



Centre Urbain
Stadswinkel



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Energy Efficient Public Buildings

Examples of Good Practices

Sustainable Energy week, Committee of Region, Brussels 27 June 2013

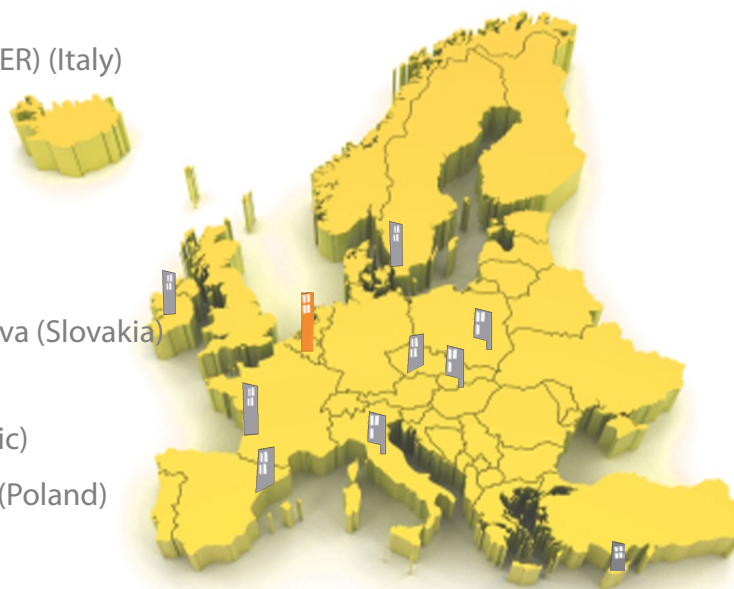


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10 Partners & 5 Typologies of buildings

Energy efficiency in a retrofitting public buildings.

- Florentine Energy Agency (PROJECT LEADER) (Italy)
- City of Malmö (Sweden)
- Metropolitan District of Bordeaux (France)
- Cyprus Energy Agency (Cyprus)
- Centre Urbain (Belgium)
- Slovak University of Technology in Bratislava (Slovakia)
- Barcelona Provincial Council (Spain)
- Energy Agency of Vysocina (Czech Republic)
- Metropolitan Association of Upper Silesia (Poland)
- Cork Country Council (Ireland)



- Historical Buildings
- Social Housing
- Schools
- Sport Facilities
- Offices



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10 Partners & 5 Typologies of buildings

Output

10 Context Analysis
1 European Context Analysis
14 Policies Good Practices



Historical Buildings : 4
Social Housing : 4
Schools : 5
Sport facilities : 3
Offices : 3

19
GP



10 Implementation plans
(design and implement pilots
actions).
1 Common Manual to be
shared with local authorities

Example of Policies GP :

Bâtiments exemplaires (Exemplary buildings)

Euronet 50/50

P.L.A.G.E. (Action plan in energy management)

Good Practice Policy



How a building manager can save 15 to 30% on energy consumption with small investments?





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PLAGE

Plan Local d'Action
pour la Gestion Énergétique

Plan voor Lokale Actie
voor het Gebruik van Energie

is the answer!

Example of a GP policy





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PLAGE, what is it?

■ Definition

- Local Action **P**lan for **E**nergy **M**anagement
- **P**lan Local d'Action pour la **G**estion **É**nergétique (PLAGE → the “beach!”)

■ Objectives

1. To assess the **consumption** of Public buildings and their **energy efficiency**
2. To identify **potential energy savings** and to set priorities for action
3. To organise internal management for efficient maintenance of buildings
4. To integrate energy efficiency in investment decisions



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PLAGE: who benefits?

Actors

5 successive **calls** for projects :

2006 : 7 out of the 15 **Brussels' LOCAL AUTHORITIES**

2007 : 5 **HOSPITALS**

2008 : 8 **other local authorities**

2009 : 6 **EDUCATION NETWORKS (SCHOOLS)**

2011-2013 : 6 **SOCIAL HOUSINGS COMPANIES**





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PLAGE: funding

■ Bruxelles-Capitale's regional contribution:

- **For hospitals, local authorities and social housing :**

- 50% : Energy Manager + small equipment and expert fees

- max 160.000 € for 4 years

Monitoring and expert support given to the Energy Manager during 4 years

- **For education networks :**

- 100% : Energy Manager

- 50.000 € for small equipment and studies (audits)

Monitoring and expert support given to the Energy Manager during 4 years



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PLAGE: five steps for beneficiaries

STEP 1 : to hire an Energy Manager

STEP 2 : to set up an energy cadastre

STEP 3 : to establish an action plan

STEP 4 : to implement the action program

STEP 5 : to communicate the results



➤ **To measure is to save!**

Améliorations		Gain annuel énergie primaire [kWh/an]	Gain financier annuel [€/an]	Invest. [€]	Retour simple sur invest. [an]	CO ₂ (ton) évitées par an
école communale "Les Marronniers" (Anerlecht)	remplacer chaudière par chaudière à condensation	99 726	5 485	32 670	6	21.6
	isoler les conduites dans locaux non chauffés en permanence	14 304	787	1 250	2	3.1
	panneaux isolants /réfléchissants derrière radiateurs	17 808	979	1 950	2	3.9
école communale "Claire Vivre" (Evere)	adapter les horaires de régulation aux horaires d'occupation réelle du bâtiment	24 000	1 320	1 000	<1	5
internat autonome CF (Forest)	Isoler conduites d'ECS dans les locaux non chauffés en permanence	9 400	441	625	1.5	2.9
	Isoler les vannes et circulateurs	9 515	446	1 020	2.5	2.9
	Installer des minuteriers dans les locaux occupés de façon intermittente et des détecteurs de présence dans les locaux occupés de façon irrégulière	6 438	966	3 812	4	2.5

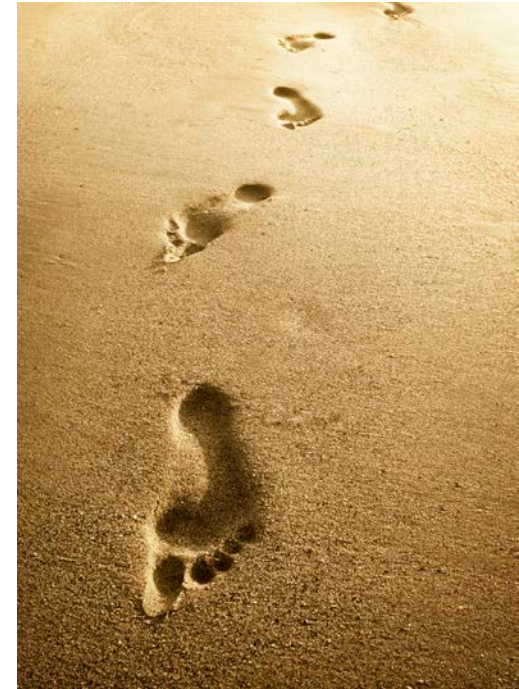


Energy savings figures, payback time and avoided CO2 are meaningful for decision makers!



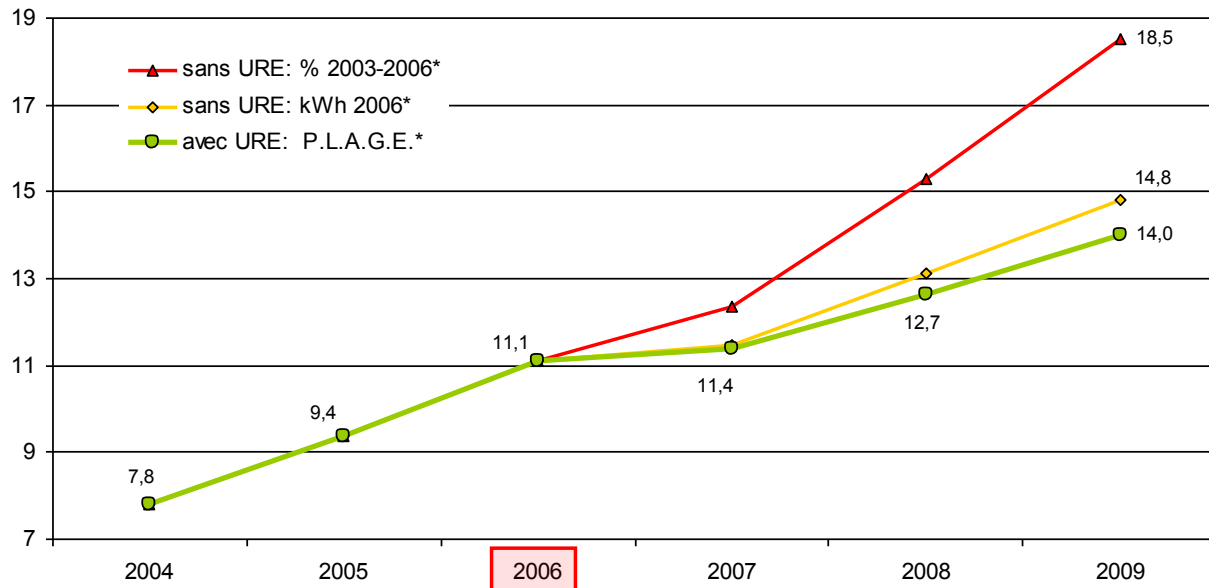
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Evidence of success



P.L.A.G.E. Hôpitaux: gains économiques

million €





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GP Building: Sofielundsskolan Malmö





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Sofielundsskolan – School building

- School for:
 - Kindergarden
 - School for Children between 7 an 15 years (1 to 9 grade)
- Built 1948
- Area before renovation: 16 126 m²
- Area after renovation: 12 681 m²
- Large kitchen that prepares around 6000 portions per day



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Sofielundsskolan – Before







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Sofielundsskolan – Before





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Sofielundsskolan – Before





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Sofielundsskolan after renovation





- Parts of the property have been torn down.
- The central heating system replaced.
- New ventilation systems, HRV.
- Photovoltaic installation.
- Additional insulation of foundation and roof joists.
- Energy efficient and presence controlled light
- New DDC system for better control of the systems
- Energy meters



All Public buildings which were previously heated by electricity are converted to the District Heating.

Cost around 0,06 €/ kWh

95 g CO₂/kWh, around 60 % come from renewable energy.





- Total energy in kWh/year:
 - 2005 heating: 2283257 kWh, electricity: 636769 kWh
 - 2011/12 heating: 1210438 kWh, electricity: 553389 kWh
 - Reduction 2005 – 2011/12 heating: 1072819 kWh (47 %)
 - Reduction 2005 – 2011/12 electricity: 83380 kWh (13 %)
- The energy in kWh/m², year:
 - 2005 heating: 141,6 kWh/m², electricity: 39,49 kWh/m²
 - 2011/12 heating: 95,4 kWh/m², electricity: 43,64 kWh/m²
 - Reduction 2005 – 2011/12 heating: 46,2 kWh/m² (33 %)
 - Increase 2005 – 2011/12 electricity: 4,15 kWh/m² (11 %)
- A significant part of the electricity is used in the kitchen. Since this part has not been affected by the renovation and demolition is not entirely fair to compare kWh/m², year.



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The green roofs of Malmö



A former soap factory in the centre of
Brussels



Context :

The factory ceased trading in 90's

CPAS (Social welfare) bought that area

An urban slum in the core of Brussels

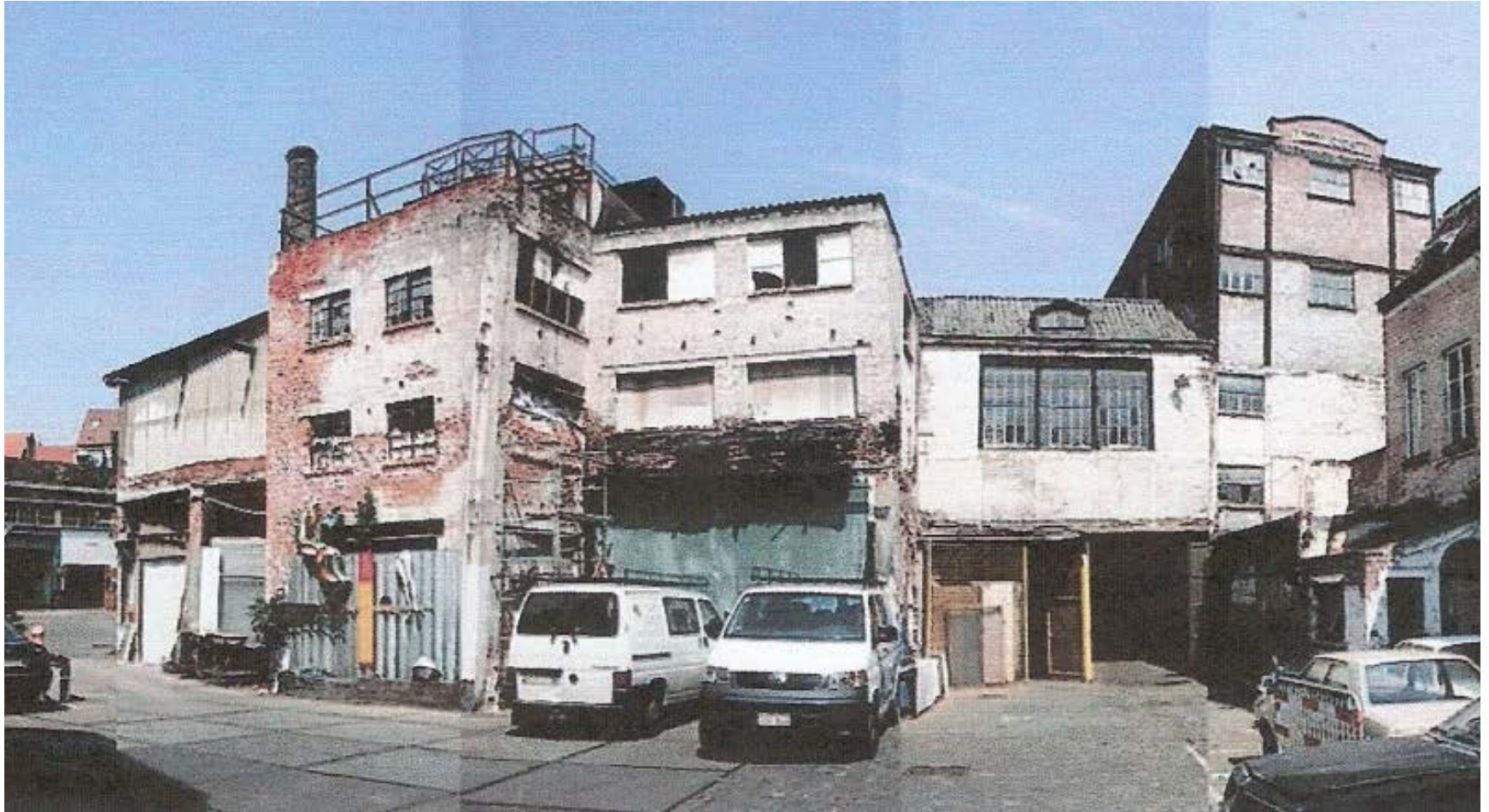
Soil pollution

Lack of housing in the city



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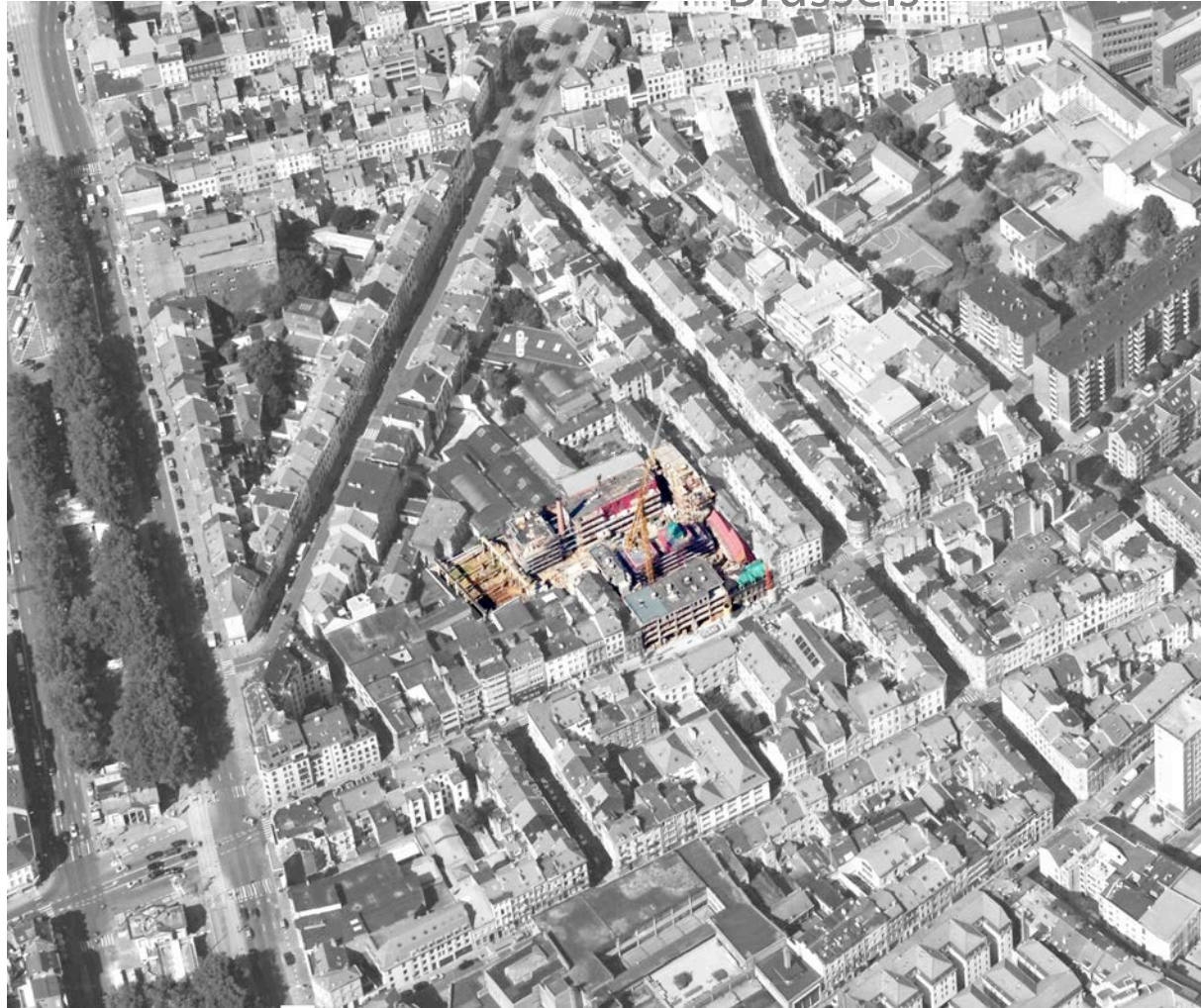
urban slum





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Environmental and social approach in the core of Brussels



Technics used in the renovation

- High EE building envelope
- Heat recovery ventilation (HRV)
- Cogeneration (37kW thermal and 17kW electric) – Central heating.
- Photovoltaic cells (36m²)
- Green roofs
- Bioclimatic loggias
- Rain water recuperation
- EE: retrofit as a low energy building (K33, 46kW/an.m²)





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Deep renovation





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Good practices and transferability

Architectural integration

- Architectural integration
- Mixt of functions





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Good practices and transferability : Social aspects

Functional diversity : a “small village in the city” !

- Park for children : Big and open playground
- “Café du coin”
- Kindergarten : an interface with the neighbourhood.





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Good practices and transferability : Social aspects

Social diversity

- Low rent apartments
- Priority for people from the neighbourhood

Energy bills are lowered by EE equipment.

Involvement of the concierge:

- Surveillance of heating system
- Key role in Inhabitants awareness : rational use of energy.



Thank you !

Contact:

Guillaume Amand
Yanitza Grantcharska
Centre Urbain
Boulevard d'Anvers, 24
1000 Brussels
Belgium



www.serpente-project.eu