

ISO 50001 Energy Management System Case Study

2021

Austria

Porsche Holding Gesellschaft m.b.H.



"Group Store Window" - Porschehof Salzburg

Organization Profile & Business Case

Porsche Holding Salzburg (PHS) is the largest automobile trading company in Europe, active in 22 European countries as well as in Colombia, Chile, China, Malaysia, Singapore, Brunei, and Japan. The company was founded in Salzburg by Ferdinand Porsche's two children - Louise Piëch and Ferry Porsche. In 1949, with the import and sale of the Volkswagen Beetle in Austria, they laid the foundation for the successful development of the PHS.

Today, PHS represents the brands of the Volkswagen Group both in wholesale (importer) and in retail (dealer) and in the after-sales business (service). Porsche Holding Salzburg has been a 100% subsidiary of Volkswagen AG since March 2011 and contributes its decades of know-how in the car business to the Volkswagen Group's global sales force.

In 2014, the Federal Energy Efficiency Act was passed in Austria, which obliged large companies to either have an external energy audit every four years or to implement an energy management system. Porsche Holding opted for the energy management system, as this represented the more sustainable solution for the company. Additionally, the management of Porsche Holding adopted an energy policy in which two energy targets were set. The Company took a new, trend-setting path which also takes an important contribution to the corporate strategy.

Case Study Snapshot

Industry	Car Retail
Product/Service	Wholesale and retail sales of vehicles
Location	Austria
Energy management system	ISO 50001
Energy performance improvement period, in years	6
Energy Performance Improvement (%) over improvement period	26.90%
Total energy cost savings over improvement period	1,737,197.57 USD
Cost to implement EnMS	500,000 USD
Total Energy Savings over improvement period	66,594.1104 GJ
Total CO ₂ -e emission reduction over improvement period	8,565 Metric Tons

"Focusing on consistent decarbonization can be a strong competitive advantage. In any case, it offers the best setting of the course for the common path towards a secure and economically successful future on a planet worth living in."

Georg Kell, Spokesman for the Volkswagen Group's
Sustainability Advisory Board

With the new "TOGETHER - 2025+" strategy, the Volkswagen Group is taking responsibility for our environment, safety, and society by continuously reducing our carbon footprint.

Business Benefits

As already mentioned, the Federal Energy Efficiency Act was passed in Austria in 2014. Therefore, the Porsche Holding Salzburg decided to implement an energy management system according to ISO50001 instead of doing an external energy audit every four years. The scope here includes all locations in Austria. Since this represented a new topic and a new challenge for the group, a new employee (Thomas Huber, MA) was recruited who, along with the meanwhile five other employees, is still working on this.

At the beginning of the implementation of the energy management system, the priority for the group was to meet the legal requirements, but this quickly changed in a positive sustainable direction after the evaluation of the first results regarding energy and cost savings.

In the adopted energy policy, the following two energy goals until 2025 were set:

- Reduction of energy consumption, based on 2014, by 25% per square meter of gross floor area (kWh/m²)
- Reduction of CO₂ emissions, based on 2014, by 25% per square meter of gross floor area (kg/m²)

Each target is monitored annually in terms of achievement and cost savings and communicated to the management. In addition, the results regarding to the energy consumption are weather adjusted with heating degree days.

	2014	2015	2016	2017	2018	2019	2020	2025
Energy kWh/m ² (real)	184.5	183.0	174.4	174.1	161.4	152.8	134.8	-
Saving % (real)	0.0	-0.8	-5.5	-5.6	-12.5%	-17.2%	-26.9%	-
CO ₂ -Emission kg/m ²	46.2	45.2	41.1	42.7	38.9	36.4	19.6	-
Saving %	0.0	-2.0	-11.0	-8.0	-16.0	-21.0	-58.0	-
Target Value %	0.0	0.0	-2.0	-5.0	-10.0	-15.0	-20.0	-25.0
Energy kWh/m ² (adjusted)	184.5	171.0	162.0	161.1	156.5	147.3	127.7	-
Saving % (adjusted)	0.0	-7.3	-12.2	-12.7	-15.2	-20.1	-30.8	-

Chart 1: KPI-Development - PHS

As shown in Chart 1, both targets have been exceeded every year since 2016. The positive results led to more budget being released for innovative projects and a steady increase in savings. A significant contribution to the reduction of CO₂ emissions was made by the switch to 100% green electricity since 2020. However, it should also be noted that in 2020 the COVID pandemic had an impact on energy consumption as well as CO₂ emissions.

In addition to energy and CO₂ savings, cost savings are of course the most important point for the group. The implemented energy management system and the implemented energy efficiency measures have saved a total of EUR 1,479,869.10 or USD 1,737,197.57 (changeover August 12, 2021) since 2014. For the calculation of these savings, the growth via the increase in area was also considered. It should also be mentioned that these are purely energy costs. Costs that were saved, for example, through reduced maintenance or less wear and tear, are not considered here, as these are difficult to represent.

One example of this is the conversion of the lighting to LED. The significantly longer service life prevents frequent changing of the luminous bodies, which in turn saves considerable personnel and material costs.

To be able to achieve these savings at all, human and financial resources also had to be invested, of course. So far these have been made up as follows:

- Internal staff for the implementation as well as the operation and the continuous further development of the central energy management system.
The time required for maintaining and further developing the system amounts to more than a year. This also includes the time of the staff on the different locations.
- Internal staff at the individual locations who implement the requirements of the energy management system there
- External staff for advice and internal audits
- External staff for the third-party audit
- Measurement technology for ongoing monitoring

Plan

The Austrian legislation had a significant influence on the introduction of the energy management system. Due to the obligations of the Federal Energy Efficiency Act, the management could be convinced of the more sustainable benefits of a management system. After the decision, the energy manager started the preparations for the implementation.

In a first step, it was determined which data are systematically relevant and which must be collected. The focus was initially on the number of locations including their size and energy consumption, broken down by energy source. The year 2014 was set as the starting point. The data was initially recorded via the energy bills of the individual suppliers. To be able to present this more clearly and in more detail in the future, a comprehensive energy monitoring system for all sites was installed with which the electricity, heat and water consumption could be measured using main and partial meters. Currently there are around 2,500 meters installed here. This also made it possible to make savings in small optimization measures such as adapting a heating control system visible.

Figure 1 shows the energy monitoring dashboard from the main location in Salzburg. This shows the benchmarking between the individual, comparable locations. There is such an overview for every location and every location manager has access to this program. This means that it can be seen immediately whether the site is developing positively or negatively compared to other sites. This is an important tool to show the development and to promote indirect competition.

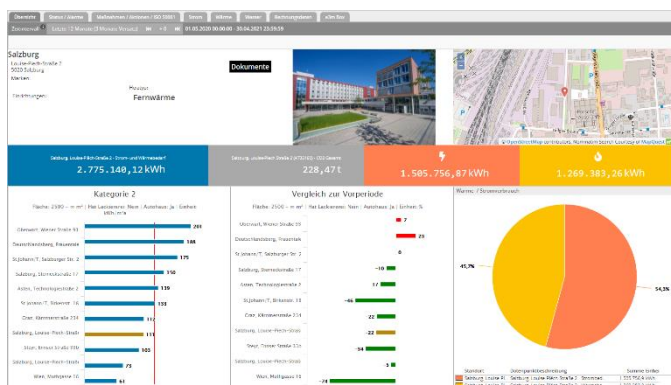


Figure 1: Energy-Monitoring - PHS

The consumption, load profiles and savings now made visible, were important tools for the management's further decisions about human and financial resources.

In a further step, those responsible for the location were trained in the topics relevant to them. These include regular training of employees at their location, compliance with the testing and maintenance obligations of energy-relevant technical systems and efficient management of their operations.

Since then, the management has been informed during regular four fixes and the annual management review.

“Climate and environmental protection affect us all. As the largest automobile dealer in Europe and a subsidiary of Volkswagen AG, we contribute to climate protection with our operations.”

Dr. Hans Peter Schuetzinger, CEO Porsche Holding Salzburg

Do, Check, Act

After the certification, optimizations were carried out continuously to improve the system, to make it more measurable and monitorable. In addition, several projects have been implemented to reduce energy consumption continuously and sustainably.

Energy-KPI

To be able to present the development of the energy consumption of the locations plausibly, a project was implemented with the AEA-Austrian Energy Agency, which aimed to establish a key figure system for the locations. A regression analysis was used to determine the factors that have the most significant influence on energy consumption and categories were created to be able to compare the performance of the locations. The weather was identified as the main influencing factor. The locations were divided into 7 categories, considering the area, the purpose of the location (car dealership or administration and logistics) and, in the case of a car dealership, with or without a paint shop. kWh/m² is used as the key performance indicator.

Figure 2 shows the AEA benchmark tool, in which the actual and expected energy consumption per location and overall is shown. This is also used to check the energy monitoring data at regular intervals.

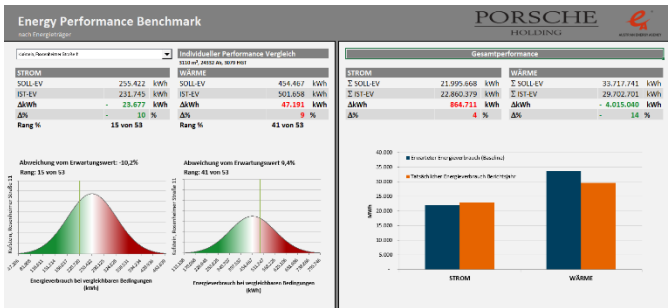


Figure 2: Benchmarktool - PHS

Testing and Maintenance Obligations

To comply with the statutory inspection and maintenance obligations a CAFM software was introduced into which all relevant systems were incorporated. This means that all energy-relevant parts such as air conditioning, heating or compressors are introduced in this database. On the one hand, this solution helps to ensure that you are legally compliant, but also that systems that have an impact on energy consumption are regularly checked and serviced. If maintenance or checks are overdue or not carried out, the supervisor is informed by an escalation.

Energy Optimization Projects

To reduce energy consumption sustainably and in the long term, optimization measures were carried out again and again. The largest and most important was the “Optimization of Operating Costs” project. The heating systems at all relevant locations were modernized or replaced. A new control system was also installed, and the hot water preparation was converted to a decentralized system. Since the hot water requirement in a car dealership is very low, this is much more efficient than heating a small amount of water with the building's heating system. It was not only possible to achieve considerable energy and cost savings here, but also an increase in comfort. Likewise, the lighting at many locations has been converted to LED and 26 photovoltaic systems have now

been installed. During the optimization measures, procurement criteria such as a maximum GWP of 750 for refrigerants or a minimum light output of 85 lumens / watt for showroom lights were defined. These get also evaluated annually and adjusted if necessary.

To ensure continuous improvement, internal audits are regularly carried out at all locations, in which essential issues such as compliance with legal and audit obligations, changes in energy consumption or comprehensible training of employees are checked. Subsequently, the grade of achievement of the energy targets, the general development of the energy consumption and the results of the internal audits are communicated in the annual management review.

Transparency

Energy management and energy targets are communicated again and again during press releases and via channels such as LinkedIn. The PHS has also repeatedly submitted projects to “klimaaktiv”, which are then communicated externally. However, the certification was not reported via a reporting program.



Figure 4: Press release E-Mobility Porschehof

What We Would Have Done Differently

One topic that was considered too late when the energy management was introduced is standardization. Data was collected quickly, and innovative optimization projects were implemented, but the specification of technical standards for new buildings or major renovations was implemented relatively late. In 2019 a location got certified according to BREEAM and from 2021 the DGNB-Gold standard was set for all new buildings and major renovations.

The introduction of such standards offers a sustainable value for the needs of the energy management system. In addition to increasing the quality of the building or site, all factors are considered from the start. It doesn't necessarily have to be an official building certification. Often it is enough to define internal standards such as no use of fossil fuels, only LED lighting for new buildings and renovations or the installation of photovoltaic systems for new buildings.

All of this will contribute to the success of the system and the sooner these standards are set, the sooner you will benefit from them.

In summary, we can say that we would have done almost everything the same way. The system described here would not have been possible without the strong support of management. Of course, the trust had to be won and strengthened successively through results, but the support of the management, be it with financial or human resources, is the decisive factor for the success of any management system. The results presented here in this case study.

Our advice to everyone who wants or must introduce an energy management system is:

Make a Plan!

Get employees involved!

Collect the right Data!

Take action and get results!

Gain and strengthen the trust of Top-Management!