ProCredit
HOLDING



ProCredit's green buildings

A selection of our energy efficient
and environmentally friendly buildings

This document was developed by our partner, Internationale Projekt Consult (IPC) GmbH, in co-operation with ProCredit Holding. We thank IPC for their expert advice in the development of this brochure.

Contents

Introduction

Promoting environmental awareness and protection, and helping to mitigate climate change, has always been a matter of concern for the ProCredit group and is a critical part of our business model – not only in connection with business operations but also in our day-to-day work. All ProCredit institutions set high standards regarding the impact of their operations on the environment and play an important role in raising the environmental awareness of their staff, clients, counterparts and the general public.
A prime example of how we promote environmental consciousness is by ensuring that our buildings are as energy efficient and environmentally friendly as possible. This brochure presents a selection of the most environmentally outstanding buildings among the ProCredit premises and illustrates how careful planning can minimise the ecological footprint of an institution.[1] However, we are not merely concerned with our own performance: by showing how we manage our own environmental impact, we aim to incentivise our clients to invest in environmentally friendly measures as well.

Environmental Management System in the ProCredit group

Economic development inherently implies increased energy consumption if it is not offset by energy efficiency. ProCredit is acutely aware that supporting economic development must go hand in hand with promoting energy and environmental sustainability. In our daily work, we contribute to ecological sustainability by implementing a comprehensive three-pillar environmental management system (EMS), which is aimed at improving both the internal and the external environmental impact of our activities.

Internal environmental management	Managing the environmental and social risk in our lending operations	Green finance
Our approach to internal environmental management is based on processes and procedures that help us to continually reduce our environmental footprint. Through direct green investments in the banks' infrastructures, we support the spread of green technologies in our countries of operation.	We aim to work with businesses whose activities do not harm the environment or endanger the health, safety and well-being of their staff and neighbours. Above all, we strive to acquire clients who make positive contributions towards the environment.	With our green finance activities we directly promote green investments within our target group and support clients who want to improve their business processes in an environmentally sound manner.

Internal environmental management

The ProCredit institutions continually monitor their own energy and resource consumption in terms of environmental impact and opportunities for improvement. Activities include implementing in-house energy and resource efficiency measures, raising the level of environmental awareness among staff, selecting and preparing instructors responsible for training and campaigns, and carrying out communication measures to provide staff with relevant environmental information. Environmental education makes up a significant part of continuing professional development for our staff on both the regional and international level.

[1] Unless otherwise specified, consumption figures are obtained from the ProCredit group's internal environmental management system data collection tool. More information regarding all graphs and calculations can be found in the Appendix on page 22.

Applying ProCredit's environmental principles in our own buildings

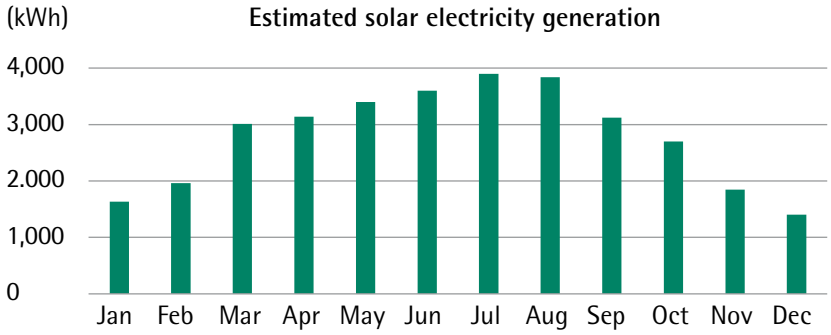
In accordance with the green principles enumerated in our corporate policy and with our internal environmental management, we apply ecological criteria to the choices we make when outfitting existing or new ProCredit bank premises, both owned and rented. The objective is not only to improve energy efficiency, but also to lessen the environmental impact of our activities by taking environmentally friendly measures and decisions. By implementing energy efficiency measures, the banks can reduce their energy consumption and overall greenhouse gas emissions, and thus also reduce energy costs.
Going beyond the basic energy efficiency measures, such as using LED lights and insulating walls, the buildings featured in this brochure include photovoltaic systems, geothermal heating systems and stand-alone waste water treatment plants.

Independent third-party certification

On top of our efforts to improve our direct environmental impact, the ProCredit institutions have obtained ISO 14001 / EU Eco-Management and Audit Scheme (EMAS) certification. These are internationally recognised standards for environmental management systems, based on independent third-party verification.

Head Office in Skopje *ProCredit Bank Macedonia*

Opened in May 2016, the 4,700 m^2 head office of ProCredit Bank Macedonia makes use of various energy efficiency measures and renewable energy solutions to reduce their carbon footprint. The expected monthly energy consumption of 10 to 12 kWh/m^2 is significantly lower than the average energy consumption of similar buildings in the country.
In addition to the energy-saving measures, the head office includes environmentally friendly measures such as a green roof, which not only improves the insulation of the roof, but also serves as a meeting place and space where employees can relax.



Annually, the photovoltaic system on the rooftop can generate an estimated

33 MWh

Building envelope

- *Thermal insulation*
- *Triple-glazed windows*
- *Building management system*

During the design phase, the energy performance of the building was a major consideration. Thermal insulation for the external walls, floors and roof was installed. Triple-glazed windows, rarely seen in the Macedonian market, were used in the glass facades, providing thermal insulation while allowing natural light in.
An independent ventilation-recuperation system is in operation in rooms and areas that are not occupied continuously. A recuperation system saves energy by using the heat in the outgoing air to warm up the incoming fresh air. The building also has a smart building management system which controls the temperatures of the heating and cooling system and switches it on and off as necessary.

Heating & cooling

- *Geothermal water-to-water heat pumps*

Estimates suggest that a maximum heat power of 173 MW can be obtained from the exploitable geothermal resources in Macedonia. The head office has two water-to-water geothermal heat pumps which have a heating and cooling capacity of 250 to 290 kW with an efficiency of up to 600%. Using this renewable resource reduces energy consumption and CO_2 emissions.

Lighting

- *LED lighting*
- *Motion sensors*

The main benefits of LED lighting versus conventional halogen and incandescent lighting are reduced energy consumption, a longer product lifespan and low maintenance.
Common areas such as halls, kitchens and toilets have motion sensors, which turn on the lights when they are needed, further reducing electricity consumption.

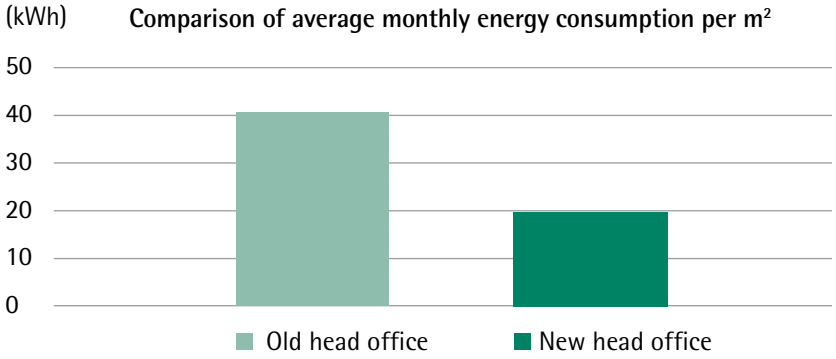
Green measures

- *Green roof*
- *Photovoltaic panels*

The space on the top of the building has been utilised for two main purposes – a green roof and the installation of a 24.5 kW photovoltaic system.
Through the evapotranspiration process of the plants, green roofs moderate the urban heat island effect and act as an insulating barrier to heat transfer, making the cooling and heating of the premises more energy efficient. Employees use the space for meetings and breaks. The roof area not covered by the garden was used for the installation of 100 photovoltaic panels. With a capacity of 245 W each, the panels reduce grid electricity consumption by up to 10%.

Head Office in Tbilisi *ProCredit Bank Georgia*

ProCredit Bank Georgia opened its head office in downtown Tbilisi in December 2012. The building only covers a small part of the plot, so many of the trees and plants in the park were retained, preserving the green environment. The 12,500 m^2 state-of-the-art building, set in its own gardens with underground parking and a cafeteria, also houses two branches, a service point and training centre.
Compared to the previous building, the new head office consumes far less energy per area, i.e. 19.8 kWh/m^2 per month instead of 40.6 kWh/m^2, achieving significantly better performance than comparable buildings in Georgia.



The new head office has reduced average monthly energy consumption per square metre by more than

50%

Building envelope

- *Thermal insulation*
- *Low-e windows*

The spacious seven-floor building boasts an atrium and a glass roof, creating a comfortable environment for clients and employees. The glass itself is low emissivity (low-e) glass and reflects extra heat from the surface, reducing the cooling demand of the building. Low-e coatings are used to minimise the amount of ultraviolet and infrared light that can pass through glass without compromising the amount of visible light that is transmitted.
At the same time, modern insulation technology in the rest of the building helps to minimise heat losses. The walls and flat roof are insulated with rock wool and extruded polystyrene, respectively, both excellent thermal insulation materials.

Heating & cooling

- *Centralised heating, ventilation and air conditioning system*

Centralised heating, ventilation and air conditioning (HVAC) systems are controlled by the Building Management System (BMS). After analysis of the bank's energy consumption data, the BMS was programmed to switch off extra lighting in corridors and reduce the working hours of the cooling and ventilation systems.

Lighting

- *Maximised daylighting*
- *Highly efficient LED lighting*

With the large atrium and glass ceiling, the whole building benefits from natural light. This not only contributes to significantly lower levels of energy consumption, but allows staff and clients to enjoy the many benefits of daylight.
Natural light creates a better working environment, enhances productivity and reduces stress. Where artificial lighting is required, LED lights are used.

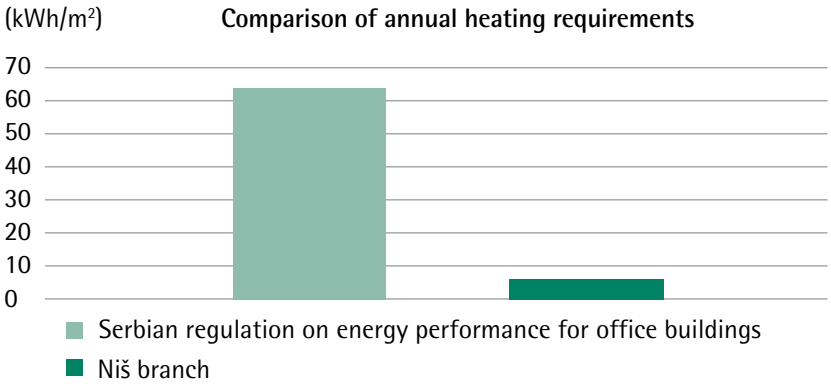
Green measures

- *Waste management system*
- *Intelligent centralised printing system*

Even though there is no legal framework for waste management, ProCredit Bank Georgia has implemented a waste separation system. To raise environmental awareness, special stickers with resource- and energy-saving tips have been placed in the printing rooms, kitchens and bathrooms. In 2015, the bank recycled 11,685 kg of paper and 60 kg of plastic.
The bank uses a centralised printing system based on "FollowMe Printing" software. After print jobs are sent, users must go to the respective printer to execute the order; printing does not occur automatically. This two-step process prevents accidental orders from being printed out and ensures that printouts do not remain uncollected on the printers, which reduces waste.

Green Branch in Niš *ProCredit Bank Serbia*

Built in 2013, the Niš branch was specially designed to showcase the bank's commitment to environmental protection. The branch has installed geothermal heat pumps for heating and cooling as well as a waste heat recuperation system, while solar water heating panels share the roof space with an extensive roof garden, which, among other benefits, also improves thermal insulation.
Thanks to these environmentally friendly and energy efficient solutions, the branch's heating demand is 90% lower than the maximum level stipulated in Serbian regulations on heating energy performance for renovated office buildings.



The heating energy performance of the Niš branch exceeds the Serbian regulatory minimum by

90%

Building envelope

- *Optimised energy efficiency according to the highest standards*
- *Movable vertical sunshields*

The Niš branch has been optimised in terms of energy performance. In addition to triple-glazed windows with low emissivity glass, state-of-the-art insulation has been affixed to the external walls, ground floor and roof of the building (high density rock wool, compressed polystyrene and vapour permeable film). Additionally, the movable vertical sunshields prevent sunlight from coming into the branch, thereby protecting against solar heat gain and glare.

Heating & cooling

- *State-of-the-art heating, ventilation and air conditioning system*
- *Geothermal heat pumps*

Serbia has strong potential for geothermal heating, as the heat flow density under most of Serbia is higher than the average for continental Europe. To take advantage of this energy source, the bank installed a geothermal heating system for space heating and cooling in the Niš branch, including a frequency controller for the circulation pump, which optimises electricity consumption. The ground is used as a heat source in winter and a heat sink in summer.
Additionally, a waste heat recuperation system provides a complementary source of heat during the winter months.

Lighting

- *Highly efficient LED lighting*
- *Motion sensors*

LED lighting is considered to be the most efficient source of illumination and lighting. The installation of LED lighting throughout the whole building therefore ensures that electricity consumption for lighting is as low as possible.
To further reduce electricity consumption, motion sensors were installed in areas with lower traffic (e.g. in the toilets).

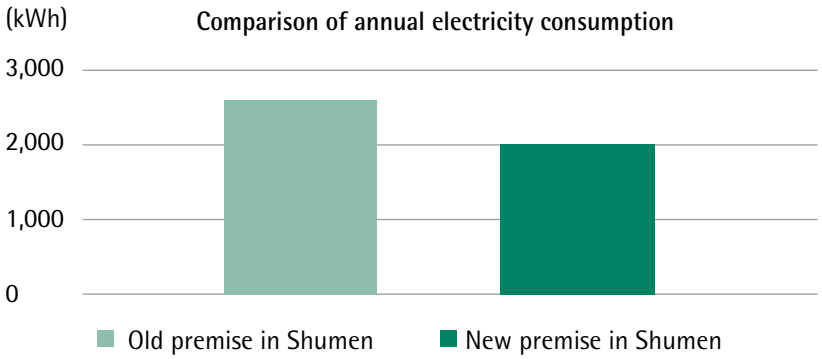
Green measures

- *Extensive green roof*
- *Solar water heating panels*
- *LEED-certified ceramic tiles*

Green plants absorb heat and use it for evapotranspiration. Green roofs therefore play an important role in reducing urban temperatures, and can lead to improvements in air quality by reducing pollution such as smog. The green roof on the Niš branch has flowers, grass and trees which clean the air and produce oxygen at the same time.
To fully utilise the space on the roof top, the bank had a solar water heating system installed. By using a renewable resource (sunlight) to heat water, the branch saves energy and reduces carbon emissions.

Energy Efficient Service Point in Shumen *ProCredit Bank Bulgaria*

The Service Point in Shumen, Bulgaria was newly constructed in April 2015, with an emphasis on energy efficiency features. Like all premises of ProCredit Bank Bulgaria, the Shumen premise follows internal standards regarding the building envelope and efficiency of the heating and cooling equipment. Compared with other outlets in the same region, the Shumen premise has a significantly better energy performance. This can be attributed to the sophisticated control system of the air conditioning equipment that was installed at this particular premise.



The average electricity consumption of the new Shumen Service Point is lower by

19%

Building envelope

- *Energy efficient windows*
- *Building energy performance according to increasingly stricter regulation*

As the front of the premise consists almost entirely of windows, energy efficient windows were installed. The bank pays close attention to the legislative requirements of Bulgaria, ensuring that all of its premises are always in compliance with regard to energy efficiency standards. The combination of energy efficient windows and thermal insulation reduces the building's heating and cooling needs. The energy efficient windows also contribute to maintain a more uniform temperature throughout the building reducing the likelihood of cold spots, as well as preventing condensation indoors.

Heating & cooling

- *Modern heating, ventilation and air conditioning system*
- *Zone-separated heating and cooling*
- *Controlled by a wireless automated building management system*

The modern, efficient air conditioning system provides heating and cooling for the premise. It is separated into three different zones, which have different heating and cooling needs. The 24/7 Zone is open to clients all the time during day and night, and therefore needs to be cooled, heated and lit up accordingly. In contrast, the client reception area and back office space is only open during working hours. Designating these areas as separate zones allows individualised temperature control, reducing overall energy consumption as the air conditioning can be turned off when a particular zone is no longer occupied by staff or clients.
A wireless automated building management system controls the entire heating and cooling system. It provides a range of options for setting up, controlling and limiting the parameters of different zones. Additionally, the monitoring and management can also be carried out remotely from the head office.

Lighting

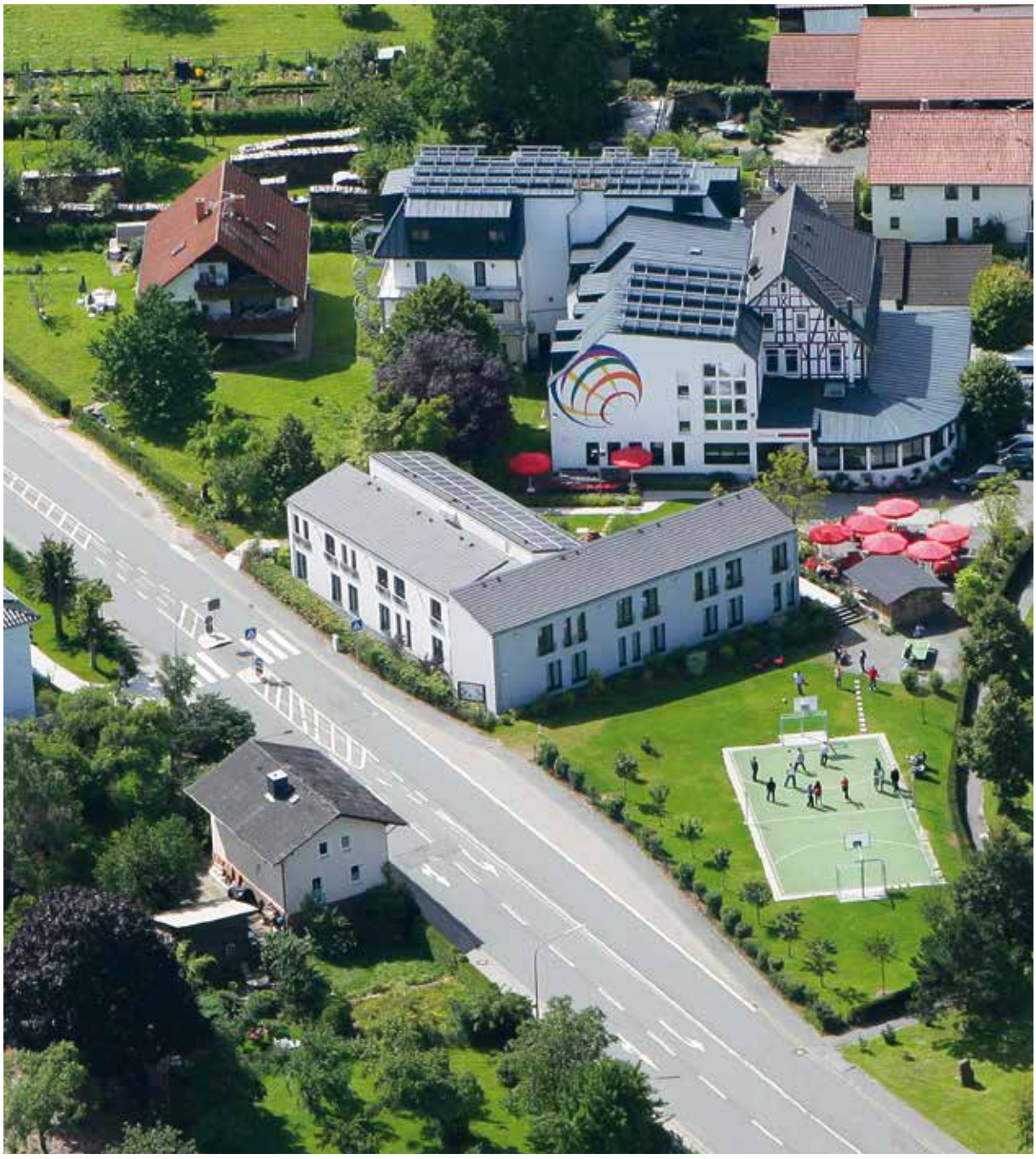
- *LED lighting*
- *LED advertising*

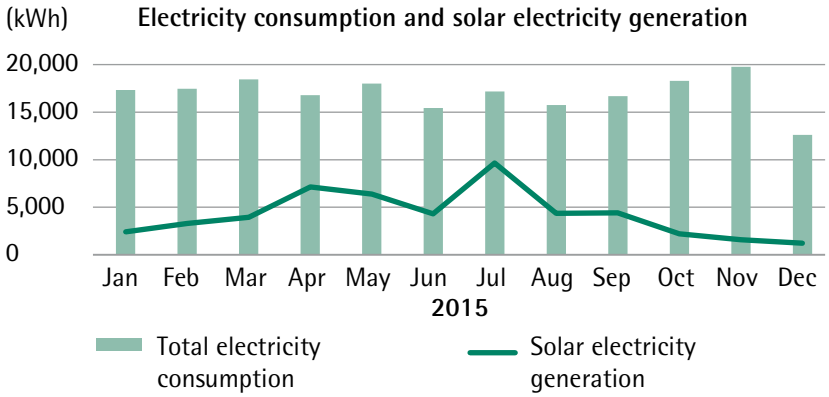
LED lighting is much more energy efficient than conventional lighting due to the fact that they consume much less power. For example, a typical 84 watt fluorescent bulb can be replaced by a 36 watt LED to produce the same level of light.

Furthermore, LEDs distribute light more efficiently and focus light in one direction, as opposed to other types of lighting which waste energy by emitting light in all directions (such as towards the ceiling). The same technology was also used for the advertising posters and signs at the premise.

ProCredit Academy in Fürth *Germany*

Built in 1870 as a hotel, the building was renovated in 2006 when it was established as the ProCredit Academy. Like the other ProCredit entities in Germany, the Academy adheres to the principles of the group's environmental management system (EMS), which aims to control energy and resource consumption, minimise environmental impact and facilitate sustainable operating practices that are based on green principles.
Today, the complex consists of the main Academy building, the guesthouse, and the language centre. These three modern, energy efficient and comfortable buildings consume energy produced on site from renewable sources, and the electricity and heating systems (with oil-fuelled heating as a back-up system) are nearly carbon neutral.





The average amount of electricity consumption compensated for by the photovoltaic system is

30%

Building envelope

- *Thermal insulation*
- *Triple-glazed windows*
- *Building management system*

The premises were renovated and the infrastructure was improved to optimise energy use. The guesthouse was constructed with the aim of fulfilling the standards of the Energy Saving Ordinance (EnEV) passed in 2004. The entire building, from cellar to roof, was fully insulated to maximise the building's energy efficiency. Furthermore, all double-glazed windows were replaced with triple-glazed models. In addition to the extra savings from the reduction in heating and cooling needs, triple glazing also reduces condensation. This allows a higher level of indoor humidity in cold weather to be maintained and reduces cold drafts, which increases the level of comfort for occupants.

Heating & cooling

- *Pellet boiler*

Hot water and central heating is provided by burning wood pellets from sustainable sources. This renewable energy source replaces traditional fuel options such as diesel, oil or natural gas.
Though wood pellet boilers do release carbon dioxide, it is the same amount that the tree absorbed as it grew – and therefore no additional carbon dioxide is released into the atmosphere.

Lighting

- *Highly efficient LED lighting und energy-saving bulbs*

In 2008, new energy-saving lighting was installed in all Academy buildings. Since then, only energy-saving bulbs and LED lights have been used in the Academy.
The range of available colours that LED lights come in makes them suitable for a wide range of purposes and applications; for example, bright white lights are used in the training rooms, while warmer yellow lights create a cosy atmosphere in the guest rooms. LED lights can also be dimmed to create the required lighting conditions.

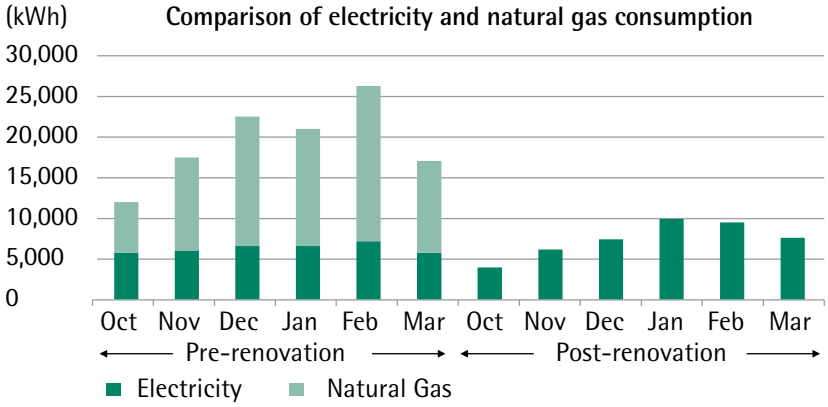
Green measures

- *Photovoltaic panels*
- *Renewable energy electricity supplier*
- *Focus on organic food and sustainable production*

Electricity is produced by photovoltaic panels on the roof and fed into the grid. The electricity produced compensates for about 30% of the total consumption. The electricity consumed at the Academy is provided by the grid, and originates entirely from certified renewable energy sources.
There is also a focus on organic food; much of the food purchased is produced in the local area. All meat prepared in the Academy kitchens is produced by a local farmer and butcher with high ecological standards. Since 2013, the Academy has also been growing its own vegetables and herbs in two greenhouses. This means that in summertime there is no need to buy lettuce or tomatoes.

ProHouse in Kyiv *ProCredit Bank Ukraine*

The ProHouse is an office building that was transformed into a guest house and training centre for ProCredit Bank Ukraine in 2014. In keeping with ProCredit group standards, the bank prioritises energy efficiency and the use of renewable energy technologies so as to increase energy independence and minimise long-term operating costs. The 639 m^2 building can accommodate up to 32 people and includes a study room, a library, two kitchens, a dining room and a laundry room. Every second Saturday, a tour is conducted for people who are interested in learning more about the environmentally friendly measures that have been implemented in the ProHouse.



Using geothermal heat pumps and a solar water heating system has reduced natural gas consumption to

0 kWh

Building envelope

- *Thermal insulation*
- *Solar film added to double-glazed windows*

During the planning phase, a conscious decision was made to maximise the energy efficiency potential of the building, with the ultimate aim of minimising the consumption of natural gas. To this end, 5 cm of basalt wool was added to the cavity brick wall for thermal insulation, while the roof was insulated with 15 cm of rock wool.
The existing double-glazed windows were kept but covered with solar window film to reduce passive solar heat gains that raise the internal temperature.

Heating & cooling

- *Geothermal heat pumps*
- *Ventilation system with heat recovery*

Nine wells with vertical pipes reaching depths of 95 metres each make up the ground source dual mode heat pump that provides the heating and cooling for the ProHouse. The ground source heat pump circulates a mixture of water and antifreeze around the loop of pipes buried in the ground. Heat from the ground is absorbed into the fluid and then passes through a heat exchanger into the heat pump, providing heating and cooling to the inside space. The ground stays at a fairly constant temperature under the surface, so the heat pump can be used throughout the year.

Lighting

- *LED lighting*
- *Motion sensors*

LED lights were installed not only inside the ProHouse, but also outside.

In addition, motion sensors were installed in all the common areas. This conserves electricity by only powering the lights while the given space is occupied.

Green measures

- *Solar water heating system*

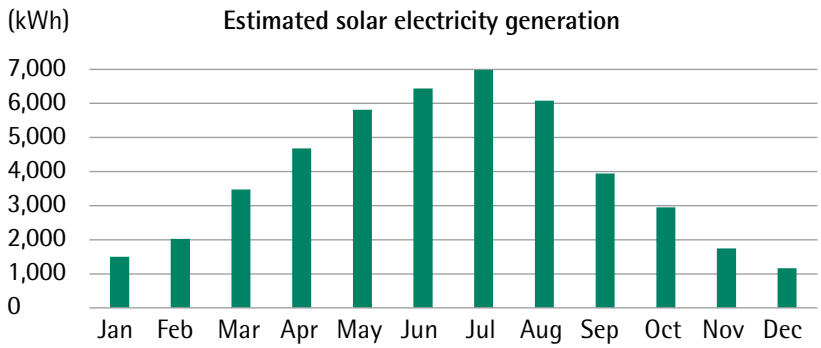
Ukraine enjoys up to 1,500 kWh/m^2 of solar irradiation annually. To take advantage of this renewable resource, the bank had nine flat-plate solar collectors installed on the roof. A flat-plate collector consists of a metal box with a clear cover on top and a dark-coloured absorber plate on the bottom.

Sunlight passes through the glazing and strikes the absorber plate, which heats up and converts solar energy into heat energy. The heat is transmitted to the liquid that passes through pipes attached to the absorber plate. This solar-heated water is then circulated inside the building and used for heating and hot water.
The combination of the geothermal heat pumps and the solar water heating system has a payback period range of between 14 to 22 years, depending on gas prices.

Training Centre in Prevalle *ProCredit Bank Kosovo*

The Training Centre in Prevalle, a region close to the city of Prizren, was built as a facility for training ProCredit Entry Programme participants, including those from the neighbouring ProCredit banks in Macedonia and Albania, which also use the facility for their own needs. The two-storey building, opened in 2016, can accommodate 30 students and six teachers or guests, and includes a canteen, sports facilities and a spacious garden.

The building is located in a mountainous area with an altitude of more than 1,000 metres. The climate is generally unforgiving, including especially harsh winters with low temperatures and high snowfall. Accordingly, to avoid high energy consumption levels, careful planning went into the design of the building envelope and the cooling and heating systems used in the building.



Annually, the photovoltaic system on the rooftop can generate an estimated

47 MWh

Building envelope

- *Thermal insulation*
- *Triple-glazed windows*

The building envelope (external walls and roof) was insulated with 10 cm of polystyrene. Building envelope insulation is critical for lowering the costs of heating and cooling, as it prevents the loss of heat. Reducing the amount of heat loss contributes to a much more stable inside temperature. As more heat will therefore be retained for longer periods, the heating system does not have to work as often or as long.
Triple-glazed windows also help to maintain the indoor temperature, and are particularly important in regions like Prevalle, where temperatures in winter often drop below zero degrees Celsius.

Heating & cooling

- *Pellet boiler*
- *Energy efficient heat pump*

The pellets used in the Training Centre are purchased from a certified pellet producer to ensure that the pellets are made from sustainably managed wood.
This system is combined with a heat pump cooling and heating system. The efficient heat pump is used for cooling, but also for heating when the temperatures are not very low. In lower temperatures, the pellet boiler is activated.

Green procurement

- *Photovoltaic panels*
- *Solar water heating system*
- *Waste water treatment*

The space in front of the Training Centre has been used for the installation of photovoltaic panels and a solar water heating system. The 100 photovoltaic panels have a total production capacity of 30 kWp, which can generate an estimated 46,800 kWh of electricity annually. The photovoltaic system is off-grid and the energy produced will cover approximately 15% of the Training Centre's electricity demand.

In order to fully utilise the solar resources, additional solar water heating panels were installed. In total 30 flat panels were installed in front of the building. These panels are connected to the central heating system of the building, and the energy they generate can be used to heat the sanitary water and the building itself.
Due to the remote location of the Training Centre, there is no access to the sewage system. A waste water treatment plant was therefore constructed on site to purify waste water and recover clean water in underground streams.

Glossary

Term	Explanation
Biomass	This term covers all biological material that is derived from living or recently living organisms, including forest residues, animal manure, wood chips and various plants. It is used not only as a source of fuel for heating, but can also be converted into transportation fuels such as ethanol or biodiesel.
Carbon dioxide (CO_2)	Carbon dioxide is the most important greenhouse gas because so many human activities contribute to large emissions of CO_2. Carbon dioxide is an important heat-trapping (greenhouse) gas, which leads to an increase in the Earth's temperature (i.e. global warming), which then leads to climate change.
Carbon footprint	The carbon footprint measures the environmental impact of an individual, a lifestyle, an activity, or an organisation's product or operation, in units of carbon dioxide.
Carbon neutral building	A carbon neutral building refers to achieving net zero carbon emissions by balancing a the carbon released (through the consumption of energy) with the equivalent amount sequestered, offset (e.g. with renewable energy generation) or with the purchase of carbon credits.
Eco-Management and Audit Scheme (EMAS)	The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance.
Energy efficiency	Energy efficiency refers to the amount of energy required to produce a given service or level of activity. The more energy efficient a technology or product is, the less energy it requires to produce the same level of service or activity.
Energy Saving Ordinance (EnEV)	The *Energieeinsparverordnung* (Energy Saving Ordinance) is a regulation in Germany describing minimum requirements regarding energy use of new and renovated buildings.
Environmentally friendly	The term "environmentally friendly" is used to denote products or actions whose purpose is to reduce the negative impact on the environment. For example, environmentally friendly paper may be made from non-wood sources, or made from responsibly maintained and sustainable forests.
Geothermal heating and cooling	Geothermal heating is the use of energy within the Earth from the ground for the application of heat, most commonly in space heating. The same technology can be used for cooling by using the ground as a heat sink: heat is absorbed from the interior space and transferred to the underground loop, where it is then absorbed by the cooler earth.
Heat pump	A heat pump is a device that channels heat energy from a source of heat to a destination through a liquid medium. Heat pumps usually run on electricity and are very efficient. They are considered to be the most environmentally friendly heating system because they do not burn fossil fuels (gas, oil) or biomass (wood, etc.) directly to generate heat.
Heat recovery ventilation	Heat recovery ventilation uses a heat exchanger between the inbound and outbound air flow to make use of heat that would be otherwise wasted.
HVAC (heating, ventilation, and air conditioning)	HVAC is the technology of indoor environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality.

Term	Explanation
Kilowatt (kW)	A kilowatt is equal to one thousand watts (W) and is typically used to state the capacity of engines or the power consumption of tools, machines and electrical equipment.
Kilowatt hour (kWh)	A kilowatt hour is a unit of energy that is used to measure the amount of energy delivered by electric utilities in an hour. It is a product of power in kilowatts (kW) and time (in hours h).
LED (light-emitting diode)	A semiconductor diode that converts applied voltage to light and is used in lamps and digital displays.
Low-emissivity (low-e)	Low emissivity refers to a surface that emits low levels of radiant heat energy, making it more energy efficient (in the case of windows).
Natural gas	Natural gas is a type of fossil fuel, a hydrocarbon gas made up mainly of methane. It is an energy source commonly used for electricity generation, heating and cooking.
Organic food	Organic food is food produced in a way that aims to cycle resources, promote ecological balance, and conserve biodiversity. The use of certain pesticides and fertilisers is also restricted and controlled in organic farming.
Renewable energy	Renewable energy sources are replenished by natural processes on a timescale sufficiently rapid to allow humans to use them more or less indefinitely. These include animal dung, ethanol (derived from plant sugars), wood, wind, falling water and sunlight. The benefit of using renewable energy is that it avoids burning fossil fuels (coal, oil, natural gas) and therefore reduces the emission of greenhouse gases.
photovoltaic panel	A photovoltaic (PV) panel is composed of individual PV cells which convert light energy from the sun into electrical energy.
photovoltaic system	A photovoltaic system is made up of PV panels, an inverter and the cables connecting them.
Solar water heating system (SWHS)	A solar water heating system heats water using the heat from the sun and then channels it to the building as space heating or as a source of hot water.
Waste water	Any water that has been adversely affected in quality by human influence is considered waste water. It can originate from a combination of domestic, industrial, commercial or agricultural activities, surface runoff or storm water, and from sewer inflow or infiltration.

Appendix

Page/Graph title	Data source and explanations
p 7 **Estimated solar electricity generation**	This graph shows the estimated monthly electricity that can be generated by the 24.6 kWp PV system in a generic year, which adds up to 33 MWh of solar energy annually. The figures on energy generation were estimated using the Photovoltaic Geographical Information System (PVGIS), which can be accessed at (http://re.jrc.ec.europa.eu/pvgis/index.htm).
p 9 **Comparison of average monthly energy consumption per m²**	This graph compares the average monthly energy consumption (incuding, but not limited to, heating and electricity consumption) per square metre of the old head office and the new head office of ProCredit Bank Georgia. The functions served by the old head office building are also served by the new head office. Like its predecessor, the new head office houses additional outlets. The average monthly energy consumption of the old head office pertains to the year 2012, whilst the consumption for the new head office was obtained by averaging the monthly consumption of the years 2013, 2014 and 2015.
p 11 **Comparison of annual heating requirements**	The graph compares the annual heating demand per square metre of the renovated Niš building to the current official Serbian regulation on heating energy performance for office buildings. Serbian construction regulations require that heating energy use may not exceed 65 kWh/m²a. The heating requirement for the Niš branch is 90% lower than the standard required by regulations. The heating requirements of a building, also known as the heating demand, is a measurement of the amount of heat energy required to heat the building to a predetermined temperature. Therefore, the more well-insulated the building envelope of a building, the lower the heating demand.
p 13 **Comparison of annual electricity consumption**	This graph compares the annual electricity consumption of the PCB premise in Shumen vs the new premise, which consumes 19% less. For the comparison, twelve-month periods were used. For the previous Shumen premises, data from 2014/15 was used; for the new Shumen premises, the data was taken from 2015/16.
p 15 **Electricity consumption and solar electricity generation**	This graph shows the monthly electricity consumption of the ProCredit Academy in Fürth and the monthly solar electricity generation for 2015. Comparing the average electricity consumption to the average solar electricity generation shows that approximately 30% of the electricity consumption is compensated for by the electricity generated from the PV system.
p 17 **Comparison of electricity and natural gas consumption**	This graph shows the energy (electricity and natural gas) consumption of the ProHouse building during the heating season before (October 2013 – March 2014) and after renovation (October 2015 – March 2016). Before the renovation, the building was an office and used natural gas for hot water and space heating. After the renovation, the ProHouse now serves as a training centre with accommodation facilities; due to the installation of the geothermal heat pumps and the solar water heating system, there is no more need to use natural gas for heating. The slight increase in the electricity consumption can be attributed to use of the geothermal heat pumps, which require electricity for their operation.

Page/Graph title	Data source and explanations
p 19 **Estimated solar electricity generation**	This graph shows the estimated monthly electricity that can be generated by a 30 kWp PV system in a generic year, which adds up to 47 MWh of solar electricity per year. The figures on energy generation were estimated based on solar radiation figures from the Photovoltaic Geographical Information System (PVGIS), which can be accessed at (http://re.jrc.ec.europa.eu/pvgis/index.htm).

In the production of this report, 202 kg of CO_2 was generated during printing and transport. These emissions were made climate neutral by ProCredit Holding AG & Co. KGaA through the purchase of certificates from recognised climate protection projects under transaction ID code DE-140-314438; www.natureoffice.com.

FSC certified: This document is made from 100% recycled material.

ProCredit Holding AG & Co. KGaA
Rohmerplatz 33-37
60486 Frankfurt am Main, Germany
Tel. +49-(0)69 - 95 14 37-0
Fax +49-(0)69 - 95 14 37-168
www.procredit-holding.com