BUSINESS MODELS FOR DISTRICT ENERGY

DISTRICT ENERGY IN CITIES

A GLOBAL INITIATIVE TO UNLOCK THE POTENTIAL OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

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Celia Martinez, Technical Coordinator Latin America and Africa, District Energy in Cities Initiative

Heat Roadmap Poland, Warsaw, January 25 2018

CONTENT

1. An introduction to the District Energy in Cities Initiative
2. Key findings on business models for district energy
3. How to choose the business model based on varying levels of risk and control appetite
4. Case Studies

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LAUNCH AT CLIMATE SUMMIT

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Sustainable Energy for All (SE4All) Sub-Committee's

Co-chairs:
- UNEP Executive Director
- CEO Accenture
- Minister for Trade and Development Cooperation, Denmark

Global Energy Efficiency Accelerator Platform: to scale up efficiency gains and investments at the national, sub-national and city levels through technical assistance, support and public-private sector collaboration

Individual accelerators focus on specific energy efficiency sectors

- Buildings
- Transport
- **DISTRICT ENERGY**
- Lighting
- Appliances & Equipment

SUSTAINABLE ENERGY FOR ALL

GLOBAL ENERGY EFFICIENCY ACCELERATOR PLATFORM

Double Global Rate of Improvement of Energy Efficiency by 2030

A GLOBAL PARTNERSHIP

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ON DISTRICT ENERGY

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EBRD
SUSTAINABLE ENERGY FOR ALL
iea International Energy Agency
EUROHEAT & POWER
thermaflex
COPENHAGEN CENTRE ON ENERGY EFFICIENCY
VEOLIA
Danfoss
ATOLL ENERGY Tailored Efficiency
POLITECNICO MILANO 1863
CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK
Union for the Mediterranean
Union pour la Méditerranée
الإتحاد من أجل المتوسط
SSG SUSTAINABILITY SOLUTIONS GROUP
INTERNATIONAL DISTRICT ENERGY ASSOCIATION
Solar Turbines
dalkia GROUPE EDF
Johnson Controls
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EESL
engie by people for people
IFC International Finance Corporation WORLD BANK GROUP
BPIE
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CARBON TRUST
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MINISTRY OF FOREIGN AFFAIRS OF DENMARK DANIDA INTERNATIONAL DEVELOPMENT COOPERATION

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WHAT DO WE DO

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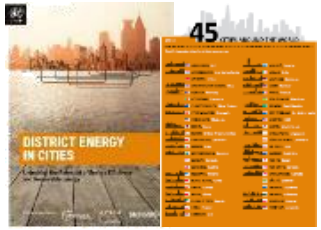
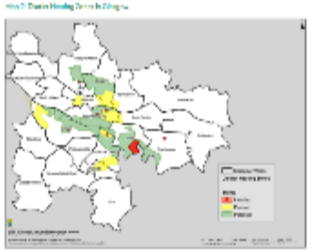
ATTRACT INVESTMENT



Increase knowledge of multiple benefits (publications, outreach and communications campaign)

Identify potential pilot projects, build capacity and develop methodologies and policies based on the implementation of pilot activities.



Scale-up through the establishment of a National Delivery Unit and the development of a regulatory framework.

Unlock investments: Design financial mechanisms to address financial barriers and support the first projects in new markets

Double the rate of energy efficiency improvements for heating and cooling in buildings by 2030 through district energy

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WHERE WE ARE

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LAUNCH OF A TECHNICAL GUIDE

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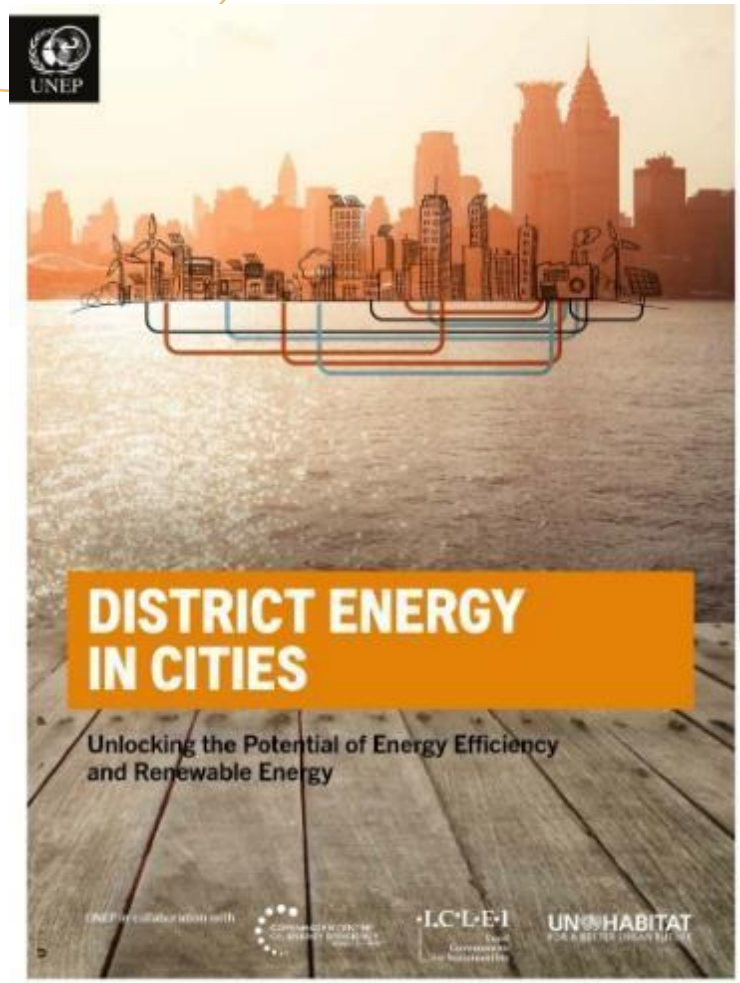

BOX 1.1

45 CITIES AROUND THE WORLD

The 45 champion cities for district energy use

- ABERDEEN, U.K.
- AMSTERDAM, the Netherlands
- ANSHAN, China
- ARLINGTON COUNTY, USA
- BERGEN, Norway
- BOTOSANI, Romania
- CHRISTCHURCH, New Zealand
- COPENHAGEN, Denmark
- CYBERJAYA, Malaysia
- DOHA, Qatar
- DUBAI, United Arab Emirates
- FRANKFURT, Germany
- GENOA, Italy
- GOTHENBURG, Sweden
- GUELPH, Canada
- GÜSSING, Austria
- HELSINKI, Finland
- HONG KONG, China
- IZMIR, Turkey
- JINAN, China
- KUWAIT CITY, Kuwait
- ŁÓDŹ, Poland
- LONDON, U.K.
- MALMÖ, Sweden
- MILAN, Italy
- MUNICH, Germany
- OSLO, Norway
- PARIS, France
- PORT LOUIS, Mauritius
- RIYADH, Saudi Arabia
- ROTTERDAM, the Netherlands
- SEATTLE, USA
- SEOUL, South Korea
- SINGAPORE, Singapore
- SØNDERBORG, Denmark
- ST. PAUL, USA
- SYDNEY, Australia
- TOKYO, Japan
- TORONTO, Canada
- VANCOUVER, Canada
- VÄXJÖ, Sweden
- VELENJE, Slovenia
- VILNIUS, Lithuania
- WARSAW, Poland
- YEREVAN, Armenia

Methodology and Key Steps

*"In launching this report we want to draw the **attention of the world's decision makers**, mayors and leaders at the community level **to the importance of district energy systems**."*

- Achim Steiner, former UN Environment Programme Executive Director. Launch of the District Energy in Cities Report - Paris, 25 February 2015

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KEY FINDINGS

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- Local governments are best placed to **alleviate risks** and are critical to **leveraging finance.**
- Private sector can deliver upfront finance and international expertise
- **Variety of business models** with varying levels of private sector and local government ownership and management.
- Business models and ownership structures can adapt over time
- Best business models incorporate multiple benefits

MULTIPLE BUSINESS MODELS FOR VARYING RISK AND CONTROL

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FINANCIAL RETURN ON INVESTMENT	DEGREE OF CONTROL AND RISK APPETITE OF PUBLIC SECTOR	TYPE OF BUSINESS MODEL	EXAMPLES
LOW	↑ High	Wholly public	■ District energy to meet social objectives related to housing or fuel poverty
MEDIUM / LOW	↑ High	Wholly public	■ Public sector demonstrating the business case of district energy systems ■ Public sector looking to create projects that will improve its cash flow ■ Public sector lowering the IRR by allowing cheaper energy tariffs than the private sector would
MEDIUM / HIGH	→ Medium	Public/private hybrid	■ Public/private joint venture ■ Concession contract ■ Community-owned not-for-profit or cooperative
HIGH	↘ Medium / Low	Private (with public facilitation)	■ Privately owned project with some local authority support, perhaps through a strategic partnership

MULTIPLE BUSINESS MODELS FOR VARYING RISK AND CONTROL

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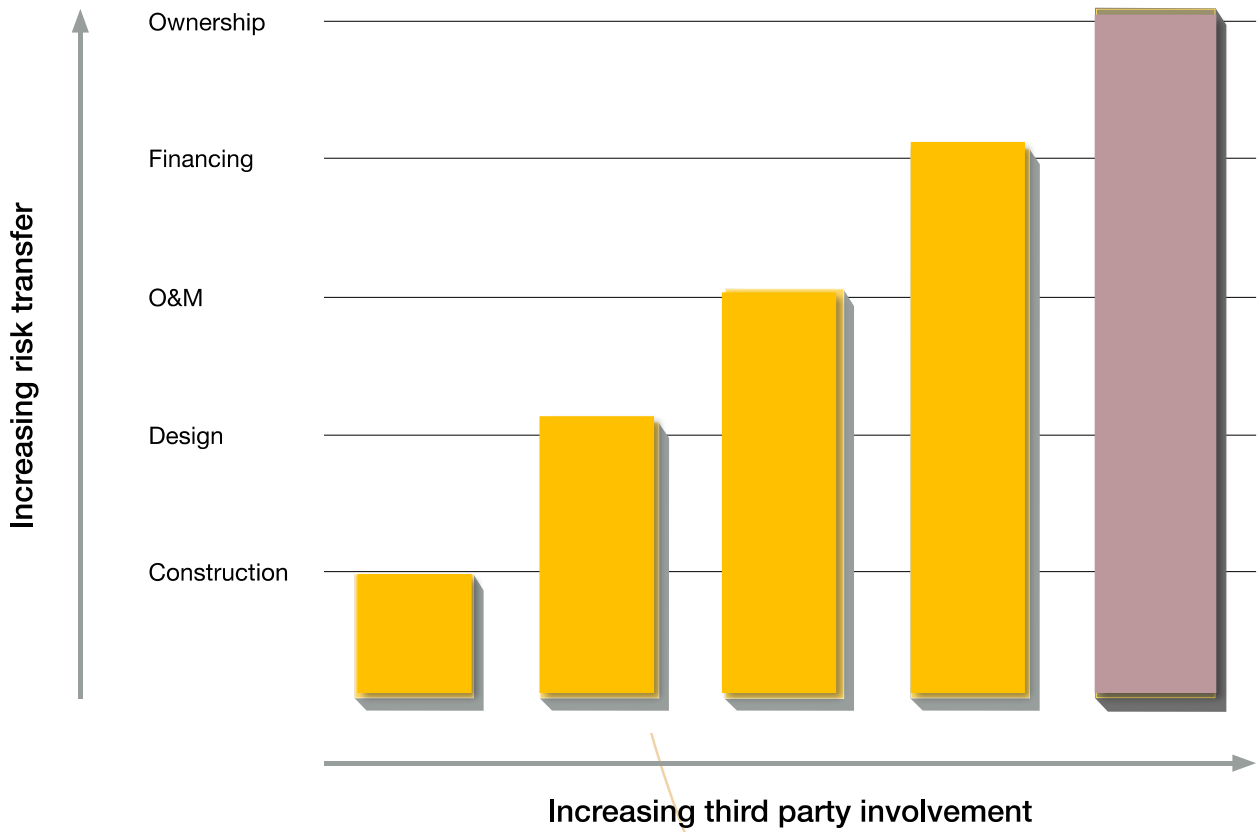
Source: Carbon Trust

PROCUREMENT OPTIONS



Source: Carbon Trust

BUSINESS MODELS

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CITY EXAMPLES

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Business model	City examples
“Wholly public” model	Vancouver, Bergen, Brest, Gothenburg, Belgrade, Banja Luka
Public-private concession contract model	Barcelona, Paris (CPCU)
Private concession contract model	London Olympic park
Cooperative and/or non-profit models	Copenhagen, Aberdeen
'Private'' business model	Temuco

CASE STUDY: BELGRADE, SERBIA

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- 50% of households connected to district heating, total length of 1,420 km and a capacity of over 2,800MW
- Publicly owned utility model
- Significant investment needed to refurbish, expand and fuel-switch: €380 mil. over the next 25 years
- Innovative new business models being consider for certain parts of network

CASE STUDY: BANJA LUKA

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PREVIOUS SITUATION

- Utility 70 % owned by the municipality
- **Inefficient network** with large heat and water losses and run 85% on heavy fuel oil
- Utility near **financial collapse** due to heavy fuel oil purchases
- **Lack of strategy** on the long-term role of district heating in meeting city objectives
- **Lack of interest** in early-stage feasibility from financiers

Change of business model

CURRENT MODEL

- Public-private partnership
- 51% owned by a private group and 49% by the Municipality
- The CTCN and the DES Initiative undertook a preliminary assessment and further a feasibility study to refurbish the network and shift from fuel oil to biomass boilers.
- EBRD showed interest in the results shown in the feasibility
- The Municipality launched a open call for tender to search for a potential private partner, change the business model and develop the project assessed in the feasibility.
- EBRD accepted to provide a loan to the municipality to cover their part.
- Project total cost €17.8 million

CASE STUDY: CHINA – BUSINESS MODELS FOR WASTE HEAT

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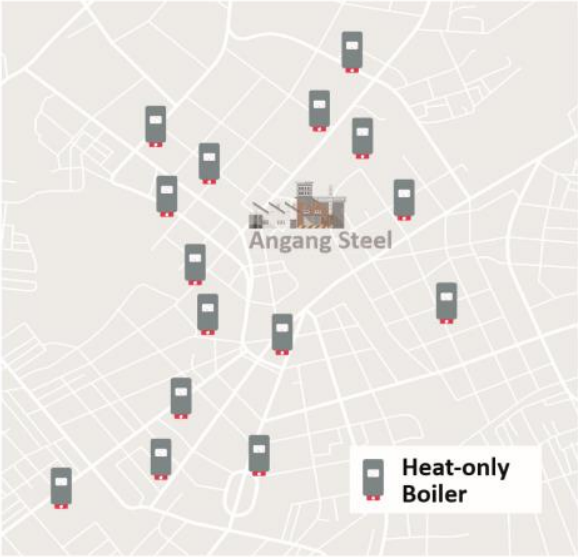
- Huge waste heat potential in China
  - Approximately half of the current energy demand for district heating in northern China
- District heating delivered by a mix of city-owned and private vertically integrated utilities
- Multiple business models to connect it:
  - Utility model with 3rd party access
  - Split asset model with heat production competition
  - ESCO business model



CASE STUDY: TEMUCO, CHILE

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- Innovative private water utility: Aguas Araucania identified district heating as a new commercial opportunity
- To test technical and commercial viability, the company has invested in a small pilot project providing hot water and heating to 5 buildings.
- This has reduced gas consumption by 90%

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THANK YOU!

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For more information on the Global District Energy in Cities Initiative and to become a partner, please visit the website or contact:

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http://www.districtenergyinitiative.org/