Audit of Carbon and Water Footprint

at the level of direct consumption of electricity, thermal energy and cold water

of the University of South Bohemia

in České Budějovice

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v Českých Budějovicích
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NÁRODNÍ PLÁN OBNOVY

MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

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1 PREAMBLE

Introduction and importance of the assessment of environmental impact of energy and resource consumption

Sustainability and reducing the negative impact of human activities on the environment are one of the fundamental themes at the global level. Companies, organisations and individuals are increasingly motivated to reduce their environmental footprint, thus contributing to the general climate protection. One of the key tools to achieve the above objective consists in the systematic monitoring and assessment of the consumption of energies, materials and resources that affect environmental impacts to a significant extent.

Reports assessing the consumption of electricity, water and thermal energy represent an essential step towards comprehension how these resources are used and with what environmental ramifications. The translation of those data to indicators such as carbon footprint and water footprint provides a clear and quantifiable image of the impact of individual structures (e.g. buildings) and entire organisations. This makes it possible to identify, in a targeted manner, the areas with the greatest potential for savings and to adopt measures that will result in a more efficient use of resources.

Benefits of the environmental analysis for organisations

For organisations, it is important not only to monitor own consumption and environmental impacts, but also to respond to growing market demands and legislative requirements. With an increasing trend, investors, customers and other stakeholders give preference to companies that are able to evidence their sustainability efforts as well as environmental responsibility. In addition to the rise in trustworthiness on the market, reducing the consumption of energies, materials and resources can bring with it direct financial benefits, such as lower operating costs and savings in the long term.

Well-prepared reports on resource consumption and their environmental impacts may serve as a basis for further strategic decisions and planning, e.g. for investment proposals or the development of sustainability policies. Accordingly, the aforesaid reports can also be used as a suitable tool for evaluating the effectiveness of measures already implemented and can motivate employees to get involved in environmental responsibility efforts.

Need for continuous improvement and adaptation of methodologies

In no case is the preparation of these reports a one-off task: this is an ongoing process. It is crucial to keep abreast of the development in technology, assessment methods and legislative requirements. This approach allows organisations to respond flexibly to changes and to optimise their resource management processes. Assessment methodologies of environmental impacts should be reviewed on a regular basis and updated to provide the most accurate and relevant information. Environmental impact reports therefore serve not only as a benchmark to determine the current situation, but above all, as a tool for future improvement and promotion of sustainability.

2 AUDIT OBJECTIVES

The objective of the present report is to quantify the environmental load related to the basic annual consumption of electricity, thermal energy and cold water at USB and its constituent parts (i.e. the individual faculties, Rectorate, Academic Library and Dormitories and Refectories), or, more specifically, the translation of their consumption into the impact category Climate Change [Global Warming Potential (GWP), which is characterised by kg CO_2 eq.] for electricity and thermal energy, and also into the impact category Use of Water [Water Deprivation Potential (for users), water consumption weighted by water deprivation (WDP), characterised by m^3 world deprivation equivalent].

Sub-objectives of the audit:

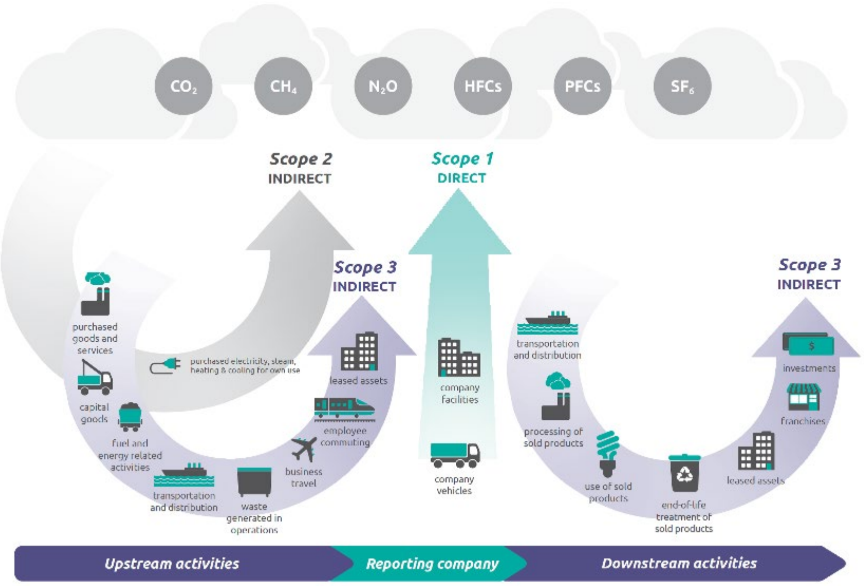
- Raise awareness and knowledge: Provide a comprehensive overview of environmental impacts of the operation of individual buildings and employees (or, more specifically, FTEs) in the organisation, with the aim of increasing awareness environmental issues across the organisational structures.
- Fulfilment of the project requirements (National Recovery Plan): Create specific outputs in accordance with the objectives and expectations of the National Recovery Plan (NPO) project, which will serve as a quantified basis for the project report and further use within the implementation framework.
- Basis for recommendation: Based on the data obtained and the analysis carried out, to design measures for reducing environmental impacts and optimise resources (energies, water, heat), with an emphasis on their contribution to the organisation's sustainable development.
- Support of decision-making in environmental management: Provide documents for strategic decision-making at the level of the organisation's management, aimed at the efficient management of environmental impacts, setting priorities and allocation of resources.
- Inspiration for future development: Prepare the basis for long-term integration of environmental approaches into the organisation's strategic development, including the support aimed at the transition to a circular economy and the achievement of climatic neutrality.

3 METHODOLOGY FOR ASSESSING THE ENVIRONMENTAL PROFILE

For assessment purposes, principles of carbon and water footprints were implemented. Carbon footprint represents the total amount of greenhouse gases (especially carbon dioxide – CO_2) which are released into the atmosphere as a result of anthropogenic activities. This is usually measured in tonnes of CO_2 equivalent for a certain period, e.g. for a year. Carbon footprint includes emissions associated with energy consumption, manufacture of products, transportation, heating or food consumption. This indicator plays an important role for assessing the impact on climate change and identifying methods of reducing emissions. Water footprint is an indicator of the total amount of freshwater needed to manufacture products and services consumed by people. This indicator comprises direct water consumption (e.g. for drinking or cooking) as well as water consumption, which is needed in production and supplier processes (e.g. for production of food, clothing or electricity). Water footprint is most often expressed in litres or cubic metres. The above indicators help assess the environmental impact of various activities and products and make thus possible to identify areas where improvements can be achieved.

Values of the environmental expression are related to the individual components of USB as well as to FTEs. The environmental expression in a form of carbon footprint was related to the impact category Global Warming Potential (GWP) (tonnes of CO_2 eq. per USB component $\cdot$ year^{-1} and tonnes of CO_2 eq. per FTE $\cdot$ year^{-1}) in a form of water footprint pro impact category identified as Water Deprivation Potential (WDP) (m^3 of water (world deprivation equivalent) per USB component $\cdot$ year^{-1} and m^3 of water (world deprivation equivalent) per FTE $\cdot$ year^{-1}). This unit expresses the impact of use of freshwater on the availability of water for other users and ecosystems in a given location/region (Europe, in this case). In other words, the aforesaid unit represents the volume of water that could be theoretically 'removed from availability' in water deprived areas. Accordingly, this unit does not indicate a direct abstraction of pipeline water. The unit ensures that the same quantity of water abstracted has a direct environmental impact depending on the region (for instance, 1 m^3 of water abstracted in a high water stress area, e.g. Sahara, will have a higher WDP value than 1 m^3 of water abstracted in a low water stress area, e.g. Scandinavia).

The focus of the assessment is on the calendar years 2021–2023. Data regarding the consumption of energies and resources from the Unit of Building Maintenance and Management (Rectorate, Bursar's Office) were used as primary data. Furthermore, USB Annual Reports for the years 2021, 2022 and 2023 were used to obtain information on the number of employees of USB individual components. The report does not include numbers of relevant students. As secondary data, sources of the internationally renowned database Ecoinvent (Wernet et al., 2016) were used. In specific terms, the following models were used for electricity: Electricity, low voltage {CZ}| Cut-off, U (This data file describes electricity available at the high voltage level in the Czech Republic, more specifically, by transmitting 1 kWh of electricity at low voltage), for thermal energy: Heat, district or industrial, natural gas {CZ}| heat and power co-generation, natural gas, conventional power plant, 100MW electrical | Cut-off, U (This data file represents the high-voltage electricity and heat generation in a conventional natural gas-fired steam boiler plant with combined generation of electricity and heat in the Czech Republic) and for cold pipeline water: Tap water {Europe without Switzerland}|Cut-off, U (This data file contains transport from producers to consumers of this products). The output is an environmental profile of individual scenarios (198 scenarios in total), which are in relation to the used secondary data in the 'cradle to grave scope", or, in other words, from mining and extraction of raw materials for energy and resource production, their processing to emissions generated by consumption of energies and recourses. The results of data inventory are assigned environmental impacts, through impact category-specific characterisation factors in line with the applied methodology Environmental Footprint 3.1. (Fazio et al., 2018) using the software SimaPro Analyst (PRé Sustainability, 2024). The quantified results of indicators of impact categories summarise the environmental profile of sub-scenarios. In terms of the GHG Protocol (WRI & WBCSD, 2011), this is carbon footprint quantification at the level of Scope 2.



Source: [Corporate Value Chain (Scope 3) Accounting and Reporting Standard (PDF)]

4 RESULTS

This part contains an assessment of environmental impacts of individual scenarios related to the specific impact categories and related units according to the methodology described. This part is divided into three sub-parts for the individual resources assessed (electricity, thermal energy and cold water).

Electricity consumption

Carbon footprint of electricity consumption expresses the quantity of greenhouse gas emissions (CO_2 eq.) generated in the production, distribution and consumption of electricity. The energy mix in the Czech Republic is still largely dependent on fossil fuels, a fact that significantly affects the electricity emission factor.

Monitoring of electricity consumption can be considered part of energy management (EM). The standard ISO 500 01 (ISO 50001:2019): Energy Management Systems specifies the requirements for the development, implementation, maintenance and improvement of energy management. The above standard is used as a basis for the implementation of the EM system. The pivotal part of the standard lies in the energy planning process, which defines energy targets. A successful EM is dependent on the systematic recording of energy flows and energy assessment of suitable monitoring mechanisms.

Efficient management of electricity consumption constitutes a fundamental factor for reducing operating costs as well as environmental impacts. Energy management has a primary focus on reducing energy waste in general (e.g. optimisation of lighting, heating and technology operations), increasing the share of renewable resources (e.g. installation of solar panels, procurement of green electricity), or monitoring and analysis of energy consumption, which enables to identify savings in an accurate manner.

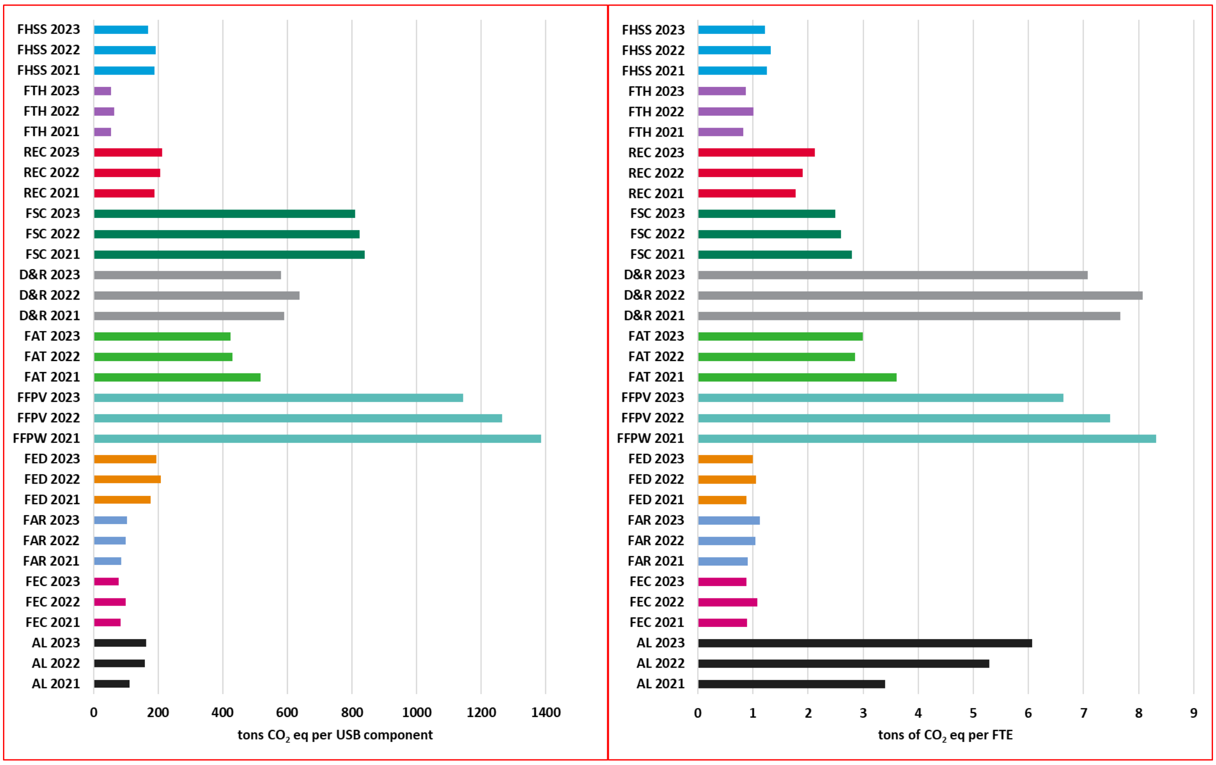
To assess the environmental impact linked to electricity consumption, the information presented in Table 1 was collected.

Table 1 Electricity consumption by USB components

Faculty/ const. part	**Electricity (kWh)**			**Year-on-year increase or decrease (%)**		
	2021	**2022**	**2023**	**2022**	**2023**	**Total**
D&R	928,767	1,002,671	911,901	8.0	-9.1	-1.1
FFPW	2,179,137	1,990,136	1,798,245	-8.7	-9.6	-18.3
FSC	1,321,566	1,295,661	1,272,228	-2.0	-1.8	-3.8
FAT	812,938	676,775	665,449	-16.7	-1.7	-18.4
FED	277,408	329,322	305,595	18.7	-7.2	11.5
REC	279,947	325,630	333,739	16.3	2.5	18.8
FHSS	296,244	303,143	266,350	2.3	-12.1	-9.8
FTH	85,379	100,203	86,845	17.4	-13.3	4.0
FEC	157,094	132,756	123,097	-15.5	-7.3	-22.8
FAR	135,215	156,909	161,904	16.0	3.2	19.2
AL	176,483	249,628	257,574	41.4	3.2	44.6
USB total	6,650,178	6,562,834	6,182,927	-1.3	-5.8	-7.1

Chart 1 was prepared on the basis of electricity consumption information within USB individual components (table 1). The chart shows electricity consumption in a form of carbon footprint expressed in CO_2 equivalent.

Chart 1 Environmental profile based on electricity consumption



The results shown above reflect electricity consumption as well as annual consumption by USB individual components. The highest carbon footprint relative to the year and USB component assessed (tonnes of CO_2 eq. per USB component) was generated by the faculties intensively oriented at science and research. These include the Faculty of Fisheries and Protection of Waters, Faculty of Science and Faculty Agriculture and Technology. Another component with a generally high electricity consumption and the associated carbon footprint is the Dormitories and Refectories. Of these USB components, the Faculty of Fisheries and Protection of Waters has the highest carbon footprint for electricity consumption. The associated level of carbon footprint was quantified at the value of 1,385.85 tonnes of CO_2 eq., 1,265.65 tonnes of CO_2 and 1,143.61 tonnes of CO_2 eq. in 2021, 2022 and 2023, respectively.

To give a better picture, the average passenger car generates approximately 120 grams of CO_2 per kilometre travelled. The carbon footprint of 1,000 tonnes of CO_2 corresponds to around 8.3 million kilometres travelled in a passenger car, an equivalent of around 200 full trips around the Earth by car. Or the average household in the Czech Republic consumes approximately 3 MWh of electricity, an equivalent of about 2.5 tonnes of CO_2 (depending on the energy mix). Accordingly, 1,000 tonnes of CO_2 corresponds to the annual electricity consumption of about 400 households. Another example: a return flight from Prague to New York for one passenger will generate about 1.5 tonnes of CO_2. The carbon footprint of 1,000 tonnes of CO_2 is an equivalent of 666 return flights on this route for one person.

On the other hand, the Faculty of Fisheries and Protection of Waters is noted for a significant trend towards reduced electricity consumption, a direction that is reflected positively on the level of the associated carbon footprint. Between 2021 and 2023 alone, carbon footprint related to electricity consumption decreased by more than 240 tonnes of CO_2 eq. (per USB component), which is, for instance, the volume of the total annual carbon footprint of the Rectorate or the Faculty of Education. Carbon footprint is also expressed in relation to FTEs. In this regard, the level of carbon footprint can thus be considered low, for example, in relation to the carbon footprint of the average inhabitant of the Czech Republic. Through his/her activities, an average inhabitant of the Czech Republic produces approximately 6 to 10 tonnes of CO_2 eq. on an annual basis.

Thermal energy consumption

Carbon footprint of thermal energy comprises emissions linked to the production and distribution of heat used for heating or for obtaining hot water. In the Czech Republic, thermal energy is produced mainly by burning fossil fuels (coal, natural gas) and renewable resources to a lesser extent (e.g. biomass).

Similar to electricity consumption, the monitoring of thermal energy consumption forms part of energy management (EM). Thermal energy considered, energy management pursues the objective of optimising the operation of heating systems and reducing energy losses, with the introduction of low-emission technologies, such as heat pumps or biomass boilers, or maximising the use of waste heat and renewable resources.

Within both Czech and European legislative frameworks, efforts to reduce greenhouse gas emissions relating to consumption of (electrical and thermal) energies are enshrined in several fundamental documents; for instance, the Act on Air Protection (No. 201/2012 Coll.), which regulates emissions from fossil resources and encourages the use of renewable resources. This area is also largely addressed by the European Green Deal (Green Deal), which, *inter alia*, aims at achieving climate neutrality by 2050, and fosters the transformation of the energy sector to low-emission operations. Moreover, the EU Energy Efficiency Directive (2012/27/EU) requires the implementation of measures to reduce energy intensity, supporting the transition to clean energy.

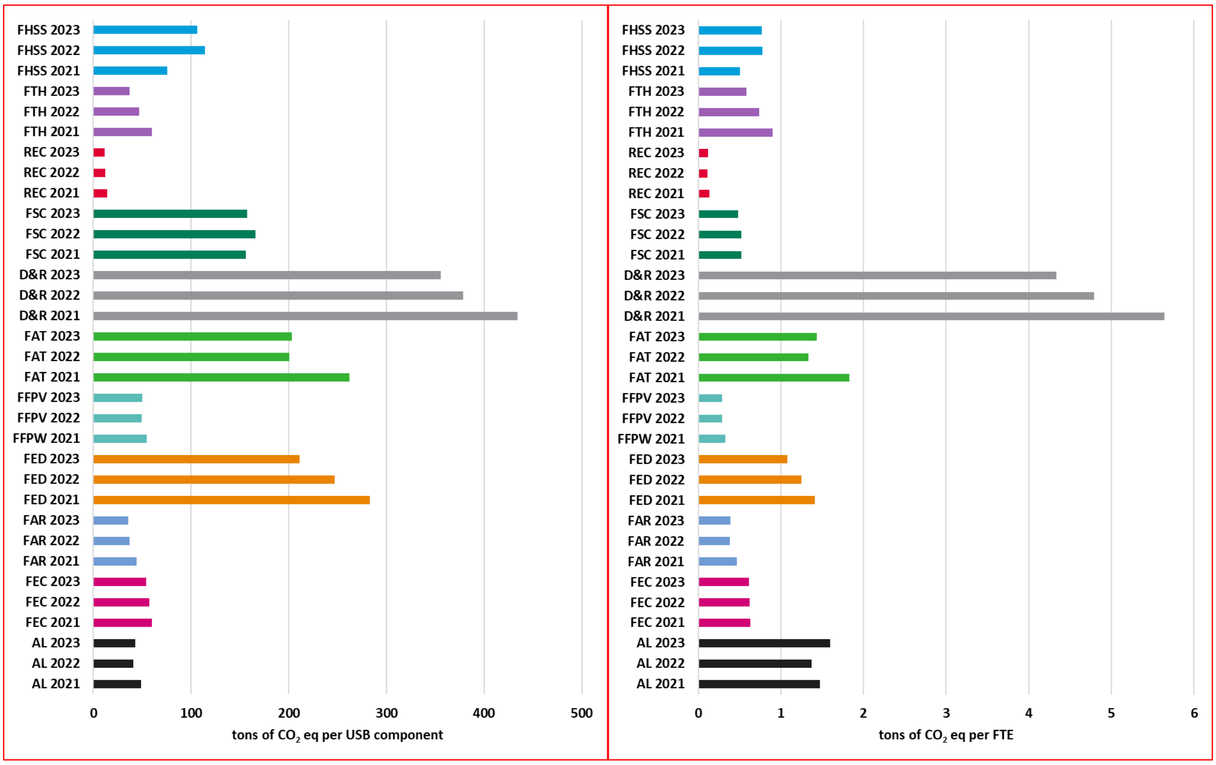
To assess the environmental impact linked to thermal energy consumption, the information presented in Table 2 was collected.

Table 2 Thermal energy consumption by USB components

Faculty/component	Thermal energy (GJ)			Year-on-year increase or decrease (%)		
	2021	2022	2023	2022	2023	total
D&R	8,594	7,485	7,031	-12.9	-6.1	-19.0
FFPW	1,079	975	985	-9.6	1.0	-8.6
FSC	3,089	3,276	3,112	6.1	-5.0	1.0
FAT	5,188	3,965	4,021	-23.6	1.4	-22.2
FED	5,605	4,886	4,174	-12.8	-14.6	-27.4
REC	284	237	230	-16.5	-3.0	-19.5
FHSS	1,494	2,254	2,109	50.9	-6.4	44.4
FTH	1,182	926	730	-21.7	-21.2	-42.8
FEC	1,186	1,138	1,075	-4.0	-5.5	-9.6
FAR	873	730	703	-16.4	-3.7	-20.1
AL	963	813	852	-15.6	4.8	-10.8
USB total	29,537	26,685	25,022	-9.7	-6.2	-15.9

Chart 2 draws from information on thermal energy consumption within USB individual components (table 2). The chart shows thermal energy consumption in a form of carbon footprint expressed in CO_2 equivalent.

Chart 2 Environmental profile based on thermal energy consumption



The results show thermal energy consumption and annual consumption by USB individual components. The highest carbon footprint related to the years and USB components assessed (tonnes of CO_2 eq. per USB component) was generated by the Faculty of Science, Faculty of Agriculture and Technology, Faculty of Education and especially the Dormitories and Refectories, where the generally rather high thermal energy consumption reflects on a high carbon footprint. The level carbon footprint associated with the Dormitories and Refectories and the related thermal energy consumption was quantified at the value of 1,385.85 tonnes of CO_2 eq., 1,265.65 tonnes of CO_2 and 1,143.61 tonnes of CO_2 eq. in 2021, 2022 and 2023, respectively.

To illustrate these values, 100 tonnes of CO_2 eq. approximately equals the quantity of thermal energy needed to heat an average family home for 15 to 20 years. For instance, imagine that 100 tonnes of CO_2 corresponds to the energy needed to heat 500,000 litres of water from 10 °C to boiling point. Moreover, carbon footprint corresponding to 100 tonnes of CO_2 eq. would, for example, cover the heating of an average school building for 2 to 3 years (assuming that the consumption of an average school building stands at around 150–200 MWh heat per year). At the same time, 100 tonnes of CO_2 eq. represents roughly the same quantity of emissions as is generated in burning 50,000 litres of diesel in engine or in heating.

In contrast, the cost-saving measures applied in the sense of thermal energy consumption are mirrored on the general trend of reducing consumption and the associated level of carbon footprint. In the overall volume, carbon footprint of USB related to thermal energy consumption decreased by 15% from 2021 (1,494 tonnes of CO_2 eq. at USB as a whole) to 2023 (1,265 tonnes of CO_2 eq. at USB as a whole).

The lowest carbon footprint associated with thermal energy consumption is attributable to the Rectorate. The carbon footprint stands at around 10% compared to the three-year average for the whole of USB.

Carbon footprint is expressed also in relation to FTEs. Consequently, it shows the relation between the number of workloads at the individual components of USB and the carbon footprint generated by thermal energy consumption. Needless to say, this is an additional indicator, which is strongly influenced, *inter alia*, by the size and structure of the given individual component of USB.

Cold water consumption

Another value quantified for audit purposes was direct cold water consumption in a form of water footprint. A sustainable management strategy can be determined using information on the consumption of water resources (in general). Sustainable water management strategies at the university are crucial for protecting the environment, efficient use of resources and performance of environmental targets. The water sustainable management strategy forms part of a broader sustainability framework, which also includes the aforesaid energy efficiency, waste management, sustainable transport and biodiversity. This strategy has been designed to be consistent with the university's overall objectives in the area of sustainability and to complement the other strategies in place. Water sustainable management stands for efficient use of water resources (in general terms, together with minimisation of environmental impacts). Regarding cold water consumption, this process primarily involves the introduction of measures to reduce the overall consumption of cold water.

Water footprint constitutes an important indicator of the environmental impact of water consumption, which comprises not only direct use of water but also its indirect aspects, such as supply, distribution and subsequent cleaning. In the context of consumption of cold pipeline water, this issue predominantly concerns environmental impacts associated with the abstraction of water from natural resources, operations of waterworks infrastructure and energy requirements of those processes. Water footprint is linked to energy management, referred to in the case of carbon footprint for direct consumption of electricity and thermal energy. As a matter of fact, the energy intensity of supplies of cold pipeline water accounts for yet another significant factor. The related processes such as pumping, treatment, distribution and cleaning of water are also associated with greenhouse gas emissions, and accordingly, these processes contribute to the organisation's overall carbon footprint. Optimising water consumption therefore makes up for another method to reduce water and carbon footprints, whereby water savings are directly linked to energy management and sustainability.

At the level of the European Union and the Czech Republic, water consumption and its environmental impacts are regulated by legislative standards. The EU Directive on Water Quality for Human Consumption (2019/904) sets out requirements for efficient use of water and places great emphasis on monitoring and reducing water losses in the infrastructure. Furthermore, the Act on Water Supply and Sewerage for Public Use (Act No. 274/2001 Coll.) calls for the efficient management of water resources and quality control of wastewater. Reports on water footprint may serve as underlying documents of climate change adaptation plans. The focus of the said plans is on preventing the impacts of drought and promoting sustainable water management, including water recycling and reuse.

On the one hand, water footprint of consumption of cold water pipeline has a direct impact on the organisation's environmental and energy profile, but on the other hand, it presents a valuable tool for sustainability management. The implementation of the aforesaid measures will contribute to the efficient water management, improved environmental management and a decrease in the organisation's overall environmental impacts.

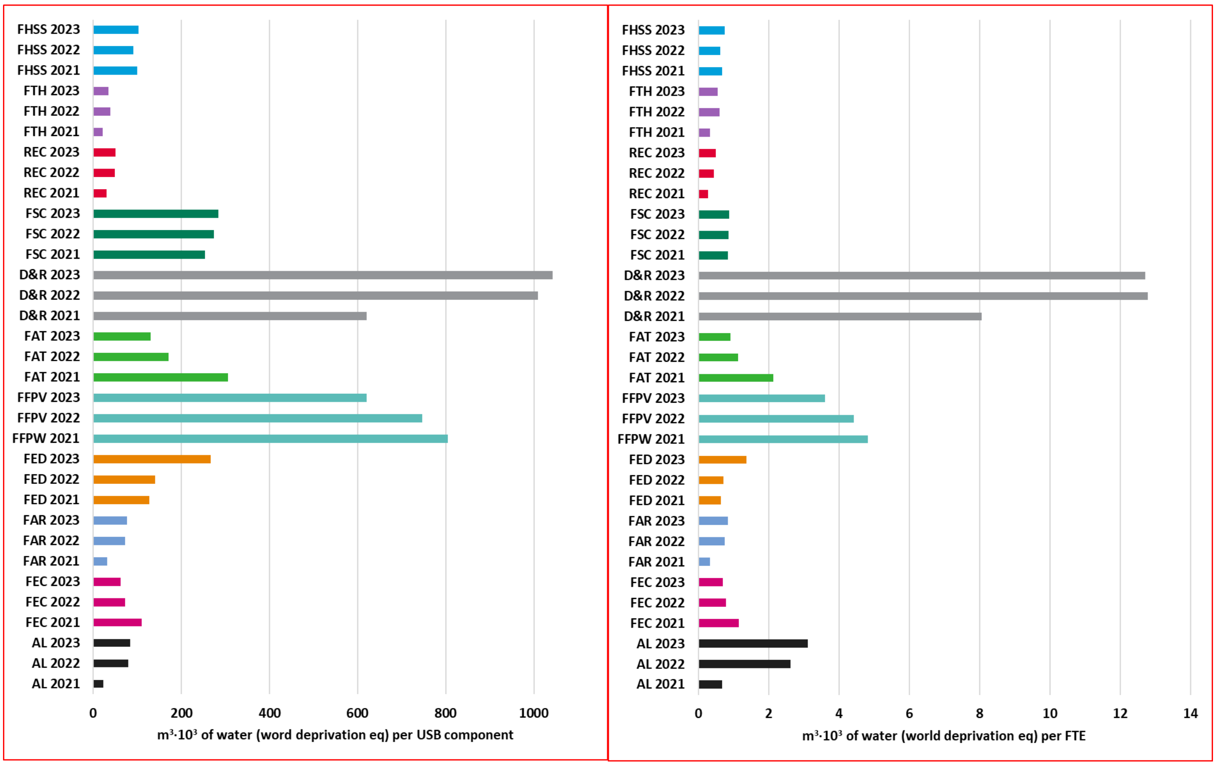
To assess the environmental impact linked to water consumption, the information presented in Table 3 was collected.

Table 3 Cold water consumption by USB components

Faculty/component	Cold water (m^3)			Year-on-year increase or decrease (%)		
	2021	2022	2023	2022	2023	total
D&R	14,450	23,493	24,258	62.6	3.3	65.8
FFPW	18,721	17,385	14,426	-7.1	-17.0	-24.2
FSC	5,910	6,369	6,593	7.8	3.5	11.3
FAT	7,100	3,992	3,022	-43.8	-24.3	-68.1
FED	2,964	3,272	6,209	10.4	89.8	100.2
REC	700	1,132	1,169	61.7	3.3	65.0
FHSS	2,332	2,118	2,397	-9.2	13.2	4.0
FTH	506	892	805	76.3	-9.8	66.5
FEC	2,544	1,679	1,444	-34.0	-14.0	-48.0
FAR	721	1,678	1,792	132.7	6.8	139.5
AL	517	1,833	1,957	254.5	6.8	261.3
USB total	56,465	63,843	64,072	13.1	0.4	13.4

Chart 3 was prepared on the basis of information on direct cold water consumption within USB individual components (table 3). The chart shows direct cold water consumption in a form of water footprint expressed in CO_2 equivalent m^3 of water (world deprivation equivalent).

Chart 3 Environmental profile based on cold water consumption



The results show cold water consumption of USB individual components in terms of annual consumption. The highest water footprint related to the year and USB component assessed, expressed in $m^3 \cdot 10^3$ of water (world deprivation equivalent) per USB component, was generated by the Dormitories and Refectories. The level of water footprint of the Dormitories and Refectories was quantified at 62 1176.4 m^3, 10 09916.7 m^3 and 10 42802.6 m^3 of water (world deprivation equivalent), which corresponds to 1 hour 50 minutes of the flow of the Vltava River in Prague under normal conditions in 2022 and 2023.

In the inter-faculty comparison, the Faculty of Fisheries and Protection of Waters has a high water footprint, but this faculty is also associated with a significant reduction in consumption (by 24.2% from 2021). The highest year-on-year savings in cold water consumption were achieved by the Faculty of Agriculture and Technology (by 68.1% from 2021). In contrast, the highest increase in direct consumption of cold water in the inter-faculty comparison is attributable to the Faculty of Arts (by 139.5% from 2021), Faculty of Education (by 100.2% from 2021) and the Faculty of Theology (by 66.5% from 2021).

As in the case of electricity and thermal energy, water footprint is expressed in relation to FTEs. Accordingly, this value shows the relationship between the number of workloads in USB individual components, and the water footprint generated by direct consumption of cold water. However, this is an additional indicator, which is strongly influenced, *inter alia*, by the size and structure of the given individual component of USB.

5 IMPLEMENTATION AND RECOMMENDATIONS

Cost-saving measures will be implemented on the basis of the Strategy of Sustainability and Green Transformation of the University of South Bohemia in České Budějovice 2025-2030, especially in accordance with the management area.

The management area is primarily addressed within the target **Energy Management** and involves the following measures:

Implementation of measures aimed at energy savings and reducing CO_2 emissions

Promotion of new technologies

Measures to reduce water consumption

Other realisable recommendations

1. Electricity

- **Energy-saving appliances**: Old appliances to be replaced with modern appliances having high energy efficiency (of class A+++).
- **LED lighting**: Switching to LED lighting, which uses up to 80% less energy than conventional light bulbs.
- **Lighting automation**: Installation of motion sensors and timers, which will prevent unnecessary lighting in unoccupied areas.
- **Optimising the operation of IT equipment**: To introduce a power saver plan for computers, monitors and other equipment after a certain period of inactivity.
- **Use of renewable resources**: Where possible, the installation of solar panels and other renewable energy resources should be considered.
- **Energy audit**: Regular performance of energy audit to identify areas with high energy consumption and potential room for savings.
- Energy management systems to put in place (e.g. ISO 50001).
- The current energy mix should be monitored and options of purchasing green electricity should be evaluated.

2. Thermal energy

- **Insulation of buildings**: Heat loss is reduced by insulating roofs, walls and replacing windows with double or triple glazed windows.
- **Temperature control**: Optimal temperature control is achieved by installing smart thermostats, depending on the outside temperature and occupancy of areas.
- **Maintenance of the heating system**: Regular maintenance and servicing of boilers, radiators and other heating systems will ensure maximum efficiency.
- **Replacement of heat resources**: Where possible, switching to more efficient heat sources such as heat pumps or high efficiency gas boilers is recommended.
- **Ventilation with heat recovery**: Installation of recuperation units, which use waste heat from ventilation to reduce requirements for heating.
- **Zone heating**: Heating should be divided into zones that will make it possible to heat only specific parts of the building as necessary and to avoid overheating of empty places.

3. Water consumption

- **Efficient sanitary technology**: Installation of water-saving shower heads, faucet aerators and two-phase flushers.
- **Reuse of water**: Use of grey water (e.g. from sinks and showers) for toilet flushing or irrigation.
- **Detection of water leaks**: Regular checks of pipes and fittings for leaks and quick repairs of leaks.
- **Automation of irrigation:** Installation of smart irrigation systems, which respond to current weather conditions and ensure the optimum amount of water for maintenance of greenery.
- **Education of staff**: Communication of information on how water can be saved and motivating the staff to behave responsibly (e.g. not to run the water at full blast for longer than necessary).
- **Monitoring and analysis of water consumption:** Regular monitoring of cold water consumption to be introduced and areas with savings potential to be identified.
- **Optimisation of operations:** Implementation of measures to reduce water waste, e.g. installation of water-saving technologies and repairs of leaks.
- **Interconnection with energy management:** To optimise the operation of energy demanding processes linked to water management.

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Audit of Carbon and Water Footprint at the level of direct consumption of electricity, thermal energy and cold water of the University of South Bohemia in České Budějovice

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