European Bank for Reconstruction and Development

Financing the bio-economy

November 2018

European Bank
for Reconstruction and Development

Contents

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- Introduction to EBRD
- Green Financing and Innovation Support
- EBRD's work in the bio-economy

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What is the EBRD

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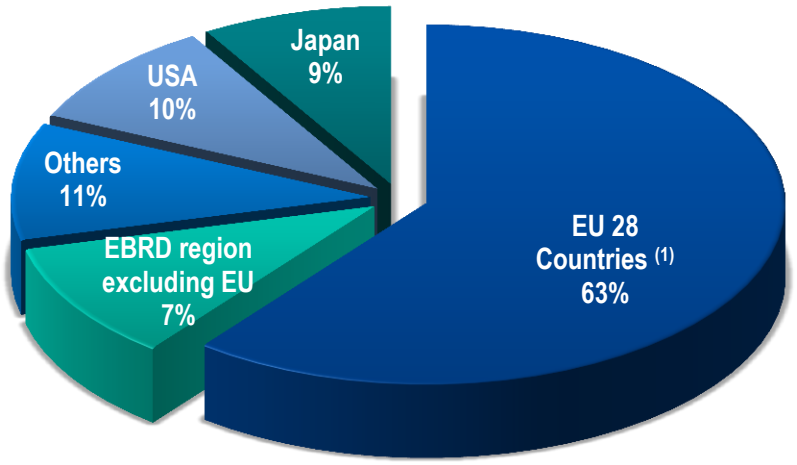
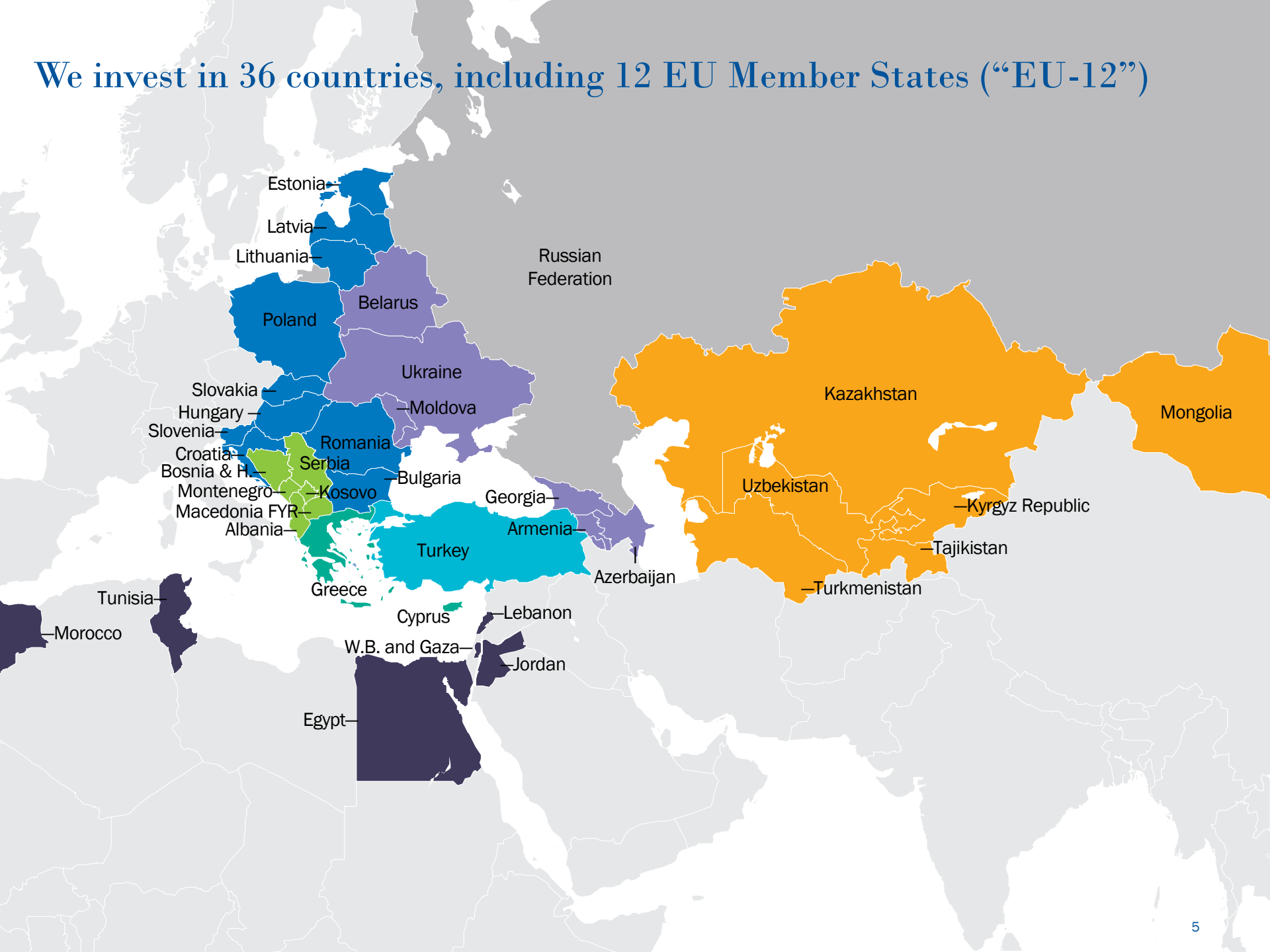
- An **international financial institution**, with the mandate to promote **transition to modern and well-functioning markets** in 36 countries from Central and Eastern Europe, Caucasus, Central Asia and the Southern and Eastern Mediterranean.
- Owned by 65 countries and 2 inter-governmental institutions (EU, EIB).
- Capital base of **€30 billion**.
- **Highest credit rating** (AAA/Aaa) from all three main rating agencies (S&P, Moody's and Fitch)
- Three operational principles:
  - **Sound banking**
  - **Transition impact**
  - **Environmental sustainability**

Shareholding structure



(1) Includes European Union and European Investment Bank (EIB) each at 3%. Among other EU countries, France, Germany, Italy, and the UK each hold 8.6%

We invest in 36 countries, including 12 EU Member States ("EU-12")



EBRD products are flexible and tailored to project needs

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	Debt	Equity	Guarantees
Typical size	> €5 mln (less for innovative projects)	> €5-7 mln	€50 k– €50 mln
Typical term	5-7 years	3-7 years	Up to 3 years
Currency	Major foreign currencies as well as local currency		
Approach	Up to 35% of project value (60% with syndication)	Minority stake	Mainly through Trade Facilitation Programme
Structures	• Senior, subordinated or convertible • Project finance • Floating or fixed rates	• Portage equity finance • Risk equity	• Import/export operations • Pure guarantees, cash advance trade finance
Applications	• Greenfield/Brownfield, JVs • Capex for expansion/modernisation, including resource efficiency improvements • Ownership change: acquisition, consolidation, privatisation • PPPs, etc.		• Issues to international banks • Takes the risk of transactions of the banks in the EBRD's countries of operations

Exact terms depend on specific needs and market conditions. The table does not represent smaller-scale lending or leasing via local partner financial institutions , which usually cover investments up to €1 mln.

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Green financing business model

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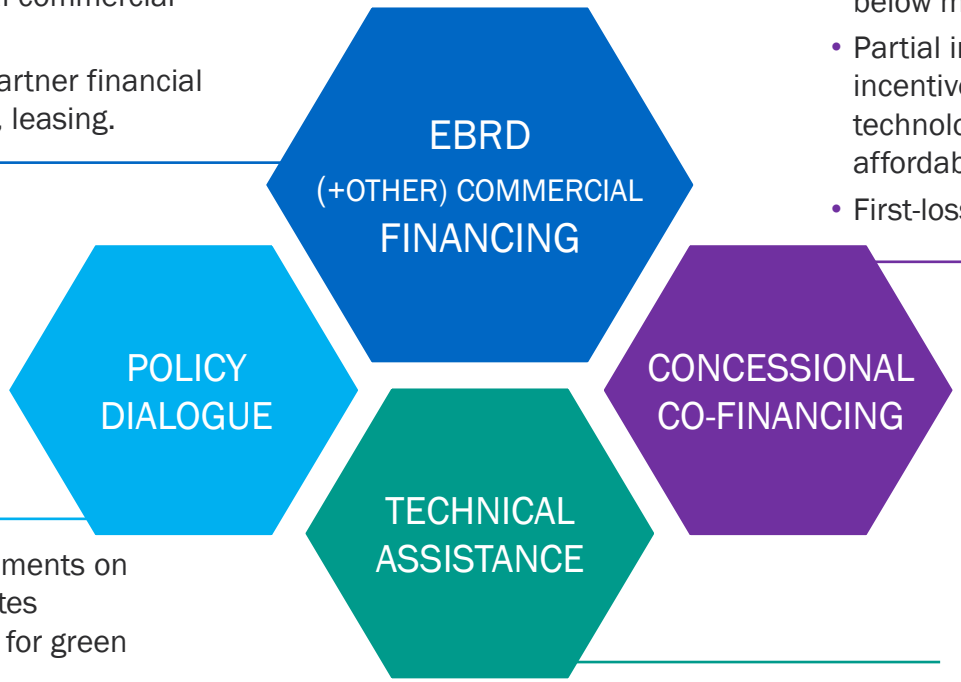
- Directly from EBRD: loans, equity investments or guarantees.
- Mobilising additional commercial sources.
- Indirectly via local partner financial institutions: lending, leasing.



- Lending facilities with pricing below market terms
- Partial investment grants or incentives payments for eligible technologies which face affordability barriers
- First-loss cover or guarantees.

- Working with governments on legislation that creates optimum conditions for green investments
- Supporting the development of legal instruments and best practice guidelines (e.g. contract templates, tenders).

- Resource efficiency audits
- Capacity building for local financial institutions (staff training, marketing, green retail lending products)
- Climate vulnerability assessment

- Project structuring support (e.g. tendering, investment guidelines)
- Support to adopt operational or CSR-type standards (energy management, buildings certification, reporting).

Green Economy Financing results in 2010 – H1 2018

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FINANCED

1,250+

green projects

900+ directly financed projects with green components, and

290+ credit lines to local financial institutions for on-lending to smaller projects

SIGNED

€ 23 billion

of green financing

For projects with a total value of €130+ billion

Since 2016 green financing has represented 35% of EBRD's total business.

Green Economy Transition impacts in 2010 – H1 2018

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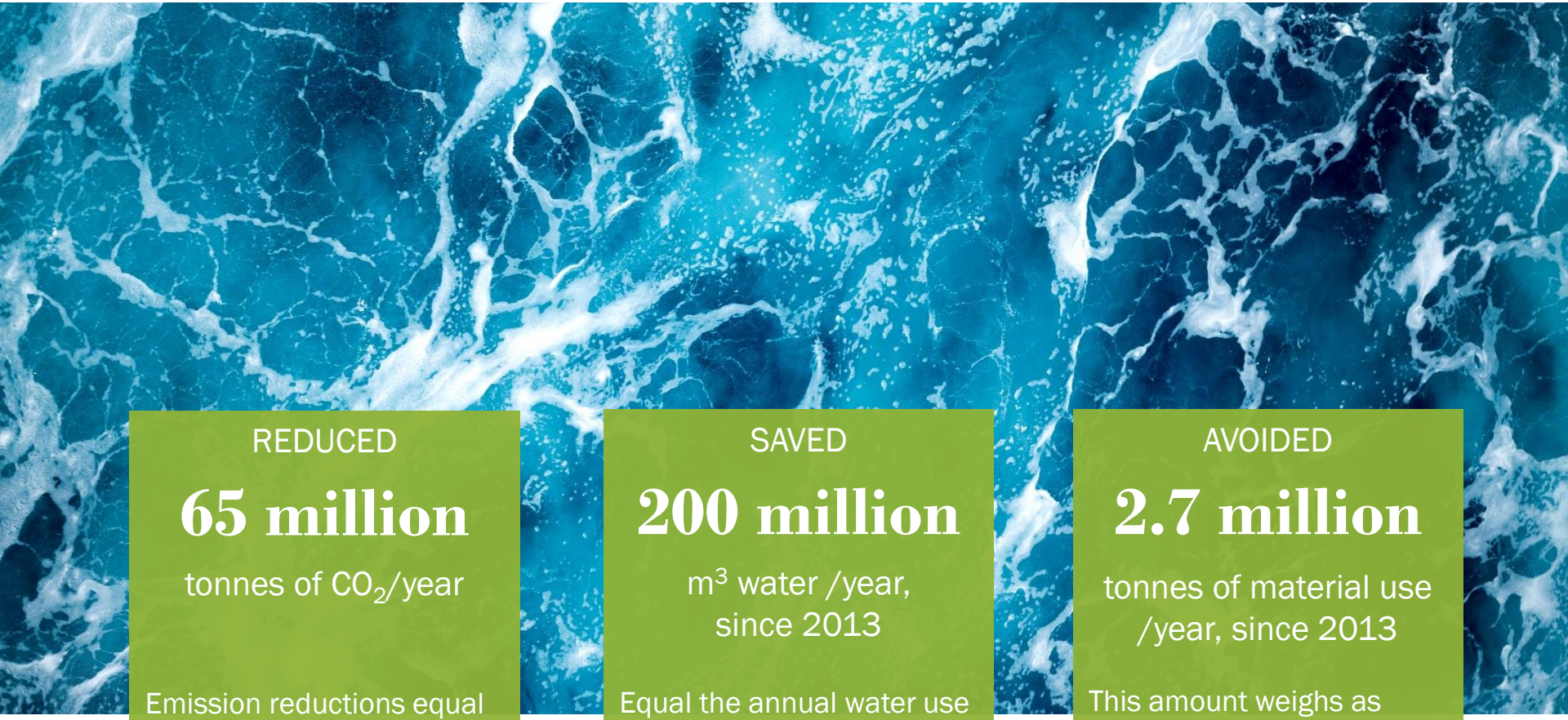

REDUCED

65 million

tonnes of CO_2/year

Emission reductions equal to the annual energy use related emissions of Greece

SAVED

200 million

m^3 water /year, since 2013

Equal the annual water use of more than a third of London's population

AVOIDED

2.7 million

tonnes of material use /year, since 2013

This amount weighs as much as the waste generated in Latvia in 2014

FINTECC: technical and innovation support

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HOW

Through its FINTECC programme, EBRD can provide **technical and grant support** to companies investing into **innovative, green technologies** in the context of an EBRD investment.
The aim is to develop low market penetration technologies and to support Research & Development & Innovation activities.

EBRD FINTECC

WHERE

	EU	Extra EU
Technical support	"EU-12"	All EBRD Countries of Operation
Grant support	Romania, Bulgaria, Latvia	Central Asia, Ukraine, Morocco, Egypt, Tunisia, Jordan

WHAT

INNOVATION FOCUS SECTORS

- Bio-energy
- Low carbon buildings
- Green transport and logistics
- Advanced agricultural processes
- IT solutions for carbon reduction
- Climate technology manufacturing and related supply chain improvements
- Advanced process technologies
- Energy storage solutions
- Development of circular business models
- MRV, Energy and Carbon Management Technologies
- CO_2 and other GHG removal and utilisation technologies
- Renewable energy technologies
- Innovative environmental technologies

FINTECC Green Innovation Programme

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Support for research, development, deployment or production related to green innovation:

- Technologies, products, software,
- Patents, creating /protecting intellectual property,
- Organisational processes and models, or
- Innovative models of interaction with suppliers /customers.

Eligible beneficiaries are companies or subsidiaries which are based in:

- **Any of the EU-12 countries, for technical assistance (TA)**
- **Bulgaria, Latvia or Romania, for investment grant assistance.**

Activities will have a positive green impact in terms of:

- Climate change mitigation
- Resilience to climate change
- Pollution abatement, or
- A more circular economy.

- Funding support provided by:

Taiwan Business EBRD Technical Cooperation Fund

Horizon 2020 Programme

- TA value per project of up to approximately **€200,000**
- Investment grant per beneficiary of up to approximately **€500,000** (depending on needs and cope of works)

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EBRD's experience in the bio-based sector

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EBRD AND THE BIO-BASED SECTOR

EBRD has been working in several green projects in the agribusiness and bioenergy sectors.

So far, focus topics have been:

- Agribusiness residues valorisation
- Energy efficiency in production
- Biofuels production
- Agricultural bio-inputs and recovery fertilisers production

EBRD is also looking to finance other types of biochemical and bio-based product manufacturing facilities

TECHNICAL COOPERATION

EBRD carries out, together with selected consultants, feasibility studies aimed at understanding potential and sustainability of bio-based investments.

Work performed usually includes:

- Analysis of feedstock availability
- Assessment of legislative framework and market barriers
- Understanding of technical risks
- Analysis of innovative technical applications
- Financial feasibility and analysis of appropriate financing mechanisms

The following pages present a selection of EBRD projects developed in the bio-based sector.

EBRD's Technical Assistance Experience in Biofuels

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TECHNICAL COOPERATION - example

The EBRD has developed a number of assessments and feasibility studies for advanced (2G) biofuel plants in Eastern Europe, by working with experienced consultants and the main technology providers. The scope of work usually covers:

- Feedstock analysis and sustainability assessment, including analysis of the GHG emission savings that can be achieved
- Logistic model and supply-chain optimization of feedstock availability
- Assessment of legislative framework and market barriers
- Supply-demand analysis of biofuel products and by-products; price analysis and projection for the country and region
- Technical design of the technology and facility
- Technological benchmarking appraisal
- Technology licensing
- Project budget and execution (capex, opex, timing, etc.)
- Financial feasibility and analysis of appropriate financing mechanisms and incentives
- Risks analysis

Making use of agricultural waste in Serbia

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CLIENT

A large Serbian agribusiness group.

EBRD supported investments at two plants specialised in seed crushing and soybean protein production.

FINANCING

2007 energy efficiency and biomass generation loan	€ 5 million
2012 biomass generation loan	€10 million

PROJECTS & TECHNICAL ASSISTANCE

Initial financing request of €40 million was expanded to include additional measures recommended following energy audits of €46,000. The audits were funded by the Government of Italy through the EBRD. Measures included:

- replacement of natural gas-fired boilers with biomass boilers using waste soy molasses and soybean straw
- electric motor replacements and steam distribution system upgrades.
- The measures have payback periods of 2-5 years

IMPACT OF PROJECTS

- Energy savings of 370 MWh/year
- Estimated emission reductions of 89,000 tonnes of CO2 /year, which is equivalent to the annual carbon footprint of 20,000 Belgrade residents.

Lithuanian Group – circular agriculture

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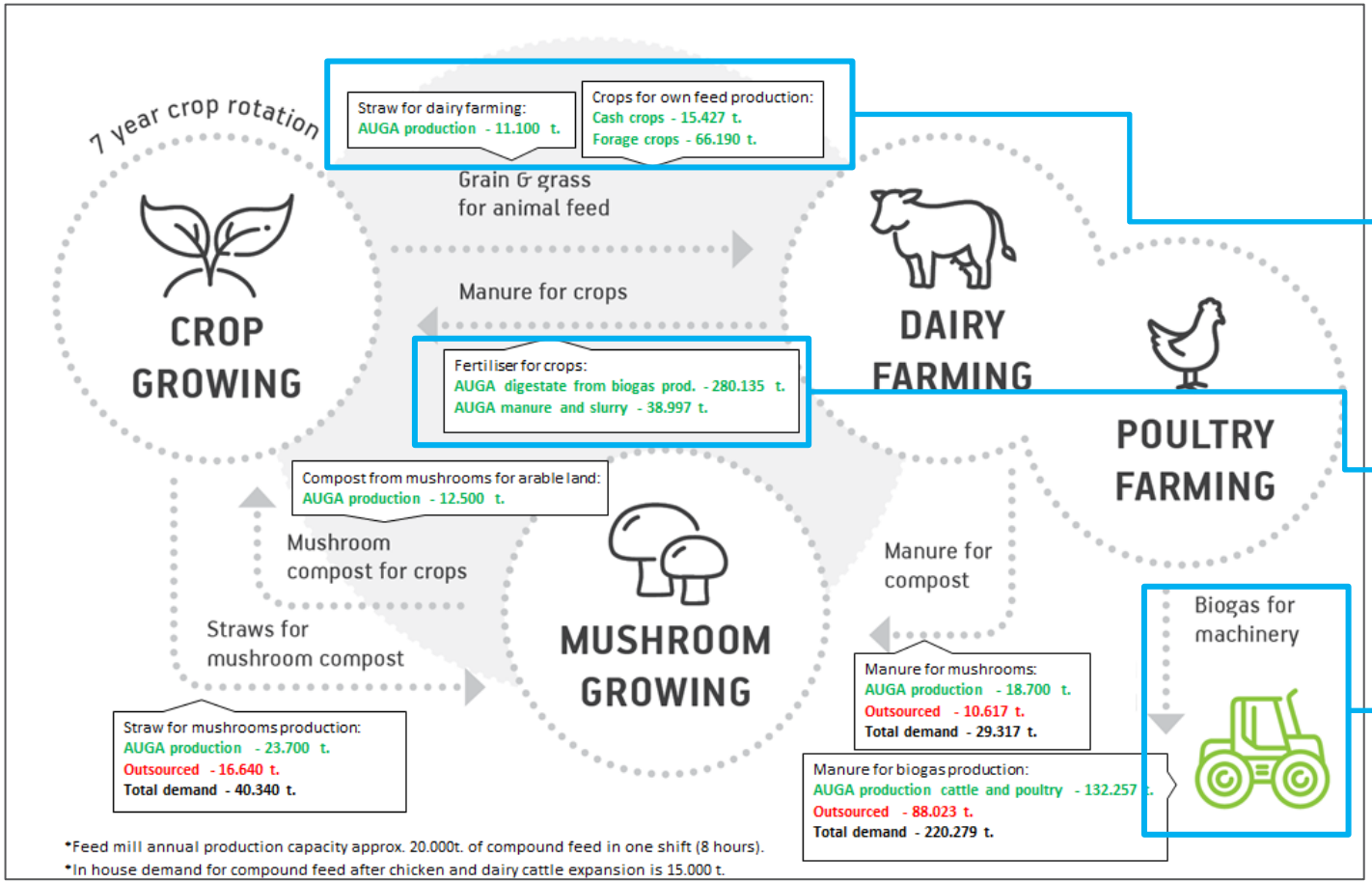

EBRD Investment

- Increased grass growth for animal feed
- Digestate from biogas production used as fertilizer
- Manure fed to anaerobic digester for biogas production

Producing sustainable agricultural products in Morocco

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COMPANY AND PROJECT

The EBRD has supported a Morocco-based producer of innovative **bio-fertilisers, bio-pesticides and bio-stimulants**. The EBRD's collaboration with the company was in relation to **research and development, increasing production capacity, and marketing and distribution** of these climate-friendly agricultural inputs.

GREEN ECONOMY IMPACT

Bio-fertilisers are produced by recycling organic agricultural and municipal wastes. This reduces landfill volumes and contributes to a low-carbon circular economy.

- 2.5 tonnes of waste are recycled to produce 1 tonne of bio-fertiliser. The project will enable the recycling of 3% of Morocco's annual municipal waste.
- Unlike chemical fertilisers which lead to loss in soil fertility and leaching, bio-fertilisers enhance soil fertility and reduce irrigation water use by 50%.
- Greenhouse gas emission reductions of over 150,000 tonnes of CO2 are estimated from avoided landfilling and the replacement of chemical fertilisers.

Long-term support for a Romanian oilseeds operator to achieve resource efficiency

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CLIENT

Romanian oilseeds operator with a processing capacity of 375,000 tpa.

PROJECTS

The EBRD has provided a number of loans to the Company since 2010, supporting the company in a number of areas as:

- Improvement of high-oleic crop farming practices
- Production capacity expansion and process upgrades
- Biofuels production facility
- On-site energy production from husk and residues
- Various energy and water saving measures
- Introduction of Energy Management System
- Risk management practices
- Engagement with farmers/suppliers on traceability standards
- New deodorisation/neutralisation process

The most recent project involved, among others, the upgrading of the deodorisation process and a hush-fired steam generator.

OVERALL FINANCIAL STRUCTURE

- EBRD A loans €152 million
- EBRD B loans €145 million
- Total project value €347 million

EXPECTED IMPACT

- Electricity consumption: -25%
- Water consumption: -35%
- Energy input: 85% from renewable sources
- Annual GHG emission reduction: 17,000 t CO2e
- Water saving: 15,000 m3/year

Renewable energy
Large-scale biomass generation plant in Poland

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CLIENT

A company producing and supplying energy to one of the largest paper and containerboard producers in Europe, situated in northern Poland.

PROJECT

EBRD loan to convert the existing boiler into a forest biomass-fired boiler (80MWt capacity) and to finance major repairs and the modernisation of existing facilities to supply energy to its off-taker.

FINANCIAL STRUCTURE

EBRD loan	EUR 30 million
of which GET	EUR 30 million
Total project value	EUR 106 million

EXPECTED IMPACT

Energy savings: 49,000 toe/year

Emission reductions: 142,000 tCO2/year

Supporting biomass energy in the Baltic region

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CLIENT

An producer of wood pellets, also specialised in forestry management and electricity and heat generation through biomass-fuelled combined-heat-and-power (CHP) plants.

PROJECTS

In 2011, 2013 and 2015 the EBRD supported the financing of three pairs of new biomass CHPs in Estonia and Latvia.

These produce both electricity to sell to the grid and heat to support the company's pellet business.

Photo credit: client

INVESTMENT PLAN

2011 EBRD loan	€ 34 million
2013 EBRD loan	€ 30 million
2015 EBRD loan	€ 42 million
Parallel commercial banks lending	€146 million

IMPACT OF PROJECTS

- New biomass-based generation capacity: 41 MW
- New biomass-based heat capacity: 109 MW
- Green electricity generation: 300 MWh/year
- Estimated emission reductions: 189,000 tonnes of CO_2/year

Agribusiness energy and resource efficiency
Biogas project in Ukraine

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CLIENT

A large agricultural company with a diversified agricultural production base with 18,000 ha of land and some 4,500 heads of milk cattle.

PROJECT

Finance for construction of a biogas plant which will generate about 10.0 GWh/year. The generated electricity will be sold to the grid at the feed-in tariff under the Green Tariff Law

FINANCIAL STRUCTURE

- EBRD-USELF loan (100% GET) EUR 3.1 million
- CTF concessional lo EUR 1.1 million
- Total project value EUR 5.4 million

TECHNICAL ASSISTANCE

The Global Environment Facility (GEF) provided support of EUR 27,500 for **project licensing, commercial negotiations, project management, and environmental due diligence**.

POLICY DIALOGUE

As a result of the EBRD policy dialogue, the **FIT for biogas was finally introduced in Ukraine** at the level of 12.3 cEUR/kWh, which is comparable with the EU levels.

EXPECTED IMPACT

- Energy produced: 5.8 million m^3stp of biogas/year
- Emission reductions: 9,800 tCO2/year
- The biogas plant will be fed with around 44,500 tonnes of feedstock per year.
- Net electricity generation for feed-in to the grid system will amount to close to10,000 MWh/year

In addition, the generated heat will partially be used for drying purposes in client's production processes.

Biogas-based energy in Croatia

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CLIENT

A fully-owned subsidiary of a leading agribusiness group in South-East Europe, specialised in renewable energy supply based on the by-products resulted from the group's operations.

PROJECT

The construction of a biogas plant with a capacity of 1MW electricity and 1MW heat. The electricity output is sold to the grid and the heat is used for one of the group's farms.

The plant is fuelled with biogas produced from livestock waste, biomass silage, manure and other organic waste by-products resulting from the group's operations.

Given these inputs the plant includes sterilisation equipment, and water purification equipment aimed at full compliance with all EU environmental regulations.

EBRD FINANCING

EBRD loan	€ 5.0 million
Sponsor contributions	€ 2.2 million
Total project value	€ 7.2 million

IMPACT OF PROJECT

- Electricity production — 8,000 MWh per year
- Heat production — 10,000 MWh-equivalent of hot water
- Emissions reductions — 6,800 tCO_2 per year

Contacts

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For more information on EBRD's Green Economy Transition:
http://www.ebrd.com/what-we-do/get.html