Chapter 3
Financing the Green Building Retrofitting Investments:
A Case Study for a Romanian Seaside Hotel

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ABSTRACT
The main financial barrier of large scale implementation of green building retrofitting investments is
due to the relatively large investment volume needed, compared to the future flow of yearly energy sav-
ings or/and yearly estimated differences of incomes collected, if the building is a commercial building
(commercial center, office building, hotel or even residential rental building). The uncertainty implicitly
involved in this estimation, both for the future savings and for the yearly differences of incomes, which
are usually not very large, both make these investments apparently not so attractive for private investors,
especially for owners of residential buildings, with limited self-financing power. Nevertheless, from the
society point of view, the benefits created by saving the energy and consequently reducing the carbon
foot print, can be very attractive. That is why the public support is often used as an “impulse solution”
for implementation of these investments. The Cost Benefit Analysis methodology, particularized for these
investments, is presented in this chapter.

INTRODUCTION
The green building retrofitting investments are viewed as an optimal solution for improving the net oper-
ating cash flows for the buildings’ owners, either only by the energy savings incurred for the residential
buildings owners, or by the energy savings and by larger revenues for the owners of commercial build-
ings (i.e. commercial centers, office buildings, hotels) and of the residential rental buildings, but also for
providing significant benefits to the society by reducing the pollutant emissions, due to energy savings.
From the second point of view, this type of investments is considered very effective in the prospect of
the 2020 and 2050 assumed targets of emissions reduction (Torregrossa, 2015), considering that about
one third of the greenhouse gases emissions are produced by buildings (He et al., 2019).

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Typically, the cost of these investments is significantly larger than the expected yearly net cash flow change, even if the additional net cash flow is due both to the energy savings and to the larger revenues or only to the energy savings. In the last case it is possible that prudent financial projections for such investments to show a zero or even negative financial net present value. Besides, especially these energy savings are affected by uncertainty or at least are perceived as uncertain by the buildings’ owners, due to the variation of the market prices of the electricity and gas but also to the variation of the future need of energy, at least partly due to the effects of the climate change.

The other benefits of the green building retrofitting, like improvement of the residents’ life quality and the corresponding reduction of the public health costs due to the improper quality of housing and infrastructure, as the rise in the value of the retrofitted buildings and even the expected new jobs created and the economic growth incentive effects, are also perceived as uncertain by the buildings’ owners and not enough interesting to counterbalance the cash out-flow for the cost of investment. Furthermore, sometimes the total effort of investment is even larger than the investment cost, if the opportunity cost of fully or partly operation interruption of the green retrofitted building during the investment is considered.

From the point of view of financial resources, the residential buildings owners have most usually limited available resources and the private lenders have low experience and interest in this kind of investments, perceived as investments with high initial cost and long payback period.

The above presented barriers are the main reasons that reduce these investments attractiveness for the building owners, as for their relatively slow deployment pace. Therefore, considering the significant social benefits generated by reducing the energy consumption and, correspondingly, by significant reduction of the buildings’ carbon footprint, the public support is required for promoting these building retrofitting investments. For this purpose, countries’ governments set various public funding mechanisms, from public supported grants for building retrofitting investment, to tax incentives and public warranted loan schemes with corresponding lower interest rate, or even loan schemes for which the interest rate is directly subsidized. For the example, in Germany direct subsidies were initially granted by the German Alliance for Work and Environment, a broad coalition between the trade unions, federal government, industry and non-governmental organizations with the purpose to provide public financed incentives for the green building retrofitting investments, as for the new green building projects and for the domestic market of the necessary materials and services. Later, the subsidies granted by preferential loans and grants were managed by the German development bank (KfW). Whereas in the U.S., at the federal government level, the tax incentives were preferred, being implemented in the form of different income tax incentives for residential and commercial buildings. Nevertheless, after 2012 at the federal level, the tax incentive for residential buildings was eliminated (Neuhoff et al., 2012).

Summarizing, the issues involved by the green building retrofitting investments are: the scarcity of the relatively large initial capital required by the investment, long payback periods for the investment (especially in case of residential buildings) and partly or fully interruption of building operation during the investment.

In dealing with these issues, involved by the green building retrofitting investments, and considering the need of prioritization and assessment of the different buildings’ investments for financing purposes, specific approaches were developed in the literature. Following are presented a few of these:

1. Cost-optimal approach is a limited cost-benefit analysis, which ignores the positive environmental effects involved by the green building retrofitting, focusing exclusively on the monetary impacts of the energy savings on the retrofitted building owners. This method was used for example in