



ProCredit
H O L D I N G



Our clients' green investments

A selection of environmentally friendly investments supported through ProCredit's green financing approach



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.

Content overview

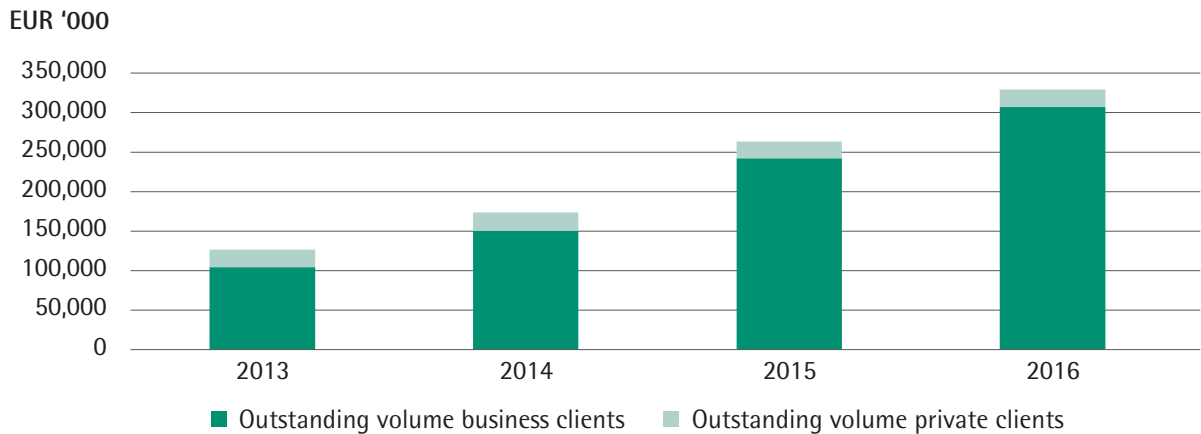
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Green finance at ProCredit

Environmental protection is often overshadowed by the pressing issues of everyday life, thus making the market environment in the countries in which we operate less conducive to green finance. As a result, ProCredit banks are doing much more than merely designing new types of loans for green purposes – we devote resources to awareness-raising campaigns and regular training sessions for our own staff, enabling them to improve the environmental performance of the companies we work with. The steady growth of the group's green loan portfolio is a testimony to our intensive efforts in this regard. Comprehensive training for our staff is not only provided at bank level, but also at group level in the ProCredit Management and Banker Academy located in Fürth, Germany.

By introducing green finance, we have encouraged many of our clients to make sound investments in environmentally friendly projects. This brochure highlights some showcase investments and demonstrates what these businesses have been able to achieve in this field.

ProCredit group green portfolio development for private and business clients



The ProCredit green loan portfolio is broken down into three categories, consisting of investments in energy efficiency (EE), investments in renewable energy (RE) and investments that have a beneficial impact on the environment (GR). Classifying loans as "green investments" is subject to strict guidelines.

The ProCredit group defines an EE investment as one that improves a client's energy efficiency. This can be achieved, for example, by installing more efficient equipment that results in significant energy savings, or by installing equipment that is the best available technology on the market.

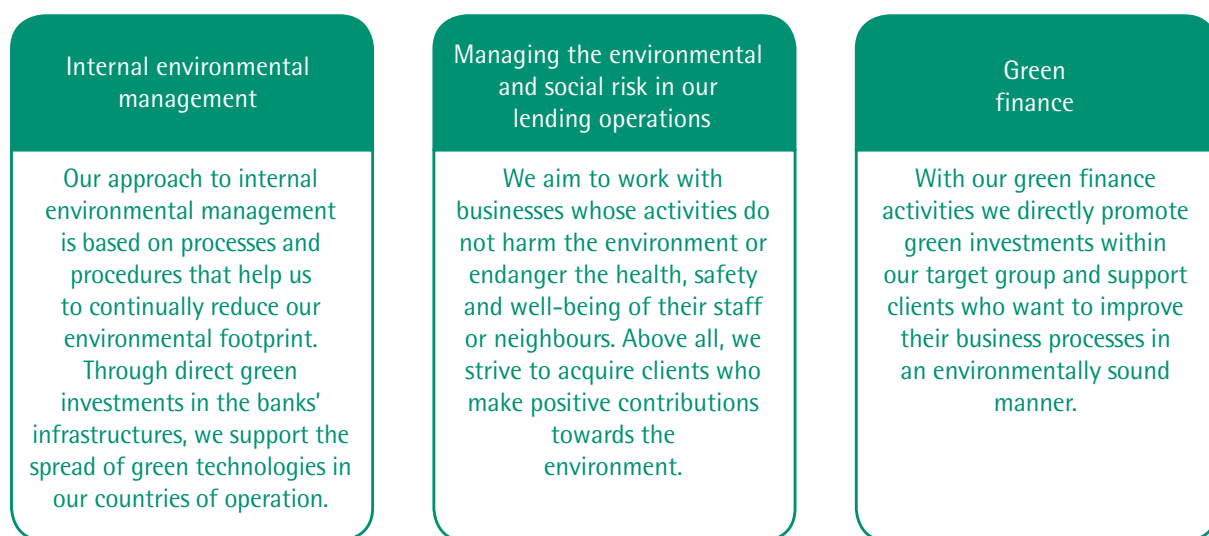
ProCredit banks also support investments in renewable energy technologies (RE), primarily in solar water heaters, photovoltaic installations, small hydropower plants and wind power turbines, as well as biogas and biomass applications.

Investments that are inherently environmentally friendly and help to conserve the quality and availability of natural resources, such as soil, air and water, are covered under the GR category. Examples include no-till farming and drip irrigation systems.

Jointly addressing environmental challenges

Offering green finance services also means taking a hard look at the credibility of the ProCredit group itself, especially where its own performance with regard to the environment is concerned. Green finance is only

one of the three pillars of ProCredit's Environmental Management System (EMS), which was introduced group-wide in 2011.



The EMS encompasses not only internal measures to minimize the environmental impact of the ProCredit institutions, but also includes mechanisms to assess the environmental and social impact of its clients. ProCredit institutions continuously monitor their own environmental performance when it comes to the consumption of natural resources and the renovation of business premises. Our procurement guidelines are also heavily influenced by environmental concerns. The organisational units at group and bank level (the environmental committees and environmental coordinators) facilitate organisational learning as well as the promotion and anchoring of environmental awareness in all institutions. Furthermore, the exchange of knowledge on technologies across the group is also ensured.

As a Hausbank for small and medium businesses, ProCredit banks seek to establish long-term relationships with its clients based on mutual trust. The group's development mission states that economic development may not be promoted at the expense of the environment. More precisely, encouraging economic advancement by increasing environmental awareness and by contributing to environmental protection has always been a vital part of ProCredit's identity. This is why ProCredit banks aim to serve responsible small and medium enterprises that create jobs in the regions in which they operate. Engaging in fruitful dialogue with clients and designing green finance services to promote environmentally sound investments has thus become a key part of the group's business strategy. ProCredit is acutely aware that promoting environmental sustainability can best be achieved by supporting like-minded businesses.

Our long-term relationships with clients and accumulated expertise have enabled us to engage in dialogue with them in order to provide information on environmentally friendly investment choices. However, the goal is not only to promote green investments. The overarching goal is to contribute to the dissemination and establishment of innovative technologies and practices that benefit the societies in which we operate. This brochure aims to illustrate what our clients have achieved with their investments and puts a spotlight on the technological solutions that have had a significant positive impact on environmental protection. All of these investments benefit both business development and the environment. Most are very innovative within their markets, whereas others can now be considered "standard green investments" among our target client group. Each of the cases presented in this brochure proves that improved environmental performance does not come at the expense of business performance, but instead goes hand in hand with it. As you will see, just as ProCredit banks often serve as role models when it comes to green procurement and buildings, many of our clients serve as role models among their peers by investing in environmentally friendly measures.

Automatized milking equipment *ProCredit Bank Albania*



Most dairy farms in Albania have milking systems which involve a significant amount of manual work and which are more appropriate for smaller farms. However, bigger farms can invest in an automated milking system, as our client (who owns 300 head of cattle) has done through consulting with ProCredit Bank Albania.

This system combines speed-controlled vacuum pumps, milking machines and cleaning functions. The milking stand shows essential information about each individual animal; further details, such as health data, can easily be pulled up as well.

Furthermore, the system enables milk sampling by displaying the box and bottle numbers and calculates the sample volume to be taken. These features make the process of management and milking more effective for business owners.

By investing in an automated milking machine, the dairy farm owner has reduced energy consumption by an estimated 48% while increasing productivity by 7%. In addition to these benefits, a modern automated milking system also allows for animal identification and herd management. A small amount of milk from each cow can be tested, providing vital information about the health of the animals. This in turn enables early detection of diseases and better management of the herd.

Advantages

- Significant energy savings compared to the older, less efficient system
- Increased productivity due to the automation of processes
- Additional processes available with the more modern equipment
- More effective business and process management
- Increased hygiene level

An automated milking machine can increase productivity by

7%

Compared to older machines, the automated milking machine leads to energy savings of

48%

Printing equipment *ProCredit Bank Macedonia*

Advantages

- *Increased productivity*
- *Wider product range*
- *Increased energy efficiency*
- *Cost savings due to reduced energy consumption*
- *Increased workforce efficiency*

The new printing machine leads to energy savings of

90%

Using the new printing machine can increase productivity by

50%



The printing industry plays an important role in every city – producing packaging, labels, calendars, posters, fliers and corporate materials, among other items. Due to the large number of companies in the printing business, increasing energy efficiency by investing in the appropriate equipment can significantly reduce the environmental impact of the industry.

Therefore, ProCredit Bank Macedonia actively engages in discussions with its clients to encourage them to invest in modern and more energy-efficient printing equipment.

The bank recently supported an investment in a fully automated printing machine. The machine has multifunctional operations (available in two to eight-colour versions, with optional inline perfecting and/or coating processes), thus increasing production possibilities while keeping energy consumption low.

The new printing machine is flexible, reliable and also compact, so it occupies very little space. Furthermore, it consumes 90% less energy than the older model, and it takes just one employee a half-day's work to operate the machine at full capacity. Not only does the client benefit from reduced energy consumption (leading to cost savings), but also from increased productivity and a more efficient workforce.

Electro-mobility loan *ProCredit Bank Bulgaria*



Cars produce a significant amount of carbon emissions and greenhouse gases, which are released into the atmosphere and cause air pollution. Fully electric cars are one way of preventing these negative environmental impacts. In Bulgaria, electric vehicles are a fairly new sight, with only an estimated 200 fully electric vehicles on the roads.

To encourage growth in this market as well as investments in electric vehicles, ProCredit Bank Bulgaria has developed the Eco-Mobility Loan, which is available to both business and private clients. This loan allows them to benefit from municipal subsidies and other benefits, such as lower fees and reduced parking charges.

Electric vehicles are particularly suited for intra-city transport. Therefore, businesses such as food delivery service providers, couriers, taxi companies and government organisations can all take advantage of these benefits, while displaying environmentally friendly behaviour.

ProCredit Bank Bulgaria is also in close communication with the city of Sofia regarding the establishment of an infrastructure for electric vehicles. This potential cooperation would involve financing from ProCredit Bank, the purchase of approved equipment and the installation of charging stations.

Advantages

- Possibility of receiving subsidies for businesses and individuals
- Potentially lower fees and reduced parking charges
- Suitable for transport within a city
- Development of local infrastructure for electric vehicles
- Electric vehicles are far less polluting than petrol or diesel vehicles, improving air quality
- Reduced emission of carbon dioxide and other greenhouse gases

Using an electric car reduces yearly CO₂ emissions by

38%

Energy savings resulting from switching to electric cars are approximately

80%

Heat recovery system *ProCredit Bank Kosovo*

As Kosovo is heavily reliant on coal and oil for electricity and heat production, energy efficiency is a particularly important topic. Small reductions in energy consumption can lead to a significant reduction in greenhouse gas emissions and thereby decrease the environmental impact.

In many production processes, especially in food production, heat is a significant source of energy consumption. A waste heat recovery system, which collects and re-uses heat – created during various processes – that would otherwise be lost, is an effective method of reducing energy consumption.

This is one of many energy-efficient technologies supported by ProCredit Bank Kosovo. For example, a beverage producer is investing in a new industrial complex to refine edible oils, which will be the first of its kind in Kosovo.

The heat recovery system built into the new edible oil refining machines makes it possible to recover 80% of the energy released by the whole system. The high-pressure steam boiler has an efficiency ratio of 85% and all of the electric motors in the system fulfil the IE3 efficiency standards, the second most efficient class of electric motors.

Advantages

- *Reduced energy consumption through the recovery of waste heat*
- *Reduced energy-related costs*
- *Introduction of an innovative technology*
- *Reduced greenhouse gas emissions*

The heat recovery system can result in heat recovery of up to

80%

The efficiency of the high-pressure steam boiler is

85%



CNC machinery for oven production *ProCredit Bank Ecuador*

Historically, Ecuador's economy has been dominated by primary and extractive industries, such as agriculture, aquaculture, forestry and petroleum. More recently, however, there has been growth and investment in highly energy-intensive industrial sectors, such as manufacturing, which makes energy efficiency among businesses a priority.

The oven production process offers ample opportunity for improvements in energy efficiency. Many different machines are involved in the production of an oven, each performing a unique procedure and requiring at least one operator. Streamlining these processes with computer numerical control machines (CNC) allows a series of steps to be combined, as was the case with an investment in a CNC machine for oven production financed by ProCredit Bank Ecuador.

Equipment manufacturers are aware of the importance of energy efficiency, productivity and quality in the machinery they produce for their clients. Therefore, reducing energy consumption in their own production processes is also key, especially for producers of machinery that is marketed as modern and energy efficient.

In this case, the new CNC machine combines three steps (unwinding, shearing and straightening),

Advantages

- *Reduced energy consumption and costs*
- *Increased productivity*
- *Increased quality of the output due to more precise cutting*
- *More efficient workforce*
- *Reduced usage of raw materials*

Using a CNC machines can lead to energy savings of more than

20%

Annual maintenance costs of the CNC machine are significantly lower by

87%

thus replacing three older machines, and produces perforated metal sheets, all the while consuming 20% less energy.



Biogas plant *ProCredit Bank Ukraine*



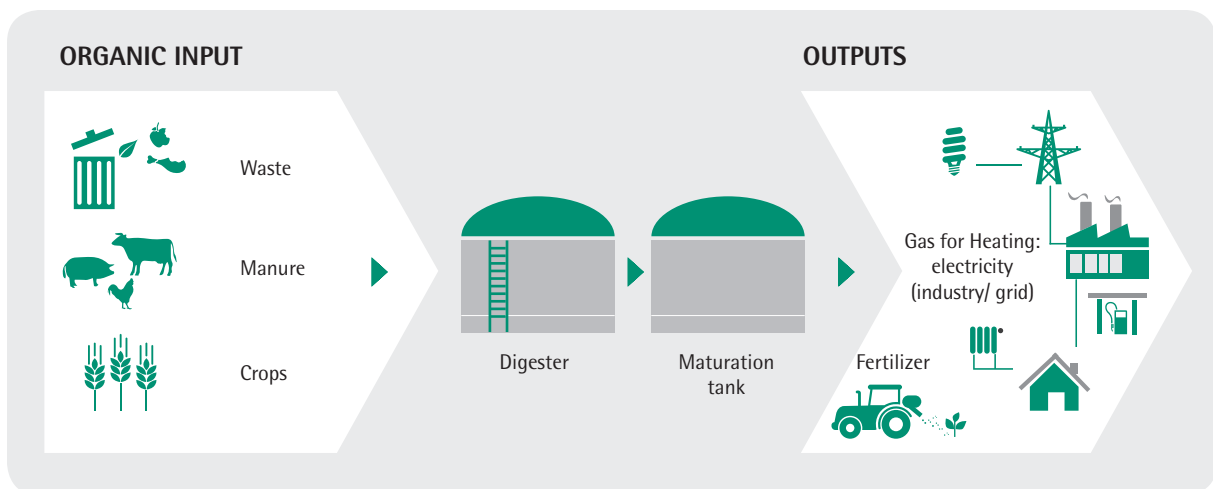
For livestock farms, waste disposal poses a major environmental and managerial challenge. A solution that also reduces energy costs is to use this waste for the production of biogas.

Manure is sent to the bioreactor, where anaerobic fermentation takes place. Energy crops are added to the bioreactor to make the process more stable. Biogas is produced as a result of the fermentation process. The biogas is then processed in two stages of treatment to remove harmful elements before being burnt to generate electricity and/or heat. The biogas plant supported by ProCredit Bank Ukraine produces 315 kW of electrical energy and 450 kW of heating energy, which is used to heat one of the largest pigsties.

Advantages

- *Generation of own electricity and/or heat*
- *Reduced heating and electricity costs*
- *Reduced reliance on grid electricity and/or heat*
- *Environmentally friendly solution for waste (manure) disposal*

In addition to the significant electricity savings and reduction in energy costs, the plant also contributes to a decrease in the overall environmental impact in the region, as the feedstock for the biogas digester is sourced locally, thus solving the waste management issue.



Solar drip irrigation system *ProCredit Bank Serbia*

Serbia enjoys relatively high solar radiation of between 1,200 to 1,500 kWh/m² per year, which translates into an average annual potential of 1,350 kWh/kWp of electricity from solar panels.

For agricultural businesses, this solar energy potential can be harnessed to fuel the irrigation process. Solar energy is converted into electricity by solar photovoltaic panels. This energy powers the pump that provides the irrigation required for crops. This system contributes to a reduction in operating costs and improved productivity. The stand-alone energy system can generate an estimated 9,450 kWh per year.

Thanks to simple operation and maintenance and no fuel requirements, the solar-powered irrigation drip system is cleaner, more reliable and less expensive than conventional pumps in Serbia. These systems can also be used at locations that do not have a connection to the grid.

To promote these investments, ProCredit Bank Serbia cooperates with a consultancy company that provides advisory services and solar equipment (with installation). The client makes the investment, financed by the bank, while the bank's partner consultancy takes over the interest payments.

Advantages

- *Optimised water usage through drip irrigation and increased soil protection*
- *Eliminates CO₂ emissions from the irrigation process and reduces primary energy consumption*
- *Reduced pollution and decreased risk of diesel leaks in the fields*

Using a solar drip watering system reduces annual fuel usage by

3,000 litres

Annual solar electricity generation is an estimated

9,450 kWh



Wind turbine *ProCredit Bank Germany*

Advantages

- *Generation of clean electricity with no carbon emissions*
- *Reduced energy costs*
- *Small footprint with minimal impact on the land at the base*
- *Use of existing land without reducing usable land area*

Annually, a 2.3 MW wind power turbine can generate an estimated

5.2 GWh

The generated electricity can power approximately

2000 households

Wind power plays an important role in Germany, which is the EU country with the highest operational capacity (44% of the total EU installations in 2016¹). Germany's wind power capacity has been increasing annually, with a total capacity of more than 50 GW at the end of 2016².

Wind energy is a renewable, sustainable and environmentally friendly means of power generation. ProCredit Bank Germany supports such investments through project financing. A recent project was financing a wind turbine in the south of Germany. Installed at an altitude of more than 1000 metres, the 2.3 MW wind turbine operates at wind speeds of between 2 m/s and 25 m/s.

As air flows past the turbine, the wind energy rotates the three blades, spinning a generator to



create electricity. With pitch control technology, the turbine can turn and adjust itself to obtain the maximum power from the wind. Additionally, a supervisory control and data acquisition (SCADA) system allows remote monitoring of the wind turbine.

¹ <https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Statistics-2016.pdf>

² Ibid.

Wastewater treatment *ProCredit Bank Bosnia and Herzegovina*



Wastewater treatment facilities are a rare sight in Bosnia and Herzegovina, which means that all residential areas and companies are significant sources of pollution. Wastewater treatment is therefore important, as it mitigates the potential for water pollution and also presents a sustainable short-term and long-term solution to water scarcity.

As companies start to consider their options for managing their wastewater, ProCredit Bank Bosnia and Herzegovina has financed investments in vacuum evaporator wastewater treatment equipment.

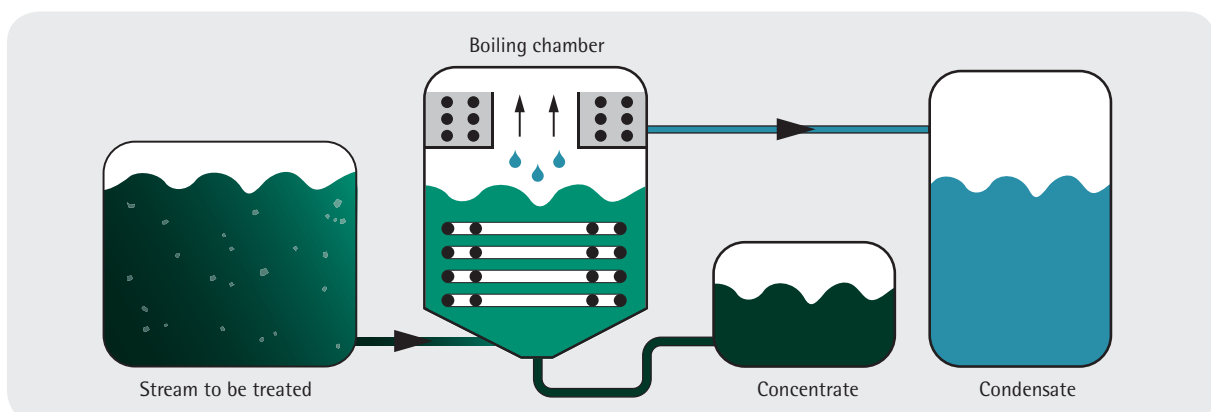
The wastewater that is to be treated is pumped into the boiling chamber, where it is heated so that the water content evaporates. The clean condensate can then be safely discharged into the water system. The concentrated sludge is channelled

Advantages

- Standalone mobile solution
- Mitigates the potential for water pollution
- Reduces negative impact on the environment
- Keeps potential diseases and bacteria from entering other water sources
- Sustainable short-term and long-term solution to water scarcity

out from the bottom of the boiling chamber, thus separating the waste from the clean water.

In addition to the stand-alone system, this vacuum evaporator system is also combined with a mobile wastewater treatment truck, which petrol stations use for their cleaning needs.



Mini-till farming *ProCredit Bank Moldova*

Advantages

- *Increased productivity due to reduced working time in the field*
- *Crop yield is less dependent on climatic conditions*
- *More efficient seed sowing*
- *Significant soil protection due to less erosion, fewer soil disturbances and better soil moisture conservation*

Mini-till farming reduces fuel costs by

43%

Within 5 years, productivity can be increased by up to

48%

Historically and economically, Moldova has relied heavily on agriculture, with farmland accounting for almost three quarters of the total land area. Most of this agricultural land is managed conventionally, whereby the land is ploughed before the crops are seeded. This traditional method allows for large harvests and facilitates weed management, but also leads to higher compaction and erosion risks, disturbance of the soil structure and excessive soil moisture losses.

To avoid these negative environmental impacts, ProCredit Bank Moldova finances investments in mini-till technology, which minimises soil disruption by cutting out the ploughing step from the seedbed preparation process. This alleviates the potential negative impacts arising from this method of soil preparation, such as soil erosion.



Mini-till farming not only makes the seed sowing process more efficient, but also reduces seed consumption by up to 10%. Seeds sown with mini-till technology are also more resistant to drought. The working width of the drills ranges between 7.5 to 9 metres, shortening the time required for working the field and thereby increasing productivity.

Moreover, during mini-till and no-till farming practices a protective plant debris layer forms on top of the soil, protecting it from adverse climatic conditions and reducing the vulnerability of agricultural work to climatic conditions.

Organic food production *ProCredit Bank Romania*



The term "organic" refers to the way agricultural products are grown and processed. In the European Union, laws on the manufacture of organic products forbid the use of genetically modified organisms as well as the use of products derived from them. Foods may only be labelled "organic" if at least 95% of their agricultural ingredients meet the necessary standards.

The European organic market is significant, accounting for 38% of retail sales worldwide in 2014. The growing interest in organic products can also be seen in Romania, with increasing demand from consumers who value the environmental benefits of organic farming. However, there are not enough certified processors in Romania, which means that Romanian raw material has to be exported to other countries, where the products are manufactured and exported back to Romania at significantly higher prices in order to fulfil the requirements of organic certification.

ProCredit Bank Romania strongly encourages the development of organic food processing. Through

Advantages

- *Incentivised development of the local organic food processing industry*
- *Increased availability of organic food*
- *More healthy products that contain less pesticide residue*
- *Environmentally friendly, because organic farming:*
 - *reduces pollution and soil erosion*
 - *increases soil fertility*
 - *uses less energy*
 - *better for local flora and fauna*

the bank's green loans, organic food processors can obtain working capital that supports their production processes and helps them to achieve standards that will allow them to access the market for organic foods. One such client is an organic pastry and bread producer, certified by Austria Bio Garantie, which inspects and certifies organic products throughout the entire food chain.

Pivot sprinkler irrigation system *ProCredit Bank Georgia*

Agriculture is one of the most vital areas of economic development in Georgia. Most farmers use free flooding and hose reel irrigators to provide the water required for their crops. However, these irrigation methods are inefficient, using a relatively high amount of water to irrigate the required area of land. This exacerbates the already problematic levels of water consumption in Georgia.

An alternative solution is a pivot sprinkler irrigation system, an investment that is supported by ProCredit Bank Georgia, which is actively engaged in providing financing for environmentally friendly technologies for agribusinesses.

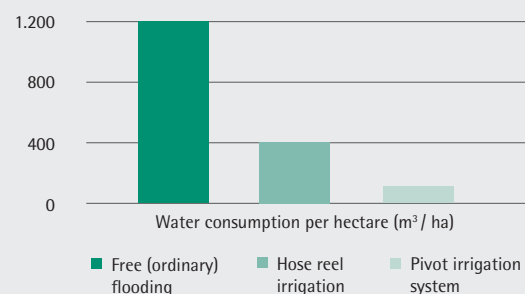
Pivot sprinklers provide overhead irrigation by means of a system consisting of several segments of pipe (usually galvanised steel or aluminium) joined together and supported by trusses. The machine moves in a circular pattern, hence the name "pivot" irrigation system.

A pivot system ensures uniform irrigation, is easy to manage and results in high-quality produce and maximum yields. It is simple, reliable and has a long life expectancy (25 years or more).

Advantages

- Ensures uniform irrigation
- Easy to manage
- Maximises crop yield
- Results in high-quality produce
- Fully automated
- Reduces water consumption
- Avoids negative environmental impacts of flood irrigation

Analysis of water consumption with different irrigation methods



Furthermore, it is automated and does not require additional workforce; it can even be operated remotely, by mobile phone or personal computer.



Appendix

P	Case	Key figure/ Graph explanation
6	Automatized milking equipment	<p>Increase in productivity</p> <p>The new automated milking system accelerates the milking process, increasing productivity by 7% (in units of milk) compared to the client's previous milking system.</p>
		<p>Energy savings</p> <p>The energy efficient components of the automated milking system are the milking vacuum pump, which has a variable speed drive, and the IE2 motor. Compared to a baseline milking vacuum pump with constant speed and an inefficient (IE1) motor, and assuming the same capacity and working hours, the annual energy consumption (kWh) of the automated milking system is 48% lower than the less efficient system.</p>
7	Printing equipment	<p>Energy savings</p> <p>Comparing the new energy efficient and fully automated printing machine to the client's previous – and older – machine, energy savings (kWh) of 90% can be achieved.</p>
		<p>Increase in productivity</p> <p>The new printing machine has a significantly larger format, which doubles the produced output in the same amount of time. The productivity of the new printing machine is therefore at least 50% greater.</p>
8	Electro-mobility loan	<p>CO₂-reduction per year</p> <p>Compared to diesel cars, electric cars produce 38% less carbon dioxide emissions based on the Bulgarian electricity mix (229 gCO₂/MJ according to the Bulgarian government Ordinance E-RD-04-2 published in January 2016).</p>
		<p>Energy savings</p> <p>Assuming the same annual mileage and considering the average fuel and electricity consumption for diesel and electric cars, the energy consumption of electric cars is 80% lower than that of diesel cars in Bulgaria.</p>
9	Heat recovery system	<p>Heat recovery/ Boiler efficiency</p> <p>These figures were provided by the supplier of the equipment.</p>
10	CNC machinery for oven production	<p>Energy savings</p> <p>The new CNC production machine can carry out three different production steps; therefore, the three older machines (with a total capacity of 23 kW) could be replaced with just one CNC machine (with a capacity of 15 kW). Assuming the same working hours, the energy consumption of the new CNC production machine is more than 20% lower than that of the three older machines</p>
		<p>Maintenance costs</p> <p>With the newer CNC machines, maintenance does not need to be carried out as frequently. In addition, because the new CNC machine replaces three older machines, less overall maintenance time is needed, which lowers maintenance costs. Altogether, the client's annual maintenance costs are reduced by 87%.</p>

P	Case	Key figure/ Graph explanation
12	Solar drip irrigation system	<p>Annual fuel usage reduction</p> <p>By switching to a solar drip watering system (powered by solar electricity), the client will no longer need a diesel-fuelled pump. This saves about 3,000 litres of fuel per year.</p>
		<p>Annual solar electricity generation</p> <p>Approximately 28 polycrystalline solar photovoltaic modules of 250 W each power the pump, which can generate an estimated 9,450 kWh annually based on the solar radiation potential of Serbia (~1,350 kWh/kWp). For the client, this is enough to fully replace the diesel pump.</p>
13	Wind turbine	<p>Estimated annual electricity generation</p> <p>Both figures are client estimates, based on the projected wind conditions on site.</p>
15	Mini-till farming	<p>Fuel cost savings</p> <p>Mini-till farming results in fuel cost savings of approximately 43% due to the reduction in energy consumption (as less tillage is required), larger seed tanks (which means fewer interruptions and quicker seeding), and the fuel-efficient tractor.</p>
		<p>Increase in productivity</p> <p>The calculations compare traditional farming to mini-till farming and measure the output (in kilograms) of various crops, such as wheat, corn, sunflowers and soybeans.</p> <p>The results show that after five years, mini-till farming leads to an increase in productivity of 48%.</p>
17	Pivot sprinkler irrigation system	<p>Water consumption per hectare</p> <p>This graph shows the comparison of water consumption per hectare of the different irrigation methods (free flooding, hose reel irrigation and the pivot sprinkler irrigation system). Compared to the pivot irrigation system, which entails water consumption of 120 m³/ha, hose reel irrigation and free flooding require 3.3 times and 10 times more water, respectively.</p>



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