

Grenoble: innovation and urban development

History of an army barracks transformed into a city-centre eco-district



Grenoble: innovation and urban development

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- 2 – Reconciling urban density, diversity, accessibility, green spaces and quality of life
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- 4 – Proactive governance



Grenoble: innovation and urban development



1 – A Grenoble "eco-system"

2 – Reconciling urban density, diversity, accessibility, green spaces and quality of life

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4 – Proactive governance



De Bonne: creating a city-centre eco-district

A Grenoble "eco-system"



Grenoble: a city of 160,000 inhabitants covering 1,800 hectares
An urban area with 400,000 inhabitants, comprising 27 municipalities stretching over 31,000 hectares

De Bonne: in the historical city centre



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A Grenoble "eco-system"

Scarce available land: a flat, dense city where growth is restricted by the three mountain ranges and the built-up suburbs surrounding the city (3rd densest in France)

A specific climate and geology: natural basin, wide seasonal and even daily temperature variations, seismic risks, shallow water table

Strong economic and demographic growth: from a small garrison town to a modern city ("Trente Glorieuses", 1968 Winter Olympics)

City of science, technology (from hydropower to nanotechnology) **and social innovation** (population of students, engineers, senior citizens, etc)

High level of environmental awareness (presence of the mountains, quality of life)



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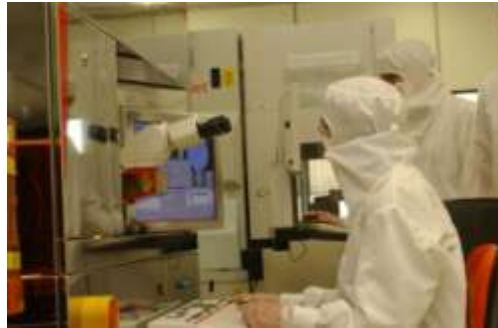
A Grenoble "eco-system"

60,000 students
(18% from abroad)

20,000 social science
students and researchers

An international school

Nearly 60 different cultural
communities



- **220** research laboratories
- **22,000** researchers
- **40,000** direct jobs in information technologies
- **20,000** direct jobs in life sciences
- A highly diverse range of cultural and sporting activities



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A Grenoble "eco-system": calling on a developer

Usual distribution of roles for urban development in France:

The public authority (in this case, Grenoble City Council) :

- draws up the programme for the future district,
- signs the corresponding contract with the developer

The developer (in this case, SEM SAGES - semi-public company - principal shareholder: Grenoble City Council):

- becomes the scheme owner
- provides project technical and financial monitoring
- designs and builds the public areas
- coordinates the builders' work sites
- seeks expert assistance for highly technical matters (pollution, energy, etc.)



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A Grenoble "eco-system"

An exemplary project in terms of the diversity, accessibility and energy efficiency of its buildings: housing, offices, public facilities



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Reconciling urban density, diversity and quality of life

Assets of de Bonne urban development zone

An outstanding opportunity: the army's departure made new land available for development

A remarkable location in the city centre, near the third tram line.

Urban and architectural choices based on compact shapes, diverse functions and populations, 'soft' transport that is accessible to all, and enhanced landscapes

An exemplary project in terms of the environment, energy management and public areas

A preparation process involving **constant consultation** with neighbourhood and other associations and the people of Grenoble



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Reconciling urban density, diversity and quality of life



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Reconciling urban density and quality of life: functional diversity



- 900 family housing units of which 40% low-cost rented
- A 15-class school
- An 80-bed care home for dependent elderly people
- 2 student halls of residence (200 beds)
- about 20 new shops
- 5,000 m² of office space, including a 1600 m² energy-plus building
- An apartment hotel and a 4-star hotel
- An arthouse cinema (3 screens)
- 5 ha park and gardens within each group of apartment blocks

Developer: SEM SAGES

Urban planner: Ch. Devillers associated with Aktis Architecture in Grenoble



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Reconciling urban density and green spaces



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Reconciling urban density and green spaces: a new garden



40% of the area of the former barracks has been devoted to green spaces

Developer: SEM SAGES

Landscape designer: Jacqueline Osty

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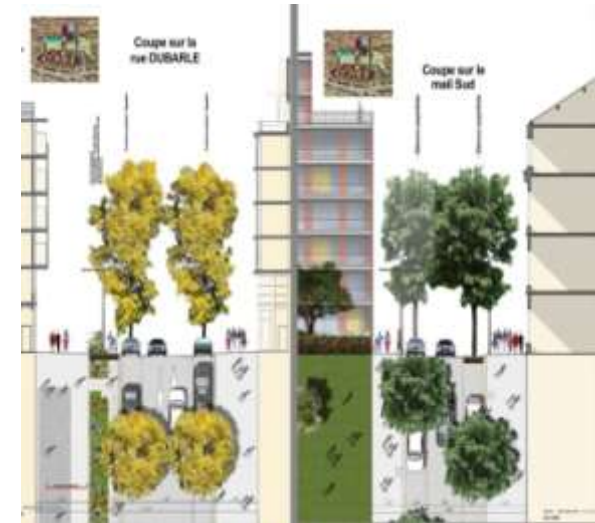
Reconciling urban density and accessibility



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Reconciling urban density and accessibility

- ✓ Sharing of the public area:
 - ✓ narrow roads,
 - ✓ 30 kph speed limit,
 - ✓ facilities for cyclists (lanes, racks, reserved areas)
 - ✓ continuity of ground revetments
 - ✓ district on one general level



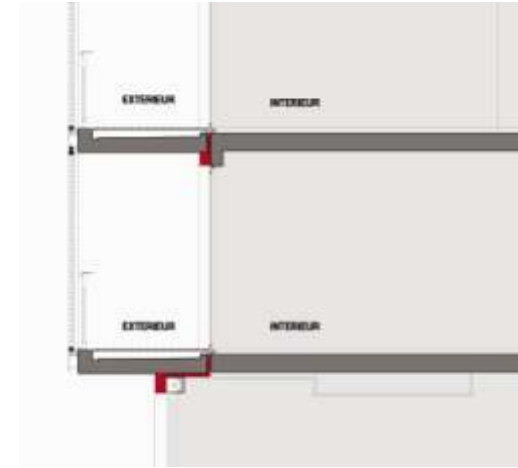
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Reconciling urban density and accessibility

All of the housing units are adaptable

No "steps" to outdoor areas (balconies, loggias, etc.), all on the same level as the indoor areas for optimum accessibility

Pavements outside buildings and entrances in keeping with the other accessibility measures



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Reconciling sustainable development with an economic model

Ambitious objectives

for the housing: energy consumption cut by 40%

for the offices: energy-plus

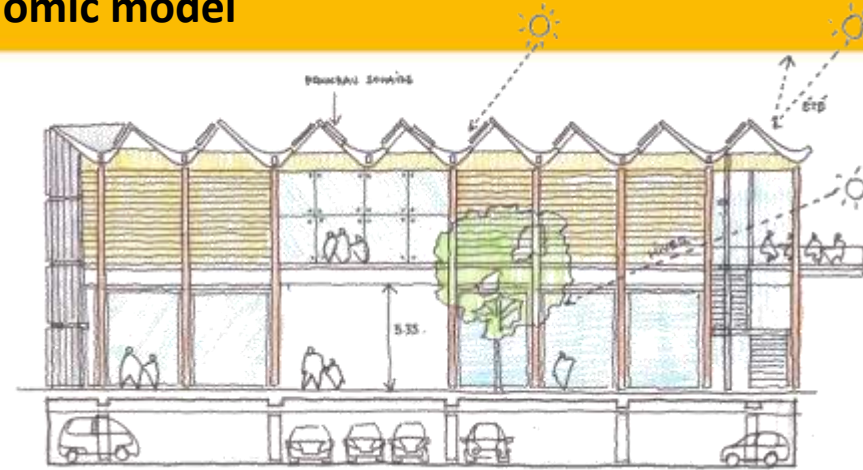
for the shops: no air-conditioning

Use of renewable energy

1 m² of solar thermal collectors per housing unit

1000 m² of photovoltaic panels on the commercial area roof

430 m² of photovoltaic panels on the roof of the energy-plus office building



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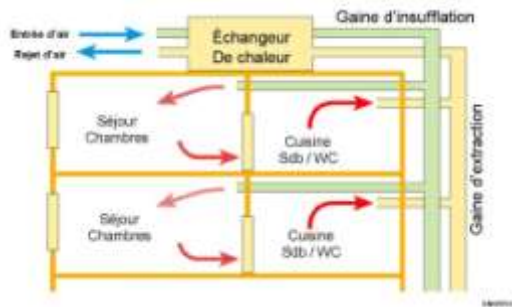
Reconciling sustainable development with an economic model

Since mid-2008 buildings compliant with French environmental standards are being delivered at the ZAC de Bonne in Grenoble

Heating 50 kWh / m² of living area/year (primary energy)

Hot water 20 kWh / m² of living area/year (excluding solar thermal)

Electricity for communal areas: 10 kWh / m² of living area/year (final energy)

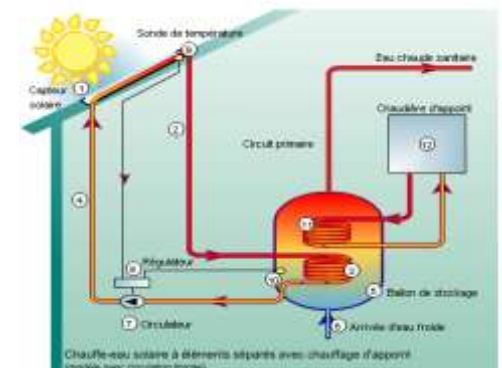


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Reconciling sustainable development with an economic model

State-of-the-art technical resources were imposed:

- super-insulation of external walls
- double-flow ventilation
- use of mini-cogeneration systems
- solar thermal heating
- high-quality glazing
- treatment of thermal bridges



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Reconciling sustainable development with an economic model

Applying to ourselves the requirements imposed on others

Sorting of materials: 90% of the materials have been reused, including 20,000m³ on-site.

Saving more than 10,000 truck round trips.



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Reconciling sustainable development with an economic model

For the SPC and the scheme accounts

New costs for governance

Assistance to the owner concerning energy at each stage of the project (amount similar to that paid to the scheme's chief architect)

For the builders

New costs related to the use of new techniques

but environmental requirements represent "merely" 7 to 10% of the pre-tax cost of the works, excluding fees, with an average around **€113/m² net floor area**

Very reasonable costs

Summary of de Bonne development scheme balance sheet		
	Starting balance sheet	2008 balance sheet
Project cost before tax	€30131 883	€38 919 275
Release of land	€8 525 950	€11 404 764
Urban developments + fees	€17 765 766	€22 926 264
Chief architect's fees	€600 000	€582 359
Environmental assistance fees	€0	€587 485
Financial expenses	€778 500	€170153
Communication	€187 000	€288 510
Other expenses	€2 274 667	€2 959 740
Project revenues before tax	€23 344 013	€38 892 470
Housing-retail space-offices	€22 792 200	€33 890 791
Revaluation from sales (1%)	€551 813	
Operators' participation	€0	€2 872 291
Miscellaneous	€0	€1 526 388
Balance before tax / Grenoble City Council	€6 787 870	€26 805
Expected grants		€603 000
Balance before tax including grants	€6 787 870	€26 805
Balance including tax including grants	€8 118 293	€32 059

Item	Vigny-Musset	ZAC de Bonne	Difference between ZAC de Bonne & Vigny-	
	in €/m ² excl. fees		in %	
Land expenses	€280	€345	€65	23%
Block centre cost	€17	€20	€3	18%
Total construction cost	€1 200	€1 500	€300	25%
- foundations	-	€200		
- double flow	-	€90		8%
- envelope (beyond external insulation)	-	€30		
- quality of services	-	€0 to 200		



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**A partnership with the builders and their
architects**



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Proactive governance: a collective partnership with the builders

Using conventional institutional means to change mindsets



→ a team specialising in energy and environmental quality was set up alongside the developer to supervise each stage and ensure that objectives were being met

→ comprehensive services including the tendering phase through to works construction and final delivery

→ notably including checking of builders' tender documents,

→ supervision of works and site surveys to ensure that the recommendations were being met and the correct materials used,

→ and monitoring over a two-year period following building delivery



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A partnership with the contractors



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Proactive governance: learning new construction methods



For the contractors

From late 2007 – early 2008, support services were provided for the contractors carrying out building work on the De Bonne site, in the form of:

- information on the climate, economic and social issues inherent to the French QEB* (environmental quality in buildings) guidelines
- and the creation from scratch of **training courses on the use of new construction techniques** for the public works contractors (labourers, supervisors and managers) working on the scheme



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Proactive governance: lessons to be learned

A country getting to grips with the techniques

Successes

- 👍 Insulation thickness and glazing quality comply with the initial recommendations
- 👍 Adaptation of the glazed area of the building
- 👍 Good-quality solar protection systems
- 👍 Main thermal bridges well treated

Areas for improvement

- 👎 The treatment of some thermal bridges was neglected: window frames, heating system insulation
- 👎 Weakness in implementing building airtightness



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A partnership with the residents and users



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Proactive governance: welcoming the residents and users

Eagerly-awaited stage: the residents (on-going phase: since autumn 2008)

Preparing to welcome them and providing them with a **handbook** explaining the building and the apartment on handing over the keys, with support from the local energy agency

Organising a reception for each building in the presence of elected officials (the City Council's urban planning officer, and even the mayor whenever possible)

Inviting interested occupiers to participate in monitoring consumption

Questioning occupiers about quality of use in their home



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An exchange of experience and a
long-term process

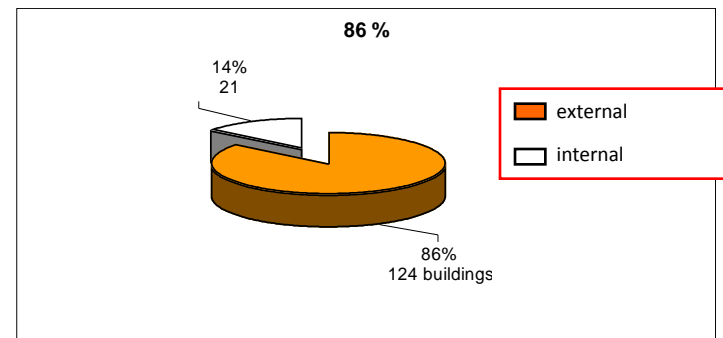
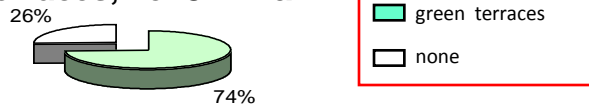


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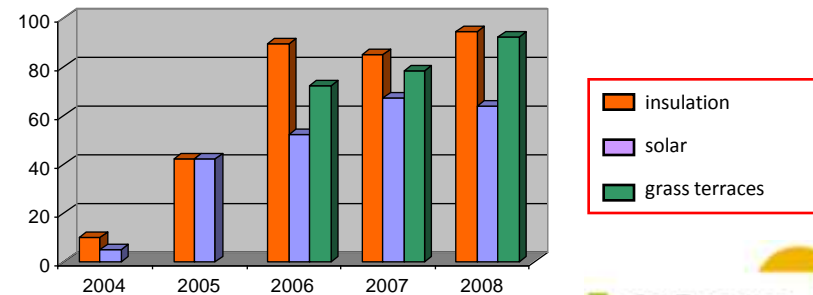
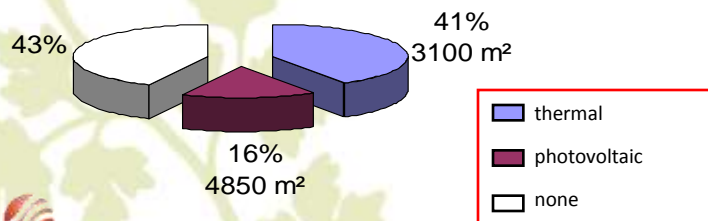
Proactive governance: also a collective partnership with the City Council

Disseminating the Council's statutory documents and sharing experience

74% of permits issued with green roofs and terraces, i.e. 5.2 Ha



57% of permits issued with solar panels, i.e. 8000 m² of collectors



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Conclusion: a long-term process

The conditions of success

- ◆ determined, ongoing political will
- ◆ a favourable economic context
- ◆ motivated stakeholders
- ◆ appropriate technical management

Governance that catalyses energy:

- ◆ defined objectives
- ◆ evaluation of results
- ◆ the necessary project management
- ◆ management of priorities
- ◆ development of new practices and know-how for all the stakeholders



To find out more: www.debonne-grenoble.fr

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An ongoing process



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Areas of work

- Limited space for private cars
- Promotion of 'soft' modes: pedestrian, cycles
- Development of public transport
- Management of waste
- Work on materials

