

Reducing Energy Dependence in European Cities



Covenant of Mayors

Committed to local sustainable energy

The Covenant of Mayors is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. Through their commitment, Covenant Signatories aim to meet and exceed the European Union 20% CO₂ reduction objective by 2020.

The Covenant of Mayors Office (CoMO) is managed by a consortium of local and regional authorities networks, led by Energy Cities, composed of Climate Alliance, CEMR, EUROCITIES and Fedarene.



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Introduction

Cities are where most European energy is consumed and also the origin of most greenhouse gas (GHG) emissions. In the context of increasing energy import costs and risks, municipalities have it in their power to be less dependent on external energy sources. This publication looks at how local authorities can diminish their dependence on external energy sources through the smart use of local resources and a general decrease in energy consumption in municipal and residential buildings, urban mobility and public lighting.

Examples have been selected of what some municipalities throughout Europe are doing to increase energy efficiency and reduce emissions in order to be less dependent on external energy resources and at the same time improve the quality of life of their citizens. The measures should help to reduce the risk of power cuts and lower costs for households, municipalities and businesses alike. Energy is also important for businesses and their development: having secure sources of energy that are also clean and efficient will contribute to the success of the European business sector and economic growth. By identifying where energy originates from and looking for local alternatives, towns and cities can improve their energy balance sheet and contribute to the prosperity of their communities.

While complete energy independence is hard to achieve, a diversified energy mix is important and can make municipalities more resilient in the future. Even though energy strategies are mostly within the competences of National Governments, Covenant Signatories and their Sustainable Energy Action Plans (SEAPs) can make a significant contribution to this aim.

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The current European energy context

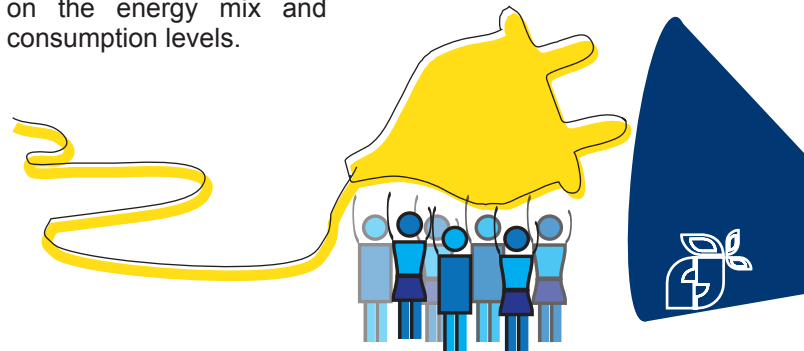
Europe is faced with growing energy challenges. For example, Belgium is concerned about how to ensure the supply of electricity, while Bulgaria and Slovakia look worriedly towards Ukrainian pipelines and Italy prepares gas supply contingency plans. Europe needs to implement new measures to adapt to the changing energy landscape.

The current energy outlook

A mix of factors, including increasing energy imports and decreasing production trends, the limited diversity of gas suppliers and poor infrastructure connections between European countries have brought us to a point where the EU needs measures at supranational, national, regional and local levels in order to ensure security of supply. The EU's energy dependence is now a staggering 53% and predicted to rise. While gross energy consumption has been steadily falling in most EU member states for the past 7 years, it has not been enough to compensate for the 20% drop in internal energy production over the same period. The natural gas market is the most critical, as it accounts for 23% of European energy use and is strongly dependent on gas pipelines that link the continent to a very small number of (geo-politically sensitive) suppliers. There is far less flexibility in supply routes and relatively little storage capacity in the gas market when compared to, for example, oil. Reverse-flow capabilities have increased, but are not sufficient for EU countries to feel at ease with winter approaching.

The energy situation in towns and cities across Europe

Geopolitical turmoil usually increases vulnerability to supply disruptions. As 80% of energy consumption in Europe is linked to urban activity, people living in cities are exposed to higher risks of electricity cuts, reduced public services and fuel poverty. However, just as the oil shock in the 1970s pushed Denmark towards energy efficiency and high gas prices made **Budapest** (HU) look at other unexploited local resources for power, the risks we currently face can also be seen as an opportunity to investigate what can be done at a local level to avoid a re-occurrence of this type of situation in the future. While the larger infrastructure projects required at European level are undertaken by regions, provinces and states, towns and cities can also have an impact on the energy mix and consumption levels.





How can towns and cities contribute?

Towns and cities can have an impact on the European energy outlook by, on the one hand, boosting local energy production and, on the other hand, diminishing energy consumption. Since municipalities are the largest consumers of energy in the EU, it is within their power to alter the current state of dependence through local coordinated action.

Local measures for a better energy mix

Improvements can be made to the energy mix by making changes to the way municipalities use resources for power production combined with increased efficiency. For example, instead of burning gas for power, renewables or waste can provide part of a city's energy, as is the case in Covenant Signatories **Heerhugowaard** (NL) and Gdynia (PL). Whilst such sources of energy are unlikely to meet 100% of a city's power needs, they can at least decrease dependence on gas and create a shift to greener sources. Complementary measures, such as financial incentives given to the owners or tenants of private buildings to install solar panels, small wind turbines or to increase the thermic insulation of their property, can also be adopted.



New financing models for municipal energy investments

Worried about the bill? Working in partnership with local energy service companies (ESCOs) could reduce it through energy performance contracts (EPC), where the company makes the initial investment and recovers the cost through lower energy bills. Although in some European countries these arrangements are still risky from a legal perspective (e.g. Ljubljana is working with the Slovenian authorities to develop legislation covering EPC), other municipalities have cut their energy bills without large upfront costs. Examples include Milan (IT), which has benefitted from European Investment Bank funding for municipal building refurbishments and the deployment of district heating (DH).

The way forward

The EU is moving towards more cooperation and the establishment of stronger energy links between EU cities, regions and countries. The latest **European Energy Strategy** is a first step in that direction, and the Covenant of Mayors has steered its activities towards providing support to sub-national actors on this long-term journey towards energy security. Local administrations definitely have a role to play in diminishing dependency and making our power greener and cleaner.



Renewables and distributed energy generation

The main way in which towns and cities can decrease the risk of paying large premiums on imported energy is to partially cover their energy needs from local resources. It can be as easy as sending their park trimmings to a biofuel or waste-to-energy plant, rather than to landfill. Municipalities can also take a de-centralised approach to local energy generation, motivating their inhabitants to invest in small solar and thermal installations.

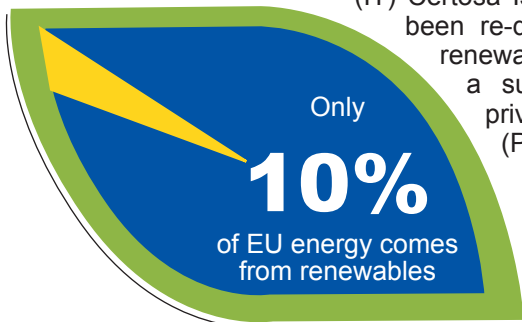
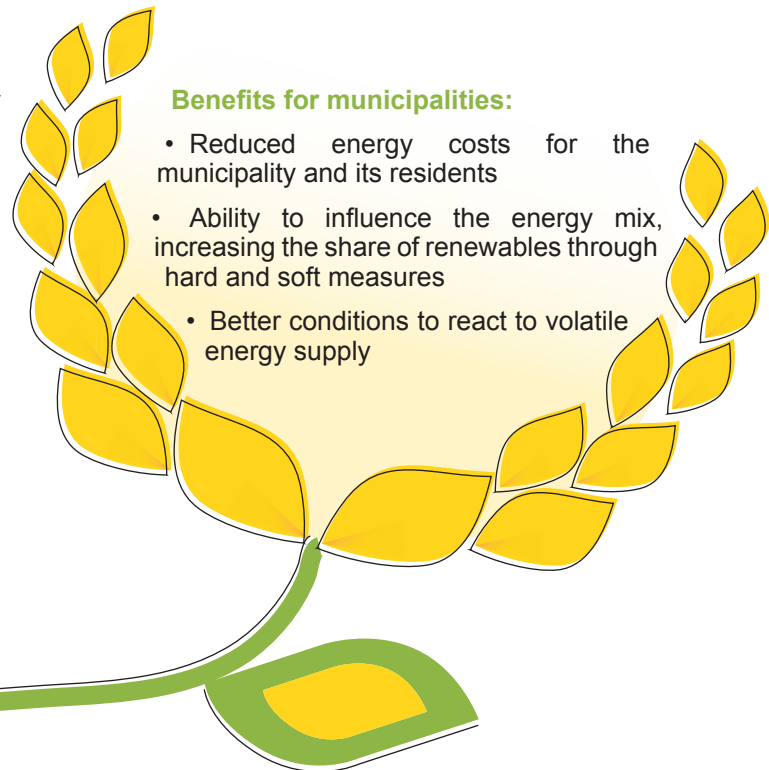
Local energy production

Towns and cities across Europe are investing more and more in local energy production, either from renewable sources or from waste. Depending on their local resources, they might decide to invest in urban wind installations, as in Amsterdam (NL), in solar photovoltaic (PV) and thermal installations, an option implemented for example in Ljubljana (SI), or in biomass plants, the solution selected in Gateshead (UK). As large municipal investments in renewables usually require significant funding, these projects can also be realised in partnership with the private sector, either through leases or preferential energy contracts. One example is Venice's

(IT) Certosa Island, which has been re-developed into a renewables hub through a successful public-private partnership (PPP).

Benefits for municipalities:

- Reduced energy costs for the municipality and its residents
- Ability to influence the energy mix, increasing the share of renewables through hard and soft measures
- Better conditions to react to volatile energy supply



Decreasing costs through district energy

District heating and cooling, as well as district combined heat and power (CHP) plants, are excellent means of decreasing local energy costs, as they generally use local resources and waste less power. With over 80% of the heat supplied by these systems coming from renewables or heat recovery, it can also be considered green energy. A growing number of EU cities – particularly those located in Northern, Central and Eastern Europe - are introducing, renovating and further expanding the district heating network in order to reduce fuel imports and diminish their residents' energy bills. Excellent examples are Amsterdam (NL), which has nearly completed a city-wide district energy belt, and **Warsaw** (PL), which uses its two co-generation plants to significantly reduce CO₂ emissions and switch from fossil to biofuel. The infrastructure costs that these projects require can be partly covered through European funds, energy performance contracting or public-private cooperation.

EU-wide investments in district energy could reduce heating costs by

€51.4 billion

per year



Examples from Signatories

Tampere (FI): fuel shift to biofuel through district heating and combined heat and power plants

In order to reduce their CO₂ emissions and move away from gas and oil based energy, Covenant Signatory Tampere has invested in two wood-based district heating and one waste-to-energy combined heat and power plants. These three additions use local resources to produce enough energy to power an entire neighbourhood. All will function as base-load power generators, resulting in a total CO₂ emissions reduction of around 30% and a significant decrease in imported gas and heavy fuel oil.

the power utility's CO₂ emissions have dropped by **23%** in 3 years



Capitalising on small-scale green energy generation capacities

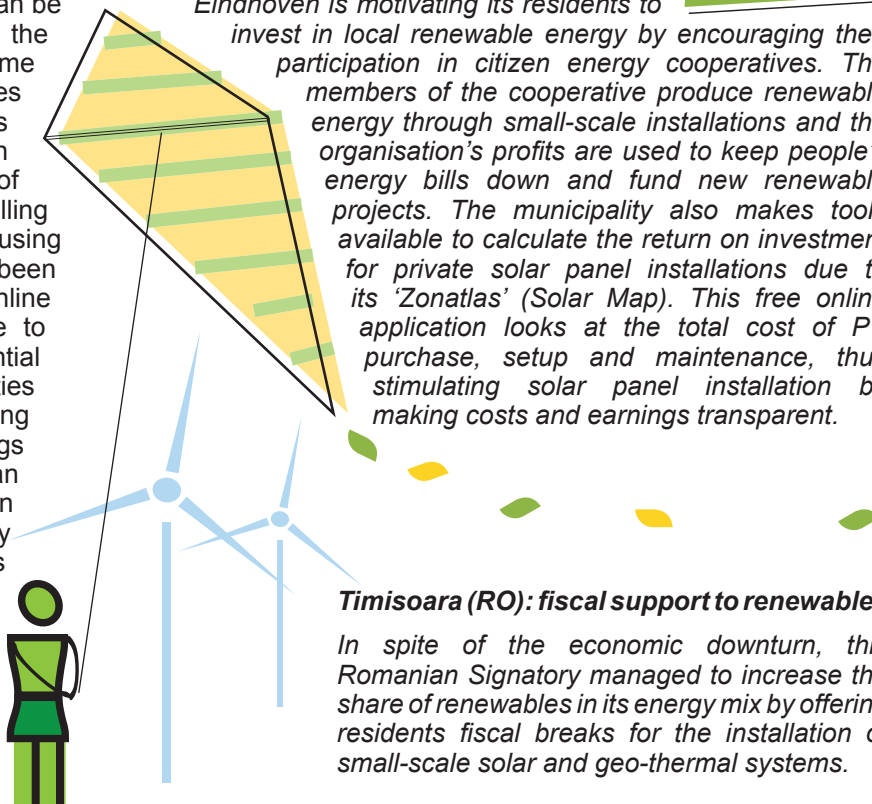
There are also plenty of soft measures that can be used to increase the share of renewables in the energy mix of a town or city, while at the same time decreasing energy dependence. Municipalities across Europe have implemented measures such as awareness-raising campaigns on the environmental and financial advantages of citizens producing their own energy by installing solar thermal and photovoltaic installations using their own funds. Practical support has been provided for those making this decision via online cost-benefit analysis tools, allowing people to understand their property's renewables potential and the investment payback rate. Many cities have served as good examples, installing solar panels on municipally-owned buildings in order to demonstrate the savings that can be achieved. An example can be found in **Birmingham (UK)**, where the local authority inspired residents in the vicinity of city offices to also install PVs. Alternative measures to encourage citizens to invest in small-scale generation include offering fiscal breaks to households or neighbourhoods that invest in small solar, geothermal or wind installations.

Eindhoven (NL): getting citizens on board

Eindhoven is motivating its residents to invest in local renewable energy by encouraging their participation in citizen energy cooperatives. The members of the cooperative produce renewable energy through small-scale installations and the organisation's profits are used to keep people's energy bills down and fund new renewable projects. The municipality also makes tools available to calculate the return on investment for private solar panel installations due to its 'ZonAtlas' (Solar Map). This free online application looks at the total cost of PV purchase, setup and maintenance, thus stimulating solar panel installation by making costs and earnings transparent.

Timisoara (RO): fiscal support to renewables

In spite of the economic downturn, this Romanian Signatory managed to increase the share of renewables in its energy mix by offering residents fiscal breaks for the installation of small-scale solar and geo-thermal systems.



Venice (IT): green redevelopment with the private sector

Venice has joined forces with private investors to redevelop Certosa Island into a low-carbon urban park. According to the PPP contract signed by the municipality, the area was to be refurbished to high energy efficient standards for its buildings and it needed to be powered by renewables. The local business that teamed up with the city for this project decided to invest in medium-scale installations for multiple renewable sources (biomass plant, district heating and cooling, solar thermal, PV and micro-wind

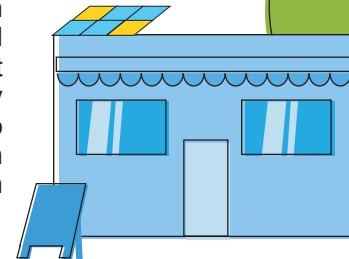
systems) to act as demonstrations that would, in the medium term, inspire other SMEs to invest in green energy sources. By reducing power consumption in general, developing its green energy generation capacities and using locally-produced biomass in the CHP plant, the city of Venice decreased its gas imports by 100 thousand cubic meters and reduced CO₂ emissions by 315 tonnes per year. Moreover, the area now combines business and leisure areas, bringing residents in contact with green integrated systems that have the potential to inspire them to invest in similar measures in their own neighborhood or household.

Developing renewables with the local business community

The importance of local businesses should not be neglected, as more and more local power installations are carried out in cooperation with commercial partners. Cities can inspire small and medium sized enterprises (SMEs) to invest in renewables by raising awareness of the energy and financial benefits of the various technologies available, by offering tax incentives or certification, by encouraging energy audits or by cooperating with ESCOs. For example, many SMEs have decided to set up in **Bristol** (UK) due to the city's green business park powered by renewables. This strengthens the public image of the ICT businesses established there and encourages further investment in green integrated systems. A wide array of loans and guarantee facilities are available for local companies willing to invest, while municipalities often support them with consultancy services or business development and partnering tools. As energy dependency and the energy mix has a major impact on both cities and SMEs, the best strategy they can adopt is to cooperate through PPPs investing in green energy.

EU SMEs receive
€6 billion/year

to invest in
renewables





Building refurbishments

Buildings consume a high volume of energy and produce a large amount of CO₂. This makes it a key sector to examine when aiming to reduce dependence on external energy sources. Buildings consume most through their heating systems and many buildings are badly insulated, which also contributes to greenhouse gas emissions. There is a huge potential for the refurbishment of European cities' building stock, particularly via efficient insulation, integrated building management systems and smart meters, as demonstrated by measures being taken by Covenant of Mayors Signatories.

Reducing energy consumption

Buildings account for 40% of total energy use and 36% of Europe's CO₂ emissions. This includes not only private dwellings, but also shops, offices and other buildings located in municipalities. Energy consumption can be reduced with measures such as adequate insulation, double glazing, green façades or even energy generation in buildings, such as solar power. Retrofitting existing buildings will help to lower energy dependence as a result of lower consumption and minimised system losses, as in the case of Kiev (UKR). Minimum standards would guarantee that new buildings are as near to zero-consumption as possible. With 14% of buildings in the EU dating from pre-1919, this represents a major retrofitting challenge. EU funds can play an important role in finding an optimum solution.

For every

1€ spent on renovation

you can get
€5 in return
within the year

Benefits for municipalities:

- Reduce fuel and energy poverty
- Better conditions to react to volatile energy process and unpredictable supplies
- Remove the barrier for citizens in accessing affordable, clean energy and efficient housing





Examples from Signatories

Energy efficiency in Kiev's (UKR) public buildings

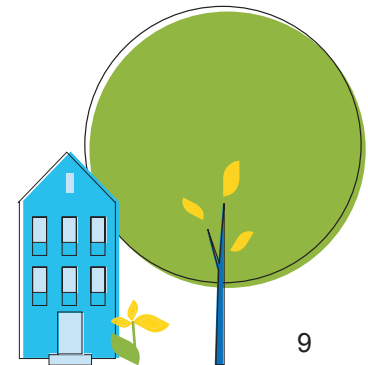
The city of Kiev looked to retrofit 1,173 of its public buildings in order to improve their energy efficiency. Although the city had implemented tariff reforms including better metering and consumption-based billing, they still wanted to improve the energy efficiency of key public buildings. Demand-side measures were complimented by supply-side investments, such as the Kiev district heating improvement project, partly funded by the World Bank. The retrofitting included the installation of modern substations connected to small district heating systems. The main results were a 17% reduction in heating consumption and a 26% decrease in heating costs. It has resulted in improvements in the performance of public buildings, the development of the energy efficiency market and an increase of public awareness on this topic.

Sofia (BG) redevelops its inefficient neighbourhoods

Sofia is refurbishing its most energy voracious districts via a programme funded by the European Regional Development Fund (ERDF). The €25 million to be invested will cover measures such as external and internal building envelopes, improved connections to district heating and include smart building management systems. The regenerations will be covered 75% from EU funds and 25% by the home owners. The city has made it possible for residents to access low-interest loans and bank guarantees to participate in the refurbishment programme.

Promoting the efficient regeneration of neighbourhoods

Municipalities all over Europe are undertaking regeneration projects. These allow an assessment to be made of the energy performance of the building stock and can have a big impact. Such initiatives usually include retrofitting of existing buildings and ensure that new properties comply with regulations. This not only has an impact on a building's performance, but also improves the quality of life of residents. By acting now, cities avoid costly retrofitting in the future, taking advantage of the opportunity to integrate the refurbished districts with other smart city systems. For example, **Albertslund** (DK) implemented a large-scale retrofitting project on its building stock from the 1960's with pre-fabricated solutions such as heat recovery ventilation or solar photovoltaic collectors. The prefabricated solutions are applicable to different types of homes. It made renovation cheaper and led to consumption savings of 23-55%. Attention should also be given to combined measures and integrated systems in regenerated neighbourhoods: solar collectors can be integrated into highly energy efficient roofs, waste management can be directly linked to the district CHP plant, and urban buildings and mobility plans can be created together.

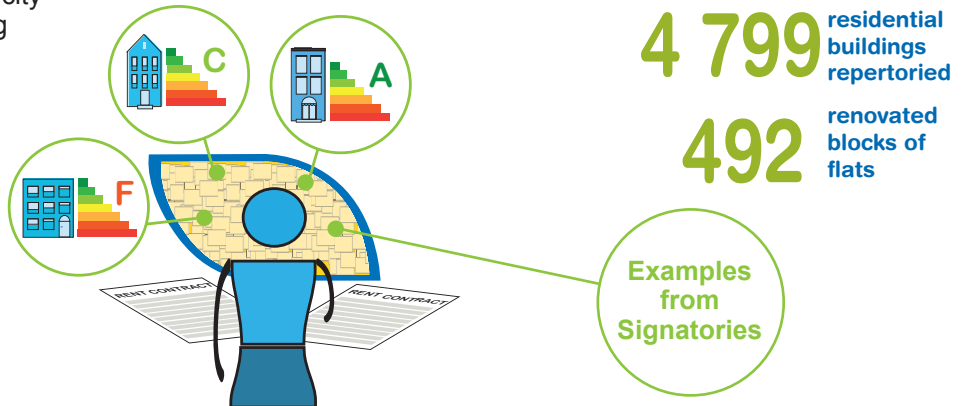


Applying smart solutions and integrating energy systems

European cities can also make an important contribution to reducing energy dependency by encouraging the use of smart systems in the refurbishment of their municipal building stock. Installing smart meters allows residents to monitor energy use and make better consumption choices. Working closely with utilities can give local authorities a better grasp of where their energy comes from and how it is used, thus giving a clear picture of where there is unexploited potential in terms of local energy production and efficiency. Moreover, substantial consumption reductions can be achieved through the integration of several city systems: development, planning, environment, energy, health and mobility. An example in this sense is Stockholm (SE), which has chosen to combine all the above-mentioned systems in its city centre redevelopment plan. While finding the funding necessary to achieve this integration is not an easy task, there are also smaller investments that can have positive effects on the efficiency of buildings and districts. Cities such as Vilnius (LT) and Riga (LV) have developed IT tools that help with urban refurbishment planning and encourage citizens to invest in energy efficiency.

Vilnius (LT) & Riga (LV): energy maps for smart residents

Beyond leading big refurbishment projects, municipalities can also encourage residents to improve their own homes. For example, Riga has made available online the annual heat consumption of over 2,500 district heated residential buildings. Similarly, Vilnius has developed an online interactive building energy consumption map, which evaluates and compares the heat consumption of buildings with regards to the previous year. The aim is to encourage residential building renovation and investment in the city, as all owners and tenants can find out how much their building costs them per year and how it compares to similar properties in their neighbourhood. So far, 492 blocks of flats have been renovated. Moreover, this on-line tool allows people looking for a new home to choose the most energy efficient option.



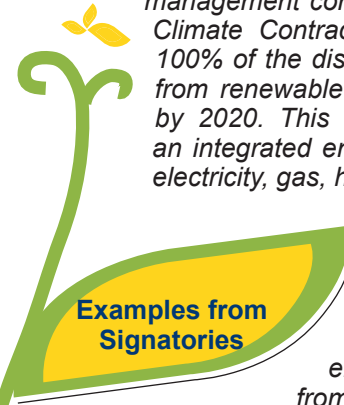
Use the business potential and ESCOs

The European building sector can make a big contribution to energy efficiency. It is estimated that reducing energy demand in the building stock by 80% by 2050 would boost economic activity in the construction sector by €830 billion per year by 2020. It could secure up to two million direct and indirect jobs in the EU. Renovating homes also increases their re-sale and rental value. In 2010, **Vienna** (AT) ensured that 20-30% of all new homes were built to passive house standards. Moreover, working with private companies, utilities and ESCOs will allow towns to leverage greater funds and give access to radically better technology. Public procurement is another tool that European cities can use in order to reduce their overall energy consumption and modify their local energy mix in favour of locally produced power. Energy and environmental considerations can be included in the contracts the municipality signs with its suppliers, as done for example in Hamburg (DE). This German Signatory has seen energy efficiency investments of €700 million from businesses that wanted to set up in the green Wilhelmsburg district.



Malmo (SE): working with private companies for the development of a climate-smart district

In order to turn its newest district -Hyllie- into the most climate-smart neighborhood in the Oresund region, the City of **Malmo** has entered into close cooperation with the local energy provider and the waste and water management company. Under the terms of the Climate Contract for Hyllie, signed in 2011, 100% of the district's energy supply will come from renewable or recovered energy sources by 2020. This goal will be reached through an integrated energy infrastructure system for electricity, gas, heating and cooling.



Buildings will, on average, consume 45 kWh/m² and make full use of the district's smart energy grid. A significant amount of the energy will be generated locally from heat pumps, wind turbines and solar panels, as well as biogas from locally produced organic waste. The integration of information technology in the district's buildings will give citizens the capacity to manage their personal energy use in an efficient and easy way. The contract is thus beneficial for the city, the cooperating businesses and local residents.



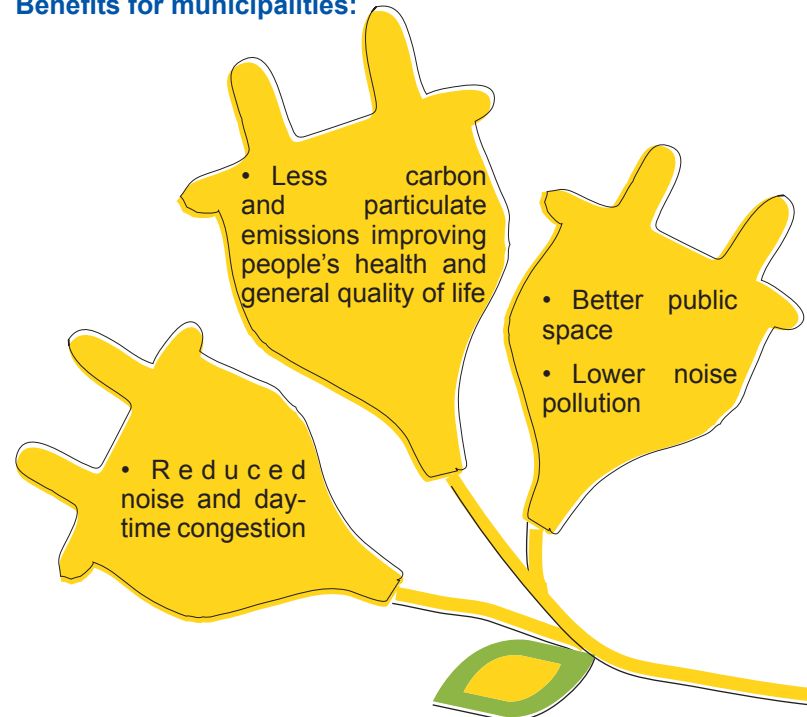
Energy efficient urban mobility

Urban mobility accounts for 40% of all CO₂ emissions from road transport. Reducing private car use and promoting the use of public transport are both essential. Considering the current instability of energy markets, it is the time to further invest in alternative fuels. However, smart mobility is not only about contributing to costly infrastructure projects; it's also about what towns and cities are doing to influence the mobility behaviour of both citizens and businesses.

Clean and energy efficient vehicles

Electric or hybrid vehicles have an important role to play in achieving the EU policy objectives of reducing energy consumption, CO₂ and pollutant emissions. Electric vehicles, for instance, produce fewer GHG and can be integrated into an intelligent power supply network. Covenant Signatories Genoa and Turin (IT) have been using electric buses for more than a decade which function well both from a technical and economic point of view. Electric cars can also help integrate more renewable sources in the power grid by acting as storage when energy production levels are high. Moreover, vehicles powered by alternative fuels can use locally produced biofuel to function. For example, the city of Oslo (NO) uses biodiesel from the local waste processing plant for its waste collection throughout the city. This change from fossil fuel to biofuel has contributed to the municipality's goal to become carbon neutral by 2050 and has earned them the Norway Research Council's Innovation Prize for 2012.

Benefits for municipalities:



Electric and bio-fuelled vehicles get a green light in Bratislava (SK)

The Slovak capital has decided to favour locally produced electricity and biofuel in its public transport system. It has invested heavily in trams and biodiesel buses, and has even conducted a feasibility study on the use of electromagnetic induction in the city. Furthermore, the municipality has connected itself to the Austrian capital by a network of charging stations which fuel the electric car and scooter sharing schemes.

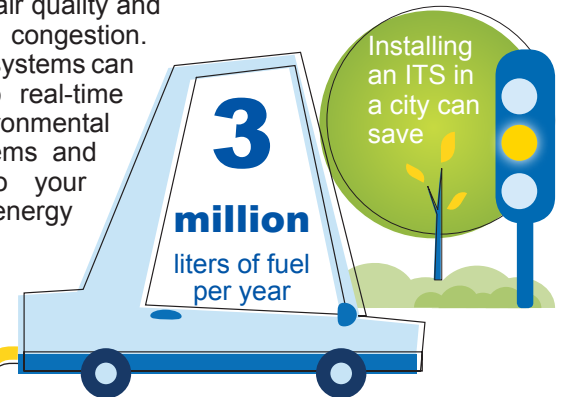
Gdynia (PL): ITS for lower energy use in the region

Gdynia cooperates with its neighboring cities of Gdansk and Sopot to increase the efficiency of public and private transport through its metropolitan congestion avoidance scheme. To avoid wasting energy in traffic, congestion-detecting cameras have been installed at key junctions in the three cities. Whenever congestion is detected, the traffic management system adapts the rhythm of green lights throughout the area to increase traffic fluidity. The system covers 140 junctions and has led to a 20% reduction in public transport energy costs and significantly lower emissions in the three municipalities involved.

Examples from Signatories

ITS for integrated services and increased efficiency

Intelligent transport systems (ITS) allow cities to integrate local services to achieve greater efficiencies. Thus, congestion monitoring, traffic management and route guidance systems can be linked up with the local smart grid in order to charge electric batteries when there is a peak in renewables production. This can be combined with the public lighting system for energy efficient routing and information communicated to businesses to diminish fuel consumption for deliveries. The city of Aalborg (DK) has partly implemented such an integrated system, which resulted in travel times 9% shorter and less fuel being used due to more fluid traffic conditions. Similarly, the city of Utrecht (NL) used ITS to reduce emissions and energy use in urban freight, with good results both in terms of air quality and decreases in congestion. Smart transport systems can also connect to real-time energy and environmental monitoring systems and adapt traffic to your city's CO₂ and energy use targets.

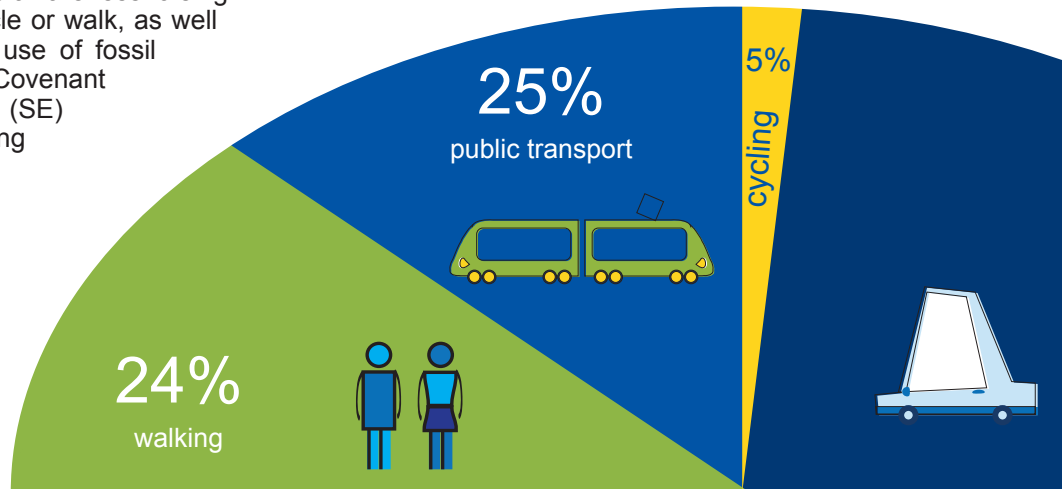


Transition to less motorised transport and more emphasis on active travel modes

In municipalities, many short trips are made by car, which contributes to carbon emissions and the dependence on fossil fuels. For this reason, encouraging residents to move around on foot or by bicycle will contribute to lowering pollution, with the added value of improving people's health and safety. By illustration, in the United Kingdom, 50% of car journeys are less than 5 km. Many of these short journeys could be undertaken using public transport or carbon-neutral alternatives. Local authorities can implement many soft measures such as awareness raising campaigns to encourage people to cycle or walk, as well as hard measures to discourage the use of fossil fuels in urban areas. For example, Covenant Signatories London (UK), Stockholm (SE) and **Milan** (IT) have used a pricing measure or 'congestion charge' which decreases the number of cars driving to the urban centres. Alternative-fuelled cars and public transport are usually exempted from such charges. These measures reduce congestion and carbon emissions, and at the same time boost the number of electric vehicles, public transport users, cyclists and pedestrians in cities.

Ostrava (CZ): a new mobility plan for cleaner public transport

The Czech municipality of Ostrava is currently developing a new mobility plan which will shift the focus from privately-owned fossil-fuel cars to green-powered public transport. This ERDF funded plan aims to reduce emissions, improve the energy mix and increase the efficiency of local mobility through the use of low-consumption vehicles and by encouraging public and climate-neutral transport.



Cooperating with businesses and public transport operators to increase urban mobility efficiencies

The municipal energy mix is heavily influenced by the choices made not only by the local authority, but also by transport operators and businesses. In order to boost the use of locally-produced renewables and decrease the overall energy consumption, some urban centres, such as Utrecht (NL), have brought together all these actors and developed smart logistical centres. City services as varied as post, freight and catering can be bundled up in urban distribution centres and efficiently dispatched via electric or green public transport. While the establishment of such a

centre requires the involvement of a broad range of stakeholders, the benefits are immediate for all parties: fuel consumption and emissions drop significantly, the modal mix changes in favour of more sustainable transport means, resulting in economic benefits and healthier residents.

45%
car

The modal split in
European cities



Last mile bike deliveries in Donostia San Sebastian (ES) improve local fuel efficiencies

The Spanish municipality decided to put together a plan to cut local congestion, improve air quality and decrease the number of fossil fuel vehicles by concentrating on freight deliveries. It brought together the chamber of commerce, retailers' associations, resident stakeholder groups, representatives of the transport industry, local police, and others involved in dispatching goods at a city level. After consultations, it was decided to invest in a smart freight centre that would consolidate shipments and would use clean vehicles for last mile deliveries. The night time delivery protocol set in place is integrated in the local ITS and communicates with other public services such as the police and the urban planning department for automatic updates of routes. This initiative now saves almost 27,000km per year and reduces overall energy consumption in the freight sector by 23%.



Lower energy dependence through public lighting

Public lighting accounts for 50% of the electrical consumption in cities and 60% of the energy bill of most European municipalities. Considering the higher and higher costs of electricity, as well as the electrical supply uncertainties in some EU countries, lighting should be taken into account when attempting to reduce local energy dependence.

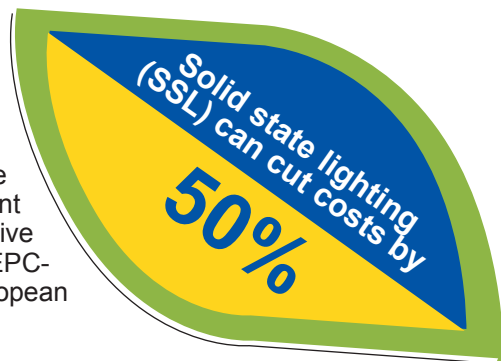
Replacing old lighting technology with efficient alternatives

There are more than 90 million streetlights in Europe, 75% of which are over 25 years old. This frequently generates an energy consumption of 10-25 GWh/year in medium-sized European towns, at least 30% of which could be saved through the introduction of new lighting technologies. Overall, the EU has the potential to save €3 billion per annum by upgrading its public lighting network; further cost and emission reductions could be achieved by linking the new LED or OLED luminaires to smart and integrated control systems. Through the latter, cities can adapt the intensity of public lighting to diminish consumption and can even control the origin of the electricity, in favour of local green power. While the cost of full refurbishment can be significant, alternative financing models -PPP and EPC- are frequently used by European municipalities.



Benefits for municipalities:

- Reduced energy costs for the municipality and its residents
- Safer public space
- Significantly lower emissions



Tallinn (EE): more light with less energy

The Estonian capital has seen its number of light points rise significantly over the past decade. However, the 30% growth that is still expected by 2020 will not entail any increases in energy consumption due to the city's use of solid state lighting and intelligent power controls. Due to these investments, the city hopes to decrease its total electricity bills by approximately 5% per year, despite constant additions to the number of luminaire in use. Estimates show that around 18 GWh could be saved every year through LED and smart control technologies.



PPPs lower the environmental impact of Berlin's (DE) public lighting system

The city of Berlin has been working with public-private partnerships and energy performance contracts for over a decade in order to reduce the environmental impact of its public services, while at the same time cutting costs for the municipality. One example is the refurbishment of its public lighting system at Tegel prison in cooperation with private investors who guaranteed over 30% energy cost savings and an annual CO₂ emissions decrease of 4,700 tonnes.

Alternative financing models for public lighting

While complete refurbishments of urban street lighting remain costly, alternative financing models have been widely employed in Europe. In cooperation with ESCOs, cities such as Birmingham and Nice have replaced large segments of their public lighting system with more efficient options. Public procurement is another leverage for radical improvements in lighting at lower costs, either by aggregating demand (as done in Gent, Antwerp and Mechelen in Belgium, who purchase LEDs together) or by challenging suppliers to ground-breaking innovation through pre-commercial procurement (as exemplified by Eindhoven in the Netherlands). Moreover, some cities cooperate with businesses, offering sections of their streets to enterprises willing to install their most innovative and energy efficient public lighting solutions. An example in this sense is Copenhagen (DK), whose business park is efficiently illuminated by demonstration systems from multiple public lighting suppliers.

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