ACCELERATING YOUR URBAN DECARBONIZATION STRATEGY

Sustainable solutions for increased resilience, operational efficiency and citizen wellbeing

CITIES HOLD THE KEY TO A DECARBONIZED FUTURE

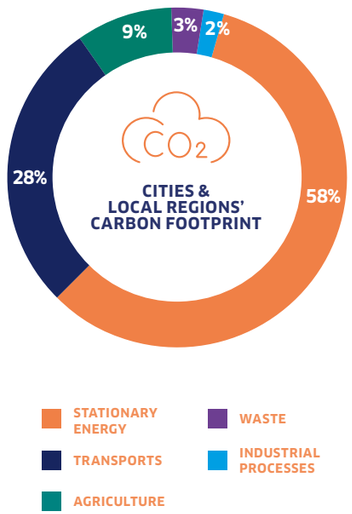
Climate action in cities is essential for achieving ambitious net-zero emission goals. **Cities account for more than 50% of the global population,** 80% of global gross domestic product* (GDP), two-thirds of global energy consumption, and **more than 70% of annual global carbon emissions*.** These figures are expected to grow significantly in the coming decades: by 2050, it is anticipated that more than **70% of the world's population will live in cities*,** resulting in massive growth in demand for low-carbon energy infrastructure and equipment.

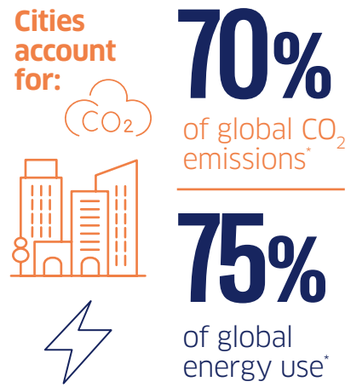
Turning climate action goals into reality is not without its challenges. Most cities are operating on tight budgets, and the pandemic has radically transformed lifestyles and urban mobility behaviors. With the support of key partners like ENGIE, cities can rethink their infrastructures to optimize transport networks, enable low-carbon energy production, and reduce the environmental footprint of buildings by making them more energy efficient.

Low-carbon solutions represent an important opportunity for cities to reduce energy consumption while still meeting service demand, improving grid stability and enhancing quality of life for all. Next-generation energy systems leverage big data and digital technologies to collect and analyze data in real time and manage city services more efficiently. These solutions are transforming the energy world by creating new synergies to reduce emissions, improve energy efficiency and enhance resilience. Local governments are in a unique position to deliver on the net-zero emissions agenda. Some of the world's biggest cities are leading the way, actively reducing their greenhouse gas emissions. Through these actions, they not only increase their attractiveness; they also optimize costs and develop new competencies and partnerships.

How ENGIE helps cities and local regions address today's urgent climate challenges:

- **by providing rapid and effective levers for greening urban areas**
- **by integrating each city's development goals into its decarbonization strategy**
- **by delivering an efficient, resilient, economic and environmental response to urban aeras.**





ENGIE's goal is to support cities and regions with the energy transition, serving as a long-term strategic partner to create or optimize their net-zero carbon strategy.

Over the past 30 years, we have honed our technological expertise in energy efficiency, district heating and cooling, energy renewables, low-carbon public lighting and waste-to-energy solutions. Through our 360° approach, we balance each city's environmental impact and financial costs with its sustainability goals and development plan. The result is tailored solutions and services that accelerate the transition towards carbon neutrality.

* Source: Empowering Cities for a Net Zero Future (IEA, 2021)

THE MAJOR CHALLENGES FACING CITIES

Faced with demographic, economic and climate challenges, cities are accelerating the pace and scale of decarbonization solutions. They need to embrace technology to become more agile, resilient and inclusive while leveraging regulations to facilitate their energy transition

Adapt to changing demographics

The demographic evolution of global populations requires flexible infrastructures. To achieve this, cities need to plan ahead, make smart investments, and drive effective management in order to create a sustainable, inclusive, and high-quality urban environment while serving citizens.

Capitalize on technologies

Integrating and mastering new technologies is essential to address the challenges of sustainable development. Using the right technologies, cities can enable innovative and adaptive solutions, drive more efficient resource management, and promote awareness of environmental and social issues. The deployment of modern technology and low-carbon solutions can be facilitated and accelerated by adoption of a more favorable regulatory framework.

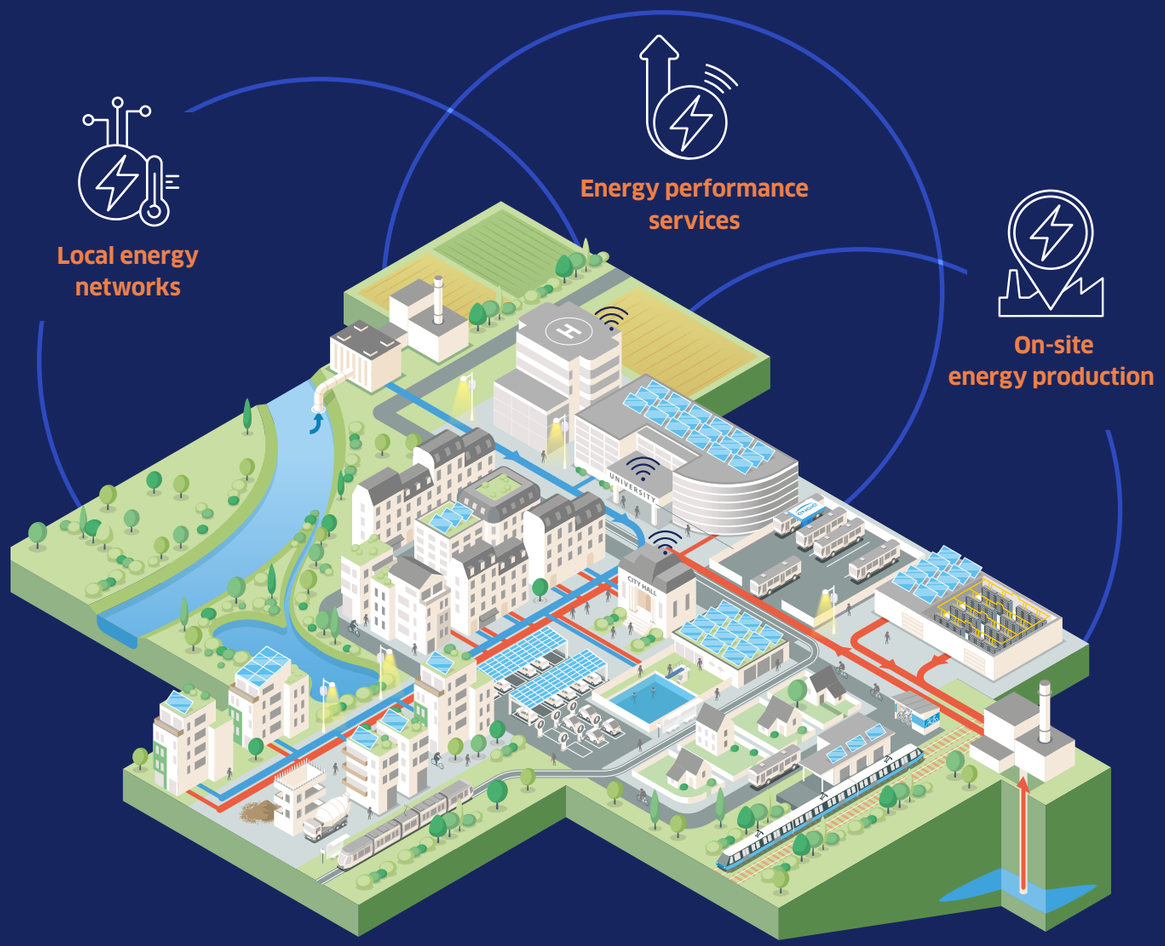
Tackle climate change

To address environmental challenges, many cities are implementing climate change adaptation strategies, investing in resilient infrastructures, promoting the transition to clean energy, and encouraging sustainable urban development practices. The key is to develop initiatives that reduce greenhouse gas emissions and mitigate the effects of climate change while strengthening the city's resilience to the inevitable impacts.

Accelerate the pace

Seeking public-private partnerships, exploring alternative sources of funding, and working to improve operational efficiency can accelerate the transformation of cities. In addition, these measures can help mitigate budget constraints, as cities often need to adopt a more cautious approach to budget management. They also need to implement long-term financial planning and prioritize the essential needs of the community in order to address budget constraints effectively and equitably.

THE LOW-CARBON CITY: A BLUEPRINT FOR MEETING URBAN CHALLENGES

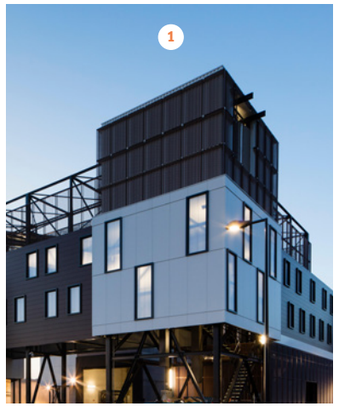


Through its three interconnected and complementary solutions, ENGIE supports cities in meeting their major challenges and transitioning to carbon neutrality.

LOW-CARBON SOLUTIONS FOR CITY-WIDE DECARBONIZATION

From enhancing mobility, heating, cooling and lighting to improving the energy mix and energy efficiency, ENGIE supports cities and local regions on their net-zero journey.

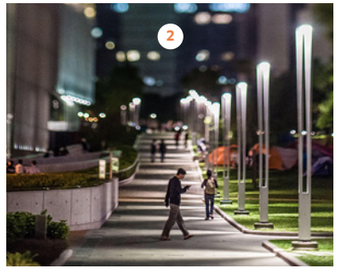
Local energy networks for sustainable development



ENGIE supports cities to decarbonize their local energy networks through interconnected services across various types of urban energy needs, including local energy grids. By pooling production to meet demand from different buildings, **district heating & cooling networks** (1) minimize peak demand, thus reducing the impact on the environment. They help cities increase the share of local renewable energy in their energy mix. Natural resources such as geothermal and aquathermal can be combined with local biomass and biomethane sources from agriculture. ENGIE can also enable cities to recover excess energy from renewable power generation, waste heat from data centers and industrial processes when they exist nearby, or heat from sewage water treatment plants.

Our **street lighting solutions** (2) Help cities focus light on what needs to be illuminated, using intelligent dimming to adapt lighting levels to pavement usage. **Modern technology can save up to 80% of energy**, and digital solutions can reduce operational and maintenance costs by up to 30%. We also provide compatibility with Wi-Fi, 5G, air quality sensors and traffic monitoring.

Through **ENGIE Vianeo**, we help cities install, operate, maintain and finance a network of **electric vehicle charging stations** (3) for use by public transport and private individuals, offering end users **100% green energy**. We are also actively developing hydrogen stations for buses and heavy goods vehicles, as well as multi-energy stations offering a mix of alternative energies, such as green biogas.



On-site energy production for resilience and autonomy

ENGIE helps cities install and operate **on-site solar and storage solutions** (4) across multiple sites and buildings. We support you in creating parking lots with solar canopies, installing photovoltaic panels on residential and public or private buildings, and powering neighbourhoods through collective solar energy. Our energy storage solutions based on powerful batteries can be used to meet energy demand in regions looking for an alternative to grid supply.

We design and deliver solutions in **local utility generation** for urban buildings (heating, cooling, combined heating and power) with guaranteed utility quality, efficiency, availability and costs. We optimize energy systems to reduce CO_2 emissions, with no investment on our customers' behalf. Our digital solutions also enable customers to remotely control installations, optimize operations, and adjust equipment settings to save energy consumption and costs.

In addition, ENGIE offers **Green Corporate Power Purchase Agreements (PPA)**, 5 to 30-year contracts that allow cities to purchase renewable energy at a predefined and stable price – helping them decarbonize while anchoring costs.

Energy performance services for efficiency and thriftiness

ENGIE's global energy efficiency solutions enable cities and regions to optimize energy performance for all types of building infrastructure while preserving comfort for its occupants. These include collective residential buildings, public and administrative buildings, offices, schools, museums, hospitals, stadiums and swimming pools.

With our **Energy and Carbon Performance Contract (ECPC),** we cover the entire value chain (design, construction, maintenance, operations) and management of all infrastructures that produce or consume energy in our customers' regions. ECPC comes with a commitment to results: **we guarantee reduced energy consumption and CO_2 emissions over the term of the contract.** Through the ECPC contract, our teams proactively optimize the energy performance of urban systems, including utilities, lighting and HVAC. We can install or modernize equipment such as heating and cooling production systems.

Our digital solutions include remote control of HVAC equipment and remote supervision of installations. Every part of our offer is focused on **optimizing energy consumption** (5) across cities or regions and promoting **energy thriftiness** while ensuring the wellbeing of citizens and contributing to reduce energy costs. In addition, we propose financing and energy supply solutions and advisory services, provided by teams whose expertise is based on solid experience and know-how in implementing proven solutions.

USING DIGITAL SOLUTIONS TO REALIZE THE BEST SCENARIOS FOR YOUR CITY

Using our digital and technical expertise, we help you improve building energy efficiency, optimize maintenance, increase local and renewable energies, and green your heating/cooling network. The benefits include lower energy consumption, regulatory compliance and controlled loads for residents and companies.

Through its easy-to-deploy solutions, ENGIE supports cities to combine their sustainability and digital transformation goals with economic growth and citizen wellbeing. From high-precision data analysis to powerful visualization tools and dynamic dashboards, we have developed our own customizable solutions to help you address decarbonization, climate resilience and digital optimization.

Our digital twin technologies bridge the gap between virtual and physical worlds, allowing you to unlock data-driven insights and map your path to success. Leveraging over 30 years of expertise in geodata, 3D modelling, and data engineering, we provide a holistic view of your city by bringing your city's data to life. Thanks to advanced visualization techniques and simulations using the digital twin of your city or region, you can compare scenarios, understand vulnerabilities or gaps, and anticipate the impact of urban transformations before they are implemented. The possibilities are endless, from cooling urban heat islands and mitigating flooding risks to optimizing urban nature solutions and increasing the ROI of EV charging stations and rooftop solar panel installations.

Another ENGIE digital solution is **Network Modelling Energy and Optimization (NEMO)**. This tool helps to refine our solutions and continuously assist operators in adapting production to match distribution needs, minimizing thermal losses based on local conditions, weather, equipment availability, price signals, and green ambitions. How? By leveraging historical data and using predictive algorithms and 3D simulations. The NEMO solution can help drive increased energy efficiency, reduced water and electricity consumption and cost savings.

HOW 4 CITIES BENEFITED FROM ENGIE'S SUPPORT

1. Abu Dhabi - Noor United Arab Emirates

- **12-year** concession public-private partnership
- **74%** savings in electricity consumption
- **134,000** lighting points
- **85%** energy efficiency luminaries
- **1,100,000 tons CO_2** emissions avoided

ENERGY PERFORMANCE SERVICES

2. Barcelona - Spain

- **30-year** concession contract Districts heating & cooling network
- **21 km** of networks deployed
- **47 MWc total installed** heat capacity
- **69 MWf total installed** cooling power
- **417,276 tons of CO_2** emissions avoided*

LOCAL ENERGY NETWORKS

3. Milpitas - USA

- **10-year** Smart City Energy and Water Savings Integrated Program
- **$1.5 million** saved in energy and water costs annually
- **200 kW of solar energy** installed with a battery system
- **2,185** LED, 4,453 streetlight controls with outage detection

ENERGY PERFORMANCE SERVICES

ON-SITE ENERGY PRODUCTION

4. Fiumicino (Roma) - Italy

- **20-year** public-private partnership
- **9,200** lighting points
- **67.4% electricity savings** through public lighting framework
- **100% green energy,** with self-produced electricity (for 31 schools)
- **35** photovoltaic systems installed (for 31 schools and 26 public buildings)
- **3,285 tons of CO_2** emissions avoided per year

LOCAL ENERGY NETWORKS

ON-SITE ENERGY PRODUCTION

ENERGY PERFORMANCE SERVICES

* Estimation by 2032 with all plants in operation

a global player leading the energy transition

N°1 in cooling networks in the world

N°3 in heating networks in the world

>3,800 km of networks

330 MWp of on-site photovoltaic*

>1 million lighting points operated

COMMITTED TO ACHIEVING NET ZERO CARBON BY 2045

For ourselves and our customers with strong ambitions

50 GW
of renewable energy
by 2025

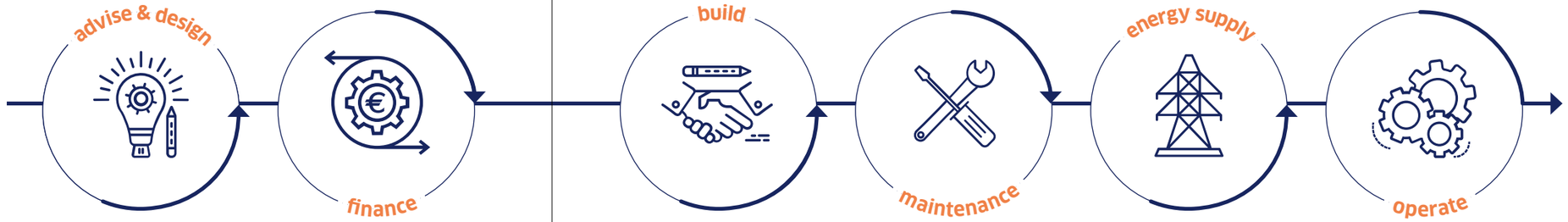
80 GW
by 2030

43 MT CO_2
equivalent of greenhouse gas emissions from energy production
by 2030

* developed in 2021

OUR VALUE CHAIN

ENGIE supports its customers at every step of the value chain, helping cities to meet their sustainability targets over the long term.



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