RIGA
Business model

* source of financing: municipal/ state budget/ EU funding, loan from a bank or international financing institution

Summary

Business model of the revolving fund that will be implemented in Riga describes the structre of the revolving fund, its contributions and management. Further economical model which is the base of the fund is described in details, including assumptions that are behind the model and brief expectations that were obtained after simulation of the fund operation.

Structure of the revolving fund to be established, contributions and management

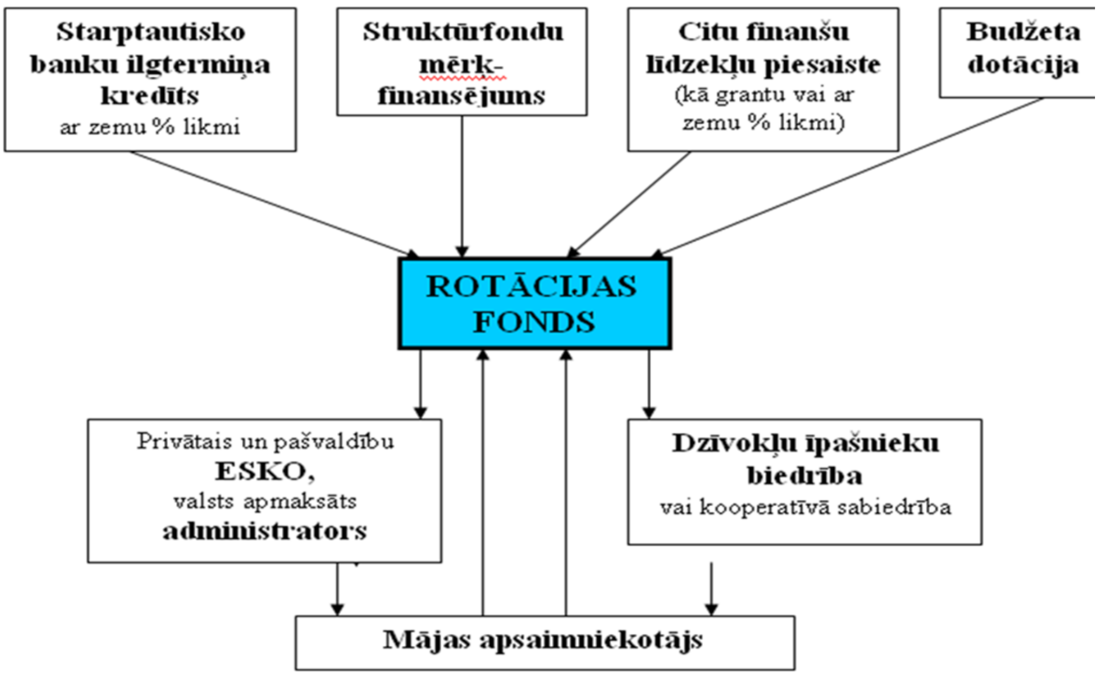
Revolving fund is being developed in order to create sustainable renovation of existing houses in Riga that requires renovation. Following section will focus on the structure of the fund, its contributors, economical model and results.

The structure and status of the revolving fund

Main principle of the Riga Municipal Revolving Fund is to establish a funding source for loans to support renovation of multi-apartment buildings. The loan repayments would be returned into the Fund, making resources available for new loans issued for the abovementioned purpose.

For establishing the revolving fund, we need to find the most effective and financially efficient model that would ensure improved energy efficiency in line with the objectives set by the European Union, Republic of Latvia and Riga Municipality.

The scheme of the revolving fund, provided in the smart city SEAP approved by the Riga City Council, in principle is indicated in fig. 4.1:



Starptautisko banku ilgtermiņa 3redits ar zemu % likmi	Long-term loans from international banks at low-rates
Struktūrfondu mērķfinansējums	Earmarked financing from the Structural Funds
Citu finanšu līdzekļu piesaiste (Kā grantu…)	Other funding (i.e. grants or soft loans)
Budžeta dotācija	State budget subsidy
Rotācijas fonds	Revolving Fund
Privātais un pašvaldību ESKO, valsts apmaksāts administrators	Private or municipal ESCO, government subsidized administrator
Dzīvokļu īpašnieku biedrība vai kooperatīvā sabiedrība	Association of apartment owners or cooperative housing associations
Mājas apsaimniekotājs	Housing manager

Revolving fund economical model

Revolving Fund Model is designed to ensure sustainable development of the fund each year, increasing the volume of multi-apartment house renovation. Fund simulates its operation with projections for a period of over 30 years, which is enough to observe operation of the fund at its maximum potential considering existing sources and scale of finance.

Renovation of houses is planned to be implemented at the same scope every year for several reasons. Firstly, to ensure that fund operates efficiently, while it is flexible to possible changes in order to increase its efficiency. Secondly, to make renovation consistent, meaning that every year specified number of houses will be renovated. Following aspect makes the process of renovation sustainable.

Future income based on repayment from loans will ensure that more houses can be renovated further.

Assumptions

1. Economic model is based upon assumption that the fund does **not have any extra injections**. Although, if it will have injections - it will increase the turnover of the fund and thus create opportunity for larger number of houses to be renovated.

2. Furthermore, model assumes that energy savings after renovation will be 40%. However, based on existing house renovation examples, savings can be up to 60%. Following point, making the model not overoptimistic can be considered as extra guarantee of its sustainability.

3. Another assumption of the model introduces a loan payback **discount** for citizens. After renovation utility bills should decrease by at least 40%. According to the model principles, savings based on heat energy reduction should be paid back to the fund until the moment when the loan is paid off. Such condition makes renovation no financial interest to citizens in the short-term period. Specifically, older generations, which are the most sensitive to the expenditure, will not feel any difference. Thus, the loan payback discount was introduced, meaning that specified percentage of the savings will not be charged, making a difference to all population of Riga being most significant for elder generation.

4. Technically, funds that are borrowed from EIB to create the Revolving Fund are not earning unless the actual loan for renovation is issued. However, the EIB will request the interest on borrowed funds. Following issue is not covered in the model. There are at least two clear ways to cover the cost of borrowed funds that are not used. First, bank that will operate the Fund could at least cover the interest rate, as it will hold the funds, meaning Bank will be able to earn, for example by lending overnight at money market. Secondly, funds can be borrowed from EIB only when they are required.

5. Amount of loan repayment is based on before-renovation house heat energy consumption. However, it should be noted that since the price of the heat energy is not constant, it should be adjusted at least every year. Thus, the higher the heat energy cost is, the more savings renovated house will generate.

6. Sustainable renovation volumes should be taken into consideration. Model can be sustainable as far as the cash flow is sustainable. Thus, it is important to keep the volume of renovated houses per year at a similar amount.

Scenarios

After the model was built it was necessary to create different scenarios in order to simulate possible deviations of particular variables in order to reflect real economic situation and to test if the model will be sustainable.

Specifically, growth of energy cost was selected as an important variable, such as fluctuations on the energy market could significantly affect renovation capabilities in terms of houses renovated per year.

Growth of renovation cost is selected as second most important factor, such as economic conditions on a country level will have a significant impact on the cost of renovation, whereas economic stability requires improvement. Initial cost of renovation was selected as another variable as it can change depending on the condition of the houses that are selected for renovation.

All scenarios considers actual 5% discount for citizens, which on average makes the period of payback 1 year longer. It should be noted that 5% of actual discount is equal to 12,5% of actual savings (considering 40% decrease in energy consumption).

Further, three scenarios were created: best-case, normal-case and worst-case.

Assumptions beneath **best-case scenario** assume stable state of the economy in the country, low level of inflation and growth of energy cost above average. The cost of renovation is assumed to be 110 EUR/m^2, such as cost of renovation may vary depending on condition and type of the building following price is fair and may be obtained. It was assumed that the growth of renovation cost is 1%, following variable highly depend on the economic state in the country, specifically on the rate of inflation, which has high correlation with Gross Domestic Product (hereafter GDP). Finally, growth of cost of renovation was assumed to be 4%, which increases after-renovation savings.

Normal-case scenario assumes that economic conditions are stable and growth of renovation costs is stable at 2% level. Cost of renovation is assumed to be 130 EUR/m2, taking into consideration that some multi-apartment buildings may require higher cost of renovation.

Worst-case scenario considers highest cost of renovation, being set at 150 EUR/m2 level. At the same time the cost of renovation is considered to be growing at 4% level. Following parameters are set on the assumption of growth of inflation. Unlike general scenario assumption of higher economic development, growth of energy cost is set at a lower level of 1%, suggesting that the cost of energy resources will not rise dramatically. Following assumption makes scenario more stressful, making overall model more stress resistant.

Weighted case scenario was then established to create a balance in expectations in proportions of 20%, 50% and 30% for worst-, normal- and best- case scenario respectively.

Full comparison of scenario details is presented in Table 1.

Table 1. Scenarios

Scenario	Worst case	Normal case	Best case	Weighted
Cost of renovation (EUR/m^2)	**150**	**130**	**110**	**132**
Growth of renovation cost	**4%**	**2%**	**1%**	**2,1%**
Growth of energy cost	**1%**	**2%**	**4%**	**2,4%**

Model formulas

1. General fund functioning model

$$R = \sum_{n}^{\infty} (\mathrm{F}_T - NHR_T + \mathrm{LR}_T - \mathrm{LI}_T - D_T)$$

F_T - Fund balance at time T

NHT_T – New house renovation cost at time T

LR_T – Loan repayment at time T

LI_T – Existing loan interest payments at time T

D_T – Discount for loan repayment at time T

2. Loan repayment formula

$$\mathrm{LR}_T = \mathrm{S}(C_T \times EC_T - C_{T+1} \times EC_{T+1})$$

S – renovated area in m^2

C_T – energy consumption (kWh) at time T

EC_T – energy cost (kWh) in Euro at time T

*T+1 – at time T+1, i.e. time period after time T.

3. Loan interest repayment formula

$$\mathrm{LI}_T = \mathrm{RL}_T \times i$$

RL_T – remaining loan amount at time T

i – loan interest rate

4. Loan repayment discount formula

$$\mathrm{D}_T = \mathrm{B}_T \times i_D$$

Where B_T is initial utility bill during heating period. $\mathrm{B}_T = \mathrm{S}(C_T \times EC_T)$

B_T – utility bill at time T

i_D – remaining loan repayment amount discount

5. Weighted case scenario formula

$$\mathrm{WS} = 0.3 \times WCS + 0.4 \times NCS + 0.3 \times BCS$$

WS -Weighted Scenario

WCS –Worst-case Scenario

NCS –Normal-case Scenario

BCS –Best-case Scenario

Variables used in the model (numbers based on Normal-case scenario; note: scenario related figures differ):

- Energy savings after renovation (model assumed 40%);
- The loan rate (3% dynamic rate);
- Initial energy consumption (200 kWh / m2 * a) = P_0
- After-renovation energy consumption (120 kWh / m2 * a) = P_1
- kWh Price increase per year (2%);
- kWh Price = initial price for 2015 = 0.169
- Cost of renovation (130 EUR/m^2)= C

- Renovation costs increase (2%);
- Annual renovation in m^2
- Annual renovation in terms of Houses (on average)
- Average m^2 of each renovated house
- Annual investment

Results, conclusions and expectations

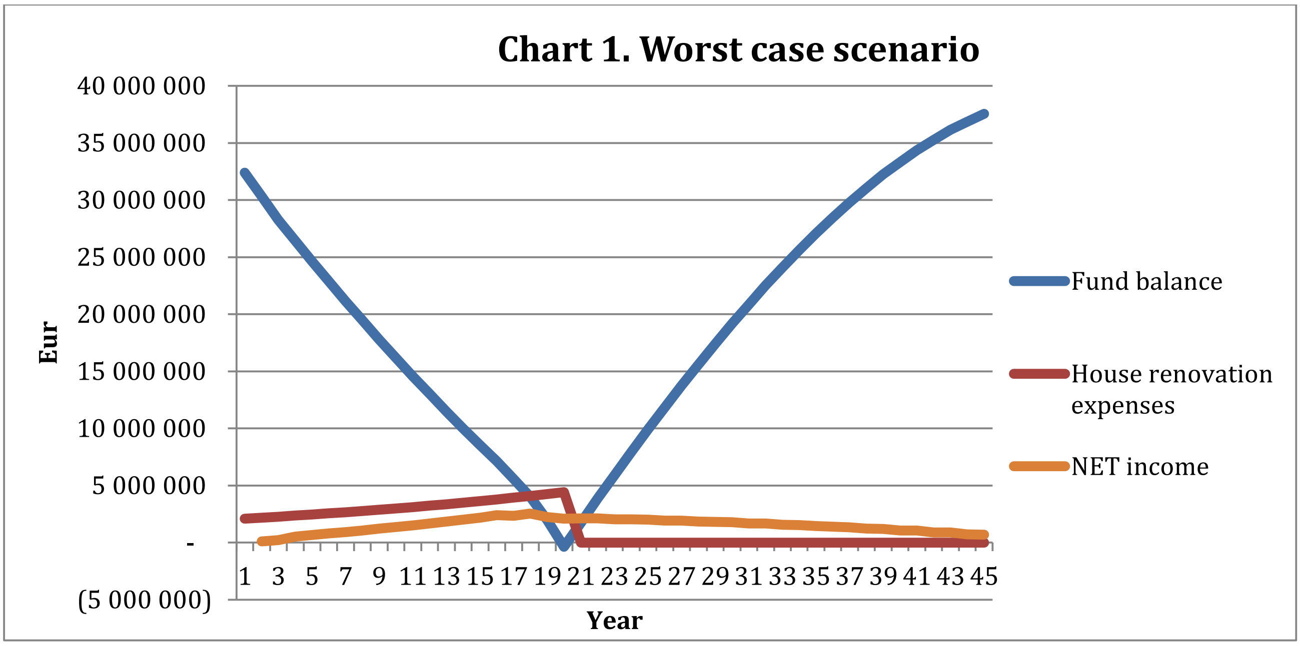
Revolving fund adopted gradual investment principle, which is beneficial for several reasons. It should be noted that gradual investment means same amount of funds to be invested every year. Firstly, following investment principle ensures that initial investment in renovation can be pilot and any process related issues that will arise can be taken into account conducting further investments, thus making whole renovation more efficient (i.e. creating opportunity for renovation of more houses). Second model presumes same number of houses to be renovated every year, until full capacity of fund is utilized. After that next house renovations will be financed from existing loan repayments. Such process takes up to 12 year in normal-case scenario. Following issue is highly dependent on external factors, which should be taken into consideration.

If the fund model would consider attitude of full capacity of fund utilization at the very beginning, the number of the houses that will be renovated can be slightly higher, but the risks that will correspond are too dramatic.

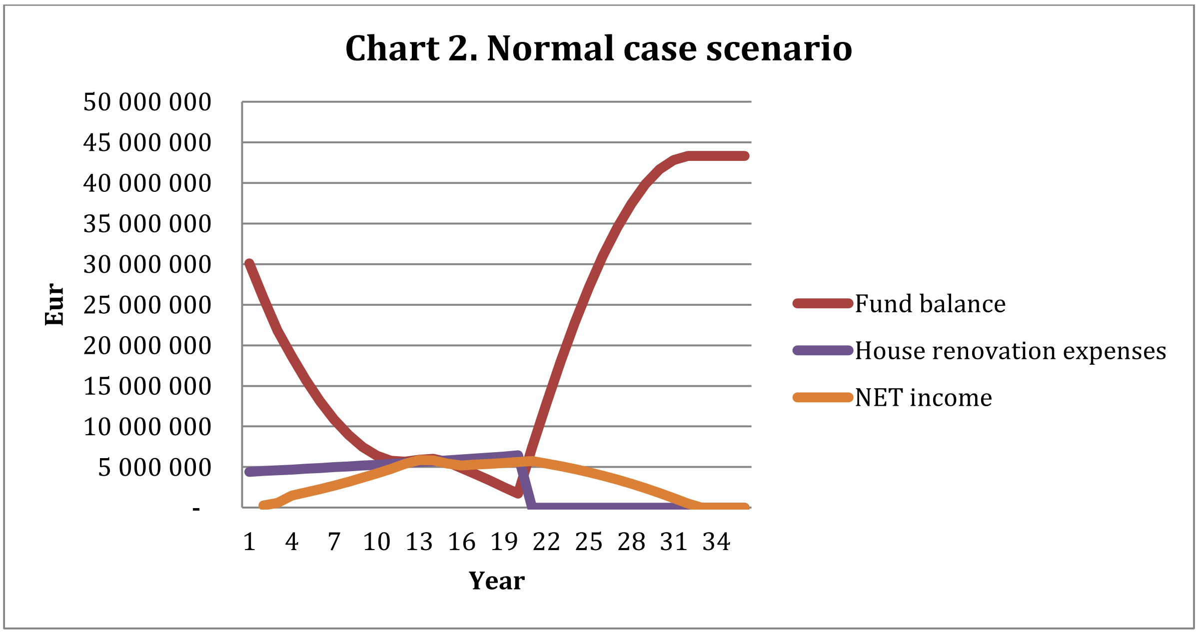
Results

Concept model of Revolving Fund proved itself to be working within all established scenarios. Naturally, specified conditions of scenarios affect the model, which results final cost of renovation and repayment period.

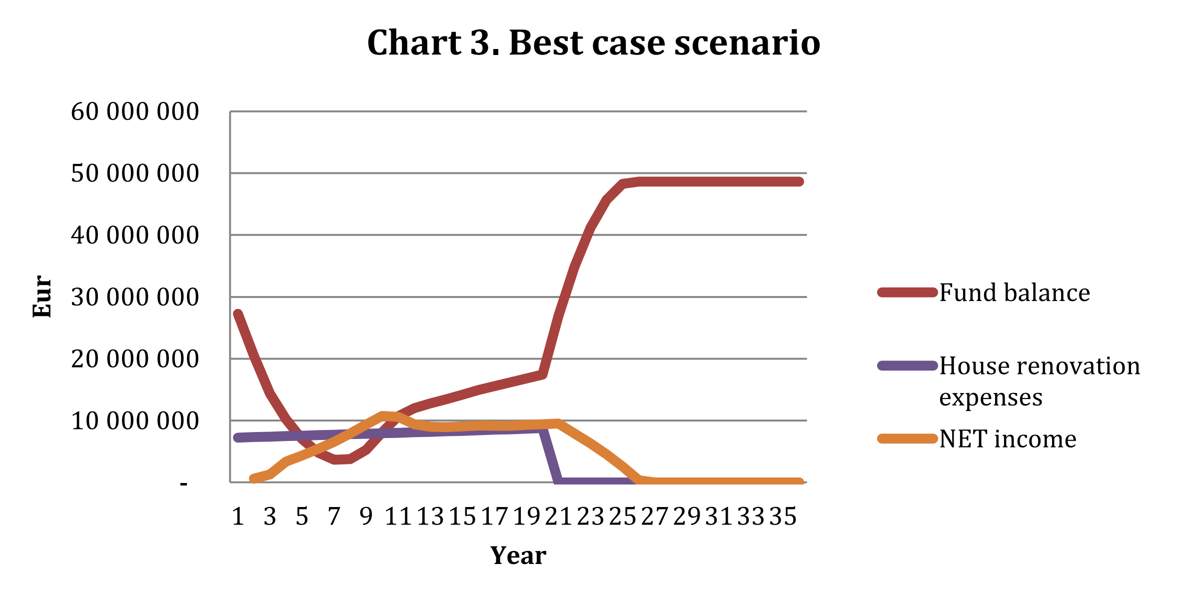
Each scenario most important result figures, including fund balance, house renovation expenses and net income, shown in Chart 1 describing worst-case scenario imply that net income from renovated houses is not capable to cover the new house renovation to keep at the same pace. In such situation, it should be expected that either additional investment may required or less houses may be renovated for some period.



Normal case scenario, presented on chart 2, shows that existing fund can be capable of renovating 17 houses per year. Curve of fund net income is come in line with house renovation expenses.

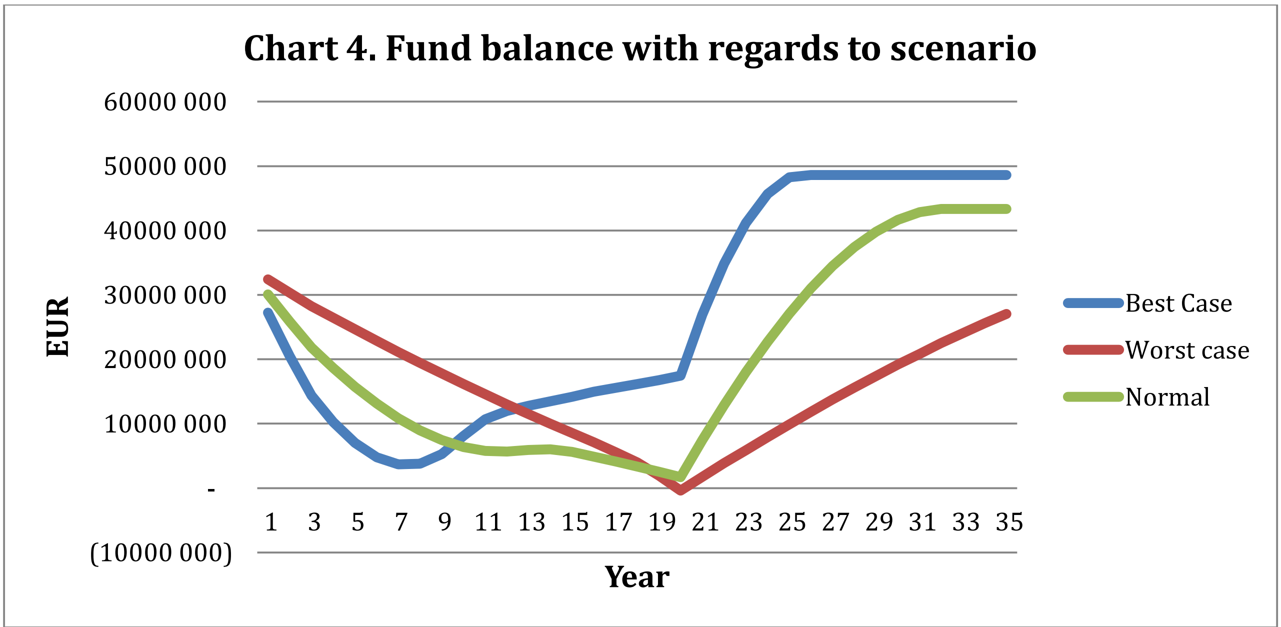


Best-case scenario, presented on chart 3, shows most optimistic outlook of the fund performance.



Comparison of scenarios

Chart 4. represents comparison of fund balance behaviour with regards to scenario. In every case fund is used to it maximum capacity according to economic conditions.



Comparison of periods required for single house renovation payback with regards to scenario is presented in Chart 5. Best-case scenario simulation suggests that it requires approximately 9 years to cover the cost of renovation, whereas normal-case scenario suggests approximately 12 years, and worst-case scenario requires up to nearly 15 years.

Following estimates include discount on utility bills of 5 percent, which on average increases the repayment period by 1 to 2 years depending on scenario.

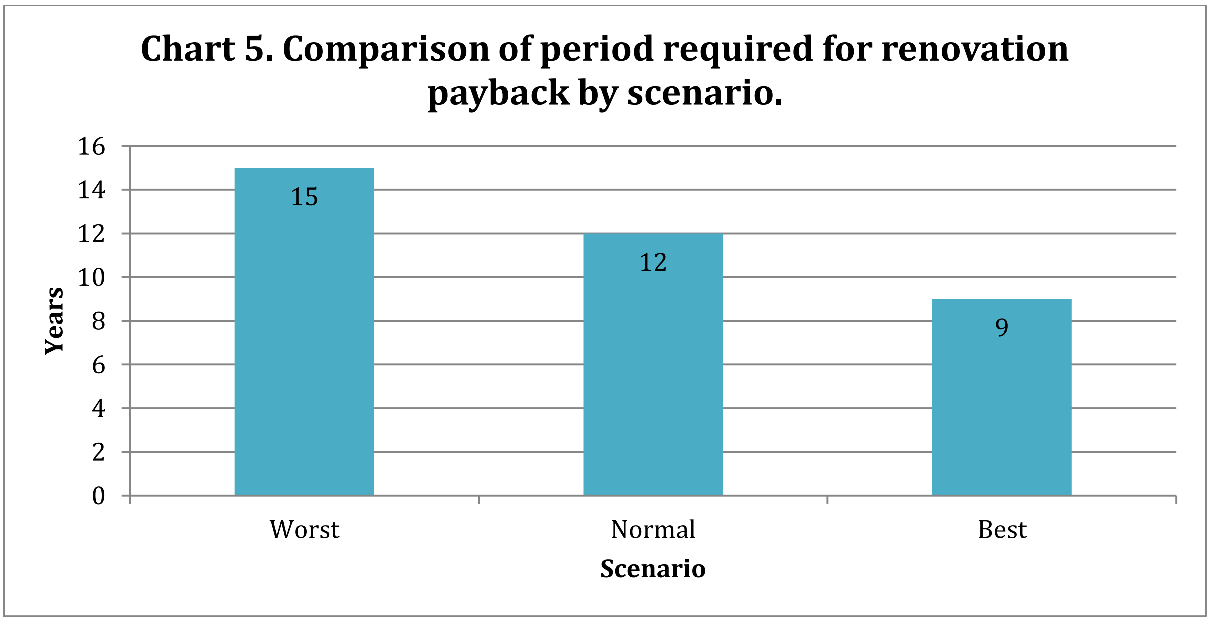


Chart 6. represents number of houses renovated per year by scenario. Obtained results show that 7, 17 and 33 houses can be renovated on annual basis in worst-, normal- and best- case scenario respectively. Deviations of best-case scenario are highest due to assumption of favourable conditions take place.

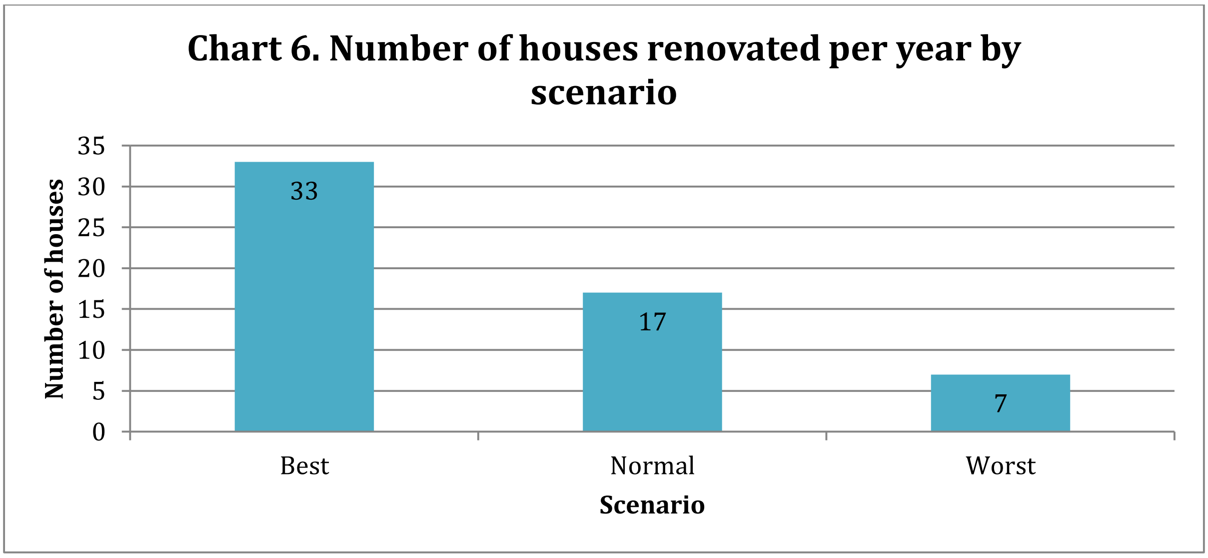
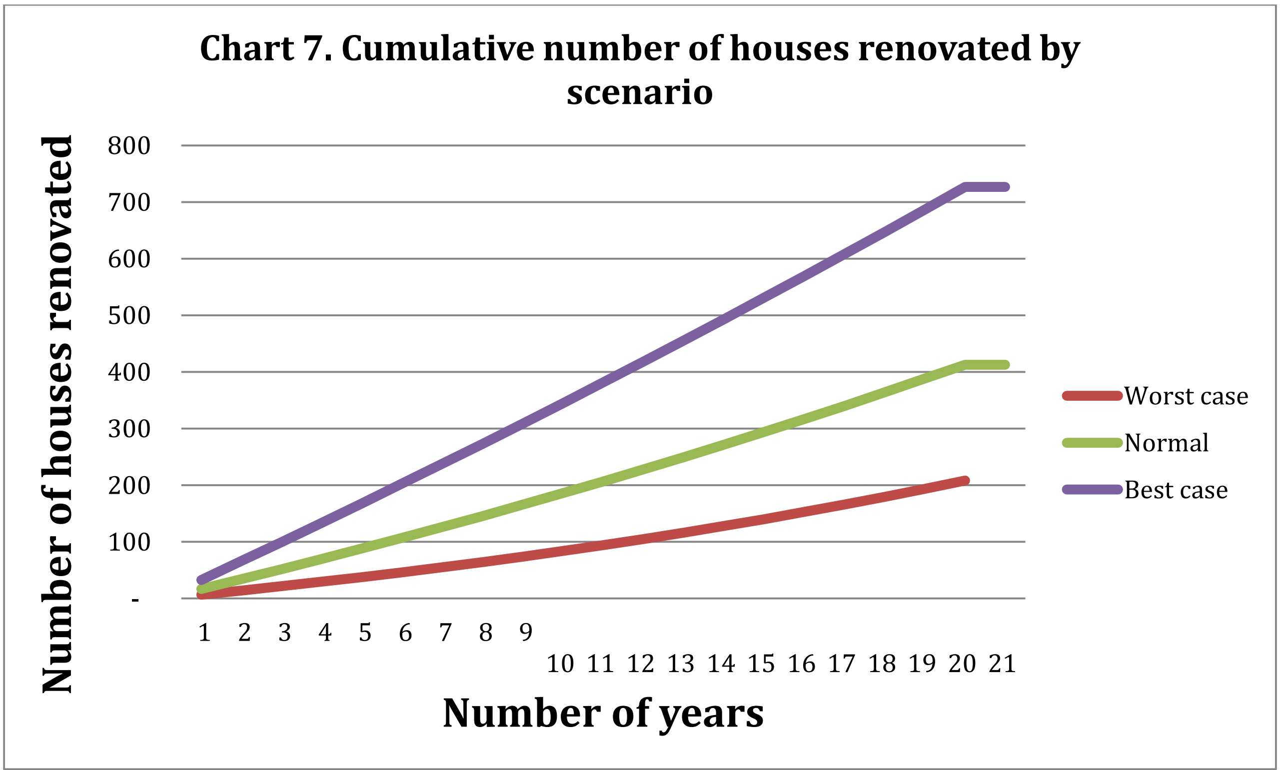


Chart 7. represents cumulative number of houses renovated by scenario for the period of 20 years after the renovations begins. Model projects 20 year period as it is enough to show

consistency. Obtained results show that 208, 413 and 727 houses in total can be renovated for the period of 20 years in worst-, normal- and best- case scenario respectively. It should be noted that following results are based on assumption that fund will operate 34,5 million fund.

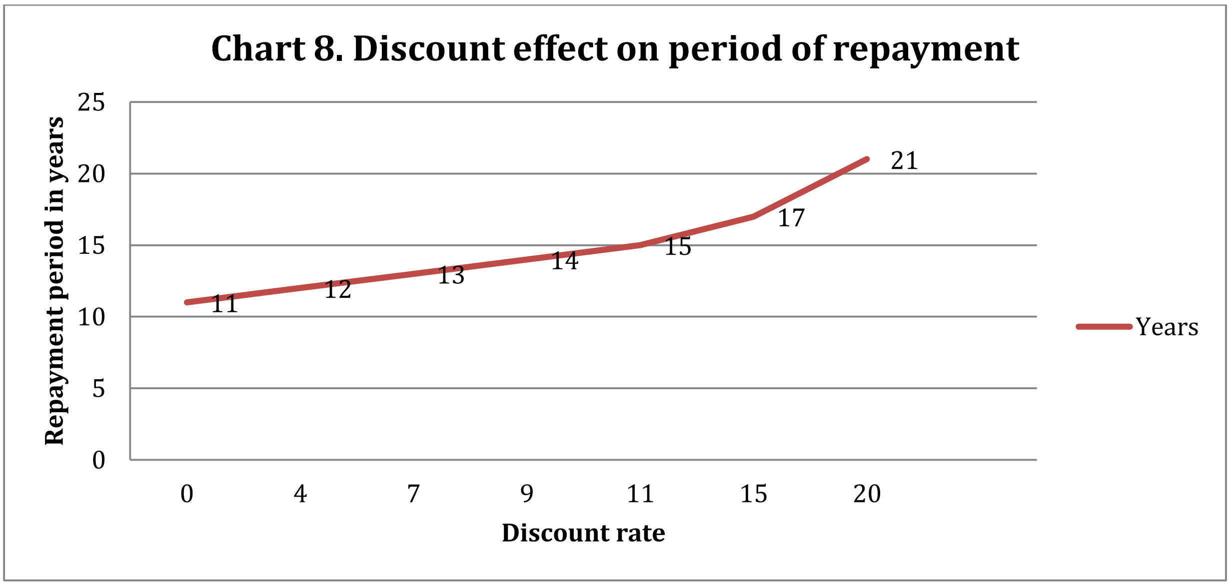


Expectations

In order to project fair expectations weighted scenario results were constructed with probabilities as described above (20/50/30). Obtained results suggest that renovation payback period is expected to be 12 years. Next, number of houses renovated per year is equal to 20 per year, which results in 466 houses to be renovated during the examined period.

More importantly, following weighted scenario expects that additional 500 million euro loan is required in order to renovate 6000 houses in Riga with an average space of 2000m^2 in 20 years. If the required amount of funds would be available, then it would be possible to renovate 286 houses per year.

Discount rate that was introduced in the model was analysed to observe the impact on the loan repayment period based on weighted scenario. Chart 8 describes the relationship. 5% discount rate has been considered to be optimal, which is equal to personal saving 12,5% with respect to total house energy savings.



It should be noted that as with the existing projections, possible deviations due to reliance on economic conditions may take. Thus, due to scale of required investment deviations may be significant.

Conclusions

Concept model has proven its sustainability, no matter what deviations from expected figures take place. However, if more favourable conditions will take place, then more houses will be renovated during specified period.

Such as the economic conditions vary, actual number of renovated houses may vary as well. Naturally, the more favourable economic conditions take place the more houses will be possible to renovate. Whereas if worsen economic conditions will take place - less houses will be possible to renovate. However, such as the model relies on economic conditions and is flexible, the number of renovated houses may fluctuate. It is important that the process of house renovation keep the course driven by the model, its methods, strategy and assumptions. Then, its sustainability will consist.

It should be noted that as economic conditions will change the number of renovated houses should be expected to change. But, no matter what economic conditions take place, loans

will be repaid. Thus, in all cases renovation process should be promoted and realized in every possible situation.

All in all, whatever the possibility to finance renovation arises, funds that are projected to be used for renovation should be borrowed only prior to actual renovation and for actual purpose of renovation. Otherwise, finance managing structure should at least be able to cover the cost of borrowed funds.

A loan granting and repayment arrangements

Procedure for granting the loan

Beneficiaries:	Riga citizens, ESCOs
Type of projects financed:	Projects aimed to improve building energy efficiency, e.g. reduced energy costs for households; The supported measures are: basically building insulation, heating systems renovation and setup of equipment for energy consumption counting and regulation.
Type of financial support provided	<u>Soft loans with interest rate ≤ 3%/year</u> Amount lent: *average renovation costs €150/m2 (average 350'000 EUR)* Interest rate: *≤ 3%/year* Maturity: *10-15 years* Guarantees: *financial flow* Insurance: *financial flow* Maximum monthly instalment: *is equal to the averaged (per year) savings emerged by improved energy efficiency.* For guarantees: - Eligibility criteria: household's utility payment (bills) financial flow. - Guarantee conditions the same as eligibility

* source of financing: municipal/ state budget/ EU funding, loan from a bank or international financing institution

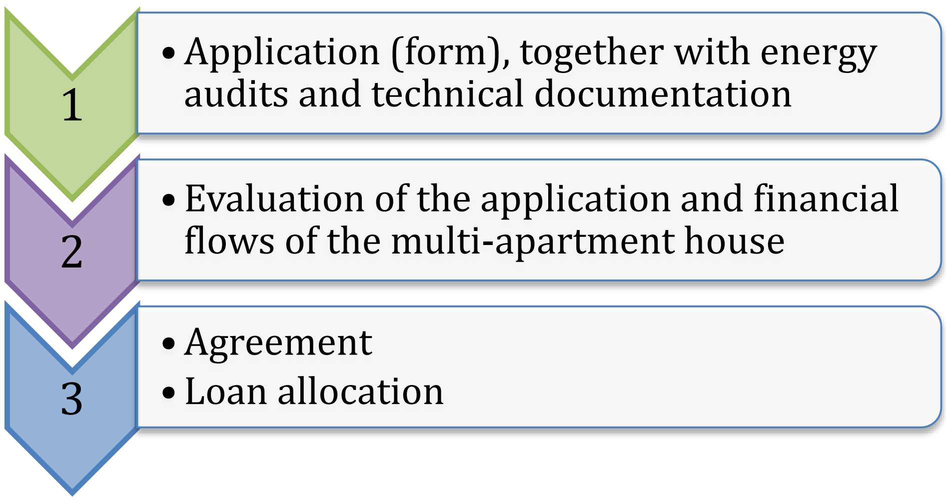
	criteria.
Energy efficency required after renovation	According to the national energy efficiency standards (%)
Application form	Standart form
Decision-making process	By the comission
Priorities	Building with the lowest energy efficiency (over 200 kWh/ m2/a)

General granting process consists of three basic steps:

1. Application (form), together with energy audits and technical documentation;

2. Evaluation of the application and financial flows of the multi-apartment house;

3. In case of positive decision, agreement signing and the loan allocation.



Apart from main procedure of getting the loan, the following proposal exists. municipal structure will monitor the houses of which the data is available and force the renovation of those that require most.

Pre-requisites for municipal borrowings and restrictions on additional borrowings

Notably, the potential liabilities of the Riga Municipality and its borrowing capacity (as well as the capacity to issue guarantees) should be assessed with respect to the following criteria:

- The municipality liabilities ratio to budget revenues may not exceed 100 % (defined by par. 17.6 of the Long-Term Liability Management Strategy of the Riga Municipality for 2013-2017).
- Municipal debt liabilities due for repayment in the current accounting year together with the debt liabilities of the past years due for repayment may not exceed 20 % of the total municipal budget for the current accounting year ("Law on Stabilizing the Financial Status of Municipalities and Monitoring Municipal Financial Activity")
- The increase of the limit for borrowings set by the Law on State Budget and its allocation as defined in the law.

By the end of 2015, the projected liabilities are 84.4 % against budget revenue.

The potential for additional liabilities (apart from the abovementioned liabilities) in 2015 below the 100 % threshold for all investment projects is 115 million euro. However, since the potential investment projects require a lot of funding and cannot be implemented over one year, new borrowings are planned for a term of three years (a loan in 2015 with 3 years of deferment) reaching the maximum liability threshold (115 million euro) in 2017, i.e. the average increase of liabilities per year is about 35 million euro.

The municipal liabilities due for repayment in the current accounting year, calculated according to the MoF methodology applicable to authorizations for new borrowings, in 2015-2020 are between 15.44-16.31 %.

In view of the existing liabilities schedule (with the borrowings approved for 2014-2015), the additional capacity for new long-term borrowings (2015-2017) below the 20 % threshold is 160 million euro or an average of 50-55 million euros per year.

The annual Law on State Budget has increased the borrowing limit for all municipalities in Latvia (119 municipalities: 110 in the regions and 9 cities, including Riga), and has allocated the limit according to the purpose of the loan (insulation of housing units is presently not covered).

According to Section 14 of the Law on State Budget for 2014, the overall limit for municipal borrowings in 2014 was increased by 118.13 million euro, with 56.91 million euro or 48 % of the total increase allocated for co-financing EU and other internationally financed projects.

It is projected that in the subsequent years the overall increase of the municipal borrowing limit could also be about 120 million Euro per year for all the municipalities, with 50 % of the total limit allocated to EU projects.

In view of the limits and restrictions set for the municipalities in the Law on State Budget, the increase of the total amount of borrowings by Riga might be about 35 million euro. This means that the maximum overall borrowings of the Riga municipality for all long-term investment projects and for all purposes (EU projects, road building investment projects apart from the EU projects, social housing, investment in educational establishments) over the average 3 year term could amount to 100-110 million euro, or about 35 million euro per year.

In view of the impact of the abovementioned criteria on the ability of Riga to borrow money for long-term investment projects, the overall borrowings over a term of three years (2015-2017) could be about 100-110 million euros or an average of 35 million euro per year.

With new liabilities undertaken it is important to make a careful assessment of the municipal budget potential in a number of aspects, i. e. the impact of the expenses related to the new projects, the related impact on the budget deficit and the budget financing.

- In the course of the implementation of the project, there are going to be expenses leading to an increase in the budget deficit.
- In the loan return period the interest payments are going to have an impact on the budget deficit, while repayment of the base amount is going to impact the financing part; i.e. the required financial resources for covering the liabilities, impacting the balance.