

Benjamin Hickman, Technical Expert: Europe and South Asia
Division of Technology, Industry and Economics, UNEP



DISTRICT ENERGY IN CITIES

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



DISTRICT ENERGY IN CITIES INITIATIVE

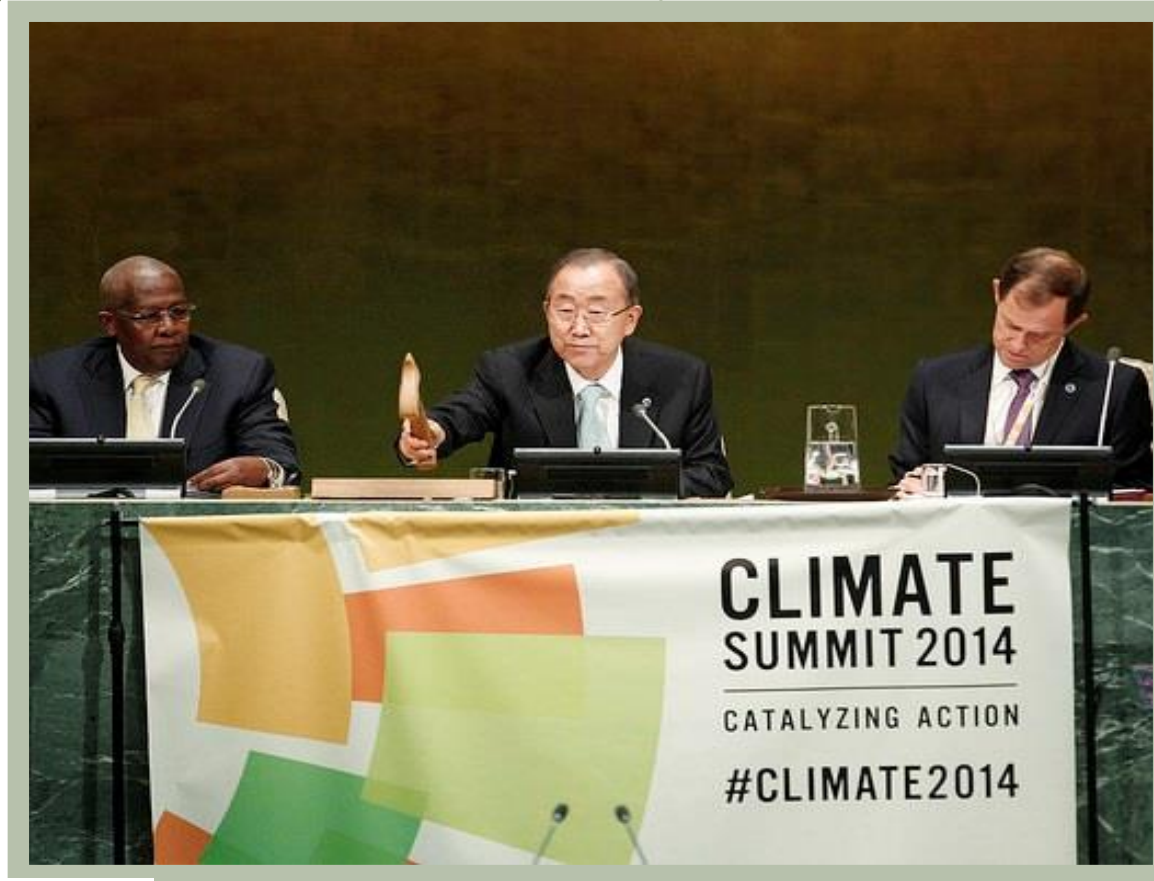


DISTRICT ENERGY
IN CITIES
INITIATIVE

LAUNCH AT CLIMATE SUMMIT



SUSTAINABLE
ENERGY FOR ALL

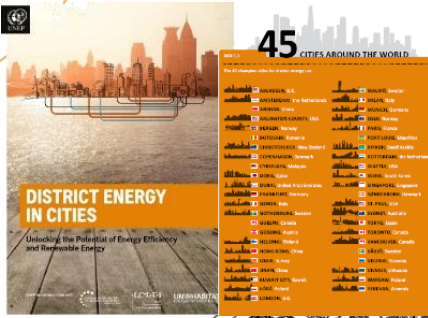


SUSTAINABLE
ENERGY FOR ALL



GLOBAL ENERGY EFFICIENCY
ACCELERATOR PLATFORM

Double Global Rate of Improvement of Energy Efficiency by 2030



MARKET TRANSFORMATION

Increase knowledge

Demonstrate viability

Scale up

Investment environment

A GLOBAL PARTNERSHIP TO SCALE-UP



**DISTRICT ENERGY
IN CITIES
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MODERN DES



SUSTAINABLE
ENERGY FOR ALL



GDF SUEZ devient ENGIE



WHAT IS DISTRICT ENERGY?



DISTRICT ENERGY
IN CITIES
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SUSTAINABLE
ENERGY FOR ALL



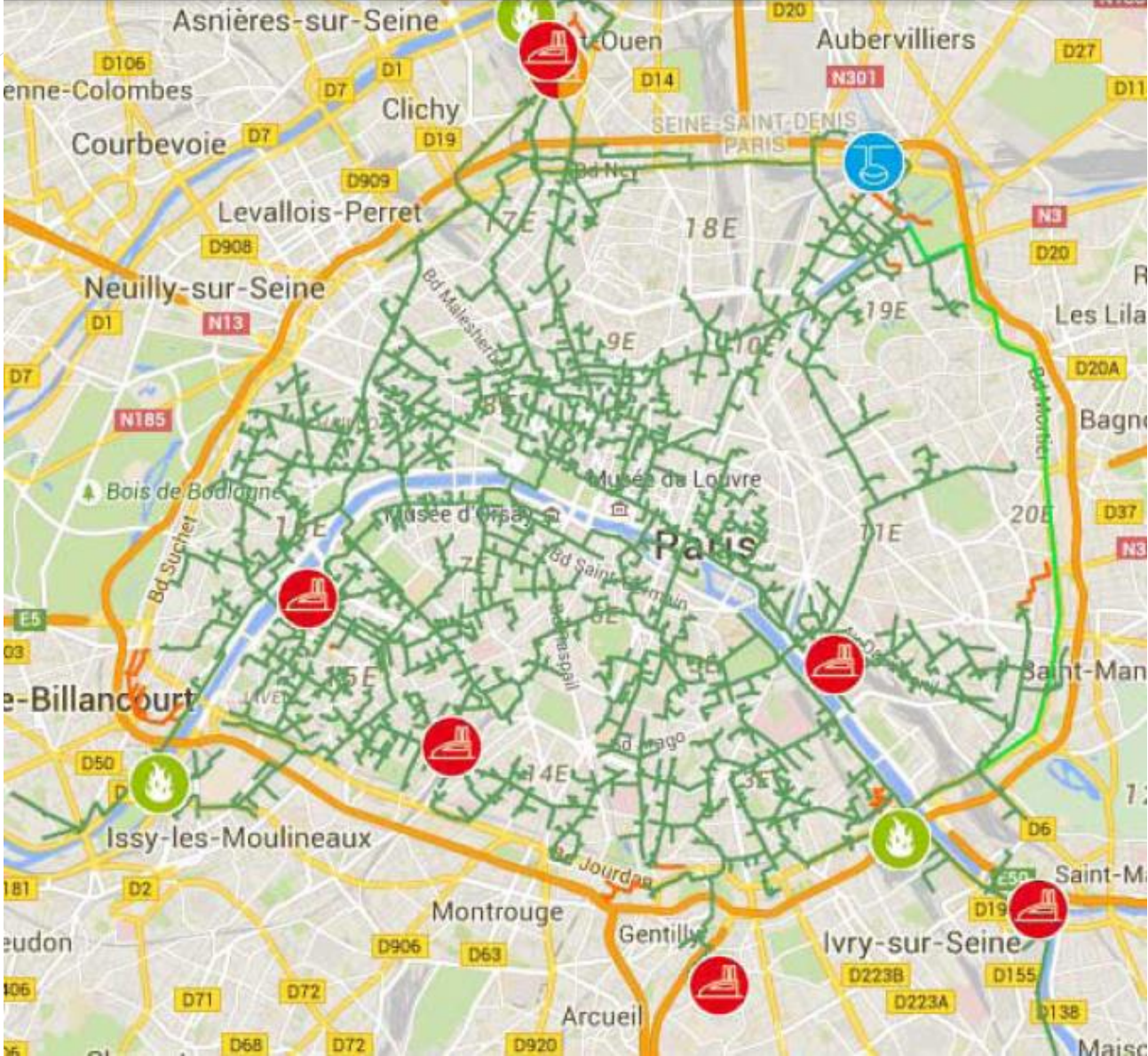
WHAT IS DISTRICT ENERGY?



**DISTRICT ENERGY
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SUSTAINABLE
ENERGY FOR ALL



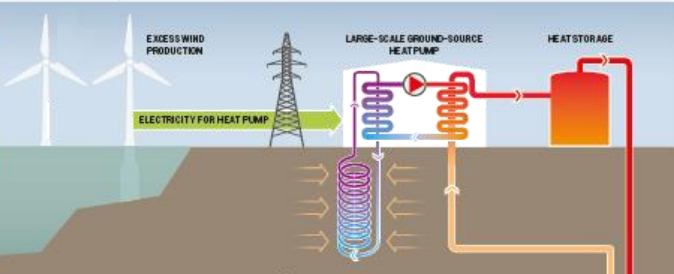
WHAT IS DISTRICT ENERGY?



**DISTRICT ENERGY
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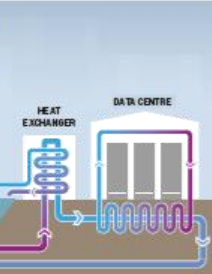
CONNECTING RENEWABLE ELECTRICITY GENERATION



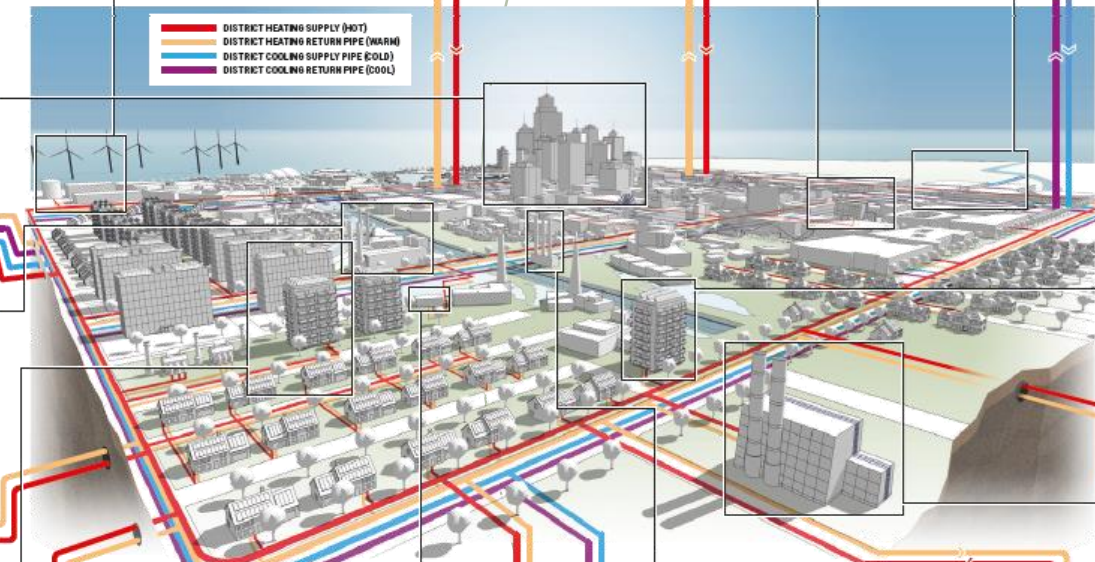
WASTE INCINERATION



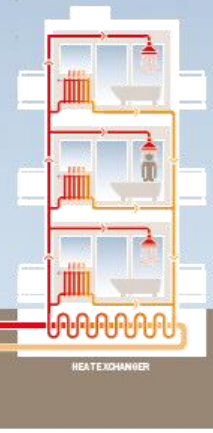
CONNECTING SOURCES OF "FREE COOLING"



CONNECTING COMMERCIAL DEMAND



CONNECTING RESIDENTIAL CUSTOMERS



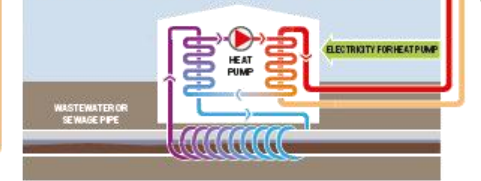
CONNECTING INDUSTRIAL DEMAND



SOLAR THERMAL CONNECTED TO DISTRICT HEATING



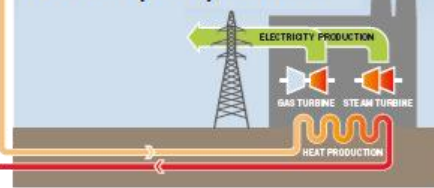
CAPTURING WASTE HEAT FROM SEWAGE AND WASTEWATER



ABSORPTION CHILLER CAPTURING WASTE HEAT



COMBINED HEAT AND POWER (CHP) PLANT



WHY IS DISTRICT ENERGY IMPORTANT?



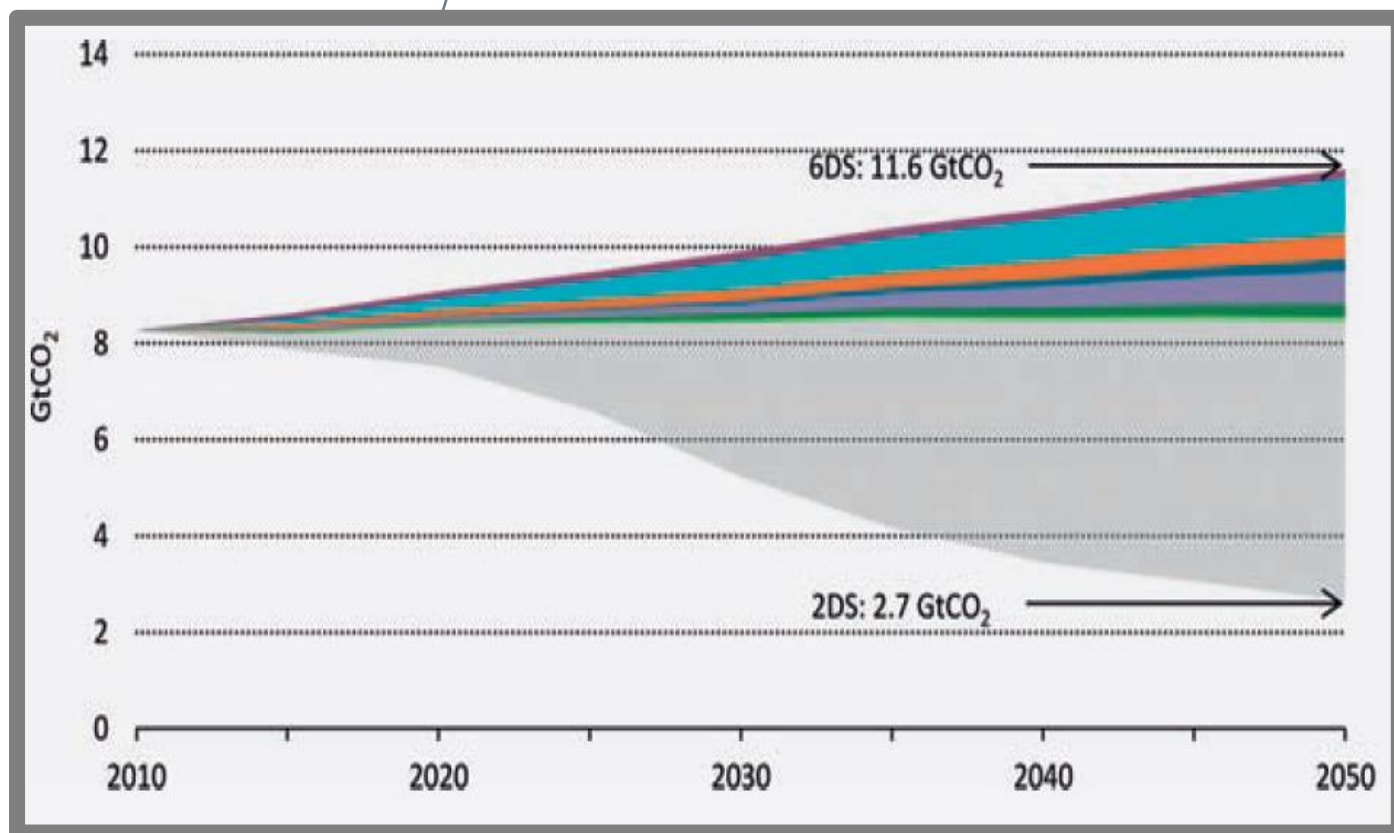
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Heating, hot water and cooling account for **60% of the global energy consumption** in buildings, largely met by fossil fuels

Connects waste heat and large scale renewables that **cannot be used** on an individual building level

30-50% primary energy savings

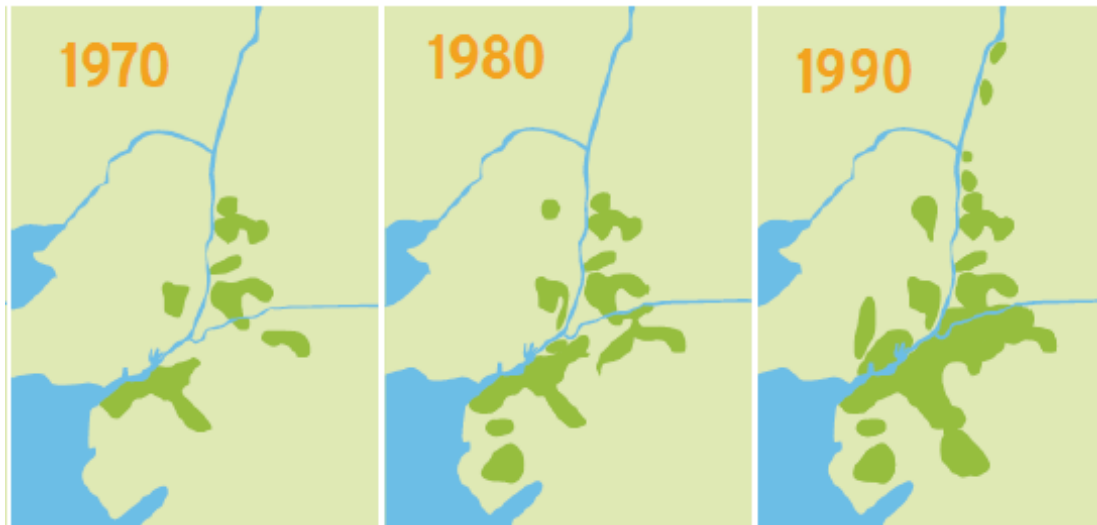


GOTHENBURG, SWEDEN: SWITCH



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FROM OIL TO WASTE HEAT



REDUCED POLLUTANTS



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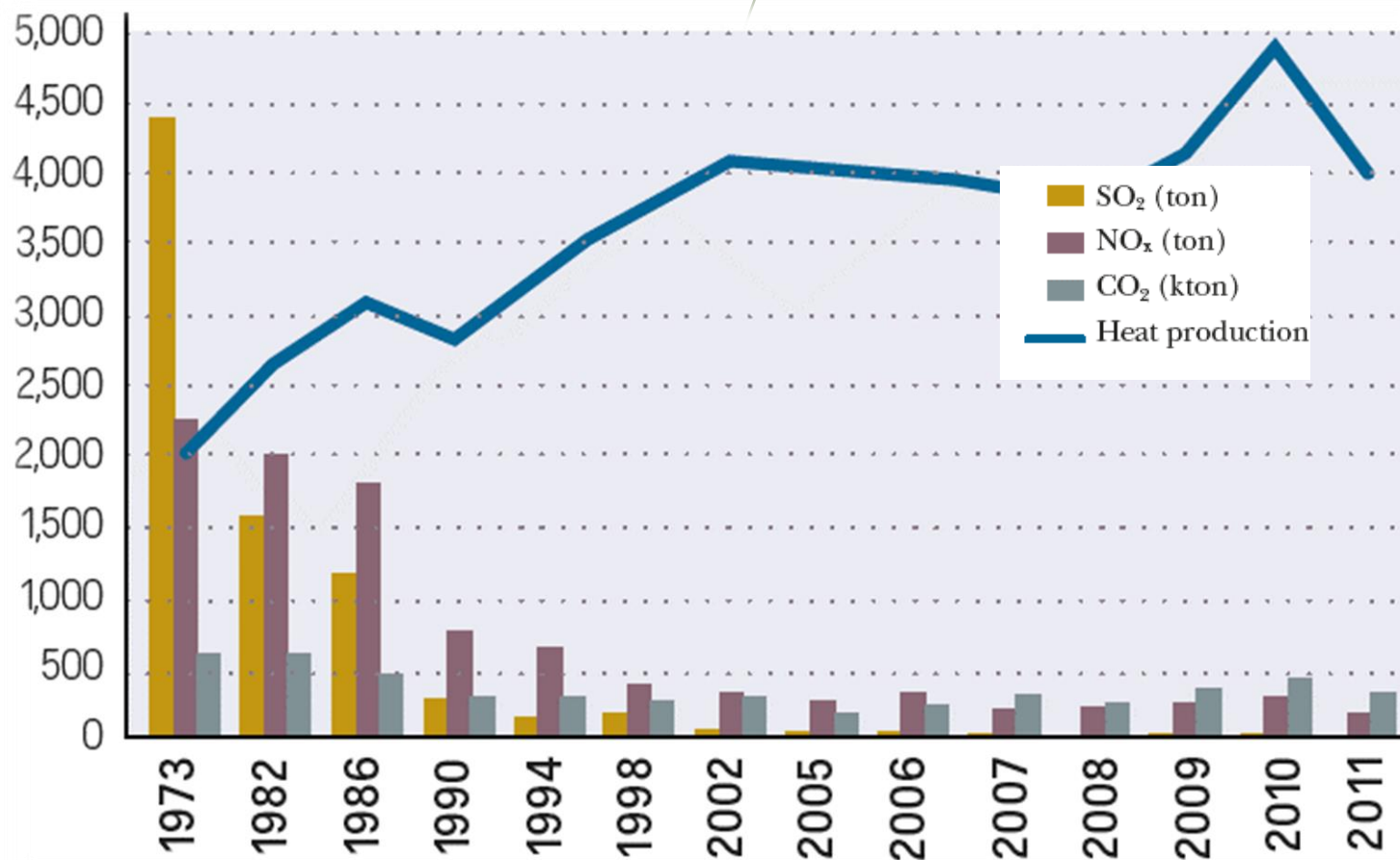
BY 50-100 PERCENT



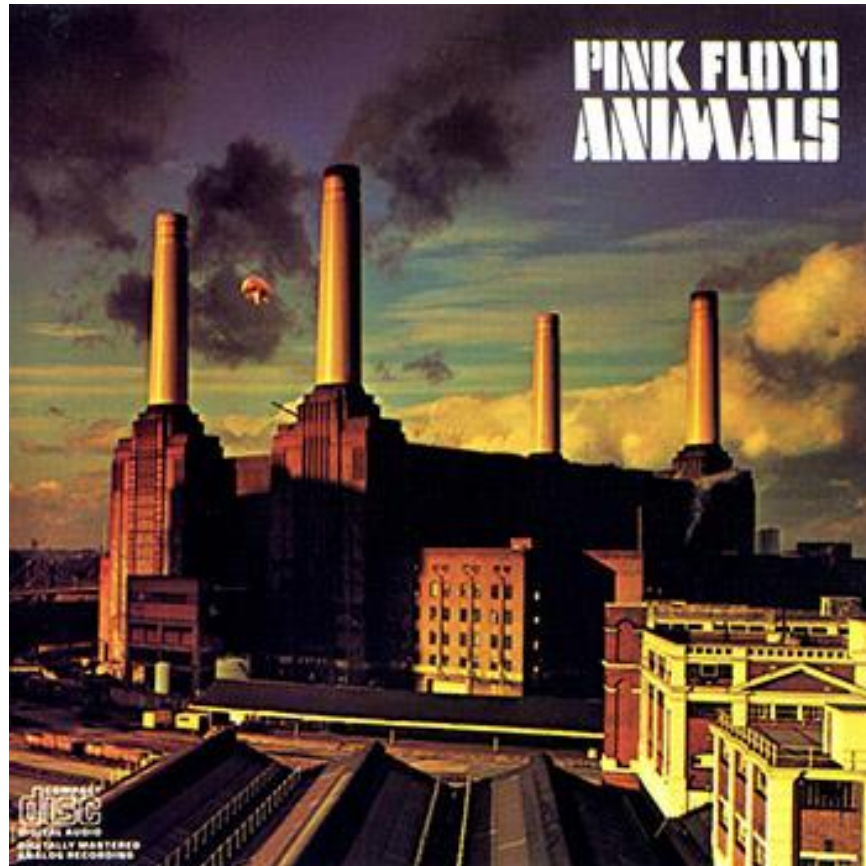
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Gothenburg, Sweden



WHY REFURBISH DISTRICT HEATING SYSTEMS?



- 80% CO₂ reduction by 2050
- Air pollution
- Fuel poverty
- Energy security
- Green economy

Battersea Power Station: no cooling towers!

WHY REFURBISH DISTRICT HEATING SYSTEMS?



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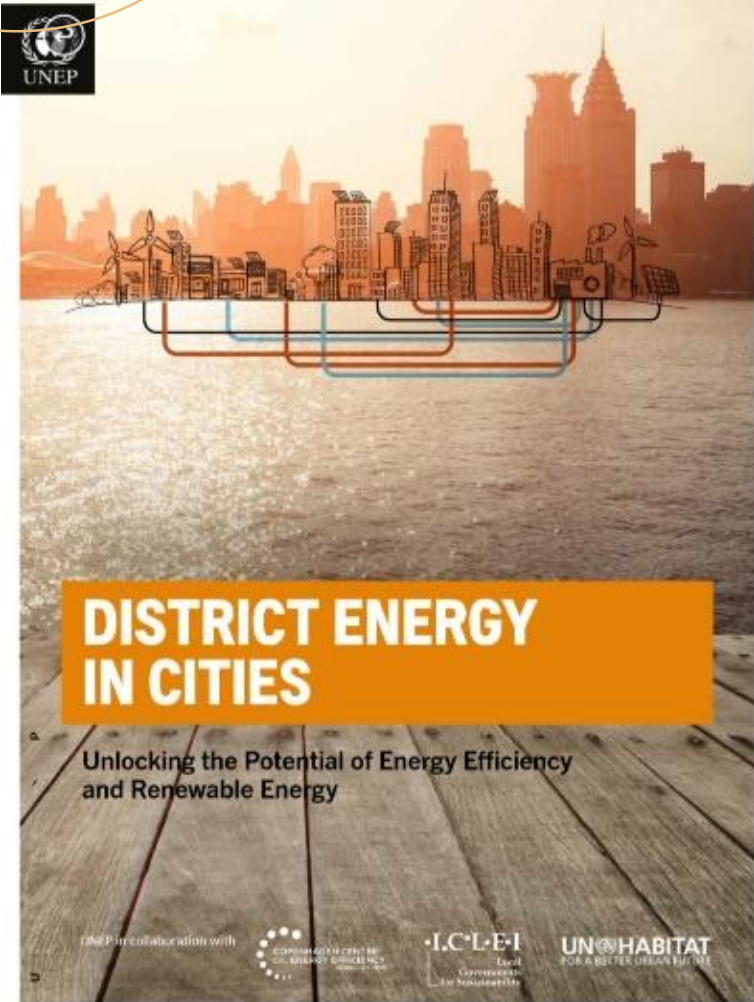
SUSTAINABLE
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LAUNCH OF A TECHNICAL GUIDE



**DISTRICT ENERGY
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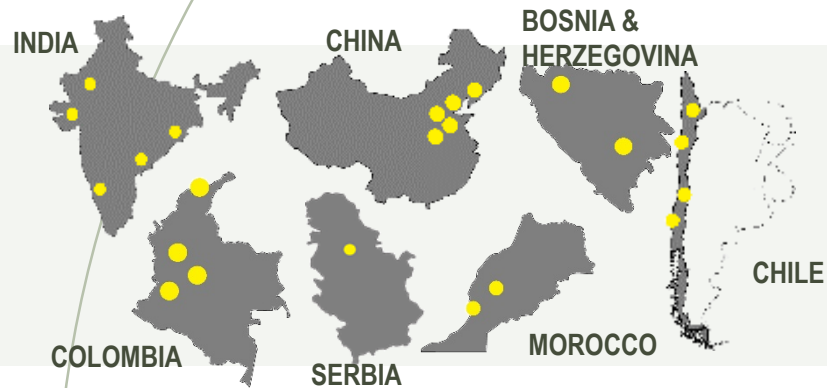
45 CITIES AROUND THE WORLD

- BOX 1.1**
- The 45 champion cities for district energy use
- | | |
|------------------------------------|-----------------------------------|
| ABERDEEN, U.K. | MALMÖ, Sweden |
| AMSTERDAM, the Netherlands | MILAN, Italy |
| ANSHAN, China | MUNICH, Germany |
| ARLINGTON COUNTY, USA | OSLO, Norway |
| BERGEN, Norway | PARIS, France |
| BOTOSANI, Romania | PORT LOUIS, Mauritius |
| CHRISTCHURCH, New Zealand | RIYADH, Saudi Arabia |
| COPENHAGEN, Denmark | ROTTERDAM, the Netherlands |
| CYBERJAYA, Malaysia | SEATTLE, USA |
| DOHA, Qatar | SEOUL, South Korea |
| DUBAI, United Arab Emirates | SINGAPORE, Singapore |
| FRANKFURT, Germany | SØNDERBORG, Denmark |
| GENOA, Italy | ST. PAUL, USA |
| GOTHENBURG, Sweden | SYDNEY, Australia |
| GUELPH, Canada | TOKYO, Japan |
| GÜSSING, Austria | TORONTO, Canada |
| HELSINKI, Finland | VANCOUVER, Canada |
| HONG KONG, China | VÄXJÖ, Sweden |
| IZMIR, Turkey | VELENJE, Slovenia |
| JINAN, China | VILNIUS, Lithuania |
| KUWAIT CITY, Kuwait | WARSAW, Poland |
| ŁÓDŹ, Poland | YEREVAN, Armenia |
| LONDON, U.K. | |



LIGHT TOUCH

CAPACITY BUILDING



DEEP DIVE

FACILITATING FINANCE



REPLICATION

CREATING A PIPELINE



BANJA LUKA: CASE STUDY



DISTRICT ENERGY
IN CITIES
INITIATIVE



CTCN
CLIMATE TECHNOLOGY
CENTRE & NETWORK



ГРАД БАЊА ЛУКА
CITY OF BANJA LUKA



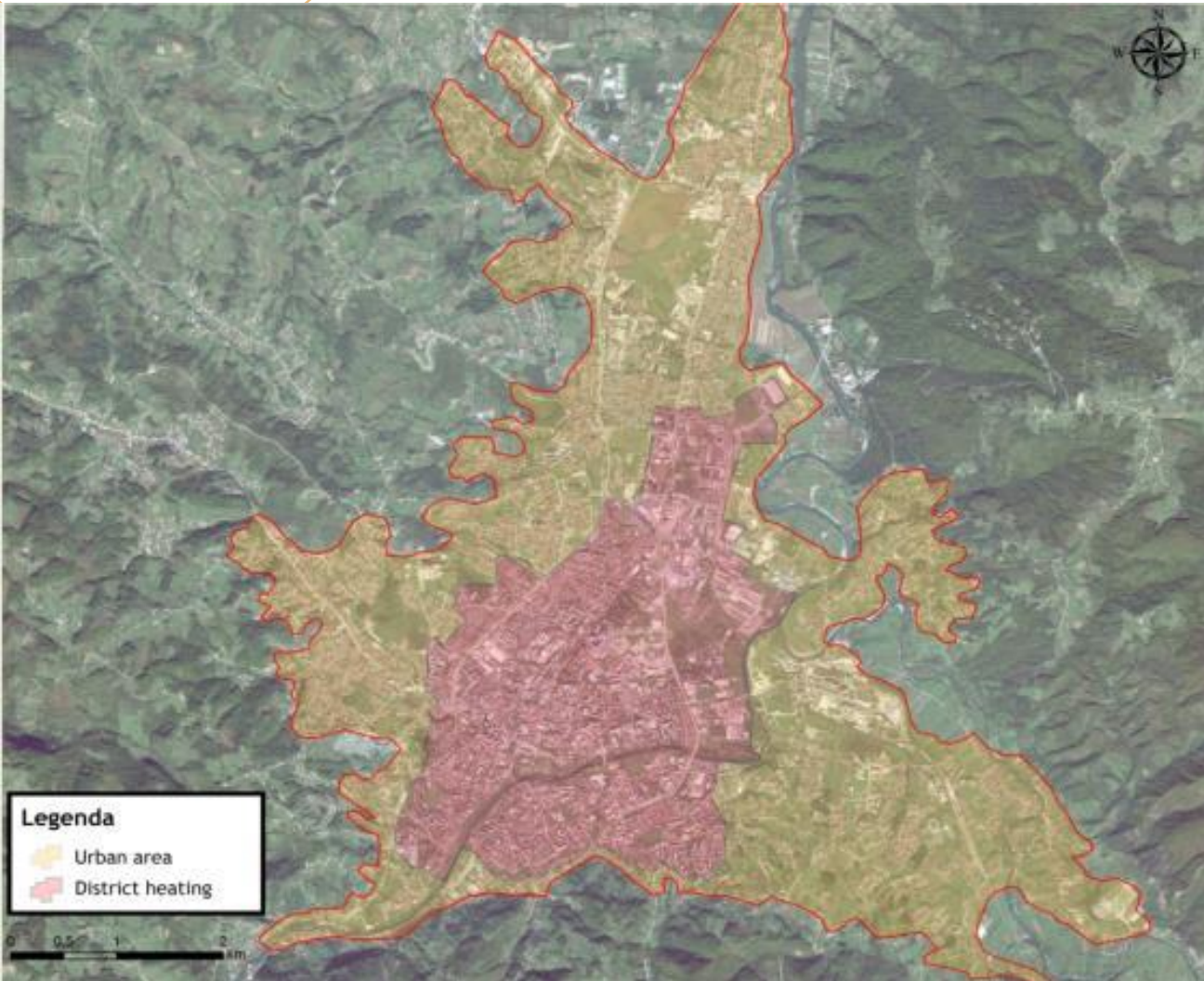
SUSTAINABLE
ENERGY FOR ALL

REHABILITATION AND MODERNIZATION OF THE
DISTRICT HEATING (DH) SYSTEM IN THE CITY OF BANJA
LUKA - FOCUS ON ENERGY EFFICIENCY

BANJA LUKA: CASE STUDY



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- 44% of the City area
- 232MW Oil
- 26MW Biomass

BANJA LUKA: CASE STUDY



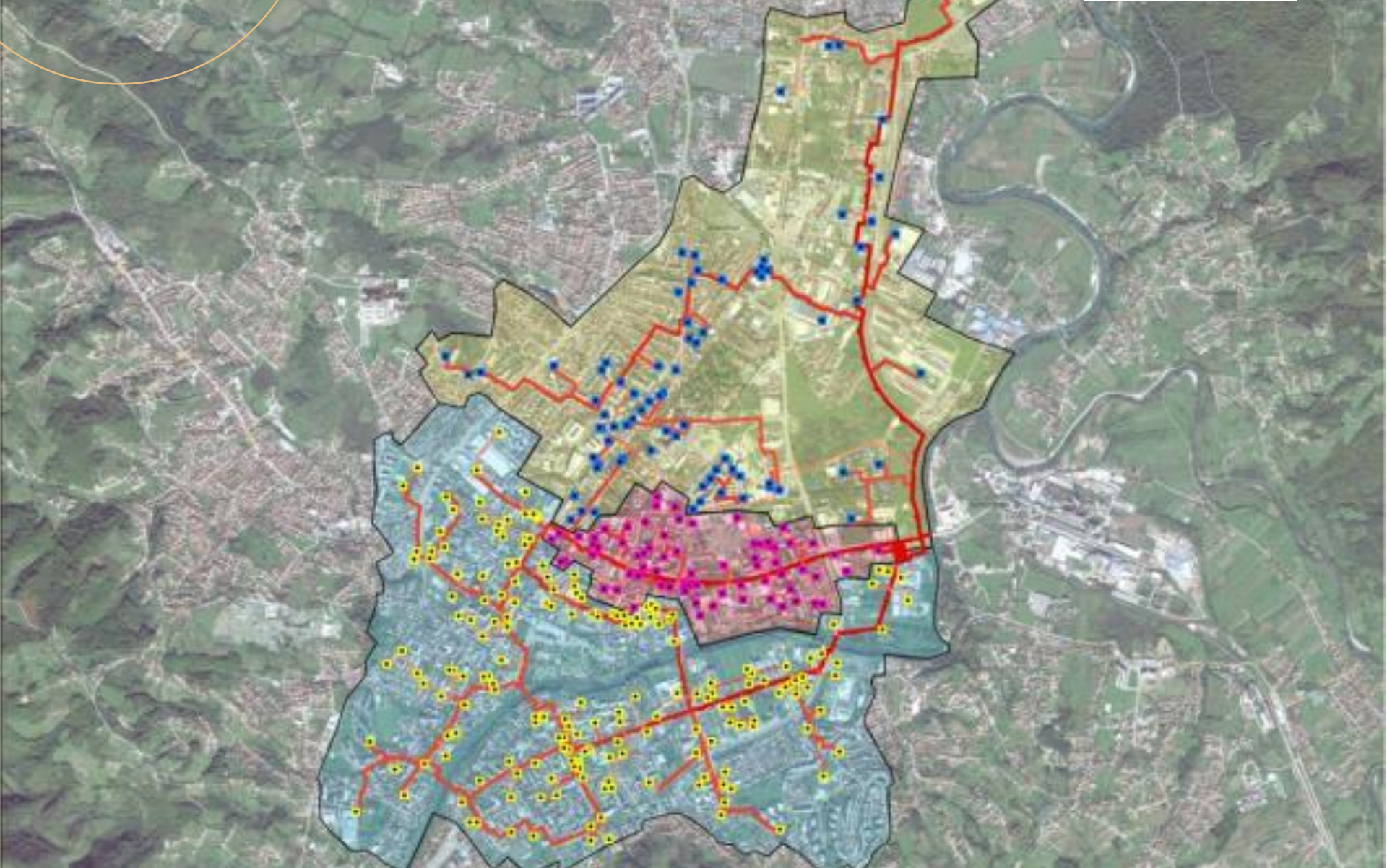
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SUSTAINABLE
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UNEP



BANJA LUKA: CASE STUDY



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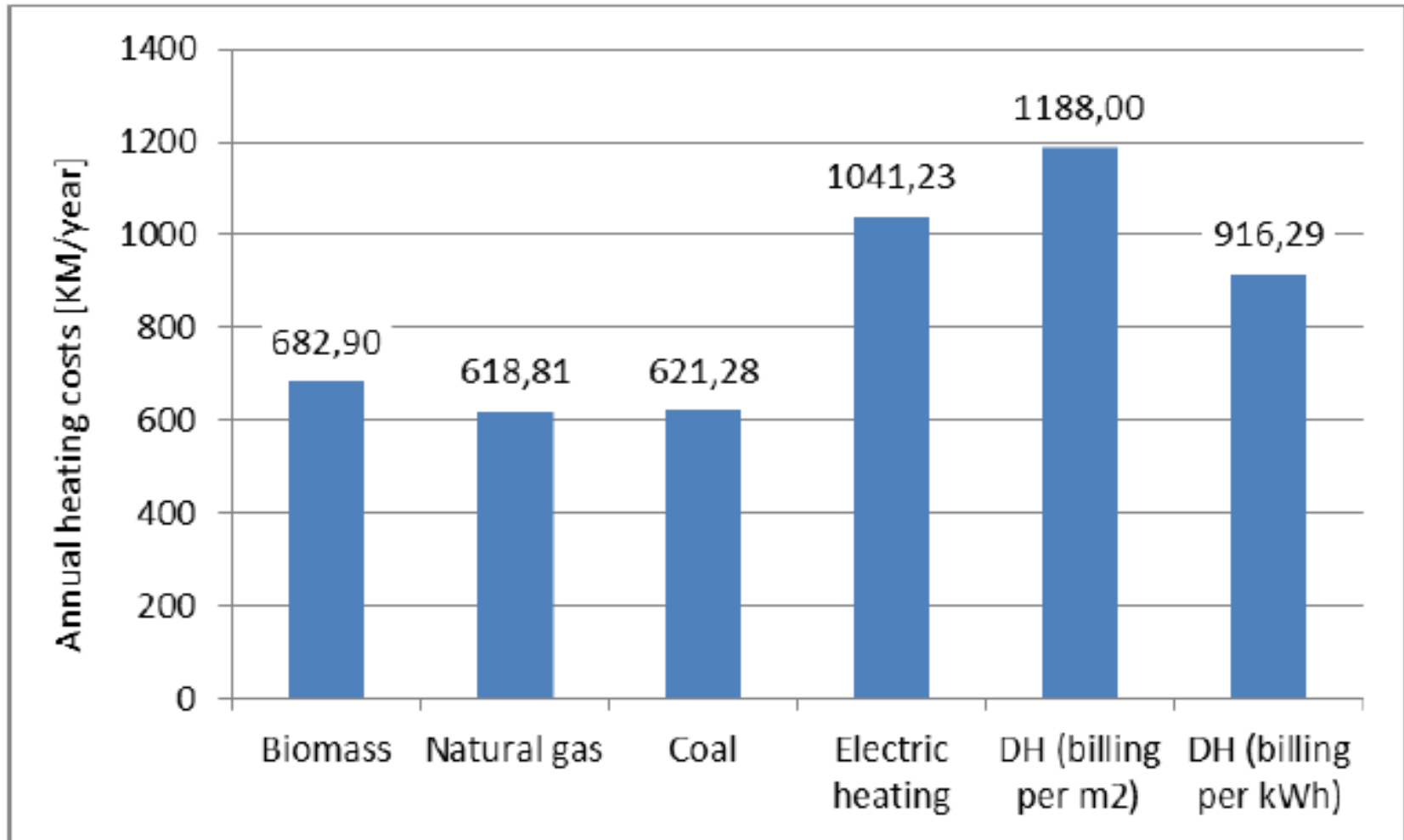


Water losses, inefficient piping = Energy Efficiency: 56-65%

BANJA LUKA: CASE STUDY



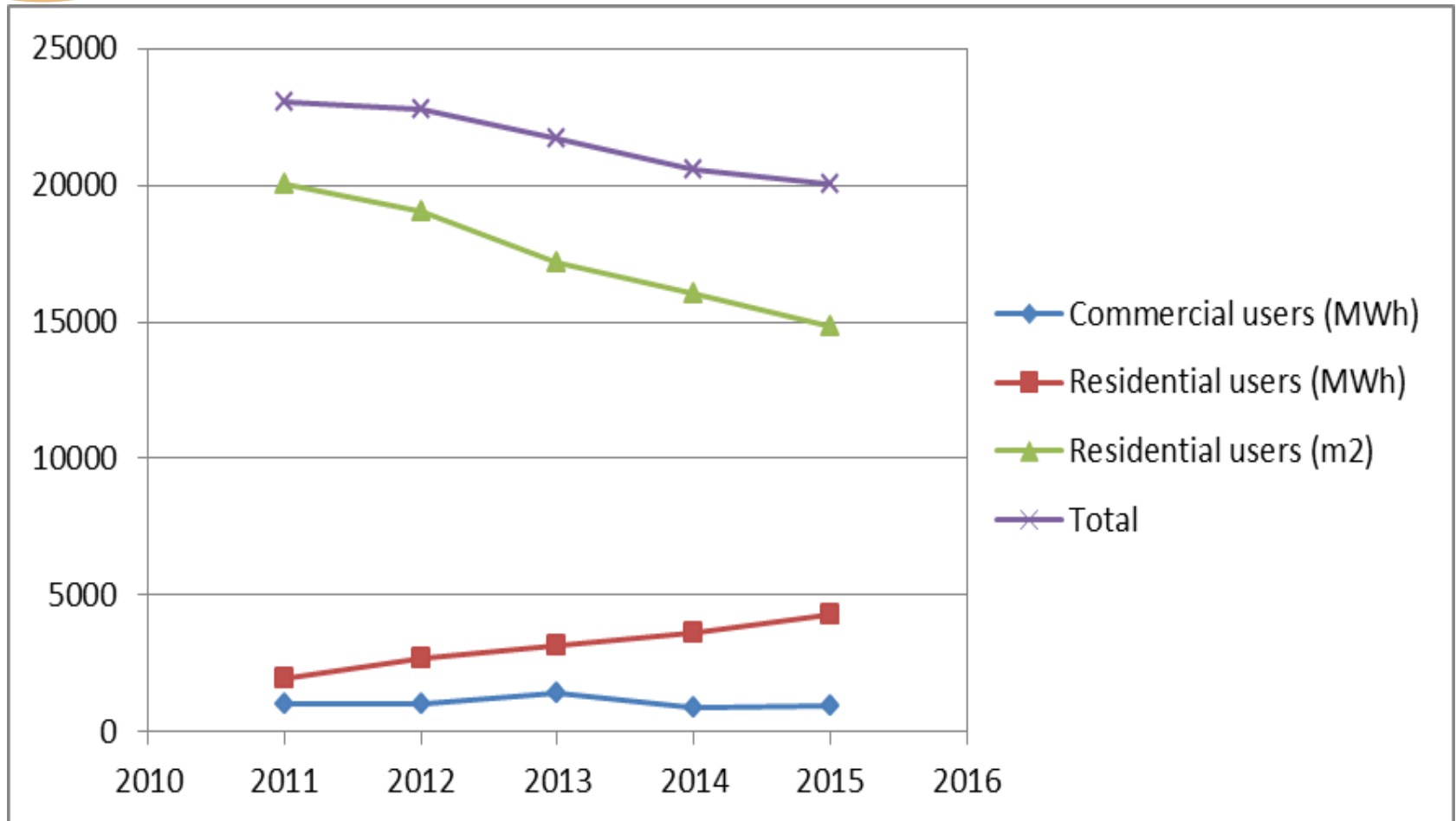
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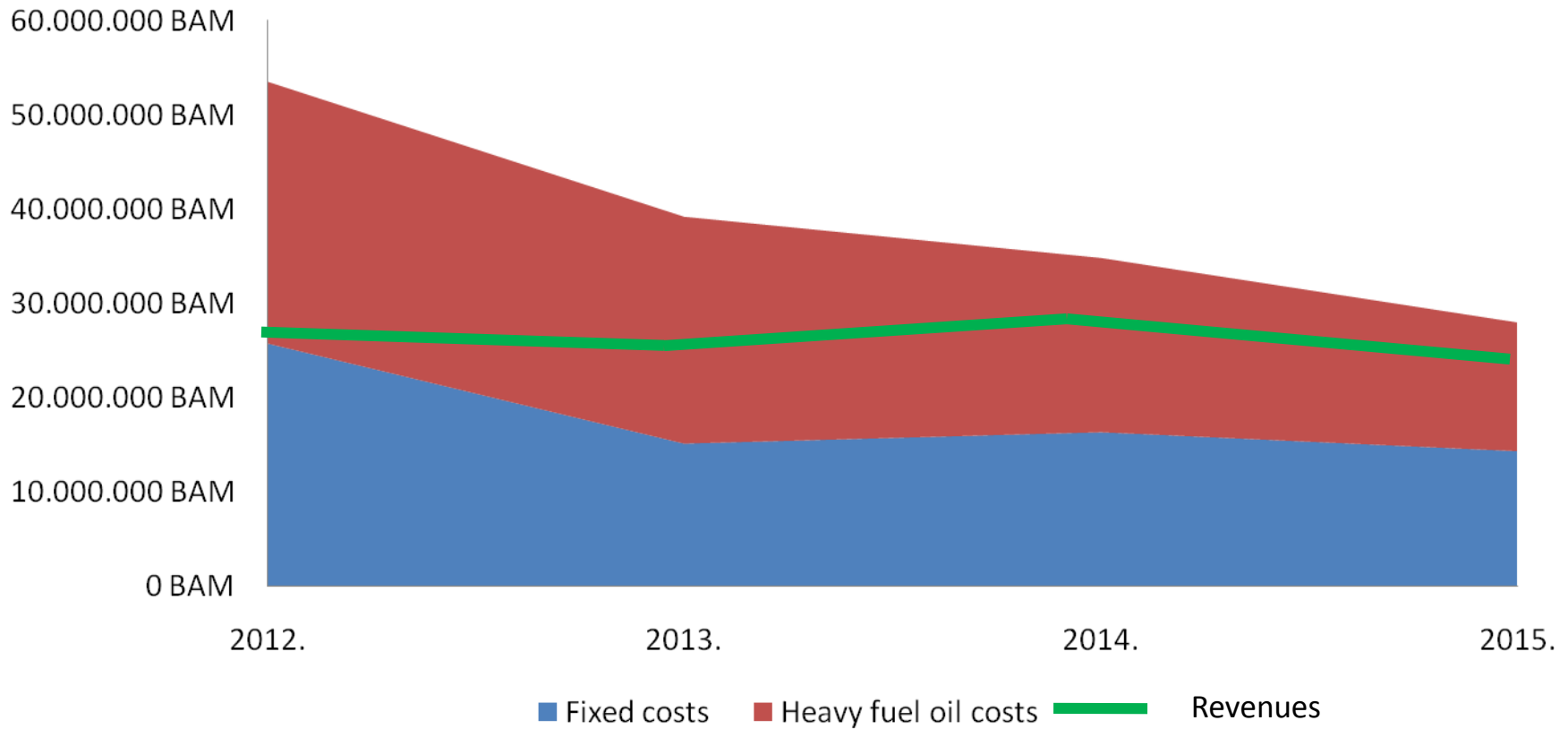
BANJA LUKA: CASE STUDY



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BANJA LUKA: CASE STUDY



Losses (2012): ~\$16 million

Losses (2012): ~\$2.5 million

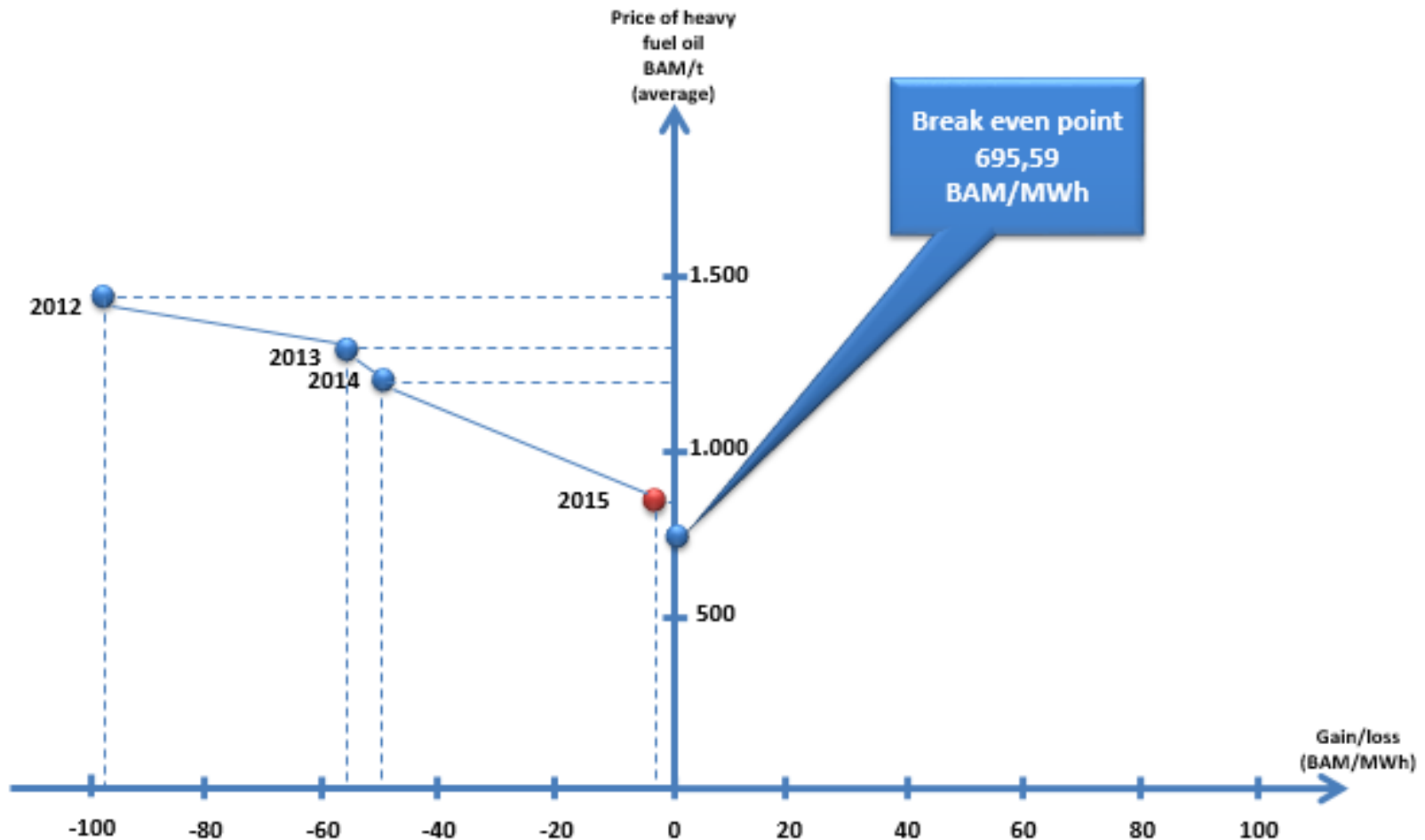
BANJA LUKA: CASE STUDY



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Falling oil costs: now is time to invest!



BANJA LUKA: TECHNICAL



**DISTRICT ENERGY
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ASSISTANCE



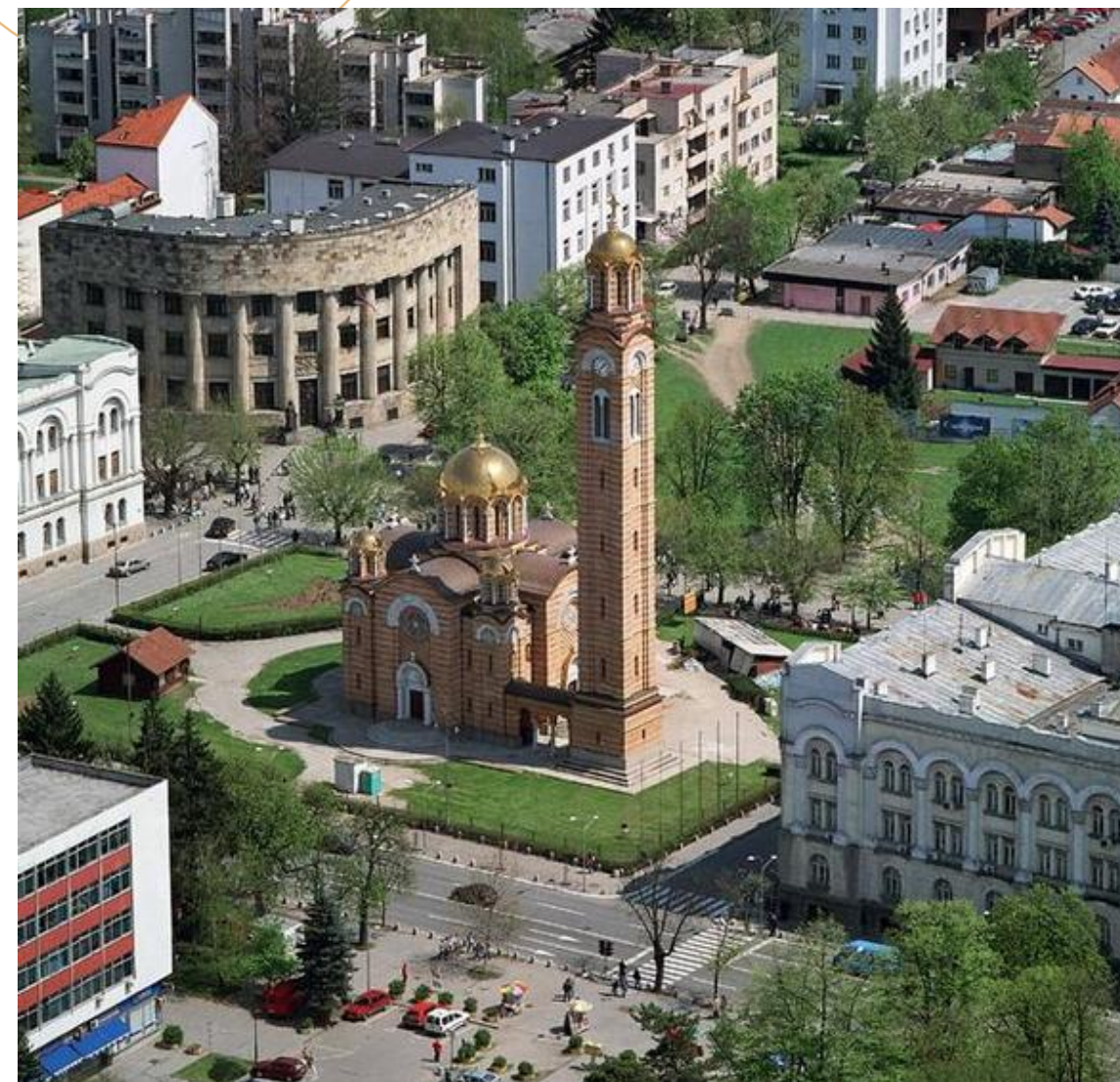
City-wide assessment

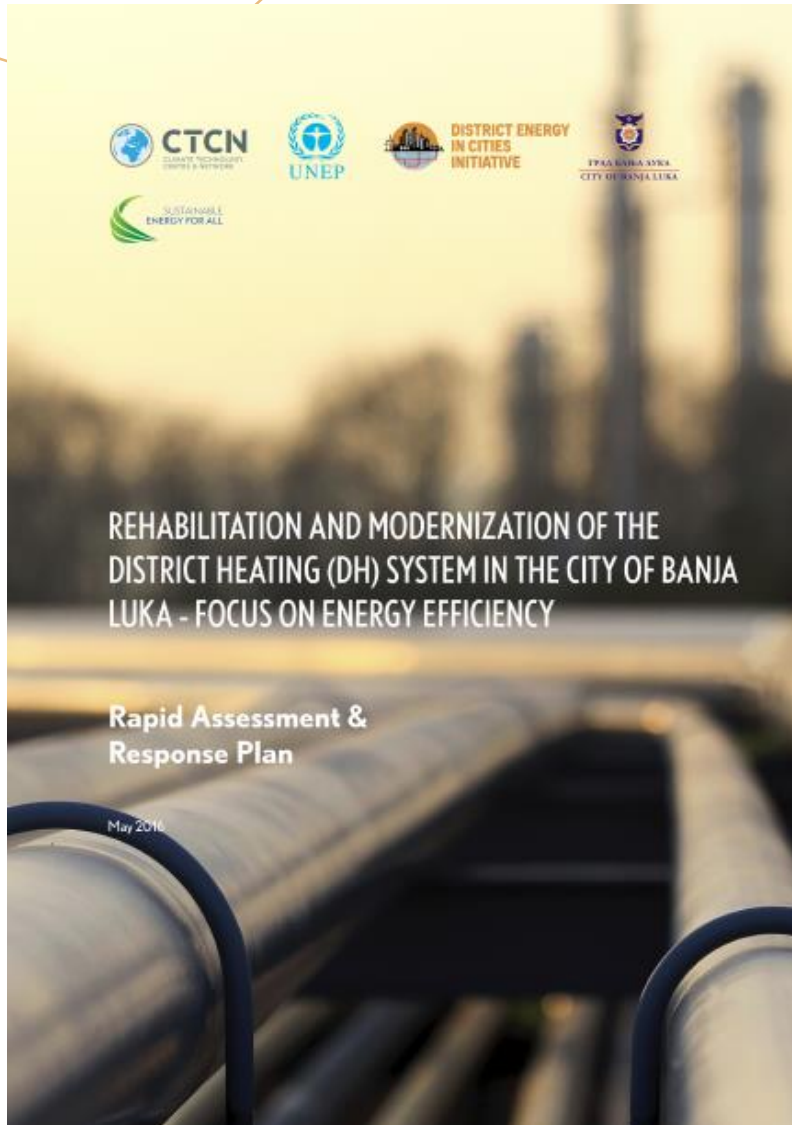
**Dialogue with utility and
local government**

**Priority investment
program**

**Building external
support**

**Long-term support
through Initiative**





Draft city-wide assessment presented to mayor and funders

- Network efficiency
- Production sources
- Building efficiency
- Benefits
- Financial analysis

**May 2016: Priority investment
program finalised**

BANJA LUKA: TECHNICAL



DISTRICT ENERGY
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ASSISTANCE

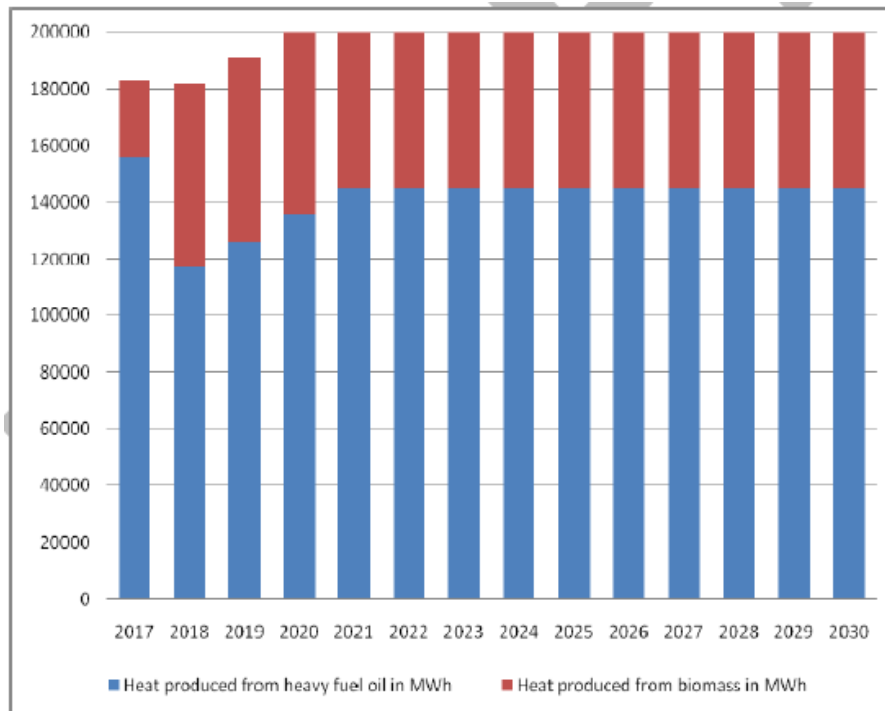


Figure 60: Heat energy production in MWh

Priority investment program:

- New biomass boilers (24MW)
- Reconstruction of oil boiler
- Network rehabilitation
- Switching metering

Total CAPEX: ~\$30 million

Benefits:

- **CO₂ reduction 18,000tCO₂/a (35% reduction)**
- **SO₂ reduction 355t/a (36%)**
- **NO_x reduction 60t/a (21%)**
- **Solid particles 2.61t/a (21%)**
- **Financial: 2017 positive net cash flow achieved**

SCALE-UP OF RESULTS



**\$17 million of financing from \$90,000
CTCN support**

Long-term support from Initiative

- **Now working with Sarajevo**
- **Scale-up regionally**



**Similar proposals are possible in
Central Asia and Eastern Europe!**



- Mr. **Benjamin Hickman**, Technical Expert: Europe and South Asia, Energy, Climate, and Technology Branch, UNEP
benjamin.Hickman.affiliate@unep.org
- Ms. **Lily Riahi**, Advisor on Sustainable Energy in Cities, Energy, Climate, and Technology Branch, UNEP
lily.riahi@unep.org