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Advanced Cost Benefit Analysis 4.2.4

Advanced Cost Benefit Analysis of investments in resource efficiency measures - A guide for SMEs seeking for external funding

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Content

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1. Introduction

One of the core outputs of the EU-project PRESOURCE (Promotion of Resource Efficiency in SMEs in Central Europe; www.presource.eu, project implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.) is a transnational tool to promote and implement an advanced cost-benefit analysis. It has been developed in order to foster investment decisions in the field of eco-innovation/resource efficiency (RE). As a result, SMEs receive a comprehensive tool in order to address their investment proposal to external capital providers. This shall result in an increase of quality to the eco-innovation funding process and foster the implementation of promising eco-innovative projects.

"The uptake of resource efficiency/eco-innovation measures is considerably slowed by the fact that conventional financial indicators used in cost-benefit analysis are unable to grasp the benefits of environmental projects. However, the methods to assess these impacts and support decision makers are available both at the company level and for public authorities. On the company level, methods of environmental accounting can be integrated into the management accounting system to provide information about the costs and benefits of environmental activities."[1].

In the following, a comprehensive overview of the necessity of assessing the feasibility of eco-innovation/RE projects by using an advanced cost benefit approach is given which as well includes the environmental impacts.

Based on more than 100 expert interviews with public financial institutions, private banks, venture capitalists and innovative capital providers that are active in the field of eco-innovation/RE within six countries, namely Austria, Czech Republic, Germany, Hungary, Italy and Poland, one big obstacle for eco-innovation implementation is the lack of external funding opportunities for SMEs. The causes for this are mainly driven by informational asymmetries, which define the characteristics on credit markets and, thus, affect financing decisions between innovators and investors.[2] Thus, internal sources (e.g. cash flows, reserve assets or bar reserves) are still by far the primary source of innovation funding for SMEs.[3]

In general, especially measures for eco-innovation are associated with a high level of uncertainty about their economic feasibility.[4] According to the expert interviews with the financial institutions in

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[1] ENEA (2013).
[2] Czarnitzki/Hottenrott (2010), p. 6.
[3] Zimmermann (2014), p. 3.
[4] Zimmermann (2012), p. 1.

Central Europe, there is a lack of specific evaluation criteria for eco-innovation/RE projects. Thus, conventional approaches are ineligible to assess the environmental benefits and finally transfer them into monetary values. On the other hand, SMEs criticise insufficient engagement of capital providers with an investment focus on eco-innovation industries.[5] Thus, important potentials for economic growth are lost due to imperfect market conditions. This fact underlines the necessity of support to close these informational gaps by signalling economic reliability of eco-innovation/RE projects.

With respect to the lack of specific evaluation criteria, the advanced cost benefit approach shall complement conventional financial valuation methods by managerial, economic and environmental indicators providing actors in the financing sector (public financing institutions, private investors and banks), policy makers and public bodies responsible for development of public funding sources, multipliers such as engineering and business associations and SMEs with an easy to use indicator system as well as a good practice calculation scheme for the better transfer of technological knowledge and environmental impact into economic terms.

As all other final project outputs this document as well as the calculation scheme can be downloaded free of charge from the competence platform (www.resourceefficiencyatlas.eu). The platform will be hosted and continuously updated by Fraunhofer MOEZ after the end of the project in order to ensure long term knowledge transfer on eco-innovation/RE promotion in Central Europe.

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[5] European Investment Monitor (2011), p. 47 – 49.

2. Financial valuation methods

"The financial evaluation of investment projects is commonly carried out using financial indicators such as net present value, payback time, internal rate of return and return on investment. These indicators can also be used for the cost-benefit analysis of environment-related projects – however, in practice it often happens that environmental projects are rejected without proper financial analysis, as managers inherently assume that environmental projects increase costs and reduce profitability. Environmental managers on the other hand are often not familiar with the above financial indicators and are unable to successfully promote even profitable projects. Thus, savings opportunities provided by improving resource efficiency may be missed"[6].

The following methods for financial valuation of eco-innovation/RE projects create the framework of the advanced cost benefit analysis.

2.1 Net Present Value

"An investment is worth undertaking if it creates values for its owners."[7] In case of potential eco-innovation investments, SMEs must therefore analyse if and with which amount an investment will add value to the company.

The Present Value (PV) is the today's worth of a future sum of cash flows (CF) given a specified rate of return. The Net Present Value (NPV) of a proposed investment includes the difference between the PV of the estimated cash flows and the amount of the initial investment.[8] The expected future cash flows are discounted at the discount rate over the number of each period. The discount rate is either estimated or usually the Weighted Average Cost of Capital (WACC) and represents the opportunity cost of the capital. With a high discount rate, the present value of the future cash flows is lower.[9] The procedure is also often called discounted cash flow valuation.

$$\text{NPV} = \sum_{t=0}^{N} \frac{CF_t}{(1+r)^t} - \text{Initial Investment}$$

Whereby:

CF_t = Cash flow per period; in this context considering both, the amount saved by the eco-innovation investment (cash inflows) and the annual costs of the measure (cash outflows)

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[6] ENEA (2013).
[7] Bradford/Westerfield/Ross (2011), p. 267.
[8] Gallagher/Andrew (2007), p. 266 - 267.
[9] Gallagher/Andrew (2007), p. 194.

r = discount rate

t = period

N = number of periods

Interpretation:

▫ If NPV > 0: the investment should be done as it will add value to the company.

▫ If NPV = 0: the investment will neither increase nor decrease the company value, but still non-monetary benefits could be considered (e.g. positive environmental impacts).

▫ If NPV < 0: the investment is negative and therefore should be rejected.

Practice Example[10]:

A company invests € 200,000 today in a new product line and generates additional annual cash flows of € 100,000 for the next three years with a discount rate of 10 %.

Year 1: PV = € 100,000 / 1,10 = € 90,909
Year 2: PV = € 100,000 / $1,10^2$ = € 82,645
Year 3: PV = € 100,000 / $1,10^3$ = € 75,131
Today: Initial Investment = - € 200,000 and cumulative PVs = € 248,685

Adding these values up and subtracting the initial investment, the NPV will be then:
NPV = € 248,685 – € 200,000 = € 48,685.

With the same cash flows but with a lower discount rate of 6 %, the NPV rises:
NPV = (€ 94,340 + € 89,000 + € 83,962) - € 200,000 = € 67,302.

With a positive NPV the company should accept the investment, as it will add value to it.

2.2 Payback Period

The Payback Period (PBP) describes the number of periods it will take in years until the cash flows equal the amount of the initial project investment.[11] To calculate the PBP, there are basically two methods: the static method and the dynamic method.

The first method is applicable if the annual financial return (which is used to cover the initial investment) is obtained in the same amount. In such cases, the PBP is calculated with the following formula:

$$\text{PBP (years)} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflows}}$$

On the other hand, the dynamic PBP method is used when the annual returns from the investment

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[10] Author's own assumptions.
[11] Gallagher/Andrew (2007), p. 265.

are of different heights. The annual cash inflows are accumulated by year until the cumulative sum is positive. Also, the present values of the estimated cash flows are taken into account. These two points define the PBP in its dynamic terms.

In general, an innovation project can be seen as acceptable if its PBP is lower than a certain prescribed number of years. The PBP can therefore be described as a kind of break-even measure in an accounting sense. Nevertheless, as simple and as easy to understand the PBP is, it has some disadvantages. The static calculation of the PBP does not include the time value of money, moreover, both methods of the PBP ignores cash flows beyond the calculated period, and generally fail to distinguish between risk differences of projects.[12]

Practice Example[13]:

1. Initial Investment of   € 150,000 (onetime)

2. Saved Energy, 7ct/kWh   € 116,000 (per year)

3. Avoided glass failures   € 30,000 (per year)

4. Avoided cleaning costs   € 25,000 (per year)

This generates a positive outcome in the first year of € 21,000 and for every following year an outcome of € 171,000. With regard to the PBP formula, the funds expended for this investment will be recouped in 0.88 years or 10.5 months.

2.3 Internal Rate of Return

The internal rate of return (IRR) of an investment is the rate of return when the NPV of the project amounts to zero. IRR calculations are commonly used to evaluate the desirability of investments: if the IRR exceeds a required minimum return of a certain project, the investment should be accepted. It is closely linked to the NPV, as the calculation of the IRR is based on its equation and leads often to similar solutions for conventional, independent projects.

$$\text{NPV} = \sum_{t=0}^{N} \frac{CF_t}{(1 + IRR)^t} - \text{Initial Investment}$$

But it has one specific advantage over the NPV: while not always being aware of the appropriate discount rate to calculate the NPV, the IRR still can be estimated. On the other hand, if two or more mutually exclusive investments have to be compared, the IRR can lead to a false decision as the NPVs

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[12] Bradford/Westerfield/Ross (2011), p. 273 - 275.

[13] The following data refers to a good practice example of the German eco-innocation funding programme *Umweltinnov–ationsprogramm* supporting an innovative project by the Ardagh Group located in Nienburg, Germany. The data is available at http://www.umweltinnovationsprogramm.de/sites/default/files/benutzer/36/dokumente/abschlussberich–t_1.pdf.

can be of contrary value. Nevertheless, next to the NPV the Internal Rate of Return (IRR) is the most popular alternative in practice.[14]

Practice Example[15]:

A company invests € 100,000 in a single-period project today, which pays € 110,000 in one year.

Today:
NPV = - € 100,000 + € 110,000/(1+IRR)

To estimate the IRR, the NPV is set to zero:
NPV = 0 = - € 100,000 + € 110,000/(1+IRR)

Solving for equation for IRR, we receive:
IRR = 10 %

If the company would require a 15 % minimum return, then it should not accept the investment. Vice versa, if the IRR exceeds the required return, the company should take it.

2.4 Return on Investment

The Return on Investment (ROI) is a commonly used indicator for the efficiency of an investment by dividing the benefit of an investment (in this context the NPV: description see above) through the cost of the investment.[16]

$$\text{ROI (\%)} = \frac{\text{NPV from Investment}}{\text{Initial Investment}}$$

Practice Example[17]:

A company has the choice between two innovation projects. The first one has initial investment costs of € 70,000 and an estimated NPV of € 100,000, the second has costs of € 80,000 and an estimated NPV of € 75,000.

The ROI for the first project would then be:
ROI_1 = € 100,000 / € 70,000 = 142.86 %

And for the second project:
ROI_2 = € 75,000 / € 80,000 = 93.75 %

With all other things being equal, the company should accept the first investment opportunity with the higher ROI of 142.86%.

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[14] Bradford/Westerfield/Ross (2011), p. 288.
[15] Author's own assumptions.
[16] Brechner (2011), p. 702.
[17] Author's own assumptions.

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3. Cost Benefit Analysis: Indicators for Investment Decisions

In this chapter indicators comprising soft, economic and environmental impacts of the investment decisions are presented. With regard to the soft indicators 3.1 and environmental indicators 3.3, it is possible to reveal external capital providers not only the benefits of the investment in an economic way but also from an environmental point of view.

3.1 Soft Indicators

The following scheme provides SMEs and external financial stakeholders a first qualitative overview of the investment's environmental general impact concerning soft indicators which reveal managerial decisions, eco-certifications, and environmental management systems among others. Therefore, this scheme can be used as an **upfront checklist**.

Qualitative Checklist for SMEs[18]

1. General sustainable impact

☐ Sustainability as a management objective (e.g. an assigned project manager for eco-innovations)

☐ Integration of a Life Cycle Assessment (ISO 14040 and 14044)

☐ Other _____

2. Implementation of organizational eco-certification

☐ Environmental Management System (ISO 14001:2004)

☐ Eco-Management and audit scheme (EMAS 2009/1221/CE)

☐ Carbon Footprint (ISO 14064:2012)

☐ Organization Environmental Footprint (OEF) (currently under development[19])

3. Implementation of product / process eco-certification

☐ Ecolabel type I (ISO 14024:2001)

☐ Ecolabel type II (ISO 14021:2012)

☐ Ecolabel type II (ISO 14025:2010)

☐ Carbon Footprint (ISO 14067:2013)

☐ Water Footprint (ISO 14067:2013)

☐ Product Environmental Footprint (PEF) (currently under development[20])

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[18] Author's own illustration based on MBG Schleswig-Holstein (2012).
[19] More information at http://ec.europa.eu/environment/eussd/smgp/product_footprint.htm.
[20] More information at http://ec.europa.eu/environment/eussd/smgp/organisation_footprint.htm.

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4. Cost reduction of natural resources

☐ Introduction of a circular economy system

☐ Improvement of energy, material and/or water conservation

☐ Usage of secondary resources

☐ Other _____

5. Reduction of environmental impact

☐ Reduction of greenhouse gases emissions

☐ Improvement of waste management

☐ Introduction of recycling and/or reuse measures

☐ Measures for soil, water and/or air protection

☐ Substitution of hazardous material

☐ Other _____

Figure 1: Qualitative Checklist for SMEs.

3.2 Economic Indicators

While conventional banks are still using their standard credit rating criteria also for financing eco-innovation/RE projects, the necessity of specific evaluation criteria for these specific projects is present.[21] In general, economic feasibility details of investment proposals typically include data regarding the investment, potential funding structures, operating costs, earnings and amortisation.[22]

In order to define suitable economic indicators to demonstrate the benefits and impact of the eco-innovation investment to external capital providers, the following approach refers to the PRESOURCE-definition of resource efficiency: "*Reducing the use and costs of energy, water, material in the production process, and life cycle in SMEs with a particular focus on the manufacturing sector.*" Thus, three environmental segments have been identified to further check with the eco-innovation/RE investment regarding its optimisation potential and cost reduction compared to the current status within SMEs: *energy, water* and *material*.

Every segment is examined regarding the aspects of:

(1) The amount of specific consumption of raw materials and utilities (energy, water, materials etc.)

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[21] Finanzierungsmöglichkeiten für das "KMU der Zukunft" über Grünes Geld. Endbericht. 2008. ÖGUT Österreichische Gesellschaft für Umwelt und Technik. http://www.oegut.at/downloads/pdf/nf_nakmufin_eb.pdf accessed on 15.06.2014.

[22] The German promotional bank KfW provides standards to preparation of investment proposal for their eco-innovation funding programme. For further information see https://www.kfw.de/PDF/Download-Center/F%C3%B6rderprogramme-(Inlandsf%C3%B6rderung)/PDF-Dokumente/Hinweisblatt-Umweltinnovationsprogramm-Projektskizze.pdf accessed on 20.05.2014.

and/or the corresponding value of costs;

(2) The optimisation potential of the project compared to the status quo without the eco-innovation/RE investment;

(3) Costs of related maintenance and

(4) The total net saving potential.

For each segment and its underlying points all data is completed by the SME itself, e.g. for the amount of energy consumption all values for electricity, fuel, lignite, natural gas, coal etc. are added up.

All findings result into the following scenario analysis tool, which enables SMEs to easily overview the main benefits of their eco-innovation/RE projects in monetary terms and to present the key figures of the investment to external capital providers, e.g. public financing institutions, private investors and house banks. Therefore, the financial valuations methods of chapter 2 are utilized in the concluding investment summary. Also, SMEs are able to compare two different scenarios of investments either with each other or also with the status quo values within the company.

The German VDI Zentrum Ressourceneffizienz (VDI ZRE) has launched in May 2014 a comparable calculation scheme. The methodology within this innovative tool was taken into consideration within this cost-benefit-analysis. The VDI-ZRE-tool assesses in particular the life-cycle costs within enterprises and compares them with alternative investment opportunities. The yearly savings are then set into relation to the investment costs, where finally the payback period and the NPV are displayed.[23] In addition to that the advanced cost benefit analysis of the PRESOURCE project is dedicated to the three segments as mentioned above. Furthermore, it provides SMEs a profound basis for their individual investment decisions.

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[23] More information at http://kostenrechner.ressource-deutschland.de/#/investitionen/anlage.

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Scenario Analysis of Eco-Innovation Investments[24]

	Status Quo		Scenario 1 Energy, water and process optimisation		Scenario 2 Improved energy, water and process optimisation	
Energy[25]						
Amount of energy consumption	500,000	kWh / year	400,000	kWh / year	380,000	kWh / year
Total value of energy costs	93,950	€ / year	75,160	€ / year	71,402	€ / year
Optimisation potential			25.00	%	31.58	%
Costs of related maintenance			2,000	€ / year	2,000	€ / year
Total cost saving potential			16,790	€ / year	20,548	€ / year
Water[26]						
Amount of water consumption	50,000	m^3 / year	40,000	m^3 / year	40,000	m^3 / year
Total value of water costs	83,500	€ / year	66,800	€ / year	66,800	€ / year
Optimisation potential			25.00	%	25.00	%
Costs of related maintenance			3,000	€ / year	3,000	€ / year
Total cost saving potential			13,700	€ / year	13,700	€ / year
Material[27]						
Value of total material input	500,000	€ / year	470,000	€ / year	450,000	€ / year
Optimisation potential			6.38	%	11.11	%
Costs of related maintenance			3,500	€ / year	4,500	€ / year
Total cost saving potential			26,500	€ / year	45,500	€ / year
Additional net profits						
Through production optimisation			10,000	€ / year	15,000	€ / year
Through process optimisation			5,000	€ / year	10,000	€ / year
Through recycling/reuse measures			0	€ / year	0	€ / year
Other cost savings (e.g. cost of emissions, pollution, waste management etc.)			0	€ / year	0	€ / year
Investment Summary[28]						
Investment costs			200,000	€	350,000	€
Useful economic life			5	years	7	Years
Net present value (NPV)			111,679	€	256,111	€
Pay Back Period (PBP)			2.78	years	3.34	Years
Internal Rate of Return (IRR)			17.55	%	16.99	%
Return On Investment (ROI)			55.8	%	73.2	%

Figure 2: Scenario Analysis of Eco-Innovation Investments.

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[24] Author's own illustration. This calculation scheme is available for free download on the Competence Platform.

[25] Assumptions for consumption values of energy are based on German statistics. In this example the company only has electricity expenditures as energy consumption. The average industrial electricity price in the first half of 2013 in Germany was 18.79 Ct/kWh. This price includes taxes, charges and apportionments - Source: BVMW (2014).

[26] Assumptions for the consumption values of water are based on German statistics. The average water price in 2013 was 1.67 € / m^3 - Source: BVMW (2013).

[27] Author's own intuitive assumptions for material consumption values.

[28] The assumed discount rate in these two scenarios is 5%.

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3.3 Environmental Indicators

In contrast to the economic indicators and the financial valuation key figures, the environmental indicators measure the environmental performance of an enterprise.

The OECD-Sustainable Manufacturing Toolkit defines appropriate indicators, which value the sustainability of SMEs through three layers of the production cycle considering input factors, operations during production, and output. The content and the calculation of the indicators are described in detail in the OECD toolkit manual.[29] As the PRESOURCE project is aimed at increasing resource and cost efficiency of energy, water and material usage, an adjusted version based on the OECD-Sustainable Manufacturing Toolkit list of indicators is applied for usage by SMEs.

Environmental Indicators[30]

Input	Indicator	Project target
Non-renewable materials intensity	…… (t / year)	…… (t / year)
Restricted substances intensity	…… (t / year)	…… (t / year)
Recycled / reused content	…… (%)	…… (%)
Operations		
Water intensity	…… (m^3 / year)	…… (m^3 / year)
Energy intensity	…… (MJ / year)	…… (MJ / year)
Renewable proportion of energy	…… (%)	…… (%)
Greenhouse gas intensity	…… (tCO2e / year)	…… (tCO2e / year)
Products (indicators are linked to each		
Recycled / reused content	…… (%)	…… (%)
Renewable materials content	…… (%)	…… (%)
Target value of total material input	…… (t / year)	…… (t / year)
Energy consumption intensity	…… (MJ / year)	…… (MJ / year)

Figure 3: Environmental Indicators of SMEs.

The outcome within the environmental indicators is that a SME and potential external capital providers receive a brief overview of the environmental performance of the enterprise and - compared to a second calculation for the estimated project target after implementation - of the benefits of the eco-innovation/RE investment.

Example for the detailed use of the environmental indicators:

1) Input   *Indicator*   *Project target*

e.g. non-renewable materials intensity (t / year)   ……(t / year)   …… (t / year)

    Weight of non-renewable resources consumed
    / Normalisation factor

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[29] OECD Sustainable Manufacturing Toolkit (2011).
[30] Author's own illustration based on OECD Sustainable Manufacturing Toolkit (2011).

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2) Operations   *Indicator*   *Project target*

e.g. water intensity (m^3 / year)   ……(m^3/year)   …… (m^3/year)

   Total water intake / Normalisation factor

3) Products (indicators linked to each product)   *Indicator*   *Project target*

e.g. recycled / reused content   ……(%)   …… (%)

   Sum for each product {(Weight of a product unit x Proportion of recycled content x Units produced) + (Weight of a product unit x Proportion of reused content x Units produced)}
   / Sum for each product (Weight of a product unit x Units produced)
   x 100

4. Conclusion and outlook

As SMEs often face difficulties to convince external capital providers of their eco-innovation/RE benefits, the necessity to assess and emphasize the added value of such investments through an advanced cost benefit approach is given.[31]

At this point the easy to use calculation scheme provides a static approach provided by the data of SMEs. As costs and prices of energy, water and materials increase over time, they become more and more crucial for future investment decisions of SMEs. Therefore, dynamic calculations for economic valuation are important to be taken into consideration. This will enable SMEs to compare its current consumption values and costs in the areas of energy, water and material usage with an estimated increase of costs in future.

This will at most reveal the necessity of compensating these increases of costs through eco-innovation/RE investments for SMEs. Likewise important are additional benefits of an investment, e.g. depreciation and tax credit. These driving factors could be integrated in an extended version of the advanced cost benefit approach in the near future. This also goes in line with the assumed discount rate at the present point. For the SME's risk adjusted discount rate the weighted average cost of capital should be a reference. This requires additional detailed data as factors as the company's beta, corporate tax rate as well as markets rate of debt and equity need to be taken into account.

To further enhance and validate the beneficiary impact of the tool for SMEs, interviews with selected external capital providers in the near future are to be considered.

To sum up, the current advanced cost benefit analysis provides SMEs with an easy to use tool to estimate and review potential investment decisions of eco-innovation/RE projects on their own. Moreover, SMEs receive a financial basis to present their investment proposals to external capital providers for an indicative decision for the final investment. For further information regarding the advanced cost benefit analysis and its free of charge calculation scheme please have a closer look on our Competence Platform (www.resourceefficiencyatlas.eu).

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[31] Zimmermann (2014), p. 2.

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6. Annex

Advanced Cost Benefit Analysis
of eco-innovative investment proposals

Annotation: All cells marked with the colour "orange" are editable for the user's data.

Scenario analysis of investment potentials	Status Quo		Scenario 1 Energy and process optimisation		Scenario 2 Improved energy and process optimisation	
Energy						
Amount of energy consumption	500.000	kWh/year	400.000	kWh/year	380.000	kWh/year
Total value of energy costs	93.950	€/year	75.160	€/year	71.402	€/year
Optimisation potential			25,00	%	31,58	%
Cost of related maintenance			2.000	€/year	2.500	€/year
Net total cost saving potential			16.790	€/year	20.048	€/year
Water						
Total amount of water consumption	50.000	m³/year	40.000	m³/year	40.000	m³/year
Total value of water costs	83.500	€/year	66.800	€/year	66.800	€/year
Optimisation potential			25,00	%	25,00	%
Cost of related maintenance			3.000	€/year	3.000	€/year
Net total cost saving potential			13.700	€/year	13.700	€/year
Material						
Total value of total material input	500.000	€/year	470.000	€/year	450.000	€/year
Optimisation potential			6,38	%	11,11	%
Cost of related maintenance			3.500	€/year	4.000	€/year
Net total cost saving potential			26.500	€/year	46.000	€/year
Additional net profits						
Through production optimisation			10.000	€/year	15.000	€/year
Through process optimisation			5.000	€/year	10.000	€/year
Through recycling measures			0	€/year	0	€/year
Other cost savings (e.g. cost of emissions, pollution, waste management etc.)			0	€/year	0	€/year
Investment Summary						
Investment costs			200.000	€	350.000	€
Lifetime of the investment			5	years	7	years
NPV over economic life cycle			111.679	€	256.111	€
Pay Back Period (PBP)			2,78	years	3,34	years
Internal Rate of Return (IRR)			17,55	%	16,99	%
Return On Investment (ROI)			55,8	%	73,2	%
Assumed Discount rate	0,05					

Sources
*Assumptions for consumption values of water and energy are based on German statistics: Average water price of 1,67€ / m3 - Source: BVMW (2013); Average electricity price of 14,97 Ct/kWh eastern states and 13,69 Ct/kWh western states - Source: Rödl & Partner (2013); Conversion ratio: 1 kWh = 3,6 MJ. The assumed discount rate for the NPV amounts to 5%.

Source: BVMW (2013): http://www.bvmw.de/nc/homeseiten/news/artikel/stromkosten-fuer-mittelstand-steigen-2013-um-mehr-als-12-prozent.html
Source: Rödl & Partner (2013): http://www.roedl-benchmarking.de/downloads/PM_130611_Benchmarking_Wasser_NRW_end.pdf

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