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# INTEGRATING GREENNESS INTO BALANCED SCORECARD IN A FOOD PROCESSING COMPANY

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**Purpose;** The study investigates how and why a case company has integrated environmental management system (EMS) into a performance management system (PMS), i.e. balanced scorecard (BSC).

**Design;** This interpretative case study utilized qualitative methods such as semi-structured interviews, internal documents and e-mails.

**Findings;** The company integrated its environmental measures into the process perspective in its BSC. The integration centralized its fragmented PMS, stimulated its strategic control and complemented its financial reporting. This integration also crystallized the causality between the company's environmental actions and financial performance. Therefore, the integration enabled to improve environmental performance as well to strengthen the Euro-oriented culture of the company.

**Limitations;** The study has general limitations concerning the used qualitative methods.

**Practical implications;** Environmental measures are worthwhile to integrate into process perspective of PMS if a company is in an industrial sector. Environmental measures can be worth selecting due to the way the measures affect a company's financial performance, if the company has a very finance-driven culture. BSC can be useful for different purposes, such as for centralizing a fragmented IS, legitimizing environmental actions and for strengthening corporate culture.

**Originality;** Various studies have separately considered the implementation of EMS or PMS in general. Most of these studies have ignored the integration between EMS and PMS. Those rare integration studies have been usually normative without empirical data. This study overcomes these limitations when it investigates the EMS integration into PMS with an empirical case data.

**Keywords;** Balanced scorecard, environmental management system, integration

**Paper type;** case study

## INTRODUCTION

The environmental management issues have been discussed more and more in different media (see for instance Chung and Parker, 2008; Dias-Sardinha and Reijnders, 2005; Lozano and Vallés, 2007; Magrini and Lins 2007; Pedersen and Neergaard, 2008). Environmental management systems (EMS) can be used to implement environmental management and policy in practice. Lozano and Vallés (2007) defined EMS as the part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

Environmental management can bring several benefits, one of which may relate to the financial performance. Improving environmental performance can bring financial benefits through cost savings due to cleaner production (e.g. Bansal, 2005; Chung and Parker, 2008; Magrini and Lins, 2007; Melnyk *et al.*, 2003; Pan, 2003; Rothenberg, 2007). Cleaner production leads to a smaller amount of waste which causes lower landfill costs. Environmental management has also brought other benefits such as increased productivity and quality, increased on-time delivery ratios, enhanced customer satisfaction, and improvements in internal procedures, employee morale or image (Magrini and Lins, 2007; Melnyk *et al.*, 2003; Pan, 2003). These benefits can be realized by improving financial performance later. Environmental management might have even greater impact on profitability in the future through public policy and market forces (e.g. Bartolomeo *et al.*, 2000).

The design and implementation of performance measurement systems (PMS) has also been a popular theme, alongside environmental management, in recent decades. Different PMS have been constructed. One of the most popular PMS is Kaplan and Norton's (2005) balanced scorecard (BSC). A BSC has been utilized in organizations of several different sizes and types (Gumbus and Lussier, 2006). There are also other PMS such as the performance pyramid (e.g. Clark, 2008), the Tableau de Board (Bourguignon et al, 2004), the intangible asset scorecard (O'Connor and Feng, 2005) and the European Foundation for Quality Management (EFQM) Excellence Model (Jacobs and Suckling, 2007; Pedersen and Neergaard, 2008). PMS always have similarities despite there being a number of different PMS. All the PMS include for instance both financial and non-financial measures.

The BSC has benefitted organizations in several different ways. Firstly, a BSC helps to integrate strategy and objectives into action and operations, as well as helping to shift an organizational culture towards a new strategy (Gumbus and Lussier, 2006). Secondly, a BSC can be used as an information system (Malmi, 2001). Thirdly, a BSC enables a firm to consider several other non-financial perspectives of performance other than merely financial performance (Davis and Albright, 2004). Fourthly, a BSC forces management to assess the operations which are required to succeed in the future. Fifthly, it helps to specify the people responsible for achieving the targets and the operations required to do so. Sixthly, a BSC can focus attention on the cause and effect relationships between different measures (Davis and Albright, 2004; Malmi, 2001). Finally, a BSC makes it possible to improve or maintain organizational, operational and financial performance (Davis and Albright, 2004; Gumbus and Lussier, 2006). Although environmental management and the balanced scorecard

have each attracted several different researchers, only a few studies have considered the integration of environmental management systems and balanced scorecards (Dias-Sardinha and Reijnders, 2005; Figge et al., 2002; Hubbard, 2009; Schaltegger and Wagner, 2006; Wagner, 2007). Some studies have considered how environmental issues can be integrated into other systems such as quality, health and safety (e.g. Castka et al., 2004; Griffith and Bhutto, 2008; Karapetrovic, 2002; Wilkinson and Dale, 1999).

Environmental issues can be worth integrating into a BSC if two conditions are fulfilled. First, if companies already apply a BSC framework it can be easier to use the same familiar framework to implement the environmental objectives (e.g. Hubbard, 2009 see also Wilkinson and Dale, 1999). The integration may also enable to reduce the costs (Wilkinson and Dale, 1999). Second, the organization's strategy should include components of sustainability so that the BSC could be used for implementing the chosen strategy (e.g. Kaplan and Norton, 2005; Wilkinson and Dale, 1999). Environmental and sustainability issues are strategic because they might have an influence on a company's image, profitability, competitiveness, markets and products, which will affect its future economic survival (Dias-Sardinha and Reijnders, 2005; Magrini and Lins, 2007; Schaltegger and Wagner, 2006).

The purpose of this study is to explain how and why a case company has integrated environmental management issues into a balanced scorecard.

## EARLIER INTEGRATION STUDIES

Some studies have considered the integration of environmental and other performance management systems (Dias-Sardinha and Reijnders, 2005; Chung and Parker,

2008; Epstein and Wisner, 2001; Figge *et al.*, 2002; Hubbard, 2009; Magrini and Lins, 2007; Pedersen and Neergaard, 2008; Yongvanich and Guthrie, 2006; Wagner, 2007; Wilkinson and Dale, 1999). The study found still a lack of qualitative empirical studies focusing exactly on the integration of EMS and PMS.

Some of the earlier studies suggested different alternatives to integrate sustainability into a BSC (Epstein and Wisner, 2001; Figge *et al.*, 2002; Hubbard, 2009) or PMS in general (Chung and Parker, 2008; Yongvanich and Guthrie, 2006). This study contributed to these studies by providing empirical case experience.

A few integration studies have been published with empirical data based on case (Magrini and Lins, 2007; Pedersen and Neergaard, 2008; Schaltegger and Wagner, 2006) or field work (Dias-Sardinha and Reijnders, 2005) or survey (Wagner, 2007). However, the studies of Magrini and Lins (2007) and Wagner (2007) were based on quantitative data, which indicates the contribution potential for qualitative case research. Dias-Sardinha and Reijnders (2005 see also Pedersen and Neergard, 2008; Schaltegger and Wagner, 2006) was a qualitative study, but it assumed that a BSC can be only used for managing environmental and social issues. However, in real life, environmental issues can be one group of objectives amongst other, often competing, objectives which may relate to, for instance, customer, quality or financial performance (e.g. Chung and Parker, 2008; Schaltegger and Wagner 2006). Case study of Schaltegger and Wagner (2006) considered also this point, but did not present the specific and detailed measures for environmental performance. Moreover, they discussed only briefly the reasons of the integration between environmental measures and BSC.

Both EMS and BSC integration benefitted an organization in several ways. However, only a few studies have simultaneously considered the integration of EMS and PMS and its effects on companies' performance (Wagner, 2007 see also Magrini and Lins, 2007). According to Wagner's (2007 see also Magrini and Lins, 2007) survey results with regression analysis, EMS integration with other managerial functions was positively associated with company performance measures such as impact on the market (e.g. competitive advantage, market share), image (e.g. corporate image, shareholder satisfaction), efficiency (e.g. cost savings, profitability, productivity) and risk (e.g. insurance conditions, access to bank loans) benefits. The integration improved the knowledge of the environmental effects caused by the organization's activities (Magrini and Lins, 2007) and also increased the understanding of the link between strategy, vision, financial performance and environmental management (Schaltegger and Wagner 2006). Therefore, EMS and PMS integration have found to result several positive outcomes.

Environmental issues can be integrated into a BSC in different ways. Figge *et al.* (2002 see also Hubbard, 2009; Dias-Sardinha and Reijnders, 2005) presented three different options. First, environmental issues can be integrated into the existing four standard perspectives. Second, an additional fifth perspective can be added to take environmental aspects into account (e.g. Hubbard, 2009; Schaltegger and Wagner, 2006). Third, a specific environmental BSC can be formulated (e.g. Yongvanich and Guthrie, 2006). Despite the form of integration, it results in a greenish balanced scorecard.

The successful integration of EMS and strategic planning required the integration of several issues (Magrini and Lins, 2007 see also Chung and Parker, 2008; Hubbard,



2009). Firstly, environmental management had to be integrated into managerial goals. Secondly, environmental information needed to be integrated with financial and administrative information systems. Thirdly, environmental issues had to be considered in the whole production process. Finally, an environmental performance system had to be integrated into existing performance appraisal systems. Therefore, many details have to be considered before integrating EMS and a BSC.

As earlier paragraphs of this section described, the integration of EMS and PMS has been an important topic, which has not been completely studied and thus there is a lot of contribution potential. Studies employing empirical and qualitative data have particular potential, while the integration had different characteristics and benefits in different organizations. Moreover, there were also several different practical options in integrating EMS into PMS or especially into a BSC. Therefore, more qualitative case research, which investigates how, why and with what kind of consequences environmental issues are integrated into a BSC, is needed.

## METHODOLOGY

This study used a qualitative case approach. Therefore, the results of the study can be generalized as being rather more theoretical and contextual than statistical (see for instance Ahrens and Chapman, 2006; Modell, 2005). The result of this study can also be used for generating a hypothesis which can be tested by a survey later (Modell, 2005).

### *Case company*

Several criteria were applied in selecting case company. First, sustainability issues had to be considered in the company. Second, the company had to utilize a balanced

scorecard for performance evaluation. Third, the company had to be sufficiently large for the implementation of sustainability issues and the balanced scorecard to be challenging and worth studying. Fourth, an industrial manufacturing sector company was needed that the sustainability issues would be important for the success of company. Finally, the case company had to be willing to co-operate with researchers. These criteria led us to select a Finnish food manufacturing company. The case company has bought subsidiaries abroad and invested in a plant in recent years.

The case site of this study was a Finnish food manufacturing company, which was the largest subsidiary of group. The turnover of subsidiary was over 700 million Euros and it has been increasing during the last years. The group was increasingly going international particularly in the Baltic Sea area, and it owned several well known brands. The subsidiary was responsible about the group's domestic operations and it had four major production plants in Finland. Customers included retailers, catering enterprises, industry and the export trade.

#### *Data gathering and limitations*

The empirical data collection was started via a preliminary interview of the technical director and quality manager of an international Finnish company. These two representatives were selected for the preliminary interviews because they were the contact persons named on the company's web pages. They were also responsible for running the environmental management policy.

The major source of empirical data consisted of ten semi-structured interviews. Different directors were interviewed whose organizational responsibilities varied from unit management, through business area management, to board level functional re-

sponsibility within the largest subsidiary and group. Both researchers participated in all the interviews. The interviews were recorded on tape and transcribed onto paper (e.g. Rothenberg, 2007). From one to two hours were usually spent in the company and the duration of interviews varied from forty to ninety minutes.

Several modes of triangulation were utilized to increase the trustworthiness of our study (Ahrens and Chapman, 2006 see also Modell, 2005). First, the study had several different types of data i.e. annual reports, public documents, e-mails and interviews. Second, interviewees had both horizontally and vertically different positions. Third, both researchers participated in all interviews. Fourth, as much time for interviewing and observing was allowed in the case company as was possible.

This study had some limitations which can be considered in future studies. One limitation of the study related to the methodology used. Due to the use of qualitative case methodology, the results can be generalized only in a contextual or theoretical way. Therefore, companies with moderate similarities, like firms in a food industry, with a similar finance-driven culture or with a similarly fragmented IS could learn from this study. In the future, our foundations could be enlarged through field study methods including several case sites or statistically tested by using wide survey data. Another limitation of study related to the number of interviewed representatives. However, both researchers participated in all interviews, and as a result, richer data were able to get than if we had used only one interviewer. Moreover, all the managers whose views were relevant to the research question were interviewed, and that further enquiries would not have revealed any more useful information for this study.

## EMPIRICAL RESULTS

### *EMS and PMS in the case company*

According to its current EMS (approved in 2006), the company ‘recognizes its environmental responsibility. It has an environmental programme aimed at controlling the use of natural resources and preventing environmental damage. It is committed to the principle of sustainable improvement. This means that the environmental risks and impact of operations are recognized and goals are set accordingly.’ Environmental programs were initially prepared for a five year period (2001-2005) and latterly for three-year periods in order to achieve the set goals.

According to the management system, a quality manager was responsible for ensuring that the environmental system contained the elements and procedures of the ISO 14001 standard. The technical director and operating engineers were responsible for planning location-specific environmental investments and monitoring their progress.

The EMS was based on the ISO 14001 standard which was awarded in 1995. The EMS was assessed by internal and external evaluators annually. The company's environmental programme was a plan that was implemented to ensure the achievement of objectives. The programme also promoted that the company was environmentally responsible and continuously sought to improve its operations. The aim was to minimize the environmental impact of production and thus also keep expenses as low as possible in this respect. The amount of waste transported to landfills was reduced, emissions into the atmosphere are monitored and the efficiency of energy consumption is improved. Environmental issues were taken into consideration in planning and

investments. Environmental impact was evaluated before starting up major new operations or projects.

Environmental issues and related environmental impacts were recognized within each production unit and unified with the company's environmental programme. Environmental impacts were evaluated and attention was paid to issues significant in terms of environmental protection and business. Evaluation of environmental impacts, for its part, forms a basis for planning administrative programs. All environmental permission conditions required for operations to be documented, and their progress to be monitored.

In order to set environmental goals, a programme to reduce environmental impact was prepared for each production location. The environmental goals related to domestic operations spanned a three-year operational cycle, and the company had goals for different financial years. The progress of the environmental programme was monitored in the management's reviews. The first goals were set for the years 2001-2005. The company had six environmental goals for the second cycle (2006-2008). These goals related to the consumption of energy and natural resources, the amount of waste, to ensuring the safety of the use of environmentally hazardous substances and to the environmental awareness of stakeholders.

The company made a decision on PMS implementation in 2004. The balanced scorecard was the basis of the implemented PMS. A steering group including the IT director, the quality manager and a group of controllers was set up. During the process, it was decided to include the environmental measures in the scorecard. The model includes the four common perspectives (financial, customer, internal processes and learning and growth). The software enables a multi-layered objective setting and re-

porting process and drill-down opportunities in managerial reporting. Environmental targets and measures were included in the process perspective because they considered processes requiring energy and producing waste.

” we considered it the most natural to include [environmental measures] into process perspective, if we consider these four alternative [perspectives]. Processes require energy and they produce waste. [Environmental measures] are not in learning perspective, they aren’t directly customers’ issue. We aren’t as yet talking Euros because it’s just consumption per one kilogram, thus, they [environmental measures] aren’t in financial perspective” (Controller of the largest subsidiary)

Figure 1 illustrates that environmental measures were included in the process perspective of BSC. According to Figure 1, the environmental measures created the third measurement category of process perspective. Two other two categories of process perspective related operation quality and product safety in our case company.

PLEASE, INSERT FIGURE 1 ABOUT HERE

Figure 2 illustrates how a single environmental measure (i.e. electricity consumption) was appeared for the users of PMS.

PLEASE, INSERT FIGURE 2 ABOUT HERE

The environmental issues had been reported earlier through a separate information system, but currently the environmental performance is internally reported through the BSC system. However, environmental performance was externally reported by an Annual Report and an Environmental Report. The Annual Report contained a section concerning company environmental issues and performance. The Environmental Report was more detailed and it presented environmental policy, definite objectives as

well as achievements. The Environmental Report was not published annually but every third year.

*The reasons for integration of EMS and PMS*

The company decided to integrate its environmental targets into the balanced scorecard for internal purposes. The company had several different information systems, and this was the main reason for integrating environmental measures into the balanced scorecard. The interviewed managers generally expressed the benefits of a single data source which included the data from several different areas, one of which related to the environment. The quality manager of the largest subsidiary appreciated that the metrics were similar in form and at the same time available for all authorized users.

“if we’ve a single information system which is used for collecting data, it’s worthwhile to conduct all aspects of reporting with that information system” (Quality director of the group)

“It’s [PMS] usable for everyone of course with certain passwords... when we put the numbers into [PMS], they are centrally in the system.” (Technical director)

All the respondents emphasized that the case company was a very finance-driven company. The quality manager considered that the culture was the reason for the company's financial stability throughout its history. One character of a finance-driven culture was that all investments were very carefully evaluated from a financial perspective. Another character of the culture was that all investments should lead to cost savings or revenue generation. The investments concerning environmental issues by the case company were not an exception. The quality director of the group executive

board emphasized that the company has found courage to invest in environmental issues because those investments saved Euros and decrease costs. In addition, both the quality manager and a director of the largest subsidiary considered that energy issues were considered more thoroughly as a result of increasing energy unit costs. The group's vice CEO concluded that the company changed its culture to become more cost-oriented since the middle of the nineteen nineties.

“we are a very euro-oriented firm. So, all developments and operative performance which relate to money making or saving will succeed.” (Quality director of the group)

A director of the largest subsidiary emphasized that all the measured environmental indicators affected the company's financial performance. The indicator's direct effect on profitability was one key factor when the case company selected the most suitable environmental indicators. These indicators were the amount of water, electricity, landfill waste, heat energy, heat recovery and biological oxygen demand of a wastewater (BOD<sub>7</sub>). Small changes of indicators have already had an influence on financial performance because the volumes involved were so large. Furthermore, the technical director emphasized that the case company operated in a low margin industry and subsequently small decreases in costs affected profitability. According to the technical director, electricity usage had the greatest impact on financial performance. The group's CEO presented a practical example concerning increased energy costs.

“energy costs increased by a million Euros in just the last quarter only in Finland [...] If you can improve energy utilization, it affects the firm's earnings. Only the delta (the change) is one million Euros in a quarter, which is just the increased price”. (CEO of the group)



According to the empirical material, the case company had two primary reasons to integrate environmental measures into a BSC. Firstly, they wanted to centralize their fragmented information systems. This integration enabled the data to be made available to all the different authorized users at the same time. Secondly, they wanted to strengthen their finance-driven culture. The BSC enabled to illustrate how improving environmental performance (such as a decrease in energy consumption) led to improving financial performance (such as profitability as a result of decreased energy costs) at the same time.

## CONCLUSIONS

### *Contribution to earlier studies*

The theoretical contribution of the study stemmed from its originality in the sense that most of the earlier EMS and BSC integration studies were normative studies without any empirical data (see for instance Figge *et al.*, 2002; Hubbard, 2008; Yongvanich and Guthrie, 2006). Dias-Sardinha and Reijnders (2005) had qualitative empirical data but their study assumed that a BSC was only used for managing environmental and social objectives. In real life environmental and social objectives are only some of the goals among others, which relate for instance to financial, quality, customer and stock market performance. Therefore, this study contributed by including empirical qualitative data and by investigating how and why the EMS and BSC were integrated in a real case company.

According to this study, the case company integrated environmental measures into the process perspective of its BSC because they considered that particularly the processes of the company required energy and produce waste. This integration was con-

ducted for internal reporting and management purposes. They decided to integrate environmental measures into the four existing perspectives of BSC (Figge *et al.*, 2002 and Kaplan and Norton, 2005) because they tried to centralize their fragmented IS (see also Griffith and Bhutto, 2008). The case company did have another possibility, to construct a separate specific sustainability BSC or to add a fifth, environmentally specific, perspective onto the existing BSC (see for instance Figge *et al.*, 2002; Hubbard, 2009; Schaltegger and Wagner, 2006; Yongvanich and Guthrie, 2006). However, the company did not decide to construct the fifth separate perspective for environmental indicators. This was a deviation from the results of Schaltegger and Wagner (2006) who found that their case company (Hamburg airport) constructed the fifth non-market perspective for environmental issues. The case company still reported environmental performance in a section of annual statements and in a specific environmental report for external stakeholders.

The study proposes that BSC could also be used to integrate environmental and performance management (Figge *et al.*, 2002; Hubbard, 2009) although the BSC was considered more as an information system than as a strategic implementation tool in the case company (Malmi, 2001). The EMS and BSC integration enabled the case company to strengthen its finance-driven culture (see for instance Gumbus and Lussier, 2006) as well as to legitimize environmental actions when they observed the cause-and-effect relation between improving environmental and financial performance (see for instance Davis and Albright, 2004; Gumbus and Lussier, 2006; Schaltegger and Wagner, 2006). However, the case company did not integrate the EMS into PMS to achieve only reduced costs of operating only one system. This was

a contradictory to the results of earlier integration studies (Wilkinson and Dale, 1999).

### *Managerial implications*

This study has some managerial implications. Firstly, it illustrated how and why EMS and BSC integration was conducted in an existing case company. Secondly, environmental measures can be integrated into process perspective of PMS if a company is operating in an industrial sector. This kind of integration into existing four perspectives may help to avoid a situation, where the environmental indicators have been measured but they were not utilized for decision making purposes. Thirdly, environmental measures can be worth selecting due to the way the measures affect a company's financial performance, if the company has a very finance-driven culture. Finally, a BSC can be useful for different purposes, such as for centralizing a fragmented IS, legitimizing environmental actions, and moreover, for strengthening corporate culture and values.

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Interviews in the case company



<i>Nro</i>	<i>Interviewed</i>	<i>Interview day</i>	<i>Recorded (min)</i>
1	Business area director of subsidiary company, member of executive board of subsidiary company.	August 29, 2006	43,52
2	Business area director of subsidiary company, member of executive board of subsidiary company.	August 23, 2006.	39,60
3	Business unit manager.	August 22, 2006.	36,28
4	Chief Executive Officer (CEO) of group, member of board.	November 3, 2006.	34,32
5	Chief Executive Officer (CEO) of subsidiary company, member of executive board of group, vice CEO of group.	December 8, 2006.	54,22
6	Controller of subsidiary company.	August 22, 2006.	50,88
7	Director of information technology (IT) and controlling, member of group executive board.	September 1, 2006	45,05
8	Director of quality and product safety, member of group executive board, business area director of subsidiary company.	August 24, 2006.	38,00
9	Quality manager of subsidiary company.	May 17, 2006; Aug. 29, 2006.	76,58
10	Technical director of subsidiary company, member of executive board of subsidiary company.	May 17, 2006; Sept. 25, 2006	63,62
	<i>Number of interviewed</i>	<i>Number of interviews</i>	<i>Recorded (min)</i>
<i>To- tal</i>	10	11	482,07

FIGURE 1. THE INTEGRATION OF ENVIRONMENTAL MEASURES INTO PMS

Paja 1						Periodi: 6/06	Sarja: Oletussarja
Hierarkia		*◇	*◇	*◇	Toimenpiteiden otsikot	Lisää toimenpide	
🏠 Paja 1	6/06 65 /100	●	↑			[ Lisää ]	
👤 1. Talous	6/06 0 /100	●	→			[ Lisää ]	
🔑 Kustannustehokkuus	6/06 0 /100	●	→			[ Lisää ]	
👤 2. Asiakas	6/06 100 /100	●	↑			[ Lisää ]	
🔑 Asiakastyytyväisyys	6/06 100 /100	●	↑			[ Lisää ]	
👤 3. Prosessi	6/06 61 /100	●	→			[ Lisää ]	
🔑 Toiminnan laadukkuus	6/06 0 /100	●	→			[ Lisää ]	
🔑 Tuoteturvallisuus	6/06 100 /100	●	→			[ Lisää ]	
🔑 Ympäristöystävällisyys	6/06 83 /100	●	→			[ Lisää ]	
🔑 Lämmön kulutus	6/06 0,29 kWh/kg	●	↓			[ Lisää ]	
🔑 Lämmön kulutus (senttiä/kilo)	6/06 3,70 snt/kg	●	→			[ Lisää ]	
🔑 Sähkön kulutus	6/06 0,50 kWh/kg	●	↑			[ Lisää ]	
🔑 Sähkön kulutus snt/kilo	6/06 8,72 snt/kg	●	↓			[ Lisää ]	
🔑 Veden kulutus	6/06 0,53 litraa/kg	●	↑			[ Lisää ]	
🔑 Veden kulutus(senttiä/kilo)	6/06 3,43 snt/kg	●	↑			[ Lisää ]	
👤 4. Osaaminen ja kehittäminen	6/06 100 /100	●	→			[ Lisää ]	
🔑 Laadukkaan toiminnan edellytykset	6/06 100 /100	●	→			[ Lisää ]	

FIGURE 2. THE VIEW OF A SINGLE MEASURE FOR THE USERS OF PMS

**Sähkön kulutus (Paja 1)**

6/06: 0,50 kWh/kg

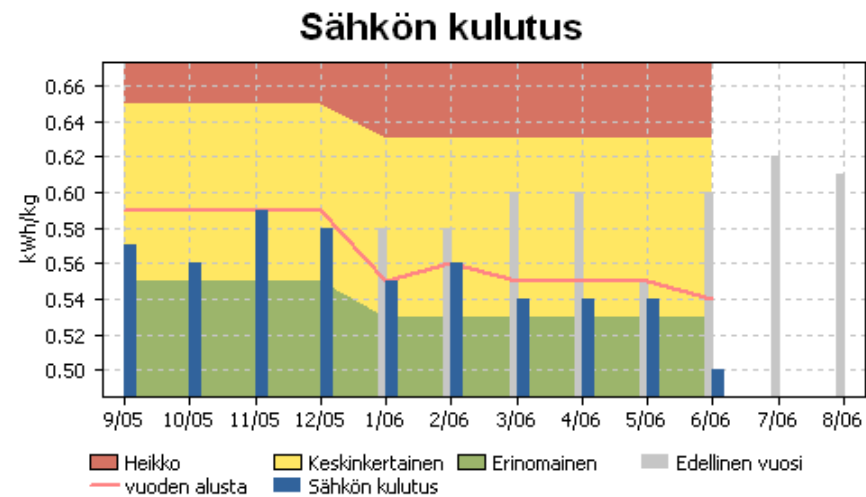
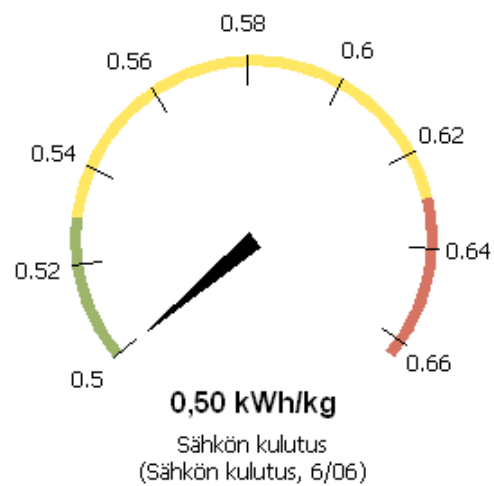
Mittaa sähkönkulutusta tuotannon kilomääriin

Vastuuhenkilö: -

Sähkö kWh / kk-tuotanto kiloina

Lähde: Kiinteistövalvonnan mittausjärjestelmä,  
valmistuskilot osastoraportilta**Kuvaaja**

[ Kuvaajan asetukset ]



Viimeisimmät toimenpiteet [ -&gt; Toimenpiteet - 6/06 ]

[ Lisää ] [ Näytä kaikki ]