District Energy in Chile

DISTRICT ENERGY IN CITIES

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

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DISTRICT ENERGY IN CITIES INITIATIVE

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LAUNCH AT CLIMATE SUMMIT

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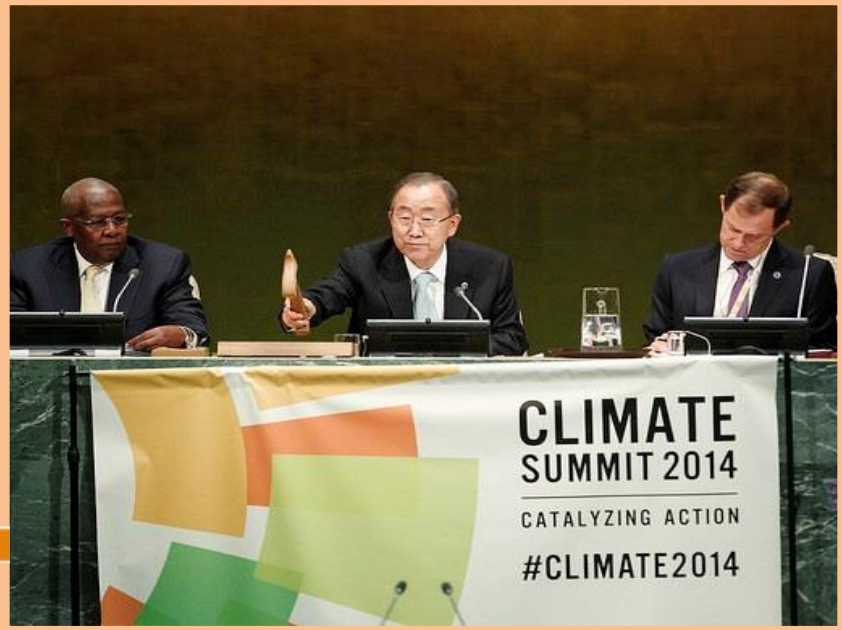
Sustainable Energy for All (SE4All) Sub-Committee's

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

WHY IS DISTRICT ENERGY IMPORTANT TO THE UN?

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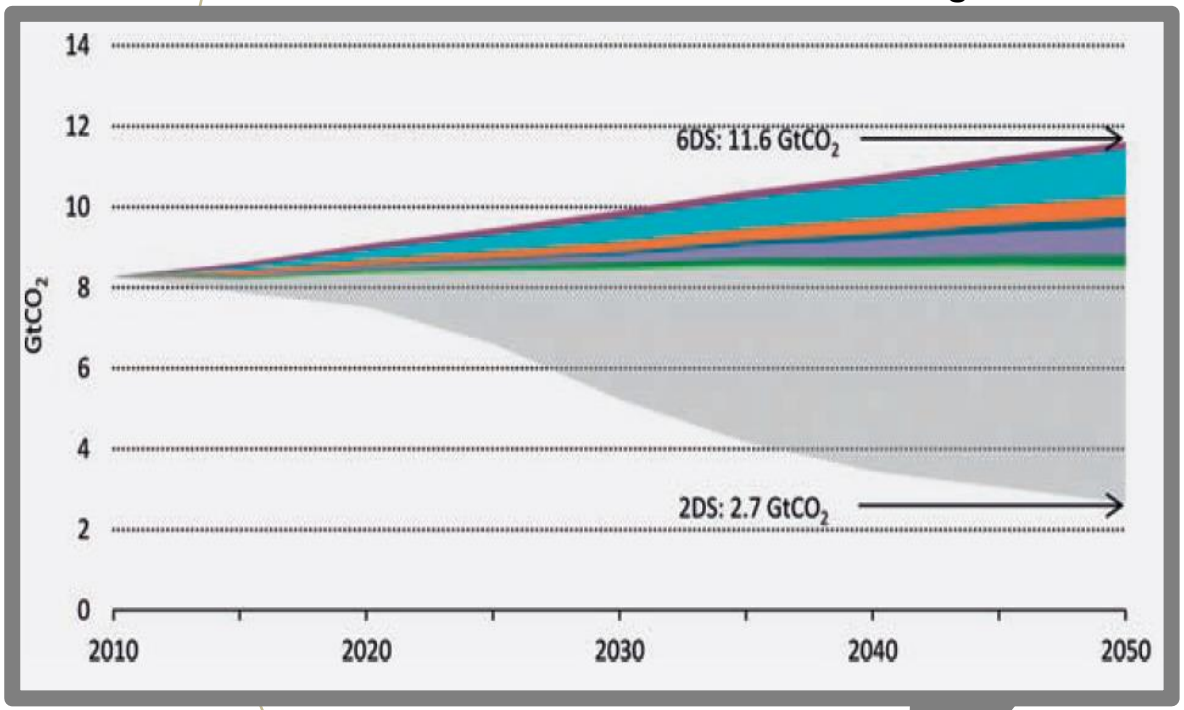
Emissions from the buildings sector need to be **reduced by approximately 75% by 2050**

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

Cooling demand will **grow by 625% by 2050** in selected regions of Asia and Latin America (IEA 2°C scenario)

CO2 emission reductions needed from buildings sector



DISTRICT ENERGY

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INTEGRATES RE AND EE

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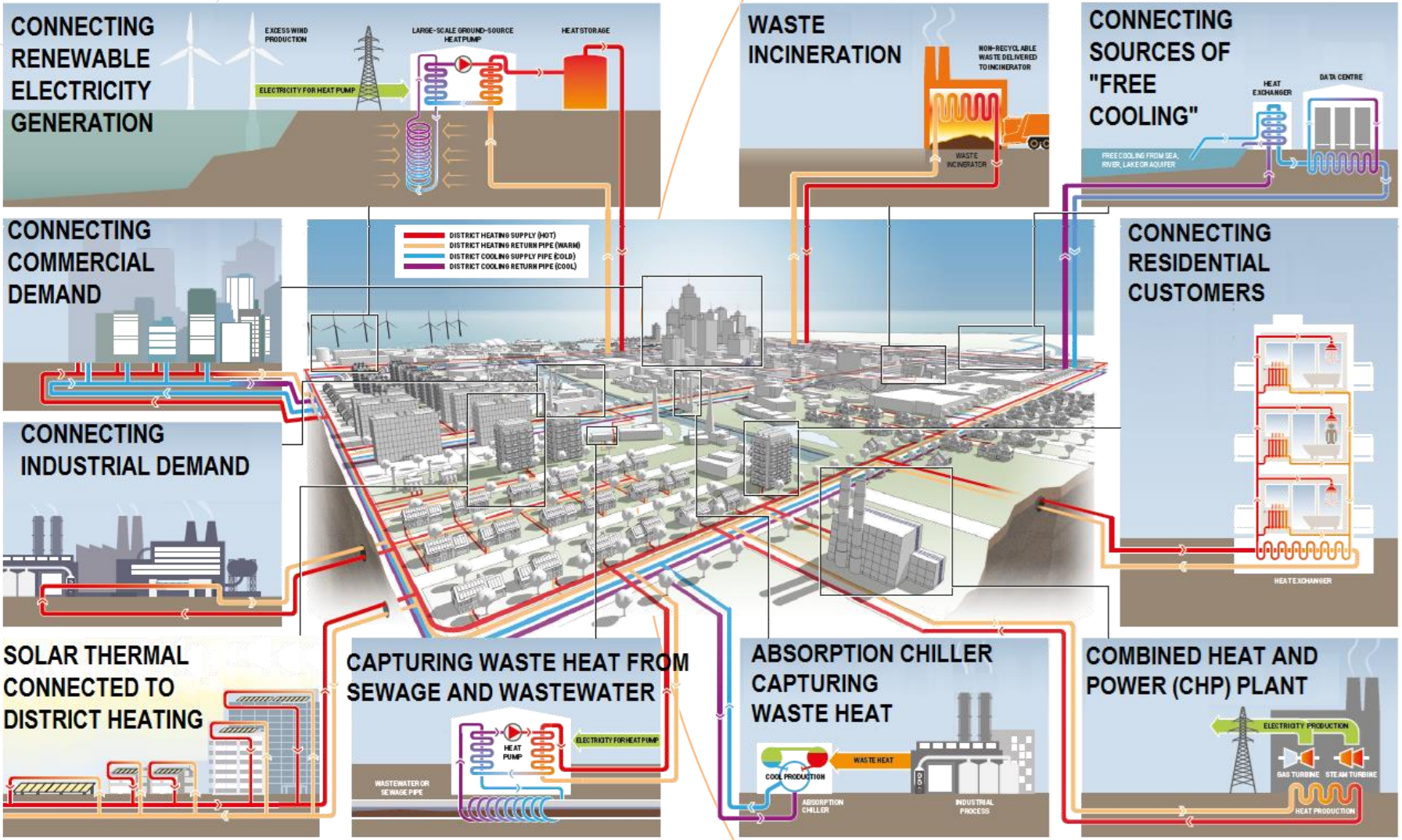

MULTIPLE BENEFITS: ACHIEVING UN SUSTAINABLE DEVELOPMENT GOALS

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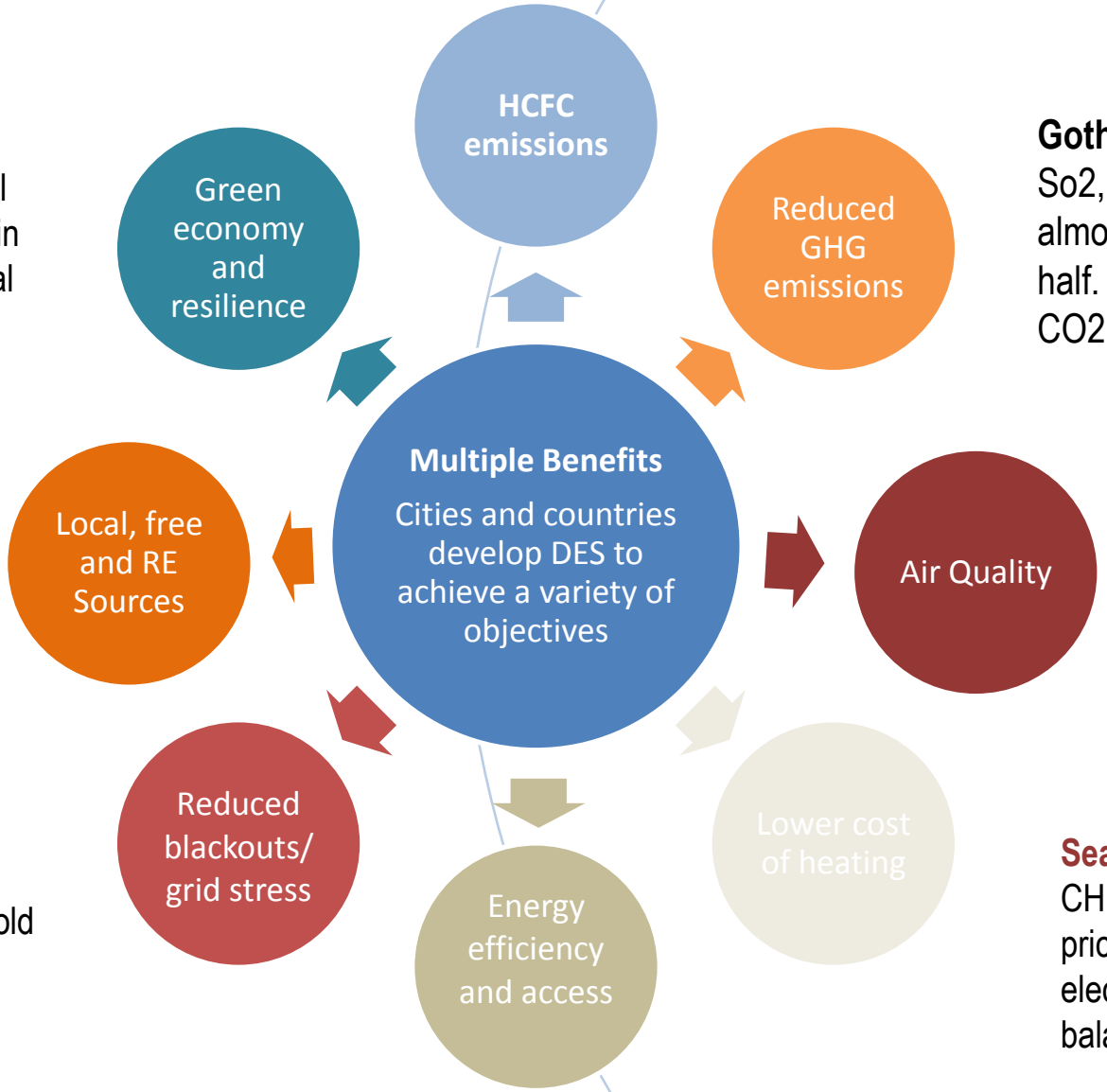
St. Paul, USA
Reduce 275,000t of coal annually US$12 million in energy dollars kept local
Reduced SO2 by 60%



Gothenburg decreased So2, No2 emissions by almost 100% and Co2 by half. **Denmark** reduced CO2 emissions by 20%

Dubai, UAE shifts peak electricity demand with cold storage lowering power transmission investment

Seattle, USA turns CHP off when electricity price is low and use an electric boiler instead balancing hydro / wind

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WHY DES IS IMPORTANT FOR CHILE?

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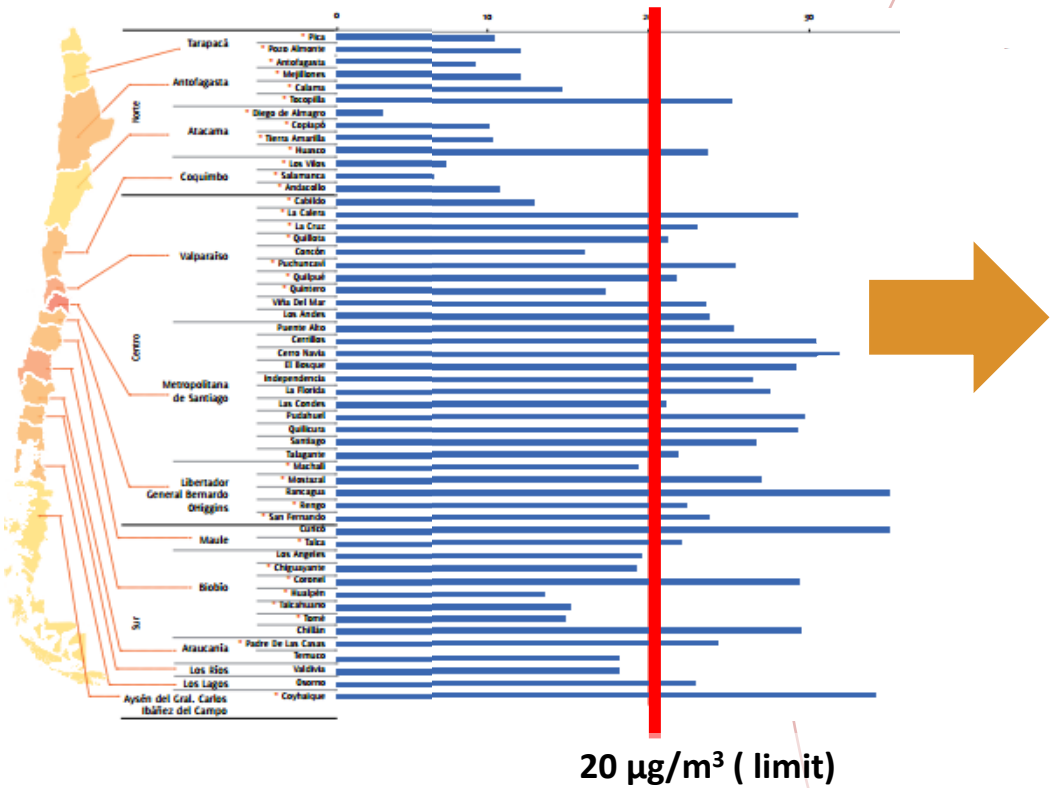
PM 2,5 annual average emissions*



20 µg/m³ (limit)

- 10 million people exposed to average annual PM2,5 concentrations above to WHO recommendations
- 4000 annual cases of fatal cardiovascular diseases with huge costs in medical expenses.
- Wood burning for heating is responsible for approx. 56% of PM2,5 emissions at national level. In cities like Temuco it is 93%.

District energy can help Chile to:

- Improve air quality
- Build local economies
- Facilitate the integration of renewables
- Spur regional replication

* source: Ministry of Environment report on air quality 2016

A GLOBAL PARTNERSHIP

DISTRICT ENERGY IN CITIES INITIATIVE

ON DISTRICT ENERGY

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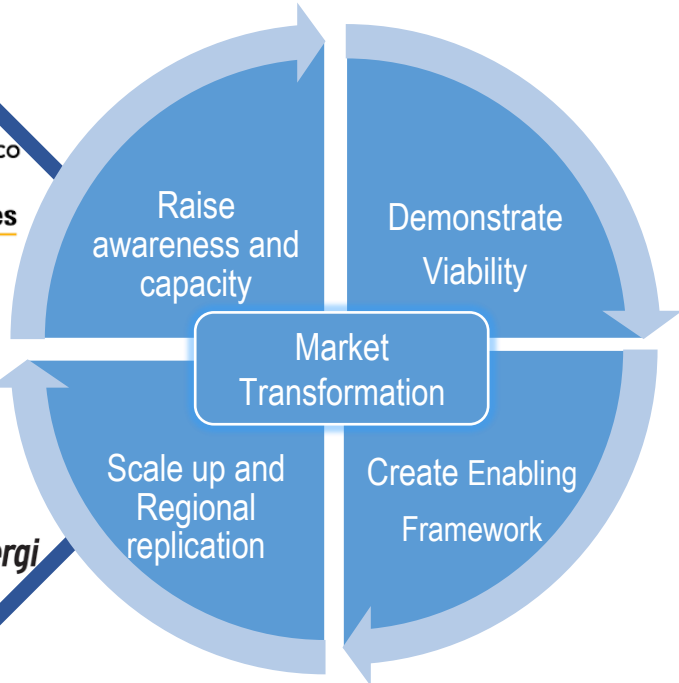

8 COUNTRIES
33 CITIES
38 PARTNERS
3 DONORS

LAUNCH OF A TECHNICAL GUIDE

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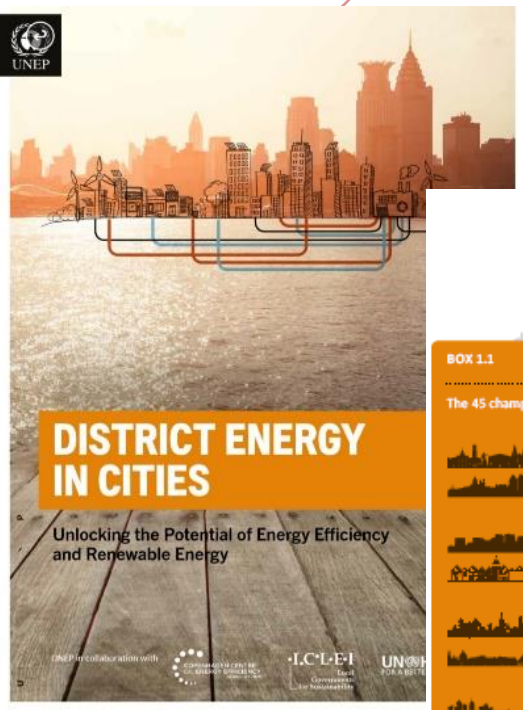

- 45 Champion Cities
- Technology and benefits
- City policies
- Business models
- National policies

Methodology and Key Steps

Available from: unep.org/energy/des

DISTRICT ENERGY IN CITIES

KEY FINDINGS

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- Local governments are best placed to **alleviate risks** and are critical to **leveraging finance.**
- **Variety of business models** with varying levels of private sector and local government participation.
- National government support and regulation is key to unlocking local governments' potential and attracting investment

THE ROLE OF LOCAL GOVERNMENT

DISTRICT ENERGY IN CITIES INITIATIVE

KEY PARTNER

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PARIS TACKLES AIR POLLUTION AND AFFORDABLE HEAT

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- Consumption of coal in the centre of Paris a significant problem (air pollution, congestion and fire risk).
- 1927: Private concession developed for district heating.
- 1939: Most iconic and administrative building connected
- 1949: City of Paris becomes 33% shareholder in CPCU.

DISTRICT ENERGY IN PARIS:

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CLEAN AND AFFORDABLE HEAT

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- **50%** renewable
- 500,000 households equivalent
- 100% of hospitals
- **50%** of social housing
- 50% of public buildings
- **19.5** million Euro in benefits

PARIS LOCAL GOVERNMENT

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IMPACT

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Planner and Regulator

Energy Strategy Designated zones

Urban Development Zones “Connect - Unless”

Mandatory connection when 50% renewable

Strategy and targets: 60% RE by 2020.

Facilitator of Finance

Enables cheap loans for CPCU

Sometimes pays for extending the network inside the new zone

Pools investment with other municipalities

City assets and transport link to lower the cost of DH

Provider and Consumer

Anchor loads (hospitals, buildings)

Network through the metro system

Sets maximum heat tariffs and sets a special low tariff for social housing

Coordinator and Advocate

With other cities to interconnect networks & develop heat production facilities

Waste, metro, tram, road**, building efficiency programmes**, new developers

TOKYO TACKLES AIR POLLUTION

RESILIENCE AND SECURITY

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- 1970 response to air pollution from building level solutions
- Reduce energy consumption and renewable energy use by 20 % by 2025
- 2009 earthquake and 2011 Fukishima
- *"1) district-wide energy planning and 2) energy consideration in the early stages of planning are necessary to further promote the design of energy efficient buildings and to introduce renewable energy." Yuko Nishida, City of Tokyo, 2014"*

RESULTS

- 20 large-scale developments per year leading to district energy development or connection
- USD $150 million in capital investment (2010-2015)
- DHC Use 44% less primary energy and 50% less CO2

TOKYO BEST PRACTICE

DISTRICT ENERGY IN CITIES INITIATIVE

ENABLING INVESTMENT

SUSTAINABLE ENERGY FOR ALL

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Planner and Regulator

"District Energy Planning for Effective Energy Utilization"

Developments > 50 000m2 submit energy plan and assess DHC opportunities

Exclusive Service areas

Developments > 10 000m2 connect unless

Facilitator of Finance

City will seek to overcome economic barriers to connection

Cogeneration subsidy to encourage increased electricity generation

Provider and Consumer

Developed a CHP facility with an independent transmission network to supply power to affected areas in time of disaster

Connecting waste heat from metro lines

Coordinator and Advocate

City coordination unit negotiating with building developers and district heat companies.

Building efficiency programmes

LONDON TACKLES CO2 AND ENERGY AFFORDABILITY

DISTRICT ENERGY IN CITIES INITIATIVE

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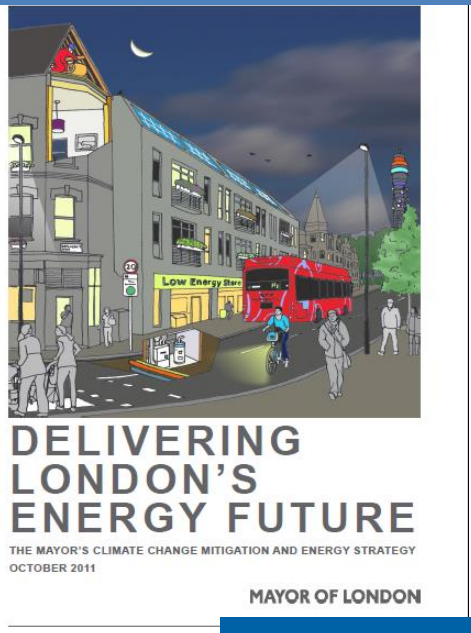
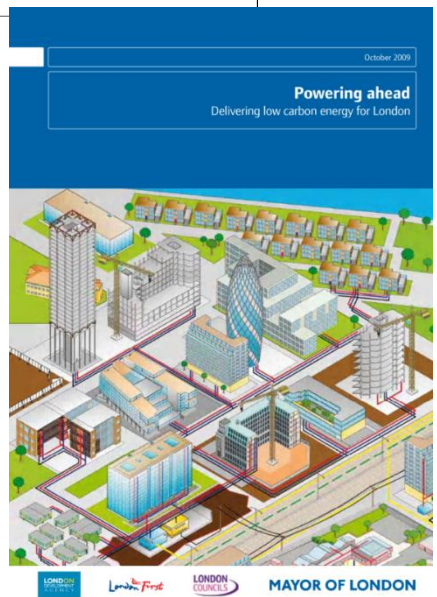
The Challenge

- 25% decentralized energy (reduce imports) and 60% Co2 reduction by 2025
- Become carbon zero by 2050
- Fuel poverty and aging infrastructure



The Opportunity of District Energy

- Annual CO_2 reduction of 3.5 million tonnes
- Employ 848 persons annually
- 10 fold increase in generating capacity
- US12.9 billion of investment in district energy by 2030



LONDON: LOCAL GOVERNMENT

DISTRICT ENERGY IN CITIES INITIATIVE

IMPACT

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Planner and Regulator

Targets

Energy assessments in new developments apply heat hierarchy

32 boroughs heat planning and zoning

New developments with high share of waste heat must accommodate connection

Facilitator of Finance

DEPDU US$4 million seed funding

Support project development: grants financing feasibility studies, tariff, contract design, tendering processes etc.

Provider and Consumer

Anchor loads (e.g. Cofely Olympic Concession)

Land for generating units

Waste heat substations & metro

Buy CHP retail to run low-voltage metro system

Coordinator and Advocate

Market facilitation unit: long-term development, interconnection, negotiation – building developers, utilities and planning authorities

Model for national government HNDU

Incorporate power suppliers into networks (waste from substations and transit)

CITIES NEED YOUR SUPPORT TO UNLOCK INVESTMENT!

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- Coordinate across programmes (e.g. SHP) ministries and stakeholders
- Devolution of authority to cities
- Assessment, heat planning, mapping, pre-feasibility, policies, licensing, consumer protection
- Methodologies, standard processes, ToRs, models, tools etc
- Capacity building and training programs

National Support is Essential!

- **Project development support (feasibility and commercialization)**

- **Capital investment support to accelerate investment**

In UK, $18 million of grant funding put aside in a first phase of support to cities will deliver $ 500 million - $1 billion of capital investment from 2015-2025. [This would mean a leverage factor of between 250 and 500.]

Enabling environment

DISTRICT ENERGY IN CITIES INITIATIVE

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/