Economic instruments promoting sustainable building projects

Although well in excess of the costs involved, the economic benefits resulting from sustainable building projects are not always sufficient to motivate decision-makers, and this for two primary apparent reasons. First, decision-makers (building owners), when not occupying the premises themselves, only recover a limited portion of the direct economic benefits, with the occupants often receiving a more sizable share (especially savings garnered on operating expenses). Second, decision-makers do not typically realize any of the gain stemming from the global benefits generated for the locality or at other levels. In order to overcome this inherent conflict, which is detrimental both in economic terms and from a sustainable development perspective, various economic and financial tools have started to be introduced in France and elsewhere. The most widespread approaches at present seek to implement, upon the initiative of local authorities, fiscal instruments and subsidy programs.

THE "CONVENTIONAL" SET OF PUBLIC ACTION TOOLS		LEVEL OF DEPLOYMENT		
		France	Leading nations	
TAX ADVANTAGES	Fiscal relief, tax credits for sustainable construction or refurbishment	*	**	United States, United Kingdom
TAX PENALTIES FOR NON-SUSTAINABILITY	Tax levied on extraction of non-recycled construction materials	-	**	Denmark, Sweden, United Kingdom
	Modulation of taxes or fees (waste, wastewater); guarantee bonds	-	**	Germany, United States
SUBSIDIES	Design studies, construction work, training, etc.	**	**	Many countries
	Awarded following competitive bid based on sustainability criteria	-	**	Austria

** Multiple applications recorded * Infrequent applications recorded - No applications identified

An increasing number of instruments have been made available by private-sector actors. In some cases, the public authority actually requires private actors to undertake (e.g. via legal stipulation or order from the service regulator responsible for water or energy supply to enact economic measures aimed at controlling user demand). Both public and private actors may also be associated (examples of joint loan rebates or the use of public resources to augment private financial funds).

PRIVATE-SECTOR INITIATIVES		LEVEL OF DEPLOYMENT		
		France	Leading country	
PREFERENTIAL BORROWING	Discount loans (offered by banks and/or co-underwritten by the public authority)	*	**	Switzerland, the Netherlands, United States
ECONOMIC INCENTIVES FOR WATER / ENERGY DISTRIBUTORS, FACILITY SUPPLIERS	Performance audit free of charge Discounts (e.g. on sustainable building material or insulation purchases) Grants for client investments (e.g. facility leases with purchase option)	-	**	Germany, Belgium, United States
PREFERENTIAL INSURANCE CONDITIONS, NEW INSURANCE PRODUCTS	Performance bond protection (e.g. energy, indoor air quality)	-	**	United States
	Preferential premiums	-	*	United States
SPECIAL ALLOCATIONS	Capital investment fund	-	**	United Kingdom, United States
	Guarantee fund	*	*	

** Multiple applications recorded * Infrequent applications recorded - No applications identified

As of the year 2000, new tools have been created such as the density bonus allocation (Switzerland, United States), accelerated building permitting process and certificate trading (with respect to CO_2 emissions, wastes, etc.).
At the same time, a number of strategy sessions have been held to lay out new and promising paths; these would include incorporating sustainable property management into corporate ratings. The current period is thus one of real expansion in the range of economic and financial tools available for implementation.

This document has been compiled using findings from the study entitled "Economic instruments and sustainable building" (February 2004), conducted by Dominique Drouet (Recherche Développement International; www.rdi-consultant.com) at the request of ARENE - Paris Region.

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APPROACH TO PROMOTE HIGH ENVIRONMENTAL QUALITY IN CONSTRUCTION

Sustainable building: the economic benefits

Key points:

- ✔ **For a sustainable building design, cumulative gains accrued over a 20-year period, capable of surpassing 10 times the initial costs.**
- ✔ **A source of several tens of thousands of new jobs.**
- ✔ **Benefits shared by all actors within both the construction and property management phases (including banks and insurance companies).**
- ✔ **A full range of economic and financial instruments awaiting deployment.**

Direct and collective economic benefits

Sustainable buildings serve to generate direct economic benefits, to the advantage of both building owners and occupants. Their inherent features also generate collective benefits for the immediate district and at various scales, running the gamut from local to global (employment creation, reduction in public health expenses, environmental improvement and preservation of natural resources…).

QUALITY OF SUSTAINABLE CONSTRUCTION (HQE families)	ECONOMIC BENEFITS	
	Direct benefits	For the public good
Eco-construction (choice of products and materials, worksites generating fewer nuisances)	• Lower risk of concealed defects. • Fewer worksite losses and less downtime. • Reduced facility-removal costs.	• Less impact from worksites (wastes, runoff, noise, local nuisances…). • Optimized utilization of resources.
Eco-management (energy, water, waste from building operations, maintenance and repair work…)	• Lower building charges (maintenance, energy, water…), savings may be shared between owner and tenant. • Less frequent need for facilities renewal thanks to ongoing maintenance. • Improvement in occupancy rate of premises; greater ease of letting space. • Possibility of trading CO_2 certificates. • Less risks of physical losses (fires…).	• Smaller contribution to the greenhouse effect (drop in CO_2 emissions). • Decline in natural resource consumption (energy, water…). • Reduced discharges into the environment (in terms of wastewater, waste…).
Comfort and health (acoustics, sanitation conditions in building spaces, indoor air quality…)	• Enhanced employee productivity, less absenteeism (for commercial/industrial premises). • Fewer health-related expenses. • Lower probability of entering into litigation (avoiding the "sick building syndrome").	• Lower reimbursement amounts absorbed by the national health care system (reduction in overall health risk).
General considerations	• Increase in property values and resale prices. • Improved image, marketing/promotional stimulus.	• Development of new economic activities and job creation.

Initial studies have been conducted on the economic benefits stemming from sustainable buildings. In awaiting the results from more systems-oriented research being undertaken across several countries, this work enables identifying the types of benefits generated, the main categories of benefit recipients, in addition to providing the first real quantitative orders of magnitude. These studies also indicate that - as a complement to the conventional set of sustainable building promotional tools (standardization, training, information dissemination…) - economic and financial instruments are being implemented to an increasing extent. In relying upon these still-fragmented levers and in proposing their transposition under certain conditions within the French context, the present document is intended to illustrate the state of current knowledge.

Direct benefits from the actor's perspective

The economic benefits associated with sustainable construction are not only advantageous to building owners and occupants. Other partners to the construction and property management processes also benefit, notably project architects/engineers, building contractors, banks and insurance companies.

Building Owner

- Improvement in the occupancy rate of premises; possibility of higher rental values
- Less frequent renewal of facilities
- Fewer risks of physical losses and concealed defects
- Increase in property values

Building Occupant

- Lower charges (maintenance, energy, water…)
- Better living and working conditions
- Fewer health-related expenses
- Enhanced image

Building Architect/Engineer

- Positioning on the emerging market
- Services with higher added-value component

Sustainable building

Building Contractor

- Improvement in the quality of construction
- Fewer losses and a reduction in worksite-related risks
- Greater prestige given to the building trades

Banking sector

- Lesser risk borne in lending operations
- Development of new banking products
- Contribution to the global "CO_2 neutrality" of banking activities

Insurance sector

- Better control over building-related losses
- Lower payment required to honor the 10-year performance bond
- A more attractive clientele for both complementary health insurance plans and pension/savings plans

Assigning values to these benefits

Some benefits (e.g. gains relative to operating costs) are straightforward to measure, while others can only be estimated using more complex methodologies. The available studies yield initial orders of magnitude and demonstrate that benefits surpass costs by a wide margin, with savings owed to health, productivity, energy and maintenance being especially substantial.

CUMULATIVE BENEFITS OVER 20 YEARS FOR TERTIARY BUILDINGS

The current net value (annual discount rate of 5%) of cumulative savings realized over the past 20 years for tertiary buildings (offices, schools) is more than 10 times greater than the cost premium, in comparison with a conventional building (average calculated after analysis of data on 33 buildings awarded the American "LEED" certification - median level; converted into an equivalent annual basis, the total net savings would be equal to € 21/m² and the savings on just operating expenses to € 5/m²):

	Current value	Share of savings
Savings on operating expenses		
Energy	€ 51.0/m²	11%
Water	€ 4.5/m²	1%
Waste	€ 0.3/m²	0%
Operations & Maintenance, commissioning of works	€ 74.5/m²	16%
Subtotal	**€ 130.3/m²**	**28%**
Savings on atmospheric pollutant emissions	€ 10.4/m²	2%
Savings on health and productivity expenses	€ 324.6/m²	70%
Total savings	**€ 465.3/m²**	100%
Cost premium	€ 35.2/m²	
Net benefit	€ 430.1/m²	

Source: Results, converted into €/m², from the study entitled "The costs and financial benefits of Green Buildings, a report to California's Sustainable Building Task Force", October 2003.

Assigning values to these benefits

VARIATION IN OPERATING BENEFITS FOR VARIOUS TYPES OF BUILDINGS

For operating benefits alone, the cumulative savings over 10 years per m² either newly-built or refurbished vary, depending on type of building, from € 16 to 34/m² (expressed on an annual basis, the average benefit in terms of operating expenses would be € 2.5/m²):

	Individual housing units	Subsidized housing	Private multi-family housing	Offices	School buildings
New	€ 34/m²	€ 38/m²	€ 31/m²	€ 16/m²	€ 24/m²
Refurbished	€ 28/m²	€ 24/m²	€ 23/m²	€ 23/m²	€ 17/m²

Total operating savings over the period 2001-2010 (discounted over 15 years at a 5% rate) less capital investments (items included: energy, carbon avoided, drinking water supply, operations, acoustic treatment).

Source: "HQE challenges for 2010 in the Paris region", ARENE, May 2001.

SAVINGS ON PROPERTY VALUES

	Property value gain
Office buildings after investment in energy conservation measures and installation of a low-cost energy supply system:	€ 8/m²

Source: Extracted from "Making the business case of high performance Green Buildings", USGBC 2002.

ANNUAL SOURCE OF SAVINGS RELATIVE TO HEALTH EXPENSES

In transposing the data estimated for the United States to the French context, the total annual source of savings relative to health expenses, thanks to a higher quality of indoor air, could amount - as an initial approximation - to an order of magnitude of 2 to 7 billion euros:

Reduction in respiratory illnesses (4 to 9 million colds and influenzas avoided)	€ 1 - 2 billion
Fewer allergies and asthma (drop of between 8 and 25% of symptoms among allergy and asthma sufferers)	€ 0.1-0.5 billion
20 to 50% fewer symptoms associated with the "sick building syndrome" (eye and nose irritations, headaches, etc.)	€ 1.2-4.5 billion
Total health-related savings	€ 2.3-7.0 billion

Source: Extracted from W. Fisk, "Health and productivity gains from better indoor air environments - Summary of prior publications", Lawrence Berkeley National Laboratory, 2003 (data transposed on a prorated basis from the population and through applying a reduction of 45% to account for the differential in health expenses per capita between the two countries).

CREATION OF NEW JOBS

Thousands of new jobs may be generated by virtue of the construction and fit-out of sustainable buildings. Such jobs stem for the most part from the need for added workforce given that several of the specializations involved (e.g. wood-materials and green roofs) are highly labor-intensive.

			Number of jobs
Germany	"Green roofs"*	Number employed in 2002 (fabrication and maintenance)	12,000
		Potential pool of new jobs created if all flat roofs were greened	100,000
	Water**	Number of jobs created in the field of alternative water management	60,000
Paris region	Scenario of strong backing for HQE construction and refurbishment effort (2010 time horizon)***	Creation of both direct and indirect employment in the Paris Region	40,000
		Employment generation (distributed throughout France) in wood building materials	10,000

Sources:
* Green Roofs for Healthy Cities, 2003.
** "La gestion alternative de l'eau dans les projets urbains", ARENE, May 2003.
*** "HQE challenges for 2010 in the Paris region", ARENE, May 2001.

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