Var eco-district.

[17] http://www.ecovallee-cotedazur.com/key-stakes/eco-exemplarity/the-ecocite-nice-cote-d-azur

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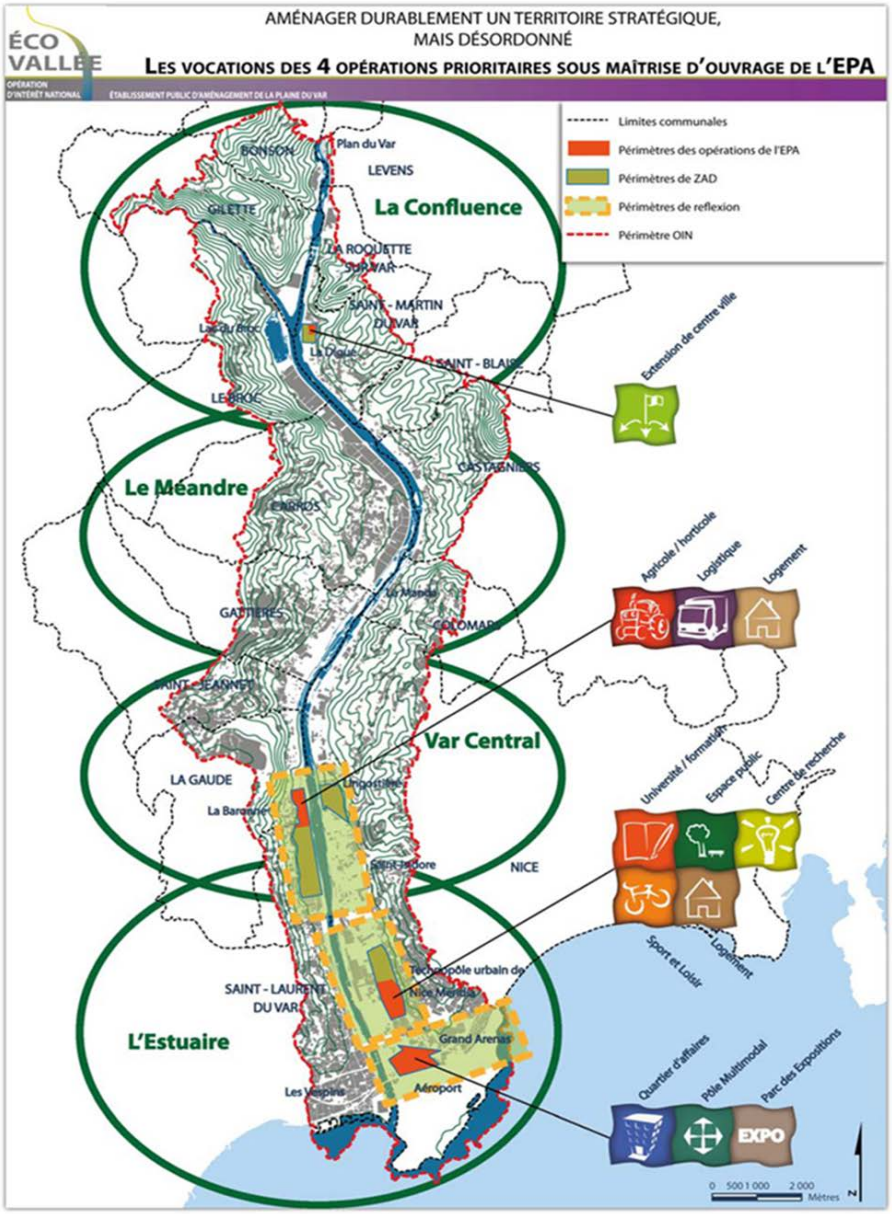

Source: http://www.ecovallee-plaineduvar.fr/les-enjeux/amenagement-et-transport/amenagement

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Grand Arénas business district

The Grand Arénas site, which covers over 10 ha with 155,000 m^2 of net floor space, will be further extended by 51h in order to turn it into one of the largest business districts in Southern Europe. The new core facility in the area will be the exhibition park (*Le Parc des Expositions*) with 75,000 m2 of exhibition space. The centre, alongside existing Acropolis Convention and Exhibition Centre, is expected to enable the city to host more large-scale international events. The Acropolis has been recognized as one of the best centres of this kind in Europe. The new exhibition park is a part of the city's strategy to attract business tourism (in fact, Nice is already number two destination for business tourism in France).

The district is in close proximity to the Nice International Airport and further infrastructural improvements are planned to make it more accessible, in particular construction of the Nice-Saint-Augustin-Airport multimodal transport hub including trains, high-speed inter-city trains, bus lines, tramway lines, bicycle (Velobleu), electric vehicles (Autobleue) and car parking spaces.

The city wants the Grand Arénas to provide a balanced mix of office space attracting foreign companies, housing, shops, hotels and local services.[18]

Nice Méridia urban technopolis

Located in close proximity to the Grand Arénas, Nice Méridia is to become an "urban technopolis" concentrating various public and private actors of the local innovation ecosystem, R&D centres and business incubators.

[18] http://www.ecovallee-cotedazur.com/projects/grand-arenas

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Initially covering the area of 24ha, the district is expected to become a catalyst for development of green technologies, urban solutions and healthcare innovation. Nice Méridia will provide more space for education and research facilities in the Ecocampus of the University of Nice Sophia Antipolis. A new building of 5000m2 will host the Mediterranean Institute for Risk, Environment and Sustainable Development (IMREDD) promoting collaboration between students, researchers, public bodies and companies in the areas of green technologies and smart city.[19] The district will also host the European Business and Innovation Centers (BICs), as well as the Chambre de Commerce et d'Industrie de Nice et Cote d'Azur learning campus (Campus regional de l'Apprentisage) offering support for business and SMEs. Despite the major focus being technology and innovation, the district will be multi-functional combining public spaces, offices and commercial areas, as well as housing and sport facilities. Additionally, Nice Méridia will be a district for experimentation with sustainable solutions. A study has also been launched on possibility of smart grid installation in the area.

Nice is currently participating in the IRIS Smart Cities project co-funded by the European Union, as one of three lighthouse cities (the other two being Utrecht and Gothenburg) demonstrating implementation of smart solutions in energy, mobility and ICT initiatives. Projects tested in the lighthouse cities will then be replicated in follower cities: Vaasa (Finland), Alexandroupolis (Greece), Santa Cruz de Tenerife (Spain) and Focsani (Romania). Grand Arenas, Nice Méridia and Les Moulins will be the test-beds for the use of renewable energy such as geothermal, sewage and solar, energy storage and grid flexibility solutions, retrofit and positive energy buildings, smart urban monitoring, and innovative transport services. [20] The project will also test various tools to involve

[19] http://unice.fr/fil/service-communication/actualites/limredd-devoile-son-futur-batiment

[20] http://irissmartcities.eu/irissmartcities/content/nice-france-cote-d%E2%80%99azur

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citizens and gather their views, such as applications and couching for tenants encouraging energy savings, crowdsourcing schemes, and an online Civocracy[21] discussion platform.

Smart grids - strategic sector for the French Riviera

Developing new eco-districts such as the Nice Méridia, the city will apply the guidelines combined in the "Côte d'Azur Smart Grid Charter" formulated by the French Riviera Chamber of Commerce in cooperation with the Métropole Nice Côte d'Azur and the Eco-Vallée Development Agency (EPA), and with support of other regional partners and the European Union.[22] The charter is a reference document for planning and implementation of smart grids presenting solutions and recommendations on involvement of stakeholders, regulations and standards, smart grid operation and energy management of the district, and demand-response measures, among others.

As "Smart Grids" have become a strategic sector in the region, there have been many related pilot projects carried out in the Métropole Nice Côte d'Azur. For example, Nice Grid[23] project turned the town of Carros into the first and largest smart solar energy test district of this kind in Europe. GRID4EU, a consortium of six major European energy distributors managing the project, demonstrated efficient photovoltaic energy generation, storage units and innovative solutions for remote control. In RéFLeXE[24] project (2011-2015), a consortium of private enterprises and R&D centers tested solutions for 'demand response' and energy storage in smart grids so as to match electricity supply and demand and improve the flexibility of the power grid. RéFLeXE linked commercial and industrial sites (among them the airport, leisure centers and museums), renewable energy systems and

[21] https://www.civocracy.org/nicecotedazur

[22] http://www.cote-azur.cci.fr/content/download/25819/346647/version/1/file/2013-09-smart-grid-version-GB.pdf

[23] http://www.nicegrid.fr

[24] https://cleanenergysolutions.org/sites/default/files/documents/pres-REFLEXE-gen-ext-EN-201310-V2Yves.pdf, www.cote-azur.cci.fr/.../2012-12-17-nrj-plaquette-REFLEXE.pdf

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storages to an aggregation platform balancing the operation of the grid. Once the network was established, the project examined strategies for energy monitoring, business models for smart grid aggregators and the environmental impact.

Several projects dealt with social aspects of energy consumption and management through participation of citizens in designing digital smart meters, monitoring and adjusting their energy consumption for more efficient operation of the grid. In projects like Nice Grid smart meters allowed users to keep track of their daily energy usage patterns and to reduce energy consumption at home. "Linky"[25] smart meters produced by ENEDIS energy distributor are currently promoted all across France in line with French government plans to install 35 million "Linky" smart meters nationwide by 2021.[26] Ecofamilies pilot project (2011-2012) first worked with local families to co-design an IT tool for efficient management of energy consumption. Discussions and workshops helped to create a prototype of a highly customizable web interface that displays information of heating, electricity and water flows in the building and provides personalized advice and alerts.[27] In CityOpt (2014-2017), an EU co-funded demonstration project, households in Nice Côte d'Azur, Helsinki (Finland) and Vienna (Austria) were equipped with smart meters and used the new CityOpt app on tablets to monitor their energy usage. Participants were asked to lower energy consumption when they received 'peak of consumption' alerts. They were rewarded with points for their efforts. The points functioned as "currency" used to support favored local community projects via crowdsourcing.

At the moment there are two major smart grid projects taking place. FLEXGRID is a project of the Provence-

25 http://www.enedis.fr/linky-communicating-meter

26 https://www.metering.com/features/smart-meters-101-frances-linky-electricity-meters/

27 http://www.nicecotedazur.org/environnement/l-%C3%A9nergie-et-le-climat/le-projet-ecofamilies

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Alpes-Côte d'Azur (PACA) region financed by the national government. Commencing in 2017, it plans to roll out a series of mature smart Grid equipment and technologies. FLEXGRID sub-projects are being carried out in six neighborhoods of the Nice Éco-Vallée with a focus on renewable energy systems, heating and cooling, energy storage, building retrofit, electric vehicles charging stations, and public lighting.[28] FLEXGRID investigates conditions under which private and commercial users of photovoltaic energy can lower energy consumption and at the same time feed surplus self-generated energy into the grid. The project examines the resulting local energy balance, advises on regulatory frameworks necessary, trains local energy managers and monitors socio-cultural impacts. By 2020, it is expected to boost jobs in the regional Smart Grid sector to 25,000 and raise turnover to €6bn. Parallel to Flexgrid, 20 industrial partners in five EU countries have teamed up in the Interflex project, which is supported by the Horizon 2020 programme of the EU (2017-2020). The main partner in the Nice Côte d'Azur metropolitan region is the energy provider ENEDIS. Interflex projects are being undertaken under the NICE SMART VALLEY coordination concept. Interflex further explores new ways to use flexible forms for optimizing local electric power systems, with a particular focus on energy storage, smart charging of electric vehicles, demand response, 'islanding', grid automation and the integration of different energy carriers (gas, heat, electricity).[29]

Housing and social inclusion in Moulins

Les Moulins, densly populated and multi-cultural neighbourhood located at the heart of the Eco-Vallée and right next to Nice Méridia, has 2,966 social housing units with about 12,000 inhabitants. The district is one of Sensitive

[28] http://www.flexgrid.fr/programme-flexgrid/, For description of all FLEXGRID projects, see: http://www.flexgrid.fr/wp-content/uploads/2016/08/Liste-des-projets-Flexgrid.pdf

[29] http://interflex-h2020.com

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Urban Zones (Zones urbaines sensibles) –urban areas facing social and economic difficulties that have been classified as priority target for urban renewal and social cohesion projects. It is also one of Priority Security Zones (Zones securite prioritaire) identified in 2012 by the French Government as areas with high crime rates.[30] Gradual urban redevelopment measures are undertaken to improve the quality of living, in cooperation with residents, institutional partners and civil society organizations. Refurbishing the district, Nice aimed to "re-connect" it with the city, create more balanced housing structure, improve social cohesion and support local businesses.[31]

The renovation project in the district includes demolition of 547 housing units, construction of 652 housing units and rehabilitation of 1244 housing units, as well as creation of roads and public spaces (approximately 76,000 m^2). A special Project House was opened to communicate with the public and inform about the district rehabilitation works. The rehabilitation project will also provide the residents with better public facilities and services: town hall, early childhood and family center, municipal library, sports and leisure activities center, premises for local associations, commercial areas. Thanks to funding from the EU European Regional Development Fund, a recycling plant will be set up in Moulins, including waste sorting area, area for the repair of small objects, exhibition and educational space for awareness-raising on topics such as community gardening, composting and recycling.[32] Since 2014, 200 flats took part in an experimental project. They were equipped with smart meters to measure and reduce private energy consumption by at least 10% [33]

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[30] http://www.20minutes.fr/nice/997877-20120906-moulins-nicois-accord-renfort

[31] http://www.nicecotedazur.org/habitat-urbanisme/r%C3%A9novation-urbaine/quartier-des-moulins

[32] http://www.nicecotedazur.org/actualite/2017/10/27/recyclerie-dans-le-quartier-des-moulins-%C3%A0-nice.

[33] http://www.nicecotedazur.org/uploads/media_items/plaquette-monitoring-urbain-environnemental-2017.original.pdf. / http://www.nicecotedazur.org/habitat-urbanisme/r%C3%A9novation-urbaine/quartier-des-moulins

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Non-profit organizations are actively providing social assistance to inhabitants with special needs, including children or men and women of migrant backgrounds. Association ADAM (Aide aux Devoirs Animations des Moulins) helps through social meditation when problems in the district arise, offers administrative and employment assistance, helps children and youth in their studies and provides leisure activities, organizes events, workshops and trips to integrate families in the neighbourhood.[34] ADAM aims for identification and prevention of violent behaviours addictions among young people and cooperates with other non-profit organizations specializing in these issues. The association has also launched local participation fund allowing residents to propose their own local initiatives and have them financed. Association Elles des Moulins offers literacy and French as foreign language courses to increase chances of migrants for integrating into French society, acquiring further education and finding employment. It also coordinates workshops in theatre, IT, gymnastics, traffic laws, cooking, and sewing[35]. The association pays a special attention to building good relations between mothers and children, helping children experiencing difficulties at school, providing information sessions about school system, and organizing workshops during which mothers and children create art works together and improve their communication.

Connected smart city

Having numerous smart city projects carried out in its territory, Nice is trying to bring together large companies, SMEs, start-ups, academia and research institutes for closer collaboration. For this purpose Metropole Nice Côte d'Azur and Nice-Sophia Antipolis University jointly developed the Mediterranean Institute for Risk, Environment

[34] https://www.associationadam.fr/

[35] https://sites.google.com/site/ellesdesmoulins

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and Sustainable Development (IMREDD) as an innovation incubator for experiments and technological demonstrations, as well as training centre offering master and diploma courses in areas related to sustainable and smart urban development. The institute focuses on areas such as: smart district/building and energy, water cycle and environment, risks management, smart and sustainable mobility.

Within the framework of IMREDD, Metropole Nice Côte d'Azur and Nice-Sophia Antipolis University opened Smart City Innovation Center as a collaborative platform concentrating industrial, education and research partners and building synergies between their innovation efforts. The Smart City Innovation Center has a 300 m^2 showroom, which permits real-time visualizations of the data stored in the Intelligent Operations Center of the Nice metropolitan area, several urban labs, and in 2018 will be equipped with an R&D Display and Testing Center to test urban development ideas in real-life conditions.[36]

Regarding smart city experimentation, in 2013 Nice cooperated with CISCO on development of various new services based on Internet of Things and 200 sensors deployed along the Boulevard Victor Hugo. The project named Connected Boulevard (Boulevard Connecté) tested, for example, smart parking system (information on free spaces checked via smartphone and payment done remotely), public lighting adjusting according to the presence of passers-by, optimized waste collection (sensors measured the level of waste and collection routes were changed accordingly).[37] In the same year, Spot Mairie Virtual Town Hall booth was tested, where citizens can carry out various administrative procedures speaking to an onscreen call-centre operator.[38]

Métropole Nice Côte d'Azur has also established close cooperation with IBM on the development of urban hyper

[36] http://icapital.nicecotedazur.org/files/Library/Digital-Innovations-EN.pdf

[37] https://gblogs.cisco.com/fr/smartcities/quest-ce-que-le-projet-boulevard-connecte-a-nice/

[38] http://icapital.nicecotedazur.org/files/Library/Digital-Innovations-EN.pdf

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vision platform - Intelligent Operations Center serving as a big data warehouse and performing data analysis that would help to create new services and tools improving urban management. Analysts can use the real-time data collected through sensors and citizens reporting as well as historical data to create predictive models of road, water and energy use.[39] It also allows the city to act immediately and inform cities about potential risks. For example, data from various sensors, warnings and cameras installed to measure watercourses and river flows is centralized and then crossed with results obtained from mapping tools and other information collected by all departments concerned. Being well-informed makes decision making easier to improve risk prevention and ensure public safety. The city has also deployed smart application "Risques Nice" to alert citizens and allow them to report natural risks, provide photos and the geo-localization.[40]

In 2015-2017, Métropole Nice Cote d'Azur experimented with IBM program 'Capteurs Urbains Mobiles – Trafic' (Mobile Urban Sensors – Traffic).[41] Based on data collected from equipment installed on vehicles and analysed at SMAS (Smarter Mobility Analytics Studio), the city is provided with estimate of the average speed of vehicles, the number of vehicles on the roads and fluidity of traffic. The program can gather evidence for the impact of mobility measures like speed limits, speed bumps and roundabouts on behaviour of drivers. The first pilot phase covered the city of Nice and the Plaine du Var, but in 2018-2020 it will be extended to the entire metropolis. It is planned that future projects will focus on mapping congested and potentially hazardous areas, monitoring parking patterns and traffic flows, and providing citizens with real-time information on multimodal mobility options.

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[39] https://www-03.ibm.com/software/businesscasestudies/ph/en/corp?synkey=O805295Q20236N65

[40] http://icapital.nicecotedazur.org/files/Library/Digital-Innovations-EN.pdf

[41] http://www.nicecotedazur.org/environnement/monitoring-urbain/mobilit%C3%A9/v%C3%A9hicules-connect%C3%A9s

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The IBM mobility management program is one of the elements of the 'Environmental Urban Monitoring' demonstration project in the Plaine du Var, developed by Métropole Nice Côte d'Azur in partnership with IBM, Veolia, Orange, and m2oCity.[42] Under the project, 3,000 sensors have been deployed to collect and process environmental data (air quality, pollen levels, noise, water distribution and consumption, energy, traffic conditions, filling level of waste bins, public lighting, watering of green spaces). Data analytics helps to optimize public services, inform new public policies and the creation of smart applications. The city sees many benefits in the implementation of the project. For instance, it is expected that smart public lighting and its remote management will allow for 10% to 20% energy savings. Air quality and noise data will help in traffic management and progress monitoring of the Metropolitan Action Plan for the Improvement of Air Quality (PAMAQA) and the Environmental Noise Protection Plan. Intelligent waste management system will improve efficiency in waste collection and reduce lorry trips (thereby lowering CO2 emissions).[43]

Healthcare innovation ecosystem

Supporting innovation and aiming to provide better care for its aging population, Nice has been developing favourable ecosystem for designing and testing digital technology solutions in healthcare with an ultimate goal to become the European Healthy City. Building closer links between various actors in this strategic sector is backed by geographic policy of Nice that has contributed to creation of 'health cluster' in the eastern part of the city with many related facilities such as hospitals and research centres being located in the Pasteur district.

Among the key players in the area of health are the Centre Hospitalier Universitaire de Nice (CHU of Nice), the

[42] http://www.nicecotedazur.org/environnement/monitoring-urbain

[43] http://www.nicecotedazur.org/uploads/media_items/plaquette-monitoring-urbain-environnemental-2017.original.pdf

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Faculty of Medicine of Nice Sophia Antipolis University, as well as medical research institutes such as the Centre Antoine Lacassagne, Centre Méditerranéen de Médecine Moléculaire (C3M), the Institute of Research on Cancer and Aging in Nice (IRCAN), and the Inria Sophia Antipolis - Méditerranée Research Centre. There have been strong partnerships and joint medical projects including the university and hospitals in the city. It has been also of utmost importance to bring together organizations specializing in different areas of medical studies and other disciplines such as ICT.

27 Delvalle[44], established in 2015, combines the role of a hub, a start-up incubator and educational centre to raise awareness about new developments in the field of health. It was established on the initiative of the City of Nice, Métropole Nice Côte d'Azur, Center of Innovation and Health Application (CIU-Santé) and France Silver Eco (an association working on development of the 'silver economy'). The Center of Innovation and Health Application (CIU-Santé), located in 27 Delvalle, created Health Innovation Committee to give projects leaders an opportunity to present their innovative solutions in the presence of actors of the healthcare innovation ecosystem and receive recommendations on their proposals. Depending on their progress and needs, they are then accompanied by experts in the development of their projects.[45] Metropole Nice Cote d'Azur developed a business incubator for start-ups in the sector of health and digital technology. It offers co-working space, support services, and access to 27 Delvalle Living-Lab PAILLON 2020 for experimenting with and showcasing new technologies and solutions. [46] There have been six start-ups hosted in 27 Delvalle and the centre has partnered with 100 companies.

[44] http://delvalle.nicecotedazur.org/apropos/

[45] http://delvalle.nicecotedazur.org/offres/informations-reseaux/comite-innovation-sante/

[46] http://delvalle.nicecotedazur.org/offres/aide-aux-entreprises/hebergement-et-accompagnement/

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27 Delvalle's demonstration apartment equipped with numerous digital technologies and innovative systems is used to provide advice to users, their families, caregivers, and healthcare professionals and test new solutions, for example, for remote medical monitoring, fall detection and assistance in daily activities. The demonstration apartment is connected to a training room via cameras and microphones and can be used for simulation of everyday situations in the patient's home to make future healthcare professionals aware of difficulties the disabled and elderly may encounter. 27 Delvalle offered training sessions for healthcare professionals on the benefits of telemedicine and, in partnership with occupational therapy schools and nursing institutes, a training course on autonomy and healthy ageing for students. The centre regularly hosts events to raise awareness among different audiences, especially children and the elderly.[47]

More information:

Ville de Nice: http://www.nice.fr/

Métropole Nice Côte d'Azur: http://www.nicecotedazur.org/

Éco-Vallée: http://eco-vallee-nicecotedazur.fr/

Nice Convention Bureau: http://en.meet-in-nice.com/

Team Côte d'Azur: http://www.investincotedazur.com/

Chambre de Commerce et d'Industrie de Nice et Cote d'Azur: http://www.cote-azur.cci.fr/

Université Côte d'Azur: http://univ-cotedazur.fr/

[47] http://delvalle.nicecotedazur.org/projets/

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