

# I think there are good reasons for believing that the modern age is over. Today many things indicate that we are moving towards a transition period where it seems that something is going to go away and something else is painfully being born. It's as if something was crumbling, is corrupt, exhausted from the inside, while something else, still indistinct, out of the rubble. »

Vaclav Havel, Philadelphia 1994

The approach of the building's performance can't be seen only from a technical perspective. A true reflection on the role of the user must be born in order to make this approach appropriate.

A new governance design and project management should be implemented.

# ité de l'environnement

When we must face new challenges, it is necessary to recover the "taste of the future" (cf. Guillebaud) and the "Taste of Others" (see Elena Lasida)

As actors and partners of cities in movement, we must find ways of governance together to meet these new challenges and enjoy it. For this it must have a taste of future!

## Taste of the future, 3 main ideas:

- 1. The great bifurcation: awareness of the dizzy depth of the rupture history and anthropology that we are going through.
- 2. Refusal of "thought grumpy": rejection of nostalgia lasting fearful just like Lot's wife.
- 3. Think different: try again to explore, for his own light, learn to criticize the present.

« In the ocean of ideas, it is necessary to fish in deep water »

# La cite de l'en A sociocratic adventure.



St-Pierre-la-Palud: standard Minergie



1<sup>ère</sup> opération de bureaux énergie positive en France

La cité de l'environnement: standard: BEPOS





2/2013

Zac de Bonne Grenoble Progr. Concerto Cons. Chauffage: <50kw/h/m²/an

1<sup>ère</sup> opération de logements passifs en France

Hauts de Feuilly: Standard: Passivhaus





1<sup>ère</sup> bâtiment d'état énergie positive en France

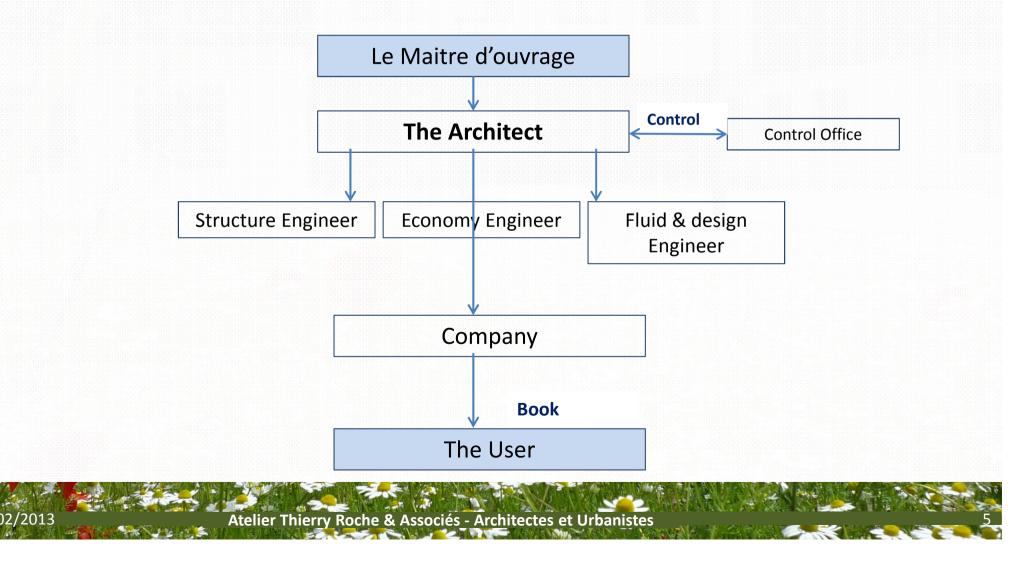
Ecole des ponts et chaussées Standard Bepos



Système Modulife Standard Passif cqfd

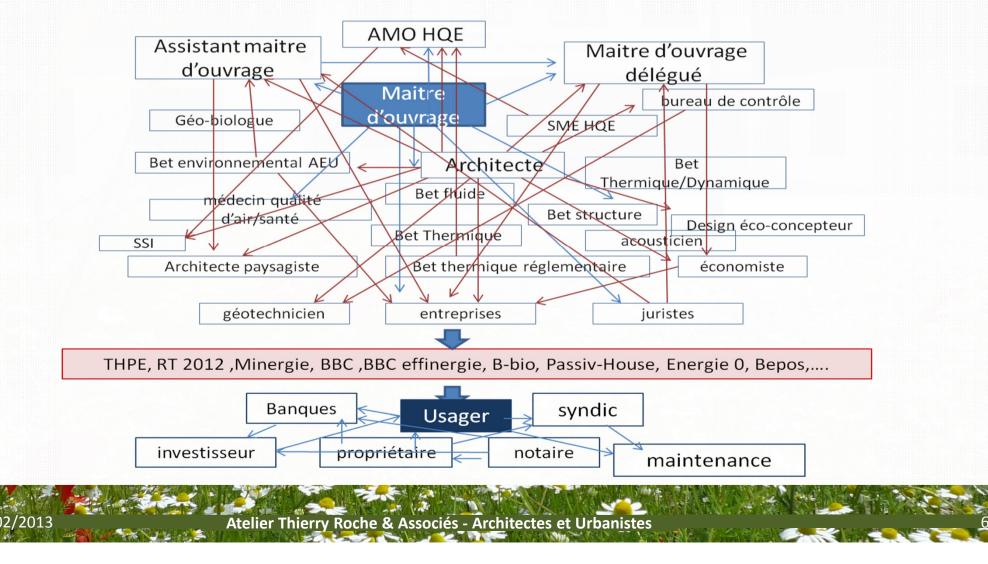


# Ancestral practice of decision-making: a process which reassures



# In front of the challenges: the illegibility !

site de lien





# **Sociocracy:** a way of governance

« When you have a hammer in the head, you see all problems as nails! »

-The sociocracy (power of a group) stimulates human relationships by providing consent as a form of decision-making: the common good.

-In sociocracy, the majority can't impose his choice to a minority.

-The truth is not arising from the confrontation of ideas but from adding the point of view.

« An organization will adopt ethical behavior when it allow its members to openly discuss its decisions in light of the common good » (what does that mean).

# **Sociocracy:** a way of governance

« The way of consent determination promotes the common good »

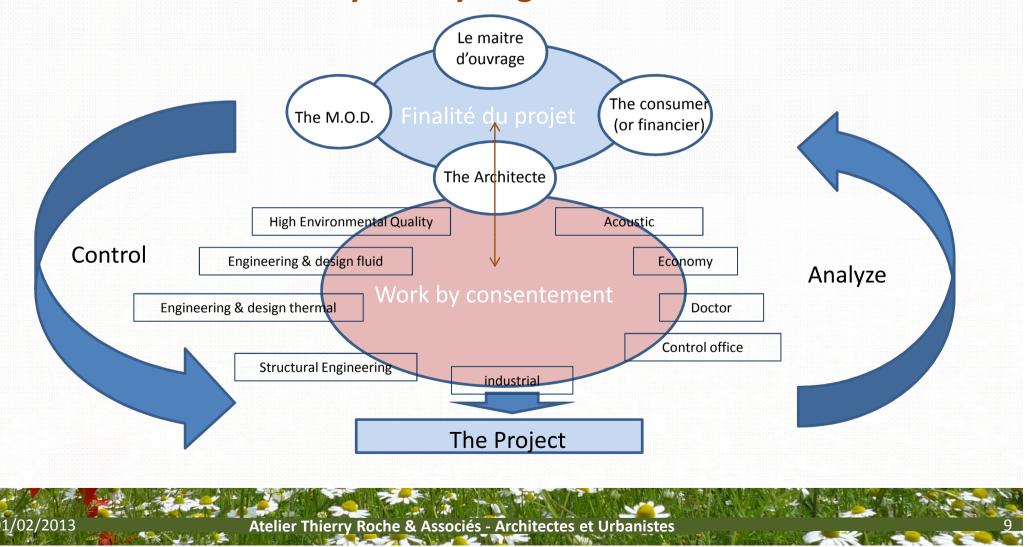
United by a common vision, we share the desire to give meaning to our work by new social and economic matters, as well as relational sides to advance environmental issues

- Interactive area between the various economic actors
- Creating places communitised

- Establishment of a charter of life
- Internal training for staff at the CNV (Non Violent Communication)
- Creation of a circle of decisioner & referents
- Integration of rule 3 X 1/3 of profits (redistribution, investment, training)

# Sociocraty: a way of governance

Gite de l'ent







The City of the Environment is the result of a project initiated in 2005 by the **POLE SOLERE**, a group of French professional experts in environmental quality of building, eager, to turn of the century, in a sustainable way to rethink the relationship of human regarding his environment through his art of building and its art of living in the building. This idea of "**build together**" a city showcase innovative know-how as responsible builders, was born gradually **City of the Environment**, where the "**living together**" with extend meaning, both within the outside the city, the constructive choices retained in respecting the environment.

**B1** 

# The community centre named PÔLE SOLERE

(Energy Renewable and Environmental Solution)

Founder of the « Cité de l'Environnement » Founder members:

> MCP Ingénierie, Atelier Thierry Roche, Atelier LD, Bastide Bondoux

Associates members:

Tribu, Enertech, Medieco, Betrec

**Diapositive 10** 

**B1** The City of the Environment is a result of a project initiated in 2005 by the POLE SOLERIE, a group of experts in the environmental quality of buildings. At the turn of the century, the group was eager to rethink the relationship, in a sustainable way, of humans regard for their environment through art of buildings and the art living in the building.

From this idea of "build together," a city showcase and innovative know how of respondsible builders, the City of the Environment was gradually born, where "living together" has an extended meaning, both within and outside the city, as well as the construction choices selected with respect to the environment.

Brian; 04/12/2012

# Sité de l'environnement



- Owner: For Home
- Location : Saint-Priest (69)
- Operation : Office buildings
  - Shon : 4499 m2
    Atrium & relaxation: 600m2
    Delivery date: Septembre 2009
    Cost of works project : 2205 HT/m2 shon (avec pv)
    Positive energy all purpose building(all purpose)

## Project Managment:

Architect : Atelier Thierry Roche & Associés Engineering Fluid : Cabinet Sidler Engineering High Quality Environmental :Tribu Economical Engineering Office : Betrec Health: Medieco (Suzanne Déoux)

# environnement etences





The City of the Environment, a bioclimatic office building, provides positive energy, brings together planners, architects, consultants and planners, and is recognized for the environmental quality in the planning.

28 companies, 225 employees.

Areas of expertise:

- engineering
- training
- real Estate

Beyond its exemplary environmental quality, the building was designed to promote exchanges between its occupants and create a true state of mind "City of the Environment."





02/2013









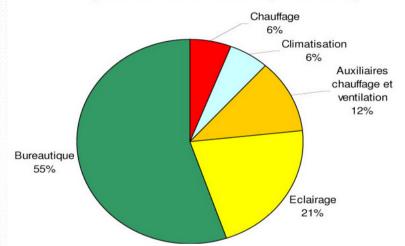
1st Floor Plan



Ground floor Plan

# ie de l'environnement

Cité de l'Environnement - Bilan énergétique virtuel (consommations de bureautique courantes)



#### Consommation d'énergie par poste

Postes	consommation en kWhep/m² <sub>sHoN</sub> .an	Energie utilisée
Chauffage	11.6	PAC géothermique
Rafraichissement	1.6	PAC géothermique
Eclairage Bureaux	20.6	Electrique
Eclairage Communs	3.6	Electrique
Auxiliaire Ventilation	7.7	Electrique
Autres auxiliaires	6.5	Electrique
Bureautique	54.2	Electrique
TOTAL hors PV	106	
TOTAL yc PV	0	

# A global vision of the environment

### An energy strategy

From 4 themes:

- A building meets the criteria of the label Passivhauss a need to lower heating 15kwh/m2/an (CG67: 144kwh/m2/an)
- Of energy efficient system that lead to a redistribution of the energy bill.

Production exceeds consumption.

### Health Approach

From 3 themes:

- Air quality( ventilation)
- Low VOC materials, elimination of formaldehyde
- Quality of lighting scenes, sound and color.

### A creative and rational approach to managment

Limitation of charges:

- Water managment: rainwater for garden and health (waterless urinals)
- Sharing space or equipment
- Establishment of a governance and management decision
- Sharing space or equipment
- Establishment of a governance and management decision

# e Kenvironnent



PAROI	Composition	U [W/m².K]	U DESCARTES [W/m <sup>2</sup> .K]
Murs extérieurs	Murs béton 20cm + isolation par l'extérieur polystyrène expansé 20 cm (R <sub>isol</sub> =5m <sup>2</sup> .K/W) Fixation du bardage avec cales thermiques.	U = 0.19 W/m².K	0.16 à 0.18
Murs / atrium	Murs béton 20cm + isolation par l'extérieur laine minérale 4 cm (R <sub>isol</sub> =1.1m <sup>2</sup> .K/W)	U = 0.39 W/m <sup>2</sup> .K	inexistant
Plancher haut bureau	Dalle béton 27cm + isolation polyuréthane 24cm (R <sub>isol</sub> =10 m <sup>2</sup> .K/W)	U = 0.10 W/m <sup>2</sup> .K	0.1
Plancher haut atrium	Structure acier + 2x90 mm laine minérale (R <sub>isol</sub> =5.6 m <sup>2</sup> .K/W)	U = 0.17 W/m <sup>2</sup> .K	inexistant
Plancher bas /sous- sol	Dalle béton + isolation en sous- face en laine de roche 14cm (R <sub>isol</sub> =3.6 m <sup>2</sup> .K/W)	U = 0.24 W/m <sup>2</sup> .K	0.2 à 0.24
Menuiseries extérieures	Menuiseries bois-alu triple vitrage	U <sub>w</sub> = 0.9 W/m <sup>2</sup> .K g=0.5	0.9
Menuiseries /atrium	Menuiseries bois double vitrage	$U_w = 2.6 \text{ W/m}^2.\text{K}$ g = 0.7	inexistant

## The envelope:

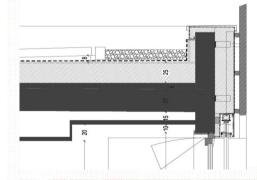
Optimization of the envelope, directions and glass surfaces Atrium treated as a thermal buffer unheated

- Implementation of performance materials and glass
- EXTERNAL insulation: expanded polystyrene 200 mm
- ATRIUM Interior insulation: mineral wool 40 mm

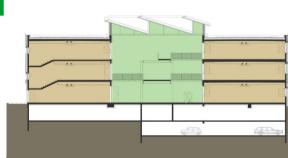
- INSULATION ROOF OFFICE: 2 layers of polyurethane foam 120mm or 240 mm. A thickness of 40 mm of asphalt perlite to support complex

- ATRIUM ROOF INSULATION: 2 layers of 90 mm or 180 mm mineral wool

- BASEMENT INSULATION: projection of rock wool on the underside thickness 140 mm



Ossature	Béton
Façades	Bardage Bois + enduit RME
Toitures	Bac acier Photovoltaïque et Sheds
Menuiseries extérieures	Bois Aluminium
Revêtement de sol	Caoutchouc et parquets
Isolation	Polystyrène, PUR





### Heat:

T 🚯 🛛

- Heat pump brine / water (87kW) horizontal geothermal reversible sensors feeding a low temperature floor.
   Surface geothermal horizontal: network crosslinked polyethylene tubes, 1700 m2 on 2 sheets of sensors ( -60 et -120 cm)
  - Network performance heating rated:
    - WINTER: COP = 5,2
    - SUMMER: COP = 5,8
- Insulation on heating systems
- Circulation with variable flow
- Managment by GTB

### **Ventilation:**

- Offices: comfort double flow ventilation with:
  - Heat recovery from exhaust air by high-efficiency rotary heat exchanger (heat exchanger efficiency of 80%)
  - Speed variation
  - High level of filtration (G4et F7 at blowing, F7 on return)
  - Preheating of fresh air by water coil (blowing at 18 ° c in the office)
  - loss of ventilation outside the hours of occupation of the offices
  - modulation speed manual tray by using the GTB
  - breakdown of meeting rooms and training subservient to the presence (or off)
- Coffe/lunch area: comfort ventilation of clock with air intake on atrium
- Basement : mechanical ventilation on detection of CO

# de l'environnement



The last occupant partially cut the entire decision aware of the openspace just by the swtich buton



jusqu'à 131 400 litres\* d'eau par an \* Économie d'eau basée sur l'utilisation d'u urinoir utilisant 2,5 litres d'eau 6 fois/heur pendant 24 heures/pendant 365 jours.

LINE CARTOUCHE ECOLOGIQ

QUI ÉCONOMISE L'EAU.







# Managment of summer comfort:

Iower the needs:

 Architectural optimization and architectural improvements to out source specific charges

• Minimization of the internal:

• Lighting performance of detection

• Clippings watches

• Performance equipment

• Effective sun prtection with automatic front south

Passive and active measures:

• At night ventilation by opening windows

 $\circ$  Underfloor cooling and ceiling fans

 $\circ$  Conditioning poitn to local server and training room (chiler condensing air)

### Water managment

- Reducing the need:
  - o Cold water only (except for local cleaning, showers and cafeteria)
  - o Rate limiting of self-regulated type moussers
  - $\ensuremath{\circ}$  Waterless urinals
  - o Limiting surfaces requiring sprinkler

 Reusing rainwater roof to supply toilet and automatic watering (underground tanks of 30 000 liters of water)

### H Ø



Several colorful animations are available for events

/2013



« Downlight » in the cafeteria



Lighting of the handrail by LEDs



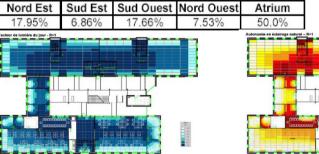
# **An efficient lighting**

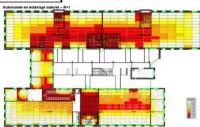
A highly efficient lithing (6w/m2) based on:

- Differenciation between office and field work task (200/400 lux) gradation auto = f (natural light)
- Of T5 + electronic ballast
- A work light withLBC
- Piezolectric wireless switches (sana batteries)
- Blocks back to very low ower(0.5w)
- Persence detection in all common areas



Objectifs d'éclairage naturel : 2% de FLJ sur le plan de travail Indice d'ouverture par orientation pour les bureaux





# **Specific electricity**

#### The Office:

Systems

- The widespread use of laptops that can go from 400 kWh / year to 20 kWh / year per machine
- The removal of corrugated centralized networks (which operate permanently under load and low efficiency) by UPS in each office

#### Servers:

 Can represent up to 50-60% of consumption of a building they shared high performance and low power
 Sharing of Internet access via optical fiber shared by 28 companies

#### Auxiliary equipment :

Sharing of coffee areas(sharing of fridges, coffee makers, microwaves..)
 Sharing of some equipment reprographic





## **Energy Production:**

#### Photovoltaïc production:

153 m<sup>2</sup> of semi- transparents modules -15 kWp 1250 m<sup>2</sup> of photovoltaic polycristalline type - 148kwc

### Estimated production:

146 000Kwh/year

## A POSITIVE Energy building!

Needs low estimate: 88.850 kWh/year Needs high estimate: 189.700 kWh/year

The building can produce 63% more energy than the occupants needs...if occupants incorporate the concept of energy restraint. Some people do...and it works! But it can also consume 30% more and be a building with negative energy! Contrary to what it is said, the technic can not do everything!!

# Cité de l'environnement

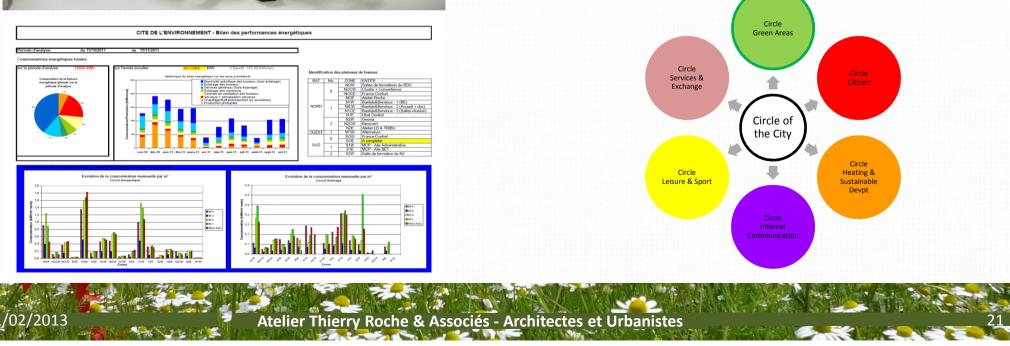


Today we know that it is possible to build a positive energy building, but it's success depends mainly on controlling electricity consumption...the heater is not a problem.

But with no changes of the habit, it will remain an illusion unless very expensive.

Governance as a sociocratic management mode brings a real context. It enables us to put the cursor in the right place between the performance issues but <del>alos</del> also of use, health quality, and quality of social ties...

It is above all the inhabitant who must be sustainable!



# Circle of the Garden

- Organization for actions to be done
- Inventory and purchase of tools
- Garden planning, selection of planting
- Setting up a maintenance plan
- Maintenance of the garden : cleaning, muncher mulching(?), amend
- Watering trees
- Compost

ire Sociocrat



# vironaement

# After 1 year of use ...



The building has a BMS to monitor and record many consumer index. These This data are is regularly analyzed and communicated to users of the city in order to inform and manage collective action .. corrective.

## **Observation year 2011:**

- Actual comsumption: 168 958 kWh (the estimated range of departure)
- **Production**: production 40% lower compared to the estimation.

## **Analysis:**

- A solar cell production due to lower number of malfinctions of the inverters. Defects identified by the late start of the non-contract monitoring installation
- The goal of « positive energy for all purposes » was not achieved, largely due to the problems of solar cells and geothermal setting
- **The building achieved the « BEPOS** » in the regulatory sense: the production REC offsets consumption related to heating, ventilation, air conditioning and lighting.
- The total consumption of primary energy all purpose have been around 168.958 kWh of final energy, or 46,9 kWh/m<sup>2</sup> of floor space, of primary energy: 121kwh- ep/m2 floor space that is the level of what became the level of label « Passive » German.

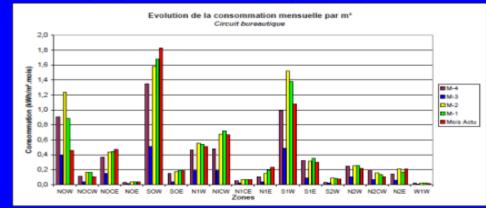
### The establishment of appropriate internal communication will achieve the goal of all positive energy use this year 2012



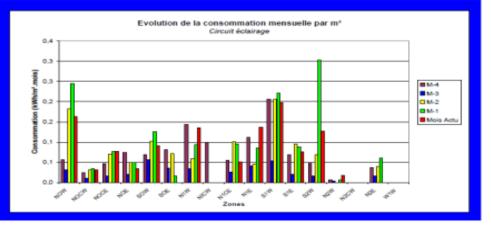
#### CITE DE L'ENVIRONNEMENT - Bilan des performances énergétiques Période d'analyse: du 15/10/2011 au 15/11/2011 Consommations énergétiques totales: sur la période d'analyse ur l'année écoulée kWh 12604 kWb (Objectif: 145 00 kWh/an) Identification des plateaux de bureau: Historique du bilan énergétique sur les mois précédents Composition de la facture BAT Niv. Electricité spécifique des bureaux (hors éclairage) Eclairage des bureaux Services généraux (hors éclairage) Eclairage des communs Centrale des communs ZONE ENTITE énergétique globale sur la NOW Salles de formations du RDC période d'analyse NOCW Cluster + Concertience 0 NOCE France Confort Atelier Roche Serveurs + climatisation des bureaux Chauffage/Rafraichissement (yc auxiliaires) Production photopiles NOE Bastide&Bondoux - 1 (BE) N1W Bastide&Bondoux - 2 (Accueil + doc) Bastide&Bondoux - 3 (Salles réunion) NORD NICW 1 N1CE N1E Ubat Control N2W Geoxia 2 N2CW Renovert Atelier LD & TRIBU N2E Alternatym OUEST W1W SOW France Confort 0 SOE \ comp SUD S1W MCP - Aile Administrative 1 MCP - Aile BET S1E

nov-10 déc-10 janv-11 févr-11 mars-11 avr-11 mai-11 juin-11 juil-11 août-11 sept-11 oct-11

/02/2013



1.1



2

S2W

Salle de formation du N2

328 Atelier Thierry Roche & Associés - Architectes et Urbanistes

## About the use:

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- Need for users to understand the building is to find the right moves
- The problem of travel time still the order of the day (45 minutes by tram from Lyon)
- The set temperatures of 19°c was the subject of negocaitions negotiations to move in some areas to 20°c
- Technical problems related to automation to solve (lights)
- Need to set up « watchman » to technical problems
- Very good understanding of space and light
- Real quality of life in the building
- Image enhancement « City of Environment »
- Numerous animations giving the impression of a lively building.

The end goal for 2012 is to realize the establishment of the sociocratic governance, achieve the performance « positive energy all-purpose » and to conduct a survey on the social and economic life of the building.







02/2013

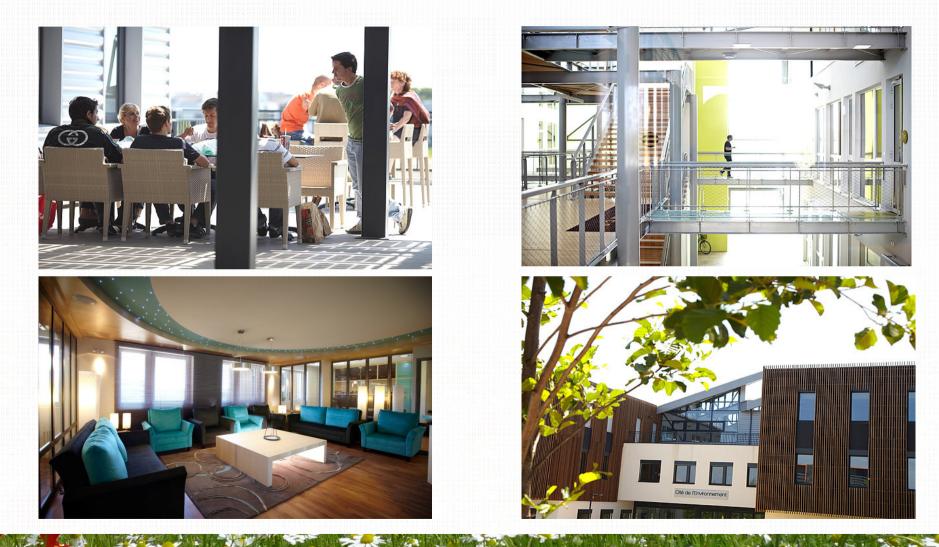
15 000 visitors at the *Cité* within a year...











Atelier Thierry Roche & Associés - Architectes et Urbanistes

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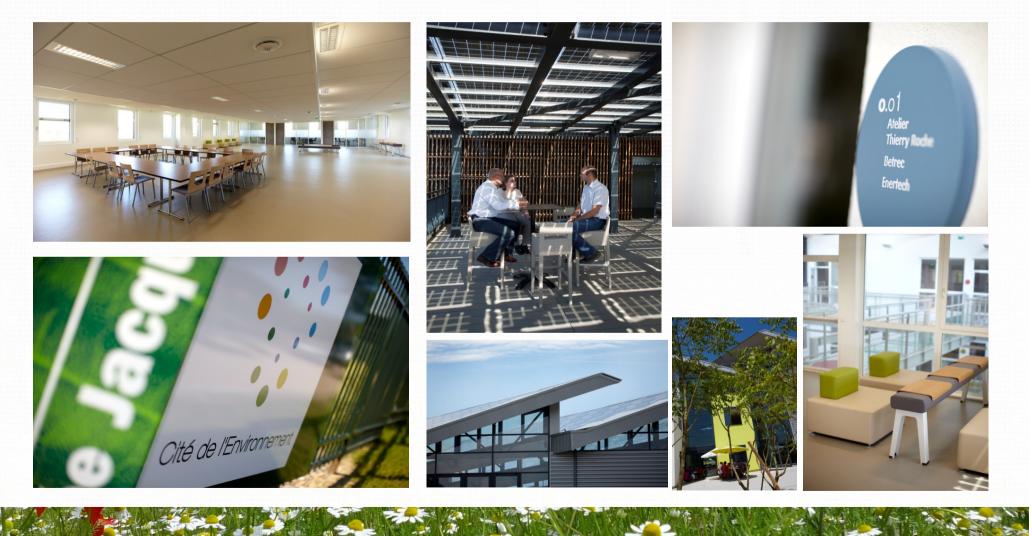
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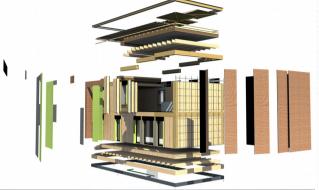


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1

2

# so a







answer in terms of cost, quality, reliability and time, new energy challenges, environmental and health buildings from conception to end of life. This constructive process, breaking with the current codes, the result of a connection between design and production, is part of a comprehensive approach (structures, enclosures, equipment, finishes, maintenance, recycling) to design and manufacture locally to all elements and components constituting a two-dimensional or three-dimensional building, then Finally assemble them dry in a simple and rapid on-site.

#### Gilbert Goutheraud gives rise to MODULIFE

- Atelier Thierry ROCHE et associés. Thierry ROCHE
- ENERTECH Olivier SIDLER
- TRIBU Karine LAPRAY
- BASTIDE BONDOUX
- Atelier LD Didier LARUE
- SINCE Studio. Matthieu ROCHAS
- MEDIECO Suzanne DÉOUX



# nv icennement



## The Cité de l'environnement: a state of mind!

• The *« Cité »*, more than a place, is a spirit, a new approach where research and development are combined with openess, connection, networking and training.

• The values we share can be summarized in :ethics, consistency, credibility and faith in the future.

This requires an eco-learning behavior where all citizens meet there together and the promotion of collective intelligence sharing « the taste for future ». This is a place for personal development of employees, companies, skills that is part of an economic reality by redefining its performance criteria.

• It has now become a reference, even more an institution. It is therefore necessary to ensure the sustainibility and spirit of its purpose.

The Architecture of the « Cité » shows that: bridges that links people, groups, places of exchange, a light that comes into the celling and illuminates the scene community !
 Thearchitecture is simple, non manered. It is true: it expresses a true taste for future: how to anticipate, how to project ourselves, on a happy way, to cross on the other side, move towards new modes of governance.

# Cité de l'Environnement

#### 1<sup>er</sup> pôle de compétences environnementale dédié au secteur du bâtiment en France

Les résidents de la Cité de l'Environnement peuvent répondre ensemble ou séparément et de manière concrète à tout projet de bâtiment environnemental (habitat collectif ou individuel, tertiaire, industrie) que ce soit dans les domaines du conseil, des études, de la conception, de l'architecture, du design, de la construction. de la rénovation, ...

#### Architecture, Urbanisme et Design

#### Atelier Thierry Roche & Associés



L'Atelier Thierry Roche & Associés Architectes et Urbanistes s'investit denuis sa création en 2004 dans une démarche environnementale et durable forte pour mieux conjuguer qualité de vie et du bâti. www.atelierthierryroche.fr

Cabinet de Design et Architecture d'intérieure respectueux de l'humain L'Atelier LD concoit avec une approche environnementale engagée, les aménagements extérieurs et de son environnement. SINCE Studio éco-quartiers, espaces publics, parcs propose de créer un lien cohérent et et jardins, tout en maîtrisant les aspects éloquent entre l'esprit d'un espace, son image et sa réception publique techniques www.atelierld.com www.since.fr

#### Promotion, construction et rénovation de logements



ANC Fondé en 1919 le Groupe Maisons France Confort est l'un des 2 leaders de

chacune de ses marques - Maison Phénix, Maison Familiale et Maison Castor - une expertise globale des la construction de maisons en France, avec 6120 maisons vendues en 2009. métiers de la construction de maisons Il propose des maisons BBC, passives et BEPOS. www.maisons-france-confort.fr



individuelles

www.geoxia.fr

1er rénovateur énergétique en France, Répovert conduit la répovation énergétique d'un logement de A à Z, du diagnostic initial jusqu'à la réalisation de 100% des travaux. www.renovert.fr



/2013

Demeures Caladoises, constructeur de maisons individuelles en Rhône- Alpes, Bourgogne depuis 1975



CEQUAMI est l'organisme référent en France en matière de promotion de la qualité de la maison individuelle dans le secteur neuf et existant. www.mamaisoncertifiee.com



MCP

(Decompositioned)

ince

Shanahai 2010

Béalon Bhône-Aloes

Portegoire Officiel

Promoteur constructeur depuis 15 ans, est à l'initiative des premières maisons passives en France, proposant des solutions de qualité, esthétiques, saines et respectueuses de l'environnement grâce à B filiales spécialisées : MCP Foncier, MCP Ingénierie et MCP Promotion. www.groupemcp.com



Conception, fabrication et commercialisation de la Dombox, 1er tableau de bord de l'habitat rassemblant toutes les informations indispensables à un usage performant, écologique et responsable d'un logement. www.lamaisondanslatele.com

#### Bureaux d'études et conseil



est conforme à la réglementation en

TRIBU

www.tribu-concevoirdurable.fr

www.bastide-bondoux.fr

viqueur).

Bureau d'études Thermiques depuis 1981, Bastide Bondoux intervient dans le conseil et l'optimisation énergétique

dès la conception les calculs thermiques réglementaires (vérification qu'un projet de construction

bâtiment pour le développement de leurs produits en vue des futures réglementations et organisation et gestion d'événements pour l'information des acteurs de l'immobilier E-mail : alternatym@gmail.com

alternaty'm

Consultant auprès des industriels du



PROMODUL vise à promouvoir la maîtrise énergétique dans l'immobilier grâce à la mise en place de formations et d'outils adaptés à l'atteinte d'une performance énergétique globale. www.promodul.fr

ENERTECH

Spécialisé depuis 20 ans dans l'énergétique appliquée aux bâtiments. ENERTECH intervient dans des travaux de recherche

très en amont et sur l'expertise et le conseil

dans la maîtrise d'œuvre ou l'assistance à



Cabinet spécialisé dans les Audits énergétiques et environnementaux. ADPE

propose des formations liées à la dimension environnementale et règlementaire dans le bâtiment, des bilans Carbone®, diagnostics énergétiques, thermographies, DPE, création d'outils MDE (Maîtrise de la Demande Energétique). www.adpe.eu



Cabinet de conseil spécialisé dans la dimension sociale du développement management,

durable (communication gouvernance), CONCERTIENCE propose de la formation, de l'accompagnement indivi-duel et d'équipe et du conseil.

#### Société d'ingénierie de santé environne-mentale et d'écologie médicale, MEDIECO est à l'origine de l'approche Haute Qualité Santé®. Elle participe à améliorer les performances sanitaires des bâtiments et assure un rôle de conseil auprès des filières industrielles nour l'Analyse Qualité Santé AQS® des produits et équipements

la maîtrise d'ouvrages.

www.enertech.fr

du bâtiment www.medieco.info

#### Énergies renouvelables



Le cluster Rhône-Alpes Eco-énergies est un réseau de 210 acteurs publics et privés qui souhaitent contribuer au développement des filières de la maîtrise de l'énergie et des énergies renouvelables en Rhône-Alpes sur le secteur du bâtiment. www.ecoenergies-cluster.fr



Conception, fabrication et commercialisation de Turboliennes Eléna (aérogénérateurs technologiquement innovants, économiguement performants. écologiquement efficaces) qui changent l'équation du petit éolien grâce à une meilleure productivité et capacité d'intégration dans tous les milieux. www.elena-energie.com

Atelier Thierry Roche & Associés - Architectes et Urbanistes

TRIBU est un bureau d'études (ingénieurs, architectes et urbanistes) spécialisé dans l'approche développement durable appliquée aux bâtiments et aux projets urbains (assistance à la maîtrise d'ouvrage ou en maîtrise d'œuvre].

Bureau de recherche et de conseil depuis 1965 au service de l'ingénierie générale du bâtiment (diagnostic, expertise, recherche et développement dans le neuf et la rénovation)



UBAT CONTRÔLE fournit les solutions les plus adaptées aux besoins de ses

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clients en termes de diagnostic de performance énergétique, de contrôle de perméabilité à l'air, de diagnostic thermique, de bilan carbone et de contrôle thermographique. www.ubat.fr

La Cité de l'Environnement bénéficie

d'un espace exposition des industriels partenaires (construction neuve





