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PUBLIC AUTHORITIES CHALLENGE TO IMPLEMENT ENERGY RENOVATION OF CONDOMINIUM BUILDINGS IN FRANCE

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ABSTRACT

In France in 2008, the “Grenelle de l’Environnement” Forum agreed and planned on energy renovation on private buildings to reduce greenhouse gases; the cost was estimated as hundreds of billion euros. Its implementation is actually more difficult than expected: in the absence of the obligation to renovate, public initiatives are required. Government strengthened incentive tax breaks, but they benefits mainly to the wealthiest individual home owners-occupiers. Public accompaniment of owners had always been necessary to improve residential co-owned buildings. Numerous local authorities helped them with the support of a national program first developed thirty years ago for social issues. Reducing carbon emissions recently became a new goal of the housing policies. This paper exposes a new device that French government has developed especially for energy renovation and that a few local authorities have experimented. It demonstrates that fight against climate change needs not only public grants but also local convergences with other aims and strong devices to convinced housing building co-owners.

Keywords: boundary object, housing improvement, mitigation, OPATB, thermal refurbishment.

INTRODUCTION

The residential and tertiary buildings represent 43% of final energy consumption and 23% of greenhouse gazes (GHG) emissions in France. Although this sector emits less as transport, it appears to be the best way to reduce French GHG emissions and, so, to mitigate climate change. Since 1975, the construction sector has adapted to successive reinforcements of energy regulation. Thank to a high thermal insulation, new buildings consume nearly ten times less energy than the average of existing buildings. This makes plausible a factor 4 (a 75% decreased in GHG) by 2050 if a substantial part of the current buildings stock will be renovated.

Housing represents the majority of the built surfaces. Private owners own 4/5th of all housings. The disjunction (Berdoulay & Soubeyran 2002) between the scale of the problem (global warming) and the decision scale (each housing) cannot be greater. The possible solidarity towards the planet from the owners will not be sufficient to reach the factor 4 in France; energy renovation requires governmental actions.

The French government strengthened incentive market measures in 2005: the tax break is the main one. In 2008, the State spent therefore 2.8 billion € for 1.6 million households who spent themselves 8.2 billion € of work. This tax break benefited almost entirely (95%) to occupiers owners (57% of housing belong to occupiers

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owners and 25% to renter owners). Among the French households, the fifth wealthiest benefited six time more of tax breaks than the fifth poorest. Owners of single-family dwelling are overrepresented (56% of French housings, 81% of tax break beneficiaries) (Clerc & Mauroux, 2010).

The limits of tax break for housing improvement are known for several decades. During 70s, the Housing Ministry had implemented a grant device in partnership with local authorities: this device targeted non-occupiers owners and modest occupiers owners. It has often been essential for condominium improvement for a main reason: work decision requires a large majority of co-owners. Unlike tax breaks, partnership devices involve local governments during several years. At least, three levels of "government" are involved: national, local and, of course, condominium.

How these different scales of government integrate the issue of climate change mitigation? How mitigation policies should be implemented for the condominium buildings?

We assume that the content of mitigation policies is determined by involved organizations: not by one of them but by their interactions. Therefore, we consider partnership projects and multi-scale devices as boundary objects (Star & Griesemer 1989, Aibar & Bijker 1997, Trompette & Vinck 2009, Debizet & Symes 2009).

This paper focuses on the experimental partnership device developed by the state and applied by several local authorities in order to mitigation: OPATB device. The first part considers the OPATB device as a boundary object involving different ministries with their specific organization: knowledge, procedures and aims. The second part shows the high degree of investment of local governments and the interactions with territorial issues: it also illustrates the necessity to implement mitigation on a local scale.

OPATB AS A NATIONAL DEVICE FOR MITIGATION, COMBINING SOCIAL AND ECONOMIC ISSUES

Housing and Economic Ministries have overseen national policies relative to housing improvement. Climate change leaded the Ministry of Environment to promote building energy renovation. In absence of obligation to renovate, they developed together the OPATB device.

An obligation to renovate legally or politically difficult to set up

Since its inception in 1975, building regulation has established minimum energy efficiency; it applies only to new buildings, i.e. those submitted to an authorization procedure. Concerning existing buildings, an energy performance assessment must be associated since 2009 with the sale (or rent) of housing; however, it only informs the buyer (or tenant). In addition, minimum performances of products are imposed on professionals: i.e. when they replace windows.

In 2007, the mitigation of climate change was one of the main issues of the French presidential race. Incumbent President Sarkozy avoided specific commitments, but vowed a broad consultation on the environment and climate change. During the "Grenelle Environnement" of the Forum, all participants agreed to mandatory energy renovation of buildings. However, a few months later, the "operational building committee" was reluctantly argue about the solvency of owners and the difficulty in defining the verifiable obligations. Laws that apply the "Grenelle Environnement" does not actually impose a general obligation. In the absence of requirement to undertake

energy renovation, incentive provisions have been promoted for several years and shall be developed for many years.

Preexisting economic incentives for owners

With 1.5 million jobs, the construction sector is one of the country's first economic sectors. As such, tax cuts for individual investors and zero-interest loans have sustained construction. Progressively, French government strengthened these incentives in case of energy efficiency work.

Tax cut and loan subsidies have always been insufficient to stimulate the landlords and modest homeowners. The former do not benefit directly of energy savings. The latter have little capacity to finance work. These two categories can receive grants from the national agency for housing improvement (Anah). Created by the State in 1971, Anah *"encourages and facilitates the execution of improvement work and housing adaptation."*

In 2008, Anah distributed two thirds of the 526 million euro of grants within local scheduled operations of housing improvement (OPAH: Opérations programmées d'Amélioration de l'Habitat). Specifically, local authorities increase the fund and define the perimeter, the goals and some grants level in consultation with Anah. Finally, the owners receive more grants than Anah usually gives outside of an OPAH perimeter (Anah 2009).

The first scheduled operations were signed with local governments in 1977, as part of urban renewal of neglected and unhealthy historic districts (Gravejat 1991). Gradually, Anah has expanded the device to economic and social aims. During 90s, energy savings appeared progressively as a lever of housing improvement.

Before partnership convention, pre-operational studies clarify the scope, work types and calibrate both subsidy levels and partners financial budget. The subsidy rate should be high enough to trigger reinvestment from private actors and low enough to respect the budget of each partner. The result is uncertain because owners (or condominium corporation) actually choose the work and, therefore, decide whether or not to use the subsidies.

OPATB national device genesis

Ministry of Housing (supervisory authority of Anah) and the Ministry of Environment (supervisory of Ademe) introduced OPATB device in February 2002 as a call for local authority projects. *"The OPATB are intended to act locally on residential and commercial buildings to reduce their energy consumption and CO2 emissions"* (Ademe & al. 2002) The OPATB device actually fitted into the mold of Scheduled Operations of Housing Improvement (OPAH) that have proven efficient since their creation in 1977 by Anah. However, the principles of call for project and the criteria to select communities correspond to Ademe procedures.

Agency for the Environment and Energy Management² (Ademe) implements environmental policies carried by Ministry of environment. It also offers its expertise to local authorities. Ademe calibrates its devices to bring out innovative experiments and facilitate its diffusion. Then, national or local governments often contribute, by grants or tax cuts, to the diffusion of a sustainable innovation initially funded by Ademe.

Ademe considers OPATB (operations rather than the device itself) as innovative experiments: *"The multiplicity of targets must create genuine competition among professionals and increase synergies [...] between building partners"*.

² ADEME is in France what the EPA is in the U.S.A.

Ministries validated the OPATB device. They ensured compliance guidance to key moments and the communication fallout. Then, Anah and Ademe have implemented the device in partnership with local governments:

- Anah fulfills its mission: aid landlords and modest tenants. It masters the operational methods: targeting buildings, defining scope and ways of grants...
- Ademe funded energy studies, technical animation, final evaluation and some high performance work. It manages also the experiences exchange network.

Ademe and Anah envisaged twenty-six local OPATB: "*The future multiplication of OPATB depends on the success of these first OPATB.*" Only 16 OPATB were underway in 2007. However, a growing number of OPAH incorporates "energy" as one of their goals: 273 of 715 ongoing OPAH in 2009.

During the OPATB device gestation period (2000-2002), Ministry of Housing (Besson 2000) appropriated the goal of climate change mitigation (targeting global solidarity) in addition to initial goal of saving energy (targeting the purse of owners and occupiers). OPATB device hybridizes OPAH (Anah) and innovation funding (Ademe), it finally encourages Anah to develop energy goal in the OPAHs. Ministry of Environment and Ademe increased their legitimacy and their visibility on the housing sector. OPATB device appears as a transient boundary object between the sectorial Ministries and between their agencies.

Let us observe how the OPATB device implements the mitigation on a local scale.

GRENOBLE AND ECHIROLLES OPATB

Six of the thirteen OPATB operations implemented in 2006 were located in the Rhône-Alpes, one of the most dynamic regions in terms of sustainable building (Roudil & al. 2008). We choose the cases of Grenoble and Echirolles³ because these OPATB mainly concern condominiums. Anah and Ademe selected Grenoble in 2002 and Echirolles in 2004.

After describing the OPATB process, we explain how local authorities approach OPATB. Then, we summarize the results of Grenoble OPATB .

A lengthy and complex implementation: i.e. Grenoble OPATB

Three years were required to define the Grenoble OPATB (two years for Echirolles). The implementation convention, signed by Ademe, Anah, the city of Grenoble, the State and Grenoble Alpes Métropole (the metropolitan authority) in October 2005, described the quantitative targets, the financial commitments, the subsidy rules and the terms of animation, monitoring, evaluation and control.

Once signed the partnership convention, the operational stage began with a long and tedious work of information to storekeepers, condominium boards and managers in order to encourage them to initiate an energy audit. After its energy audit, the condominium board was accompanied for one or two years until a majority of co-owners votes (or does not vote) for thermal work during the annual condominium meeting.

³ Grenoble (160,000 inhabitants) and Echirolles (37,000) are the main cities of Grenoble urban area (500,000 inhabitants).

When many boards of condominium planned to propose energy renovation at their annual meeting, the city left proactive communication. It avoided to involve new condominiums and, therefore, to exceed the OPATB budget.

The figure below illustrates the process. The city (“Ville de Grenoble”) steered the OPATB process and the condominium board (“copropriété”) steered the building renovation project. During work, city subsidized 20% of work cost to the condominium. The housing owners received subsidies based on their individual situation.

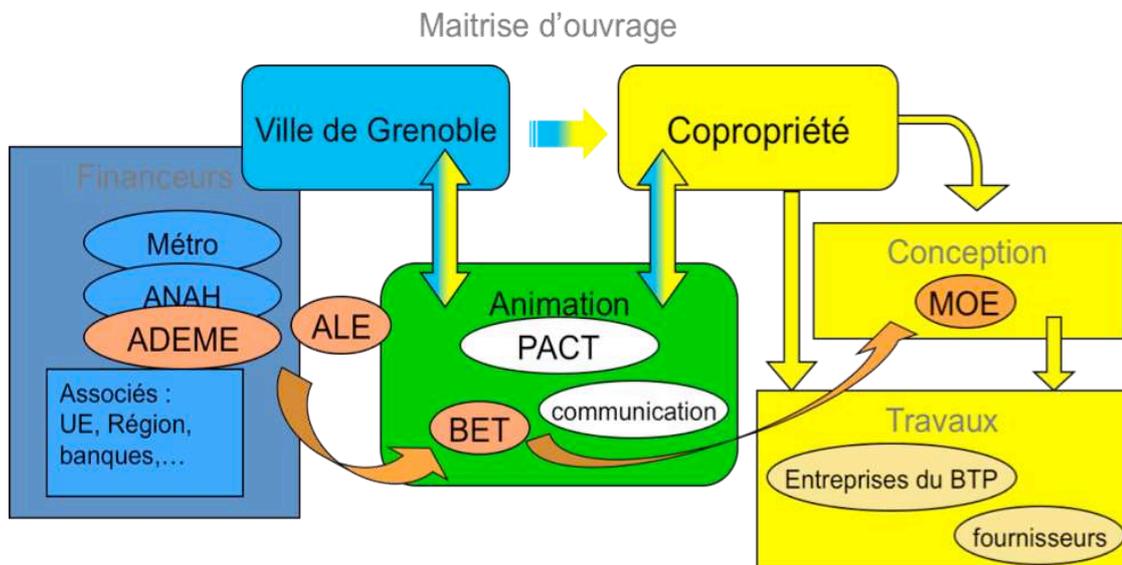


Figure 1 OPATB Grands Boulevards process. (Source: Debizet based on figure of Carré, PACT de l'Isère 2009)

Funded by the signatories of the OPATB agreement (blue or dark gray), the animation device (middle) aimed condominiums (green or light gray) to drive the energy renovation project: each condominium recruited a contractor. Each category had a technical expertise (orange or gray): this facilitated the knowledge transfer to architects (“conception”) and contractors (“travaux”) and the control of thermal performances by Ademe.

OPATB animation combined the contribution of technical, organizational, financial and communication experts. A non-profit association (PACT), specialized in assisting housing improvement, coordinated the animation team.

City of Grenoble: an urban project became an illustration of the energy-climate local policy

At the stage of pre-operational studies, perimeter covered a band of four hundreds meters around the new tramway lane through the city. Three kinds of building were targeted: tertiary public buildings, small shops and condominium housing. The scope of these last two had been restricted. The 'Small shops' only concerns facades along the new tram lane (orange line below). The perimeter "Habitat" (green line below) applies to all blocs along the tram lane (green line below).

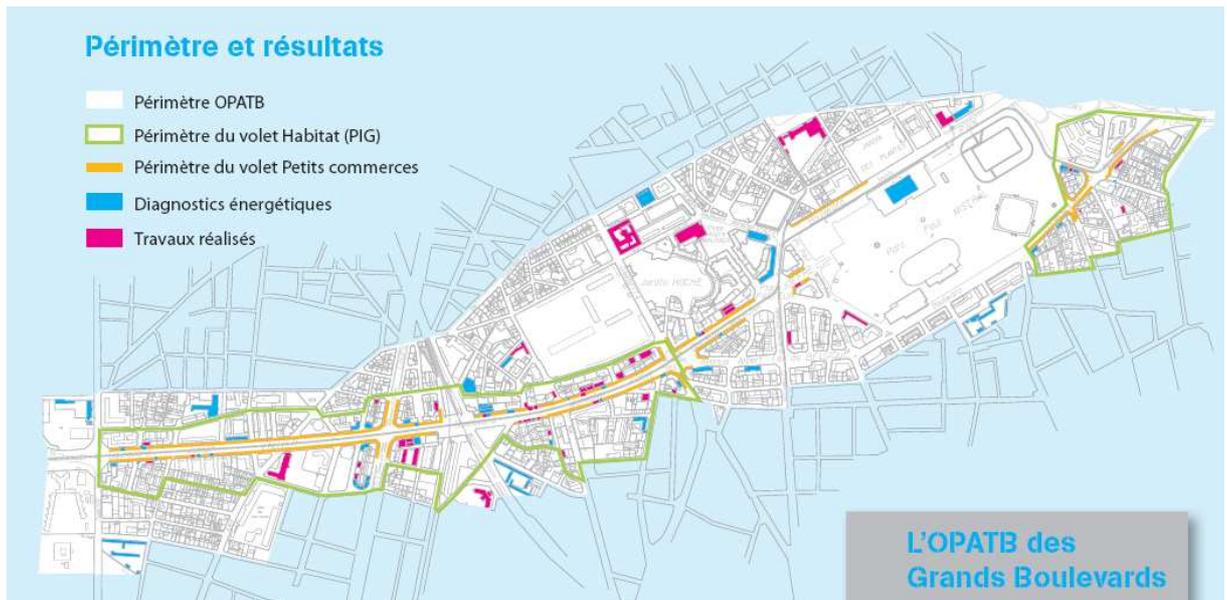


Figure 2 Perimeter and results of Grands Boulevards OPATB (Source City of Grenoble : OPATB assessment)

Realized where fortifications protected Grenoble city center until 1938 (Parent 1982), the Grands boulevards are currently lined by tall buildings built between 1945 and 1967. Their energy performance was poor.

Several major urban projects concerned this area: highway bridge demolition, new tram lane, traffic calming measures, building facelifts and also building a green district nearby (De Bonne). The city council expected to reduce urban break between the wealthy historic center and the suburbs built during the post-war boom.

"The intervention on the Grands Boulevards is part of a global project of territory conquest and transformation." explained the mayor in the 2006 brochure of the OPATB addressed to the inhabitants. It also supported the tram lane success, which some storekeepers opposed. The brochure advertised three aims: revitalizing the shops, improving buildings thermal performance, and enhancing architecture. OPATB's slogan "new air on the Grands Boulevards" exalted the aesthetic as much as climate.

Three years later, in 2009, the tramway lane was so popular with inhabitants and most of the storekeepers, that the ideal of urban continuity became useless. Now, apart from technical communication to owners, the city exposes OPATB as a flagship project of its "Grenoble Factor 4" program. "Grenoble Factor 4" is de facto the Municipal Climate Action Plan and a new ideal for the city's future (Henry 2008). The renewal of the City Council in 2008 confirmed this trend by moving the OPATB political leadership: the deputy mayor in charge of Sustainable Development replaced the deputy mayor in charge of Urban Development.

City of Echirolles: OPATB as an action of the sustainable development program complementary to major urban projects

Second town of the Grenoble urban area, Echirolles has been urbanized since 30s. In the 60s, social housing and condominiums buildings had started to grow alongside the working-class individual house area around main industrial sites. For the last twenty years, the city has built a true urban center around a tramway lane, which is the communal territory epicenter. Ten years ago, the city council launched an Agenda 21. It has mobilized residents and city staff around shared objectives by focusing on social and environmental synergies. It took care to cover all areas of the city and, both, the

diversity of sectorial thematic and the different categories of people. Since then, it has led to systematic follow-up actions with the residents.



Figure 3 Perimeter and posters of West Echirolles OPATB. (Source: City of Echirolles)

The OPATB "Echirolles West" conveniently filled the hollows of Agenda 21 and of a vigorous urban policy. First, the western districts did not benefit from the public facilities of the Echirolles city center. Second, the various actions on buildings conducted by the city did not relate to existing private buildings. The western districts focused on the higher proportion of private housing (mainly condo) and weaker political relays of the city leftist majority. Compared to Grenoble, OPATB communication emphasized household interest and, implicitly, global solidarity but it ignored the urban dimensions.

Grenoble Alpes Métropole, the metropolitan authority: embrace a new skill

Partner of Grenoble and Echirolles OPATB, the metropolitan authority (commonly called "The Metro") abounded them on its own budget. This institution is in charge of metropolitan transport, economic development, social housing and some environmental issues (atmospheric pollution, road noises, waste...) but not urban planning. The Metro created in 1999 the Local Energy Agency, which provides expertise and advice to local partners, businesses and residents. The Metro was one of the first French Métropole to develop a Local Climate Action Plan (presented in May 2005). It introduced early the climate change mitigation goal in its housing and transport policies, and mobilized the cities of the area to develop climate policies (Debizet 2009). It steers the "Mur Mur" device that succeed to OPATB from 2010.

Restricted to an animation and incitement in urban planning role, the Metro will initiate and facilitate innovation⁴ in the building industry that remains one of the main economic sectors and provides the majority of the metropolitan taxes.

Minor contributors to both OPATB operations

⁴ Grenoble is often considered as an urban laboratory. First world low-platform tramway was intended in 1987 à Grenoble in conjunction with associations for the disabled and the authorities. The Caserne de Bonne urban project was awarded as best French green district.

The **Rhône-Alpes Region** funded energy audits and some solar water heaters or photovoltaic panels. In addition to GHG reducing, the action of the Region has been part of an economic development of solar and green building sectors (Roudil et al. 2008). Non-signatory to the OPATB, the Region did not participate in their targeting.

Under the European Concerto program, **European Community** funded a tenth of the OPATB animation. This funding was acquired several months before signing the partnership convention; City of Grenoble might make choices more vigorous.

Results of Grenoble OPATB

When Grenoble OPATB period (2007-2010) ended, a quarter of eligible condominiums (22 condos grouping 637 apartments) had decided to realize thermal improvement work. Unlike previous OPATB partnership convention, their work consisted almost entirely in adding external insulation. OPATB granted 1.6 million € of the 5.5 million € work and spent 0.6 million for animation and expertise (Debizet 2010).

Grants represented 30% of work cost for an average owner. However, this rate depended on owner status and income. It varied from 35 to 80% for non-occupiers owners (landlords) and from 20 to 80% for occupiers owners. These rates did not only result of social issues. They were required to find a majority in favor of energy work during the annual condominium meeting:

- Because national law restricts the rent increase, landlords do not benefit of energy renovation when they keep the housing. Therefore, they need grants to maintain profitability of investment. Among them, the less wealthy and the older have to be helped because they cannot get a bank loan.

- The poorer and the older occupiers owners have also to be more helped. First, they cannot benefit of tax breaks and bank loan. Second, the profitability of their energy renovation investment is lower than that of the wealthiest occupiers owners because their initial energy bill is low (they already try to save energy).

Owners can also benefit from national tax breaks on the balance after OPATB grants. Failing of specific statistics, we assess that tax breaks represent roughly 10% of the global work cost. According professionals involved in the OPATB, tax breaks are not decisive for modest owners.

The Grenoble OPATB helped reduce annual carbon emission of 575 tons. Therefore, energy renovation cost 10,000 euros to reduce annually one ton of carbon: OPATB partners (including state) funded directly 4,000 euros and state funded 1,000 euros through tax breaks.

Local authorities consider OPATB as an opportunity for a wider project (or policy): sustainability program (Echirolles), urban project or climate plan (Grenoble). The specific priorities of local governments influence perimeter and targeted population. Anyway, the initial convention and the partnership steering committee ensure that the implementation respects the aims of mitigation and energy saving. We missed place to describe the cognitive and organizational aspects. The concept of boundary object could also be useful to describe the interactions of local governments and national agencies especially in order to analyze the outstanding issues of energy renovation policies.

CONCLUSION

The energy renovation appears a consensual mean to reduce GHG emission. However, it requires a high level of investment. The wealthier occupiers owners of individual dwelling can expect a financial gain thank to energy saving; they benefit easily from tax breaks and are able to quickly decide insulation work. The collective housing owners do not have the same abilities. A local accompaniment is necessary; it combines variable grants and a socio-technical mediation.

Unlike one ministry, local authorities consider the scheduled operations of energy improvement as a transversal element to their different policies. They will have to face the antagonism between mitigation and social goals (Debizet 2011). Maximizing GHG emission reduction of a given budget leads to orientate public funds toward the wealthier condominiums.

On another scale, French government should adjust the rate of tax break according household income and dwelling type. It should also increase the part of scheduled operations within its overall budget available for energy renovation. Anyway, it cannot avoid the debate between mitigation goal and social priorities. Further analyzes of the local implementations of mitigation could feed this debate.

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