



# ARCHITECTURE BRIEF REPORT





# ARCHITECTURE

## 01. CONTEXT

### 01.1 Rhône Alpes: industrial cities among mountains



Canopea® concept stems from the specific geophysical context of our region where land is scarce and expensive because of mountains and rivers. Lyon, Grenoble, Annecy-Chambéry are dense cities traditionally used to build six to eight storeys high buildings.

On the other hand, like 86% of French people, rhône-alpiens are dreaming of a single house in the countryside. They go far away in the valleys to get this ideal living conditions thus creating urban sprawl, huge traffic problems as well as pollution

### 01.2 Urban ecosystem

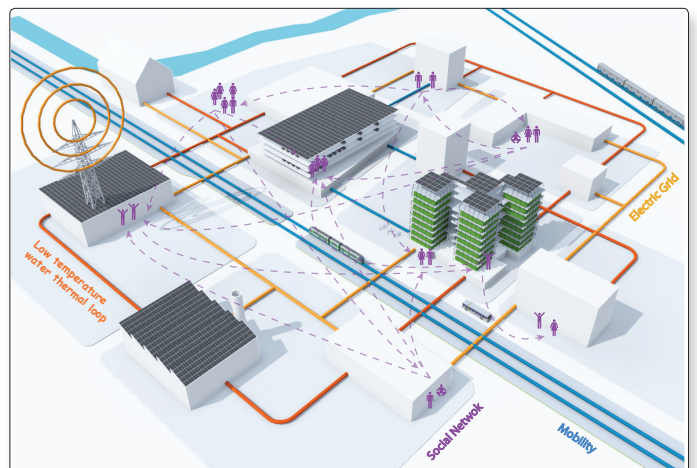
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For example, in a given perimeter, all buildings have a different energetic "signature" according to their function. Some activities are even producing energetic wastes that can be used by others. If these buildings are interconnected through smartgrids, a neighbourhood can be organised in such a way that the global balance of the whole is better than the sum of individuals.

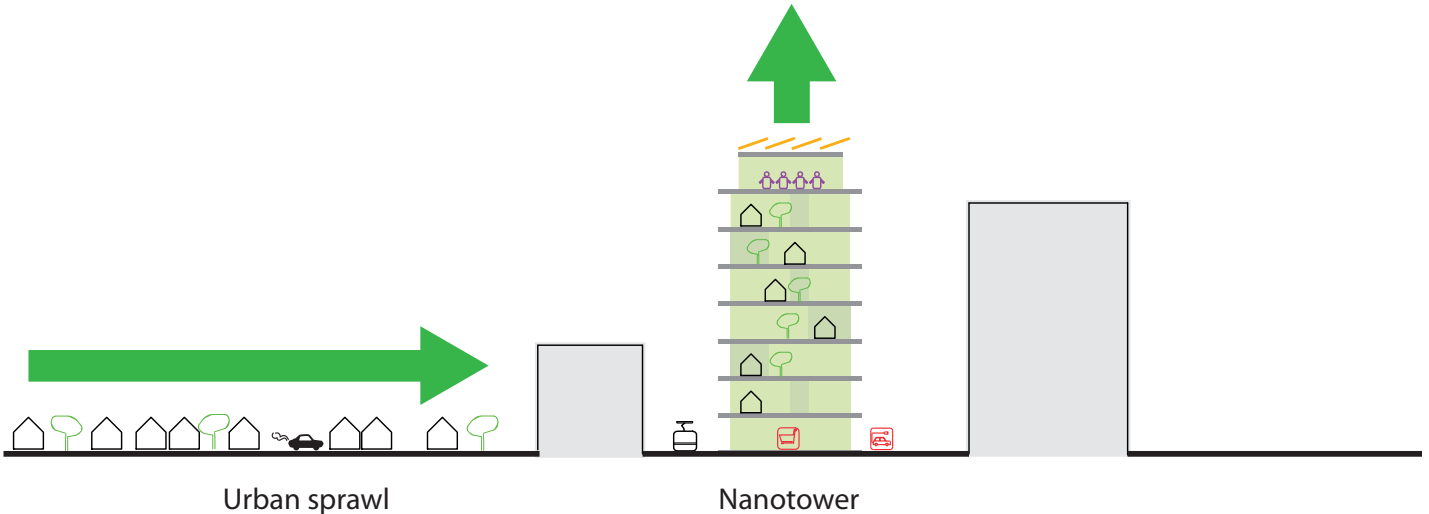
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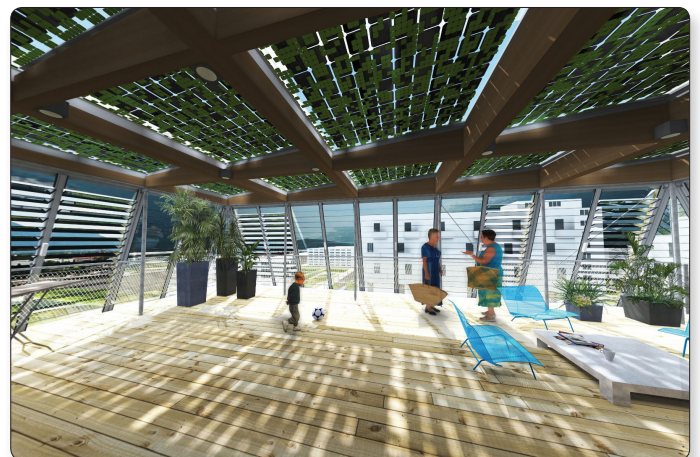
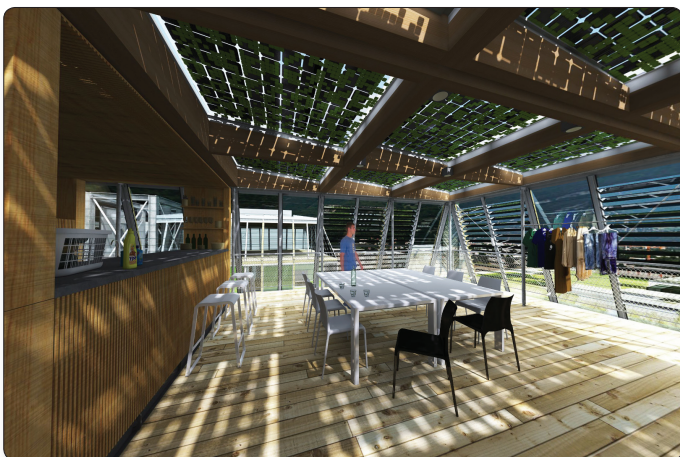


## 02. THE NANOTOWER CONCEPT



Our architectural proposal to achieve this goal is called a **NANOTOWER**. A nanotower is the piling up of seven single houses on a commercial basement, and topped with a common space. A nanotower shares an elevator shaft, a staircase and several connecting passageways with other nanotowers or with other traditional buildings. These common devices create a rich architectural "promenade" before going home. Garden boxes and storage boxes make the living units larger since these functions are externalised. Each living unit occupies a complete floor. You can take full advantage of the 360° view wide open on the surrounding mountains landscape. Peripheral catwalks allow you to go around your HOME. Exterior terraces are expanding interior living

spaces so that you feel like having a private garden. Neighbours are kept in a bearable distance. Privacy is preserved in a rather dense situation. Land cost is shared. Heavy duty mutualised equipments are installed in the basement along with commercial spaces. Offices can be rented at first floor... On the top floor, the common space embodies the Canopea® community spirit. Protected by the glass PV roofpanels this large open space can be a meeting room for family assembly, a protected playground for kids, a summer kitchen for barbecues, a shared laundry room and a space to hang out the washing and let it dry naturally in the wind, a space where to share heart beating sport events TV retransmission...





# ARCHITECTURE

## 03. CANOPEA INTEGRATED IN GRENOBLE URBAN ECOSYSTEM



Canopea® project has been developed in the real environment of the New Peninsula urban project designed by Christian de Portzamparc for the City of Grenoble. Clusters of several nanotowers are taking place among new constructions in order to create an architectural diversity in the open blocks.

**The SDE 2012 Canopea® prototype presents the top apartment and the top common space of one of the nanotower.**

Canopea® addresses also the issue of urban farming. In the middle of the block a vertical farm produces fruits and vegetables according to biological standards. The farm is able to produce enough food for all nanotowers' inhabitants.





## 04. MODULAR HOMES

On each floor Canopea® offers a 69 sq.m apartment that presents all qualities of a single house. Space is organised around three "boxes" containing specific functions:

- **A prefabricated core** containing all fluids and technical systems (kitchen, bathroom, tech-room).
- **A master bedroom box** offering a "cocoon-earth" ambiance to sleep in (bed, built-in cabinet, earth-plastered walls).
- **An extra flexible space** which dimensions can be adapted according to the displacement of a movable piece of furniture. This extra room can be used as a TV room, an office or an extra bedroom for friends... It can become a permanent bedroom for new parents or disappear to merge the kitchen and the living room in a large and fluid open space perfectly suited for parties.

Other combinations of apartments are possible:

- Two storeys can be used to organise a duplex four bedroom apartment combined with a studio.
  - Two studios can be layed out on the same floor...
- The nanotower concept is highly adaptable to different spatial conditions in order to create social diversity.

All cores are stacked vertically in order to facilitate pipes and ducts transit. Each tech-room is accessible from the exterior passageways so that maintenance does not interfere with private life.



### INNOVATIONS

- **Social mixity and bearable urban density:** Canopea® program is based on a mixity of uses and functions that create an urban biodiversity ensuring sustainability at the city scale.
- **Innovative architectural type:** a nanotower is a stack of individual housing units providing spatial qualities close to those of the single house (outdoor extensions of indoor living spaces; peripheral walkways allow people to go around their home, 360° view in all directions, one apartment per floor, individual privacy in a dense urban environment) while taking advantage of city facilities (schools, health and daycare centres, public transportation systems, shops and public spaces...)
- **Interior space flexibility** due to movable furniture block allows people to take advantage of multiple spatial configurations (from Raumplan to Free Plan).
- **Common space:** a specific space provides a sense of community and complete the apartments' functions.
- **Integration of urban agriculture** in the project. Vertical farms in the middle of each open block.



# SOLAR DECATHLON EUROPE MADRID

# 20 12

CANOPEA<sup>®</sup>  
NANOTOWERS  
IN THE CITY



## Villa Solar Documentation Engineering & Construction Brief Report Team Rhône-Alpes



# ENGINEERING & CONSTRUCTION BRIEF REPORT

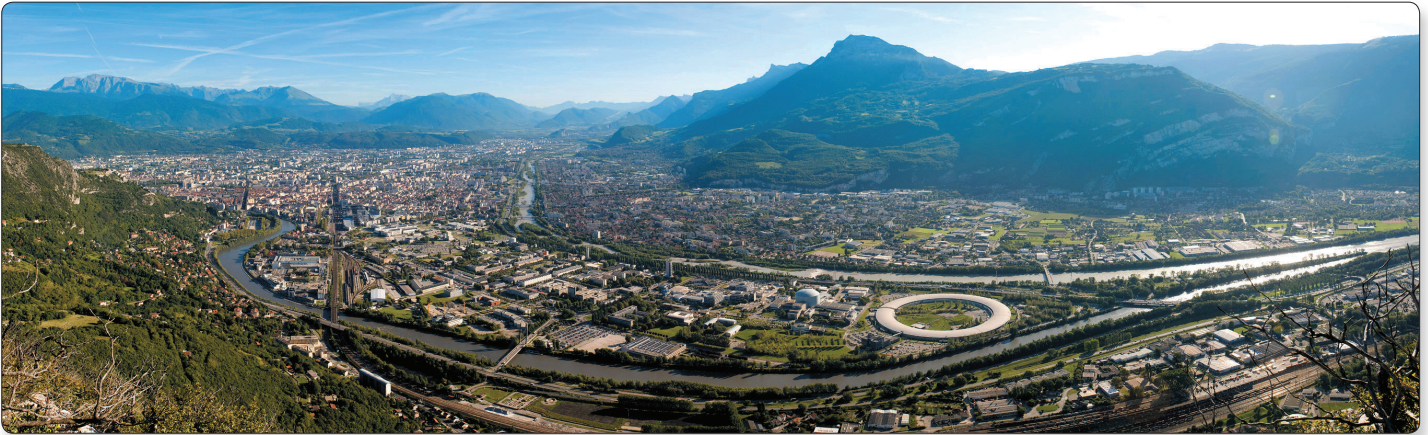




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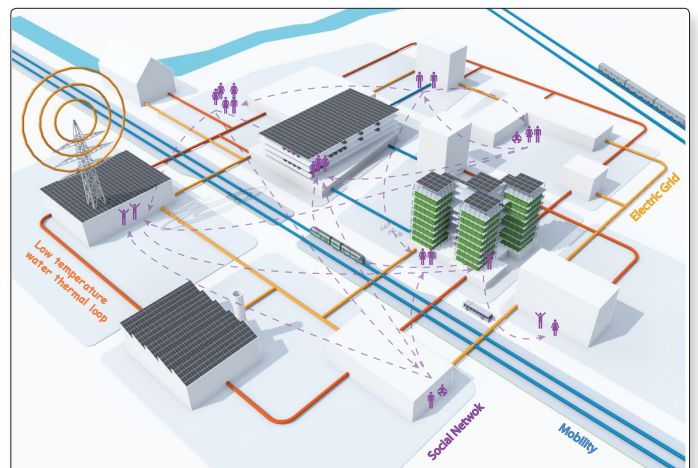
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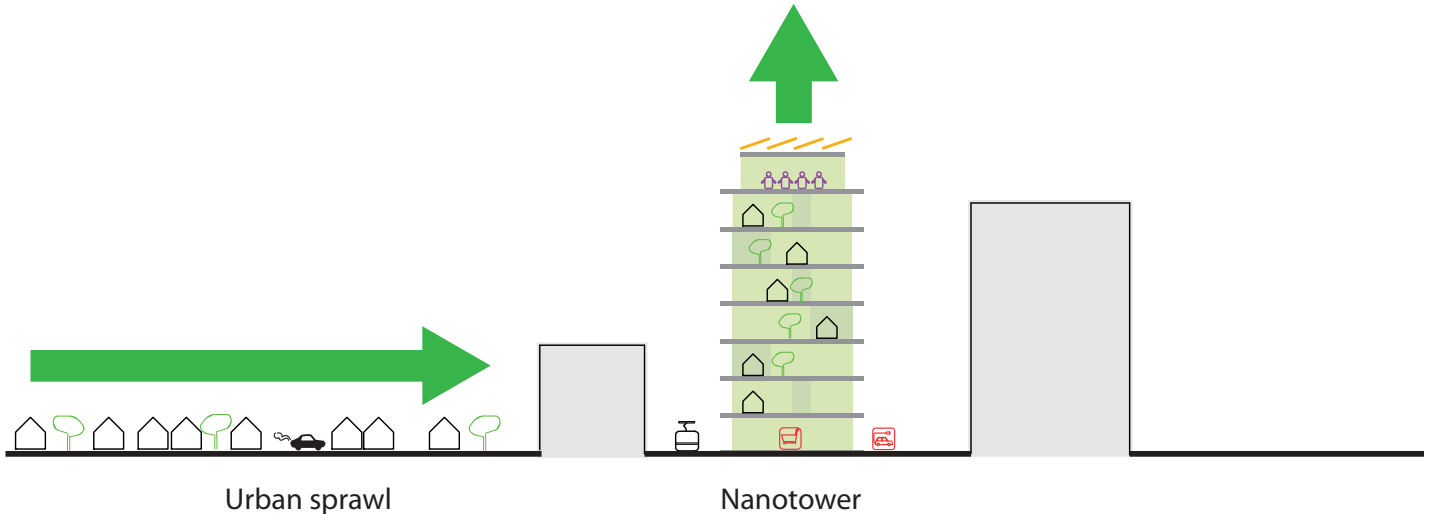
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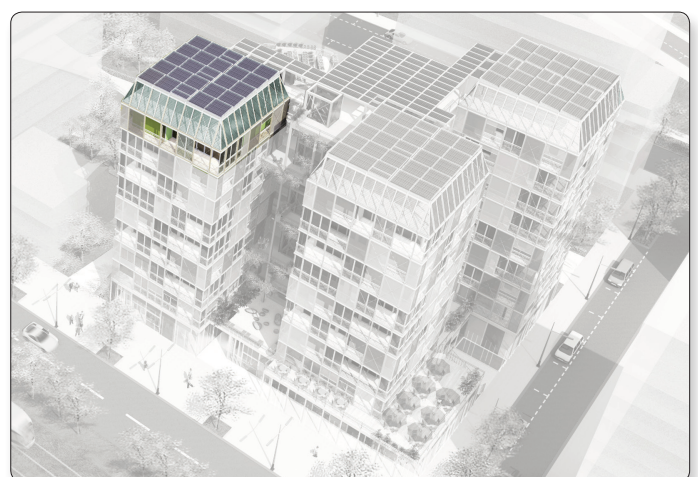
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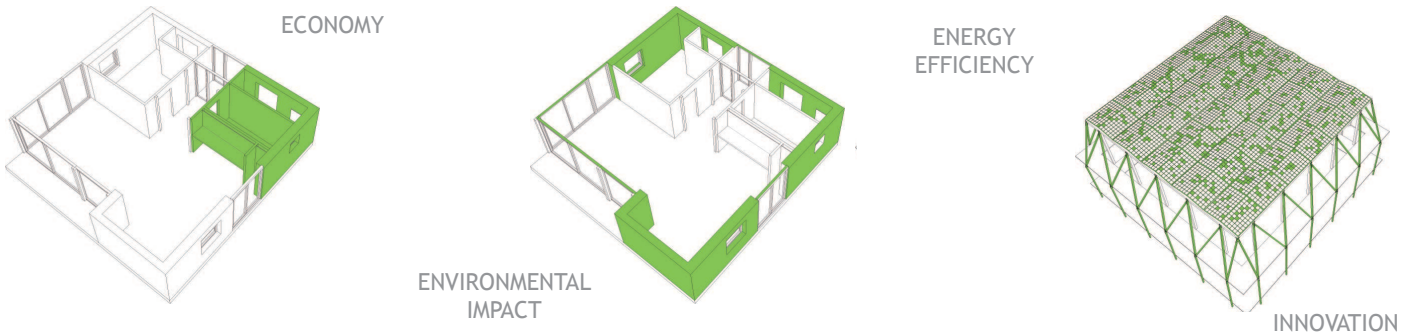




# ENGINEERING & CONSTRUCTION

## 03. QUICK TO BUILD EFFICIENT & SMART SOLAR HOMES

### 03.1 Core/skin/shell assemblage



#### CORE

Compact prefab block containing all technical equipments. Can be industrialised in order to limit assembly phase on site and to simplify fluids and structure interfaces.

#### SKIN

High performance thermal envelope. Defines the tempered zones of the housing unit. Can be realised with local materials and prefab elements by local companies at controlled costs.

#### SHELL

Additional exo-structure supporting photovoltaic panels and solar protections. Tailored production with CNC process by Rhône-Alpes steel and wood building companies.

*Canopea® constructive system: CORE/SKIN/SHELL decomposition principle*

### 03.2 Key features & Innovations

#### Constructive systems and structure

##### Production process adapted to French

**building industry:** industrialised CORE / locally produced SKIN / tailored prefab SHELL.

- *Dry assembly process* : reduction of assembly time on site and limitation of environmental impact of the construction phase.

**Mixed structure metal+wood:** peripheral steel structure holding large span wood slabs.

- *Compliance with medium seismic conditions.*
- *Free floor plan for housing.*

##### Use of natural materials:

- *Earth plaster on interior partition walls.*
- *Heated wood sidings and exterior deck flooring.*

#### Passive strategies - Architecture and systems

**Bioclimatic design:** Canopea® thermal envelope provides high insulation performances.

- *Thin envelope: net floor area/gross floor area good ratio*
- *Bioclimatic openings repartition: natural lighting from four directions.*
- *Various solar protections: mobile or fixed, allow to regulate external gains and comfort.*
- *Four sides orientation: natural cross-ventilation*
- *Multiple buffer spaces (top floor, south winter garden...) reducing the indoor/outdoor temperature difference.*
- *Low inertia for a quick thermal answer (inertia externalized in equipments).*
- **Passive equipments** : lower energy consumptions / global efficiency improvement.
- *Thermal air phase-shifter* : operating in the ventilation system, participating into heating/cooling needs coverage.
- *Power pipe* : free pre-heating of water.

# BRIEF REPORT

## HVAC systems

**Compact machine** : NILAN Compact P - JVP insures heating/cooling, ventilation and DHW production (4 in 1 compact machine):

- Good level of efficiency.
- Reduced footprint.

**Terminal units** : insure occupants comfort

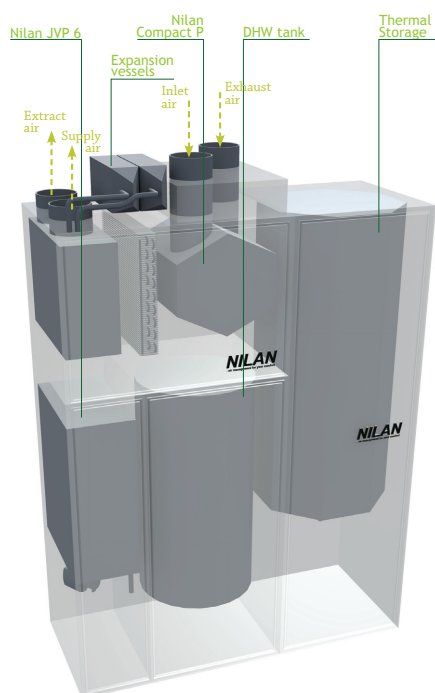
- Ceiling radiant panels for heating and cooling
- Ventilation : air blown in floor distribution ducts and extracted in ceiling.

**Cascading systems** : the repartition of systems between individual and collective scales takes into account efficiency and footprint to ensure inhabitants' comfort. The different levels of production allows to achieve global efficiency of installations.

**Metabolism systems** : innovative connections between equipments lead to a global efficiency.

**Regulation system** : flow and temperature sensors linked to smart regulation system.

**Environment integration** : HVAC installation is integrated into its urban environment (thermal water loop, resources...)



NILAN Compact P machine

## Photovoltaic plant (roof)

**Building integrated photovoltaic panels** : customized screenprinted glass-glass modules.

- Electricity production.
- Solar gains regulation.
- Canopy lighting ambiance on the top floor.

**Hybrid panels PV/T**:

- Electricity and thermal production, the hybrid character of the panel improves its efficiency.
- Part of the HVAC installation.
- Radiative cooling phenomenon valorisation for cooling through the JVP heat-pump.

**Electrical storage** : an inverter-charger allows to distribute electrical production either to electric cars' batteries located in the parking silo, either to internal consumptions, to storage batteries or eventually to the network.

- Power-capping capacity to limit demands on urban network during consumption peaks.

## Home automation system

**Building Management System** : equipments and systems control in order to ensure comfort, to improve global efficiency and to reduce energy consumption:

- Communication mode: KNX network.
- Available on a touchpad in housing units with an easy access interface.
- Advisory role to empower and to guide occupants to energy sobriety.

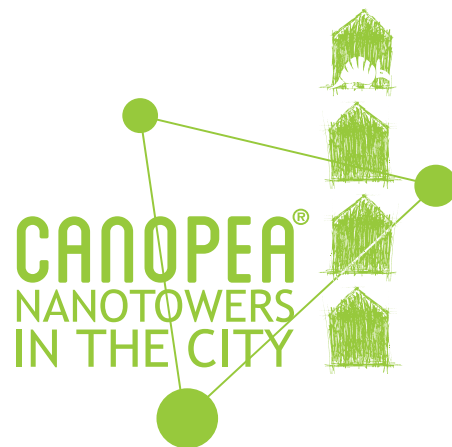


Canopea® home management system interface





# ENERGY EFFICIENCY BRIEF REPORT





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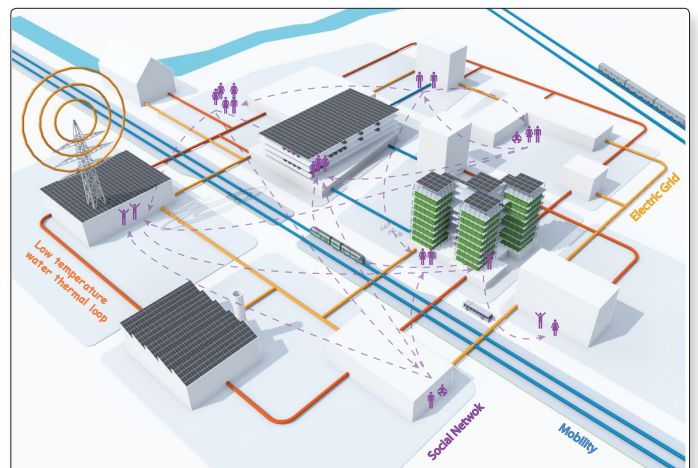
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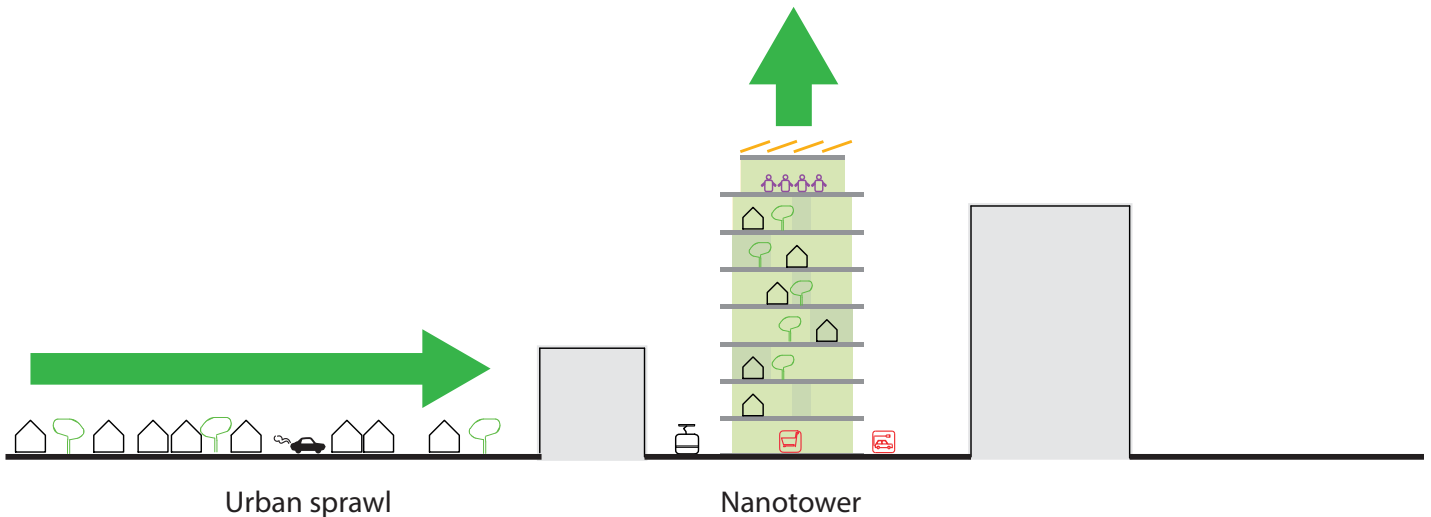
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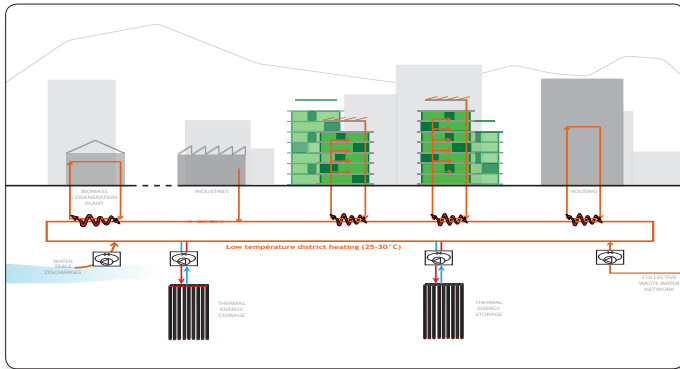
**The SDE 2012 Canopea® prototype presents the top apartment and the top common space of a nanotower set in Grenoble Peninsula.**





# ENERGY EFFICIENCY

## 03. CANOPEA IN GRENOBLE PENINSULA NEW ECODISTRICT



*Thermal smart grid*



*Electrical smart grid*

Canopea® nanotowers are set in the ecosystem of Grenoble Peninsula new urban development. The project addresses energy issues such as the lack or the disparity of resources and the over-sizing of network production equipments because of consumption peaks. To answer these problems our goals are to **reduce consumption** by reducing needs and **mutualising** production installations, and to limit network consumption peaks by **shifting** our internal demands.

To reach these goals, nanotowers are designed as **high performance passive constructions** following bioclimatic principles. The urban layout, the architectural design and the high performance thermal envelope technologies allow to maximize solar gains in cold season, while limiting them during the warm season with efficient mobile and fixed solar protections as well as natural cross ventilation. To complete this passive approach our energetic active strategy is based on the mutualisation of as many equipments as possible. Then the project is based on a **cascading organisation of active equipments**.

Grenoble Peninsula New Ecodistrict environment provides a low temperature (25°C) thermal loop accessible as a media for in/out energy exchanges. Canopea® uses this water loop as a key source for heating/cooling needs coverage and sanitary hot water production. Active systems of the tower (technology and repartition) have been determined after considering this energy environment. The



*Nanotower - Equipments repartition*

project defines collective equipments placed in the basement and individual ones placed in each home. The district is also equipped with electric smartgrids connecting buildings to the local (GEG) and the national (EDF) electric networks. The PV production plant (BIPV and PV/T panels) located on the roof of the nanotowers takes part in this grid.

## 04. ENERGY STRATEGIES AND SYSTEMS

### Energy strategies

**Environment integration:** HVAC installation is integrated into its urban environment (thermal water loop, resources...)

### Seasonal strategy:

- Limited heating needs due to low thermal losses through the high performance thermal envelope.
- Efficient cooling strategy thanks to efficient equipment and solar protections.
- PV plant optimized for summer production.

**Phase-shifting strategy :** limits instantaneous consumptions on urban network during consumption peaks.

- Thermal storage tank.
- Thermal air phase-shifter (ventilation system)
- Electricity storage : PV production stored in batteries for consumption peaks power-capping.

**Exergy and losses valorization:** energy is also considered through its quality. The objective is to use any source of energy until its exergy is not null, losses of a system can be a resource for another.

**Cascading systems:** HVAC installations are designed on different levels of production for a global efficiency. Repartition of systems between individual and collective scale takes into account efficiency and footprint to ensure inhabitants comfort.

**Metabolism systems:** innovating connections between efficient equipments lead to a better global efficiency

**Regulation system:** flow and temperature sensors permit to know instantaneous systems' status. A smart regulation system collects these datas to make the best combination choice for energy efficiency, sobriety and occupants awareness.

**Building Management System:** each home is equipped with a BMS allowing to pilot interior comfort conditions through a tactile tablet.

### Passive strategies - Architecture and systems

- **Bioclimatic design:** Canopea® thermal envelope provides high insulation performances: **U<sub>bat</sub> = 0.20 W/(m<sup>2</sup>.K)**

- Thin envelope: net floor area/ gross floor area good ratio.
- bioclimatic openings repartition : natural lighting from the four directions, various solar protections, four sides orientation for natural ventilation, multiple buffer spaces.

- low inertia for a quick thermal answer.

**Passive equipments:** lower energy consumptions while improving global efficiency (thermal air phase-shifter, power pipe).

### HVAC systems

**Ventilation:** ( + part of heating/cooling)

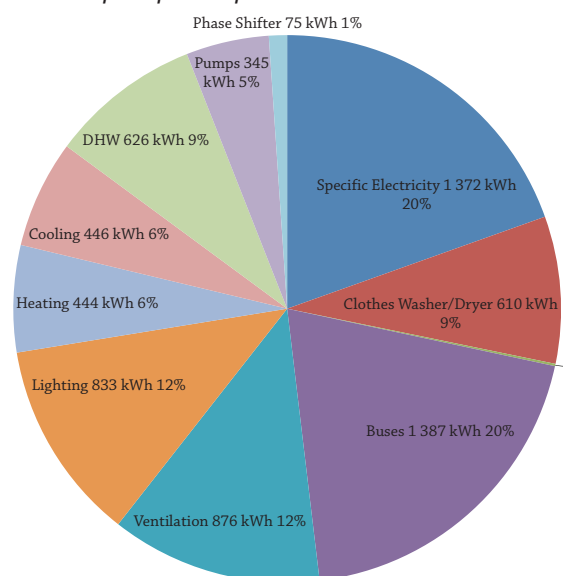
- Thermal air phase-shifter + Compact P : air/air heat pump combined with counter current air exchanger.
- Distribution : air blown in floor distribution ducts, extracted in ceiling.

**Heating/cooling:**

- Collective storage tank connected to the collective water/water JVP heat pump + mixing bottles.
- Terminal unit : radiant ceiling panels.

**DHW production:** 3 levels of heating.

- Power pipe on grey water (passive system).
- Collective storage tank connected to the collective water/water heat pump JVP.
- Individual storage tank connected to the individual air/air heat pump Compact P.



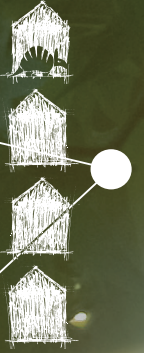
Annual consumption repartition Madrid



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Deliverable #3  
Design Development  
PR#3, PM#3, PD#3  
workshop documentation  
september 14-2011

Deliverable #6  
Design Adjustments  
Documentation  
PR#6, PM#6, PD#6  
Villa Solar documentation  
audiovisual 2, approval documents  
august 14-2012

Deliverable #2  
Dissemination Material  
model, webpage,  
audiovisual  
1 april 13-2011

Deliverable #4  
Construction  
Documentation  
PR#4, PM#4, PD#4  
february 8-2012

Deliverable #5  
Updated Construction  
Documentation  
PR#5, PM#5, PD#5  
may 23-2012

Deliverable #1  
Schematic Design  
Documentation  
PR#1, PM#1, PD#1  
preliminary web-page  
march 02-2011

Deliverable #7  
As Built Documents  
PR#7, PM#7, PD#7  
Simulation input report  
november 17-2012

# SUSTAINABILITY BRIEF REPORT

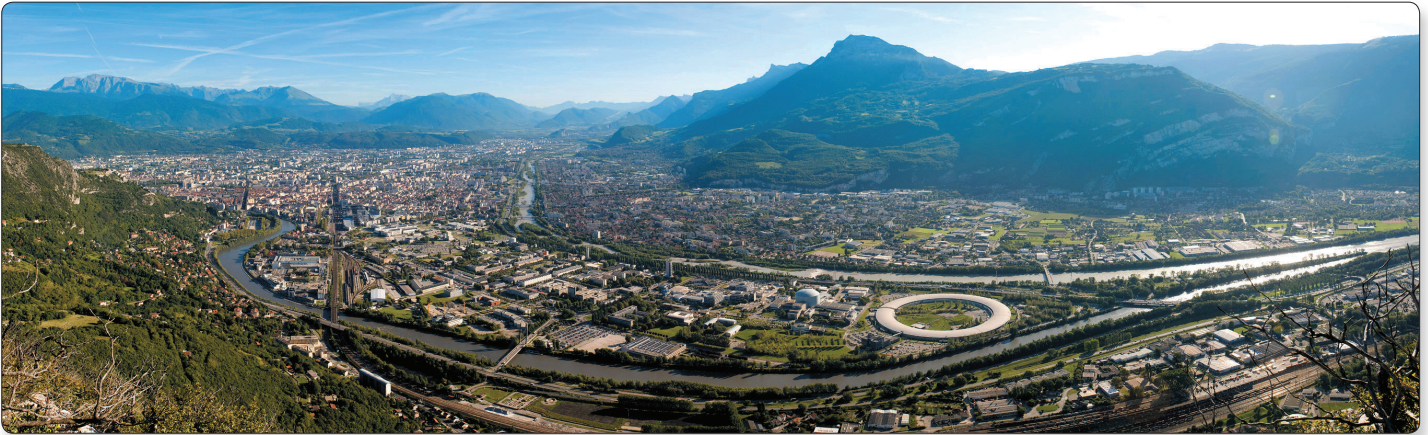




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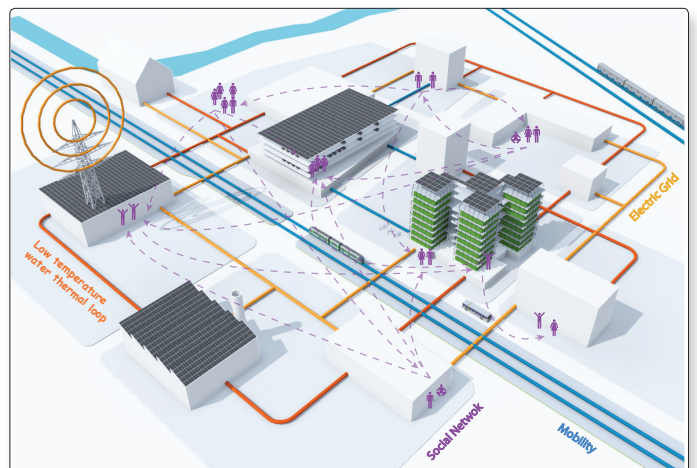
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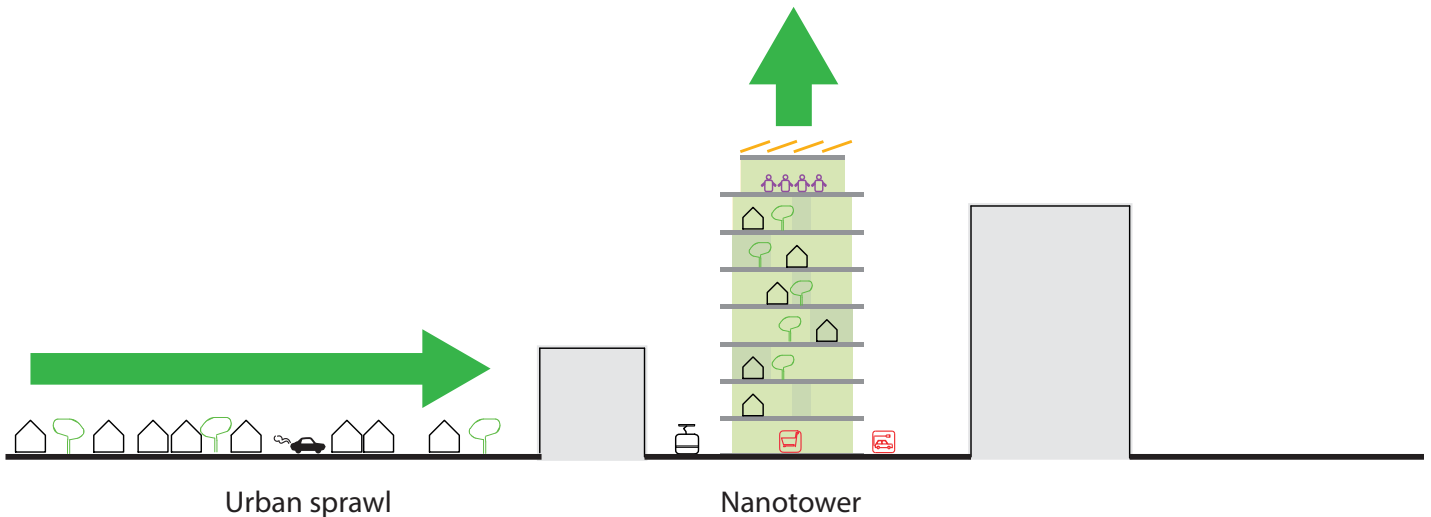
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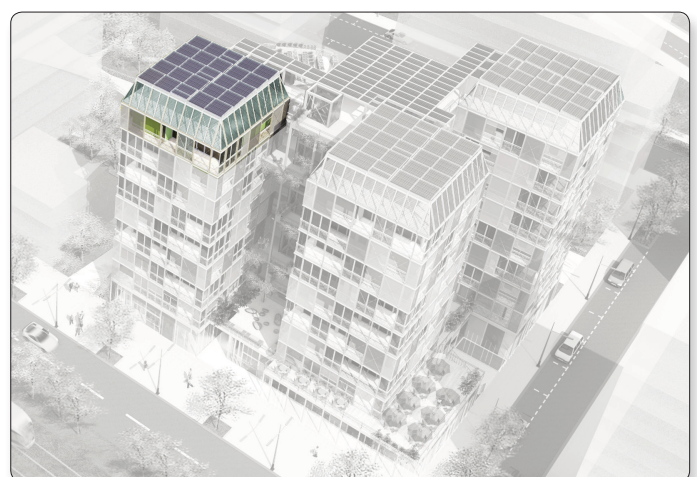
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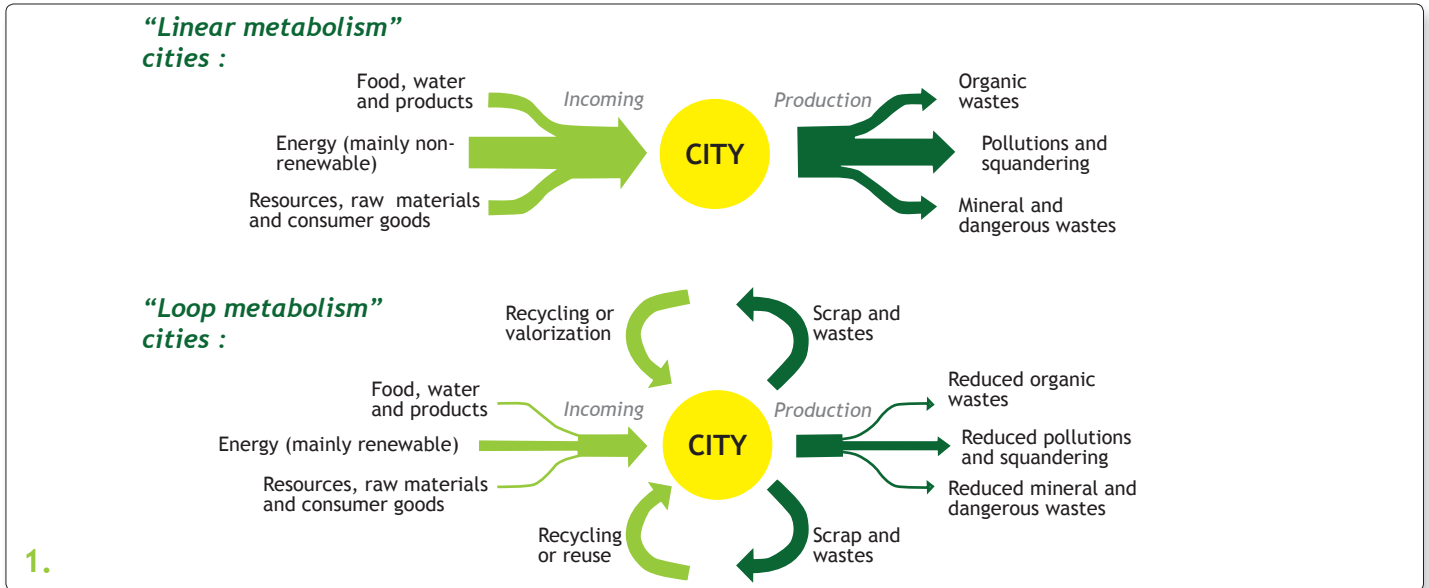
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# SUSTAINABILITY

## 03. A TRANSVERSAL APPROACH OF SUSTAINABILITY



Urban growth is a major issue and we think it's a priority to address the issues of density and sustainable development of our cities. The overall Canopea® sustainability concept incorporates the principles of **urban metabolism (Image 1)**. Cities with a *linear metabolism* tend to continually increase their scope, consume, squander and pollute widely. They depend on an increasingly broader territory to supply resources and energy. In opposition to this linear development mode, cities with a loop metabolism are characterized by the **reduction of their consumptions** and the **optimization of recycling/reuse of resources and wastes**. They preserve fossil energies and promote the renewable sources of energy. The Canopea® concept integrates sustainability as a key-element of design, whatever the working scale. This concept of urban metabolism requires a systemic approach and therefore an holistic vision which made us working about the global energy strategy and urban planning as well as issues related to the bioclimatic design of the project, the choice of eco-efficient materials, conducting a detailed assessment of energy footprint and the development of strategies to save water and manage wastes (rain water recovery and reuse, compost and sorting...) which are fully presented in the Sustainability Report. Thanks to a bioclimatic design and efficient semi-passive systems (thermal air phase shifter), the energy consumption of the apartment are

drastically reduced. At the urban scale, the use of energetic smart-grids (thermal and electric) allows energy pooling. Just like in loop-metabolism cities, the functional diversity of the district (different energy signatures) allows interactions between buildings (valorisation of industries thermal wastes through the thermal district loop, repartition of the PV production...) which are achieved by a certain urban density/intensity: **a home in a Nanotower uses 11 times less land than a single house**. According to the urban metabolism principles, the materials used to build the prototype were chosen for their **recycled content** (cellulose wadding, OSB...) or their ability to be **easily recycled or valorized** (glass, steel, wood...). We also privileged the natural and bio-sourced materials (carbon sink capacity of wood) and as much as possible. We chose **local materials and local industries** in order to avoid unnecessary transport (earth coating, alpine wood cladding). We favour a dry assembly system in order to reduce the amount of construction waste, save water, and reduce the on-site building duration. We also evaluated our materials choices with LCA studies and estimated the embodied energy level of the materials used (both for the prototype and for the urban project: **Image 2**). Given the complexity of the topic, thinking about housing or cities of tomorrow sustainability requires **a global thinking about the way we inhabit our environment**. **Image 3** compiles the results presented in the Sustainability Report and

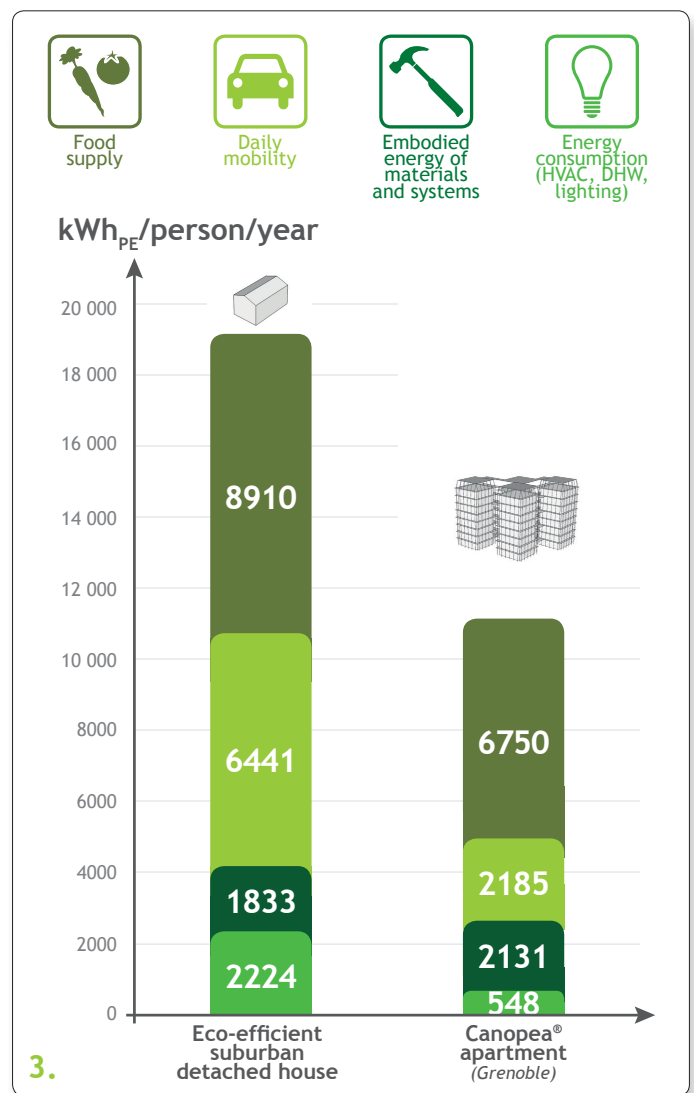
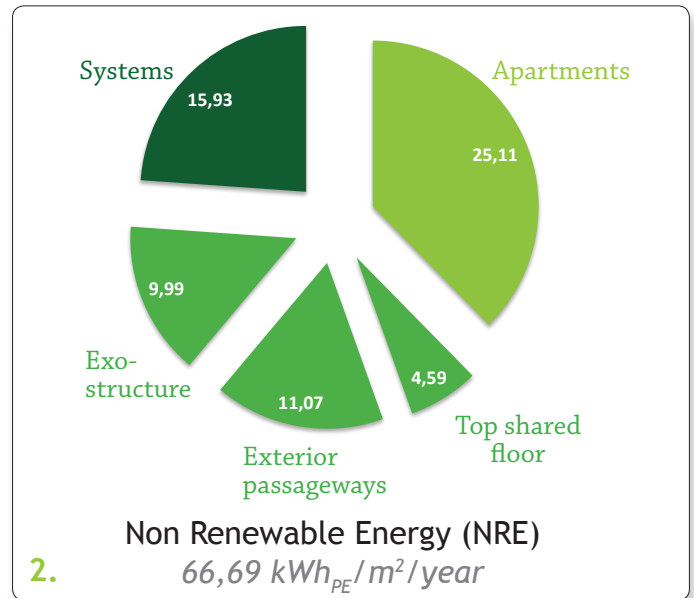
# BRIEF REPORT

compares the environmental footprint (energy) of a Canopea® apartment with a suburban eco-efficient detached house. Indeed, the Canopea® project is an urban alternative to scattered detached houses by keeping some of its qualities. Our approach is not limited to a low consumption level for heating and cooling. Beyond the embodied energy of the materials, the urban dimension of the Canopea® project led us to **extend our study scope and to take into account the mobility and the food chain issues**.

Nanotowers' inhabitants can recycle their organic wastes by composting: the aim is to provide natural fertilizer for vertical farms located at the centre of the urban block. The watering of these urban farms is done with collected rainwater. The agricultural production is directly sold on-site to the customers in order to **reduce transport, retail and packaging energy expenses**. The drastic reduction of transportation needs (functional diversity in the district, efficient public transportation network, electrical car-sharing, segways and electrical bikes rental...) allows a huge reduction of energy expenses and pollution related to mobility: they are **nearly divided by 3**. Contrary to suburban detached house inhabitants, the Canopea® residents are not car-dependent. They save time (no more traffic jams), they have a lower mobility budget and they **significantly reduce their fossil fuel consumption and their GHG emissions**.

Through Canopea® project, it is **a whole way of life and a certain idea of tomorrow society** that we propose.

Moreover, Canopea® sustainability strategy cannot be reduced to saved kWh. There are more qualitative aspects that cannot be quantified. For instance the exterior spaces bring a real comfort and a quality of life to the apartments (even if they penalize the embodied energy assessments). The flexibility of the dwelling and of the top shared floor, the easy maintenance, the proximity of city services, the easy access to public transportation, the 360° views over the mountains, the four orientations and the development of social sustainability through the creation of an interactive social network: all this aspects contribute to the inhabitants comfort and therefore directly contribute to the sustainability of the apartment. Although this cannot be shown in energy or economy assessments, the **inhabitants comfort and the quality of life** are the very centre of the Canopea® project.







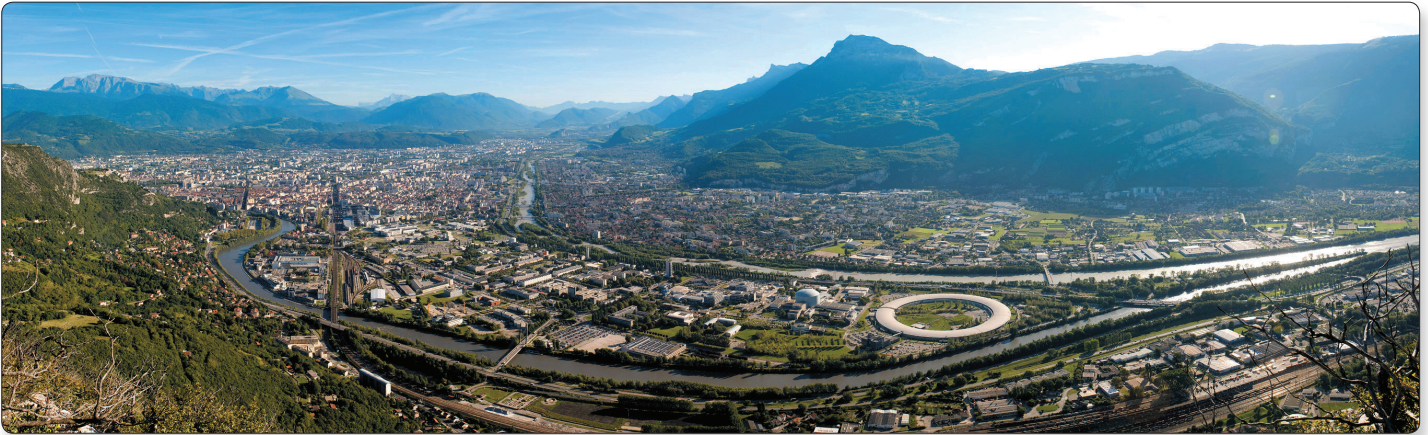




# INDUSTRIALISATION & MARKET VIABILITY

## 01. CONTEXT

### 01.1 Rhône Alpes: industrial cities among mountains



Canopea® concept stems from the specific geophysical context of our region where land is scarce and expensive because of mountains and rivers. Lyon, Grenoble, Annecy-Chambéry are dense cities traditionally used to build six to eight storeys high buildings.

On the other hand, like 86% of French people, rhône-alpians are dreaming of a single house in the countryside. They go far away in the valleys to get this ideal living conditions thus creating urban sprawl, huge traffic problems as well as pollution

### 01.2 Urban ecosystem

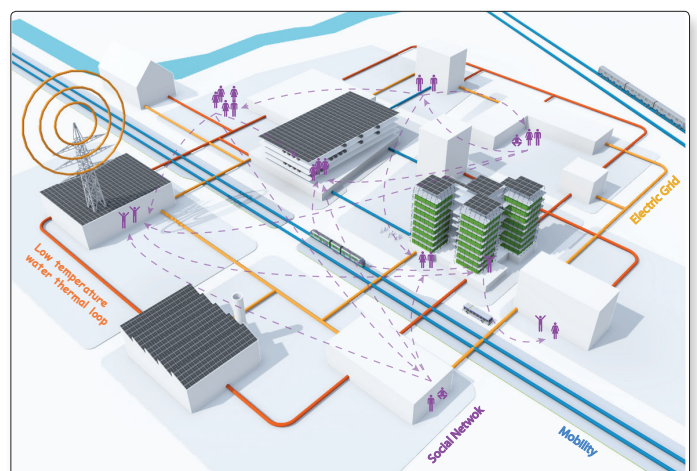
We consider the urban territory as an ecosystem in which space, infrastructure, land, energy and resources can be mutualised in order to achieve a global sustainability.

For example, in a given perimeter, all buildings have a different energetic "signature" according to their function. Some activities are even producing energetic wastes that can be used by others. If these buildings are interconnected through smartgrids, a neighbourhood can be organised in such a way that the global balance of the whole is better than the sum of individuals.

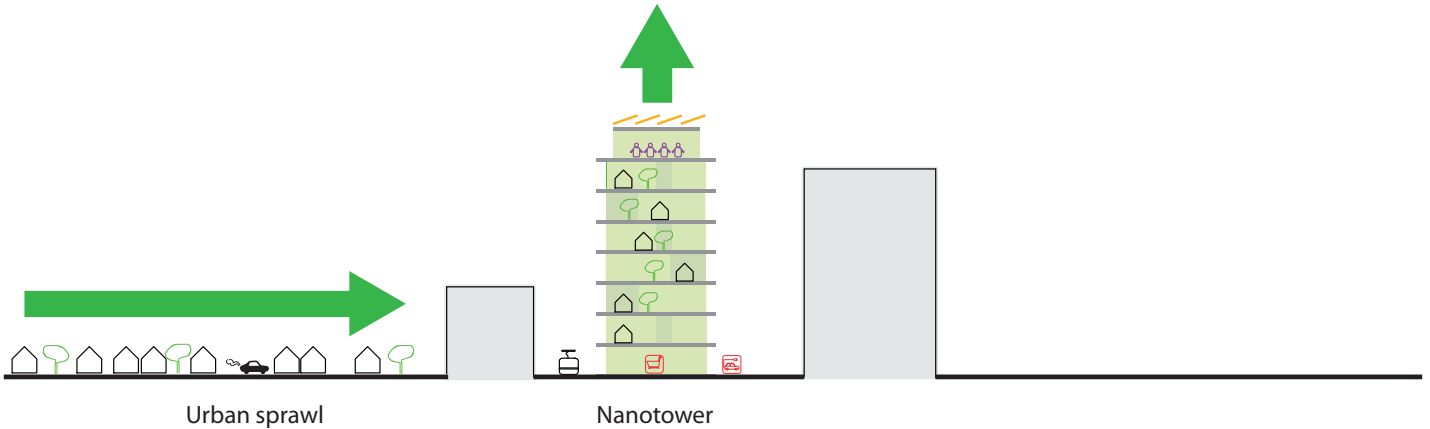
This is also true for transportation systems and social networks. Therefore Canopea® proposes a project of collective apartment building integrated

peaks. Team Rhône-Alpes has chosen to address this issue. Our research aims at finding architectural solutions for a comfortable and sustainable vertical density... How can we live together with a sense of community while feeling at home just as if we were living in a single house? How can we have easy access to urban services and cultural facilities without driving too long and still feel in a rich and natural spatial "milieu"? What kind of city can achieve this feeling? What architecture results from this spatial agenda?

in an urban ecosystem organised around the mutualisation of infrastructures and equipments as well as the sharing of land and space.



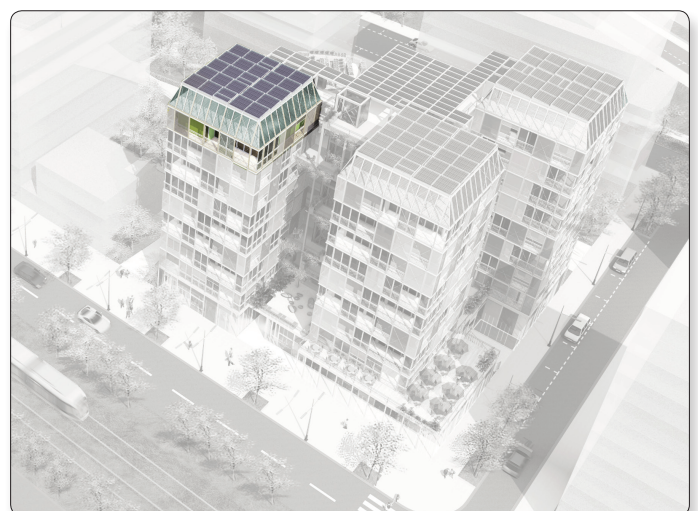
## 02. THE NANOTOWER CONCEPT



Our proposal to achieve this goal is a **NANOTOWER**. A nanotower is a small tower (less than 28m high) piling up seven single houses on a commercial basement topped with a common space. A nanotower shares an elevator shaft, a staircase and several connecting passageways with other nanotowers or with other traditional buildings. Each living unit occupies a complete floor. You can then take full advantage of the 360° view wide open on the surrounding mountains landscape. Peripheral catwalks allow you to go around your HOME. Exterior terraces are expanding interior living spaces so that you feel like having a private garden. Neighbours are kept in a bearable distance.

Privacy is preserved in a rather dense situation. Land cost is shared. Heavy duty equipments are mutualised in the basement along with commercial spaces. Offices can be rented at first floor... On the top floor, the common space embodies the Canopea® community spirit. Protected by the glass PV roofpanels this large open space can be a meeting room for family assembly, a protected playground for kids, a summer kitchen for barbecues, a shared laundry room or a space where to share heart beating sport events TV retransmission...

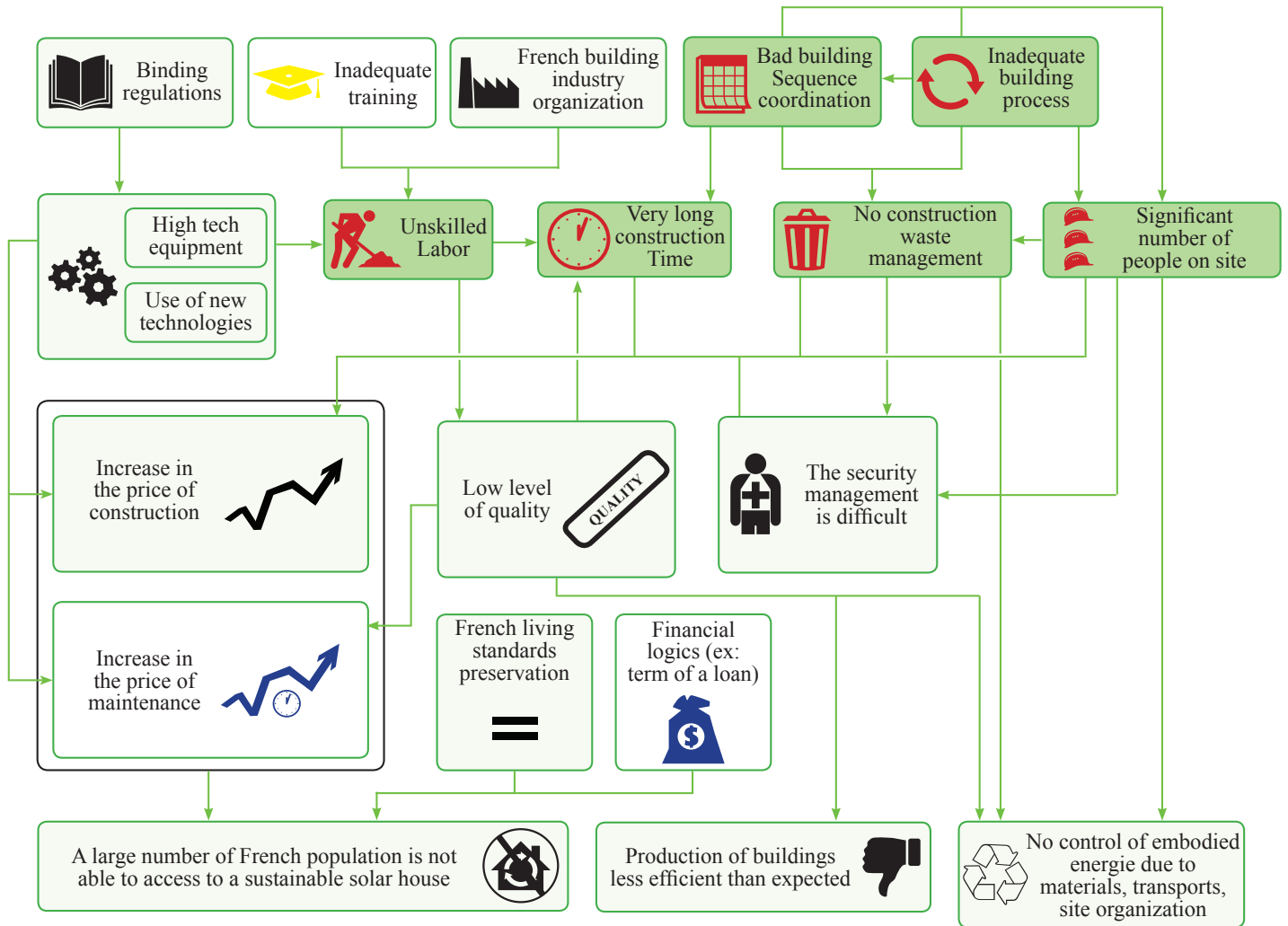
**The SDE 2012 Canopea® prototype presents the top apartment and the top common space of a nanotower set in Grenoble Peninsula.**





# INDUSTRIALISATION & MARKET VIABILITY

## 03. FRENCH BUILDING INDUSTRY CONTEXT



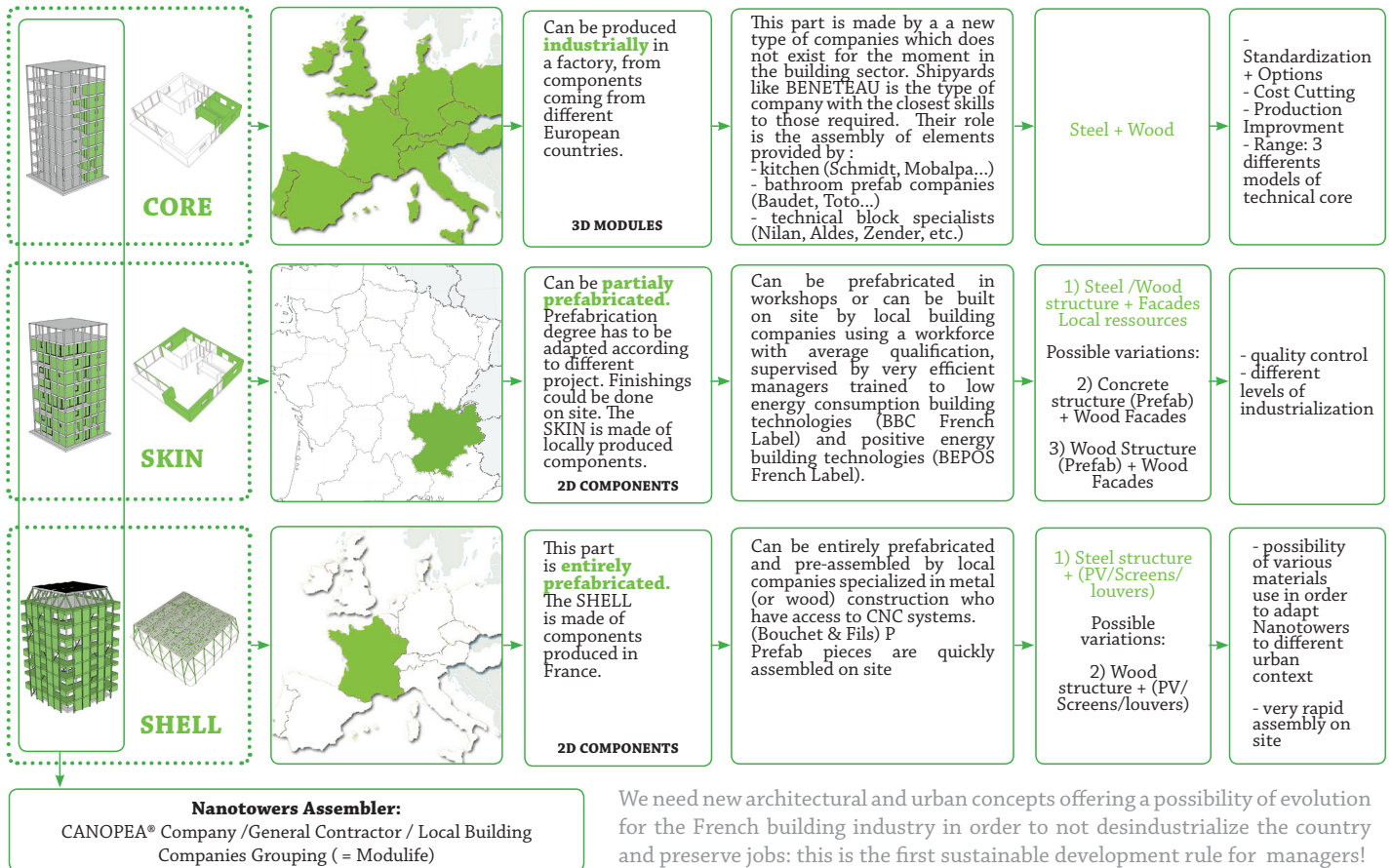
- Point amended by the logic of industrialization of Canopea®
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Canopea® project interferes with a French building industry context that needs a major organisation shift in order to meet sustainable development requirements. This shift implies important evolutions in management as well as the use of new constructive systems favouring prefabrication and dry assembly in order to improve quality control level and to lower construction costs.

Canopea® innovative constructive system follows a CORE/SKIN/SHELL decomposition principle. Put together, these three pieces made in very different ways, according to very different techniques, with

various knowhows and tools, enable us to build very quickly. The biggest part of the final cost being intimately related to labor cost, the quicker the assembly of the three pieces, the cheaper the house. These different parts are assembled on site mechanically. The idea is to mix high-tech and low-tech so that high performances standards can be reached and local jobs would be preserved. The industrialization process, interfere upstream on some key criterias in order to improve the functioning of the entire chain of the building industry.

## 04. CORE/SKIN/SHELL ASSEMBLAGE



### INNOVATIONS

#### A new urban deal for a new building industry opens new markets:

How to live together but separately? This is the question that we try to answer with Canopea® project for SDE 2012. In the market viability study, we interviewed professionals specialists of the eco-housing market in order to develop our project and verify its relevance. Pooling, sharing, mutualisation, living together, is sometimes hardly perceived in France... But the actual economical crisis pushes people forwards.

The real nanotowers programs that we are actually planning with some of our major partners in Lyon and Grenoble prove that we are able to position Canopea® on the actual market in the 1800€/sqm SHON to 2000 €/sqm SHON VAT free construction costs range.

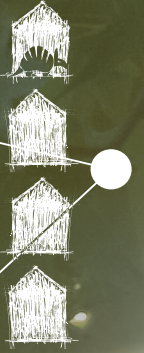
Today, we are selling the intellectual property of Canopea® concepts to developers. In the future, we want to develop our ideas about urban ecosystem, energy and mobility sharing but also about social connections between the inhabitants, and we shall create a company able to design, build and industrialize the nanotowers. In partnership with a network of professionals, this firm will sell the project to real estate companies and will control its construction costs thanks to the core-skin-shell principles. It can also position itself in the niche market of cooperative housing. **Canopea® project innovation is finally as social and spatial as technological.** Materials and technologies used in the project already exist. But it is the specific way we combine them and articulate them in a real ecosystem that makes the difference!



# SOLAR DECATHLON EUROPE MADRID

# 20 12

CANOPEA<sup>®</sup>  
NANOTOWERS  
IN THE CITY



## Villa Solar Documentation Communication & Social Awareness Brief Report Team Rhône-Alpes



# COMMUNICATION & SOCIAL AWARENESS BRIEF REPORT





# COMMUNICATION & SOCIAL AWARENESS

## 01. CONTEXT

### 01.1 Rhône Alpes: industrial cities among mountains



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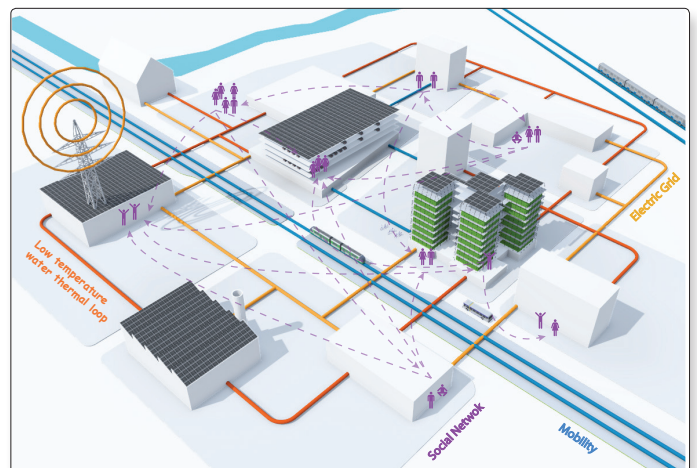
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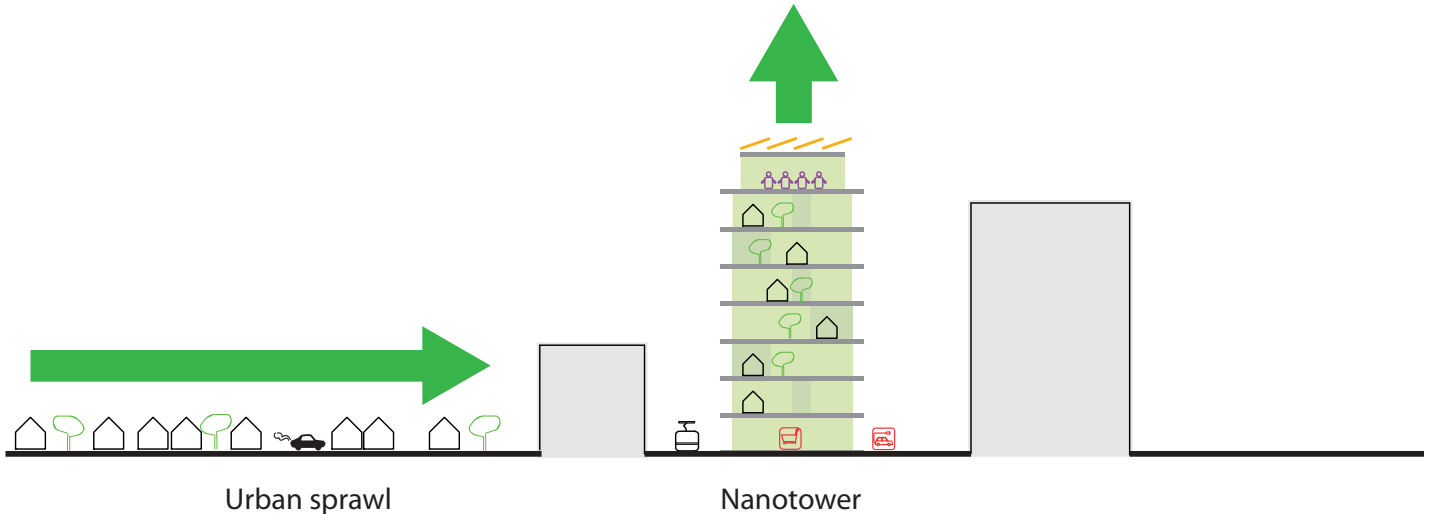
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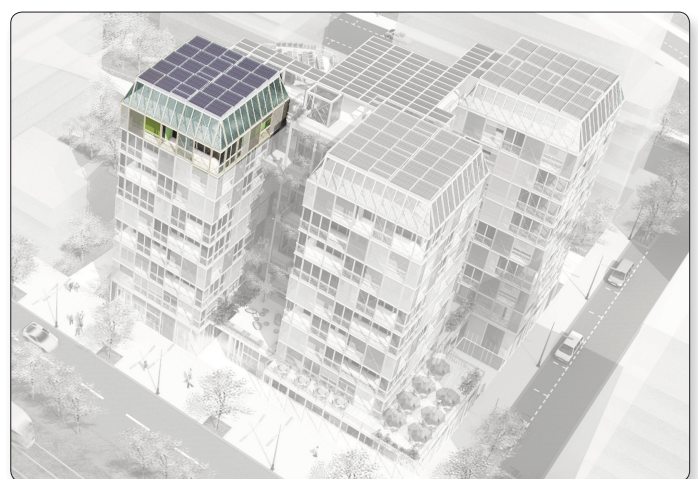
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**The SDE 2012 Canopea® prototype presents the top apartment and the top common space of a nanotower.**





# COMMUNICATION & SOCIAL AWARENESS

## 03. COMMUNICATION PLAN



**Since the beginning of the SDE 2012 competition, the main purpose of Canopea® project communication plan has been - and will be - to share these urban ideas.**

We tried our best to explain the urban ecosystem and nanotowers concepts to our communication targets. Meanwhile we also broadcast the main values of the Solar Decathlon Europe about sustainability, energy efficiency and innovation in architecture. Team Rhône-Alpes is trying to communicate to **the largest possible audience**. This means: students and professionals of the building industry, but potential buyers and children too.

Some of our institutional and commercial partners are very interested in Canopea® urban proposals. We are currently and jointly developing **real nanotowers application programs in Lyon and Grenoble** (France). These programs should materialize by the end of 2012 or in 2013. These professionals are both partners and main targets of our communication plan. Many of them took over from us to transmit the Canopea® concept to their own potential clients. A partner has even created a contest for its employees to win a trip to Madrid and visit the Villa Solar! In this brief report, we present the main actions undertaken and the tools used **before, during and after** the SDE competition (for more details see our communication plan in the Project Manual #6).

### **Before the competition**

**Our website is the central tool** of our communication plan. We post videos, news, as well as informations about the project and about our partners. During the building phase at Grands Ateliers, we had two webcams that allowed everybody to follow the Canopea® construction. During the competition phase, we animate **live events** for the French public who could not come to Madrid. The website relays the **events** we have attended or we have made. We use specific tools such as models, posters and PPT presentations. We have also been very present on **social networks**. Facebook, LinkedIn, Twitter and Google + are linked together to share the freshest news about the Canopea® Community. We made a lot of **videos** about many topics and we managed to be published and broadcasted in the general and specialized **medias**. French television (France 3) made several reports on our work in progress.

### **During the competition**

In Madrid the challenge of our project is to present a prototype the size of a house set in a park and make people understand that they are - in fact - at the top of a 28 meters high tower integrated in an urban environment!

In order to create **a better understanding of Canopea® as an urban proposal and not as a single house proposal**, we have adapted an interactive **augmented reality tool** to visualize

# BRIEF REPORT

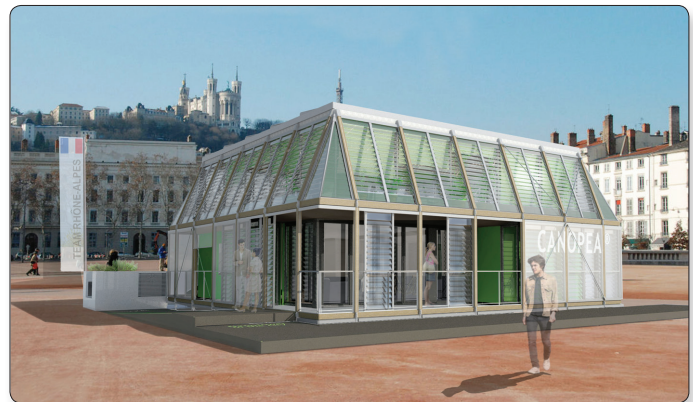
the real project in its real environment through an I-Pad tablet. The deck around the prototype represents the **real nanotowers 8th floor passageway**. On the south-side a large sign printed on textile explains the project to the queuing public. The I-Pad is used by guides during the public tour as a window on the project. The special apps can also be directly downloaded on personal smartphones through a flashcode. This flashcode is available on all our visuals and on **the postcards** that are distributed at the end of the public tour. During the competition, we also use a **quizz and and game** we made to share and spread our main ideas about urban sustainability with the visitors of Canopea®.

## After the competition

Our team participated in the **SDE 2010** edition with the Armadillo Box® project. The next **SDE 2014** edition will take place in Versailles and we are very proud of it. We hope to do our best for **transmitting all the knowlegde** we acquired during these early experiences to other French schools and universities. Therefore, our communication plan does not stop in September 2012. **The prototype will then travel to Grenoble, Lyon and Versailles** to continue to communicate our values and our partners' involvement in sustainable development. Finally, by 2015, Canopea® will join the Armadillo Box® on INES campus to become a demonstrator for researchers and training support for students of Rhône-Alpes universities and secondary schools.



Canopea® during 2011 BATIMAT in Paris



Canopea® during 2013 Renewable Energies Fair in Lyon

## INNOVATIONS

- **COMMUNICATION PLAN** - Canopea® (canopy in spanish) is the top floor of the forest, directly influenced by the solar radiation. It also captures 30% of the rainfall and constitutes a real ecosystem. All our visual identity incorporates the metaphor of the Canopy and the ecosystem at an urban scale.
- **COMMUNICATION MEDIA** - To communicate our project to the largest targets, we used innovative tools such as a 1:1 scale model, a Canopea® board game, a quizz and a website. Our website integrates videos, photos and live events in Lyon and Madrid reported through webcams.
- **PUBLIC TOUR** - To guarantee a good understanding of the Canopea® urban scale concept, the public tour starts along the south facade of the prototype where a fresco explains the main concepts of the nanotowers and the urban ecosystem when mobility issues are adressed around a real electric car set on site. During public visits, a team member makes a quizz wizz with people waiting in line. This animation entertains people before small groups of 8 persons can reach the (fake) elevator to the 8th floor of the nanotower. The augmented reality software allows the public [and jurys] to see Canopea® real urban environment through the Ipad carried by the guides. The Apps is also downloadable on smartphones with this flashcode:

