

National to local: Best practice policy frameworks to unlock renewable and efficient district energy



DISTRICT ENERGY IN CITIES

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

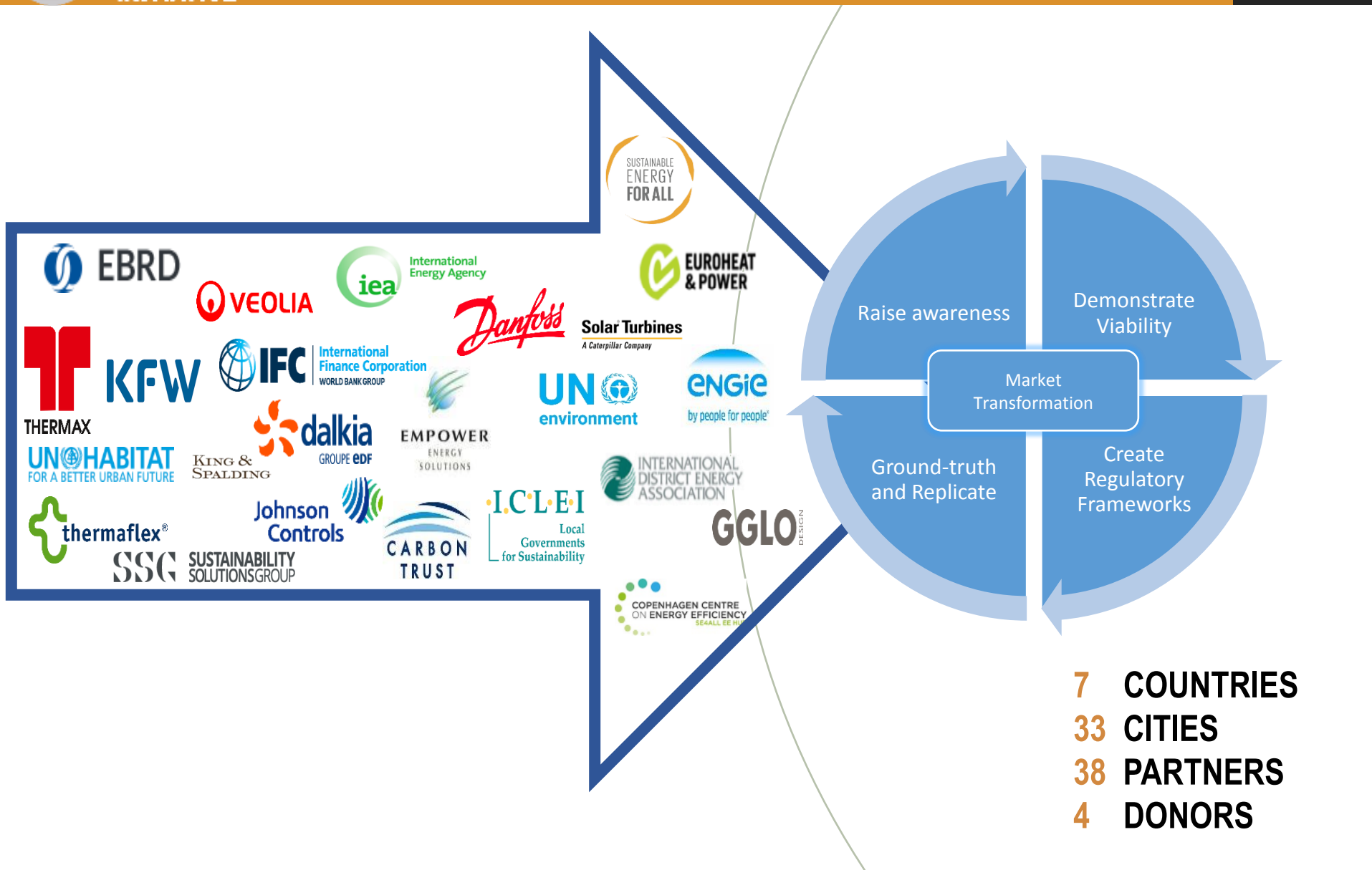


Benjamin Hickman, Technical Expert – Europe and South Asia
Energy, Climate and Technology Branch
Economy Division, UN Environment

A GLOBAL PARTNERSHIP ON DISTRICT ENERGY



DISTRICT ENERGY
IN CITIES
INITIATIVE



UNLOCKING ENERGY EFFICIENCY AND

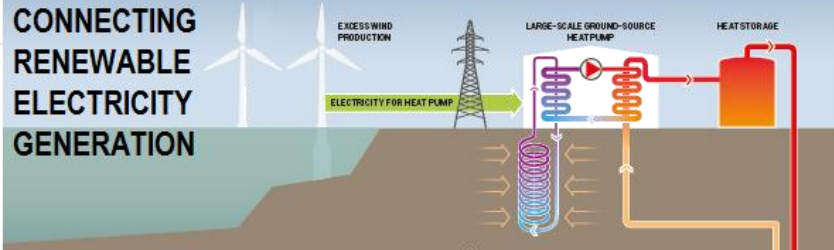


**DISTRICT ENERGY
IN CITIES
INITIATIVE**

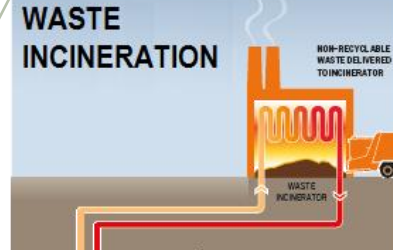
RENEWABLES



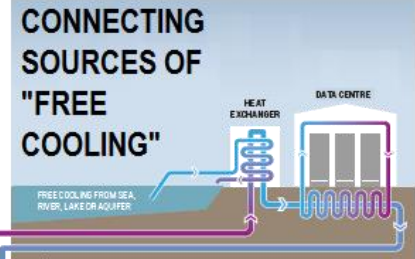
CONNECTING RENEWABLE ELECTRICITY GENERATION



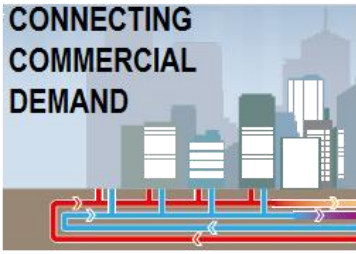
WASTE INCINERATION



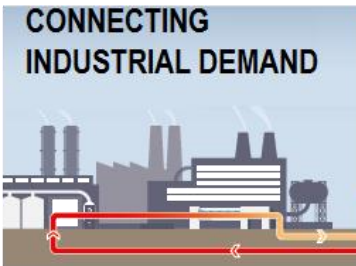
CONNECTING SOURCES OF "FREE COOLING"



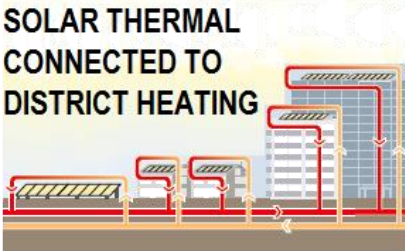
CONNECTING COMMERCIAL DEMAND



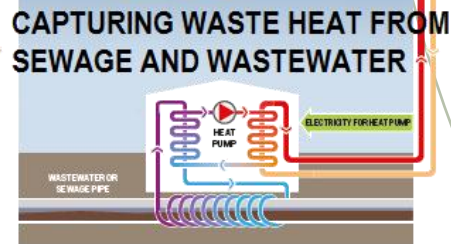
CONNECTING INDUSTRIAL DEMAND



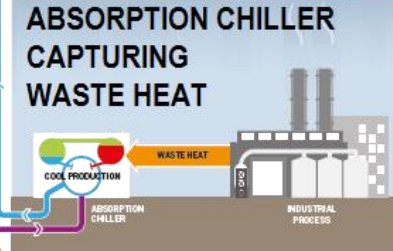
SOLAR THERMAL CONNECTED TO DISTRICT HEATING



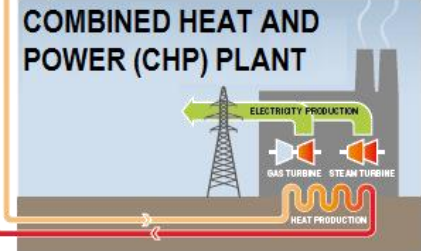
CAPTURING WASTE HEAT FROM SEWAGE AND WASTEWATER



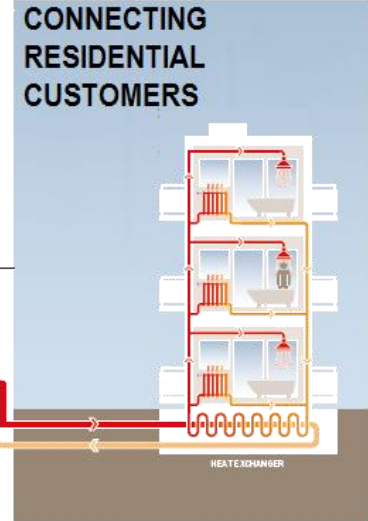
ABSORPTION CHILLER CAPTURING WASTE HEAT



COMBINED HEAT AND POWER (CHP) PLANT



CONNECTING RESIDENTIAL CUSTOMERS



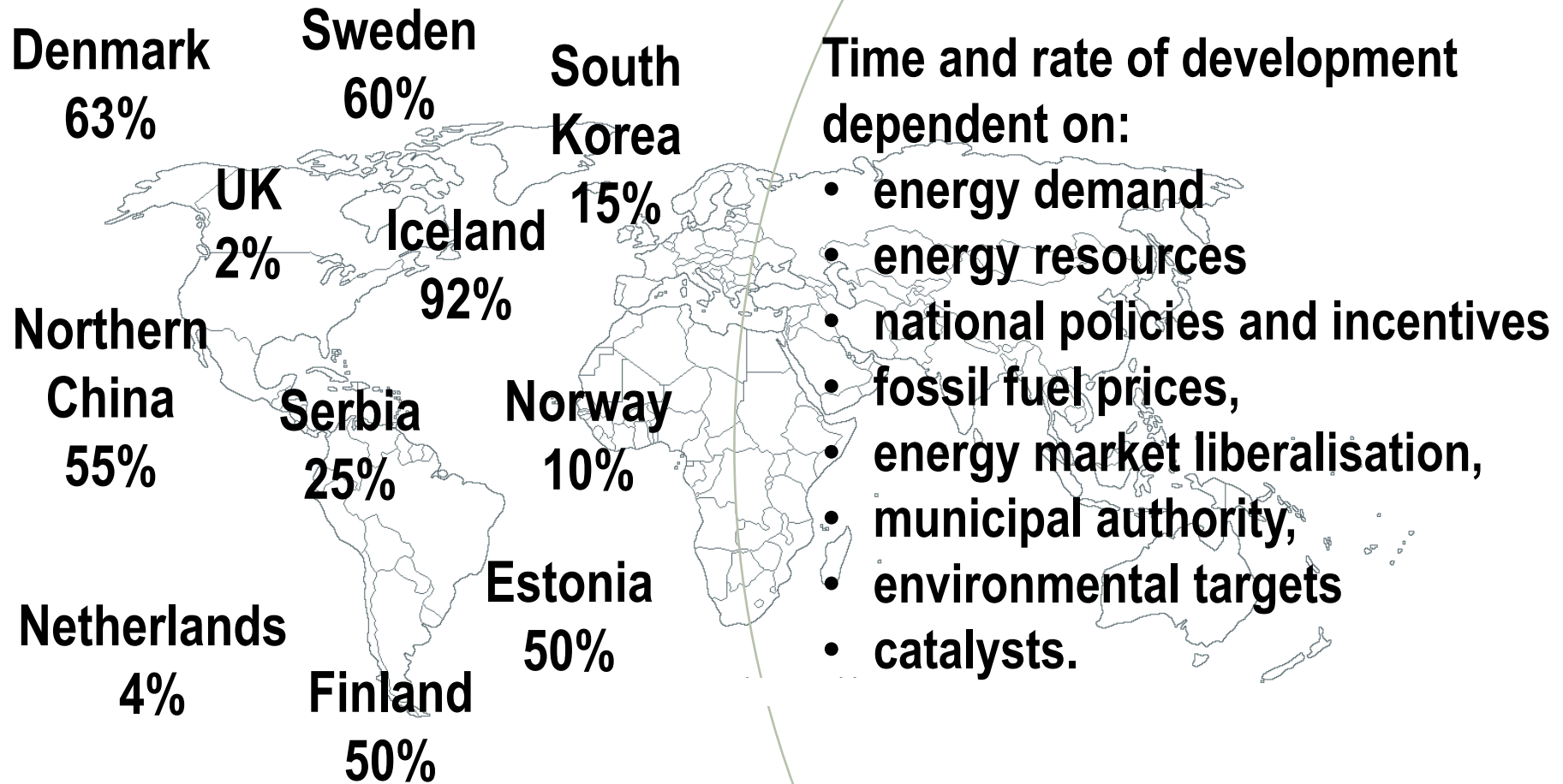
— DISTRICT HEATING SUPPLY (HOT)
— DISTRICT HEATING RETURN PIPE (WARM)
— DISTRICT COOLING SUPPLY PIPE (COLD)
— DISTRICT COOLING RETURN PIPE (COOL)

RANGE OF DISTRICT ENERGY



**DISTRICT ENERGY
IN CITIES
INITIATIVE**

MARKET SHARES



Data: Multiple sources – figures are illustrative with different methodologies employed

ROLE OF NATIONAL GOVERNMENTS



**DISTRICT ENERGY
IN CITIES
INITIATIVE**

IN DISTRICT ENERGY

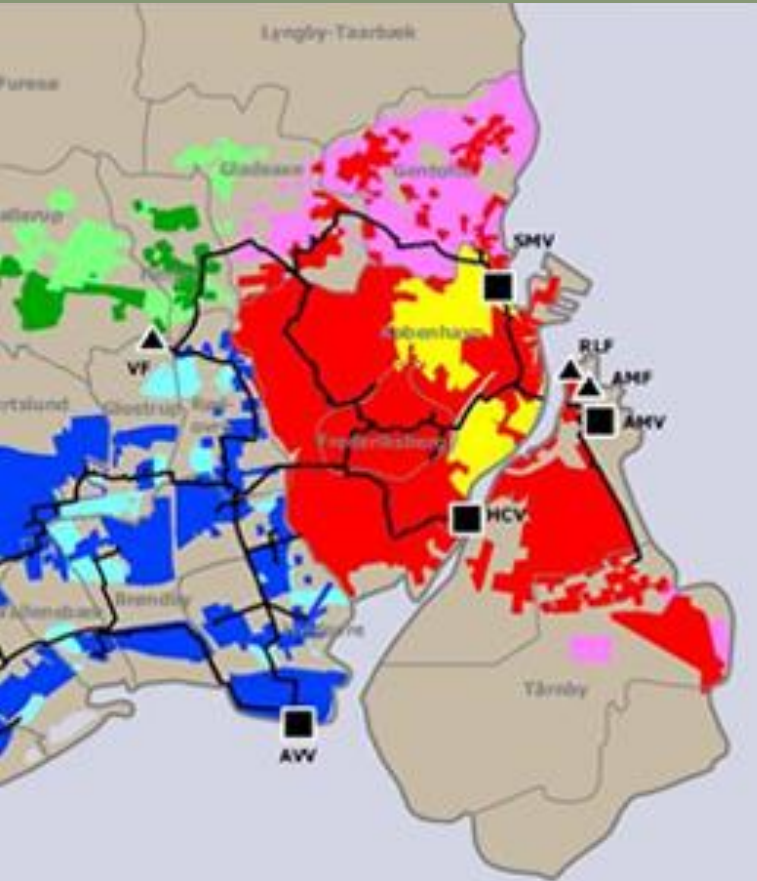


NATIONAL POLICY ON MUNICIPAL



DISTRICT ENERGY
IN CITIES
INITIATIVE

HEAT PLANNING



- National policies can require and support cities to develop heat/energy plans.
- Requiring heat plans acknowledges role of municipality to act on heat and can then be used to target connection policies
- Needs a harmonised methodology with funding
- Many **champion cities** develop such plans and national policy goes on to scale-up this best practice nationally
- Supported by EU Energy Efficiency Directive 2012

Strong successes: Denmark, Norway, Korea

High shares can be achieved without it: Sweden, Finland

Softer approach also used: France, Italy, UK, Netherlands



MANDATORY CONNECTION: A DISTRICT ENERGY GREY AREA

- National /regional policy can strengthen and define the authority of municipalities to mandate connection
- Successful examples link heat planning, franchise zones, connection mandates, tariffs and consumer protection.
- Cities able to reduce load risk through other tools (e.g. land ownership, coordinating municipal services, buildings codes and standards, etc.)

Mandate



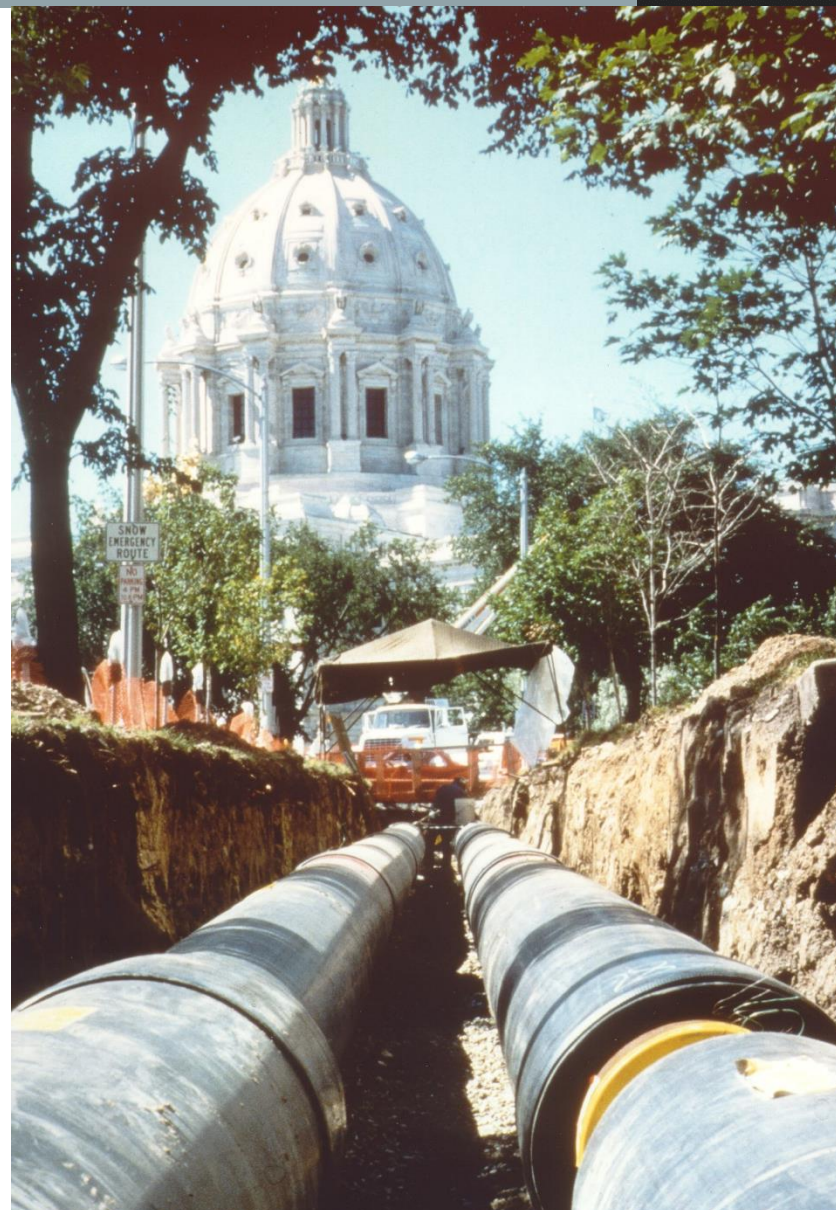
Denmark

Korea, Norway, Singapore

UK, Sweden

Netherlands, Finland

No mandate



NATIONAL POLICIES TO PROTECT



DISTRICT ENERGY
IN CITIES
INITIATIVE

CONSUMERS



Competition and consumer protection legislation exist in most countries. As markets expand, this protection is further defined and additional national policy developed:

Business model requirements

- Danish non-profit model
- Singapore profit sharing
- Iceland requires a minimum 51% public ownership

Tariff setting

- Priced against alternative (Netherlands, Norway, Singapore)
- Pass on costs (Denmark, Japan)
- Unregulated (UK, Sweden, Finland)

LEVELLING THE PLAYING FIELD

- National policy responses to market barriers
 1. Provide financial support and capacity building for city assessments and planning
 2. Make business case for district energy feasible
 3. Target switching to different fuel mixes and energy efficiency
- Champion cities can advocate for stronger national support based on their experiences



BEST PRACTICE IN TOKYO



DISTRICT ENERGY
IN CITIES
INITIATIVE



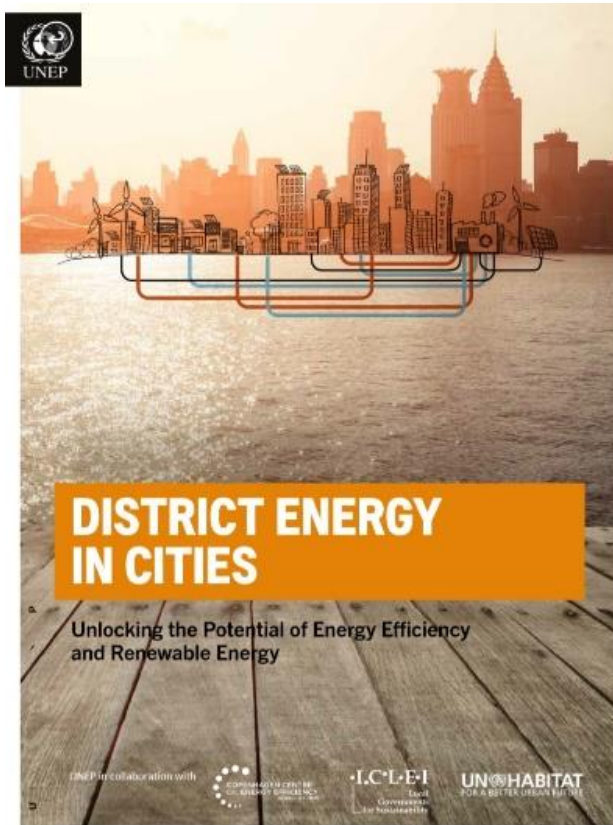
- **Catalysing network development**
 - District energy operators given exclusive service areas
 - Requires large developments to assess district energy development through “Energy Plan for Effective Utilization”
- **Encouraging connections**
 - City requires large developments to assess connection to DH and DC and consult with district energy suppliers.
- **Tariff Regulation and Customer Protection**
 - Historically had regulated tariffs.
 - Today tariffs are more liberalised but dependent on specific zones





**DISTRICT ENERGY
IN CITIES
INITIATIVE**

A TECHNICAL GUIDE TO DISTRICT ENERGY



Working with:

- Bosnia & Herzegovina
- Chile
- China
- India
- Malaysia
- Morocco
- Serbia



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

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

<http://www.districtenergyinitiative.org/>