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BACHELOR THESIS

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Field of study: Finance and Taxes

FEASIBILITY STUDY RECONSTRUCTION OF RESIDENCE OF ENVIPROJEKT Ltd

(Bachelor Thesis)

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Kunovice, April 2009

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Approval of bachelor work topic in subject Finance and taxes

Dear Sir,

I apply for approval of bachelor work: Feasibility study reconstruction of residence of ENVIprojekt Ltd

Outline:

1. Introduction

2. Basics concepts of feasibility study

3. Introduction of project (investment) submitter and time schedule

4. Stipulation of capital investments and operational costs, investment budget and proposal of project funding

5. Efficiency rating, sensitivity analysis and risk management

6. Enclosure

The Bachelor work (Thesis) will be worked up for ENVIprojekt Ltd

Thorough description of the work is attached.

Thank you for the approval in advance.

_____

autograph

Kunovice

I confirm that I am the sole author of this work under the supervision of Mrs. Markéta Hošková and all sources are listed in the bibliography.

Kunovice, April 2009

I would like to thank Mrs. Ing. Markéta Hošková for the methodical help she provided during the preparation of my Bachelor work (Thesis).

Kunovice, April 2009

Martin Přívara

Contents:

Introduction

The topic of my bachelor work is „Feasibility study of reconstruction of residence of ENVIprojekt Ltd“. The submitter of the work is the ENVIprojekt Ltd. The study will solve a reconstruction of the company's residence and its subsequent utilization for the company's development.

I chose the topic of this bachelor work because investment planning is an important part of decision making process in companies. Investment implementation can lead either to development of the company or problems and even decline of the company. I also chose this topic because my employer is currently planning an investment to reconstruction of the company residence and an extension of a training centre.

The ENVIprojekt Ltd bought a property in Zlín in Na Požáře street, no. 144 in the year of 2007. The property was acquired in order to move the company into own premises. The acquired property is fully up to a company residence standard, however was built up by the end of the sixties and due to it required small fixtures. All of them were fixed before the movement.

The ENVIprojekt Ltd plans to realize another capital investment in its residence in 2009. The mentioned capital investments will sustain of building several rooms of a new training centre. The training centre will be used for the purpose of schooling and development of personnel as well as other people active in the area of architectonic and engineering activities and incidental consultant services in the area of waste management. In the same time the company also decided to change windows and insulate an exterior that should lead into energy savings and operational costs savings. Further a new design of outside the company area, fences, parking area.

For clarification of some theoretical and methodological problems I used some literature which is listed below. I also got used of my praxis in company finance.

With a help of this literture I dealt with essential clarification of feasibility study, project (investment), cost division, financial plan setting, sources of financing and last but not least evaluation of investment efficiency. The practical part deals with feasibility study of the above mentioned investment of the ENVIprojekt Ltd.

The aim of my work is to answer the questions:

1) Is the ENVIprojekt Ltd able to undergo such an investment and how the investment should be financed.
2) Further I would also like to answer the question of investment efficiency and a period of an investment recovery.

I believe that the feasibility study will help to make a decision on the execution of the project, and in the case of its realization it will contribute to the improvement of working environment, the quality of schooling and provided services, the settlement of parking inconvenience, the operational costs savings and the overall improvement of the company's image.

1 Basics concepts of Feasibility study

1.1 Project

Project is a focused concept to implement innovations in given time schedule of its initialization and finalization. Basic characteristics are:

- Follows up particular target
- Defines strategy to fulfill the target
- Designs essential sources and expenses including expected benefits from the project implementation
- Determines beginning and ending of the project

Project classification:

- Complex – rare, unique, nonrecurring, long-term, many activities, high costs, many resources
- Special – medium-term, lower range of activities, temporary staff assignation, correspondent resources and expenses
- Simple – small project, short-term, realized by a single person, few activities, standardized procedures

The projects associated with a development are often called capital investment projects. It is linked to a concept - capital (investment) development [1]. These projects relate to the Construction Act. Before the project realization it is essential to read through the construction act in detail and find out what documentation is needful to provide before the investment project realization.

1.2 Capital investment

1.2.1 Description and classification of capital investment

Economic theory looks at the concept of capital investment from several perspectives. In its broadest concept the capital investments are characterized as economic activities, during which a subject (state, a company, and an individual) gives up its recent needs with a view to increase its future goods production. Accordingly, the capital investments are understood as victimization of today's (warranted) value in order to get

future (generally) less warranted values. Perception of the capital investment in the area of finance and accounting is slightly different.

Generally, extensive financial expenditures which are expected to convert into future gains within longer time period are considered to be a capital investment. The time period and the amount of capital expenditure are given by accounting standards and tax legislation, partially by the company. Such financial expenditures are called capital expenditures. It differs from operational expenditures, which are assumed to convert into gains within a year. [2]

Based on above mentioned the investment is considered a capital expenditure, when it changes to a future gain in more than a year and its acquisition costs exceed amount given by the accounting standards and the tax legislation.
Capital investments can be divided into three groups:

- Acquisition of intangible fixed assets, for example research and development, etc.
- Acquisition of tangible fixed assets, for example reconstruction, technology purchase, extension of capacity of production, etc.
- Purchase of long-term financial investment, such as commercial papers, dividends or purchase of other company.

All three groups of capital investments have, unlike operational activities, their own characteristics:

- Allegiance of capital in fixed assets
- Increased demand for capital – usage of outside sources
- Increased exposure – assessment of anticipated receipts and expenditures

1.2.2 Investment strategies decision-making

Investment strategy is very important for every company. The investment serves for many years, for many years it is a source of the company's profit but also a burden of fixed cost. Investment decision-making process is basically the most important activity of the company as it decides about the company's progress and efficiency. It is a decision on how much, when, where and how to invest. Wrong investment decision can lead to a bankruptcy.

Maximization of a fair market value should be the main indicator for any capital investment. Strategic plan, which shows goals, current ranking and heading of the company, is very important for that. It also takes into account an influence of outside the company. The Strategic plan, in itself, is not salvable, and its elaboration does not secure that set out goals will be fulfilled.

There are various investment strategies:

- Maximization of annual yields – a stakeholder prefers maximum yields to a growth of an investment value or its maintenance. It is convenient to enforce such strategy when inflation rate is low by the reason that annual yields are not depreciated and capital investment retains its actual value at that time.
- Growth of investment value – a stakeholder prefers such projects where the maximization of an original investment value is expected (capital gain on shares). It is convenient to enforce such strategy when inflation rate is high by the reason that annual yields are depreciated and capital investment does not retain its actual value at that time.
- Growth of investment value combined with maximization of annual yields a stakeholder chooses such projects that bring both, a growth of an investment value and maximization of annual yields. Such investment opportunities are the most ideal in light of basic financial goal of any company, i.e. maximization of a fair market value, practically they occur very sporadically. In general, investments that bring maximized annual yields are different to types of investments where a growth of a value is expected in the future.
- Aggressive investment strategy – a stakeholder prefers projects with high exposure (for example foreign investments, investments to unexplored markets, etc.). High exposure is compensated by possibility of high yields.
- Conservative strategy – a stakeholder proceeds very carefully, to observe any risk and to choose projects with no risk or very low risk level. Such projects of course bring a lower rate of an investment return (investment to state bonds, to existing production, etc.). An example of such investment is investing into money-market funds where by laying out invested amounts lowers a risk of an investment.

- Strategy of maximum liquidity – a stakeholder prefers such projects that are able to transform into cash promptly and are the most liquid (for example investments with short-time return period). [2]

1.2.3 Long-term financing strategy

Investment strategies closely relate to long-term financing strategies. It results from the company goals:

They are divided into three groups:

- **Conservative strategy** it is typical for using long-term sources for short-term assets funding (temporary current assets) and for preferring a lower involvement of long-term liabilities and a lower financial risk to a higher rate of profit. Such financing strategy lowers the risk.
- **Aggressive strategy** it is typical for using short-term sources for long-term assets funding and also for preferring a high involvement of long-term liabilities and thus high financial risk. High financial risk allows a high rate of profit.
- **Moderate strategy** a company pursues, so that continuing need of long-term assets (fixed and partially current assets) was covered by long-term sources and so involvement of long-term liabilities and a financial risk stayed at optimum. [2]

1.2.4 Financial aspects of investment project

Investment project results from a defined strategy and a stipulated goal. A study constitutes a set of technical and economical ratios that serve for preparation and realization. It involves for example:

- Efficiency rating and project defensibility
- Period of capital investment recovery
- Present value
- Net present value
- Internal rate of return and period of capital investment recovery

Identification of capital expenditures and prognosis of expected income are the important aspects of any study.

1.2.5 Identification of capital expenditures

They should cover all expenses (cost) directly connected with a capital investment project, mainly:

- Expenditure on acquisition of new fixed assets, including expenditure on installation, transport and preparation of documentation.
- Expenditure on perpetual additions to net working capital caused by a new investment.
- At the same time expenditure should be corrected by the proceeds from the sale of fixed assets that are replaced.

Capital expenditure can be formalized:

$K = I + O - P \pm D$

K= Capital expenditure

I = Expenditure on acquisition of fixed assets

O = Expenditure on additions to net working capital

P = Tax shield (positive or negative) [2]

1.3 Purpose and utilization of Feasibility study

1.3.1 Feasibility study - framework

Feasibility study, also called a technically-economic study, describes an investment plan globally and from important stand points. Its purpose is to evaluate feasibility of the given investment plan as well as to give a groundwork for the own investment decision making. Such document is in various forms used for preparation of investment plans in business and public sectors. As it results from the defined purpose, a feasibility study is worked out in preliminary – pre-investment stage of a project.[3]

1.3.2 Feasibility study and other types of studies and analysis

Feasibility study is a fundamental document which usually comes up from pre-investment period. However, there are other types of studies that arise from a preparation of capital investment projects.

Opportunity Study – it is a document that lays down a foundation of a pre-investment stage, within its scope a number of investment opportunities (capital investments) is defined. Such document contains only essential information and estimation on each project.

Pre-feasibility Study – it is an inter stage between fundamentals of Feasibility study and above mentioned Opportunity study. As a matter of fact it does not differ from the Feasibility study in structure of presented information. The difference lies in details and accuracy of the study processing.

It is namely suitable to work out an Opportunity study where a potential of investment opportunities is not known. Pre-feasibility study is meaningful to work out in the situation when there are several alternatives of investments available and it would be too expensive to compile a feasibility study for each of them. [3]

1.4 Progress of work and Feasibility study framework

1.4.1 Progress of work – Feasibility study

Feasibility study is divided into thematically separate sections, subdivided by problem areas. It is of course possible to solve different aspects of a project development and a project operation one by one, but it is necessary to realize, that selected solutions within the frame of particular sections are mutually influenced and editing of one section can affect and as a rule it does affect suitability of solution of the topics resolved in the previous step. Thus, selection of an optimal solution from one point of project's view can influence other solutions from other points of project's view. [3]

Variability of approaches toward particular problem solutions is usually necessary. Creative approach is possible to indicate as the second distinct feasibility study element. Variability of approaches toward the particular problem solutions is given by the unrepeatability of each project. Even though the projects are resolved in a similar manner, every investment project is authentic. [3]

1.4.2 Feasibility study framework

Usual structure of construction investment feasibility study is as follows: contents, introduction, brief characterization of a project, market analysis, estimation of demand, marketing strategy, project management, technical and technologic solution, assuring of investment project, capital management, financial plan, efficiency rating and project defensibility, risk analysis and risk management, time schedule and enclosure.

The structure of feasibility studies differ based on type and task of realized investment project.

1.5 Costs and revenues

1.5.1 Costs

Costs are monetarily expressed consumption of production factors (material, services) during particular period. They are divided into three main categories:

- Operating costs which include common accounting cases and which are connected to the business subject for which the accounting unit was established. They relate to revenues as far as time and content is concerned.

  a) expended marketing – includes consumption of material, energy and other supplies and sold goods

  b) services – include services, repairs and maintainance, travel and representation costs and other services

  c) personal costs – include salaries and similar costs, mandatory, social and health insurance paid by employers and other social costs

  d) taxes and fees – e.g. Vehicle excise duty, real estate tax, other taxes and fees but income tax and VAT

  e) other operating costs which are depriciated price of sold tangible and intangible property, gifts, sold material, shortages and damages

  f) depreciation, inventory and rectifying items of oprating costs – inventory making, deduction of tangible and intangible property, rectifying item making
- financial costs – include financial operations done in an accounting unit, especially the ones related to financial institutions (e.g. interest operations, costs related to share selling), inventory making and rectifying item making
- unexpected costs – these are accounting cases, which are unusual, random or unplanned (e.g. damages)

Besides this division of costs according to their kinds, there is also a relationship between costs and output, meaning that costs rise or fall depending on the amount of goods

or services. However, there are also costs independent of the amount of goods. Accordig to this relation to changing amount we divide costs into:

- variable costs (changing) – They depend on the output and more or less rise or fall according to the amount. They are workers´ salaries or material costs.
- fixed costs (permanent) – They are independent of the output, they do not change according to production, e.g. rent, overheads, depreciation

  a) completely fixed – their amount does not change during a particular period even if the production does. These include some employees´ salaries or depreciation of buildings.

  b) relatively fixed – their total amount does not change, only if we concern a particular part of the production we can see some change. They start at making the first product but the following production does not need increase of the fixed costs. Reaching a particular level of production the fixed costs change suddenly, not gradually.

1.5.2 Revenues

Costs are an important factor especially if we can compare them with the corresponding revenues. The division of revenues is not as difficult as the division of costs. The key factor is a purpose relation of revenues to costs. It is important to see the revenues in relation to their costs. At the same time the costs have to be seen separately from their costs. Revenues can be divided into:

- operating revenues – They come from the main activity of the company and include sales of goods or services
- financial revenues – These are sales of shares, interests of bank deposits, exchange rate profit, dividends (yields of shareholding of other companies)
- unexpected revenues – They are revenues from unusual operations comparing to a common activity of a company and also revenues from unexpected and random situations (shortage or damage refund, surplus)

1.6 Investment budget

Investment budgets are made according to a specific investment activity of a company. There are five basic categories of investment which have different impact acording to operating cashflow.

	Category of an investment activity	Impact
1	Investment restitution	The same sales and profit
2	Enhancement investment	Increase of sales, the same profit
3	Modernization investment	Increase of sales, increase of productivity
4	Rationalization investment	Increase of profit
5	Investment providing restitution of depreciated property	Change of operating costs range(depending on price policy)

Chart no. 1: Investment impact
Source: [4]

Investment planning is an integral part of investment budgeting. It is based on several factors:

- Prognosis of technical development of investment facilities and their prices
- Prognosis of technical development of products and manufacturing processes in particular fields
- Production cosi

When a long-term investment plan has been prepared, it is time to prepare an investment project. Some investment projects are necessary for companies and some of them are initiated by companies and their strategic planning.

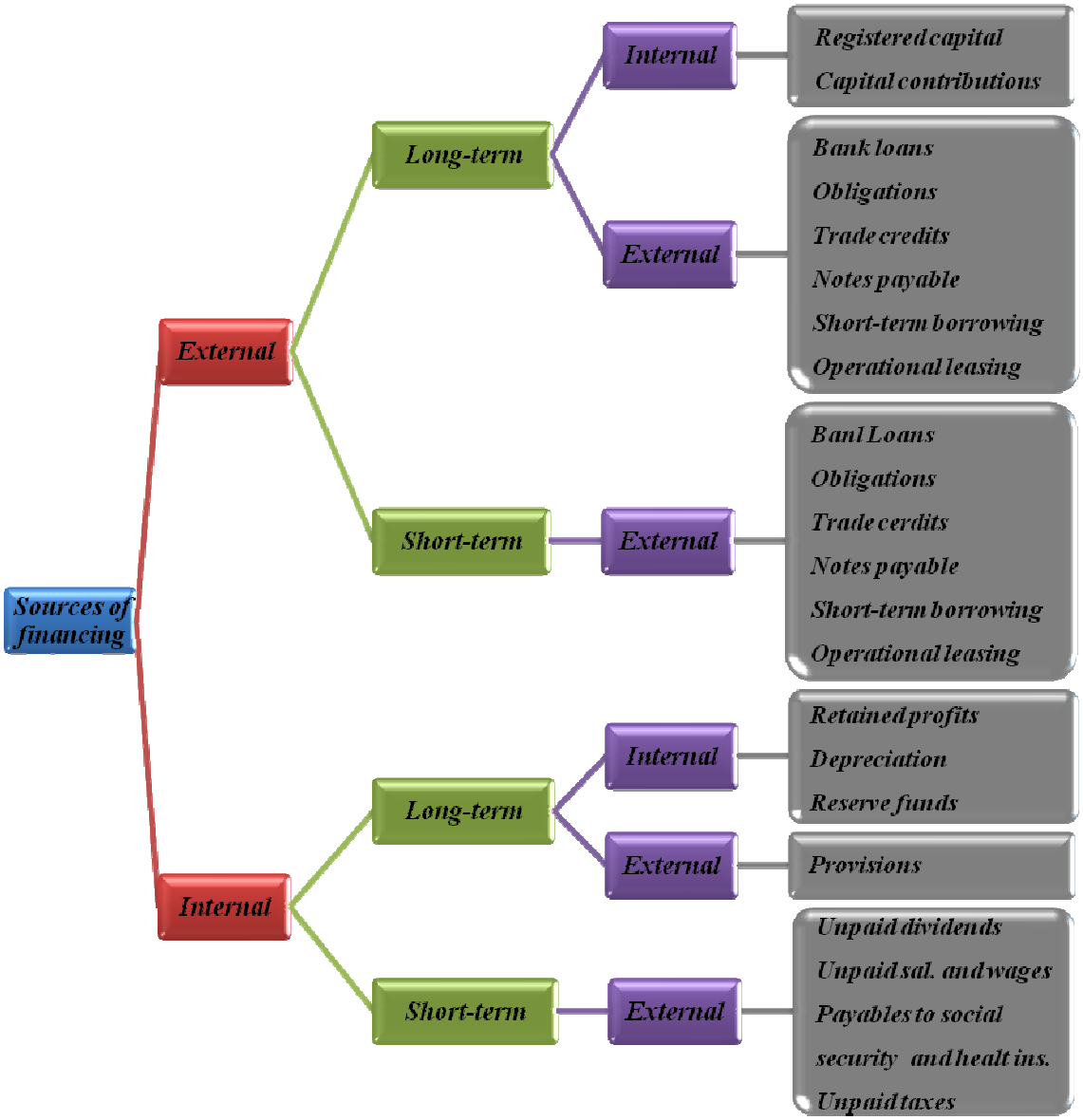
Following this, it means that when there are more investment projects, it is necessary to make a selection. This is made during strategic decision making. The best option is chosen with a help of specific calculations where investment costs are compared with net cashflow set up by implementation of this project. The calculations include investment return, net current value etc. On the other hand, investment return and investment yield rate are not always the only criteria of investment decision making. However, they indicate if the investment is profitable for the company or not. For example, when the return is too long and yields too low, it is obvious that the investment project will not be useful for the company.

Relating to cashflow plans, investment projects represent sales, gross profit and investment costs. From the economic point of view, the evaluation of investment projects is the same as evaluation of cashflow plans. “Suitability of each project can be evaluated according to the impact of its including or excluding in an investment plan. It would be useless to adopt a plan which is not necessary and which would lead to decrease of yields or increase of risks just because large funds are available at the moment.“ [4]

Investment budget or budget of investment costs and revenues follows the schedule of investment building. Investment, investment costs and nett yields of every project in particular years are included. Thanks to this, every company can observe overall investment costs and increase of net yields every year.

1.7 Sources of funding

Sources of financing can be divided by different criteria. The most often they are divided to foreign (external) and own (internal). The internal sources of financing are created by the activities of a company and they are actually the results of its economic activities. On the other hand the external sources are obtained from outside a company, such as debtors, financial institutions and also a public sector. The second most often used criteria is time, from that point of view the sources are split to short-term (less than a year) and long-term (over a year).



Scheme: no. 1 – Sources of financing
Source: [5]

Each of the sources has advantages and disadvantages. Mutual element is a price for obtaining a particular source.

1.7.1 Interní zdroje financování

Depreciation – represent a part of tangible and intangible fixed assets price that is systematically included into operational costs over the asset's useful life. They are displayed in the Profit and loss account where they influence a level of profit or loss and thus a tax base and business profitability. It constitutes a tax shield that can be formalized as follows:

DO = O * (1-T)

DO = tax savings from depreciation
O = amount of depreciation
T = (income) tax rate [2]

Depreciation make relatively stable source of financing, because it is not influenced as creation of the profit is and is available even in the situation when a company does not retain any profit. In real life of the companies, depreciation is set based on tax regulations and distinguishes to tax depreciation and accounting depreciation. If there are:
accounting depreciation > tax depreciation … difference increases profit (loss) after tax,
a***ccounting depreciation < tax depreciation*** …difference decreases profit (loss) after tax.

In the year of 2007 a change in booking of assets that are acquired by a mean of subsidy (grant) took place. In such case depreciation is charged only up to the amount of own funding. A valuation of intangible and tangible fixed assets and technical enhancement (improvements) will reduce by the subsidy provided for the acquisition of fixed asset and by a subsidy to cover interest included in the asset valuation, with the exception of emission allowances and preferential limits acquired without charge established by first user or holder. The subsidy shall be treated free of charge transactions which are provided directly or indirectly under the specific legislation of the state budget, state financial assets, the National Fund, from state funds, the budgets of local government units for the purposes intended. The subsidy will also be free of charge performance for the purposes of foreign funds from the European Community or from public budgets and the foreign country grants awarded under a special legal regulation. Subsidies will also mean a waiver of fees, where legislation allows a competent authority determines the part of the waived fees for the grant.[6]

Retained profits, Dividend policy and Reserve funds – profit indicates an efficiency of the company. In order to fulfill its purpose it must be changed into cash, i.e. sufficient cash flow must be ensured. Usage of profit for an investment funding is however influenced by a management attitude towards a dividend payout and a reserve creation. Three approaches to the dividend payout exist:

- ***residual*** – the company re-invest its profits as long as the investment brings higher rate of return than requested,

- ***dividend stabilization*** – tries to prevent dividends from swings, therefore a ratio of dividends to net profit increases in periods of profit reduction and decreases in periods of profit growth,
- ***stable dividend ratio*** – ratio of dividends to net profit is stable, [2]

Creation of reserve funds is typical namely for the European corporations as the corporations in USA report whole net profit after dividend payout to retained earnings. Two types of reserve funds are created in the corporations:

- ***statutory*** – under the Commercial law its creation is mandatory for corporate bodies, i.e. limited companies and joint-stock companies. It serves to cover losses of the companies or get over the periods of disfavourable economic.
- ***Joint-stock company*** creates reserve fund in the period and within the range given by the Commercial law and statutes of the company. The corporation is obliged to create the reserve fund from its net profit reported in final statutory accounts. Its level is set up by the law – in the range of at least 20% of net profit, maximally 10% of company's equity.

Funding of investment by internal sources has the following advantages:

- number of stakeholders and debtors is stable,
- cost of emission of securities does not incur,
- financial risk of insolvency lowers and so the risk of up rise of cost of financial distress

The disadvantages are:

- rather unstable financial source
- relatively expensive financial source as the tax shield does not take effect
- the level does not have to be sufficient enough for large investments [2]

1.7.2 External sources of financing

Issues of shares - share as a security represents a right of its owner to a share in the joint-stock company. The shares differentiate to common and prior (senior) shares.

- Common shares – beside the right to dividend payout, their holder has right to vote
- The prior (senior) shareholder has a limited right to vote and only collects its dividend

Issue of shares as a source of financing has its advantages and disadvantages. Among advantages there is namely lowering of average cost of capital; common shares are easier to sale as their profitability is usually higher, prior shares increase equity with no limitation of common shares holders. Among disadvantages belong higher risk as investor will expect higher profitability, also the risk is that shares will not be placed and higher cost of share issue (10-12%). Except that the number of debtors increases.

Bank loans – the most common type of external source of financing. They differ by the term of expiration, amount of interest rate and purpose of the use. At the present the whole range of different types of loans exist. Long-term loans stand up in commercial bank portfolios as investment loans and mortgages. Investment loans are gradually amortized by the investor during the term of expiration based on so called curtail plan, it usually has fixed interest rate. Two types of mortgages exist, respectively purpose and non-purpose mortgages, also called U.S. mortgage.

- Purpose mortgage can be only used for the purposes defined by bank. It is mostly investment to real estate.
- Non-purpose mortgage, i.e. U.S. mortgage does not limit a client for what purpose the mortgage will be used. Both purpose and non-purpose loans must be secured by a real estate.

Leasing financing – it is a lease of means of production or durable goods (fixed assets) for settled rent, for the specific period and non-specific length of notice. It is a specific way of financing of investment needs and serves to the companies that do not have enough of own capital (equity). In the eye of the law it is generally three-way relation among a letter, a supplier and a tenant. The letter remains the owner of the leased property for the duration of the lease contract.

Short-term lease contract, when length of the lease contract is substantially shorter than economic life of leased thing, is classified as operational leasing. It is also typical that the letter usually provides servicing, repair and maintenance, in some case trained staff, takes care of insurance, in case of breakdown of machinery provides adequate replacement. Very often the operational lease contract can be canceled by a tenant without a notice.

After expiration of the contract period the letter remains the owner of the thing and it is used by other tenants or the original contract continues. Car and PC leases are typical examples of such leasing.

Financial leasing is the most common type of a leasing operation. It is a long-term lease, often connected with a consequential transfer of all rights to the thing, directly embodied in the lease contract. Another attributes of such contract is that total rent is close to an acquisition price and the length of the lease contract is close to economic life of the leased thing. The basic standpoint for the financial leasing is separation of ownership and utilization of the leased thing, it means repair, and maintenance and insurance are provided at tenant's cost. The letter only provides financing.

Operational Programs – external financing in a form of a subsidy (grant), usually inscribed as "Operational Programs", can be used for financing of long-term investment projects. Operational Programs target the concrete ways of assistance in various areas. In the Czech Republic there are accredited operational programs for the period of 2007 to 2013. For that period there is available € 6,69 milliards. Financial sources are provided through the following operational programs. [7]

- **OP Enterprise and Innovation (OPEI)**
- OP Research and Development for Innovation
- OP Human Resources and Employment
- OP Education for competitiveness
- OP Environment
- OP Transportation
- Integrated Operational Program
- 7 –times Regional Operating Program
- OP Technical Assistance
- OP Prague Competitiveness
- OP Prague Adaptability
- OP Cross-border Cooperation
- OP Interregional Cooperation
- OP Transnational Cooperation

Individual programs include specific areas of subsidy utilizations. In case of drawing of the subsidy, the recipient of the subsidy must take care of the whole project financing. Consequently after the realization of the project and reporting eligible expenditure funding is provided.

The Operational Program Enterprise and Innovations supports development of entrepreneurship and transfer of research and development results into business practice. It supports establishments of new and development of existing companies, their innovation potential and usage of up to date technologies and renewable energy sources.

Actual overview of calls within the frame of the Operational Program Enterprise and Innovation:

It includes:

- Establishment of companies
- Business Development
- Efficient energy
- Innovations
- Environment for Entrepreneurship and Innovations
- Services for business development
- Technical Assistance

It is possible to withdraw grants from 15 programs within the frame of OPEI. Brief abstract lists the following

- Start Loan
- Progress Loan
- Warranty Preferred warranty
- Development Subsidy
- ICT and strategic services Subsidy
- ICT I in business Subsidy
- Ecological energy Subsidy
- Innovations Subsidy
- Potential Subsidy

- Cooperation Subsidy
- Prosperity Subsidy
- **Training Centers Subsidy**
- Real Estate Subsidy
- Consultancy Subsidy
- Marketing Subsidy [8]

1.7.3 Fundraising costs

Fundraising costs depend on three key factors:

a) maturity of funds – the longer the estimated time is, the higher yields the investor claims and the higher the costs are
b) level of risk the investor takes – the higher risk the investor takes, the higher yields they claim and the higher the costs are
c) recovery of funds

If the costs decrease the tax base, they are more suitable for companies (e.g. loans). If the costs must be paid by the company, they are more expensive for the company in net profit (e.g. dividends).

If we look at all these factors, we can sum up all kinds of funds as follows: The cheapest option is a short-term loan (external funds) because the maturity is short, risk of the debtor relatively short and the interest of the external funds is a part of costs and decreases the tax base. A medium-term and long-term loan (external funds) is more expensive because the maturity is longer and risk higher. The interest can also decrease the tax base. Stocks are the most expensive option because in fact there is no maturity. The shareholder´s risk is much higher than the creditor´s. The stock costs are also increased by the fact that the dividends cannot be included in the company costs and do not decrease the tax base. [2]

1.7.4 Tax influence

Identifying of investment revenues is based on estimated net revenues (tax is a real cost which must be deducted from the estimated revenue). Income tax influences not only the investment revenue but also the interest rate used for deduction. Because the interest is always deductable in taxation, the real interest rate influencing the revenues is decreased by the tax influence.

1.8 Economic method of investment evaluation

Based on estimated capital and operational expenditures and expected revenues from the capital investment project, the evaluation and formulation of the optimum alternative can be perform. To evaluate them the methods that take into account the effects from investment are used, eventually the methods that take into account a time factor. When evaluating long-term projects it is essential to always take the time factor into account, as money we hold now has higher value today than money we obtain in the future.

1.8.1 Method of net present value

It is a dynamic method that considers effect from investment as positive cash flow from the project, that compose of expected profit after tax, depreciation, or other incomes. It is defined as the difference between discounted cash flows from the investment project and capital expenditure. The investment can be accepted if the net present value is positive. The following formula in its extended form is used for the calculation:

$$\check{C} = \frac{P_1}{(1+i)} + \frac{P_2}{(1+i)^2} + \frac{P_3}{(1+i)^3} + ... + \frac{P_N}{(1+i)^n} - K$$

In simple form

$$\check{C} = \sum_{n=1}^{N} Pn \frac{1}{(1+i)^n} - K$$

Č = net present value

$P_{1,2\ N}$ = cash flow from the investment in particular years of its lifetime

i = requested profitability (interest rate in %/100)

N= investment lifetime

K = capital expenditure [2]

1.8.2 Period of investment return

Through the use of the method, the time period, in which the project is paid out from project cash flows, is determined. Profit after tax and depreciation are considered as effect. When the period of investment return is shorter than criteria period of investment return it is regarded as favorable.

The stipulation of criteria period of investment return is rather questionable; it is governed by evaluator and it also depends on the operating field of the project.
The following formula is used:

$$I = \sum_{i=1}^{a} (Z_n)$$

I = Costs of acquisition

Zn = Profit after tax in particular years

a = Period of investment return [2]

1.8.3 Interest effect

Interest – as a price of borrowed money, is important in different areas of financial decision making. It fulfills the following functions when it comes to an investment decision making.

a) It creates stimuli for savings and investments – when interest grows, the savings also grow and investments decrease and vice versa.

b) It is an allocation instrument - it enables to elect investment variants with the biggest force. When interest grows, a company reduces its investment projects with the lowest yields. On the other side when interest declines it is able to realize investment projects with lower yields.

c) Interest takes time factor into account – through the use of interest-bearing and taking out interest-bearing, we can settle a future value or a present value of capital expenditures and investment yields. Interest is perceived as an alternative cost of capital. [9]

1.8.4 Discounting

What discount rate should be used, it is a problem that arises in connection with determination of a present value of investment project cash flows. So called “private” discount rate is used for a valuation of investment projects in a profit oriented sector.

It is usually understood market discount rate (PRIBOR rate, that is daily published by the Czech central bank and also in the newspaper Hospodářské noviny, is usually used as the market discount rate). Many factors however complicate its usage (different access of individual subjects to loans, different terms of obtained loans). Average cost of the company’s capital or discounted rate settled by the company’s management are often used alternatives to it. [5]

1.9 Sensitivity analysis and risk management

1.9.1 Risk analysis and risk management

Risk has a very important role in every investment project. It constitutes a danger that estimated capital expenditures and revenues will differentiate from actual ones. Correct specification and quantification of risk ensure that when the problems come, they will be successfully overrun.

The most important part of risk management is an assessment of risk critical factors of investment project. In fact, it is actually a selection of critical factors that govern the whole investment project.

Usually these are a price, a system performance, a time utilization, operational costs, etc. Sensitivity analysis helps to indentify the critical factors. The higher is the sensitivity to an individual factor, the higher is the risk and so the attention must be paid to that factor. Complying with risk is essential attribute of correct investment decision making. It is especially important when introducing a new product or investing into research and development.

Basically, subjective valuation of risk is always better than no valuation at all. [2]

1.9.2 Sensitivity analysis

The purpose of sensitivity analysis is to find out how expected cash flow of the project depends on changes of various factors that influence it and figure out the key factors that are able to decide on the success or nonsuccess of the investment project.

There are many factors that influence cash flows, namely revenues from projects. The most obvious it is with project's profit. Sales, input prices, output prices, interest rates and so on belong here.

Factors, whose modification leads to slight shifts in revenues and efficiency criteria of investment projects, are considered as less important. On the contrary, factors, whose modification leads to considerable shifts in revenues, are considered as very important.

The aim of sensitivity analysis is to locate the very deciding factors and define their influence to the efficiency of the project. Procedure of sensitivity analysis is following:

1) Revenues relation to deciding factors must be defined
2) Expected revenues are set down
3) Changeover values of individual factors are established
4) The most significant or the least significant factors, which influence revenues, are stipulated [2]

2 Introduction of project (investment) submitter and time schedule

2.1 Company introduction

ENVIprojekt Ltd is an independent reputable consultancy, designing, engineering and supply company in the field of environmental protection, targeting namely complex handling of waste disposals, proposals of waste management technologies, exploitation of grants(subsidies) for projects funding, project preparations and execution of ecological constructions related to waste and water management, the exploratory geological (engineering-geological and groundwater) tasks, testing, the redevelopment of old ecological loads and the geotechnical works for the uses in engineering projects.

An individual approach to a customer and tailored problem solving are characteristic for the ENVIprojekt Ltd. We also seek to use our experience in this field of knowledge abroad. The headquarter of the company is in Zlín, its branch office is in Ostrava. The company, however, develops its business activities over the whole Czech Republic territory.

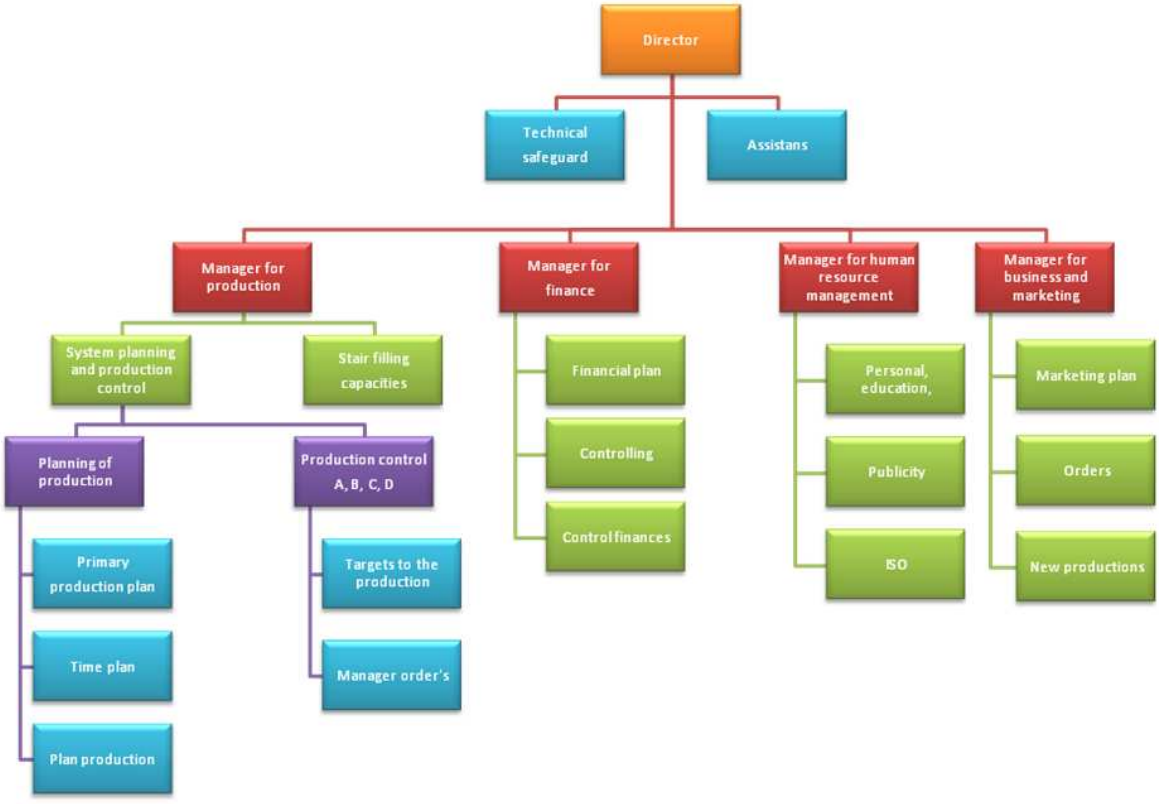
The company has established its own quality and environmental management system certified in accordance with international ISO standards (ISO 9001:2000 and ISO 14001:2004) provided by the international company SGS Czech republic.

The company is a member of professional associations: Association of welfare service based in Žďár nad Sázavou, ANS – association for exploitation of household refuse based in Braunschweig, Germany.

The ENVIprojekt Ltd is a holder of the certificate of professional expertise to provide expert comments based on the §11 of the law no. 76/2002 Sb. - Integrated pollution prevention. Individual experts are the owners of the certificate of professional expertise to design, execute and valuate geological worksin in the area of engineering geology, hydrogeology and redevelopment geology.

Wide range of services provided by the company is used by the municipalities and public sector as well as by the private subjects. In the area of new waste management technologies the ENVIprojekt Ltd entered in 2007 into relation with prestigious Germany company Poyry Environment GmbH.

When realizing projects that are financially demanding, the standard is to cooperate closely with a customer to obtain funding from Operational programs of European Union and the Czech Republic funds.



Scheme no. 2: Organizational structure chart
Source: own

2.2 Brief project introduction

The project is called „Establishment of training centre in residence of the ENVIprojekt Ltd“. The ENVIprojekt Ltd bought a property in Zlín in Na Požáře street, no. 144 in 2007. The property was acquired in order to move the company into own premises.

The acquired property is fully up to a company residence standard, however was built up by the end of the sixties of the last century and due to it required small fixtures. All of them were fixed before the movement.

The ENVIprojekt Ltd plans to realize another capital investment in its residence in 2009. Mentioned capital investment will sustain of building premises for a new training centre. The training centre will be used for the purpose of schooling and development of human resources as well as other persons active in the area of architectonic and engineering activities and incidental consultant services in the area of waste management. In the same time the company also decided to change windows and insulate an exterior of the building that should lead into energy savings and operational costs savings. Further, fences should be renovated as well as a parking area, thus resolving problems with parking.

The ENVIprojekt Ltd plans to realize another capital investment in its residence in 2009. Mentioned capital investment will sustain of building premises for a new training centre. The training centre will be used for the purpose of schooling and development of human resources as well as other persons active in the area of architectonic and engineering activities and incidental consultant services in the area of waste management. In the same time the company also decided to change windows and insulate an exterior of the building that should lead into energy savings and operational costs savings. Further, fences should be renovated as well as a parking area, thus resolving problems with parking.

In the first stage of the investment project the top floor of the property will be completed. It actually already exists but its current platform is only a half of the total property platform. Another half consists of an open terrace now. Technically it is building of an extension and reconstruction of the existing part, in total the area is 198 m^2. Current property has three floors and a cellar. It will concern building of the extension in the area of the open terrace; the area of the extortion in the project documentation equals 60 m2.

Windows will also be exchanged while realizing this part of the investment. The insulation of the building exterior should follow. After finishing constructions work another part of work should follow, it is renovation of fences and renovation and extension of the parking area

Picture no.1: Picture of ENVIprojekt Ltd residence
Source: own

1) Finishing of the top floor of the building:

The 97A studio, architect Milan Navara, Osvoboditelů 91, 760 01 Zlín provided project documentation for a building permit. The project solves construction of the extension of the existing terrace; the area of the extortion in project documentation equals 60 m^2. In total the area is 198 m^2. The extortion will be used as the training center of the ENVIprojekt Ltd. The area will be furnished with a projector. Its size is approximately 11,2 x 4,7 m and 2,6 m high. By making a hole, the training centre will be connected with the existing office, the toilet and the kitchenette. The new kitchenette will be built next to the staircase. The kitchenette will be furnished with a sink, a microwave, a hot-plate cooker, a kettle and a refrigerator. Integral part of the extension will be a construction of a smaller office for a trainer and a new social-technical area that will be used by employees, eventually by the visitors of the training centre. A new entrance to a roof will be made from the stair case area.

The construction will not influence the surrounding of the company; it is in no conflict with both urbanistic and architectural points of views. Aesthetically it is the extension of the existing building. The extension will be, in its part which will face the street, made from glass.

Description of individual training rooms and their employment

301 staircase

302 corridor – its area is 5, 85 m^2, with a PVC flooring. It will be furnished with a wardrobe for approximately CZK 15.000 (other machinery and equipment).

303 kitchenette – its area is 5,70 m^2, with a PVC flooring. It will be furnished with basic installations - a sink, a microwave, a hot-plate cooker, a kettle, a refrigerator and a dishwasher in the total amount of approximately CZK 35.000. The kitchenette is designated as a social-technical area and will be used by trainers and visitors of the training centre.

304 bathroom, toilet – its area is 4,7 m^2, with a PVC flooring. It will have a standard features such as basin, a toilet bowl and a shower in the total amount of approximately CZK 13.000 (other machinery and equipment).

305 trainer's office – trainer's office together with the training room no.1 is the second biggest space of the planned construction of the training centre. Its area is 20,5 m^2, with marmoleum flooring. The room will be used for preparation of the trainers and consequential testing of trained applications. There will be 4 working areas equipped with necessary technology. The space will be furnished with 4 desks and 4 chairs in the middle. The room will be furnished with probably 3 coffers used for storage of the office supplies and papers and other materials needed for trainings. There will also be placed a small safe for archiving accounting and other documentations. The safe will be in the corner of the room. There will be a PC and a monitor placed on every desk. The PCs will be equipped with software needed for execution of planned training sessions. There will also be a LCD monitor hanged on the wall with a size of 117, eventually 132 cm and DVD placed on a table under the LCD monitor. Individual working areas will be inter-connected through boxes in the floor with the room no. 306 and so it will be possible to make a presentation from the room no. 305 directly on the projection in the room no. 306 (it is also possible other way around, the presentation will be then displayed on the LCD monitor). Computers will also be interconnected with the existing computer network. The purchase price of other machinery and equipment will be approximately CZK 70.000, hardware CZK 120.000 and software CZK 142.000.

306 training room – it is the biggest room of the planned construction of the training centre. Its area is 54,6 m^2, with marmoleum flooring. It will be used for the planned training sessions. The room will be able to separate into two parts by movable wall. The bigger part of the room will be furnished with a conference desk with 14 seating places (chairs) with an interactive board and a projector at the head of the desk. In the corner a computer will be placed that will be put through the projector. The computer, the projector and the interactive board will be used for a demonstration of educated products. The room will be sounded with speakers.

The smaller part of the room will be furnished with 2 desks and 2 chairs and 2 computers. It will be used in a similar way as the room no. 305.

An audio-visual system will be arranged so that there will be a possibility to use the training room as a whole or separated in two rooms. In case of emergency the training room will be divided in two parts, so that two different trainings will take place. Operation of both parts will be fully individual. The video can be distributed on-line on the LCD monitor in the room no. 305. The computers will be also connected to the existing computer network. The purchase price of other machinery and equipment is CZK 114.015, hardware CZK 153.000 and software CZK 68.000.

2) Windows replacement:

The next stage is a replacement of current wooden and metal windows:

6 pieces – 2 wings

4 pieces - 3 wings

2 pieces – balcony doors (French windows)

6 pieces – small wooden windows

5 pieces – cellar windows

Current windows will be replaced by wooden Euro-windows.

3) Insulation and finish of exterior :

New insulation and finish of the company residence exterior will be made after the change of windows.

4) Repair of wooden fences:

Exchange of wooden fences on left and right sides of the building will be made. The pillars will be built and wooden filling settled.

5) Renovation and extension of parking area:

The existing parking area will be renovated, interlocking pavement will be used. Further, it will be extended by 10 x 5 m of an existing lawn bordering with the parking area. Newly built area designated for parking will be also fixed with interlocking pavement.

2.3 Time schedule

- Solving of subsidy — April 2009
- Selection procedure — May 2009
- Choosing of the supplier — June 2009
- Beginning of construction works — July 2009
- Finishing of construction works — October 2009
- Training centre furnishing — November 2009
- Final building approval — December 2009

3 Stipulation of capital expenditure and operational costs, investment budget and proposal of project funding

3.1 Anticipated capital expenditure of investment realization

Before the investment project realization it was necessary to stipulate anticipated capital expenditure of each stage of the construction works. In order to reinsure the data I have contacted 3 companies to get quotations. After obtaining the data I have anticipated capital expenditure by making a simple average and divided costs in 2 groups:

1. Costs of building up the training centre on the third floor of the company's residence.
2. Costs of other fixtures of the company's residence.

Title	Price in CZK excl. VAT
Project documentation for extension of training centre	99 400
Building of extension of training centre	1 644 585
Purchasing of equipment for training centre (desks, chairs, etc.)	247 015
Purchasing of hardware for training centre	273 000
Purchasing of software for training centre	210 000
Total cost of training centre	2 474 000

Schedule no.2: Capital expenditure – building of training centre
Source: own

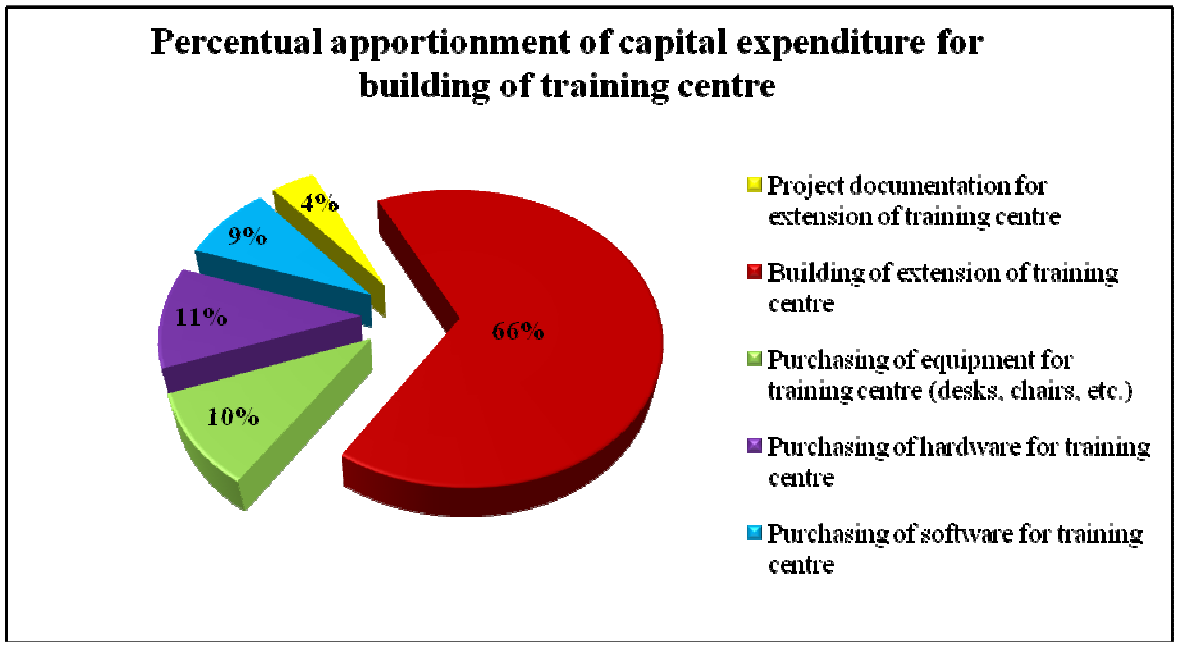


Chart no. 1: Percentual apportionment of capital expenditure for building of training centre
Source: own

Title	Price in CZK excl. VAT
Replacement of windows	250 000
Insulation and finish of exterior	475 000
Repair of fences	301 000
Renovation and extension of parking area	300 000
Total costs of other fixtures	1 326 000

Schedule no. 3: Capital expenditure – other fixtures of company‘s residence
Source: own

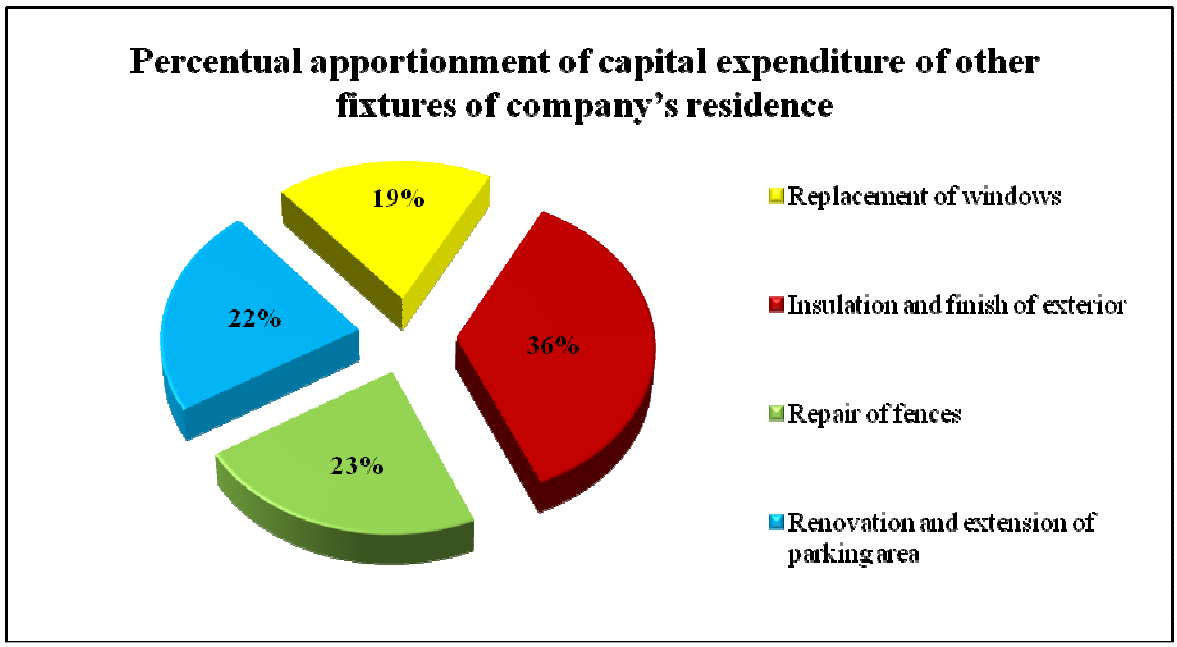


Chart no. 2: Percentual apportionment of capital expenditure of other fixtures of company's residence
Source: own

Total costs of execution of the capital investment project are based on my study CZK **3. 800.000 excluding VAT**. If the company's management decides to execute the project, the total capital expenditure will be more specified before the own execution. In such a case the selection of procedure will take place, in which 5 companies will be addressed to provide quotations. Consequently a provider of the construction works will be selected. It is assumed that the selection will take place in April and the company that will provide the construction works will be selected in May, the latest.

3.2 Estimated annual operating costs of the investment

For efficiency assessment of the project it was necessary to assume operating costs relating to implementation of the investment plan. I divided these costs into several groups.

Overheads costs (electricity, water and gas bills) were set according to real costs in 2008. Training materials were set according to estimated use of the training centre. Services connected to maintenance of the investment were also set according to real costs in 2008, trainers´ services were set according to estimated use of the training centre for commercial purposes, which is approximately 15% p.a., which means 36 days, 8 hours each day. Average external trainer´s wage is estimated at 500 CZK/hour. Estimated annual costs of the training centre are 247,000 CZK/hour. I also set maintenance and repair costs of this investment. These are mainly windows, fences and parking space.

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Title	Price in CZK excl.VAT
Electricity	20 000
Gas	22 000
Water	3 000
Office supplies	30 000
Cleaning and other maintenance of training centre	18 000
IT service	10 000
Cost of trainer	144 000
Total operational cost of training centre	247 000

Schedule no. 4: Anticipated yearly operational costs of realized investment
Source: own

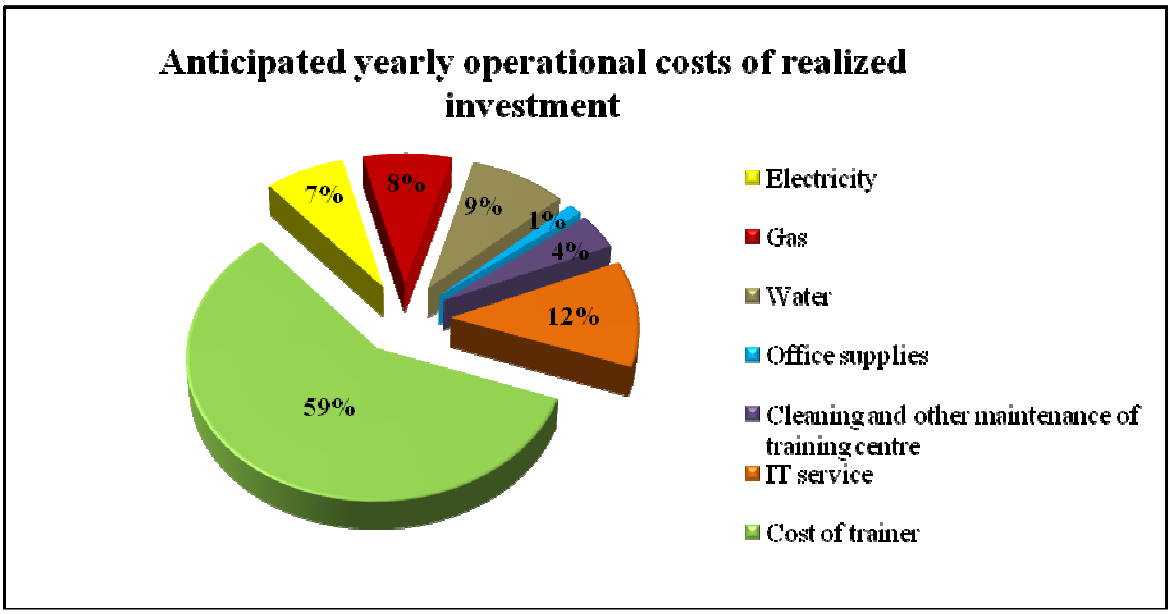

Chart no. 3: Percentual apportionment of estimated yearly operational costs of executed investment
Source: own

3.3 Estimated yearly revenues of executed investment

Estimated yearly revenues should make approximately 15 %, it represents approximately 36 working days. A tuition fee was stipulated for CZK 1.250 per hour. Other revenues will be in the form of savings of the lease of space for training sessions. In 2008 it was CZK 30.000. Other revenues will be in the form of cost saving of the lease of parking lot. In 2008 it was CZK 41.000. Compare to costs before the investment project, savings of CZK 15.000 should arise from lowering the costs of repair and maintenance of windows, fences and parking area (savings from purchased services). Creation of 2 posts (jobs) in engineering department, that should based on the results of 2008 bring CZK 460.000 per year per post, is also an important benefit. Last but not least, the company will benefit from better quality of training of the company's personnel (thanks to quality technical background). This benefit was not taken into account in my calculation.

Title	Price in CZK excl. VAT
Revenues from Training Centre	360 000
Savings – lease of parking lots	41 000
Savings – repair and maintenance (windows, fences, parking)	20 000
Savings – lease of space for trainings	30 000
Revenues from 2 posts (engineering)	960 000
Total revenues from Training centre	1 381 000

Schedule no. 5: Estimated yearly revenues from executed investment
Source: own

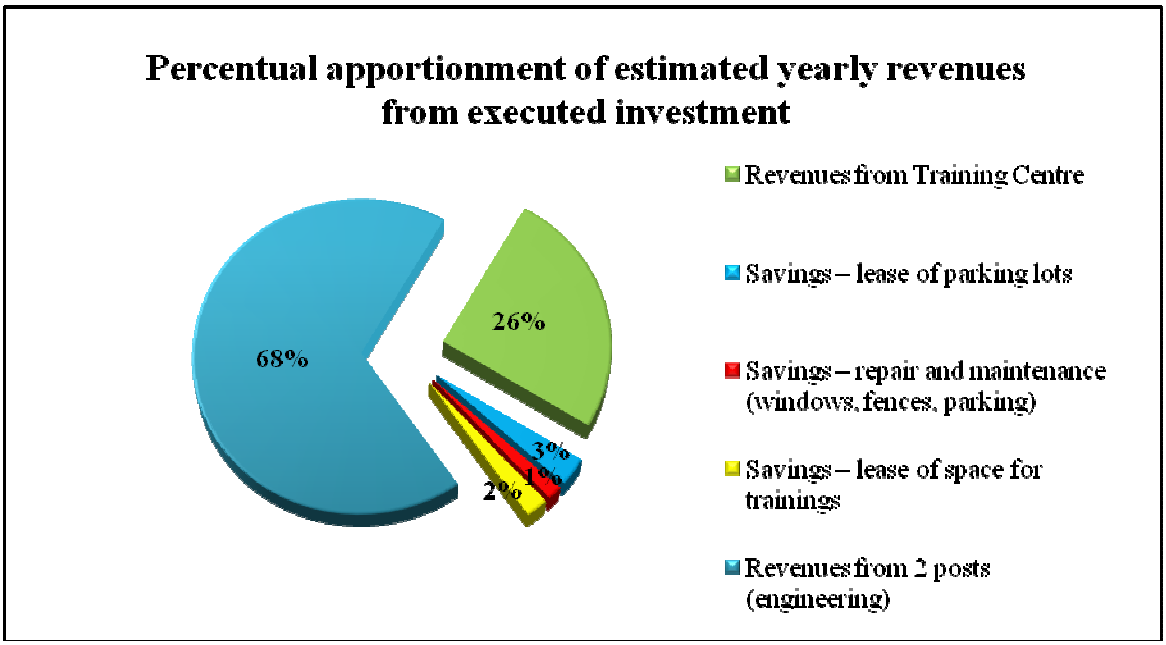

Chart no. 4: Percentual apportionment of estimated yearly revenues from executed investment
Source: own

3.4 Stipulation of investment budget for 10 years period from 2010 to 2019019

An investment budget was stipulated for 10 years period based on estimated costs and revenues set down in previous sections. I assume that revenues will increase by 3% and costs by 4% on a yearly basis and every fifth year costs of repair and maintenance will grow by 30 %.

	Title	2010	2011	2012	2013	2014
+	Revenues from Training centre	360 000	370 800	381 924	393 382	405 183
+	Revenues from 2 new posts (engineering)	960 000	988 800	1 018 464	1 049 018	1 080 488
+	Savings – leasing of parking lots	41 000	42 230	43 497	44 802	46 146
+	Savings – repair and maintenance (windows, fences, parking)	20 000	20 600	21 218	21 855	22 510
+	Savings – own(internal) expenses of personnel training	30 000	30 900	31 827	32 782	33 765
-	Electricity	20 000	20 800	21 632	22 497	23 397
-	Gas	22 000	22 880	23 795	24 747	25 737
-	Water	3 000	3 120	3 245	3 375	3 510
-	Office supplies	30 000	31 200	32 448	33 746	35 096
-	Cleaning and other maintenance of training centre	18 000	18 720	19 469	20 248	27 132
-	IT service	10 000	10 400	10 816	11 249	11 699
-	Cost of trainer	144 000	149 760	155 750	161 980	168 460
	Total	1 164 000	1 196 450	1 229 775	1 263 996	1 293 064

	Title	2015	2016	2017	2018	2019
+	Revenues from Training centre	425 442	438 206	451 352	464 892	478 839
+	Revenues from 2 new posts (engineering)	1 080 488	1 112 903	1 146 290	1 180 679	1 216 099
+	Savings – leasing of parking lots	47 530	48 956	50 425	51 938	53 496
+	Savings – repair and maintenance (windows, fences, parking)	23 185	23 881	24 597	25 335	26 095
+	Savings – own(internal) expenses of personnel training	34 778	35 822	36 896	38 003	39 143
-	Electricity	24 333	25 306	26 319	27 371	28 466
-	Gas	26 766	27 837	28 950	30 109	31 313
-	Water	3 650	3 796	3 948	4 106	4 270
-	Office supplies	36 500	37 960	39 478	41 057	42 699
-	Cleaning and other maintenance of training centre	28 217	29 346	30 519	31 740	42 532
-	IT service	12 167	12 653	13 159	13 686	14 233
-	Cost of trainer	175 198	182 206	189 494	197 074	204 957
	Total	1 304 594	1 340 664	1 377 693	1 415 705	1 445 202

Schedule no. 6: Investment budget for 10 years period from 2010 to 2019
Source: own

3.5 Proposal of project funding

For the purposes of the investment project funding I have learned possibilities of taking advantage of subsidies targeted on small companies.

Subsidies – possibilities of obtaining a subsidy from Operational Program Enterprise an Innovations for investment project **„Reconstruction of residence of ENVIprojekt Ltd”**.

Probable outlin:

- Analysis of available programs and references of the most suitable program
- Formulation of project
- Filling of application form and relevant enclosures
- Consulting during the project execution (Czechinvest – regional agency in Zlín)
- Observance of publicity rules based on EU criteria
- Auditing of observance of the project and subsidy rules
- Continual assurance of actual information on changes
- Attendance on workshops concerned with subsidies (in cooperation with the Employment office in Zlín and Zlin's regional authority)

Assistance program	Brief description of program	Receipts of RR	End of receipts of RR	Receipts of FR	Endo of receipts of FR	Planned allocation for the call up
Training centers I.	Supports development, reconstruction, purchase or furniture of training centers and rooms	03. 03. 2008	28. 02. 2009	01. 07. 2008	30. 04. 2009	CZK 400 mil.
Potential II.	Helps enterprises to introduce and extend capacity needed for realization of research and development and innovation activities	03. 03. 2008	30. 09. 2009	01. 05. 2008	30. 11. 2009	CZK 2 580 mil.
ICT and strategic services	Supports competitiveness and growth of ICT sector and specific strategic services	03. 03. 2008	30. 06. 2008	02. 06. 2008	31. 10. 2008	CZK 500 mil.
Real estate	Supports rise and development of business real estate including infrastructure and contributes to creation of functional real estate market	01. 04. 2008	31. 12. 2008	-	Up to 10 months from confirmation of successful RR	CZK 2 000 mil.
INNOVATIONS	Supports obtaining industrial and legal protection of intangible assets as patents, utility models, industrial designs and trademarks	03. 03. 2008	31. 12. 2008	16. 06. 2008	28. 02. 2009	CZK 60 mil.

Schedule no.7: Resources of Operational program Enterprise and Innovations
Source: [8,10]

Analyzing all available subsidy programs I have concluded that the program "Training centers I." is applicable for our anticipated investment project. The company can obtain a subsidy targeted on small and middle companies; in the amount of 60% of estimated capital expenditures, in our case it represents CZK 1 484.000. That is why the

company decided to submit the request for the subsidy and in case of positive result the subsidy will be used for the investment project funding.

Funding of any investment project can be either internal or external. Internal sources that can be used for funding are depreciation and retained earnings. The first possibility is depreciation. Tax deductible depreciation is however very low compared to other advanced countries as depreciation period is 50 years. Thus, using depreciation as a funding instrument of the investment is not realistic. Other way of funding is retained earnings. Retained earnings as a part of equity are not for free. To give up retained earnings the company's owner requests that the retained profit brings the yield of minimum 10%. For reasons given above, the company should fund its investment project from retained earnings, provided that external funding will not be more profitable.

The only external source of funding that can be used for the project funding is a bank loan with Volksbank. Other external funding cannot be used as the company already makes use of the Volksbank long-term loan for 7% and 7 years term. The condition was that in case of need of further funding, it can only be provided with the agreement of the Volksbank. Therefore I referred to the bank with the investment project funding. The bank promised the long-term loan for 6% and a term of 10years.

In the view of the above stated I suggest funding the investment project externally through the use of the bank loan. Below I introduce schedules of installments for funding the investment project through the use of the loan and through the use of the subsidy.

Installment	Opening balance	Constant installment	Interest	Annuity	Closing balance
1	3 800 000	516 298	228 000	288 298	3 511 702
2	3 511 702	516 298	210 702	305 596	3 206 106
3	3 206 106	516 298	192 366	323 932	2 882 174
4	2 882 174	516 298	172 930	343 368	2 538 806
5	2 538 806	516 298	152 328	363 970	2 174 836
6	2 174 836	516 298	130 490	385 808	1 789 028
7	1 789 028	516 298	107 342	408 957	1 380 071
8	1 380 071	516 298	82 804	433 494	946 577
9	946 577	516 298	56 795	459 504	487 074
10	487 074	516 298	29 223	487 073	0
Paid in total		5 162 980	1 362 980	3 800 000	

Schedule no. 8: Funding of investment project not considering the subsidy
Source: own

Installment	Opening balance	Constant installment	Interest	Annuity	Closing balance
1	2 316 000	314 670	138 960	175 710	2 140 290
2	2 140 290	314 670	128 417	186 253	1 954 037
3	1 954 037	314 670	117 242	197 428	1 756 609
4	1 756 609	314 670	105 397	209 274	1 547 335
5	1 547 335	314 670	92 840	221 830	1 325 505
6	1 325 505	314 670	79 530	235 140	1 090 365
7	1 090 365	314 670	65 422	249 248	841 117
8	841 117	314 670	50 467	264 203	576 914
9	576 914	314 670	34 615	280 055	296 859
10	296 859	314 670	17 812	296 859	0
Paid in total		3 146 700	830 702	2 316 000	

Schedule no.9: Funding of investment project considering the subsidy
Source: own

Installment	Opening balance	Interest	Annuity	Total
1	Funding without use of subsidy	1 362 982	3 800 000	5 162 982
2	Funding with use of subsidy	830 702	2 316 000	3 146 702

Schedule no. 10: Funding of investment project recapitulation
Source: own

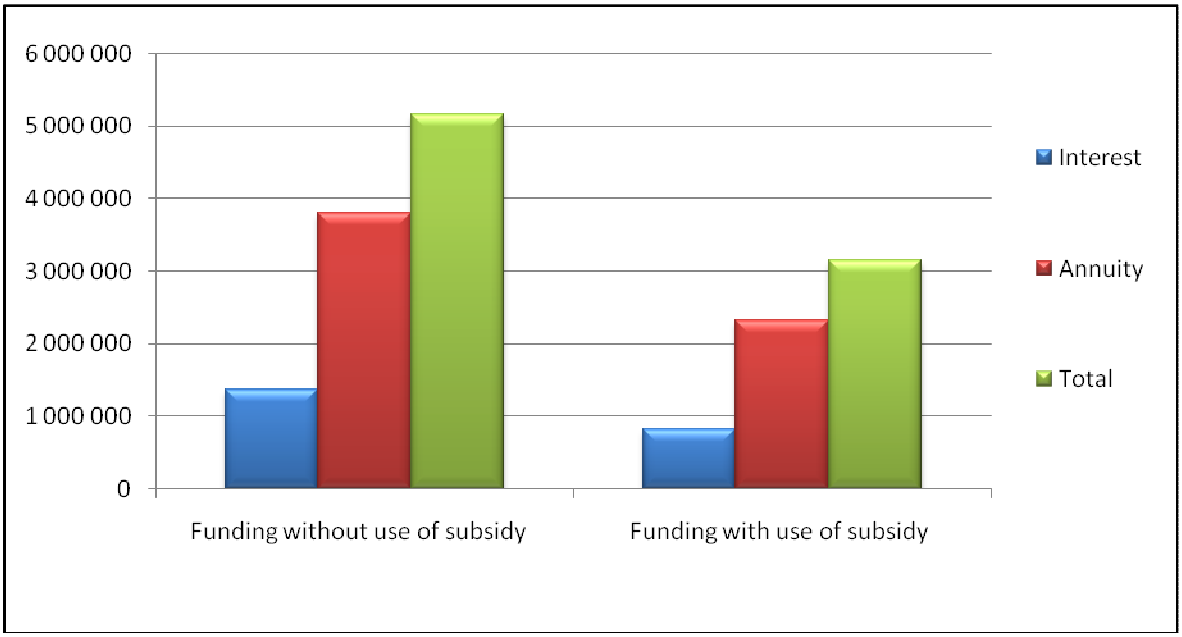

Chart no. 5: Diagram - funding of investment project recapitulation
Source: own

4 Efficiency evaluation, sensitivity analysis and risk management

Efficiency of anticipated investment was necessary to review from several aspects, for that purpose I selected the following methods:

- Period of capital investment recovery
- Net present value

4.1 Period of capital investment recovery

It is time (years) in which cash income from investments offset the initial capital expenditure of the investment. Depreciation is not resolved. The following calculation is used:

$$I = \sum_{i=1}^{a} (Z_n)$$

I = acquisition price,

Zn = yearly profit after tax from investment in individual years

a = recovery time [2]

Year	2010	2011	2012	2013	2014
Year	1	2	3	4	5
Investment income (revenues – expenses)	1 164 000	1 196 450	1 229 775	1 263 996	1 293 064
Interest on loan	228 000	210 702	192 366	172 930	152 328
Profit or loss before tax	936 000	985 748	1 037 408	1 091 066	1 140 735
Income Tax 19 %	177 840	187 292	197 108	207 303	216 740
Net profit or loss	758 160	798 456	840 301	883 763	923 996
Annuity amortization	288 298	305 596	323 932	343 368	363 970
Yearly net income	469 862	492 860	516 369	540 396	560 026
Cumulated yearly net income	469 862	962 721	1 479 090	2 019 486	2 579 512
Capital expenditure	3 800 000				
Total	-3 330 138	-2 837 279	-2 320 910	-1 780 514	-1 220 488

Year	2015	2016	2017	2018	2019
Year	6	7	8	9	10
Investment income (revenues – expenses)	1 304 594	1 340 664	1 377 693	1 415 705	1 445 202
Interest on loan	130 490	107 342	82 804	56 795	29 224
Profit or loss before tax	1 174 104	1 233 322	1 294 888	1 358 910	1 415 978
Income Tax 19 %	223 080	234 331	246 029	258 193	269 036
Net profit or loss	951 024	998 991	1 048 860	1 100 717	1 146 942
Annuity amortization	385 808	408 957	433 494	459 504	487 074
Yearly net income	565 216	590 034	615 366	641 214	659 868
Cumulated yearly net income	3 144 728	3 734 762	4 350 128	4 991 341	5 651 210
Capital expenditure					
Total	-655 272	-65 238	550 128	1 191 341	1 851 210

Schedule no. 11: Period of investment recovery not considering the subsidy
Source: own

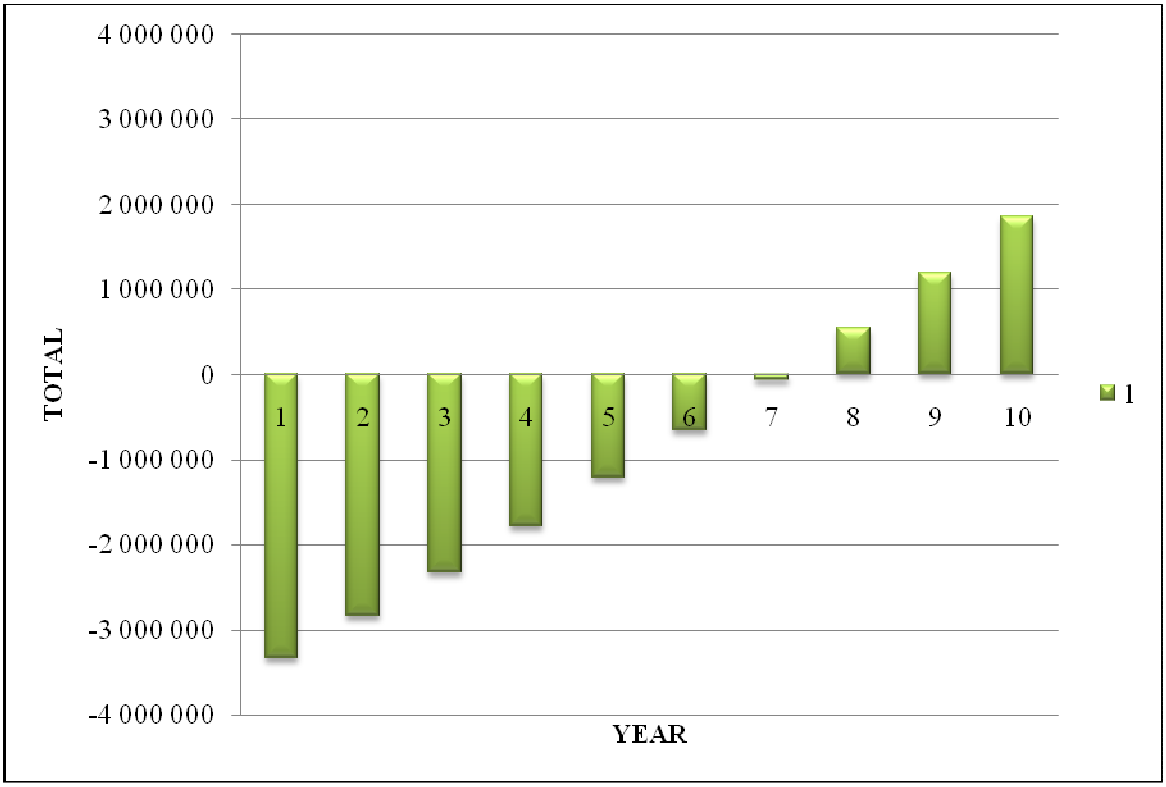

Chart no. 6: Diagram of period of investment recovery not considering the subsidy
Source: own

Year	2010	2011	2012	2013	2014
Year	1	2	3	4	5
Investment income (revenues – expenses)	1 164 000	1 196 450	1 229 775	1 263 996	1 293 064
Interest on loan	138 960	128 417	117 242	105 397	92 840
Profit or loss before tax	1 025 040	1 068 033	1 112 532	1 158 600	1 200 224
Income Tax 19 %	194 758	202 926	211 381	220 134	228 042
Net profit or loss	830 282	865 106	901 151	938 466	972 181
Annuity amortization	175 710	186 253	197 428	209 274	221 830
Yearly net income	654 572	678 854	703 723	729 192	750 351
Cumulated yearly net income	654 572	1 333 426	2 037 149	2 766 341	3 516 692
Capital expenditure	2 316 000				
Total	-1 661 428	-982 574	-278 851	450 341	1 200 692

Year	2015	2016	2017	2018	2019
Year	6	7	8	9	10
Investment income (revenues – expenses)	1 304 594	1 340 664	1 377 693	1 415 705	1 445 202
Interest on loan	79 530	65 422	50 467	34 615	17 812
Profit or loss before tax	1 225 064	1 275 242	1 327 226	1 381 090	1 427 391
Income Tax 19 %	232 762	242 296	252 173	262 407	271 204
Net profit or loss	992 302	1 032 946	1 075 053	1 118 683	1 156 187
Annuity amortization	235 140	249 248	264 203	280 055	296 859
Yearly net income	757 162	783 698	810 850	838 627	859 328
Cumulated yearly net income	4 273 854	5 057 552	5 868 401	6 707 029	7 566 357
Capital expenditure	2 316 000				
Total	1 957 854	2 741 552	3 552 401	4 391 029	5 250 357

Schedule no. 12: Period of investment recovery considering the subsidy
Source: own

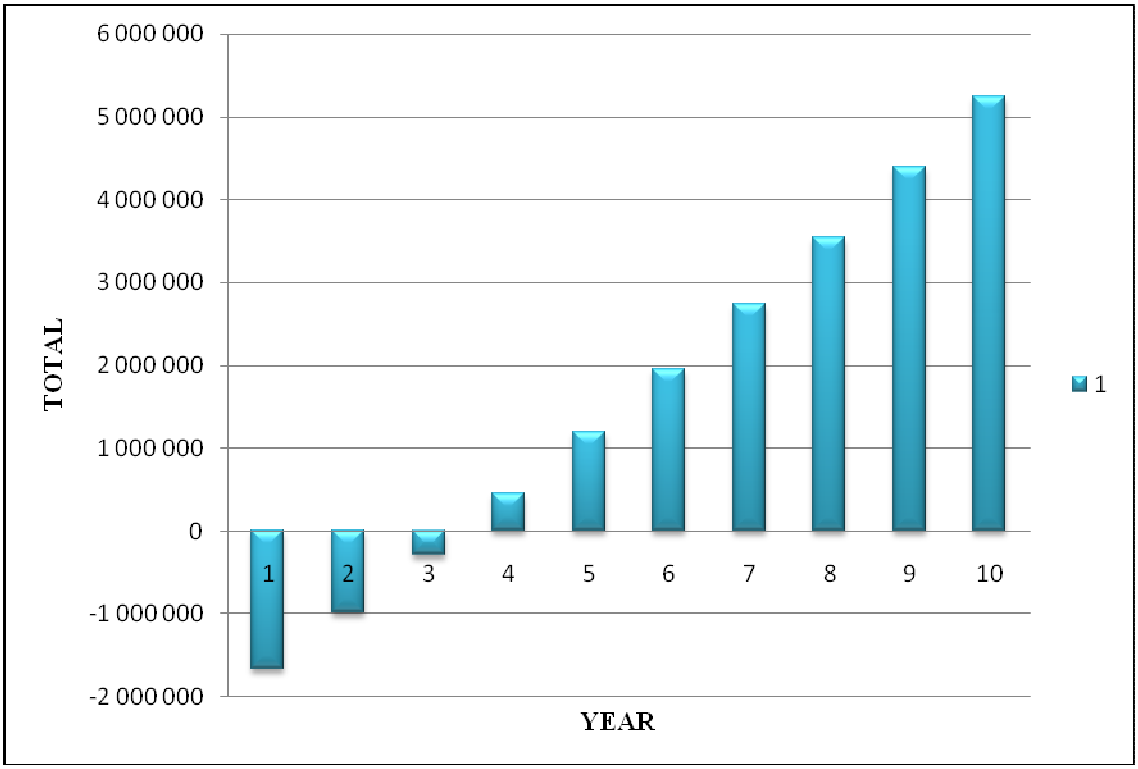

Chart no. 7: Diagram of period of investment recovery considering the subsidy
Source: own

Period of capital investment recovery is established and often used standard for investment projects evaluation. In general, it is time in which the investment project is paid out from incomes that were generated by the project, simply paid out from the net profits. The shorter is the time period, the more favorable is the project's evaluation. The project is reasonable when the period of return is shorter than stipulated period of return. Technically, the period of investment project return is calculated so that yearly net profits are figured out. The incomes from the investment are cumulated. The year, whereof the cumulated net profit equals the capital expenditure, outlines wanted period of return. Based on the calculated period of the investment recovery results that the recovery period is 4 years when the company obtains the subsidy, falling with it, the period will be 8 years. To make comparison it is essential to stipulate criteria period of return. The period will be settled by the company's management. The disadvantage of the method is not respecting the time and not considering incomes that arise after the period of investment recovery. That is why it is essential to use another method of the investment evaluation. The method of net present value is predominant for the investment evaluation.

4.2 Net present value

Net present value (NPV) is a financial value that reflects present value of future cash flows and (eventual) present expense. The main advantage of the standard is that it takes into account the time. It is defined as difference between discounted incomes from the investment and capital expenditure. It is treated as the optimal way of economical evaluation of the investment projects. Technically, the net present value is calculated so that the discounted yearly net profit is figured out. These incomes from the investment are cumulatively summed up and at the same time discounted from the capital expenditure. The company's management settled the discounting rate for 5 %. Two variations of the net present value were considered, with the subsidy and without the subsidy. The net present value was calculated for the period of 10 years.

Year	2010	2011	2012	2013	2014
Year	1	2	3	4	5
Investment income (revenues – expenses)	1 164 000	1 196 450	1 229 775	1 263 996	1 293 064
Interest on loan	138 960	128 417	117 242	105 397	92 840
Profit or loss before tax	1 025 040	1 068 033	1 112 532	1 158 600	1 200 224
Income Tax 19 %	194 758	202 926	211 381	220 134	228 042
Net profit or loss	830 282	865 106	901 151	938 466	972 181
Annuity amortization	175 710	186 253	197 428	209 274	221 830
CF	654 572	678 854	703 723	729 192	750 351
Discounted CF	623 402	615 740	607 903	599 908	587 920
Cumulated discounted CF	623 402	1 239 142	1 847 045	2 446 953	3 034 873
Capital expenditure	2 316 000				
Total	-1 692 598	-1 076 858	-468 955	130 953	718 873

Year	2015	2016	2017	2018	2019
Year	6	7	8	9	10
Investment income (revenues – expenses)	1 304 594	1 340 664	1 377 693	1 415 705	1 445 202
Interest on loan	79 530	65 422	50 467	34 615	17 812
Profit or loss before tax	1 225 064	1 275 242	1 327 226	1 381 090	1 427 391
Income Tax 19 %	232 762	242 296	252 173	262 407	271 204
Net profit or loss	992 302	1 032 946	1 075 053	1 118 683	1 156 187
Annuity amortization	235 140	249 248	264 203	280 055	296 859
CF	757 162	783 698	810 850	838 627	859 328
Discounted CF	565 006	556 959	548 815	540 587	527 553
Cumulated discounted CF	3 599 879	4 156 838	4 705 653	5 246 240	5 773 792
Capital expenditure					
Total	1 283 879	1 840 838	2 389 653	2 930 240	3 457 792

Schedule no. 13: Net present value of investment project considering the subsidy
Source: own

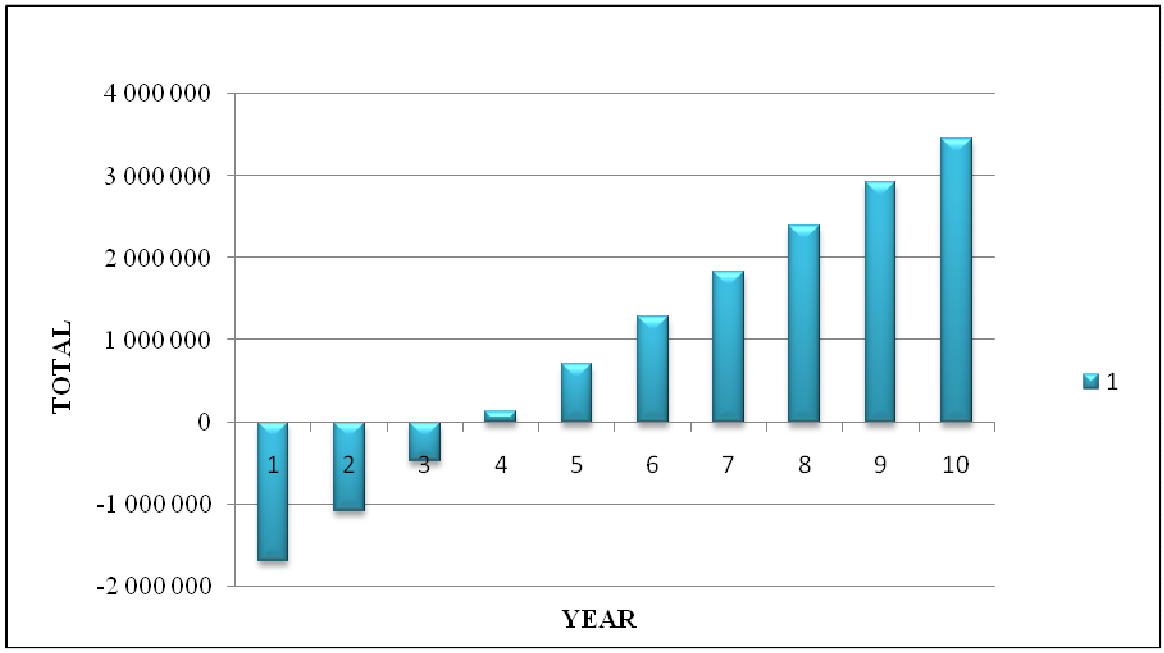

Chart no. 8: Diagram of net present value of investment project considering the subsidy
Source: own

Year	2010	2011	2012	2013	2014
Year	1	2	3	4	5
Investment income (revenues – expenses)	1 164 000	1 196 450	1 229 775	1 263 996	1 293 064
Interest on loan	228 000	210 702	192 366	172 930	152 328
Profit or loss before tax	936 000	985 748	1 037 408	1 091 066	1 140 735
Income Tax 19 %	177 840	187 292	197 108	207 303	216 740
Net profit or loss	758 160	798 456	840 301	883 763	923 996
Annuity amortization	288 298	305 596	323 932	343 368	363 970
CF	469 862	492 860	516 369	540 396	560 026
Discounted CF	447 487	447 038	446 059	444 585	438 795
Cumulated discounted CF	447 487	894 526	1 340 584	1 785 169	2 223 964
Capital expenditure	3 800 000				
Total	-3 352 513	-2 905 474	-2 459 416	-2 014 831	-1 576 036

Year	2015	2016	2017	2018	2019
Year	6	7	8	9	10
Investment income (revenues – expenses)	1 304 594	1 340 664	1 377 693	1 415 705	1 445 202
Interest on loan	130 490	107 342	82 804	56 795	29 224
Profit or loss before tax	1 174 104	1 233 322	1 294 888	1 358 910	1 415 978
Income Tax 19 %	223 080	234 331	246 029	258 193	269 036
Net profit or loss	951 024	998 991	1 048 860	1 100 717	1 146 942
Annuity amortization	385 808	408 957	433 494	459 504	487 074
CF	565 216	590 034	615 366	641 214	659 868
Discounted CF	421 773	419 326	416 504	413 332	405 102
Cumulated discounted CF	2 645 737	3 065 063	3 481 567	3 894 899	4 300 001
Capital expenditure	3 800 000				
Total	-1 154 263	-734 937	-318 433	94 899	500 001

Schedule no. 14: Net present value not considering the subsidy
Source: own

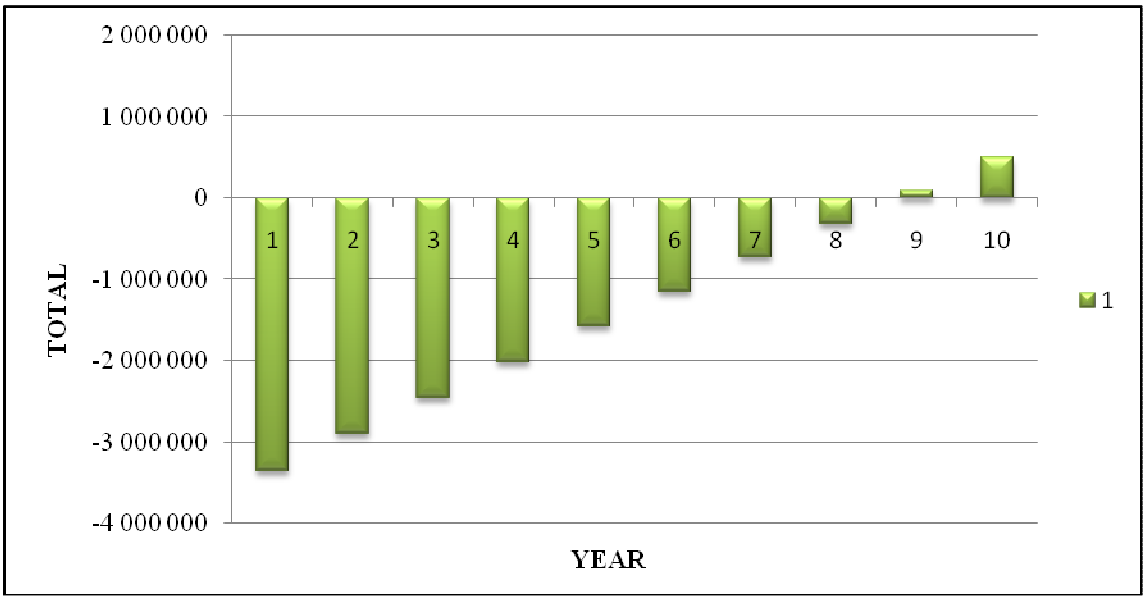

Chart no. 9: Diagram of net present value not considering the subsidy
Source: own

The net present value is positive in both variations. The net present value of the variation considering the subsidy is CZK 3.457.792 after 10years. The net present value of the variation not considering the subsidy is CZK 500.001 after 10 years. That means that the investment project funded with the use of the subsidy is reasonable and realizable provided that it lasts at least for 4 years. The project funded without the use of the subsidy when it lasts minimum of 9 years.

4.3 Risk management

Monitoring of basic financial indicators of the investment project is fundamental for prevention of significant operational difficulties. It mainly defines eventual fluctuations and their influence on the overall project evaluation.

There are values that influence the investment. It is not possible to quantify their development. These are mainly revenues, capital expenditures and operational costs. I did evaluation through the use of sensitivity analysis.

4.4 Sensitivity analysis

Sensitivity analysis is a procedure that researches variable and problematical premises of investment project, namely the effect of their changes on final indicator.

In our investment project, the effect of revenues, capital expenditure and operational costs on criteria indicator was researched, which is the development of net present value in the 10^{th} year of the investment. The purpose of risk analysis is identification of basic premises and variables. It shows where additional (more specific) information is the most useful and helps to uncover credibility of the prognosis. The assignment would be as follows:

There were identified considerable risk factors in the risk analysis:

- Every premise (risks) gradually adjusted by 1 % and for every adjustment the value of critical indicators were calculated by using the rule „ceteris paribus“

For every adjusted premise the change of final criteria indicators in percentage was calculated:

Percentual change of indicator = *(value of indicator after adjustment of premise – value before adjustment) / value of indicator before adjustment of premise*

Risks with identified financial impact were tested with help of sensitivity analysis. All defined risks were tested for percentual change of above stated criteria indicators. There are presented results of performed sensitivity analysis in the following schedules and charts.

Sensitivity analysis - NPV in the 10.th year – absolute change			
Change	*Change in revenues*	*Change in costs*	*Change in capital expenditure*
5%	3 954 142	3 365 136	3 226 989
4%	3 854 872	3 383 667	3 273 150
3%	3 755 602	3 402 199	3 319 310
2%	3 656 332	3 420 730	3 365 471
1%	3 557 062	3 439 261	3 411 632
0%	3 457 792	3 457 792	3 457 792
-1%	3 358 523	3 476 324	3 503 953
-2%	3 259 253	3 494 855	3 550 114
-3%	3 159 983	3 513 386	3 596 274
-4%	3 060 713	3 531 918	3 642 435
-5%	2 961 443	3 550 449	3 688 596

Schedule no. 15: Sensitivity analysis - NPV in the 10.th year – absolute change, comparison of revenues, costs and capital expenditure changes
Source: own

Sensitivity analysis - NPV in the 10.th year – change in CZK			
Change	*Change in revenues*	*Change in costs*	*Change in capital expenditure*
5%	496 350	-92 656	-230 803
4%	397 080	-74 125	-184 642
3%	297 810	-55 593	-138 482
2%	198 540	-37 062	-92 321
1%	99 270	-18 531	-46 160
0%	0	0	0
-1%	-99 269	18 532	46 161
-2%	-198 539	37 063	92 322
-3%	-297 809	55 594	138 482
-4%	-397 079	74 126	184 643
-5%	-496 349	92 657	230 804

Schedule no. 16: Sensitivity analysis - NPV in the 10.th year – change in CZK, comparison of revenues, costs and capital expenditure changes
Source: own

Sensitivity analysis - NPV 10.year – % change			
Change	*Change in revenues*	*Change in costs*	*Change in capital expenditure*
5%	14,35	-2,68	-6,67
4%	11,48	-2,14	-5,34
3%	8,61	-1,61	-4,00
2%	5,74	-1,07	-2,67
1%	2,87	-0,54	-1,33
0%	0,00	0,00	0,00
-1%	-2,87	0,54	1,33
-2%	-5,74	1,07	2,67
-3%	-8,61	1,61	4,00
-4%	-11,48	2,14	5,34
-5%	-14,35	2,68	6,67

Schedule no. 17: Sensitivity analysis -NPV in the 10.th year – % change, comparison of revenues, costs and capital expenditure changes
Source: own

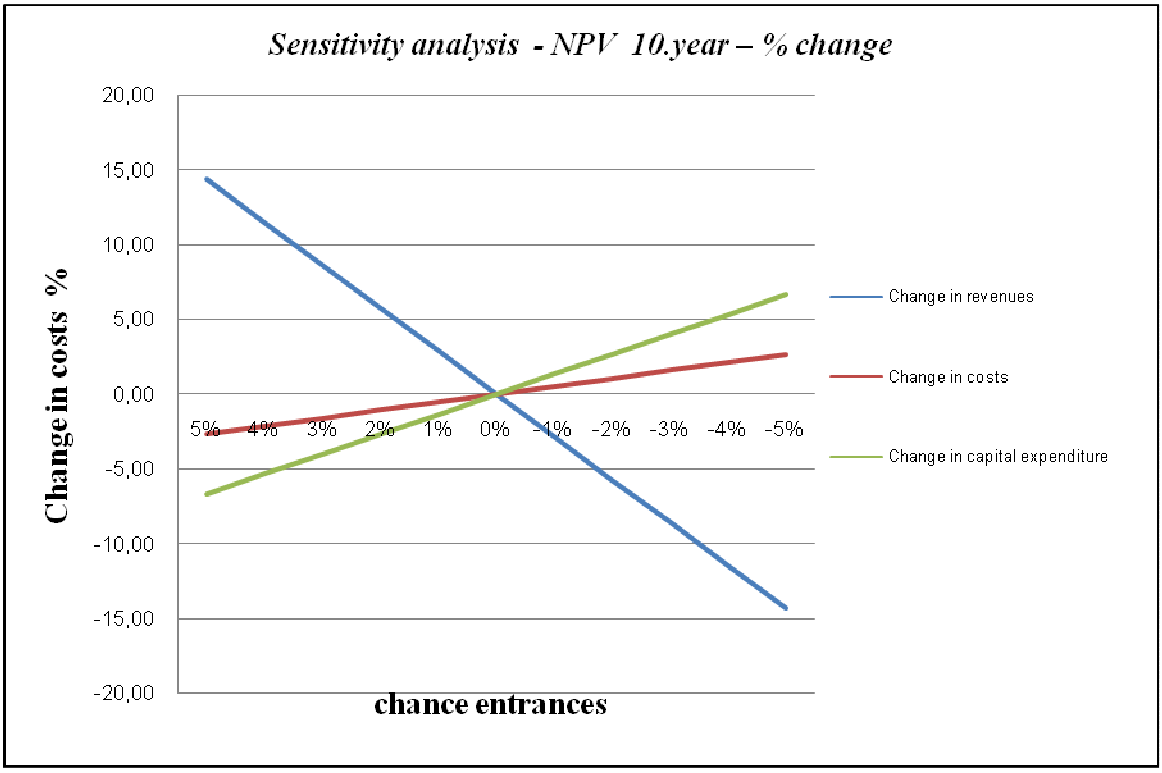

Chart no. 10: Diagram of Sensitivity analysis -NPV in the 10.th year – % change, comparison of revenues, costs and capital expenditure changes
Source: own

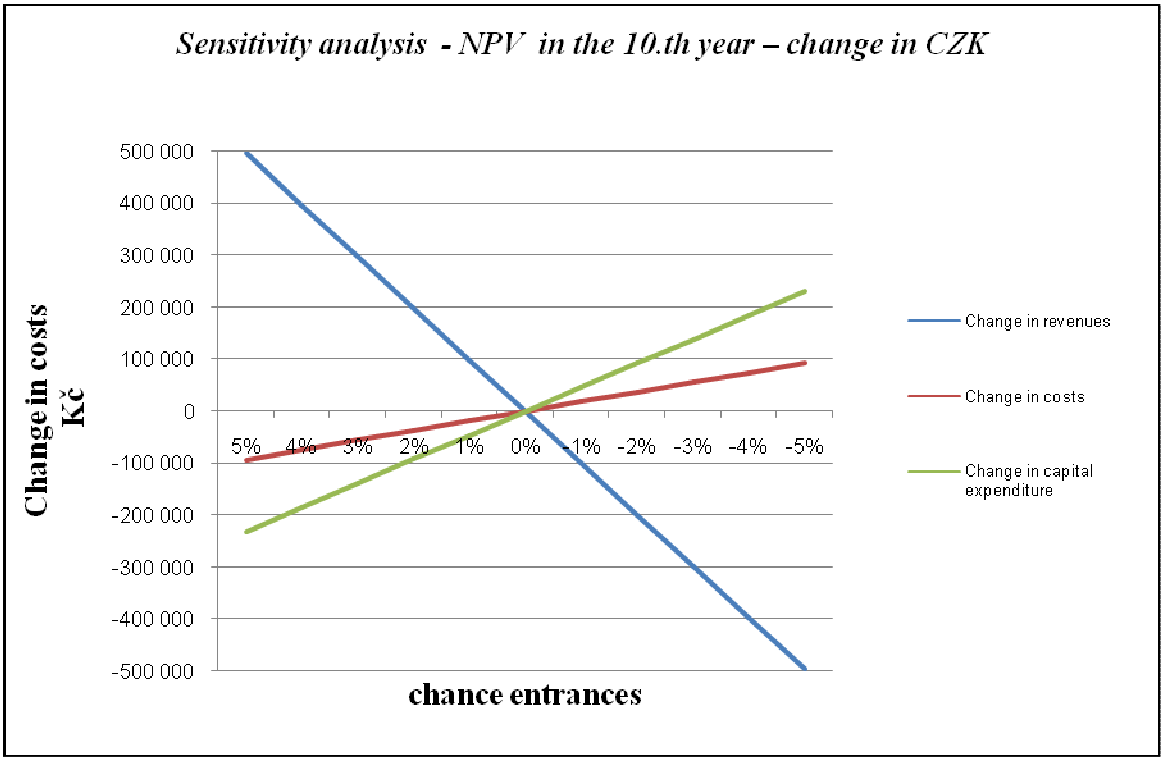

Chart no. 11: Diagram Sensitivity analysis - NPV in the 10.th year – change in CZK, comparison of revenues, costs and capital expenditure changes
Source: own

Revenues have the most remarkable impact on net present value in 10 years period. By their decreasing (increasing) by 5 % it constitutes the adjustment of net present value by CZK 496.350, which is 14,35 % fall (growth). Capital expenditure follows. By its adjustment by 5%, it decreases (increase) net present value by CZK 230.803, which is 6,67 % fall (growth). The least relevant adjustment stipulates operational expenses. By their adjustment by 5 %, it decreases (increases) net present value by CZK 92.656, which is 2,68 % fall (growth).

Conclusion

I would like to introduce you the process of preparing my bachelor work (thesis) with the topic „Feasibility study of reconstruction of residence of ENVIprojekt Ltd.“, that was assigned by the ENVIprojekt Ltd. I have chosen the topic for reasons that investment planning and budgeting process is very important part of decision making process of any company and also that the ENVIprojekt Ltd. is currently deciding on execution of capital investment in a form of reconstruction of the company's residence.

The goal of the work was to assist in decision making on execution of investment project of the company. That means to give answers to some basic questions concerning the mentioned investment project. First of all whether the company will be able to execute the investment project, how it should be funded, what period of investment recovery will be acceptable, what will be the efficiency of the investment and last but not least to uncover the possible risks of the investment project with the use of risk analysis.

The feasibility study gave answers to all questions and so it should be helpful enough to help the company's management in decision making on the investment project. The first goal was to answer whether the company will be able to execute the investment project. It results from the study that the company will be able to do so. The second goal was to answer how the investment project should be funded. It results from the study that the company should firstly take advantage of using the subsidy and the rest of the project should be funded with the external sources (bank loan). The third goal was to answer what will be the efficiency of the project. This was resolved with the help of two methods (period of investment recovery and net present value), of which result that in case the company will succeed in obtaining the subsidy and fund the investment from bank loan, according to net present value the profitability of the project after 10 years period will be CZK **3.457.792**. If the company will not succeed in obtaining the subsidy, according to net present value the profitability of the project after 10 years period will be CZK **500.001.** In this case, the project must be in place for at least 9 years, otherwise there is the risk that the profitability of the project will be negative.

The last goal was to point out possible risks connected with the project execution. The study compared adjustment of operational revenues and costs to net present value in 10 years period. The result was that for the project the biggest risk is the adjustment of revenues, then capital expenditures and the least risk for the investment project is the adjustment of operational costs.

Summary

PŘÍVARA, M. *Feasibility study reconstruction of residence of ENVIprojekt Ltd.* Kunovice 2008. Bachelor thesis. European Polytechnic Institute, Limited.
Tutor: Markéta HOŠKOVÁ

Key terms: project, cost classification, sources of funding (financing), economic method of investment evaluation, period of capital investment recovery, present value, sensitivity analysis

The goal of my bachelor work (thesis) was to work out the study that will assist in decision making on execution of investment project of the company. The bachelor work (thesis) is divided into several sections.

The introduction section deals with the selection of the topic and sets up goals of the feasibility study.

Theoretic (methodological) section explains basic terminology of feasibility study. The terminology is very important for easier understanding of the given area. It is namely a project, an investment, costs, yields and revenues, sources of funding, an investment evaluation method, and the whole theoretic section is completed by sensitivity analysis and risk management.

Practical section of (application) feasibility study is concerned with the concrete investment project, respectively reconstruction of the ENVIprojekt Ltd residence. It also gives answers to questions asked in the section dealing with efficiency evaluation, processing of feasibility study and risk management. Based on the study the calculated period of the investment recovery is 4 years when considering the subsidy and net present value for 10 years period is CZK 3.475.792. Period of the investment recovery will be 9 years when not considering the subsidy and net present value for 10 years period is CZK 500.001.

The study solves efficiency of the project from different criteria, of which result that investment is realizable. It is very profitable when considering the subsidy. Last but not least, it was concluded based on sensitivity analysis that adjustment of operational revenues means the biggest risk; when adjusting by 5 %, it represents fall (growth) of net present value by approximately CZK 500.000 excluding VAT.

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List of charts, schedule, picture and scheme