Module financing

1. Introduction

By becoming a GreenBuilding Partner, your company can demonstrate its commitment to significantly reduce the energy consumption in its non-residential buildings which are participating in this effort.

In the following, you may find assistance for the financing of your investments in energy efficiency and renewable energy measures.

The GreenBuilding Programme encourages its Partners to tap a large reservoir of profitable investments without the need for specific financial incentives from the Commission. The GreenBuilding investments use proven technology, products and services which can reduce building energy use by 20% to 40%, earning rates of return between 10% and 30%.

Antiquated supply units, inefficient utilisation techniques, insufficient operation and servicing, lack of consumption control are reasons for high energy consumption in all sectors. Targeted investments, modern operation management, intelligent user motivation are preconditions for long-lasting cost reduction. Contracting offers these results.

Beneath conventional financing strategies, Third Party Financing (TPF) has proved to be a powerful tool in order to get efficient energy technologies into the existing building stock, mainly in cases where no respectively limited building shell refurbishment measures are demanded. This module can help the building owners in the first step to find the best financing strategy to protect the natural and financial resources.

2. Profitability calculation

Improvements in energy efficiency generally have an initial cost which then leads to reduced future energy costs. An existing building shell and equipment may be providing suitable heat in the deep winter, but provides too high temperatures in spring and autumn. The installation of additional insulation, an automatic control system or other measures will entail the expenditure of an initial sum of money, but future running costs will be reduced. Is this future saving sufficient to justify the initial expenditure? In order to decide this question, first of all the costs involved must be added, and then the benefits, in the form of energy savings, evaluated. An assessment of the cost effectiveness of the proposed system can be made in a number of ways.

a. Basic data compilation

The compilation of the complete costs and benefits is the basis of every profitability calculation.

Costs fall into two categories: initial costs and running costs.

- Initial costs are those incurred in getting the scheme installed and running. They include equipment costs: building shell and equipment, controls and cables; installation costs: wiring and builders' work; and commissioning: checking and adjusting controls, testing circuits and measuring.
- Running costs often exceed the initial purchase cost of the installation within a short time. They include the energy costs, cleaning, replacement of equipment at the end of their economic life and replacement of any other failed components.

Benefits are usually in the form of reductions in energy costs and in some cases reductions in service and maintenance costs. Improvements in comfort can also yield other benefits, such as improved productivity - but these are more difficult to quantify.

b. Simple payback

This is the simplest method of appraisal. It is usually used where a new proposal is being compared with an existing building shell and scheme. If the initial expenditure for the new scheme is **x** and the annual cost saving is **y**, then the payback period is **x/y** years.

However, simple payback is not a good indicator of profitability because it does not consider returns beyond the payback period and ignores the time value of money. Therefore, the GreenBuilding Partners are advised to choose between two other more powerful indicators: the Net Present Value and the Internal Rate of Return.

c. Net Present Value

An improvement to the simple payback assessment is to consider the discounted value of the annual savings. Money today is worth more than the same amount of money in the future because it can be invested today to earn interest and produce a greater sum in the future. For example 100 Euro invested today at a real rate of return of 10 % per annum will be worth 110 Euro in a year's time; alternatively 110 Euro in a year's time is worth 100 Euro today if discounted at 10 %. It is possible to calculate what future savings are worth today by discounting them by the rate of return anticipated on an investment. This is a common financial appraisal technique.

The discount factor *f* for a single year *m* with the discount rate *R* is calculated from:

$$f = \frac{1}{(1+R)^m}$$

For example the factor for the third year at a rate of 10 % would be:

$$f = \frac{1}{(1+0.10)^3} = 0.751$$

This means, that a saving of 100 € in the third year has to be calculated with the today's value of 75 €. In energy efficiency praxis the saving over a longer period is more relevant, thus, the cumulative discount factor *c* is the basis for the calculation. Over the sum of *n* years the factor is given by:

$$c = \frac{1-(1+R)^{-n}}{R}$$

With this factor the present value *PV* of annual savings *as* is given by:

$$PV = as \times c$$

In our example a saving of 100 € per year for 3 years discounted at 10% is worth today:

$$PV = \frac{100€ \times 1 - (1 + 0{,}10)^{-3}}{0{,}10} = 249€$$

The net present value *NPV* of an investment is the present value of the income or savings less the initial cost *IC* of the investment calculated over its lifetime, i.e. 15 years in GreenBuilding:

$$NPV = PV - IC$$

A cost effective investment is one where the *NPV* is positive, i.e. the savings are worth more than the initial investment.

d. Internal Rate of Return

The Internal Rate of Return *IRR* is the interest rate that equates the present value of expected future cash flows *PV* to the initial cost of the project. Expressed as a percentage, *IRR* can be easily compared with loan rates to determine an investment's profitability: The higher the *IRR*, the more cost-effective the investment.

The *IRR* of a single investment *IC* causing an annual saving with the present value *PV* over the period of *n* years is given by

$$IRR = \sqrt[n]{\frac{PV}{IC}} - 1$$

In our example the PV of the 3 years savings with the amount of 249 € is related to initial cost of 200 €, thus the IRR is:

$$IRR = \sqrt[3]{\frac{249}{200}} - 1 = 8\%$$

The GreenBuilding commitment defines a profitable investment as one that provides an annualised IRR equivalent of at least 20% over a 15-year period.

3. Financing Options

The basic financing methods for the energy-efficiency building upgrades fall into four categories:

a) Self-financing
b) External financing
c) Third Party Financing by Energy Service Companies
d) Subsidies

a. Self-financing

The simplest and most important source of finance is shareholders' equity, raised either by stock issues or retained earnings. Advantages: all cost savings realised from the upgrade are immediately available and the equipment depreciation becomes a tax deduction.

b. External financing

The next most important source of finance is debt. Debt holders are entitled a fixed regular payment of interest and the final repayment of the principal. It is important to note that tax authorities treat interest payments as a cost. This means the company can deduct interest when calculating its taxable income. Interest is paid from pre-tax income. Dividends and retained earnings come from after-tax income.

Increasingly, strategic issues such as the method of funding and the total cost of ownership (TCO) play a major part in the final decision for leasing solutions as plant construction leasing or finance contracting. Leasing options can often help companies (lessee) to tip the balance in favour of investing now, instead of putting it off until the next budgeting period. The two main categories of leasing are:

- Finance Leasing – at the end of the leasing period, which approximates the life period, usually the customer becomes the owner of the equipment; because the major risk share remains with the customer this type is most reasonable for immovables such as boilers, CHP's, air-conditioning etc.
- Operate Leasing – at the end of the lease period, which is much shorter than the life period, the customer may be given the option of purchasing the equipment, continuing the lease or terminating it; because the major risk share is with the leasing provider this type is most reasonable for mobile equipment such as IT and vehicles etc.

c. Third Party Financing by Energy Service Companies

The basic principle of Third Party Financing (TPF) or contracting schemes is quite simple. An energy service company (ESCO) provides his know-how and in many cases also his financial means to a project. Among many variations, the two basic approaches to third party financing are: Energy Performance Contracting (EPC) and Delivery Contracting (DC). For an EPC project, an Energy Service Company provides its know-how for energy saving measures in buildings. The ESCO takes on the performance risk and guarantees that adequate measures are implemented and the stipulated energy savings are achieved. The investment is refinanced through the savings. While Energy Performance Contracting reduces energy bills by increasing efficiency of the building, Delivery Contracting targets the production of heat, cold, or electricity through the ESCO. [clearcontract; EUROCONTRACT]

The basic role of the ESCO is to provide comprehensive energy efficiency services to consumers including project finance, engineering, project management, equipment maintenance monitoring and evaluation. ESCOs can package their services using a variety of finance schemes whereby they finance up-front capital improvements in the client's premises in exchange for a portion (or the total, depending on the contract) of the savings generated. [JRC]

Reasons why a property owner may enter into a TPF vary. It could be a financial reason - a property owner may lack the money to invest in new equipment. It could be a business strategy - a property owner only wants to pay for the equipment once the value-added functions, such as reduced energy bills are demonstrated. For companies and government organisations, TPF can be used to inspire innovations, which improve the building value and attractiveness, and encourage the use of more energy efficient equipment and help achieve CO2 savings. [IEA]

Many potentials seen for themselves are too small to be interesting for any investor. Taken together, by the creation of sizeable bundles of projects that result in feasible cross calculations, projects become interesting for contractors and clients alike. [clearcontract]

Beneath the requirement of a high structural security (building use, ownership structure), a relevant saving potential are the minimum requirements for contracting projects referring to the energy costs [contractingoffensive]:

- Delivery Contracting: Possibly GreenBuilding partners are in general most suitable
- Single Performance Contracting: Yearly minimum energy costs of 100.000 EUR are required
- Performance Contracting Pool: Yearly minimum energy costs of 250.000 EUR are required

Over the past years the whole project development procedure especially for performance contracting could be standardised. The availability of model contracts and the existence of competent energy service providers as well as independent experts for project development and the management of tender procedures support directly the building owners in developing their own TPF projects. Standardisation of contracts and procedures facilitates risk management and helps to ensure a quality as well as a transparent tender process. For both the client and the energy service provider, a relevant reduction in transaction costs can thus be achieved.

The following manuals and guidelines offer support for building owners:

- Energy Performance Contracting Manual - Preparation of an EPC project; This guide informs about solutions pf problems which could occur within Energy Performance Contracting projects [EPC manual]
- Project Development Standard Energy Performance Contracting; This guide includes also descriptions of necessary instruments like tendering procedures and model contracts [Standard EPC]

General information, news and hints for conferences/workshops are published on the following websites:

- End-use energy efficiency activities at the European Commission Joint Research Centre Energy Service Companies; including an European database of ESCOs and best practice projects [JRC]
- International Energy Agency, Demand Side Management Programme, Task X: Performance Contracting [IEA]
- OPET BUILDING - the European network for the promotion of energy technologies in the building sector, WORK PACKAGE 2 Energy Performance Contracting
- Clearinghouse and one-stop-shop for energy contracting in Central and Eastern Europe [clearcontract]
- European Platform for the Promotion of Energy Performance Contracting [EUROCONTRACT]

d. Subsidies

On European level no subsidies for investments in energy efficiency measures respectively the use for renewable energies are supplied. But for central and eastern European countries the following programmes exist:

- The EBRD is the largest single investor in central and eastern Europe and the CIS. The Bank has committed more than €20 billion to over 800 large projects. Small

projects are almost always financed through financial intermediaries. By supporting local commercial banks, micro-business banks, equity funds and leasing facilities, the EBRD has helped finance around 200,000 smaller projects. The EBRD provides loan and equity finance, guarantees, leasing facilities and trade finance. The Bank also finances professional development through support programmes. [EBRD]

- IFC, in cooperation with the Global Environment Facility, has developed an innovative program to support the financing of energy efficiency (EE) projects in Central European countries whose economies are 3-5 times more energy intensive than European Union standards. The Program is active in Estonia, Latvia, Lithuania, Slovakia, and the Czech Republic. [CEEF]

References:

[clearcontract] www.clearcontract.net

[EUROCONTRACT] www.eurocontract.net

[JRC]; http://energyefficiency.jrc.cec.eu.int/esco.htm

[IEA] http://dsm.iea.org/NewDSM/Work/Tasks/10/task10.asp

[contractingoffensive] Contracting-Offensive für öffentliche Liegenschaften (in German language); www.contractingoffensive.de

[EPC Manual] www.energyagency.at/(en)/publ/pdf/epcman_engl.pdf

[Standard EPC] www.opet-building.net/downloads/publications/WP2/be_projectEPC.pdf

[OPET BUILDING]; www.opet-building.net or www.opet-building-epc-lcca.net

[EBRD] www.ebrd.org

[CEEF] www.ifc.org/ceef