

Evaluating Consulting Programs for Sustainable Businesses – The EcoBusinessPlan Vienna Case Study

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Abstract: EcoBusinessPlan Vienna is a consulting program run by Municipal Department 22 (Environmental Protection) of the City of Vienna since 1999. The program supports the implementation of environmentally friendly measures in Viennese businesses by subsidising environmental consulting. The key objectives are (i) to foster environmental awareness of Viennese businesses, (ii) to support the implementation of environmentally friendly measures by subsidising environmental consulting, (iii) to encourage an exchange of experiences and (iv) to build a network. A key feature of the program is the co-operation between the City of Vienna and private enterprises. Experienced consultancies support the participating businesses in carrying out an analysis of their current environmental performance, in setting up an environmental program and in implementing environmental measures. Since the introduction of EcoBusinessPlan Vienna in 1999, nearly 500 companies have participated in one of its five program lines (EcoBonus for micro-companies, EcoProfit for improving the eco-efficiency of medium sized companies, EMAS and ISO14001 for the implementation of environmental management systems, Ecolabel Tourism for hotels, inns and restaurants). The EcoBusinessPlan Vienna has been evaluated by an interdisciplinary team since its inception on a regular basis in order to improve its effectiveness and efficiency. The evaluation concept combines quantitative methods (e.g. assessment of environmental effects, amortisation of measures) with qualitative methods (such as stakeholder analyses and interviews with participating businesses and consultancies). For performance measurement an internet database of environmental measures has been established from the very beginning and contains detailed information of more than 8,000 projects and measures of the participating businesses. An additional long-term evaluation followed the question of whether the measures planned with consultants have actually been implemented, and whether the one-time participation in the program has led to long-term effects. The conference paper will give a brief outline of the program, describe the evaluation concept and methodology and summarize the key findings of the last evaluation reports. The case study is suggested for one of the subsequent EASY-ECO-Trainings.

Keywords: environmental consulting, theory based evaluation, case study, EcoBusinessPlan Vienna

1 The Diffusion of Consulting Programs for Sustainable Businesses

In many European countries, consulting programs for sustainable business activities are initiated, funded and implemented by public authorities. Examples of such programs are Miljøfyrtårn – “environmental lighthouse” in Norway, The Natural Step in Sweden, Envirowise in the UK, Green Network in Denmark, Bretagne Environment Plus in France, environmental pacts and alliances in nearly all German regions (*Bundesländer*) as well as the consulting program “Ökoprofit” that was initiated in Austria and has since been diffused worldwide (Beer, 1992; Freimann, 1995; Minsch et al., 1996; Fresner, 1998; Geelhaar and Muntwyler, 1998; Bradbury and Clair, 1999; Petek and Glavic, 2000; Sage, 2000; Castellaz and Widerin, 2000; Stockmann and Meyer, 2001; Tischer, 2001; Hammer, 2001; Störmer, 2001; Friedman and Mills, 2002; Fromhold-Eisebith, 2002; Ammenberg and Hjelm, 2003; Malmberg, 2003; Palan, 2005; Martinuzzi and Galla, 2006). These programs offer inexpensive consulting services, support the development of actor networks, encourage corporate learning and capacity-building. In some cases they even comprise awards for voluntary measures which can have an important public relations effect for companies.

An analysis of the characteristics and diffusion of consulting programs for sustainable businesses shows the following trends:

- From individual consulting to actor networks: The first consulting programs were initiated by a small number of actors and included funded individual consulting. Subsequent consulting programs integrated a multitude of actors and created a “one-stop-shop” for enterprises for all questions regarding sustainable business activities. This development decreased the transaction costs for businesses and also utilized potentials for other actors taking part in the program.
- From information distribution to broad user packages: At the beginning, the actual consultation was the main focus of the programs. In the newer programs, additional user potentials gain more importance, e.g. networking, image effects and deregulation. With this change, consulting programs can appeal to a larger amount of enterprises.
- From individual initiatives to a self-contained consulting product: The first consulting programs were very much oriented towards the respective regional circumstances. Newer programs could develop largely independent from its initiators and now show signs of a self-contained consulting product with trademark characteristics. Moreover, questions related to brand policy gain more and more importance, e.g. quality assurance, communication or market penetration strategies, etc.
- From pure funding to broader fields of activity for public authorities: During the first consulting programs, public authorities were primarily concerned with financial issues. At later stages, when participants of consulting programs received awards, the public authorities were also concerned with quality assurance and public relations. Starting with the “environmental pact” (*Umweltpakt*) in Bavaria and its associated alliances and partnerships, environmental agreements, as a particular instrument of environmental economics, were also integrated in the consulting programs. Therefore, public authorities now fulfil a number of functions and the management of consulting programs has increased noticeably in its complexity.

While consulting programs are applied in other policy fields for some time¹, they are a rather new instrument in environmental policy, a sector that was for a long time characterized by command-and-control regulation:

- Through consulting programs, environmental policy – that is generally shaped by public authorities or intermediaries – enters **new ways of policy implementation** by reconciling business interests with public objectives and by creating win-win situations.
- Consulting programs allow public authorities to **create structures** in order to establish the eco-consulting sector as interface between national environmental policy and affected enterprises. This allows to integrate the business sector in the implementation process of the national SD strategies (Martinuzzi, 2003).
- Public authorities can also use consulting programs to **structure the influence of the eco-consulting sector**. Through this, public authorities support the development of user-oriented consulting programs, communicate them to potential clients, establish credibility and ensure the quality of consulting services through the support of pools of consultants and accompanying evaluations.

¹ For example, business development (Messner, 1996), innovation policy (Kaufmann and Tödting, 2000), development of rural areas (Tischer, 2001).

2 The EcoBusinessPlan Vienna – Program Structure and Activities

The EcoBusinessPlan Vienna is one of the most successful local consulting programs for sustainable businesses in Europe. Since its beginning in 1999, about 500 enterprises took part in the program, more than 8,000 environmental protection measures could be implemented with a total investment of € 40 Mio. Figure 1 shows a simplified logic model of the EcoBusinessPlan Vienna:

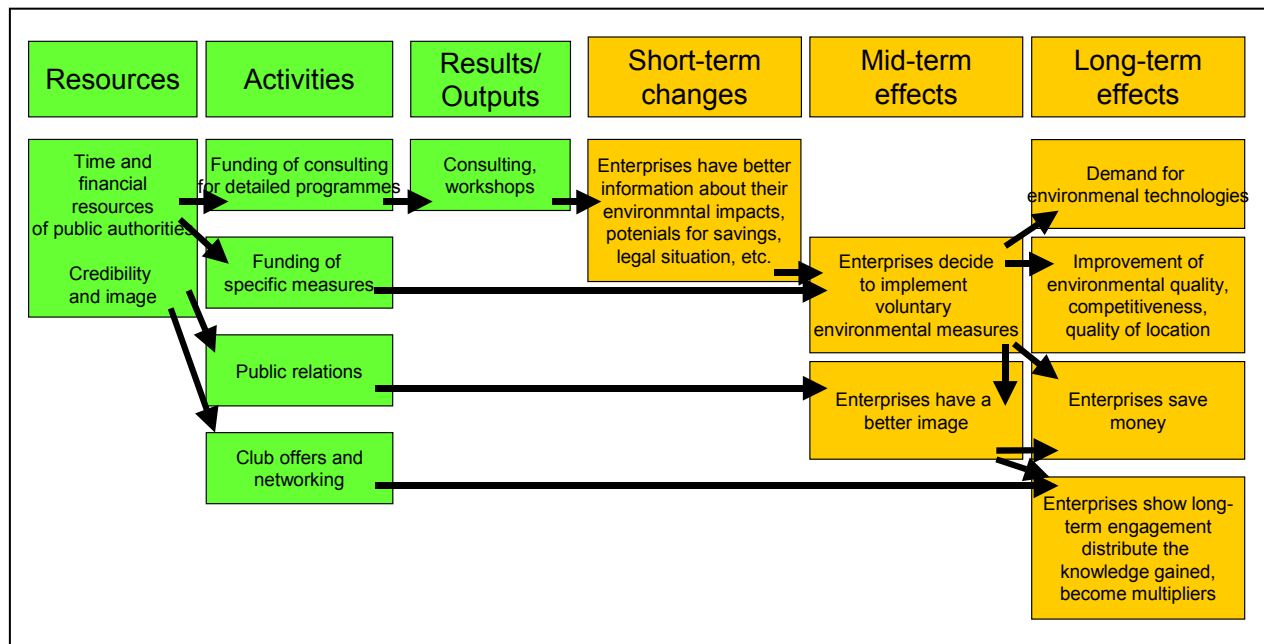


Figure 1: Simplified logic model of the EcoBusinessPlan Vienna.

2.1 Initial Conditions

The EcoBusinessPlan Vienna was conceptualized in 1998 as a local consulting program with the aim to help achieve the climate protection objectives of the City of Vienna, to establish Vienna as a model city for environmental policy, to improve the environmental quality in the city and to safeguard Vienna as an important business location. Therefore, the EcoBusinessPlan was not initiated to resolve a concrete environmental policy problem, but to establish an instrument that could serve a number of objectives at the same time. The political objectives were relatively vaguely formulated by the City Council. This guaranteed extensive leeway for the program management unit that outlined the objectives of the program in a program handbook, funding guidelines, call specifications and folders (Martinuzzi and Huchler, 1999: 12)

2.2 Actors

The actors who took part in the program are presented in Figure 2:

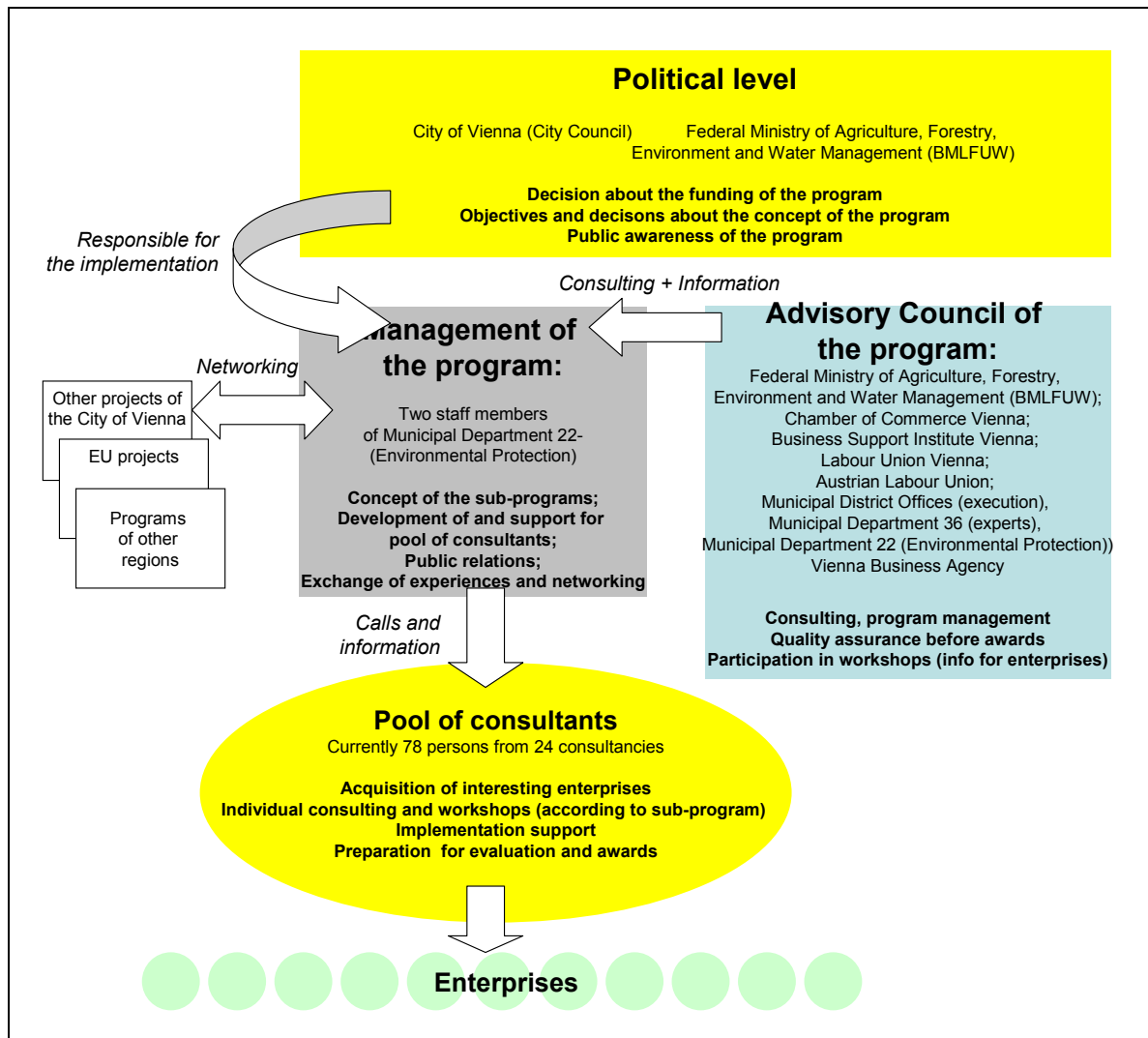


Figure 2: The actor network of the EcoBusinessPlan Vienna²

2.3 Resources

Since its beginning, approx. € 9.8 Mio of public money were invested into the EcoBusinessPlan Vienna. The distribution is as follows: 30 per cent for consulting funding, 23 per cent for funding measures and 35 per cent distributed between public relations, further development, program management and evaluation. The ‘investment’ on the side of the enterprises was the following: € 1.5 Mio participation fee, € 9.3 Mio time resources and € 36.3 Mio investments for environmental protection measures. Some further € 54.8 Mio were invested into measures to improve the infrastructure (e.g. renovation of buildings) and for the upgrading of core business activities (e.g. new production lines)³.

² The arrows in Figure 2 illustrate the main activities and decisions that had direct consequences for other actor groups. Feedback takes place via informal contacts (e.g. from the consultants to the program management) and via accompanying evaluation (e.g. from the enterprises to the program management and the advisory council of the program), however, these relationships are deliberately left out in Figure 2 in order to keep the focus on the essential formal procedures.

³ The data collected during the evaluation project showed a multiplier effect of 1:5 for public spending, and an equivalent funding rate of about 20 per cent.

2.4 Activities

These are the central components of the EcoBusinessPlan Vienna:

- **Environmental checks** that enable an efficient first analysis of the environmental situation of an enterprise and provide funding information.
- The **consulting of businesses**, including: detailed analysis of the current situation, search and utilization of potential savings as well as the development of plans for measures. Additionally, workshops and individual consulting are organised.
- **Public relations** for the EcoBusinessPlan Vienna and the various enterprises taking part in the program is organized and financed by the City of Vienna (e.g. company brochures, gala event, media work, etc.).
- **Additional support** for the enterprises in the form of re-awards and regular events.

The sub-programs of the EcoBusinessPlan Vienna are designed differently and address different target groups. Due to this thematic breadth, the EcoBusinessPlan could be flexibly adapted to new challenges.

Duration	Sub-program	Offer	Basis of Award	Target Groups
Consulting programs for very small enterprises				
1999-2002	"Companies in the climate pact"	Free of charge individual consulting for three days; additional seminars	Self-commitment to climate protection	Very small enterprises, non-profit organisations, energy-intensive enterprises
2002-2003	"Climate protection in small enterprises" and "Waste prevention in small enterprises"	Two half-day workshops with the participation of several enterprises; three days of funded individual consulting	Participation in workshops and implemented projects	Very small enterprises with high waste accumulation or high energy consumption
since 2004	"ÖkoBonus"	Two half-day workshops with the participation of several enterprises; three days of funded individual consulting	Participation in workshops and implemented projects	Very small businesses
Consulting program ÖkoProfit				
since 1999	"ÖkoProfit"	Eight full-day workshops with the participation of several enterprises; four days of funded individual consulting	Participation in workshops and implemented projects	Medium-sized enterprises from particularly environmentally-sensitive sectors
Consulting for environmental management systems				
since 1999	"EMAS"	€ 6,000-7,000 funding for individual consulting per enterprise; public relations through program	EMS certificate and first implemented projects	Large enterprises with interest in environment-related public relations (environmental statements)
since 2000	"ISO14001"	€ 6,000-7,000 funding for individual consulting per enterprise; public relations through program	EMS certificate and first implemented projects	Large enterprises with connection to quality management
Consulting for environmentally friendly tourism enterprises				
since 2000	"Ecolabel Tourism"	Funding for individual consulting for up to five days; public relations through program	Fulfilment of minimum criteria (checklist)	Hotel and restaurant sector

Table 1: The sub-programs of the EcoBusinessPlan Vienna

3 Evaluation Assignment, Concept and Methodology

The evaluation concept combines quantitative methods (e.g. assessment of environmental and economic effects) with qualitative methods (e.g. interviews with businesses and consultancies). For performance measurement, an internet database of environmental measures has been established from the very beginning and contains detailed information of more than 8,000 projects and measures of the participating businesses. An additional long-term evaluation was concerned with the question of whether the measures planned with consultants have actually been implemented, and whether the one-time participation in the program has led to long-term effects.

3.1 Evaluation Assignment and Concept of the Project

From the very beginning of the implementation of the EcoBusinessPlan Vienna, evaluation was an important topic. At the request and initiative of the program management, an accompanying evaluation for the first program period (1999-2001) was announced in a tender. The following objectives were formulated:⁴

1. Evaluation of the achievement of the program objectives and its sub-programs in order to assess whether the public money has been spent purposefully and efficiently, whether the EcoBusinessPlan is an effective local funding program for environmental objectives and whether the implementation has been carried out effectively.
2. Suggestions for the further improvement of the program and the continuation after the end of the first program period in order to rapidly remove flaws and to outline potentials for a permanent institutionalisation of the EcoBusinessPlan Vienna.

The proposal that had been submitted by the author of this article was selected to undertake the evaluation. The following levels were defined for the evaluation:

1. Evaluation of the **concept** of the EcoBusinessPlan Vienna as well as its sub-programs (definition of target groups, design of sub-programs, comparison with experiences in other cities and regions).
2. Evaluation of the **implementation** of the EcoBusinessPlan Vienna (analysis of the advancement and success of the project from the perspective of the different participating actors).
3. Evaluation of the **success of the project** from the perspective of the participating enterprises (expectations, success factors and problem areas in the implementation phase, ex-post evaluation of the project).
4. Evaluation of the implemented **measures** as well as the resulting ecological and economic **effects** (emission reduction, resources and energy reduction, investment volume, return on investment, qualification effects).

In order to guarantee an immediate consideration of the evaluation results, it was agreed to issue annual progress reports that were presented to the program management, the project advisory council and the consultants.

⁴ A more exact formulation of the evaluation objectives was not included in the first call for proposals. Therefore, the development of an evaluation concept which fitted the program was the main challenge for the submitted proposals.

In 2002, an accompanying evaluation of the second program period (2002-05) was announced in a second tender. In this call, the content and coverage of the evaluation was prescribed in much more detail:

On the level of the enterprises

- analysis and evaluation of the implemented measures, incl. correctness of data;
- analysis and evaluation of the costs;
- analysis and evaluation of the achieved level of environmental protection;
- development of sustainable development indicators.

On the level of the entire EcoBusinessPlan Vienna

- analysis and evaluation of costs and performance;
- evaluation of efficiency;
- analysis and evaluation of program sequence, public relations, acquisition;
- measurement of success, evaluation of ex-post support;
- evaluation of effects (outcomes compared to objectives).

On the level of the sub-programs

- highlighting success factors;
- evaluation of target group orientation, communication strategy, public impact;
- adjustment of different sub-programs.

On the level of the partners of the EcoBusinessPlan Vienna

- analysis and evaluation of how the program was used by the participating institutions;
- evaluation of the interfaces between the partners;
- comparison with other regions and cities;
- analysis of the unused room for manoeuvre of the participating partners and of existing constraints;
- documentation of the resources (money, time, information, others) that have been brought in by all partners, commitment made for bringing in the resources.

It is particularly worth mentioning that the call demanded the contractor to use the current version of the standards for evaluation developed by the German Evaluation Society (DeGEval) and the Swiss Society for Evaluation (SEVAL). The following selection criteria for bids were mentioned in the call:

- | | |
|-------------|---|
| 30 per cent | Evaluation team (references of team leader, staff members, communicative and technical-analytical competences); |
| 40 per cent | Evaluation concept (overall impression, completeness, clarity, structure, incl. time structure), possibility to address evolving questions, methodology, integration of program management; and |
| 30 per cent | Costs. |

The proposal that had been submitted by author of this article was again selected for the evaluation. The following steps were outlined for the evaluation:

1. Performance evaluation: Complete and systematic survey of the implemented and planned measures, their costs and savings as well as the economic, ecological and social effects, measuring of amortisation time, evaluation of the level of innovation and technology diffusion. Comparison with company data, use of indicators, measurement of eco-efficiency and comparison between sectors if reference data is available. Balance of total costs (incl. invested time resources) for the enterprises, the City of Vienna as well as the partners.
2. Process evaluation: Survey of the objectives and expectations of the enterprises, their previous knowledge and environmental awareness, planned investments, successful instruments of acquisition. Evaluation of the quality of the consulting service, the invested time resources, success factors and restraints during the implementation of the measures. Use of funding, aspects of public relations, improvement in the contact with public authorities and other enterprises, motivation of employees as well as safeguarding jobs and improving work conditions due to the participation in the EcoBusinessPlan Vienna.
3. Analysis of framework conditions: Multiple interviews with consultants, program-management, members of the advisory board and further actors involved (e.g. policy-makers), analysis of the resources brought in, the used and as yet unused rooms for manoeuvre.
4. Long-term evaluation: Survey and analysis of the long-term effects on the economic and ecological level (environmental impacts, long-term amortisation), organisational-social level (long-time stability of the organisational structure, improvement of environmental awareness), implementation of the planned measures and the long-time effects on the image of the enterprise.
5. Learning transfer of the evaluation results: Multiple feedbacks with the program management, linking of reporting with important decisions of the program management, intensive feedback to the consultants, inclusion of external experts in order to exchange experiences with other cities and regions.
6. Demand-oriented work: additional empirical and analytical work in order to support program-relevant decisions, e.g. through interviews in those companies that have decided not to participate in EcoBusinessPlan Vienna, extended analysis of the database of measures.

In comparison to the first program period, the share of decision-related short studies was increased to support the decisions of the program management in a more efficient and targeted way. This comprised the following:

- international comparison with other consulting programs to support the development of the third program period (2006-2009);
- a typology of environmental measures to deduce different diffusion strategies; and
- application of methods of theory-based and systemic evaluation in order to enable new perspectives for the program management.

At the beginning, the evaluation of the EcoBusinessPlan Vienna has had a formative character and was used exclusively for the further development of the program. In the second program period, the the evaluation results were increasingly used for public relations and in the exchange with policy-makers in order to increase legitimacy.

3.2 Evaluation Design and Empirical Survey

The evaluation design aimed at a quantitative-oriented measurement of the achieved impacts of the program. In so doing, an internet-based database was developed in which the consultants enlisted the planned and implemented measures undertaken by the companies. This included technical measures (e.g. cleaner technologies, recycling initiatives), organisational measures (e.g. waste separation, development of management systems), product-related measures, infrastructure investment (e.g. renovation of buildings), investments into the core business (e.g. new production lines), as well as measures to avoid risks (e.g. fire prevention). The data collected by the consultants was checked by the evaluation team if it was complete and correct and then statistically evaluated. This made it possible to analyse the environmental effects (e.g. waste reduction, sewage treatment, CO2 emissions) as well as the investments and savings made. From this data, the achieved multiplier effects of public spending, environmental achievements and the average amortisation time could be assessed. The database of measures distinguished between confidential data (that was used for the statistical evaluation only) and publicly available data (that is also accessible on the EcoBusinessPlan Vienna website, e.g. verbal description of each measure and the subsequent impacts). This combination of evaluation project and public relations created an additional impulse for the enterprises to document their measures extensively (Breuer and Martinuzzi, 2002). Between 1999 and 2006, more than 8,000 measures could be documented. This makes the database of the EcoBusinessPlan Vienna the most comprehensive database of consulting programs worldwide. In the meantime, it was used by five other Austrian regions for documentation and evaluation.

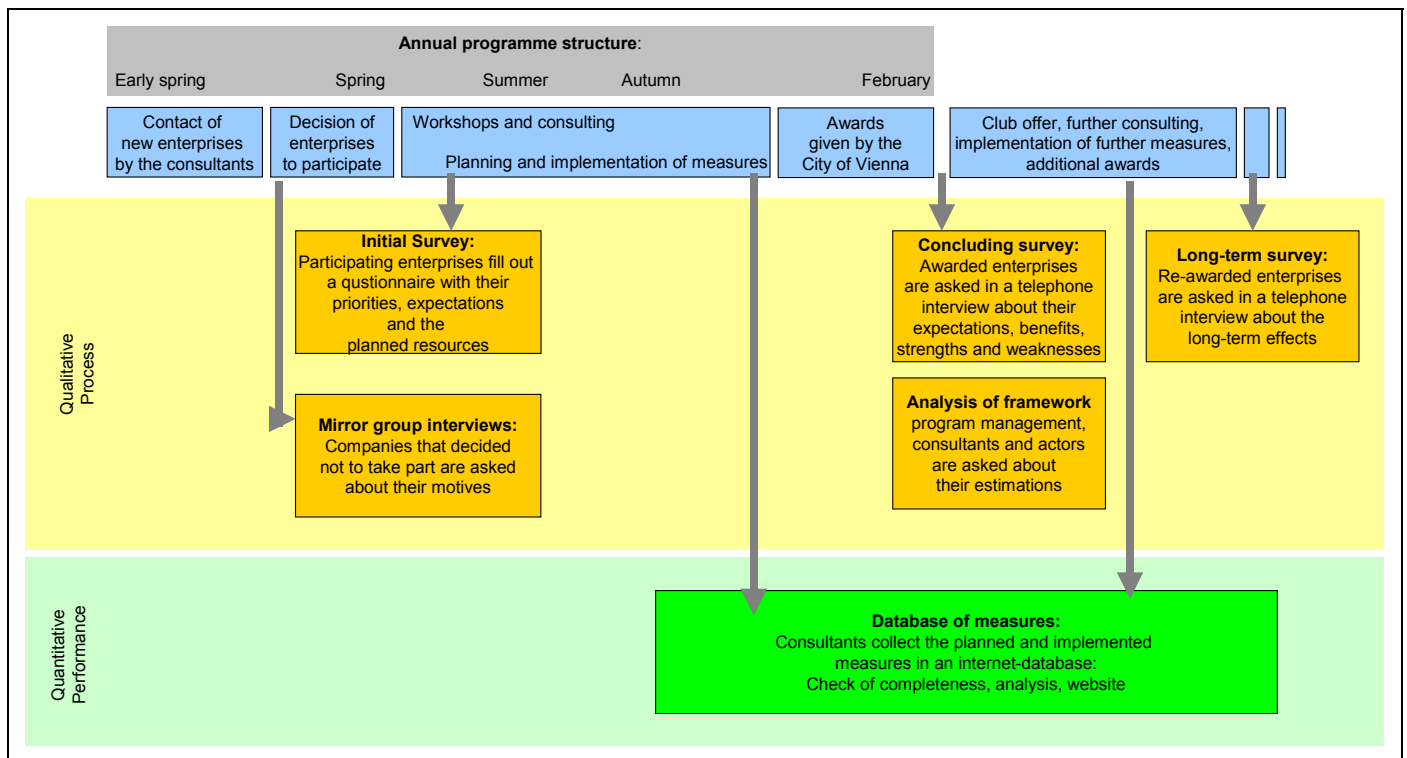


Figure 3: The evaluation concept – combining performance and process evaluation

In order to receive qualitative insights into the perception of the actors involved more than 800 telephone and personal interviews were undertaken between 1999 and 2006:

- written survey of enterprises directly after their decision to take part in the program in order to assess their expectations, problem areas, their planned time and financial resources (return rate 46 per cent, 220 enterprises in total);
- telephone interviews with awarded enterprises in order to find out success factors, weak points and actually invested resources (participation rate 76 per cent, 360 enterprises in total);
- additional telephone interviews with 53 enterprises, 2-5 years after their first awards in order to estimate long-term effects;
- telephone interviews with a control group of more than 100 additional enterprises in order to assess the visibility of the program; and
- repeated personal interviews with participating consultants and the program management (80 qualitative interviews in total) to evaluate task sharing, roles and possibilities for improvement.

The inquiry into business objectives, that was used in the majority of the interviews, turned out to be of particular use:

- The consultants were asked about the strengths of the concept of the EcoBusinessPlan Vienna. This allowed to develop a profile for each of the sub-programs which showed the strengths of the concept. At the same time, it was possible to check the homogeneity of the answers of the consultants.
- The enterprises were asked at the beginning how important the investigated objectives were for them and if they think that they could be achieved when participating in the EcoBusinessPlan Vienna.
- At the end of their participation, the enterprises were asked once more. This time, it was assessed whether the individual objectives have been achieved through the participation in the EcoBusinessPlan Vienna. Already during the telephone interviews, the answers given at the beginning of their participation (about importance and achievement) were compared to those given at the end (actual achievement). For those objectives whose achievement was much better or worse than expected, the interviewees were asked for their explanations (e.g. too high expectations, problems during implementation).
- In the context of the mirror-group interviews, those enterprises that had shown interest but had finally decided not to take part in the EcoBusinessPlan Vienna were asked in telephone interviews. The importance and achievement of business objectives was again the focus of investigation. The comparison with the participating enterprises of EcoBusinessPlan Vienna showed whether the reason for participation of the companies were different priorities or problems in communicating the idea of the program.

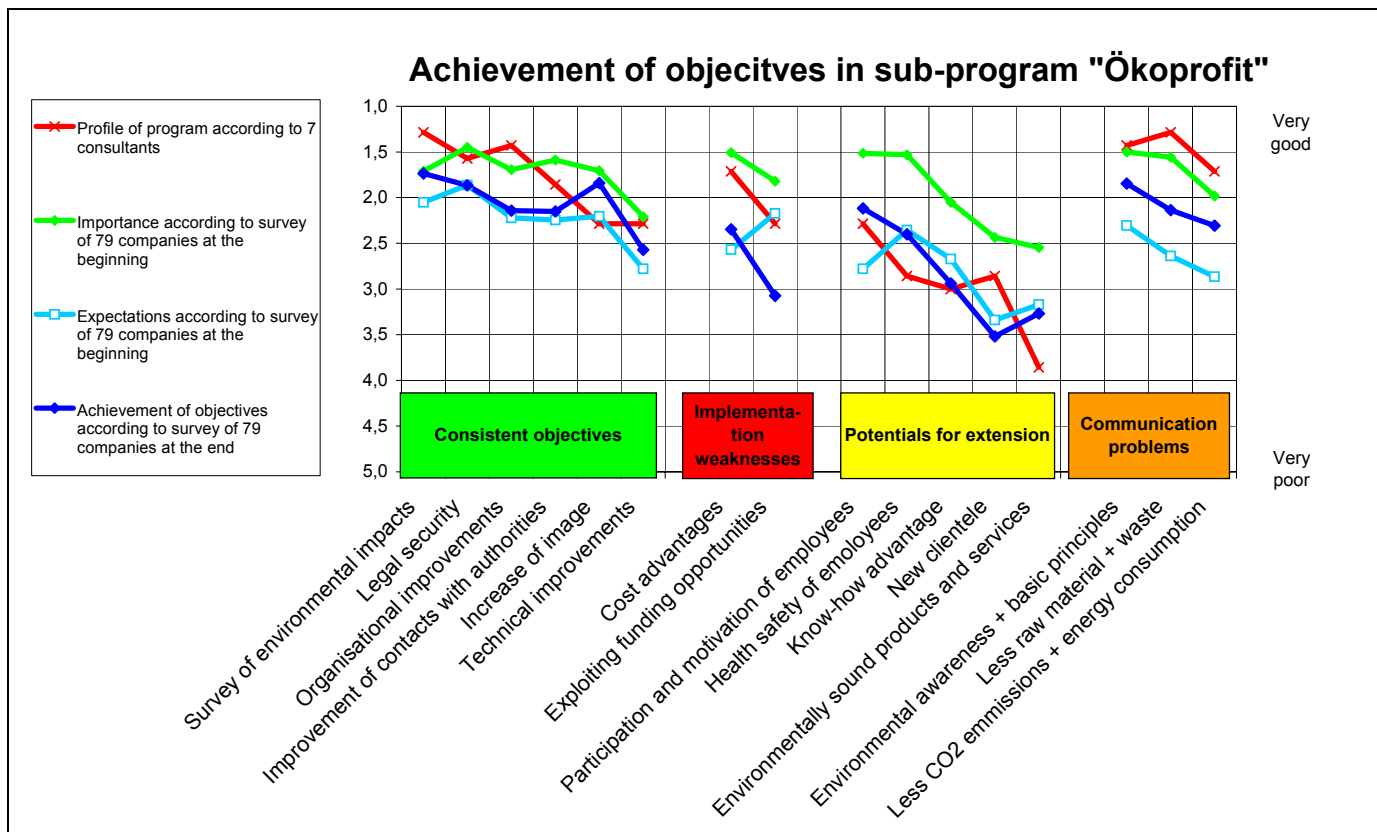


Figure 4: Example of the identification of success factors, potentials for improvement and weaknesses

Figure 4 shows as an example the analysis of the company objectives for the sub-program "Ökoprofit" (eco-profit) of the EcoBusinessPlan Vienna:

- **"Consistent objectives"**: Those objectives where the strengths of the sub-program (according to the consultants), coinciding with the priorities of the enterprises, the expectations before as well as the expectations at the end of their participation in the EcoBusinessPlan Vienna.
- **"Implementation weaknesses"**: Those objectives that are important for the enterprises and that should, in the view of the consultants, be easy to achieve through participation, but turned out to be not achieved in the companies' view.
- **"Potentials for extension"**: Those objectives that are important for enterprises, but are not supported by the sub-program and, therefore, could not be achieved.
- **"Communication problems"**: Those objectives which are strengths of the sub-program, but companies were not aware of them from the beginning of their participation.

4 Key Findings

The findings of the eight-year long accompanying evaluation process were published in eight consecutive reports (Martinuzzi and Huchler, 1999; Martinuzzi et al., 2000; Martinuzzi and Egger-Steiner, 2000; Martinuzzi et al., 2001; Martinuzzi et al., 2002; Martinuzzi et al., 2004; Martinuzzi et al., 2005; Martinuzzi et al., 2006). To list all the findings here would exceed the space available for this article. Moreover, the EASY-ECO conferences focus on methodological questions rather than on a comprehensive list of evaluation results. Therefore, below you will find only some selected key findings which may be of interest for other evaluation projects.

4.1 Characteristics of Enterprises reached by the EcoBusinessPlan Vienna

The EcoBusinessPlan Vienna is open for all Viennese enterprises. As a result of the acquisition activities of the consultants the following characteristics of participating enterprises evolved:

- The enterprises that took part in EcoBusinessPlan Vienna are **economically successful above average**. This is a result that throws a critical light upon the scope of consulting programs as voluntary environmental policy instruments.
- The **portion of enterprises without prior consulting experience** is above 80 per cent. This indicates that consulting programs manage to reach clients that would have otherwise not engaged in environmentally-oriented consulting services.
- The **share of ‘pioneers’** (i.e. companies with a strong track record for environmental measures) has decreased from initially 50 per cent to currently 30 per cent. This shows the dilemma of environmentally-oriented consulting programs: On the one hand, if many pioneers take part, outstanding examples can be presented to the public; the environmental improvements initiated by the program are, however, rather small. On the other hand, if only a small percentage of pioneer participates in the program, a number of important environmental improvements can be made, but the awarded businesses can hardly be marketed as model enterprises.
- Additionally, the **distribution of large, medium and small enterprises** points to a further dilemma of environmentally-oriented consulting programs: On the one hand, the most significant ecological and economic effects can be found in large enterprises (Windsperger and Steinlechner, 2005: 44), on the other hand, publicly funded consulting services should have a structural effect and be available to small-and-medium-sized enterprises (Wicke, 1992: 48 and 94).

4.2 Scope of the EcoBusinessPlan Vienna

During the first three years of the EcoBusinessPlan Vienna, an ever increasing number of enterprises participated in the program. Between 2003 and 2005, the focus was more and more on re-awarding enterprises which already participated in the consulting program. Only in 2006, this trend could be interrupted. This was made possible by the introduction of new pilot projects for the preparation of sustainability reports. For other consulting programs, this suggests to find the right mix between continuity (being recognized and authentic for potential participants) and flexibility (integrating new societal challenges and current topics in the consulting program). The high proportion of repeated participation points to a high and enduring engagement on the side of the enterprises which needs to be supported by networking activities. In this context an exchange experiences with other programs and networks is desired.

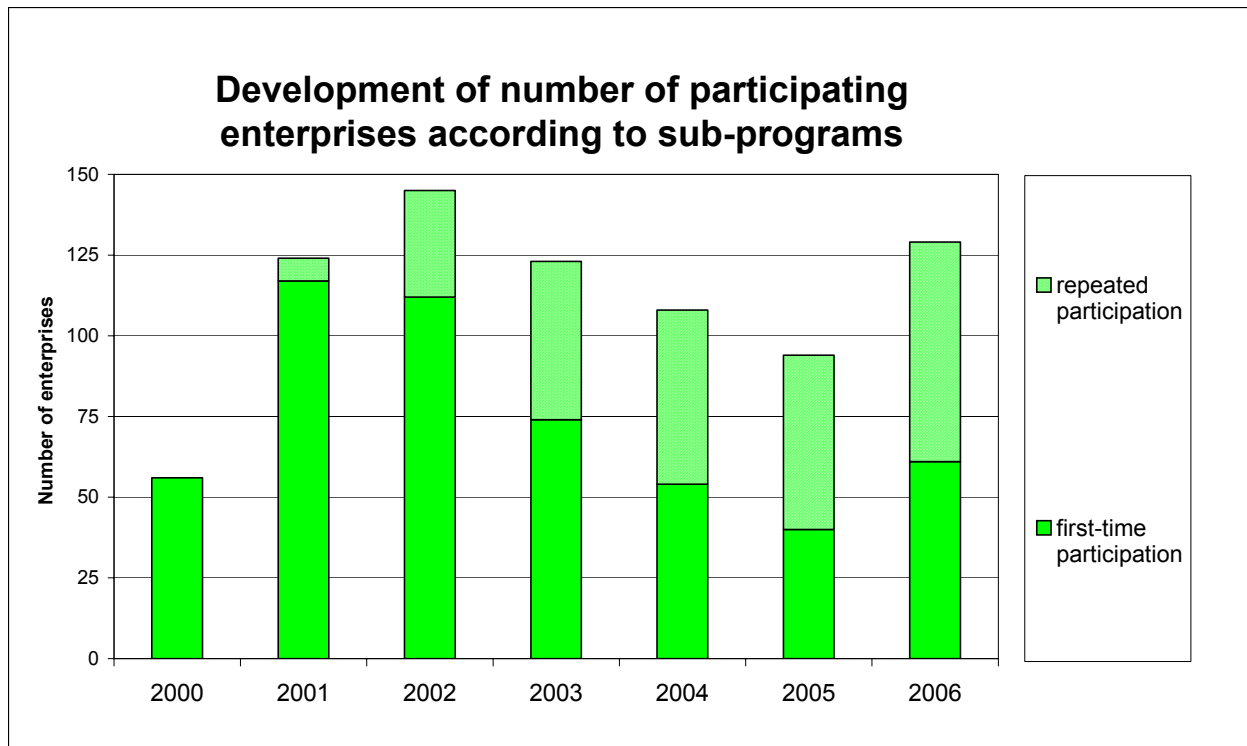


Figure 5: Enterprises participating in the EcoBusinessPlan Vienna

Although the number of enterprises participating in the program is remarkable, the market penetration is low at first glance: 500 enterprises in the EcoBusinessPlan Vienna, compared to nearly 70,000 Viennese enterprises in total. The resulting market penetration is below one per cent and equally low like the diffusion of environmental management systems, i.e. EMAS and ISO14001, in an international comparison. In order to make meaningful statements, the market penetration was calculated according to sectors and company size. Instead of taking the total number of Viennese enterprises for comparison, only the major target groups for the EcoBusinessPlan Vienna were taken into account. This shows that the market penetration in the production sector as well as in the hotel and restaurant sector is already above 10 per cent. The construction, retail and financial sectors show potentials for a conceptual extension of the EcoBusinessPlan Vienna.

4.3 Impacts of the EcoBusinessPlan Vienna

The ecological and economic impacts were included in the database of measures of the EcoBusinessPlan Vienna, tested by the evaluation team and analysed descriptively.⁵

Impacts of the implemented measures	1st program period (2000-2002)					2nd program period (2003-2005)				
	2000	2001	2002	accumulated	for every additional year	2003	2004	2005	accumulated	for every additional year
Savings made (in Mio. €)	1,5	2,3	3,0	12,1	6,8	1,0	3,3	2,5	12,1	6,8
Raw materials (in t)	459	1.267	473	4.385	2.199	5.312	325	717	17.302	6.354
Supplies (in t)	750	83	131	2.547	964	146	237	181	1.093	564
Non-hazardous waste (in t)	14.435	36.433	1.561	117.730	52.428	542	496	469	3.088	1.508
Hazardous waste (in t)	348	47	83	1.220	478	5	33	182	265	221
Drinking and industrial water (1000 m3)	5	91	107	303	203	65	93	96	476	254
Electricity, district heating and other energy (GWh)	4	3	10	29	18	4	10	3	35	17
Fossil fuels (GWh)	5	6	3	30	14	2	1	1	8	4
Transport - heavy goods vehicles (Mio tkm)	0	8	6	24	15	9	4	0	35	13
Transport - passenger cars (Mio Pkm)	0	4	0	10	5	0	1	0	2	1
CO2 (t)	2.953	3.764	3.995	20.381	10.712	1.981	3.686	1.082	14.397	6.749

Figure 6: Environmental relief through EcoBusinessPlan Vienna

Despite the huge amount of data, the highly secured data quality and the ideal integration of the data collection into the program implementation, three methodological weaknesses revealed itself:

- The collected data refer to individual measures their costs, savings and environmental reliefs. These data could be analysed in an aggregated way and compared between the different sub-programs and years. However, until now, they could not be related to the total environmental effects for the enterprises in the consulting program as no satisfactory data could be collected. A future survey should take into account variations in production, outsourcing and indirect environmental impacts (e.g. in the supply chain) and should be based on sector-specific indicators. This would only be possible as an integrated part of the consulting process.
- In total, 55 out of the more than 500 awarded enterprises are responsible for about 75 per cent of the economic and ecological impacts of the EcoBusinessPlan Vienna. Only five enterprises are responsible for a third of the impacts. These are generally large enterprises with a high number of employees. This high degree of concentration on a few cases makes it very difficult to make meaningful predictions for newly participating enterprises. Moreover, the development of indicators is methodologically very difficult due to the high variance between the businesses.
- The environmental relief is measured as the difference between the situation before and after the implementation of the respective measure.⁶ There was an intensive discussion about how long an extrapolation of these impacts is scientifically sound. Environmental impacts are relevant in the following years not only when making large investments, but also, for example, when using energy-saving lamps. Therefore, an extrapolation of the impacts (like in Figure 6 in the columns “accumulated” and “for every additional year”) would be justified. On the other hand, one has to take into account that some measures expire (e.g. when renewing the car pool) and impacts made will become state-of-the-art through technical progress. It was suggested to include an ecological amortisation time for each individual measure which, however, is not yet included in the database of measures.

⁵ In order to compare the two program periods, Figure 6 shows the results for three consecutive years. In 2006, similar environmental reliefs could be achieved.

⁶ Negative relief was also taken into account, e.g. decrease in the use of heating oil and, at the same time, increase in the use of gas when changing heating installations.

The social impacts of the EcoBusinessPlan Vienna are difficult to measure and can only be described on the basis of the subjective assessment of the participants: The immediate impacts on increasing the number of jobs are rather low, both in the awarded enterprises and the participating consulting companies. An analysis of the implemented measures indicates that direct impacts on the creation of jobs at the suppliers can be less expected in plant construction sector than in the trade sector and the building industry. Exact data are, however, not available. Environmental managers, who took part in the EcoBusinessPlan Vienna, found new possibilities for further training and a stronger position within their company. A career improvement, however, did not result from the participation in the program.

4.4 Long-term Impacts in the Enterprises

In order to evaluate the long-term impacts, 53 enterprises were investigated during spring 2005 that (a) were repeatedly awarded during the EcoBusinessPlan Vienna or (b) have not participated since a long time since they were awarded (Martinuzzi et al., 2005: 25-28). The comparison of these two groups revealed the following results:

- The most important **motives for repeated participation** are company policy (e.g. the wish to position themselves as an environmentally conscious enterprise, specifications of the top management level to establish an environmental management system), strong personal commitment of the management for environmental issues and positive previous experiences with the program.
- **Long-term engagement** is also extremely high in enterprises that no longer participate in the program. About 60 per cent of the planned measures, 58 per cent of the planned investments and 50 per cent of the planned savings were made without further support through the program. This shows that measures that were planned during the first participation have an impact for years to come.
- An unfavourable cost-benefit ratio as well as no further potentials for improvement were stated as most important **restraints for a re-award**. It showed that with a change of personnel of the environmental responsible person, the knowledge about the participation and implementation history of the measures are lost, however, the specific knowledge and commitment of enterprises will not decrease. Serious throwbacks could be identified in those cases where there was an internal restructuring in a company or where the top management level withdrew its support for environmental engagement.
- According to the interview partners, **experiences** made during the participation in EcoBusinessPlan Vienna were **applied in other business locations** although they did not take part in one of the sub-programs. About 1/3 of the interviewees said that other enterprises could be motivated to participate in EcoBusinessPlan Vienna. From a quantitative perspectives, the diffusion effects are remarkable. From a qualitative perspective, it becomes evident that they are limited to informal talks and hardly documented. An estimation about the indirect economic and ecological impacts is, therefore, not possible.
- The **development of networks** between the enterprises could be well achieved through workshops. About 40 per cent of the interviewed companies said that they maintained the contacts over the years. These are primarily informal contacts in order to exchange experiences and only in a few cases did they lead to new business relations.

5 Lessons Learned

Our experiences made during the accompanying evaluation of the EcoBusinessPlan Vienna show that three issues of prime importance and may also be of relevance for other evaluation projects.

a. Where is the basis of the program objectives?

At the beginning of the EcoBusinessPlan Vienna, no specific, measurable, attainable and realistic targets were formulated apart from the general objective of the program to “contribute to sustainable development in the City of Vienna”. In response to our question according to which criteria the actors involved would decide whether the EcoBusinessPlan Vienna is a successful program, we received highly different and mostly very unspecific answers. After two years into the program, the situation had changed: The very same interview partners perceived the EcoBusinessPlan Vienna as a particularly successful program and pointed out that more than 100 enterprises have already participated. Without a discussion about the objectives of the program, the number of participating enterprises became the indicator for success. In the following years, the impacts documented in the database of measures gained more importance as success criteria. This, however, happened again after these impacts had been measured and proven to be a satisfying result in the view of the actors involved. Quantitative ecological or economic objectives were not set as objectives at any time. During the last years, the question about how many jobs could be created or safeguarded by the EcoBusinessPlan Vienna has become increasingly important. Again, the same pattern emerges: impacts are identified without a prior formulation of specific program objectives.

We got the impression, that the actors involved have no interest in publishing specific and measurable targets ex-ante. Therefore, the question emerges whether the objectives of the program should be the only focus of an evaluation or whether system-exmanent objectives should also be taken into account by the evaluation team.

b. The right timing

The right timing of the moments when the evaluation takes place turned out to be particularly important. Through the evaluation of motives and expectations directly after the decision to participate, very realistic results could be achieved. Individual examples show that the presentations at one single workshop can make a significant difference in the answers. When assessing the satisfaction and the qualitative impacts achieved at the end of the participation in the program, a dilemma was revealed: In order to rapidly eliminate weaknesses, it seems necessary to undertake interviews immediately after the end of the consulting process or after the awards are given to the enterprises. A high motivation after receiving the awards could be used to gain a higher willingness to take part in the interviews. However, many impacts cannot be assessed at this stage (e.g. image effects) and some measures are not yet implemented. If the interviews were undertaken at a later stage, single experiences intermingle into a general impression, thus the answers of the interviewee are less rich in content and less differentiated.

The database of measures has proven to be an ideal instrument to combine consulting and evaluation at the right timing: The public funding enables the program management unit to ask the consultants to document the planned and implemented measures and the combination of evaluation data and public relations data creates an incentive for the enterprises.

c. The implicit understanding of sustainable development

In the first few years, the focus of the EcoBusinessPlan Vienna was on the implementation of environmental measures, the increase of eco-efficiency and the necessary transfer of basic information. Regarding the three dimensions of sustainable development, the ecological dimension (less resource and energy consumption, less environmental impacts) and the economic dimension (quick amortisation through savings in the companies) were of prime importance. Only over the last two years, the social dimension has gained significance and the EcoBusinessPlan Vienna is intended to be developed into a sustainability program in the third program period. As a first step, a pilot project was developed. Its evaluation revealed the various perspectives of the participating actors. For them, sustainable development means

- eco-efficiency plus with some additional social aspects (e.g. safeguarding jobs, security, avoiding discrimination), or
- implementing a common vision and an appropriate participation process, or
- taking into account a multitude of societal and socio-political topics (distribution of wealth, participation, social security, etc).

The question, whether enterprises participating in this pilot project should also be awarded was seen differently. The following suggestions arguments were made:

- every voluntary engagement should be appreciated and, therefore, all enterprises should be awarded;
- individual projects in which companies undertake activities that go beyond legal requirements should be awarded;
- only enterprises which developed an environmental report that fulfils certain criteria should be awarded; and
- only enterprises that are beyond doubt with regard to their societal and socio-political activities should be awarded.

Due to our experience, we think it is absolutely necessary to clarify the implicit understanding of the actors when possible at the beginning of the program (in the context of another research project, we have developed a toolbox for this, see Langer et al., 2003). The reason is not to initiate a scientific debate about different approaches und theories, but to develop a detailed common understanding of the program objectives. Our experience shows that the application of logic models has proven to be useful and is more important than a discussion about different indicator systems.

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