European Bank
for Reconstruction and Development

Business models in district energy systems

UNEP DTU Partnership Webinar

February 2021

EBRD
Who we are

European Bank
for Reconstruction and Development

An international financial institution supporting the development of sustainable well-functioning market economies

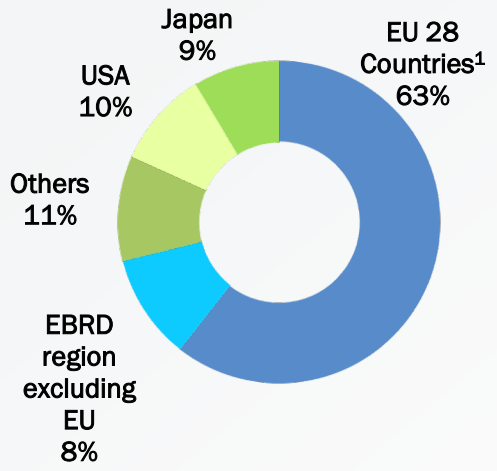
Highest credit rating
(AAA/Aaa)

Owned by 69 countries and 2 inter-governmental institutions
(the EU and EIB)

€30 billion authorised capital

1991	Established
1992	Russia and 11 other members of the former Soviet Union join
2007	The Czech Republic becomes the first country to "graduate" from the EBRD
2012	Starts investing in Egypt, Jordan, Morocco and Tunisia
2016	25th anniversary; China becomes 67th member
2017	Lebanon became a country of operation and the Bank also commenced operations in West Bank and Gaza

Shareholding structure



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

EBRD Objectives for the Sector

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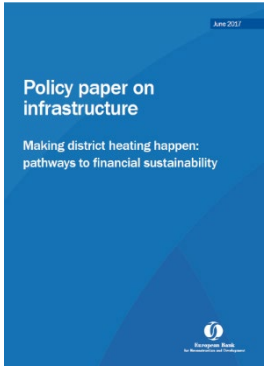
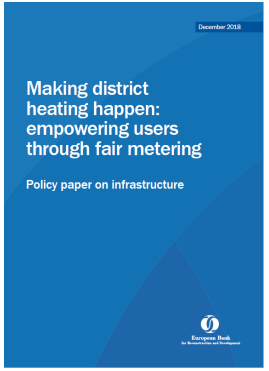
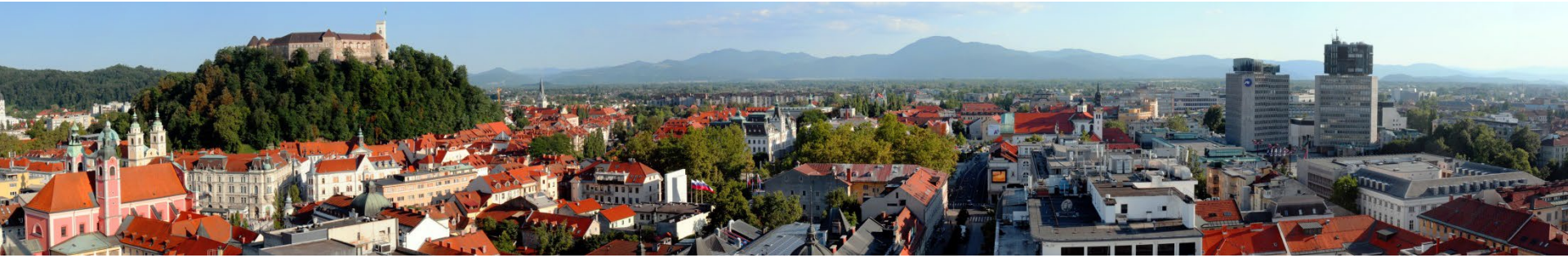
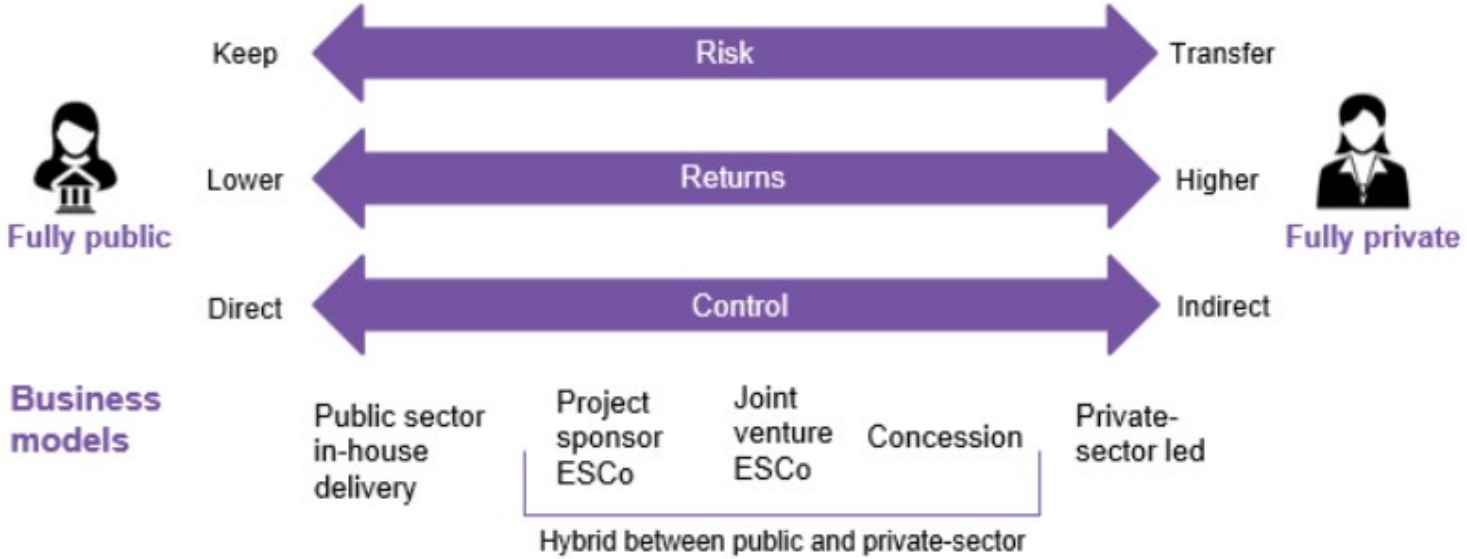
- Increase energy efficiency and reduce environmental impacts
- Improved service levels
- Increased commercialisation, consumer control and consumption based billing







District Energy Business Models



Level of risk has substantial impact on financing costs

*Image source: Bloomberg New Energy Finance

EBRD DE Financing Approach

Sovereign-backed loans	Municipal loans or utility loans guaranteed by municipality	Quasi corporate utility loans	Loans to PPP/ private companies
Central Government	Municipality	Utility Company or SPV	Private Company

Investment Size

€ 5 million to € 150 million

District Heating Regulation

Company

Customer

State

- No ‘one size fits all’ regulatory model for the sector
- Models range from heavy regulation (overly bureaucratic and prescriptive) to a ‘light touch’ approach with no price regulation
  - Impact on likelihood of private sector participation
- National Governments may enact an overarching national law which governs the sector, or it may be covered by wider energy sector legislation
- Regulation may also be necessary to ensure that the sector contributes to national objectives for renewable energy or CO2 reductions
  - Alternatively, this can be accomplished indirectly through carbon pricing or taxation of fossil fuels
- Correct balance that **protects consumer rights**, enables utility operators to cover costs, make a reasonable profit and **incentivise investment in the sector** (especially needed for decarbonisation)

Regulation as an Incentive for DE

- Ambitious national energy efficiency or renewable energy targets favour increased uptake of DE
- Countries with low levels of DE uptake vs mature DE markets have different requirements
- Planning or new build construction requirements for DE connection
- Connection or ‘DH zones’ with specified districts
- Embedding incentives in building codes or accounting for DE in green building certification schemes
- Fewer risks associated with deregulation in mature DE markets

Pricing and Competition from Alternative Sources

- Common tariff setting approach is the **'two-part tariff'**
  - Variable portion charged on a per-unit basis intended to cover opex costs, can be linked to fuel prices
  - Fixed portion charged at flat rate (dependent on capacity) intended to cover infrastructure costs such as networks
    - 'Regulated Asset Base' (RAB) model is common for natural monopolies
- A rigid price cap set by politicians often doesn't take account of actual costs or investment needs
  - Bad experience of this model within EBRD's Countries of Operation
  - Sovereign or sub-sovereign financing or government budget transfers is the most common funding approach
- Competition and the presence of heating alternatives can reduce the need for price regulation
  - Level playing field – subsidised natural gas or electricity affects competitiveness

State Funding and the Role of Subsidies

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- **Up-front state funding**, either in the form of an equity stake or a capex grant may be necessary in less mature DE markets
  - A project achieves policy aims but has a poor internal rate of return
  - Low early stage tariff revenues in new networks due to low loads during build-out
  - De-risking to attract private sector participation
- Public or state sector adoption of DE – creation of 'anchor loads'
- Precedent in Eastern and Central Europe and former USSR for rehabilitation of legacy networks and to facilitate major reforms
- 'Open-ended' subsidy by Government to loss-making public companies is unsustainable
  - If tariffs are set below costs for social reasons, a targeted subsidy for low income groups is much more effective

Banja Luka District Heating Project

Bosnia and Herzegovina

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EBRD Finance	€ 8.35 million
GHG Reduced	45,750 tonnes of CO_2 eq / yr

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

- New 49 MW biomass boiler plant replacing heavy fuel oil based capacity
- Majority private-owned joint venture with the City
- First non-sovereign municipal project in the country
- City adopted a new tariff structure
- DH company to adhere to EBRD's environmental and social requirements

District Cooling Considerations

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- Most DC networks are associated with new large scale mixed use developments.
  - Concession agreement between developer and DC operator are most common in the Middle East
  - Developer requires that end-users purchase cooling from the DC operator
- DC networks are less likely to have direct legislation or tariff regulation
  - Onus on the developer to ensure that the concession agreement governs tariff setting and termination rights in the case of breaches
- Network pipeline infrastructure often built by developer and the DC operator is required to adopt the network upon appointment

DC Business Models for Real Estate Developers

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	In House	Joint Venture SPV	Full Concession
Developer Equity	100% Developer equity • Developer retains risk but has full control • O&M or management can be contracted • Potential sale or concession post-completion	<50% Developer equity • Equity partner shares cost and risk • Partner may bring operational expertise	0% Developer equity • Max risk transfer • 25 – 50 year BOOT contract • 3rd party finance
Potential Equity Investors	None – 100% Developer equity	Developer equity/DC operators/Other equity investors	DC operators/Other equity investors
DC Operations	Internal/O&M or Management contractor	DC operators	DC operators

*Source: King and Spalding for District Energy in Cities Initiative

Abdali District Heating & Cooling Project

Jordan

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EBRD Finance **€ 26.6 million**

GHG Reduced **~15,000**
tonnes of CO_2 eq / yr

New system for a major commercial, leisure and residential redevelopment in Central Amman operated by the part-private Jordan District Energy Company (JDE).

- New 110 MW (31,000 TR) ammonia cooling plant
- ~40% energy savings
- Minimal water consumption (air cooled plant)
- € 42 million EPC cost developer co-financed
- JDE is a SPV established for the purpose of district energy provision. It is a joint venture owned by the development consortium and a Jordanian state development company.

In Conclusion…

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- Countries are looking to increase district energy investment to utilise more local renewable and waste heat sources in their energy systems. Some key considerations:
    - Business model can have a large influence on a project's perceived risk and funding costs
    - Regulation can act as an incentive, particularly in less mature DE markets
    - Tariffs must be transparent and account for or encourage investment
    - Subsidies or grant funding are a powerful tool to revitalise and rehabilitate legacy infrastructure or facilitate a new sector
    - In an unregulated market, an independent dispute resolution mechanism is recommended
- No single model is applicable everywhere!

Contacts

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