SEI SUSTAINABLE ENERGY INITIATIVE

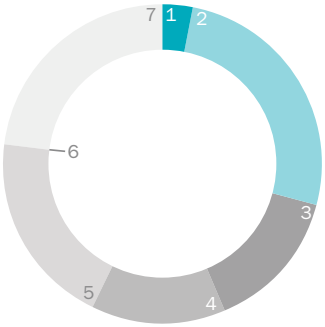
European Bank
for Reconstruction and Development

RENEWABLE ENERGY

RENEWABLE ENERGY: COMING OF AGE

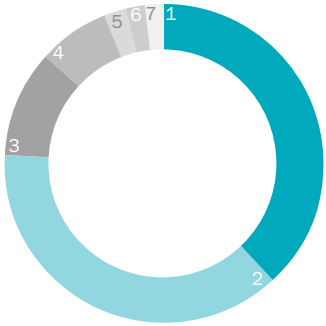
SINCE 2006, THE EBRD HAS MADE MORE THAN 160 INVESTMENTS IN RENEWABLE ENERGY FINANCING PROJECTS IN 24 COUNTRIES.

THESE PROJECTS HAVE LED TO ANNUAL CO_2 EMISSION REDUCTIONS OF OVER 11 MILLION TONNES.



EBRD financing for renewable energy projects by region, 2006-13

		€ million
1	Central Asia	95
2	Central Europe and the Baltic states	792
3	Eastern Europe and the Caucasus	436
4	Russia	411
5	South-eastern Europe	595
6	Southern and eastern Mediterranean	3
7	Turkey	689
	Total	**3,020**



EBRD financing for renewable energy projects by technology, 2006-13

		€ million
1	Wind	1,157
2	Large hydro (>10MW)	1,137
3	Biomass	325
4	Small hydro (<10MW)	225
5	Geothermal	63
6	Biogas	57
7	Solar	57
	Total	**3,020**

* An investment can include multiple sites or facilities, examples of this being sustainable energy financing facilities with partner banks which then on-lend to smaller-scale clients.

All countries in the EBRD region have the potential to develop a range of renewable energy projects. In countries with growing energy demand, renewables can help to diversify energy supply while reducing greenhouse gas emissions.

The EBRD's Sustainable Energy Initiative (SEI) brings together investments, technical cooperation and policy dialogue across the full range of the Bank's operations. It aims to increase energy efficiency and promote renewable energy investments in wind, hydropower, biogas, biomass, geothermal and solar energy.

As regulatory frameworks are crucial for renewable energy generation, the EBRD engages with governments and regulators to develop robust frameworks. These can justify investment in new technologies and also minimise market distortions.

Since the EBRD's first renewables project in 2006, the cost of renewable energy technology has fallen and investor interest has grown, with increased sustainable energy generation taking place worldwide.

As this trend continues, the Bank seeks to support important projects in countries where renewable energy is not widely deployed. This includes funding early-stage projects, supporting new private operators, scaling up pilot operations to commercial levels and building a critical mass of investments that establish renewable energy as a mature, mainstream industry.

In other countries, where renewables markets are more developed, the Bank focuses on ensuring the sustainability of the sector.

DIFFERENT PRODUCTS FOR DIFFERENT MARKETS

Renewable energy projects financed directly or indirectly by the EBRD range from large 140 MW wind farms to small 1 MW installations. The Bank is pursuing the use of renewable energy across its entire project pipeline, from dedicated power and energy projects to the industrial and municipal sectors.

Across all sectors, successful funding for renewable energy projects requires a variety of financing instruments. The EBRD has therefore developed tailored approaches to financing renewable energy projects.

For power sector renewable energy projects:

Debt financing

- Project finance loans
- Corporate loans with specified use of proceeds
- Loan tenor of 10-15 years
- Margins benchmarked to market
- Fixed rate and/or local currency
- The EBRD can directly finance up to 35 per cent of an enterprise's long-term capital (or project costs for greenfield projects); additional funds can be mobilised through syndication.

Equity and other financing

- Equity stakes below 20-25 per cent
- Investment through capital increases
- Investment in funds that address smaller projects or larger stakes
- Exits through IPO, trade sale or put/call agreements
- Bonds.

For projects in other sectors:

Corporate and municipal projects

- Systematic consideration of renewable energy elements in industrial, agricultural and municipal projects
- Integration of assessments examining renewable energy potential into the EBRD's Energy/Resource Efficiency Audit Programme
- Where possible, replacement of fossil fuel use by renewable fuels to reduce energy costs and improve environmental performance
- Projects include the use of biogas by a Ukrainian sugar manufacturer.

For smaller and medium-sized projects:

1. Direct financing facilities

The EBRD has established several investment mechanisms that encourage firms to pursue sustainable energy projects, which are often challenging to finance and implement. These mechanisms offer tailor-made debt financing coupled with assistance from technical consultants for businesses and local authorities. Financing is available directly from the EBRD for small and medium-sized projects, with a simplified, streamlined and rapid approval process, which reduces transaction costs. Dedicated direct lending facilities for renewables currently operate in Ukraine and the Western Balkans. In other countries, small projects can be financed through Local Enterprise Facilities.

Characteristics of direct lending facilities:

- Limited by volume or capacity of the project
- Restricted to specific countries and regions
- Approval procedures for eligible projects are simplified and delegated, depending on the project's environmental or social impact
- Combined with substantial donor finance to support technical assistance, and in some cases, concessional finance or grant support to project implementation.

- Integrated technical assistance packages include:
  - Dedicated project implementation unit for marketing and project assessment and support
  - Policy dialogue element to improve implementing environment.

2. Sustainable energy financing facilities (SEFFs)

- Dedicated credit lines offered to local financial institutions (partner banks and leasing companies), for on-lending to sustainable energy projects
- Largely private sector, including small and medium-sized businesses, corporate clients and retail companies
- From 2006 to the end of 2013, the EBRD disbursed an estimated €660 million. This financing was provided to partner banks in Bulgaria, Georgia, Slovakia, Turkey, Ukraine and the Western Balkans.

POLICY DIALOGUE, TECHNICAL COOPERATION AND DONOR SUPPORT

The EBRD closely integrates energy sector investments with technical cooperation (TC), policy dialogue and climate finance activities. Donor partnerships make these activities possible, helping the Bank better address challenges in the energy sector. They provide targeted support to develop and promote markets, reduce energy intensity and support low-carbon solutions.

Donor-funded TC in the energy sector concentrates on two main areas.

- **Project preparation and implementation**, including:
  - Feasibility studies, design, project supervision, environmental and social impact assessments, legal due diligence, and procurement support.
- **Reform and restructuring**, including:
  - Support for the development of energy sector roadmaps and renewable energy regulation, advice on improving tariff methodologies in the electricity and gas sectors, and support for the commercialisation of public sector entities.

The Bank also undertakes substantial capacity-building with government, regulators, and public energy companies to strengthen the regulatory frameworks for sustainable energy. This work includes:

- Strategic environmental assessments covering the cumulative impact of specific technologies – for example, wind turbines – in a country or region
- Work on renewable energy legislation to help develop regulatory frameworks that drive investment
- Support for secondary regulations, including feed-in tariffs and power purchase agreements.

CLIMATE FINANCE – ADDRESSING GAPS AND ENSURING SUCCESS

In countries where the EBRD works, implementing non-recourse finance or project finance can be challenging. For this reason, progress on smaller projects or first-time larger projects in difficult markets has been helped by combining EBRD financing with climate finance (concessional lending or grant funding) support from the Clean Technology Fund (CTF) and the EU, and TC support from a number of donors, including the Global Environment Facility (GEF).

This model is an effective means to strengthen the business environment for private sector renewable energy and foster project development. This is especially important for project financing in nascent markets, particularly in countries with a good resource base whose regulatory support frameworks are emerging or untested.

WIND FARM

COUNTRY

MONGOLIA

PROJECT

SALKHIT

TOTAL EBRD FINANCING AND INVESTMENT

€31.2 MILLION LOAN
€3.8 MILLION EQUITY INVESTMENT

TOTAL INSTALLED CAPACITY

50 MW

ZERO-CARBON POWER GENERATION/YEAR

> 140,000 MWh

CO_2 SAVINGS/YEAR

> 164,000 TONNES

Salkhit Wind Farm is Mongolia's first wind energy project and the country's first privately owned generator. This 50 MW project is located 70 km outside Ulaanbaatar, and sponsored by the Mongolian Newcom Group. Funded in March 2012, the investment is the culmination of five years of interlinked investment, policy dialogue, and technical cooperation from the Bank. The project began in 2007 and included an early-stage development equity investment in 2009.

Salkhit will provide about 5 per cent of the country's electricity needs, which are currently met almost entirely by ageing, coal-fired power plants.

WIND FARM

COUNTRY

TURKEY

PROJECT

BARES WIND FARM

TOTAL EBRD FINANCING AND INVESTMENT

€100 MILLION LOAN

TOTAL INSTALLED CAPACITY

143 MW

ZERO-CARBON POWER GENERATION/YEAR

> 375,000 MWh

CO_2 SAVINGS/YEAR

> 270,000 TONNES

Bares Wind Farm, owned by Enerjisa, the leading private energy company in Turkey, is located in rural western Turkey. With 52 wind turbines strung along a series of hilltops close to the city of Balikesir, it is currently the country's largest wind farm.

Capable of producing 143 MW of power, the EBRD-financed Bares wind farm will boost wind-generated electricity in Turkey by 8 per cent. In addition, the CO_2 emissions savings of 270,000 tonnes per year equate to removing 100,000 cars from the road.

The project will provide clean electricity to about 170,000 households, reduce Turkey's need for costly imported resources, enhance energy security, and bring the country closer to its renewable energy targets.

As part of the investment, the EBRD also syndicated €35 million to a local bank, and converted €85 million of its loan into local currency.

HYDRO POWER REHABILITATION

COUNTRY

GEORGIA

PROJECT

ENGURI POWER PLANT REHABILITATION

TOTAL EBRD FINANCING AND INVESTMENT

€58 MILLION

TOTAL INSTALLED CAPACITY

> 100 MW

CO_2 SAVINGS/YEAR

> 580,000 TONNES

Located north of the town of Jvari, in the mountains of north-western Georgia, Enguri is the second tallest arch dam in the world, producing over 40 per cent of electricity consumed in Georgia and selling surplus power to Russia and Turkey. Managed by state-owned Engurhesi Ltd., the plant was originally built in the 1970s. It underwent a comprehensive rehabilitation programme covering civil engineering works on the structure as well as an upgrade of the generator units.

In addition to EBRD financing of US$ 58 million, the project was co-financed by €20 million from the European Investment Bank and €9.4 million from European Union grants with a further €5 million through its Neighbourhood Investment Facility.

In addition, the Swiss Government provided grant funds to finance engineering consultants for the design phase. At the end of 2012, the project was registered as a Clean Development Mechanism (CDM) project, making its credits eligible for use in the EU Emissions Trading System.

The rehabilitation works have led to better dam safety and additional capacity at the plant. Each unit at the plant now generates between 10 and 15 per cent more power. The project has reduced the need for electricity generated by fossil fuels, promoting cleaner electricity, and creating more reliable power for all Georgians.

BIOMASS

COUNTRY

POLAND

PROJECT

KONIN BIOMASS

TOTAL EBRD FINANCING

€80 MILLION

TOTAL INSTALLED CAPACITY

154 MWt AND 50 MWe

CO_2 SAVINGS/YEAR

> 409,000 TONNES

Elektrownia Patnow II Sp. Z.o.o. (EPII), a subsidiary of Zespol Elektrowni Patnow Adamow Konin S.A. (ZE PAK), constructed a 154 MWt/50 MWe biomass boiler at the Konin power plant. This project is part of a larger investment programme by ZE PAK to apply a renewable energy solution by converting an old polluting lignite-fired power plant to biomass-fuelled power generation.

The project will help the plant meet future, stricter environmental standards, and to support and maintain its production potential. It will also increase the number of biomass projects operating in Poland, boosting the renewable energy share of Poland's power generation sector.

SOLAR POWER

COUNTRY

UKRAINE

PROJECT

POROGI SOLAR

TOTAL EBRD FINANCING AND INVESTMENT

€3.8 MILLION LOAN

CLIMATE TECHNOLOGY FUND FINANCING

€1.6 MILLION CONCESSIONAL LOAN

TOTAL INSTALLED CAPACITY

4.5 MW

CO_2 SAVINGS/YEAR

> 5,000 TONNES

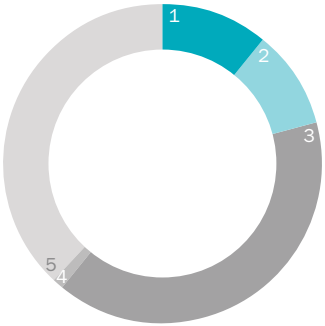
Rengy Development LLC established a special purpose company, Green Agro Service LLC (GAS), near Porogi in the region south of Vinnitsa, for the first photovoltaic solar facility directly financed by the EBRD. The project was the first to be commissioned in 2012 under the Ukraine Sustainable Energy Lending Facility, which targets smaller-scale renewable energy projects.

Porogi's total capacity is 4,495 kW, producing around 5.0 GWh of electricity per year to the local electricity grid of Vinnitsaoblenergo. The planned electricity output of Porogy will reduce greenhouse gas emissions by about 5,000 tCO_2 per year.

MID-SIZED SUSTAINABLE ENERGY FINANCING FACILITY (MIDSEFF)

COUNTRY

TURKEY



TOTAL EBRD FINANCING AND INVESTMENT

€700 MILLION

FOR ON-LENDING TO PRIVATE SECTOR BORROWERS

TOTAL INSTALLED CAPACITY

591 MW INSTALLED

CO_2 SAVINGS/YEAR

> 1,216,000 TONNES

		Share of MidSEFF	
		(€ million)	(%)
1	Energy efficiency	**57**	**11**
2	Geothermal	**53**	**10**
3	Hydro	**210**	**40**
4	Waste-to-energy	**5**	**1**
5	Wind	**196**	**38**

In April 2011, the EBRD launched MidSEFF, a financing facility that supports Turkey's investments in renewable energy and energy efficiency projects, increasing energy savings and decreasing carbon emissions. The EBRD has provided these credit lines to seven banks in Turkey.

€700 million of EBRD financing has been further leveraged to €1 billion with additional co-financing from the European Investment Bank. The European Union has provided technical cooperation support for project preparation and implementation. By 31 March 2014, 30 projects had been signed for MidSEFF financing of €522 million, representing 2,012 GWh of renewable electricity production per year.

Renewable projects have the following eligibility criteria:

- Mid-size (5 to 50 MW; up to 40 MW for hydroelectric power plants) renewable energy sub-projects
- Private sector investments in municipal and/or industrial waste-to-energy projects
- Individual sub-loan amounts from €10 to €40 million
- Total investment cost for sub-projects below €50 million.

OTHER AREAS OF SEI ACTIVITY

www.ebrd.com/sei

INDUSTRIAL ENERGY EFFICIENCY

Making energy efficiency investments in energy-intensive industrial processes such as steel manufacturing, aluminium smelting, cement and glass production, as well as major transport investments, such as in railway operating companies.

SUSTAINABLE ENERGY FINANCING FACILITIES

Financing facilities through local banks in countries of operations to support industrial energy efficiency in small and medium-sized enterprises (SMEs), small-scale renewable energy and building energy efficiency projects.

CLIMATE CHANGE ADAPTATION

Developing approaches to integrate climate risk management and adaptation into project appraisal and development with a particular focus on the private sector.

MUNICIPAL INFRASTRUCTURE ENERGY EFFICIENCY

Upgrading neglected municipal infrastructure to provide efficient district heating, public transport networks and water supply systems.

POWER SECTOR ENERGY EFFICIENCY

Improving the energy efficiency of transmission networks and thermal power stations which generate the majority of energy in the region. The ageing energy infrastructure includes a large number of plants with low generation efficiency, high running costs, and excessive pollution and carbon emissions.

CARBON MARKET DEVELOPMENT

Promoting the financing of low carbon projects in the region through the use of carbon market tools. The development of this market requires the creation of new institutions, clear regulatory frameworks and a critical mass of investments.

European Bank
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SEI SUSTAINABLE ENERGY INITIATIVE

The EBRD is investing in changing people's lives and environments from central Europe to Central Asia and the southern and eastern Mediterranean.

Working together with the private sector, we invest in projects, engage in policy dialogue and provide technical advice that fosters innovation and builds sustainable and open-market economies.

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