



Pipes being laid during the construction phase of the new Banja Luka district energy system.

Human Settlements Case Story

District Energy in Cities Initiative

Cities, both individually and through cooperative initiatives, are already making significant commitments and are taking action to reduce greenhouse gas emissions and adapt to climate change. As hubs of economic activity and intellectual capital, cities are naturally positioned to use available technologies and lead the transition to low-carbon and resilient forms of human settlement. To achieve significant reductions in city-level greenhouse gas emissions, and to adapt to new climate conditions, profound changes are required, including across urban energy, waste and water management systems. District energy technology^a harnesses synergies between these systems and allows cities to provide heating, cooling and water services, in a resource efficient way, to buildings which are located within the same geographic area. Further, by reducing reliance on polluting fossil fuels, district energy systems generate financial and socio-environmental co-benefits at the local level.

Launched in 2014, the [District Energy in Cities](#) initiative is a partnership which aims to accelerate urban transitions through the deployment of modern district energy systems. Focusing on emerging economies and developing countries across Asia, Latin America, Africa and Eastern Europe, the initiative provides technical assistance to local governments that

wish to develop, retrofit or scale-up district energy systems. Specifically, the initiative aims to overcome upstream investment barriers, facilitates peer-to-peer learning and advocates for the establishment of enabling policy and regulatory frameworks that attract private investment.

Coordinated by UN Environment and funded by the Global Environment Facility, the Danish International Development Agency, and the Italian Ministry of Environment and Protection of Land and Sea, District Energy in Cities is part of the [Sustainable Energy for All](#) (SE4All) Global Energy Efficiency Accelerator Platform. At present, District Energy in Cities brings together over 45 partners, including private sector actors (such as utility service providers, equipment suppliers and professional services firms), think-tanks and research institutions, city networks, municipal governments and national partners.

After three years of development, the initiative's first pilot project in Banja Luka (Bosnia and Herzegovina) is now operational. The newly installed 49MW biomass boiler plant, which was added to the existing 35-year-old local district heating network, will reduce carbon dioxide emissions by 90 per cent, amounting to 45,000 tonnes each year.^b The retrofit is also expected to save

a. Modern district energy systems are akin to thermal micro-grids, linking the piping network to combined heat and power technologies, thermal storage facilities, heat pumps, solar thermal systems and/or decentralized energy. By harnessing efficiency gains and optimizing renewable energy use, district energy systems can result in a 30 to 50 per cent reduction in primary energy consumption and help in the move away from fossil fuels.

b. EBRD (not dated), GrCF – Banja Luka District Heating. Available at: <https://www.ebrd.com/work-with-us/projects/psd/grcf-banja-luka-district-heating.html>; UNEP Press Release (November 2017), Winter is Coming for Fossil Fuel Heating in Banja Luka. Available at: <https://www.unenvironment.org/news-and-stories/press-release/winter-coming-fossil-fuel-heating-banja-luka>

Human Settlements Case Story – District Energy in Cities Initiative

Presentation of components of the new Banja Luka district energy system during the construction phase.

up to EUR 900,000 annually as a result of reduced expenditure on fuel oil – money which can be reinvested in local services. There will also be a health benefit to the local population through a significant improvement in air quality, as the upgrade cuts sulphur dioxide emissions by 94 per cent.^c

During the project development phase, District Energy in Cities engaged its partners to bring on board stakeholders from the value chain, including finance providers and system operators. In Banja Luka, for example, the Initiative worked with the European Bank for Reconstruction and Development (EBRD) to ensure that plans and assessments align with the requirement of finance providers. The Initiative also worked with the [Climate Technology Center and Network](#) (CTCN, read more about it in the Technology snapshot), private sector, local stakeholders, and the city authority to build consensus and trust on planned interventions. Engaging relevant stakeholders from the very beginning has proved vital to ensure that projects are bankable and that they are completed on time. Further, by providing ‘names and faces’ to the lengthy project development process, stakeholder engagement can help to keep city governments and local communities engaged.

In 2017, Chile launched a national district energy strategy focusing specifically on cities with high levels of air pollution. To date, ten Chilean cities have joined the Initiative looking for support to address air quality challenges through district energy. The initiative has supported Temuco, a city of 290,000 inhabitants located about 700 kilometres south of the capital Santiago, in developing a business model for a local district energy system. Temuco’s air quality is the third worst in Chile, with dangerous pollutant concentrations five times higher than

World Health Organization standards.^d In Renca, a commune of Santiago, the initiative is currently helping the local government build innovative partnerships with the local business community to develop plans for a district energy system which would connect an energy plant and local industrial operations with schools, hospitals and municipal buildings.^e

The District Energy in Cities Initiative works with city planners and local governments to gain experience and develop capacity in the tools and expertise needed to incorporate district energy into long-term city plans and neighbourhood design. In its work with Chilean municipalities, District Energy in Cities invited municipalities with similar operational conditions like Vancouver (Canada), Sonderborg (Denmark) and Gothenburg (Sweden) to a knowledge exchange workshop in Chile.

To scale-up district energy systems worldwide, the Initiative is developing standardised guidance and tools to help cities in the assessment, planning and procurement of projects. The Initiative will also build on existing collaborations with governments to advocate for the inclusion of district energy in national energy plans and so create enabling policy and regulatory frameworks.

Transformations to low-carbon and resilient urban hubs need to be tailored to fit local context. Project development requires close collaboration between all relevant stakeholders. As cities in emerging markets and developing countries turn to district energy, the Initiative is ready to direct international best practice gained over decades to where it is needed and export lessons learned from pilot projects to neighbouring cities and countries.

Building on the existing work of District Energy in Cities, phase two of the partnership will work to harness the full potential of renewables, which, along with efficiency gains, is crucial to help cities transition to low-carbon models. As an evolution of the work on district energy, UN Environment plans to promote the co-existence of distributed renewables, mini thermal grids and renewable grid integration.

The Initiative has shown that vertical integration across all levels of governance works. It has demonstrated the power of partnership with banks and investors. There is huge potential for roll out across the globe if development banks and international finance institutions create a ‘preparation or readiness fund’ for District Energy projects in cities. By providing technical assistance and building capacity, District Energy in Cities has shown how policymakers, practitioners, researchers and other stakeholders can work together to support cities in developing business models and projects that improve people’s lives without damaging the climate.

c. UNEP Press Release (November 2017), Winter is Coming for Fossil Fuel Heating in Banja Luka. Available at: <https://www.unenvironment.org/news-and-stories/press-release/winter-coming-fossil-fuel-heating-banja-luka>

d. UNEP (April 2017), Chile Makes Bold Air Quality Commitment by Adopting a District Energy Strategy. Available at: <https://www.seforallforum.org/sites/default/files/Chile%20Press%20Release.pdf>

e. District Energy in Cities Initiative (March 2018), Renca Business Could Benefit Big from District Energy Connection. Available at: <http://www.districtenergyinitiative.org/renca-business-could-benefit-big-district-energy-connection-0>; District Energy in Cities Initiative (April 2018), Renca joins Switzerland and UN Environment to initiate an innovative energy project. Available at: <http://www.districtenergyinitiative.org/renca-joins-switzerland-and-un-environment-initiate-innovative-energy-project>