

Funding District Heating

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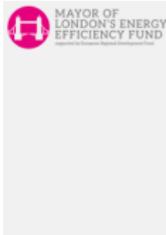
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Talk Structure

- Part 1 - Sources of funding for district heating
- Part 2 - Stakeholder views

Public-Private Partnerships

- Cooperation between public and private sectors.
- For district heating, often an ESCO is set up with joint ownership.
- Requires high level of stakeholder engagement.
- Islington demonstrator on CELSIUS project a highly successful example of this.
- BS| Energy (75% privately owned and 25% publicly) in Brunswick, Germany another successful example.



THE MAYOR OF LONDON'S ENERGY EFFICIENCY FUND (MEEF)

MEEF is a new investment fund, established by the GLA with funding from the European Commission, which will help achieve London's ambition of being a zero carbon city by 2050.

The Fund is managed by Amber Infrastructure Group.

- Follow up to London Energy Efficiency Fund (LEEF).
- Invests in projects of 1m + and up to around 20m.
- Fund term of 20 years.
- 2m of technical support funding.
- Minimum of 70 percent of funds must be allocated to public sector.
- Private sector recipients can be SMEs or ESCOs.



Other City/Regional/National funds

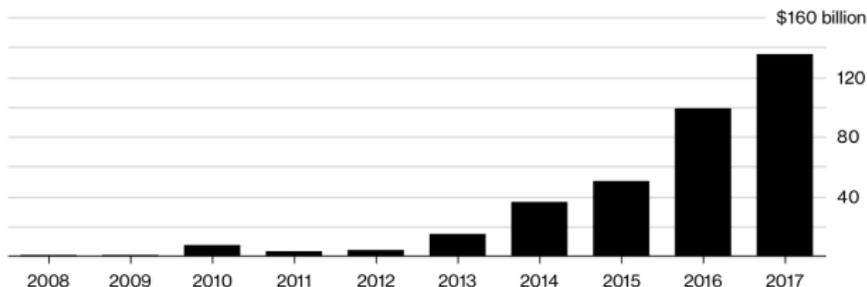
- Scottish Governments Green Infrastructure Strategic Intervention.
- ADEME Fonds Chaleur (France)
- Scottish Government's district heating loan fund.
- Re:Fit (England and Wales)

Green Bonds

- Bonds specifically designed to fund green projects.
- Often come with tax incentives, encouraging green investments.
- May be of interest to companies with corporate social responsibility targets.
- Investments often *aggregate* to gain volume.
- Global green bond issuance growing very quickly.

Green Bond Boom

Global green bond issuance is projected to reach \$135 billion this year



Source: Bloomberg New Energy Finance

Green Bonds

- Gothenburg first city in the world to issue green bonds in 2013.
- First issuance of around 50 million euros in 2013.
- Further 170 million in 2014 and 95 million in 2015.
- Used to fund district heating from a passenger ship as part of CELSIUS Project.
- Was given a Green Bond Award in 2016.
- Gothenburg aims to be transparent and share knowledge and output with other cities.



Gothenburg, Sweden's second largest city. File photo: ShowtimeGothenburg/Flickr

- Contractors such as Engie and Veolia often fund, build and operate district heating schemes.
- Veolia operates over 100 district heating schemes around Europe.
- Engie operates around 180 schemes.
- Contractors have extensive experience and knowhow.
- Often not keen on taking on risk of new types of project.
- Projects such as ReUseHeat can help fund pilot schemes.

Crowdfunding

- Crowdfunding is the process of funding a project through a large number of small contributions.
- Has grown hugely in popularity in recent years (12 times increase globally between 2012 and 2015).
- Small environmental projects are sometimes funded through specialist crowdfunding websites.
- Major attraction of crowdfunding is often to do something 'worthwhile' rather than to generate a return.
- TRINE is a crowdfunding website that funds solar projects through small investments from the general public (25 Euros plus).
- Crowdfunding is not currently used to fund district heating.
- A study on the viability of crowdfunding district heating is expected as part of the TEMPO EU project.



Large scale peer to peer financing

- A specific form of crowdfunding.
- Non-profit organisations reach out to supporters who fundraise on their behalf.
- Example - 'Speed of Light' raises money for solar projects in Africa.
- Much easier to raise funds for charitable projects than those like district heating.

Impact Investing

- Investments with aim of making social and environmental impacts.
- A form of philanthropy as return likely to be lower than other investments.
- Typically funds bigger investments than crowdfunding and peer to peer.
- 85 percent of S & P 500 companies produced sustainability in 2017 (up from 20 percent in 2011).
- Potentially a source of funding for district heating as lower return required.
- Would require environmental and social benefits to be clearly set out.
- Example - the Energy Access Debt Fund aims to provide access to energy in developing nations.



User Owned Cooperatives

- Non-profit cooperatives owned by customers.
- Only owners (not tenants) of buildings can usually become members.
- Around 340 cooperative district heating schemes in operation in Denmark.
- The Danish District Heating Association (a ReUseHeat partner) provides support.
- Similar associations in other countries.
- Connection sometimes mandatory.
- Only owners (not tenants) of buildings can usually become members.
- Socio-economic benefits must usually be demonstrated before approval.



Case Study - Brunswick, Germany

- One of four demonstrators on the ReUseHeat project.
- A data centre will meet base demand of heat for around 400 new homes.
- Will be connected to existing district heating network to meet rest of demand.



Case Study - Brunswick, Germany

- BS|Energy is an ESCO set up to provide energy for Brunswick.
- Jointly owned by Veolia (75 percent) and the city of Brunswick (25 percent).
- Project jointly funded by BS|Energy and ReUseHeat
- ReUseHeat funding helped push the project over the 'threshold of viability'.
- Project unlikely to have gone ahead without EU funding.
- Experience from project likely to make similar projects viable without public funding.

- Mathematical modelling can help provide better forecasts of KPIs.
- This can help to reduce risk and improve project viability.
- Modelling comes at a cost. More complicated modelling is more expensive.
- Complexity of modelling carried should therefore weigh up these two things.
- The Alan Turing Institute has been awarded a large grant on this subject.

Part two - Stakeholder Analysis

- As part of the ReUseHeat project, interview of stakeholders in ten different countries were carried out.
- Five categories of stakeholders: Customers, DH companies, investors, heat providers, policy makers.
- Topics discussed included funding and financing.
- Responses gave good insights into stakeholder views.

Funding Pilot Projects

- Pilot projects help identify difficulties/complications of a project, reducing risk for future projects.
- Lessons learned from pilot projects seen to be highly valuable.
- Banks and private companies generally reluctant to take on risk of pilot projects.
- EU projects like ReUseHeat provide part or full funding for pilot projects.
- Lessons learned are then disseminated in project deliverables.

Challenges for Private Funding

- Getting private companies to fund district heating projects entirely is difficult.
- Banks often require project to be viable without additional funding (E.g. from the EU).
- Pilot projects seen as useful in making future projects viable.
- Involvement of the public sector seen as useful to reduce risk.

Incentives and Regulation

- Widespread view that incentives are required to encourage heat recovery.
- Since waste heat recovery is relatively new, limited regulation/incentives are in place.
- Some countries provide tax breaks on electricity used for heat pumps. Seen as a potentially useful step in others.
- Requiring companies to reuse some percentage of excess heat seen as an option by some.
- Penalising potential customers for not signing up seen as an option to reduce demand risk.
- Seen as potentially bad for customer relations by others. This option was rejected for Brunswick demonstrator on ReUseHeat.

The Role of Corporate Social Responsibility

- Corporate social responsibility becoming more and more relevant.
- Many companies see social and environmental benefits as important.
- Many also have carbon emission targets.
- Investors sometimes happy to accept lower returns, longer payback periods etc for green projects.

- Green bonds in demand from pension fund managers.
- Good financial indicators needed to fund. Evaluation of cash flows etc. also often required.
- ESCO most likely to be funded as most creditworthy.
- Must be able to point to existing solutions to get credit from a bank.
- District heating projects need special treatment.
- Bigger investments may be more attractive (e.g. 20 Metro stations rather than one).

What is needed?

- Standardisation
- Process
- Certification
- Modelling
- Design
- Risk
- Uncertainty
- Aggregation
- Blending (finance)
- Systems

Some Useful Links

- www.reuseheat.eu
- www.celsiuscity.eu
- www.meef.co.uk
- www.greeninfrastructurescotland.scot
- www.fonds-chaleur.ademe.fr
- www.energysavingtrust.org.uk/scotland/grants-loans/district-heating-loan