EBRD support for low carbon and renewable district energy
Energy Community workshop on efficient district heating

June 2020
EBRD District Energy Projects

- More than 60 DE projects in 18 countries
- EBRD financing: more than EUR 0.7 billion
- Total projects’ capex: EUR 1.6 billion
Objectives for the Sector

- Increase energy efficiency and reduce environmental impacts
- Improved service levels
- Increased commercialisation, consumer control and consumption based billing

EBRD provides financing and works with operators and policymakers to improve the operational, environmental and financial performance of the DE sector.
EBRD DE Project Approach

DE Company Level

- Sub-Sovereign loans often co-funded by donor grants
- PPPs, private loans and equity investments
- Heat generation (excl. coal), network and demand side improvements
- Assistance with feasibility through to implementation

Country or Sector Level

- National framework agreements
- Policy paper series “Making District Heating Happen”
- Technical cooperation projects with Government agencies
Ongoing Projects in Ukraine

• **Six** Ukrainian cities (**Lutsk, Zhytomyr, Ternopil, Lviv, Ivano-Frankivsk and Chernivtsi**);

• **Priority Investment Programmes:**
  - Construction of 2 biomass-fired CHPs;
  - Boiler house modernization including new boilers, burners, pumps and auxiliary equipment;
  - Installation of biomass boilers;
  - Network upgrades and customer reconnection;
  - Installation of IHSs;
  - Installation of SCADA systems.

• **Financing sources:**
  - ~65 M EUR Capex
  - EUR loans from EBRD and CTF;
  - Grants from the E5P fund and Sweden.
Kyiv DH Project – Under Development

Working with Kyivteploenergo to develop a project focused improving the reliability and sustainability of DH services in Kyiv

Proposed investment programme:

- Modernisation of CHPs;
- Reconstruction of large boiler houses;
- New monitoring and dispatching system (SCADA);
- Replacement of networks; and
- Installation of IHS.

* Project is under development
### Bălți District Heating Project

#### Moldova

<table>
<thead>
<tr>
<th>EBRD Finance</th>
<th>€ 7 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Funding</td>
<td>€ 3.7 million</td>
</tr>
<tr>
<td>GHG Reduced</td>
<td>18,300 tonnes of CO₂ eq / yr</td>
</tr>
</tbody>
</table>

New and upgraded generation infrastructure and modern network control in Moldova’s 2nd largest city

- New gas engine CHP plant with a capacity of 13,4 MWe and 12.5 MWth
- 0.65 MWth Biomass boiler
- Installation of 169 IHS in 130 buildings
- Phase II project under preparation
Aim to enable renewable DE investment in:
• Albania
• Bosnia and Herzegovina
• Kosovo
• Montenegro
• North Macedonia
• Serbia

Funding is available for:
• Policy support for renewable DE
• Project preparation and feasibility
• Capacity building and networking

Special focus on solar DH

ReDEWeB@EBRD.com
## ReDEWeB Fund - Pipeline

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>City</th>
<th>Project scope</th>
<th>Processing stage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Serbia</td>
<td>Pancevo</td>
<td><strong>Solar thermal</strong> * + Network refurbishment** + Buildings Energy Efficiency **</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development. Feasibility study contracted.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>2</td>
<td>Kosovo</td>
<td>Pristina</td>
<td><strong>Solar thermal</strong></td>
<td>Joint work with KfW being a lead IFI. Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Public</td>
</tr>
<tr>
<td>3</td>
<td>Serbia</td>
<td>Bor</td>
<td><strong>Solar thermal</strong> * + Buildings Energy Efficiency ** + Substations modernisation** * + Network refurbishment **</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>4</td>
<td>Serbia</td>
<td>Novi Sad</td>
<td><strong>Solar thermal</strong></td>
<td>Pre-Feasibility Study completed. Presenting the results to the Mayor.</td>
<td>Public</td>
</tr>
<tr>
<td>5</td>
<td>Montenegro</td>
<td>Zabljak</td>
<td><strong>Biomass</strong> based greenfield district heating development</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private</td>
</tr>
<tr>
<td>7</td>
<td>Serbia</td>
<td>Sabac</td>
<td>Heat pump utilising the heat from the waste water treatment facility (WWTF)</td>
<td>Contracting the consultants for the pre-feasibility study</td>
<td>Private</td>
</tr>
<tr>
<td>8</td>
<td>Serbia</td>
<td>Nis</td>
<td>Phase 1 <strong>Solar thermal</strong> * + Buildings Energy Efficiency ** Phase 2 **Geothermal + Biomass + DH Energy Efficiency</td>
<td>Expression of interest received. Mandate letter-signing phase.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>9</td>
<td>Serbia</td>
<td>Zrenjanin</td>
<td><strong>Solar thermal</strong> * + Buildings Energy Efficiency **</td>
<td>Concept development phase.</td>
<td>Public</td>
</tr>
<tr>
<td>10</td>
<td>Bosnia &amp; Hercegovina</td>
<td>Sarajevo</td>
<td><strong>Heat pump utilising geothermal heat</strong> + Energy efficiency in DH plant</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
<tr>
<td>11</td>
<td>Bosnia &amp; Hercegovina</td>
<td>Banja Luka</td>
<td>DH Network refurbishment + Industrial waste heat</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
<tr>
<td>12</td>
<td>Serbia</td>
<td>Belgrade</td>
<td><strong>Solar thermal</strong> * + Energy Efficiency in DH plants and Buildings Energy Efficiency **</td>
<td>Preparation of the Memorandum of Understanding. Joining efforts with UN Environment.</td>
<td>Private* Public**</td>
</tr>
</tbody>
</table>
## ReDEWeB Fund - Pipeline

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>City</th>
<th>Project scope</th>
<th>Processing stage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Serbia</td>
<td>Pancevo</td>
<td>Solar thermal* + Network refurbishment** + Buildings Energy Efficiency**</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development. Feasibility study contracted.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>2</td>
<td>Kosovo</td>
<td>Pristina</td>
<td>Solar thermal</td>
<td>Joint work with KfW being a lead IFI. Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Public</td>
</tr>
<tr>
<td>3</td>
<td>Serbia</td>
<td>Bor</td>
<td>Solar thermal* + Buildings Energy Efficiency** + Substations modernisation** + Network refurbishment **</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>4</td>
<td>Serbia</td>
<td>Novi Sad</td>
<td>Solar thermal</td>
<td>Pre-Feasibility Study completed. Presenting the results to the Mayor.</td>
<td>Public</td>
</tr>
<tr>
<td>5</td>
<td>Montenegro</td>
<td>Zabljak</td>
<td>Biomass based greenfield district heating development</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private</td>
</tr>
<tr>
<td>6</td>
<td>Serbia</td>
<td>Valjevo</td>
<td>Heat pump (Waste water Treatment Facility - WWTF) + Extension and New connections to DH system + Buildings Energy Efficiency **</td>
<td>Pre-Feasibility under development.</td>
<td>Public</td>
</tr>
<tr>
<td>7</td>
<td>Serbia</td>
<td>Sabac</td>
<td>Heat pump utilising the heat from the waste water treatment facility (WWTF)</td>
<td>Contracting the consultants for the pre-feasibility study</td>
<td>Private</td>
</tr>
<tr>
<td>8</td>
<td>Serbia</td>
<td>Nis</td>
<td>Phase 1 - Solar thermal* + Buildings Energy Efficiency</td>
<td>Expression of interest received. Mandate letter-signing phase.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>9</td>
<td>Serbia</td>
<td>Zrenjanin</td>
<td>Phase 2 – Geothermal + Biomass + DH Energy Efficiency</td>
<td>Concept development phase.</td>
<td>Public</td>
</tr>
<tr>
<td>10</td>
<td>Bosnia &amp;</td>
<td>Sarajevo</td>
<td>Heat pump utilising geothermal heat + Energy efficiency in DH plant</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
<tr>
<td></td>
<td>Herzegovina</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bosnia &amp;</td>
<td>Banja Luka</td>
<td>DH Network refurbishment + Industrial waste heat</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
<tr>
<td></td>
<td>Herzegovina</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ReDEWeB Fund - Pipeline

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>City</th>
<th>Project scope</th>
<th>Processing stage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Serbia</td>
<td>Pancevo</td>
<td>Solar thermal* + Network refurbishment** + Buildings Energy Efficiency **</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development. Feasibility study contracted.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>2</td>
<td>Kosovo</td>
<td>Pristina</td>
<td>Solar thermal</td>
<td>Joint work with KfW being a lead IFI. Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Public</td>
</tr>
<tr>
<td>3</td>
<td>Serbia</td>
<td>Bor</td>
<td>Solar thermal* + Buildings Energy Efficiency ** + Substations modernisation** + Network refurbishment **</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>4</td>
<td>Serbia</td>
<td>Novi Sad</td>
<td>Solar thermal</td>
<td>Pre-Feasibility Study completed. Presenting the results to the Mayor.</td>
<td>Public</td>
</tr>
<tr>
<td>5</td>
<td>Montenegro</td>
<td>Zabljak</td>
<td>Biomass based greenfield district heating development</td>
<td>Pre-Feasibility Study completed. The City decided to proceed further with the project development.</td>
<td>Private</td>
</tr>
<tr>
<td>7</td>
<td>Serbia</td>
<td>Sabac</td>
<td>Heat pump utilising the heat from the waste water treatment facility (WWTF)</td>
<td>Contracting the consultants for the pre-feasibility study</td>
<td>Private</td>
</tr>
<tr>
<td>8</td>
<td>Serbia</td>
<td>Nis</td>
<td>Phase 1 - Solar thermal* + Buildings Energy Efficiency **</td>
<td>Expression of interest received. Mandate letter-signing phase.</td>
<td>Private* Public**</td>
</tr>
<tr>
<td>9</td>
<td>Serbia</td>
<td>Zrenjanin</td>
<td>Phase 2 – Geothermal + Biomass + DH Energy Efficiency</td>
<td>Concept development phase.</td>
<td>Public</td>
</tr>
<tr>
<td>10</td>
<td>Bosnia &amp;</td>
<td>Sarajevo</td>
<td>Heat pump utilising geothermal heat + Energy efficiency in DH plant</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
<tr>
<td>11</td>
<td>Hercegovina</td>
<td>Banja Luka</td>
<td>DH Network refurbishment + Industrial waste heat</td>
<td>Expression of interest received.</td>
<td>Public</td>
</tr>
</tbody>
</table>
Pancevo Solar Thermal District Heating Project
Serbia

Collector field
35,000 m²

Seasonal storage
150,000 m³

24.3 GWh
30 – 95°C
5.5 GWh
20 – 60°C

150,000 m³

28 GWh

27.9 GWh

1.9 GWh

Natural Gas
Gas per day currently
Gas per day BigSolar + Flue gas

3,858.4
2,136.2
1,776.8
1,036.5
20.9

0.0
0.0
0.0
0.0

0.0
0.0
0.0
0.0

0.0
0.0
0.0
0.0

3,117.3

Solar heat via HP
Solar heat - direct

35,000 m²

0
0
0
0

449
534
528
446

576
5,086
2,838
0

8,166
12,460
397
547

17 June, 2020
**EFW Project “Vinca”**

**Serbia**

**EBRD Finance**  € 78 million

---

**Main project parameters:**

Heat production: 56MW

Electricity production: 20.9 MW

Heat to be delivered: more than 200 GWh

Reliable baseload heat for Belgrade district heating system
Indicative prices for heat energy including all life-cycle costs:

**Fossil fuel:**
- Natural gas - boiler – 45 €/MWh

**Renewable sources of thermal energy:**
- Solar thermal – between 22 and 33 €/MWh.
  - After the repayment of the investment - 2 €/MWh
- Heat pumps (without a high temperature geothermal) - between 30 and 35 €/MWh
- Heat from the waste incinerator – up to 30 €/MWh
- Biomass – 30 - 35 €/MWh
- Geothermal energy - depends on temperature, yield and distance.
- Waste heat (data centers, industry, refineries ...) - ????
Banja Luka Biomass Project
Bosnia and Hercegovina

**EBRD Finance**

€ 8.35 million

**GHG Reduced**

45,750 tonnes of CO₂ eq / yr

Supporting the City of Banja Luka for the purchase of an equity stake in a new district heating Company ‘Eko Toplane’.

- New 49 MW biomass boiler plant replacing heavy fuel oil based capacity
- Green City Action Plan preparation
- City adopted a new tariff structure
In Conclusion

The Bank will continue to support technical innovation in the sector and enhanced private sector participation across the EC countries.

- Renewable heat generation (solar, heat pumps, geothermal and biomass), EfW and waste heat utilisation
- Thermal storage and integration with renewable electricity generation
- Capacity building and networking, jointly with ECS and District Heating and Cooling Associations
Questions

For all further enquiries, please contact:

**Bojan Bogdanovic**  
ReDEWeB Fund Manager  
Tel: +381 63 863 9079  
Email: BogdanoB@ebrd.com

**Greg Gebrail**  
Sector Specialist – District Energy  
Tel: +44 20 7338 7480  
Email: gebrailg@ebrd.com

**EBRD**  
One Exchange Square  
London, EC2A 2JN, UK,  
[www.ebrd.com](http://www.ebrd.com)