

Introduction to the Global District Energy in Cities Initiative

In September 2014, at the Climate Summit, Sustainable Energy for All (SE4ALL) announced a partnership of businesses and governments called the Global Energy Efficiency Accelerator Platform¹ with the goal of doubling the global rate of energy efficiency improvement. The Platform consists of six individual public-private Accelerator initiatives that target buildings, lighting, appliances, district energy systems (DES), industry and transportation. The Global District Energy in Cities Initiative (DES Initiative) is the implementing mechanism of the SE4ALL District Energy Accelerator and is coordinated by the United Nations Environment Programme which hosts the Secretariat of the DES Initiative.



Launch of the DES Initiative at the Climate Summit

Accelerating District Energy

The DES Initiative will support market transformation efforts to shift the heating and cooling sector to low-carbon, energy efficient solutions that include DES with an aim to double the rate of energy efficiency improvements for heating and cooling in buildings by 2030 and quantify the corresponding decrease in greenhouse gas emissions. In particular the DES Initiative is focused on the role of cities and sub-national governments in transitioning to DES.

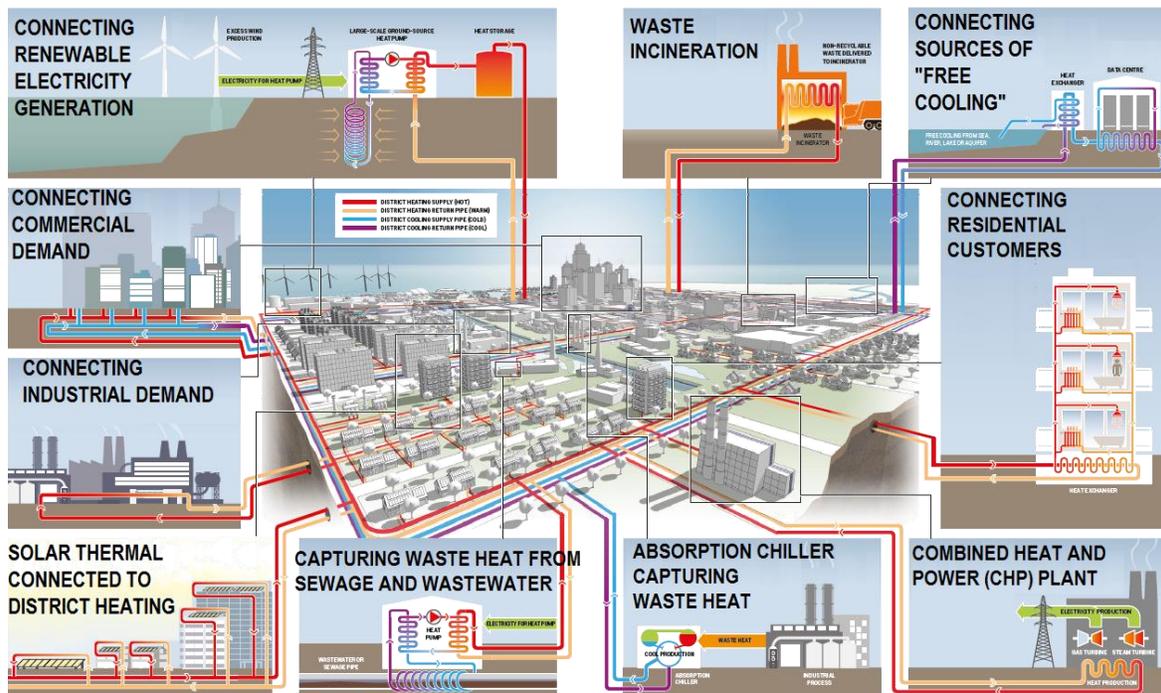
Why do we need district energy?

Modern DES can reduce primary energy consumption for heating and cooling of urban buildings by up to 50%. Such systems create synergies between the production and supply of heat, cooling, domestic hot water and electricity and can be integrated with municipal systems such as power, sanitation, sewage treatment, transport and waste, and this means heating and cooling can be low-carbon and efficient and maximise 'free', renewable resources. Modern DES provide the only means to use of low-quality thermal energy (waste heat) to provide heat, cool and hot water services in buildings. They allow for high levels of affordable renewable energy supply through economies of scale, diversity of supply, balancing and storage making them a key measure for cities/countries that aim to achieve 100% renewable energy or carbon neutral targets. If DES is compared with competitive technologies on an even playing field, it is frequently more cost effective – by up to 50% - than individual heat or cooling production if the energy demand density of a neighborhood is sufficient enough.

What is district energy?

District energy is a proven energy solution that has been deployed for many years in a growing number of cities worldwide. The ability of district energy systems to combine energy efficiency improvements with renewable energy integration has brought new relevance to these technologies. For example district heating meets 12% of heat demand in Europe and 30% in China while in Russia, district heating meets 50% of heat demand in buildings. The USA has the largest district cooling capacity at 16 gigawatts-thermal (GW_{th}), followed by the United Arab Emirates (10 GW_{th}) and Japan (4 GW_{th}). In South Korea, district cooling more than tripled between 2009 and 2011. At least 20 countries in Europe use renewables in their district heat systems, with at least 20% of EU-wide district heat generated by renewable sources.

¹ For more information on SE4All and the Global Energy Efficiency Accelerator Platform please visit: <http://www.se4all.org/energyefficiencyplatform/>



DES include district heat networks and district cool networks that pump cold water, hot water or steam through pipes in cities to replace building level production from boilers, air conditioning and electric heaters. DES are the only way to connect large renewable and waste heat sources to buildings such as from power stations, free cooling from lakes and rivers, waste heat and geothermal. For a full explanation of DES and the multiple benefits see the UNEP publication 'District Energy in Cities. Unlocking the Potential of Energy Efficiency and Renewables'.

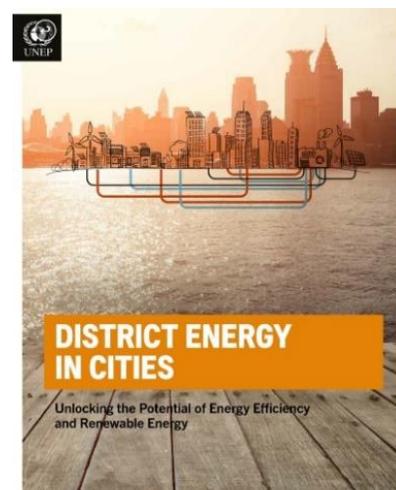
Challenges and Opportunities

Although shares of DES are expanding and several national and local governments are setting policies and targets, there are still long-standing barriers to greater deployment of modern DES.

These barriers include:

- Lack of awareness and misperceptions.
- Local and institutional capacity for coordinating DES development.
- Lack of holistic planning policies that integrate energy and DES
- Incentives and accounting methods that are not harmonized.
- Commercial viability of DES unproven in some markets
- High project development costs
- Lack of data on heating and cooling consumption in cities

One of the first activities of the DES Initiative was the publication of best practice guidance for cities and national governments to overcome these barriers through four chapters on technology, local policy, business models and national policies and regulations, and a fifth chapter describing a methodology for cities to develop modern district energy. This UNEP publication is entitled 'District Energy in Cities. Unlocking the Potential of Energy Efficiency and Renewables'.



'District Energy in Cities. Unlocking the Potential of Energy Efficiency and Renewables' is available for download at unep.org/energy/districtenergycities

For more information, please contact:

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The DES Initiative's offer to cities

As cities are the most important actors in facilitating investment in DES, the DES Initiative is offering to support signed-up cities across three broad areas:

- Assessing and prioritizing locally-appropriate policies, projects and city actions
- Implementing actions and projects, through provision of expertise, methodologies and tools
- Tracking action and documenting progress, and sharing lessons learned

The DES Initiative has identified 10 steps to developing modern DES in cities and the existing policy actions in a city (see below). Cities will be provided with support in these ten steps through an Online Platform, and learning cities will also receive Fundraising and Matchmaking Sessions with DES Initiative partners as well as regional workshops organised by the DES Initiative.

- *Access to an Online Community and Platform*

The DES Initiative Online Platform that provide signed-up cities with regionally tailored tools, methodologies, trainings, best practices and a communication link with champion cities and technical experts. Example tools, methodologies and best practice that will be available, along with appropriate online training, include:

- Methodology for a DES rapid assessment of a city to understand DES potential and barriers
- Decision tool for local and national policymakers to identify policy interventions
- Software and support for establishing energy mapping in a city.
- Methodology for establishing data collection for heat and cool in a city
- Case studies of policy, finance and technology best practice in champion cities

- *Access to Fundraising and Matchmaking Sessions*

Learning cities will benefit from 'fundraising and matchmaking sessions' bringing learning cities together with partners of the DES Initiative to explore opportunities for city assessments through city and private sector co-finance. These city assessments could include:

- **Rapid assessments:** a city visit of 3-7 days by technical experts to work with the city to assess potential for DES, barriers, and identify high-potential DES projects.
- **'Deep dive' support:** an extended city visit leading to a DES city-wide plan and support to take a DES demonstration project to tender.

Where possible, learning cities will be asked to make in-kind commitments as a result of these sessions. Such in-kind commitments could include, time given by city planners, engineers and officials as assistance in the assessments or in training other cities in the region.

1.	ASSESS existing energy and climate policy objectives, strategies and targets, and identify catalysts
2.	STRENGTHEN or develop the institutional multi-stakeholder coordination framework
3.	INTEGRATE district energy into national and/or local energy strategy and planning
4.	MAP local energy demand and evaluate local energy resources
5.	DETERMINE relevant policy design considerations
6.	CARRY OUT project pre-feasibility and viability
7.	DEVELOP business plan
8.	ANALYSE procurement options
9.	FACILITATE finance
10.	SET measurable, reportable and verifiable project indicators

The DES Initiative's 10 Steps to Developing Modern DES in Cities

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DES Initiative Partners

(As of October 2015)

NGOs/Associations/Multilateral Organizations

- ✓ United Nations Environment Programme (UNEP)
- ✓ ICLEI - Local Governments for Sustainability
- ✓ Copenhagen Centre for Energy Efficiency (C2E2)
- ✓ United Nations Human Settlements Programme (UN-Habitat)
- ✓ World Resources Institute (WRI)
- ✓ Global Environment Facility (GEF)
- ✓ International Energy Agency (IEA)

Industry Associations:

- ✓ EuroHeat and Power (EHP)
- ✓ International District Energy Association (IDEA)
- ✓ Global Wind Energy Council (GWEC)
- ✓ World Wind Energy Association (WWEA)
- ✓ World Bioenergy Association (WBA)

Service Providers/Companies:

- ✓ Danfoss
- ✓ Empower
- ✓ Dalkia
- ✓ Veolia
- ✓ ENGIE
- ✓ Johnson Controls
- ✓ Climespace
- ✓ CPCU
- ✓ Sustainability Solutions Group
- ✓ GGLO
- ✓ Thermaflex
- ✓ Grundfos
- ✓ Siemens
- ✓ Vattenfall

Local governments:

- ✓ Anshan (Liaoning Province, China)
- ✓ Banja Luka (Bosnia & Herzegovina)
- ✓ Belgrade (Serbia)
- ✓ Betim (Brazil)
- ✓ Bogotá (Colombia)
- ✓ Boston (USA)
- ✓ Focsani (Romania)
- ✓ Helsinki (Finland)
- ✓ Jeju (South Korea)
- ✓ Jinan (Shandong province, China)
- ✓ London (UK)
- ✓ Milan (Italy)
- ✓ Nairobi (Kenya)
- ✓ Paris (France)
- ✓ Quito (Ecuador)
- ✓ Rajkot (India)
- ✓ Recife (Brazil)
- ✓ San Jose (Costa Rica)
- ✓ Santiago de Cali (Colombia)
- ✓ Seoul (South Korea)
- ✓ Sarajevo (Bosnia & Herzegovina)
- ✓ Sorocaba (Brazil)
- ✓ St. Paul (USA)
- ✓ Tokyo (Japan)
- ✓ Vancouver (Canada)
- ✓ Vaxjo (Sweden)
- ✓ Velenje (Slovenia)
- ✓ Warsaw (Poland)

National partners:

- ✓ US Department of Energy
- ✓ DANIDA
- ✓ Croatia
- ✓ ADEME

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