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DISTRICT ENERGY IN CITIES

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



UNEP in collaboration with





DISTRICT
ENERGY
IN CITIES

LAUNCH OF DISTRICT ENERGY IN CITIES INITIATIVE AT CLIMATE SUMMIT



SUSTAINABLE
ENERGY FOR ALL

Double Global Rate of
Improvement of
Energy Efficiency by
2030



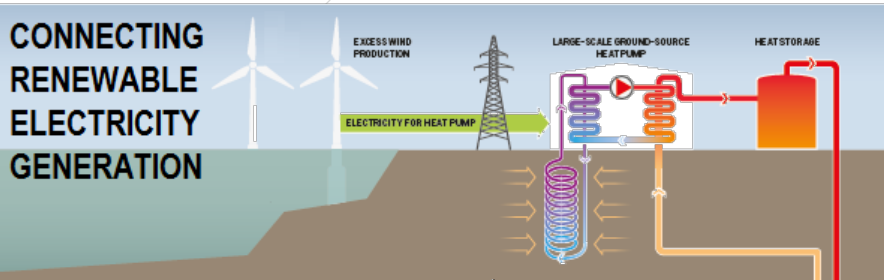


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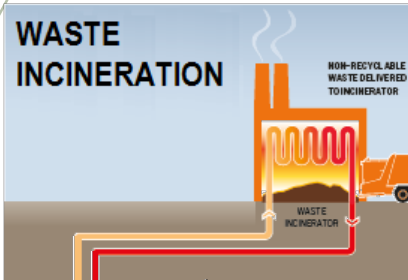
WHY DISTRICT ENERGY?



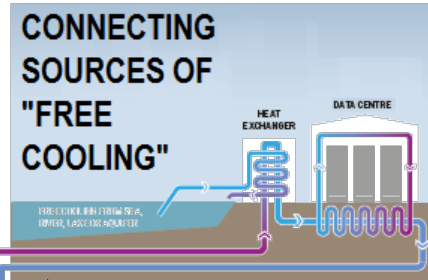
CONNECTING RENEWABLE ELECTRICITY GENERATION



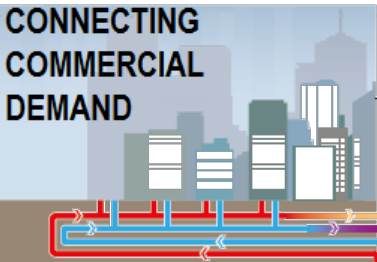
WASTE INCINERATION



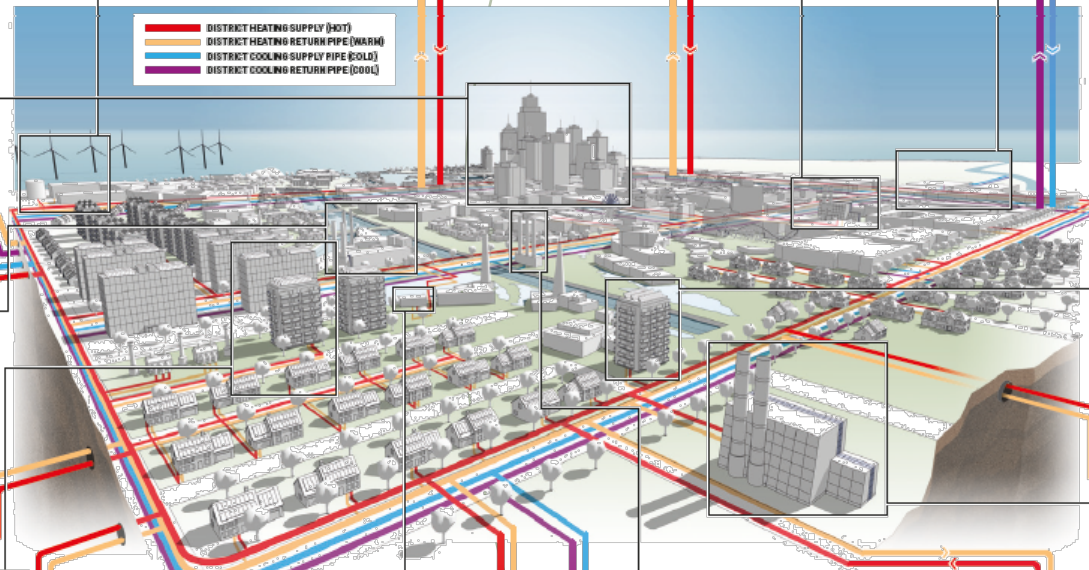
CONNECTING SOURCES OF "FREE COOLING"



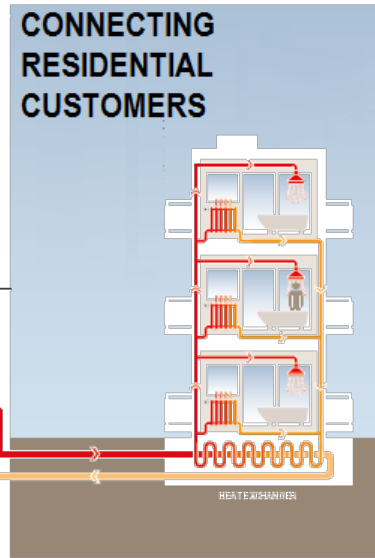
CONNECTING COMMERCIAL DEMAND



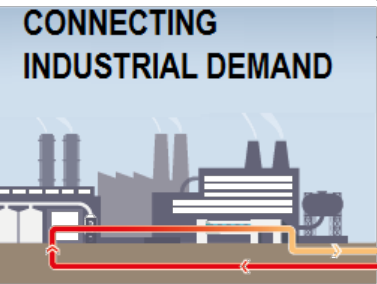
- DISTRICT HEATING SUPPLY (HOT)
- DISTRICT HEATING RETURN PIPE (WARM)
- DISTRICT COOLING SUPPLY PIPE (COLD)
- DISTRICT COOLING RETURN PIPE (COOL)



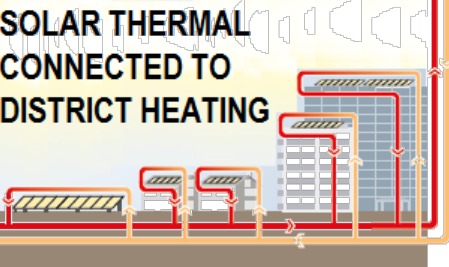
CONNECTING RESIDENTIAL CUSTOMERS



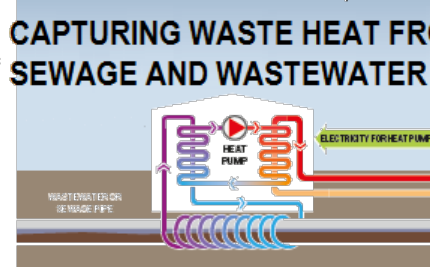
CONNECTING INDUSTRIAL DEMAND



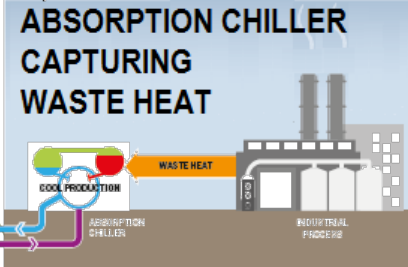
SOLAR THERMAL CONNECTED TO DISTRICT HEATING



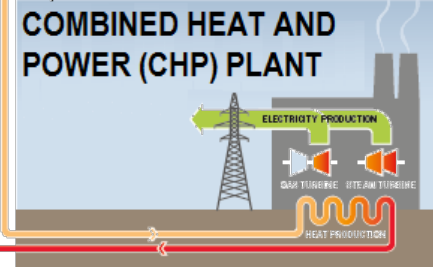
CAPTURING WASTE HEAT FROM SEWAGE AND WASTEWATER



ABSORPTION CHILLER CAPTURING WASTE HEAT



COMBINED HEAT AND POWER (CHP) PLANT





Long-standing barriers

- Awareness
- Local and Institutional capacity
- Holistic planning policies, harmonized incentives and regulations
- Finance
- Data/information



A GLOBAL PARTNERSHIP TO SCALE-UP MODERN DISTRICT ENERGY SYSTEMS



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GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET



GDF SUEZ devient ENGIE





OBJECTIVES OF THE INITIATIVE

TAP THE POOL OF EXPERTISE ACROSS ITS PARTNERS TO:

- Increase awareness
- Promote and strengthen local - national policies
- Create an environment that attracts investment

INITIATIVE ACTIVITIES

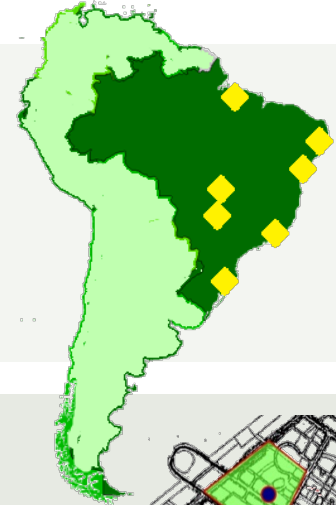


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ASSESSMENTS & TOOLS

- Assessments of DES potential and benefits in cities, identifying local resources and policy barriers



POLICY

- Disseminate best practice local & national policies for supporting DES
- Workshops and training



IMPLEMENTATION

- Initiative methodology rolled-out to multiple cities
- Demonstration projects and policy-investment roadmap for cities





Global Awareness Raising



Virtual Platform

- Matchmaking
- Training
- Tools



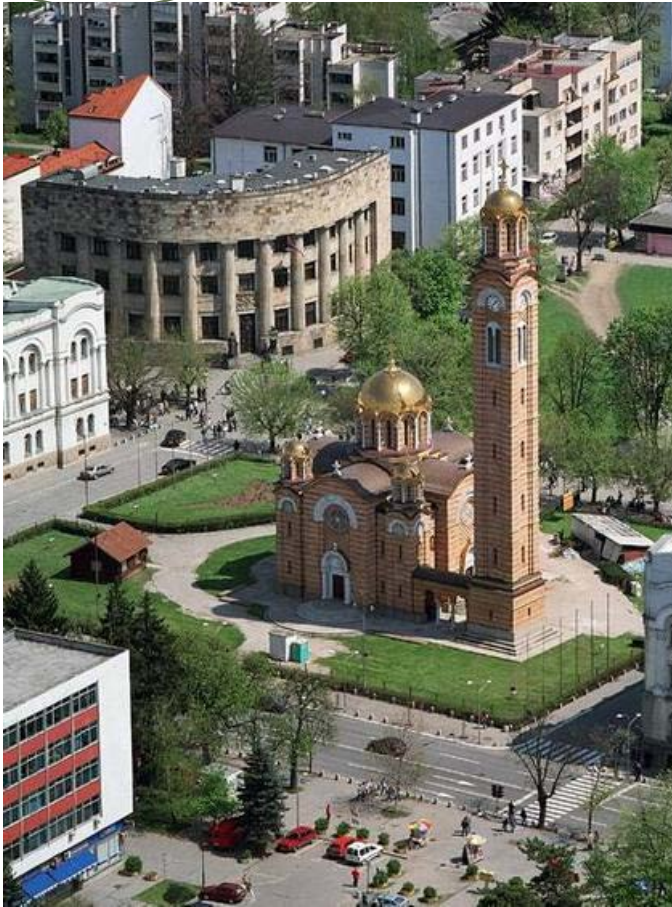
CLIMATE TECHNOLOGY CENTRE & NETWORK (CTCN)



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Fast and short (3 pages) application process for countries



ctc-n.org

Technical assistance provided:

- To developing countries upon their request
- Free of charge (value up to 250,000 USD)
- State of the art and locally relevant expertise
- To academic, public, NGO, or private entities
- For a broad range of adaptation and mitigation technologies

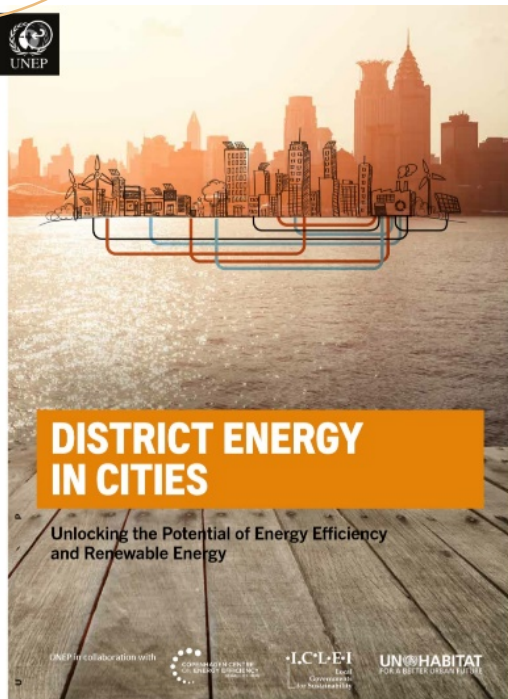
At all stages of the technology cycle:

- Identification of technology needs
- Prioritization of technologies
- Feasibility analysis of deploying specific technologies
- Support to scale up use and identify funding for specific technologies
- Support testing of technologies
- Support laws and policy frameworks

A TECHNICAL GUIDE TO DISTRICT ENERGY



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



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DEVELOPING THE INITIATIVE'S APPROACH



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.	

Best Practice Guidance developed with
45 champion cities (150 Interviews)

- Technology Options and Benefits
- City policies
- Business models
- National policies



INITIATIVE'S APPROACH FOR
ACCELERATING DES

BUILDINGS AND DISTRICT ENERGY



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Buildings sector: 77% reduction in emissions needed (IEA)

Buildings energy consumption: 60% for space heating, cooling and hot water

Demand: energy saving

Building envelope.

Appliances (heat pumps, efficient AC)



Supply: renewables and resource efficiency

Decarbonised power system

Building-level renewables

District energy (waste heat & large scale RE)





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BEST PRACTICE CITY POLICIES: COMBINING BUILDINGS AND DES



- City specific building codes
- Municipal building requirements
- Land-use and planning policies
- City-led efficiency programmes
- Targets
 - % Increase in energy performance
 - Share of City's energy use from buildings that is met by DES
 - See www.unep.org/energy/des



DISTRICT ENERGY IN CITIES MILAN CASE STUDY

OVERVIEW

Milan has a large district heating system providing over 5% of the city's heating demand in buildings. The city also has a small district cooling network serving 800,000 m³ of cooling demand. The city is using district energy to replace to switch the heat consumption of the city from predominantly gas boilers and oil boilers to renewable heat and cool consumption of the city from inefficient air conditioners to waste heat from power plants and ground water sources (through absorption chillers). In 2011 thanks to district heating about 70,000 tons of CO₂ emissions were avoided (with reference to a "no district heating" scenario) and by 2020 this is expected to be 138,000 tons of CO₂ avoided annually. This case study references to best practices defined in the District Energy in Cities publication.

MW thermal of heat production connected to a DES	MW electric of electricity production from DES connected CHP	MW of Cool Production connected to a DES	MWh of Heat production per year on DES	MWh of Cool production per year on DES	Kilometres of heat network	Kilometres of cool network
823 MW _{th}	115 MW _e	17.0 MW	640,000,000 kWh	7,400,000 kWh	111 km	7 km



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THANK YOU!



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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www.districtenergyinitiative.org