100 Pioneers for Efficient Resource Management
Examples of excellence in Baden-Württemberg from all parts of industry

Best practice case of Vector Informatik GmbH
Background and objectives
Vector Informatik is the world’s leading supplier of tools, software components and services for the development of automotive electronics. The present company location in Stuttgart-Weilimdorf reached its capacity limits due to the company’s rapid growth, so that expansion became vital. The new building was to incorporate not only offices, but also a canteen for the site and a large training area. A plot was acquired for the new building in the existing industrial park in the immediate vicinity of the present buildings. This new building was to be connected to parts of the existing buildings to form a modern and attractive campus, offering development opportunities for future company growth.

As an innovative technology company, Vector Informatik also relied on state-of-the-art technology and concepts for the construction project. Strict ecological, economic, functional and technical standards were to be rigorously applied. A further aim was to achieve high employee satisfaction, attractive aesthetics and good urban integration on over 20,000 m² of usable floor space.

Challenge
No office building can be fully environmentally neutral in the foreseeable future. And the larger an office building or complex of office buildings becomes, the more difficult it is to balance the demands on logistics, short distances, operational needs of departments and individual preferences of individual employees. The aim was therefore to design and implement construction and operation to conserve resources as much as possible while at the same time being economical, efficient and employee-friendly.

Idea
The project was to be subjected to a strict certification process for sustainable construction in every phase, which requires marked additional effort on the part of clients, planners and contractors, but guarantees high process quality. Sustainability aspects were therefore to be fully taken into account and comprehensively documented.

At the same time, many solutions and details were to be developed and tested which would not only be adopted in future Vector buildings, but could also be of interest for any new office building construction. Very high flexibility in use, accessibility and employee friendliness were important planning goals to increase motivation, health and employee retention.

The increase in user comfort was to be achieved by holistic planning with regard to acoustics, thermal comfort, indoor air quality, visual axes, room dimensions and even corridor widths. The sum of many individual measures aimed to achieve not only significant savings in operating costs, but above all positive effects for the employees thanks to the favorable working environment.

Implementation
The new and existing buildings have created an IT Campus together. The external coherence of the buildings has been achieved by including characteristic red ceramic tiles as façade cladding, coordinated proportions and bridges between new and existing buildings. The buildings, both old and new together, enclose a carefully landscaped courtyard garden.
The main objective with regard to building operation was to cover heating requirements internally as far as possible and thus achieve a reduction in CO₂ emissions through the use of renewable energy. A solar heating system with a collector surface of over 120 m² was installed for heating drinking water i.e. domestic hot water. Electricity is generated from renewable energy using a photovoltaic system consisting of 532 modules with a total output of approx. 98 MWh/year. In addition, the ventilation systems are equipped with a heat recovery facility, which recovers up to 83% of the heat from exhaust air.

Geothermal energy is a central component of the heating and cooling system. A heat pump is used to exploit geothermal energy for heating and cooling the building, including the server rooms. The heat pump system is supplied by 68 geothermal probes, which extend to a depth of 95 m. Vector Informatik thus operates one of the largest geothermal areas in Germany. The heat pump is a bivalent heat pump that extracts heat from the ground in winter and stores the heat from the office areas back into the ground in summer. The heat pump operation allows for simultaneous heating and cooling. A natural gas-fired condensing boiler system has also been installed to cover the peak load that occurs during canteen operation despite load management.

Finally, CO₂ emissions are avoided not only through the contribution of energy generation, but also through automated building control and monitoring, including a monitoring system for individual parts of the building and separate floors.

**Savings**

Vector Informatik’s new, forward-looking building contributes to the conservation of resources in many ways. Attention was given to the connection to local transport systems and e-mobility as early as the construction phase. Building materials were also selected on the basis of sustainability criteria. The use of Cobiax reinforced concrete slabs, for example, made a significant contribution to resource efficiency in construction. This measure saved close to 7,000 m³ of concrete which is a third of the amount of concrete required for a conventional building.
There are further significant energy savings in the operation of the new building compared to a conventional office building. The use of geothermal and solar thermal energy has reduced natural gas consumption by around 70%. In addition, the photovoltaic system and the intelligent building control system reduce electricity consumption, so that a total of approx. 460 t of CO₂ emissions are avoided during operation per year.

The Vector campus was awarded the German Sustainable Building Council (German: DGNB) platinum certificate for sustainable building in 2017 and has received the DGNB diamond for outstanding architecture with exceptional quality of design and architectural culture. This makes it the first and up to now only building in the world that holds both awards.

**Learning objective**
The building clearly demonstrates how a convincing overall concept of ecology, economy and employee friendliness can be achieved by combining many individual measures. To do so, extra demands must be made on planning and construction with regard to planning quality and sustainability in every project phase. The building can serve as an example that these requirements can be implemented in practice.

**Company**
Vector Informatik GmbH was founded in 1988. An international, constantly expanding company has grown out of a small engineering office. Vector is a professional partner for the development of automotive electronics. At 24 locations worldwide, more than 2,000 Vectorians support manufacturers and suppliers in the automotive and related industries with a professional platform of tools, software components and services for the development of embedded systems. Moreover, Vector and above all the Vector Foundation are involved in a variety of educational, research and social projects.
The project "100 Companies for Resource Efficiency" was initiated by the Alliance for Greater Resource Efficiency between the leading trade associations of the state of Baden-Württemberg and the state government. The alliance includes the Ministry for the Environment, Climate and the Energy Sector Baden-Württemberg, the State Association of the Baden-Württemberg Industry (LVI), the Baden-Württemberg Chamber of Industry and Commerce (BWIHK), the Chemical Industry Association of Baden-Württemberg (VCI), the Mechanical Engineering Industry Association (VDMA) for Baden-Württemberg and the Electrical and Electronic Manufacturers’ Association (ZVEI), Regional Office of Baden-Württemberg.

The project was carried out jointly by the Institute for Industrial Ecology (INEC) at Pforzheim University and the Baden-Württemberg State Agency for Environmental Technology. The examples presented were carefully examined and selected by a jury of members of the participating alliance partners.

The initiative shows how resource efficiency can be implemented and the benefits associated with it. It supports the previous activities on resource efficiency in the country with concrete, presentable results and brings them to the operational level. This motivates other companies to participate.

The 100 examples of excellence have a strong impact beyond Baden-Württemberg and underline the efficiency of the local economy. The aim is to highlight and present the examples of excellence in a representative, high-profile and exemplary way.

Further information about the project:
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