



Online Information

# Sustainable Hospital

to face the future

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## Preamble

Social ecology investigates the various options of a societal transition that heads for sustainable development. Health questions are new in this context. As we can observe research dealing with the interlinkages between sustainability and health (“sustainable health research”) is gaining international significance. From the global scale to the level of micro economics different scale choices can be made. For the concrete implementation of sustainability strategies it seems to be highly promising to directly deal with actors in organizations.

As level of investigation and intervention we chose the hospital, since the hospital is the organization which plays as the core organisation of the health system a central role in restoration and sustainment of health.

How can the establishment of sustainable development criteria in the hospital be achieved? How can the actors’ interest be sparked in a long-lasting and stable way to provoke their contributions for sustainable development? What benefits can hospitals expect, if they get engaged? This type of questions we were pursuing in the pilot project “the sustainable hospital”. Right from the start we were aware that such an undertaking requires an inter- and transdisciplinary examination. It can only be achieved with the engagement of participants from practice and science.

Here we want to thank our project partners of the Viennese Otto Wagner Hospital, the Viennese Hospital Association, the Berlin Immanuel Diakonie Group, the Boltzmann Institute Health Promotion Research and ARECon GmbH for their extraordinary engagement, the excellent collaboration and the convenient and trusting working atmosphere.

Ulli Weisz and Willi Haas, Vienna, November 2009

# Executive Summary: Testing the sustainable hospital

## Synopsis

**Based on a feasibility study an interdisciplinary team of researchers supports hospital practitioners implementing the concept of sustainable development in a pilot hospital. Changes within three key areas should lead to significant improvements.**

## Initial situation / Motivation

Building on a feasibility study, the “sustainable hospital” was tested in a setting of intensive cross-disciplinary cooperation over a period of two years. Top management and employees from the medical and nursing sectors of the pilot hospital, the Otto Wagner Spital, were involved in the study, together with a representative of the general management board of the Vienna Hospital Association (KAV), the director of the Immanuel Diakonie Group (Berlin) and an interdisciplinary research team.

## Approach

We understand sustainability in the hospital setting as an integrated treatment of social, economic and ecological aspects, which is oriented towards maintaining the hospital's relationship with the relevant social and natural environments in the long term. This should ensure that tendencies to defer solving problems are avoided and that “robust” and sustainable solutions are found to the major challenges that confront hospitals and our health care system today.

## Objectives and content

The objective of the project was to relate sustainability to the already introduced concepts of health promotion, quality and environmental management and employee- and patient-focussed approaches and to anchor sustainability as an important basic business management principle at the pilot hospital. To establish the “sustainable hospital” successfully, a good case must be made for the potential benefits to hospitals and the contribution to social sustainability must be evident. This was tested in three priority areas for sustainable development in hospital;

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1. Sustainable business management: Create orientation  
Introduction of sustainability in normative and operational management of the pilot hospital.
2. Sustainable provision planning: Innovative planning  
Planning of a new provision model for long-term ventilator-dependent patients (“Weaning Center”) according to sustainable development criteria. Needs survey for the KAV and evidence of savings/ improvement potential.
3. Sustainable service provision at ward level: Making sustainability work in day-to-day business  
Potential for implementing sustainability in the working life of the hospital.

### Key findings

- A working understanding of “sustainable hospital” developed together with key actors.
- From the three sub-projects: (1) Target and measurement system for a hospital (SBSC). Concept linking EFQM and SBSC (2) Needs-related provision planning for chronically ill patients: Calculation model and evidence of improvement and savings potential for the Vienna KAV (3) Sustainability evaluation of processes in the wards of a pilot department.
- Evidence of benefits (added value) which a hospital can generate by adopting the criteria of sustainable development.

### Conclusions

Sustainability can easily be integrated with health concepts that have already been introduced and due to its integrative effect, brings added value to hospital practices. In examples, it was possible to optimize core services in accordance with multiple criteria, enabling significant relief effects from ecological, social and economic pressures to be identified without deferring problem-solving.

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At the political level, health is seen as a significant prerequisite for and objective of sustainable development. Hospitals, as the core organisations of our health care system, carry a particular social responsibility in this respect. As financial constraints and demands increase and the conditions in which they operate change, hospitals themselves face pressing problems that call the sustainability of the services they offer into question. This demands an innovative management approach that is capable of responding to different challenges with sustainable solutions.

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Fundamental to our research definition of the sustainable hospital has been building upon both concepts, strategies and instruments that have already been introduced and met with proven success in hospitals, such as quality management, and challenges and interests that come directly from the “everyday life” of hospitals. In particular, we believe that the connection with health promotion strategies can result in important synergy effects. For this reason, our primary concern is to identify and provide evidence of the social, economic and ecological benefits of a sustainability approach for health promoting hospitals.

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### Testing area 1: Sustainable Business Management Getting Orientation

#### Introduction

Where hospitals wish not merely to act in a reactive manner but rather to look proactively to the future and set themselves visionary and ambitious objectives – as is the case in developing towards sustainability – (sustainable) business management attains a central importance.

At the present time, hospitals are undergoing a process of transformation. This can be understood as redesigning expert-oriented administrative bureaucracies as customer-oriented complex service provider. One aspect of this transformation is that no management instruments that have been introduced and tested over the long term exist that could be simply adapted for sustainability purposes. This situation, however, provides us with the chance to integrate sustainability at the earliest stage in the design of new instruments.

The management board of the pilot hospital has already been aware of these challenges for many years and has thus chosen to focus since the early 1990s on the increasing demand for organisational intelligence, making significant investments in the development of specialised competencies relating to different aspects of service provision.

The following relevant developments in the pilot hospital may be mentioned here: In 2008, the pilot hospital was awarded the EMAS certificate for its environmental management system. It has been a member of the Austrian Network of Health-Promoting Hospitals for many years and has adopted the EFQM (European Foundation of Quality Management) model in the further development of its service quality. A burn-out manual for hospitals was formulated in close cooperation with the organisational developer of the pilot hospital (OA Dr. Karl Purzner) and this has raised awareness of the theme among hospital management. The hospital has also developed a one-click management system that enables rapid access to relevant financial information.

#### Objective

As complex and important as these initiatives are, one problem that was simultaneously identified concerned the need for a business management concept that was comprehensive but still suitable for everyday application and that connected these initiatives with one another as well as with agreed future strategies. This recognition produced the objective of developing and testing a set of related instruments for sustainable business management. In clinical terms, this meant developing instruments capable of integrating economic, patient-

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oriented and employee-oriented, (social) and ecological aspects and capable of accomplishing the integration of these aspects with a clear development strategy, thereby promoting balanced decision-making.

### Methods

The “sustainable hospital” project test phase is a cooperation project between theory and praxis. The idea is that specialists from sustainability research with expertise in economics, ecology, social studies and health promotion should exchange knowledge with representatives working in healthcare, with the aim of testing instruments in selected areas. Various research aspects together with a wide range of aspects from hospital practices were taken into consideration, so that these instruments will have an integrative function and finally be accepted in the working life of hospitals. These aspects of hospital practice range on the one hand across all levels of the organisation’s hierarchy, from the management board to staff on the wards, and on the other hand through all those competencies represented in hospitals, such as medical, nursing, financial, administrative and technical, as well as organisational development, quality management and environmental management. Appropriately for the character of this cooperation project between theory and praxis, a flexible and reflective approach was chosen, in order on one hand to be able to react flexibly to rapid changes occurring in the hospital and on the other, to ensure through reflective intermediate staging that the focus upon the objective of testing a sustainable form of business management via key actors was not lost.

### Results

In the testing area in concrete terms:

- Visions already formulated were evaluated and summarised according to strategic categories
- An objectives and measurement system was chosen from a number of alternatives
- The business aspects central to the success of sustainable management were identified
- Concrete key objectives were developed
- Target values were formulated for selected objectives
- Objectives were aligned with strategies
- Objectives and target values were checked to find out to what extent requisite information could be made available for testing during the everyday running of the hospital

The set of instruments thus developed is a modified version of the Balanced Score Card (BSC), which on the one hand is compatible with the EFQM system already implemented and on the other hand, draws upon sustainability as a fundamental aspect of the design. This Sustainability Balanced Score Card (SBSC) is the result of dialogue with both policy makers and those affected by decision-making and of consultation with healthcare partners from Berlin. The existing version facilitates the integration aspects mentioned here and focusses the attention of business managers upon objectives that are little related to one another. In addition, a simple decision-making formula was developed. This involves a multi-criteria instrument for optimising the quality of results that envisions the results criteria of patient treatment, health promotion, economic efficiency (costs and revenues), social aspects (work pressure) experienced by employees and patients) and ecology (material usage, energy). The formula enables alternative solutions for decision-making processes to be evaluated.

### Conclusions

The implementation of objectives and measurement systems that are focussed on sustainability in the pilot hospital and in health promoting hospitals in general can be designed to promote existing concepts and strategies with high added value and low work investment.

The experience in the testing area showed that due to synergies it is recommended to implement a sustainable business management in a health promoting hospital that has implemented an environmental management system. The Otto Wagner Spital fulfils both preconditions (health promoting hospital (hph) since the beginning of the hph network and EMAS certificate since 2008). Another central concept that is standard in hospitals is the quality management. Synergies could be achieved by adding the sustainability dimensions as additional targets to the outcome quality. In such an arrangement the added value of the sustainable hospital is an integrated approach that promotes balanced decisions with a wider horizon as regards contents and time.



### Testing area 2: Sustainable provision planning Innovative planning

#### Objective

Testing area 2, “sustainable provision planning”, was developed in relation to provision planning for long-term ventilator-dependent patients. The objective was to provide evidence of the potential improvements to be gained from sustainable service planning using the example of a Weaning Center. The results should provide a sound basis for the implementation of service provision in hospitals, leading to more efficient use of resources (financial, physical and time resources) and also enabling higher quality care provision.

#### Starting point

Experts believe that the quality of care provision for long-term ventilator-dependent patients can be improved where the setting is optimally adapted to the needs of the patients and their families, such as the three-stage model proposed by the Weaning Center. Taking this hypothesis as the starting point, we tested the effects of a Weaning Centre according to sustainable development criteria and discussed them in the context of health promotion.

A Weaning<sup>1</sup> Center is a pneumological competence center, offering staged care provision for patients with a special need for prolonged artificial respiration, including those receiving artificial respiration at home. The program aims to enable optimal care provision by transferring patients to specially-designed “Step-Down Units”. The basis for a Weaning Center already exists in the pilot hospital in the form of two pneumological intensive care wards. The next step towards the development of a competence center involves the proposed establishment of a respiratory ward beyond the intensive care ward level (a so called Respiratory Management Unit).

#### Content and results

We were able to show through prospective needs surveys within the Vienna Hospital Association (KAV) that 13.5% of bed occupancy for artificially respired patients on the highest dependency intensive care wards (ICU class 3) was not appropriate to needs and that those patients could be transferred to the Respiratory Care Unit (RCU) within an

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<sup>1</sup> “weaning” in this context refers to the weaning of patients from their dependency on artificial respiration.

intensive care ward class 1 at the pilot hospital<sup>2</sup>. More than half (56%) of the bed occupancy at the pilot hospital's RCU could also be transferred out of the intensive care area.

The results show that, in comparison to "traditional" provision with only marginally increasing revenues, a Weaning Center offers cost savings of 8% (4.1 million Euro) and possible materials savings of 8% (352 tonnes; regarding these products which cause 80% of the costs).

Furthermore, in terms of health promotion, the Weaning Center represents a significant empowerment for patients, by enabling them to spend less time on intensive care wards and simultaneously providing them with better preparation for the time that follows their stay in hospital.

### Conclusions

Traditional care of long-term ventilator-dependent patients is not optimally designed to answer the specific needs of such patients and their relatives. This leads to misallocation of patients on intensive care units (ICUs and RCU), which in turn represents an inappropriate use of resources.

By establishing an additional unit, the RMU, misallocations can be avoided and savings can be made in terms of financial resources (costs) and ecological pressures while at the same time social improvements can be realised. The reduction in length of stay at intensive care units reduces patients' health risks since they are relatively high at these units (e.g. nosocomial infections). Furthermore the reduced length of stay offers favourable conditions for health promotion. These positive effects are not reflected in our calculations. The economic and ecological savings and social improvements might exceed the once proofed here by far.

We conclude:

- Allocation of hospital beds according to need has a major impact on all three core dimensions of sustainable development and upon health promotion. The potential savings that are thereby generated are far greater than those generated by traditional efficiency and cost-reduction strategies.
- A sustainability approach places environmental agendas at the heart of the organisation's business management.

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<sup>2</sup> The Respiratory Care Unit at the pilot hospital is unique in Austria- The RCU is a specially-designed unit devoted to the care of seriously ill and chronically ventilator-dependent patients. A further focus of the RCU lies with the training of patients and relatives, with the particular aim of enabling patients who require continual artificial respiration due to the nature of their illness to receive this provision at home.

We have formulated the following recommendations for sustainable care provision planning:

- Provision planning must react to changing needs in order to avoid inappropriate allocation of hospital beds and all the consequences thereof (changing needs include shifting patterns of illness or demographic changes).
- Inappropriate allocation of hospital beds should be seen as a central sustainability indicator for hospitals. For this reason, we propose that the controlling systems of hospitals and the organisations that run them be adapted so that the inappropriate allocation of hospital beds can be flagged up and dealt with.
- Training programs and transmural case management should be included in the list of services funded by the “LKF-System”.

We were able to show through our study that the economic and social aspects of provision planning can lead to significant improvements and simultaneously to savings in physical resources if – together with quality criteria of care services – such planning makes use of sustainable development and health promotion criteria. It was evident that the quantitative and qualitative results of this study have generated great interest among decision makers, who are making use of them as the basis for decisions.



### Testing area 3: Sustainable Service Provision

## To Make Sustainability work in day-to-day business

### Objective

The objective of testing area 3 was: (1) to formulate a concept of operational organisation that enables sustainable service provision and to test examples of selected improvement measures employed on a pilot ward. This was to result in the formulation of recommendations for the transferability of the concept and the interventions to other wards at the Otto Wagner Spital. (2) A further focus lay with monitoring the impact of the quality of constructional and spatial structures, in the context of overall ecological renovations to the hospital ward building (or “pavilion”), upon service provision.

#### Starting point

The pilot ward for testing area 3 is the ward for alcohol-dependent men in Pavilion 26. The ward has 26 beds and cares for alcohol-dependent men with a mid-term treatment programme, which patients who have completed a withdrawal programme may undertake.

Ecological sustainability goals and strategies for the hospital as a whole are set out in the organisation’s Environmental Statement, signed by the Collegiate Board in May 2007. These environmental goals are monitored through the “Environmental Checkup Survey” (“Abfrage – Umweltcheck”) with an environmental profile. The last Environmental Checkup was carried out in January 2006.

A further sustainability strategy undertaken by the Otto Wagner Spital is “ecological building design”. Pavilion 26, occupied by the ward for alcohol-dependent men, has been renovated in line with this ecological building design concept. Thus the constructional and material infrastructure of the ward was distinguished from the start by a high degree of sustainability, both in ecological and in social aspects of its design.

### Content and results

#### 1. Evaluating sustainable service provision

The concept of sustainable operational organisation follows our concept/research definition of the sustainable hospital and relates to the basic dimensions of sustainable development (economy, social aspects, ecology) and to the criteria of health promotion. In addition, it must include the quality criteria of core service provision aspects.

We therefore developed a self-evaluation instrument, which enables staff working on the ward to assess the sustainability performance of their ward.

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The self-evaluation procedure is a six-step process:

Step 1 – Self-evaluation in teams: The assessment consists of an evaluation of the question using the school grading system (1-5, where 1 is highest) and appraisal of the need for action (Priority: high, medium, low). In addition, comments and options for improvement are recorded in the questionnaire.

Step 2: Analysis and processing of self-evaluation (external): Results of the self-evaluation questionnaires, designed for specific professions, are combined within an evaluation profile and the questions ordered in accordance with the reported need for action.

Step 3: Consensus meeting for the ward: Presentation and discussion of the interview results (“common reality”) and collection of proposals for concrete actions.

Step 4: Report/protocol on ward consensus meeting (external): Proposed actions which do relate solely to the ward’s area of responsibility are outlined by focal area..

Step 5: Stakeholder meeting: Presentation of results by ward managers to internal stakeholders:

Step 6: Appraisal and evaluation: Assessment of success in implementation of adopted measures. Abridged report sent to staff and internal stakeholders in the hospital organisation.

The self-evaluation process was tested at the pilot ward and implemented in March 2007. A total of 10 staff members (including ward managers) from the ward, comprising three doctors, three nursing staff and four therapists, participated in the group interviews.

Examples of “instant measures” that were developed in the process of the evaluation procedure:

- “Commission” to formulate a “future concept for service provision at the ward for alcohol-dependent men by the departmental managers
- Improvement of lighting in therapeutic setting through immediate consent for uplighter installation.
- Consent from the technical director for subsequent installation of sunshades/blinds in the rooms.
- Creation of a waste separation system within Pavilion 26.
- A member of staff who was unhappy with the working space allocated was able to move into an unoccupied office

### Conclusions

The trial showed that the procedure is lean and efficient enough to obtain acceptance from ward managers and staff.

An important strength of the procedure lies with its participative and socially integrative approach, which promotes interest and engagement. It creates a good basis for highlighting sustainability as a theme on the ward and stimulating discussion on this topic among staff members. This leads to higher levels of commitment to the sustainability goals of the organisation as a whole. The procedure thus contributes to the communication of the Environmental Statement and the overall health promotion goals of the hospital to the ward level. At the same time, the results also provide useful feedback to the management and staff units about how far it has been possible in the past to communicate the central sustainability strategies and persuade staff to take on responsibility for these matters.

It has also been demonstrated that within this structured and moderated communications process it has been possible to quickly identify solutions and put them into practice. Initial results are thus visible to staff without much time delay.

To summarise the results of the test procedure in the context of the pilot project, it can be said that it has a role to play both in evaluation and in the development of sustainability and that it can be easily adopted at ward level.

A further trial at other wards of the Otto Wagner Spital can thus be recommended in principle. If similar success is seen in these further trials, the systemic establishment of the evaluation procedure within the hospital's sustainability management system is conceivable.

### 2. Excursus ecological design – Buildings promoting well-being

Between 2002 and 2006, the renovation of Pavilion 26 at the Otto Wagner Spital, developed in cooperation with the buildings and maintenance directorate of the pilot hospital, the central environmental protection department of the Vienna Hospitals Association and external environmental consultants, was planned and carried out according to ecological and health promotion principles.

The impact of the building design used at Pavilion 26 was evaluated on three levels: on the objective level, through measurements of internal air quality; on the feasibility level, by establishing the relationship between scientifically tested criteria and the measures that were implemented; and on the subjective level, by carrying out a survey of staff working there.

The evaluation resulted in the following recommendations for the renovation and design of further pavilions at the pilot hospital: The general ecological criteria as they were applied in the case of the renovation of Pavilion 26 are exemplary and as such should be applied in the

case of future renovation projects as standard. This seems to be not least ensured by the pioneering role played by the Otto Wagner Spital and the guidelines of the Vienna Hospitals Association. In the case of future projects, these guidelines guarantee that, on the one hand, European and national regulations will be followed and furthermore that “voluntary” standards concerning the user quality of buildings and ecological purchasing regulate sustainable construction quality

Among other things, the staff survey results showed that it was advisable to include users in the planning process, and to consult them after completion on their satisfaction with the project. This participative approach renders perceptible individual needs and “blind spots”, to which it is often possible to respond effectively by making small adjustments or adaptations.

### Conclusions

A success factor of the project is based on the effective cooperation between science and practice partner. Half yearly networking workshops were crucial for that. They were considered as “time out” from daily business which promoted discussions without pressure for urgent decision making with view on essential issues. The mix of participants across professions, hierarchies and scientific disciplines enabled innovative solutions to sustainability problems. The teams of the testing areas comprised of the same mix from science and practice and could make use of it.

Due to the close cooperation of science and practice the actors’ expectations for use were shaping project and results. This approach was responsible that the sustainable hospital was not created as an additional and segregated idea. In contrary the approach was integrating existing concepts, instruments and initiatives of the hospital and could close gaps in areas where the hospital partner envisaged its challenges and interests.

A central concern of the project was to go beyond end-of-pipe approaches or just increasing ressource efficiency as many sustainable enterprise projects do. By using a multi-criteria optimisation of the core services of the hospital a far wider scope for action with increased potential for improvements could be achieved. This was attained by the widening of the scope of the notion of quality which incorporated in addition to the quality of health treatment health promotion, social, economic and ecological sustainability.

One of the biggest challenges of the testing phase was to establish sustainability structurally in the pilot hospital. While sustainability found its way into processes and the notion of results quality, the structural establishment is quite difficult. This will require further consideration and development.

A significant factor for success was the enormous commitment of the members of the project team and the key players in combination with their professional approach.

During the project it became clear that a hospital considering its viability for the future needs an objective and measurement system that is in tune with its vision and that focuses on key strategies and objectives. Such a system is a major advantage in communicating with stakeholders respectively staff. For science and partners from practice it turned out that such an instrument is a key to a “sustainable hospital”.

The potential of a multi-criteria optimisation can be used at length, if the room for manoeuvre in the planning phase can be utilized. Therefore we recommend establishing the sustainable provision planning as an additional key to a “sustainable hospital”.

As special entry point for improvement of hospitals’ sustainability misallocation of patients could be identified. Misallocation is from a business economics point of view often no problem, however, it causes costs at the level of the national economy without proper treatment, for patients it is everything but desirable and does not empower patients to deal with their own health problem. Furthermore it leads to additional stress for hospital staff and induces resource use and emissions without success of therapy.

The testing in the field of sustainable service provision showed that the developed instrument for self-assessment is lean and efficient so that leadership of ward and staff can accept it. Another strength is that it draws upon the in-house expertise to identify problems and solutions. To recover this knowledge means in turn that persons responsible to implement it and staff need to invest time. All together it can be stated that the instrument can deliver contributions to both evaluation and development of sustainability.