



## Romanian Energy Efficiency Fund

# Lending to Industrial Energy Efficiency Projects

Mihai - Marius VORONCA, Ph.D.

Parallel Session C

“Energy Efficiency in the Industry and SME Sectors”

Financing Energy Efficiency in Romania, Hungary and Bulgaria  
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23 January 2018

“Financing energy efficiency in Romania, Hungary and Bulgaria”





## Romanian Energy Efficiency Fund

- Summary**
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  - **Conclusions** 🖐️





# Romanian Energy Efficiency Fund

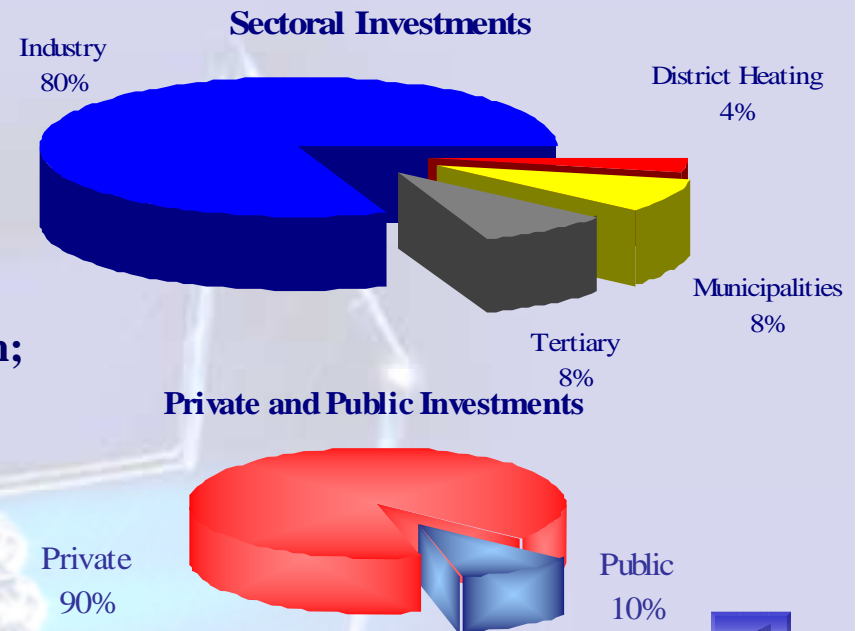
## Romanian Energy Efficiency Fund: Overview

**Investment Size:** USD 64 million

**Performance:** USD 1 invested yields to 0.8 koe/year Energy Savings or 2.3 kg/year of CO<sub>2</sub> Emission Reduction;

**Profitability :** USD 1 invested yields to annual USD 0.28\* Benefits  additional Benefits if Emission Trading occurs

\* quotation: equivalent of USD 48/barrel against the current USD 69/barrel 





## Romanian Energy Efficiency Fund

### Energy Efficiency Investments:

- Move from Consumer to Prosumer
- Compressed Air
- District Heating
- Energy Management System
- Industrial Co - generation
- Industrial Local Heating
- Equipment Refurbishment
- Industrial Water Systems Modernization

### Eligibility Criteria:

Co-financing: up to USD 1 million

#### Exceptions:

- USD 2,0 million loan
- USD 1,6 million loan

Project Sponsor Share: minimum 20%  
of total Investment Size

Quick Payback Time (less than 4 – 5 years)

Environmental Permit

At least half of Financial Benefits  
from Energy Savings





## Romanian Energy Efficiency Fund

### The Financing Approach

**FREE Funds: USD 8 million**  
(USD 20,853,000 committed 🖐).

**FREE offers loans with floating interest rates plus commission.**

**FREE does not subsidize loans for any borrowers.**

**FREE revolves with interest and principal payments flowing back into it for additional loans.**

**Loans made on a commercial basis to creditworthy customers.**

**Loans in US dollars denominated local currency; repayments would also be made in dollar denominated local currency.**

**Borrowers with good growth prospects and where the energy savings from the investments would generate positive cash flows, which would be partially used to repay the loans.**



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## Romanian Energy Efficiency Fund

### Products and Services offered

- **Direct Financing** ; **Cash-flow based term loans made directly to end users (either based upon cash flow of the project plus the creditworthiness of the end user or on projected cash flow alone);**
- **Energy Services Companies (ESCO)** ; **Cash flow-based loans made to energy service companies (“ESCOs”) on a project-by-project basis;**
- **Equipment Manufacturers & Suppliers**  **“Performance” loans where FREE partners with a supplier consortium and offers a total project package including engineering, equipment and financing.**
- **Promoters** .





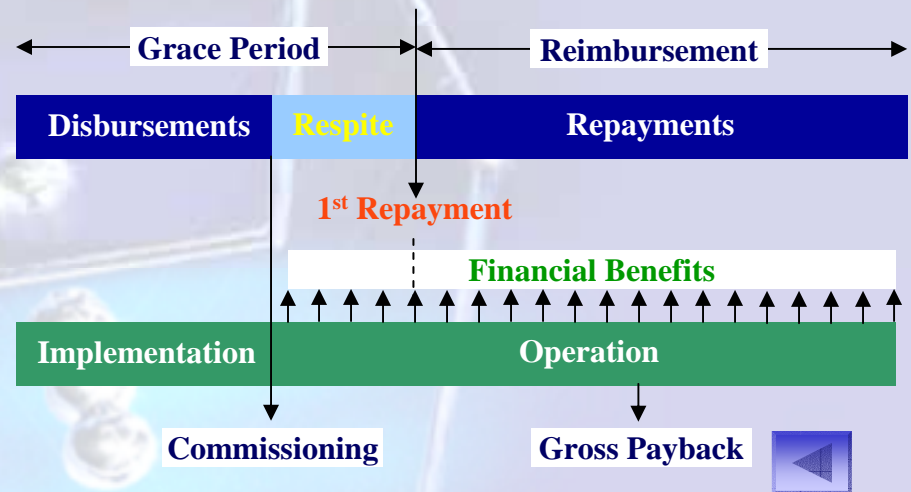
# Romanian Energy Efficiency Fund

## Structure Financing

The financing gap is filled by originating transactions, by combining expertise in energy efficiency analysis, structured finance and credit analysis, and by attracting commercial co-financing. 🖐️

For technically robust and bankable projects meeting the eligibility criteria, actions for structuring financing are taken.

- Due diligence to identifying any co-financing alternatives in accordance with the type of investment;
- Sizing of the requested loan;
- Risks assessment and sharing.





## Romanian Energy Efficiency Fund

### Conclusions

- Priorities:**
- Renovation of Public Buildings and wider Use of ESCOs;
  - “Greening” Transports and Buildings;
  - Smart Grid;
  - Storage.

**Perspectives:**

- USD 75 million Leverage in Energy Efficiency Investments;
- “Full option” Services Delivery: “Standardized” Loans and Collaterals
- Further Business Development: a USD 100 million “Financing Threshold”







## Romanian Energy Efficiency Fund

Crediting **Intelligent** Consumption

<http://www.free.org.ro/>

**Romanian** Energy Efficiency Fund

**Strauss Building**

**2A, Johann Strauss Street, 6<sup>th</sup> Floor, sector 2, ROU - 020312 Bucharest 30, Romania**

**phone: + 4021 233 88 01; fax: +4021 233 88 02**



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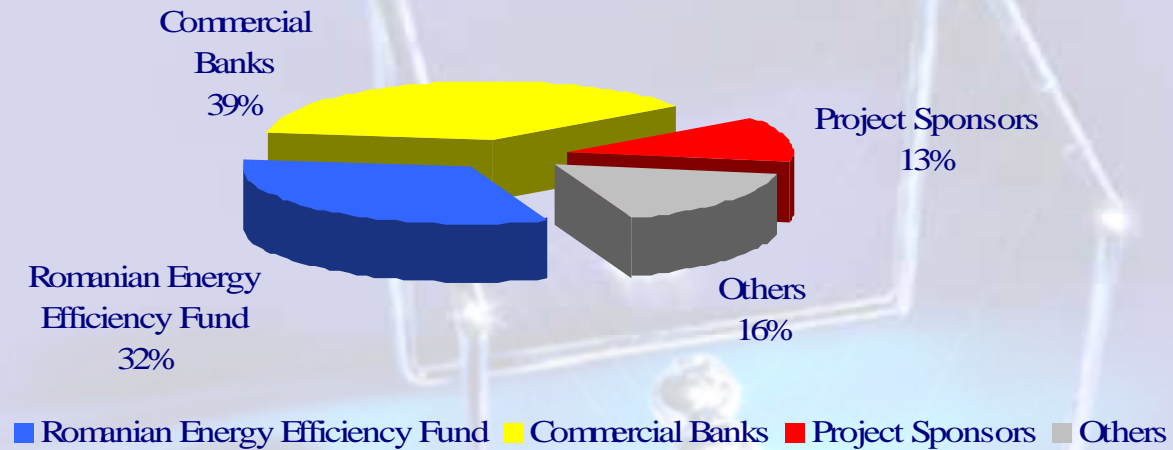
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# Romanian Energy Efficiency Fund

## Energy Efficiency Investments: Structure Financing

### Co-financiers Involvement in Project Financing





## Romanian Energy Efficiency Fund

### Project Portfolio (February 01<sup>st</sup>, 2018)

Application (Current Status)	Project Description (Key Words)	Loan (USD million)
38 Financing Agreements	Air Compressors, District Heating (Geothermal and Fossil Fuel), Biomass fired Boilers for Industrial Use, Energy Management System, Modernization of Steam –Condensate System to Paper Mills, Outdoor Public Lighting, Melting Glass Furnaces Modernization, Micro Hydro Units, Industrial Cogeneration, Industrial Local Heating, ESCO	<b>20.853</b>
21 In-depth Analysis	Industrial Systems for Heat Generation, Landfill Biogas Recovery and Use for District Heating, Biomass to Heat, Air Compressors, District Heating Industrial Cogeneration, Industrial Local Heating, Outdoor Public Lighting, Ceramic Kiln and Dryer Replacement etc.	<b>10.825</b>
78 Early Analysis	Industrial Systems for Heat Generation on Biomass, Thermal Rehabilitation in Industry, Local Heating Systems, Cogeneration, Air Compressors, Heat Pumps, Wind Farms, Biofuels, Solar Thermal	<b>63.962</b>
6 Agreements in Principle	Thermal Rehabilitation in Industry, Cogeneration, Exhausting and Air Conditioning, Outdoor Public Lighting, Industrial System for Heat Generation on Biomass, Wind Farms	<b>0.685*</b> * estimations
<b>Total</b>		<b>96.325</b>



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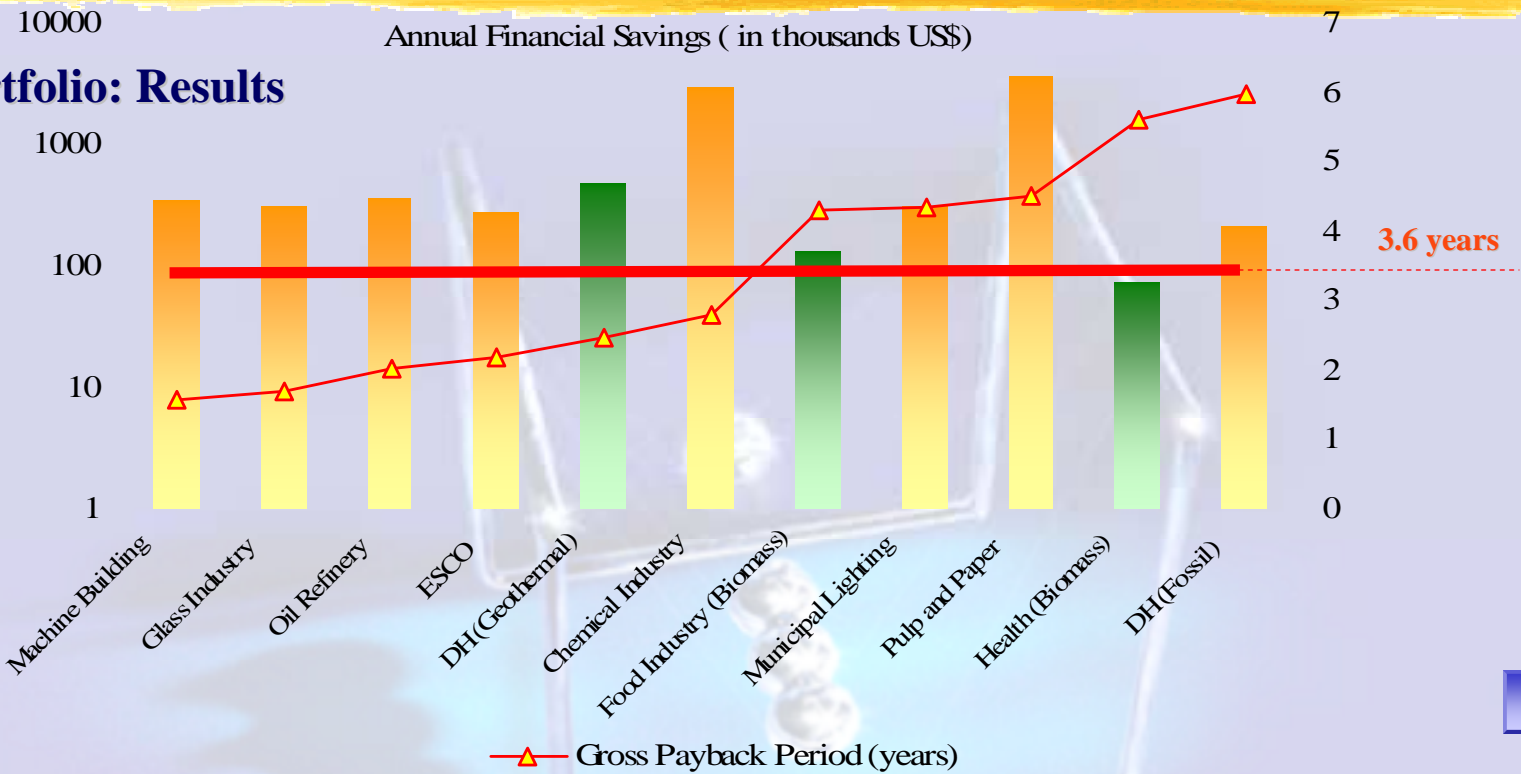
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## Romanian Energy Efficiency Fund

### Projects Portfolio: Results

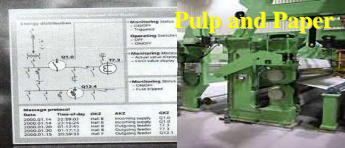




# Romanian Energy Efficiency Fund



## National Project Portfolio



Date	Time of day	GW	AKV	AKV	AKV
2008-01-16	22:30:00	144.8	144.8	144.8	144.8
2008-01-28	01:17:45	144.8	144.8	144.8	144.8
2008-01-28	01:17:45	144.8	144.8	144.8	144.8
2008-01-15	20:09:13	144.8	144.8	144.8	144.8



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## Romanian Energy Efficiency Fund

### Machinery Building Industry

<b>Beneficiary</b>	<b>UNIO S.A. Satu Mare</b>
<b>Project Type:</b>	<i>Replacement of Air Compressors</i>
<b>Investment Size (USD)</b>	<b>290,000</b>
<b>Loan (USD)</b>	<b>130,000</b>
<b>Maturity (years)</b>	<b>3.0</b>
<b>Payback Time (years)</b>	<b>2.6</b>
<b>Net Present Value (USD)</b>	<b>264,000</b>
<b>Internal Rate of Return (%)</b>	<b>37</b>
<b>Annual Energy Savings (toe)</b>	<b>440</b>
<b>Annual Reduction of CO<sub>2</sub> emissions (tones)</b>	<b>- 1,530</b>





## Romanian Energy Efficiency Fund

### District Heating (Geothermal)

<b>Beneficiary</b>	<b>Transgex S.A. Oradea</b>
<b>Project Type:</b>	<i>5 Thermal Substations Connection to the Geothermal Plant</i>
<b>Investment Size (USD)</b>	<b>1,178,474</b>
<b>Loan (USD)</b>	<b>425,000</b>
<b>Maturity (years)</b>	<b>3.0</b>
<b>Payback Time (years)</b>	<b>2.5</b>
<b>Net Present Value (USD)</b>	<b>1,140,000</b>
<b>Internal Rate of Return (%)</b>	<b>39</b>
<b>Annual Energy Savings (toe)</b>	<b>5,800</b>
<b>Annual Reduction of CO<sub>2</sub> Emissions (tones)</b>	<b>- 14,300</b>





# Romanian Energy Efficiency Fund

## District Heating (Fossil Fuel)

<b>Beneficiary</b>	<b>CET S.A. Iași</b>
<b>Project Type:</b>	<i>Modernization of 3 Thermal Substations and related Networks</i>
<b>Investment Size (USD)</b>	<b>1,250,000</b>
<b>Loan (USD)</b>	<b>980,000</b>
<b>Maturity (years)</b>	<b>2.0</b>
<b>Payback Time (years)</b>	<b>6.0</b>
<b>Net Present Value (USD)</b>	<b>377,000</b>
<b>Internal Rate of Return (%)</b>	<b>17</b>
<b>Annual Energy Savings (toe)</b>	<b>937</b>
<b>Annual Reduction of CO<sub>2</sub> emissions (tones)</b>	<b>- 2,831</b>







## Romanian Energy Efficiency Fund

### Food Industry (Biomass)

<b>Beneficiary</b>	<b>Ulerom S.A. Vaslui</b>
<b>Project Type:</b>	<i>Installation of a new Sunflower Husks fired Boiler</i>
<b>Investment Size (USD)</b>	<b>560,000</b>
<b>Loan (USD)</b>	<b>448,000</b>
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>4.3</b>
<b>Net Present Value (USD)</b>	<b>400,000</b>
<b>Internal Rate of Return (%)</b>	<b>23</b>
<b>Annual Energy Savings (toe)</b>	<b>621</b>
<b>Annual Reduction of CO<sub>2</sub> Emissions (tones)</b>	<b>- 1,487</b>



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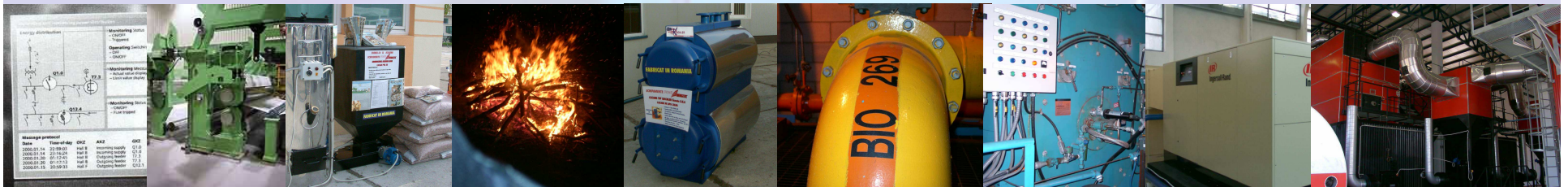
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## Romanian Energy Efficiency Fund

### Pulp and Paper Industry

<b>Beneficiary</b>	<b>SOMEȘ S.A. Dej</b>
<b>Project Type:</b>	<i>Energy Monitoring System; Paper Mill Steam - Condensate System Modernization</i>
<b>Investment Size (USD)</b>	<b>940,000</b>
<b>Loan (USD)</b>	<b>752,000</b>
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>1.7</b>
<b>Net Present Value (USD)</b>	<b>2,939,000</b>
<b>Internal Rate of Return (%)</b>	<b>60</b>
<b>Annual Energy Savings (toe)</b>	<b>1,130</b>
<b>Annual Reductions of CO<sub>2</sub> emissions (tones)</b>	<b>- 2,807</b>



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## Romanian Energy Efficiency Fund

### Machinery Building Industry

<b>Beneficiary</b>	<b>UNIO S.A. Satu Mare</b>
<b>Project Type:</b>	<i>Installation of an Industrial Local Heating System</i>
<b>Investment Size (USD)</b>	<b>257,000</b>
<b>Loan (USD)</b>	<b>206,000</b>
<b>Maturity (years)</b>	<b>2,5</b>
<b>Payback Time (years)</b>	<b>1.1</b>
<b>Net Present Value (USD)</b>	<b>1,264,000</b>
<b>Internal Rate of Return (%)</b>	<b>87</b>
<b>Annual Energy Savings (toe)</b>	<b>957</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 2,911</b>



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## Romanian Energy Efficiency Fund

### Glass Industry

<b>Beneficiary</b>	<b>ARC S.R.L. Dorohoi</b>
<b>Project Type:</b>	<i>Modernization of Technological Equipments</i>
<b>Investment Size (USD)</b>	<b>514,000</b>
<b>Loan (USD)</b>	400.000
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>1.7</b>
<b>Net Present Value (USD)</b>	<b>1,552,500</b>
<b>Internal Rate of Return (%)</b>	<b>60</b>
<b>Annual Energy Savings (toe)</b>	<b>898</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 2,218</b>



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## Romanian Energy Efficiency Fund

### Crude Oil Refinery

<b>Beneficiary</b>	<b>'Steaua Română' Refinery</b>
<b>Project Type:</b>	<i>Installation of a new Saturated Steam Boiler</i>
<b>Total Size (USD)</b>	<b>580,000</b>
<b>Loan (USD)</b>	460,000
<b>Maturity (years)</b>	<b>3.0</b>
<b>Payback Time (years)</b>	<b>2.1</b>
<b>Net Present Value (USD)</b>	<b>1,814,000</b>
<b>Internal Rate of Return (%)</b>	<b>49</b>
<b>Annual Energy Savings (toe)</b>	<b>1,368</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 3,257</b>





## Romanian Energy Efficiency Fund

### Health (Biomass)

<b>Beneficiary</b>	<b>Oradea County Hospital</b>
<b>Project Type:</b>	<i>Installation of two Wooden Pellets fired Boilers</i>
<b>Investment Size (USD)</b>	<b>405,000</b>
<b>Loan (USD)</b>	<b>324,000</b>
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>5.6</b>
<b>Net Present Value (USD)</b>	<b>159,000</b>
<b>Internal Rate of Return (%)</b>	<b>17</b>
<b>Annual Energy Savings (toe)</b>	<b>187</b>
<b>Annual Reduction of CO<sub>2</sub> Emissions (tones)</b>	<b>- 445</b>





## Romanian Energy Efficiency Fund

### Crude Oil Refinery

<b>Beneficiary</b>	<b>'Steaua Română' Refinery</b>
<b>Project Type:</b>	<i>Modernization of Atmospheric Distillation Installation Boiler</i>
<b>Total Size (USD)</b>	<b>179,000</b>
<b>Loan (USD)</b>	<b>143,000</b>
<b>Maturity (years)</b>	<b>3.0</b>
<b>Payback Time (years)</b>	<b>1.9</b>
<b>Net Present Value (USD)</b>	<b>363,000</b>
<b>Internal Rate of Return (%)</b>	<b>53</b>
<b>Annual Energy Savings (toe)</b>	<b>233</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 555</b>





## Romanian Energy Efficiency Fund

### Pulp and Paper Industry (Micro Hydro I)

<b>Beneficiary</b>	<b>Omnimpex Hârtia S.A. Bușteni</b>
<b>Project Type</b>	<i>Power Generation in new Micro Hydro Units for covering own Electricity Demand</i>
<b>Investment Size (USD)</b>	<b>1,869,000</b>
<b>Loan (USD)</b>	<b>990,000</b>
<b>Maturity (years)</b>	<b>5.0</b>
<b>Payback Time (years)</b>	<b>4.4</b>
<b>Net Present Value (USD)</b>	<b>1,273,000</b>
<b>Internal Rate of Return (%)</b>	<b>22</b>
<b>Annual Energy Savings (toe)</b>	<b>1,012</b>
<b>Annual Reduction of CO<sub>2</sub> Emissions (tones)</b>	<b>- 2,409</b>



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## Romanian Energy Efficiency Fund

### Delivery of Energy Services in Meat Processing Industry

<b>Beneficiary</b>	<b>ENEAS S.R.L. București</b>
<b>Project Type:</b>	<i>Installation and Operation of a Cogeneration Unit to a Third Party</i>
<b>Total Size (USD)</b>	<b>623,000</b>
<b>Loan (USD)</b>	<b>499,000</b>
<b>Maturity (years)</b>	<b>4.5</b>
<b>Payback Time (years)</b>	<b>4.2</b>
<b>Net Present Value (years)</b>	<b>254</b>
<b>Internal Rate of Return (%)</b>	<b>20</b>
<b>Annual Energy Savings (toe)</b>	<b>462</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 1,101</b>



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## Romanian Energy Efficiency Fund

### Chemical Industry (Cogeneration I)

<b>Beneficiary</b>	<b>CHIMCOMPLEX S.A. Borzești</b>
<b>Project Type:</b>	<b>Installation of a Cogeneration Unit (GT)</b>
<b>Total Size (USD)</b>	<b>8,147,000</b>
<b>Loan (USD)</b>	<b>2,000,000</b>
<b>Maturity (years)</b>	<b>4</b>
<b>Payback Time (years)</b>	<b>2.8</b>
<b>Net Present Value (USD)</b>	<b>8,151,183</b>
<b>Internal Rate of Return (%)</b>	<b>33</b>
<b>Annual Energy Savings (toe)</b>	<b>13,509</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 32,151</b>



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## Romanian Energy Efficiency Fund

### Pulp and Paper Industry

<b>Beneficiary</b>	<b>A6 IMPEX S.A. Dej</b>
<b>Project Type:</b>	<b>Installation of a Wooden Waste fired Steam Boiler</b>
<b>Total Size (USD)</b>	<b>13,464,090</b>
<b>Loan (USD)</b>	<b>1,594,000</b>
<b>Maturity (years)</b>	<b>4</b>
<b>Payback Time (years)</b>	<b>5.1</b>
<b>Net Present Value (USD)</b>	<b>6,111,000</b>
<b>Internal Rate of Return (%)</b>	<b>19</b>
<b>Annual Energy Savings (toe)</b>	<b>7,743</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 40,192</b>



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## Romanian Energy Efficiency Fund

### Brick Industry

<b>Beneficiary</b>	<b>3FAN CONSTRUCT S.R.L. Alba Iulia</b>
<b>Project Type:</b>	<i>Refurbishment of the Bricks Manufacturing Line</i>
<b>Total Size (USD)</b>	<b>2,578,000</b>
<b>Loan (USD)</b>	<b>1,000,000</b>
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>6.1</b>
<b>Net Present Value (years)</b>	<b>567</b>
<b>Internal Rate of Return (%)</b>	<b>15</b>
<b>Annual Energy Savings (toe)</b>	<b>684</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 1,788</b>





## Romanian Energy Efficiency Fund

### Pulp and Paper Industry (Micro Hydro II)

<b>Beneficiary</b>	<b>Omnimpex Hârtia S.A. Bușteni</b>
<b>Project Type</b>	<i>Power Generation in new Micro Hydro Units for covering own Electricity Demand</i>
<b>Investment Size (USD)</b>	<b>1,199,000</b>
<b>Loan (USD)</b>	<b>959,000</b>
<b>Maturity (years)</b>	<b>4.0</b>
<b>Payback Time (years)</b>	<b>4.6</b>
<b>Net Present Value (USD)</b>	<b>868,000</b>
<b>Internal Rate of Return (%)</b>	<b>22</b>
<b>Annual Energy Savings (toe)</b>	<b>688</b>
<b>Annual Reduction of CO<sub>2</sub> Emissions (tones)</b>	<b>- 1,688</b>



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## Romanian Energy Efficiency Fund

### Chemical Industry (Cogeneration II)

<b>Beneficiary</b>	<b>CHIMCOMPLEX S.A. Borzești</b>
<b>Project Type:</b>	<b>Installation of a Cogeneration Unit (GT)</b>
<b>Total Size (USD)</b>	<b>15,030,000</b>
<b>Loan (USD)</b>	<b>2,000,000</b>
<b>Maturity (years)</b>	<b>3.25</b>
<b>Payback Time (years)</b>	<b>2.7</b>
<b>Net Present Value (USD)</b>	<b>16,657,000</b>
<b>Internal Rate of Return (%)</b>	<b>36</b>
<b>Annual Energy Savings (toe)</b>	<b>8,999</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 20,338</b>



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## Romanian Energy Efficiency Fund

### Delivery of Energy Services in Furniture Industry

<b>Beneficiary</b>	<b>ENERGY SERV S.R.L. București</b>
<b>Project Type:</b>	<i>Installation and Operation of an ORC Bottom - Cycle and Cooler to a Third Party</i>
<b>Total Size (USD)</b>	<b>783,000</b>
<b>Loan (USD)</b>	<b>620,000</b>
<b>Maturity (years)</b>	<b>7.0</b>
<b>Payback Time (years)</b>	<b>4.8</b>
<b>Net Present Value (years)</b>	<b>222</b>
<b>Internal Rate of Return (%)</b>	<b>18</b>
<b>Annual Energy Savings (toe)</b>	<b>1,678</b>
<b>Annual Reductions of CO<sub>2</sub> Emissions (tones)</b>	<b>- 3,827</b>



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