



European Bank
for Reconstruction and Development

KIDSF

Kozloduy International
Decommissioning
Support Fund



Bulgarian Energy Efficiency and
Renewable Energy Credit Line



Participating Banks

Allianz Bank Bulgaria

DSK Bank

Eurobank Bulgaria

Piraeus Bank Bulgaria

Raiffeisenbank (Bulgaria)

UniCredit Bulbank

Unionbank

United Bulgarian Bank



Contents

Background.....	page 1
What is BEERECL.....	page 1
BEERECL Structure.....	page 2
Results and Statistics.....	page 3
Benefits.....	page 4
Case Studies of Sustainable Energy Projects.....	page 5
Case Studies of Renewable Energy Projects.....	page 12
Locations of the Presented BEERECL Projects.....	page 15
EBRD SEFF	page 16

Background

In 2004 responding to the energy sector challenges in Bulgaria, EBRD established a new model of private sector credit lines. The credit lines' objective was to reduce energy demand, and replace generation capacity by financing renewable energy production, and business energy efficiency projects.

Sustainable Energy Financing Facilities (SEFFs) are EBRD credit lines provided to local partner banks that are supported with grant funding for technical assistance and financial incentives to sub-borrowers and banks. The local partner banks on-lend the funds at standard commercial rates to private businesses and/or the residential sector for their eligible sustainable energy projects.

Technical consultants raise awareness of the facility, build capacity at partner banks and assist prospective borrowers with preparing sustainable energy projects. An independent technical consultant verifies project completion.

Incentives to borrowers are made upon verification of project's completion (the incentive is typically 15% to 20% of the project's loan amount) and partner banks receive administrative fees to compensate them for the restricted use of proceeds and monitoring and reporting requirements.

In Bulgaria, the SEFF model created a market for energy efficiency and renewable energy financing through eight commercial banks disbursing EUR 150 million of financing leveraged by EUR 35.2 million of concessional funding that included technical assistance grants and incentives. Based on the experience in Bulgaria the SEFF model is operating in 20 countries with total EBRD financing in excess of EUR 2 billion.

What is BEERECL?

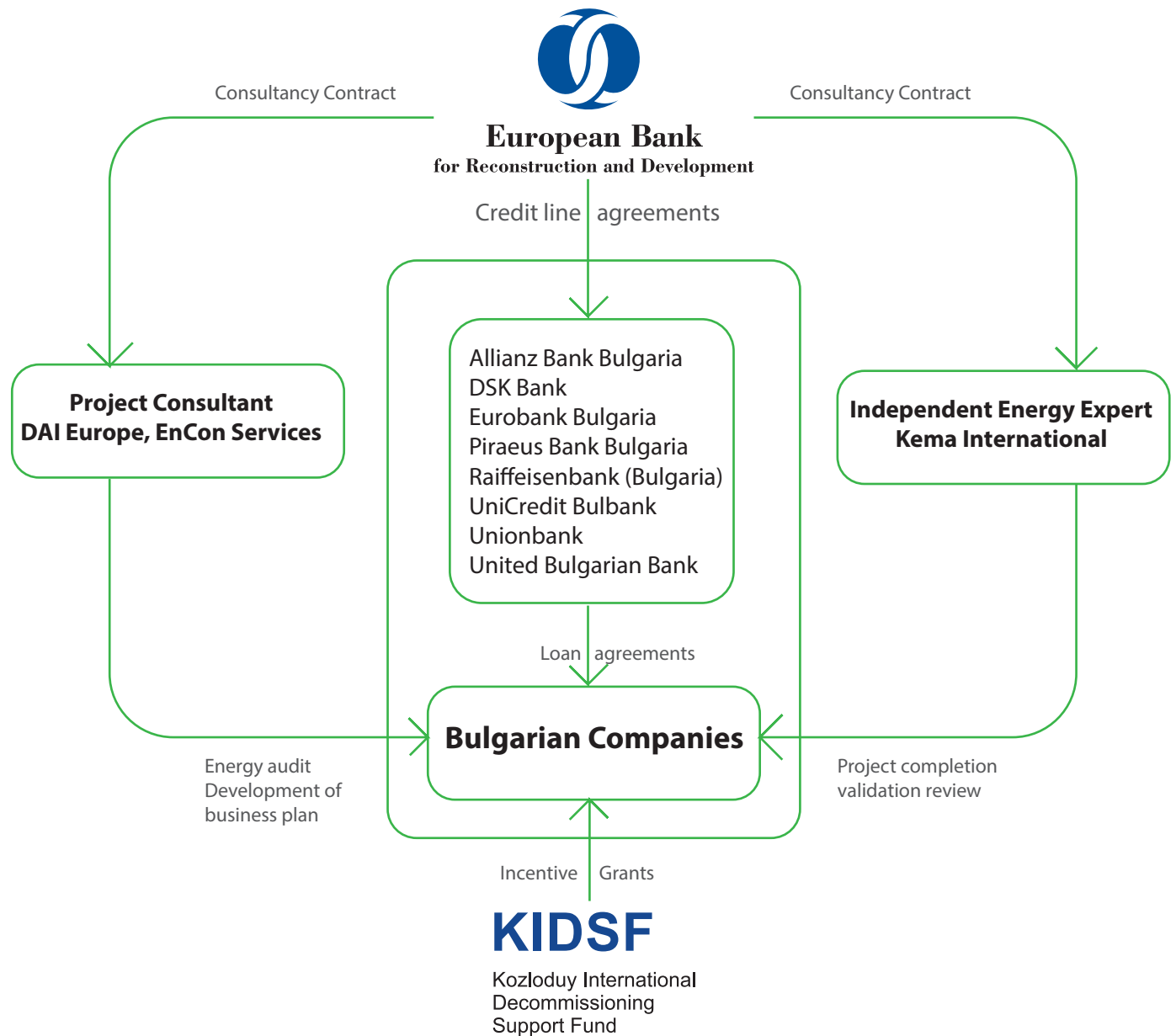
The Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL) supports small-scale energy efficiency and renewable energy investments that mitigate the impacts of the Kozloduy nuclear power plant's closure. These investments reduce energy demand through energy efficiency and increase local energy production by adding green energy supply. BEERECL was complemented by EUR 35.2 million of grant funding from

Kozloduy International Decommissioning Support Fund (KIDSF).

BEERECL had three phases. The initial facility of EUR 50 million was approved by the EBRD in January 2004 and loans were signed with six participating banks. In June 2006, EBRD approved an extension of the credit line for EUR 50 million, all of which was committed to five participating banks. In December 2008 EBRD approved a further EUR 55

million, all of which was committed to five participating banks. In total eight Bulgarian banks, Allianz Bank Bulgaria, DSK Bank, Eurobank Bulgaria, Piraeus Bank Bulgaria, Raiffeisenbank (Bulgaria), UniCredit Bulbank, Unionbank and United Bulgarian Bank, worked with the facility. The banks benefited from the access to the BEERECL as sustainable energy lending was perceived as a required business line and it provided banks with a competitive advantage.

BEERECL Structure



Results and Statistics

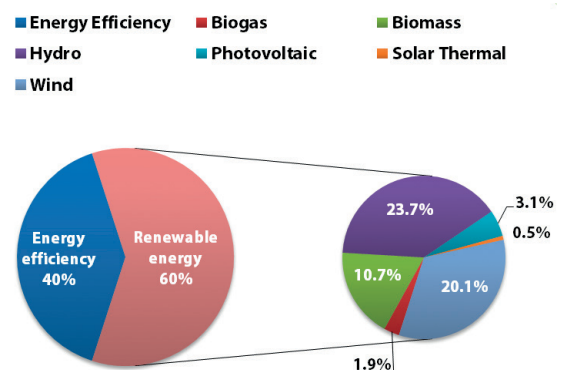
After operating for almost 10 years the credit line showed strong results. BEERECL initially served largely the renewable market. However, after regulatory changes, and focusing on energy audits and marketing with banks, the energy efficiency loan portfolio grew over time.

Almost 300 sustainable energy projects received more than EUR 150 million worth of financing under the facility towards EUR 235 million of investment costs. The annual electricity savings of 1,078,502 MWh is the equivalent of the residential electricity use of 893,600 Bulgarians. This is greater than the residential electricity use of the Bulgarian cities of Plovdiv, Varna and Burgas, combined. The annual CO₂ emission reductions of 710,000 tons are equal to the emissions from 390,275 cars. The electric capacity reduction equivalent savings is equal to 9.5% of the former Kozloduy nuclear power plant's capacity.

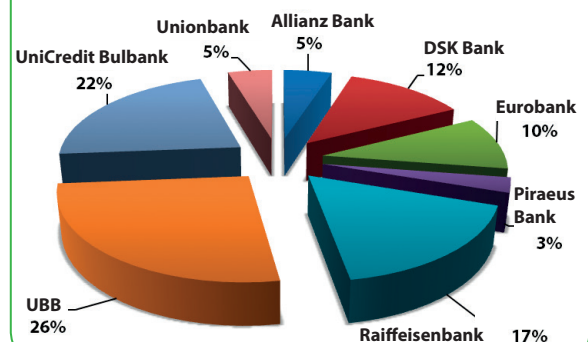
The 195 energy efficiency loans ranged in size from EUR 11,000 to EUR 2.5 million with an average sub-loan of EUR 310,000. Eligible packages of measures were identified by the consultants and included investments in upgrading and/or replacing machinery, co-generation of heat and power, thermal insulation of production halls, etc. in industries such as pulp and paper plants, sugar mills, chemical plants, bakeries, farms, parts manufacturers, and metal processors.

The 98 renewable energy loans range in size from EUR 30,000 to EUR 2.5 million with an average size of EUR 877,000. The investments included hydropower, wind, biomass, biogas, solar electric and solar heat projects.

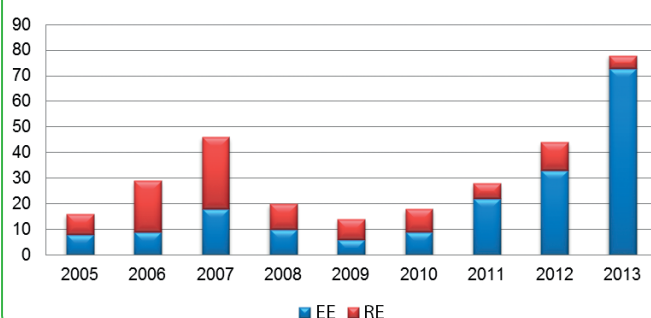
Share of Loans by Technology



Share of Loans by Partner Bank



Number of Energy Efficiency and Renewable Energy Loans by Year



Benefits

The advantages that BEERECL brought to the market are:

- ✓ Transparent, easy-to-access, “one-stop-shop” for energy efficiency and renewable energy investments, which provided grant, loan and technical assistance funding under a single facility with a standardised approach, thus speeding up project processing and implementation.
- ✓ Local commercial banks worked as intermediaries and leveraged their branch networks helping ensure the capacity needed to process a large number of projects across Bulgaria.
- ✓ Technical assistance consultants, with international and Bulgarian experts, provided:
 - *Project preparation for all of the projects, comprising ex-ante verification of compliance with eligibility criteria, energy audits, capital investment appraisals, developing rational energy utilisation plans – thereby ensuring that investments are properly targeted*
 - *Independent completion verification, through a separate consultant, to ensure that projects are completed according to the agreed specifications.*
- ✓ Payment of the grant was made by EBRD only upon verified project completion, ensuring that funds were properly used and providing an incentive for timely implementation.

By providing a significant funding volume, and by enabling multiple local banks to participate, the banks competed and were motivated to overcome issues such as their lack of familiarity with the sustainable energy market.

BEERECL made a significant transformative impact on the local finance market for sustainable energy. It was also instrumental in creating, shaping, and growing this market to a point where it could become self-sustaining.

The credit line helped Bulgaria reduce its energy intensity and increase its local renewable generation. The facility’s energy efficiency and new renewable energy investments resulted in an energy equivalent savings of 1.08 Terawatt hour. This is about 3.3% of Bulgaria annual electric use. Also BEERECL played a key role in helping start and grow Bulgaria’s small renewable energy market by supporting 96 MW of renewable energy projects.

As a result of the BEERCL investments:

- Bulgarian industries are more competitive
- Fossil fuel use intensity fell
- Significant amounts of greenhouse gas emissions are avoided

Furthermore, the credit line provided added value by:

- Ensuring local experts can competently identify and evaluate investment opportunities
- Making local financial institutions familiar with appraising and financing sustainable energy investments
- Generating long-term local capacity and helping establish a self-supporting and dynamic market

Case Studies of Sustainable Energy Projects

About 300 energy efficiency and renewable projects were financed for the lifetime of the BEERECL. In this publication several examples of the implemented projects are presented structured in categories in terms of measures and sector.

Energy Efficiency Projects in Industry



Biovet JSC is a leading Bulgarian manufacturer of feed additives, enzymes, active substances and pharmaceuticals, located in Peshtera. Their energy efficiency project required a BEERECL loan of EUR 496,996 and grant funding of EUR 74,549 from KIDSF. The funds were used to install variable speed drives on fans, pumps and motors. As a result the annual energy costs were reduced by 12.6%, while the CO₂ emissions decreased by 7,800 tons. The payback period is 1.5 years.



Gamma Commerce Ltd produces and trades paper products. The company received a EUR 130,000 energy efficiency loan from BEERECL and EUR 19,500 KIDSF grant. By introducing a new processing line with automated machines, efficiency, productivity and quality all increased, while operating and repair costs declined. The annual energy costs per unit of production fell by 55.4% and CO₂ emissions dropped by 142 tons. The project's payback period is less than 6 years.



Medica JSC is a leader on the Bulgarian pharmacy and hospital markets, one of the largest producers of medicinal products in Eastern Europe, with manufacturing facilities in Sandanski. For its energy efficiency project they used a EUR 100,000 BEERECL loan and EUR 15,000 grant from KIDSF. The funds were used to replace old heavy-oil fired steam boilers with two gas-fired boilers, and upgrade the steam pipes. As a result the heavy fuel oil and electricity consumption, and operating and maintenance costs were all significantly reduced. The investments cut annual energy costs by 21% and CO₂ emissions by 1,300 tons per year. The project's payback period is 1.7 years.

Energy Efficiency Projects in Industry



Delta Textile Ltd produces socks for popular global brands. They received a EUR 840,000 energy efficiency BEERECL loan and KIDSF grant of EUR 126,000. The project replaced 49 knitting and 12 sewing machines with 34 new state-of-the-art knitting machines. These machines significantly boosted company revenues by increasing the production of higher quality socks, reduced waste, and lower operation and maintenance costs. Energy costs per unit of production were slashed by 36% and carbon emissions were reduced by 380 tons per year. The project's payback period is 5.6 years.



Neochim PLC produces acids and fertilizers and is located in Dimitrovgrad. They used financing from the BEERECL via a EUR 31,000 loan and EUR 4,000 KIDSF grant to install an automated management system for steam-production. The system maintains the efficient distribution of steam, depending on the needs of individual steam loads. The steam usage is optimized and additional steam is supplied to the co-generation unit as appropriate. The company benefits by improving production quality, higher profits and being more competitive. Neochim increased electricity production by 14.6% while CO₂ emissions declined by 4,941 tons per year. The project's payback period is 2.26 years.



HB Electric JSC (formerly Elprom ZEM) is the largest manufacturer of rotating electric machines in Bulgaria. They received a EUR 48,000 BEERECL loan and a EUR 7,200 KIDSF grant to replace five machines with one new induction copper welding machine. The new machine improved the company's operations and competitiveness, and the work environment. Their welding operations annual energy costs declined by 73%, while water, labour and material costs were also reduced. Their annual carbon emissions fell by 81 tons. The project's payback period is 1.5 years.

Energy Efficiency Projects in Large Companies



A **sarel-Medet JSC** is the largest open pit copper mining and processing company in Bulgaria. Their BEERECL project was financed with a EUR 900,000 loan and they received a EUR 136,000 KIDSF grant. The funds were used to upgrade their heating ventilation and air conditioning systems at five administrative buildings, and replace four old diesel forklifts. The project improved the working environment, enhanced the company's image, and reduced fuel consumption, maintenance and repair expenses. The project trimmed annual energy costs by 78%, and annual CO₂ emissions by 1,000 tons. The project's payback period is 3.6 years.



B **ulmetal JSC** produces metal containers and is located in Gurkovo. The company invested EUR 367,500 in building and plant vehicle energy efficiency projects financed through a BEERECL loan and KIDSF grant of EUR 55,124. They installed thermal insulation, energy efficient doors and windows, and a water-to-water heat pump for space heating and cooling for their buildings, and new forklifts and trucks. The project resulted in 44% energy cost savings, improved building comfort, reliable plant vehicles, reduced operation and maintenance costs and cut carbon dioxide emissions by 170 tons per year. The project's payback period is 4.4 years.

Energy Efficiency Projects in Food & Beverages Sector



Eliaz Ltd is a large bakery located in Sofia. The company improved its production process by introducing a new production line utilising modern technology with a EUR 600,000 BEERECL loan and a EUR 45,000 grant from KIDSF. The new ovens use natural gas, unlike the old ovens which were electric. The project increased energy efficiency, improved product quality and reduced operating and repair costs. As a result the bakery's oven's annual energy costs declined by 64% and CO₂ emissions fell by 1,920 tons. The project's payback period is 4.2 years.



Lomsko Pivo JSC is a brewery located in Lom. The company used a BEERECL loan of EUR 310,000 and received a EUR 23,250 grant from KIDSF. Their project reconstructed the bottling plant, upgraded heating, lighting and steam condensate systems, installed energy monitoring and control systems, and made boiler efficiency upgrades. The brewery not only reduced its annual energy costs by 23,2% and its carbon emissions by 930 tons per year, but also improved workplace safety. The project's payback period is 4 years.

Energy Efficiency Projects in Buildings



Impuls JSC is a company that produces industrial components. It is located in Gabrovo. The company received BEERECL financing with a EUR 128,900 loan and a KIDSF grant of EUR 19,335. The energy efficiency project insulated the exterior walls and roof of their building, and replaced old leaking window and door frames. Their annual cash savings exceeded EUR 40,000. Their annual energy costs are cut by 37.5% and CO₂ emissions reduced by 255 tons. The project's payback period is 4.7 years.



Metalik JSC is a hotel located in Stara Zagora. The hotel used financing under the BEERECL with a EUR 614,000 loan and a EUR 92,000 KIDSF grant. With these funds they installed roof and wall insulation and a new modern space heating and cooling system. The investments reduced building energy consumption and provided better indoor conditions for staff and guests, making the hotel more competitive and attractive. Their annual energy costs were reduced by 76%, and CO₂ emissions declined by 2,341 tons. The project's payback period is 4.22 years.

Energy Efficiency Projects in Agriculture



Alt Co JSC has a large greenhouse in Kresna. They received financing through the BEERECL with a loan of EUR 1,944,000 and a KIDSF grant of EUR 145,800. The project converted two boilers to natural gas, installed a co-generator, and reconstructed and modernized the boilers rooms. Both the heating and electricity needs of the greenhouse are now met by the new combined heat and power plants. Hot water produced by the boilers is used for heating the greenhouse. Annual energy costs were significantly cut and CO₂ emissions are reduced by 9,550 tons per year. The project's payback period is 5 years.



Kolendro Ltd is one of the biggest agricultural companies in North-Western Bulgaria. The company used BEERECL financing to replace their tractors and harvesters of EUR 349,000 loan and a EUR 44,000 KIDSF grant. As a result they lowered consumption of diesel oil, and increased productivity, while operation and maintenance costs were reduced. The company benefits from producing higher quality crops and cut the equipment's annual energy costs by 32%. Thus, they are more competitive. The investment's payback period is 3.14 years.



BEERECL supports energy efficiency projects in the agricultural sector. Common measures include replacing agricultural tractors, harvesters, sprayers and other with modern one. Three companies **Kemapul Ltd**, **ZP Emil Stamov** and **ZKPU Obedinenie 93** replaced old inefficient tractors. The loans that the companies received under the BEERECL financing vary from EUR 50,000 to EUR 140,000. One new large tractor can replace four to six existing small tractors. The projects also support installment of new ploughs, sprayers, cultivators and other tractor attachments. The new equipment reduces the time needed to complete field processes, allowing the farm to do field processes and harvest crops at the optimal time. Labour costs are reduced, as well as fuel expenses and maintenance and repair costs. The energy costs are cut by 35% to 45%, and the carbon emission are reduced by 28 tons to 48 tons per year. The payback periods vary between 3.8 years to 5.5 years.

Energy Efficiency Projects in SMEs



Fiesta 13 Ltd is a confectionery and food retailer in Pleven. The company used a EUR 150,000 BEERECL loan and a KIDSF grant of EUR 26,108 to renovate their building and its energy systems. The building energy retrofit improved the work environment and company's image. The project included installing thermal insulation, efficient windows and doors, a solar water heating system, air-to-air heat pumps and a natural gas boiler for space heating and cooling, as well as a modern ventilation system. Their annual energy costs were reduced by 67%, and the carbon emissions were lowered by 530 tons per year. The payback period of the investment is 4 years.



Mototehnika Sliven JSC has an automobile service centre in Sliven. To improve its building's energy efficiency the company used a EUR 28,000 loan under the BEERECL and a grant of EUR 4,170 from KIDSF. The energy efficiency measures included exterior wall thermal insulations, double glazed windows, and energy efficient metal doors. The retrofit of the premises improved the work environment and the company's image, and increased the value of the building. Electricity costs were cut by 47%, and the carbon emissions were reduced by 160 tons per year. The project's payback period is 3.7 years.

Case Studies of Renewable Energy Projects

Featured renewable projects implemented under the BEERECL including wind, solar, hydro, biomass and geothermal energy

Wind



Ventus Ltd is located in Hrabrovo. The company installed a wind turbine financed under the BEERECL with EUR 2 million loan and a KIDSF grant of EUR 200,000. It is a new 2 MW wind turbine with an average annual wind speed, based on on-site measurements, of 6.18m/s at a 70 meter height. The expected annual electricity production of the wind turbine is 6,014 MWh. The turbine's payback period is 5.69 years. The project reduced Bulgaria's annual CO₂ emissions by 4,252 tons.



Parkeco BG Ltd is located in Burgas. The company installed a wind turbine financed under the BEERECL with EUR 1,850,000 loan and a KIDSF grant of EUR 278,000. The new 1,5 MW wind turbine has an average annual wind speed of 6.36m/s at a 60 meter height. The wind turbine's expected annual electricity production is 4,466 MWh. Annual CO₂ emissions are reduced by 6,395 tons. The project's payback period is 5.97 years.

Biomass



Euroethyl JSC is the first plant to produce ethanol and bioethanol in Bulgaria. It is located in the town of Alfatar in an agricultural region, where the raw materials, wheat and corn, are grown. Euroethyl used BEERECL loan for EUR 2 million and received a EUR 400,000 grant from KIDSF. The project installed a biomass steam boiler, which fires straw, to replace two heavy-fuel oil boilers. The project resulted in annual energy cost savings of 64% and reduced carbon emissions by 23,300 tons per year. The project's payback period is 1.3 years.



Eco Energy Dospat EAD is located in the Blagoevgrad region. The company used BEERECL financing with a EUR 1.2 million loan and a KIDSF grant of EUR 181,000 to construct a biomass-fuelled combined heat and power plant. The electricity output is used for the plant's own needs and for selling to the National Electric Company. The plant converts wood waste into a synthetic gas that fuels the plant. It consumes 12,900 tons wood waste each year. The project's payback period is 3.5 years and it reduces Bulgaria's CO₂ emissions by 7,225 tons per year.

Hydro



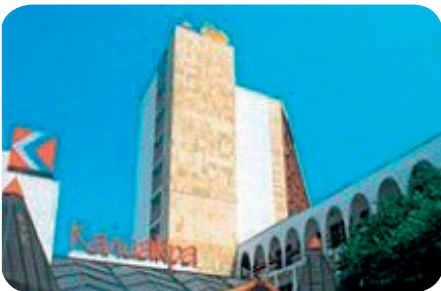
Electra Hydro JSC built a small irrigation system hydro power plant on the Belmeken-Sestrimo cascade in the Pazardzhik region. They used a EUR 280,000 BEERECL loan and KIDSF grant of EUR 56,000. The hydropower plant was designed and is operated to ensure the down stream water needs of two irrigation systems, two towns and many fields. The project generates 5,580 MWh of green power per year. It has a simple payback period of 1.8 years and reduces Bulgaria's annual carbon emissions by 4,350 tons per year.

Geothermal



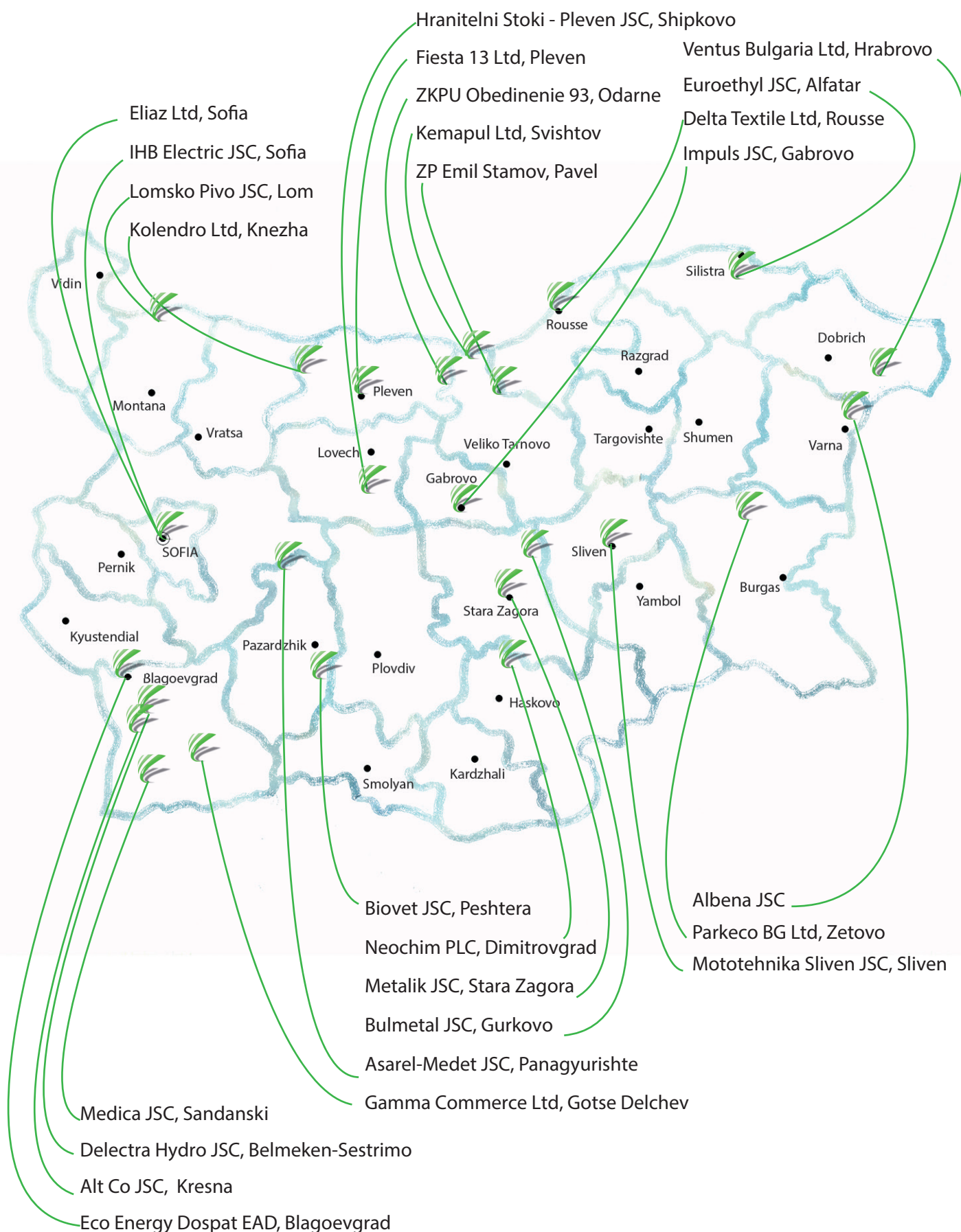
Hranitelni Stoki - Pleven JSC has diverse business activities ranging from food trading and packaging to renting buildings to consultancy. The company built the Hotel Shipkovo in the Stara Planina mountains. Their BEERECL EUR 64,000 loan with a EUR 12,800 KIDSF grant financed their installation of an open ground loop geothermal heat pump system for heating, ventilation and air conditioning (HVAC) and water heating for the swimming pool. The geothermal heat pump has a capacity of 215 kW. When compared to a conventional HVAC system and pool heating system, their annual savings are EUR 23,150, which includes reduced energy costs as well as reduced operation and maintenance costs. The project has a simple payback period of 2.8 years and reduced CO₂ emissions by 26 tons per year.

Solar



Albena JSC is Bulgaria's largest tourism company with three Black Sea resorts. The company used a EUR 194,000 BEERECL loan and a EUR 38,800 KIDSF grant to install a solar water heating system at their Albena resort's Kaliakra Hotel. The 150 solar panels with an active surface of 300 m² replaced 13 electric water heaters and produce 255 MWh of heat each year. The investment reduced the water heating energy costs by 92.9% and carbon emissions by 224 tons per year.

Locations of the Presented BEERECL Projects





www.ebrdseff.com

The Sustainable Energy Financing Facilities (SEFFs) support the financial institutions, businesses and households to realise their investment efforts in energy efficiency and renewable energy. The SEFFs – one component of the EBRD's Sustainable Energy Initiative – provide credit lines as well as local and international expert guidance on designing lending products, assessing feasibility and monitoring projects. Through the facilities, a wide range of sustainable energy projects have delivered excellent return on investment and significant reduction in utility bills and carbon footprint to companies and property owners under the SEFFs projects. Since 2006, the EBRD has provided over EUR 2 billion in SEFFs to more than 80 financial institutions, reaching more than 40,000 clients in 20 countries.

The SEFF Approach

The Sustainable Energy Financing Facilities (SEFFs) extend credit lines to local Participating Financial Institutions (PFIs) that seek to develop sustainable energy financing as a permanent field of business. The PFIs on-lend the funds to their clients including small and medium-sized companies, corpo-

rate and residential sector borrowers. Two key sustainable energy financing areas are energy efficiency and small-scale renewable energy.

The SEFF Range

The SEFF financing for businesses typically ranges from a few hundred thousand to few million euros to support purchase and installation of equipment, systems or processes. Across the EBRD region, the SEFF financing has supported projects in virtually all sectors, ranging from agribusiness, food processing, and manufacturing to industry, construction and services. The SEFF loans to the residential sector typically cover a few thousand to a few hundred thousand euros, most often to support improvements on the building envelope. Various client groups have benefited from SEFFs, including individual house owners, individual flat owners, groups of home owners and multi-apartment associations.

The SEFF highlights

Investments in sustainable energy under SEFFs offer excellent opportunities for businesses to boost profitability and increase their competitiveness by using energy resources more effectively. The SEFF financing helps businesses to optimise energy solutions, rehabilitate existing facilities and install highly energy-efficient systems. SEFFs also support building and home owners in improving comfort levels while reducing utility bills. The SEFF financing helps them to replace obsolete equipment, improve insulation systems and implement small-scale renewable energy systems.

In addition to the dedicated financing, SEFFs provide technical assistance for local Participating Financial Institutions and sub-borrowers. The technical assistance is a key factor in identifying profitable investment opportunities with lower technical risk.



Bulgarian Energy Efficiency and
Renewable Energy Credit Line

www.beerecl.com



European Bank
for Reconstruction and Development

KIDSF

Kozloduy International
Decommissioning
Support Fund