Submission by Belgium and the European Commission on behalf of the European Union and its Member States

Brussels, 15/04/2024

Subject:

Input to the MWP first global dialogue in 2024: Views on opportunities, best practices, actionable solutions, challenges and barriers relevant to the enhancement of mitigation ambition and implementation in Cities - buildings and urban systems

Summary of Key points:

The EU welcomes the selection of "Cities: buildings and urban systems" as the MWP topic for 2024. Addressing emissions from buildings and urban systems is highly relevant to the global efforts needed to keep the 1.5˚C goal within reach in this critical decade. According to the IPCC, urban emissions represented in 2020 more than half of total global GHG emissions, while the building sector accounted for 21% of global GHG emissions in 2019.

Generation of electricity and heat accounts for the majority of GHG emissions from buildings, while transport is among the biggest contributor to GHG emissions from cities. This underlines the centrality of the energy transition, which remains the sector with the highest GHG emissions and the sector with the greatest emission reduction potential in this critical decade. The MWP topic of this year thus relates strongly to the discussions under the MWP global dialogues on just energy transition last year.

In this regard, the MWP should respond to the invitation from the GST Outcome (1/CMA.5, §186) to integrate the relevant elements of the GST into the work of the MWP.

As outlined in this submission, the EU proposes the following sub-topics to be discussed at the 1st global dialogue in 2024:

1. Energy efficiency in buildings and building codes,
2. Renewable energy integration in cities,
3. Phasing out fossil fuel energy production and consumption in city energy systems: cooling, heating, cooking and electricity generation,
4. Urban planning and design: improving circularity and transport.

For each of these sub-topics, the submission provides further elements to be addressed during the GD and suggestions are made for how to address the topics during the IFE. The submission also contains examples of EU and Member State experiences with reducing GHG emissions from urban systems and buildings.

Furthermore, suggestions are made regarding the logistical arrangements of the first GD and IFE in 2024.

Introduction

The EU welcomes the selection of "Cities: buildings and urban systems" as the topic to be discussed under the global dialogues of the Sharm el-Sheikh mitigation ambition and implementation work programme (MWP) in 2024, and the opportunity to share our views on related opportunities, best practices, actionable solutions, challenges and barriers.

Addressing emissions from buildings and urban systems is highly relevant to the global efforts needed to keep the goal of limiting global temperature rise to 1.5°C within reach in this critical decade. According to the IPCC[1] urban CO2 and CH4 emissions in 2020 were estimated to be 29 GtCO2-eq, more than half of total global GHG emissions, while greenhouse gas emissions from the building sector were 12 GtCO2-eq in 2019, equivalent to 21% of global GHG emissions.

The IPCC furthermore concludes that urbanisation with the growing concentration of people and activities is an opportunity to increase resource efficiency and decarbonise at scale. With ambitious and immediate mitigation efforts to limit global warming to 1.5°C, including high levels of electrification, energy and material efficiency, renewable energy preferences, and socio-behavioural responses, urban GHG emissions could approach net-zero and reach a maximum of 3 GtCO2-eq in 2050.

This will require urgent action in this decade. The EU has set a joint target of reaching emission reductions of at least 60% in the building sector by 2030 compared to 2015 and achieving climate neutrality by 2050. The EU advanced its emissions trading system (ETS2) to the buildings and road transport sector and fuel combustion in industry not covered by the existing EU ETS, which will start in 2027. Part of the revenues from the auctioning will be used to support vulnerable households and micro-enterprises through a dedicated Social Climate Fund, the remaining revenues are to be used by EU Member States for climate action and social measures. The Revised Energy Performance of Buildings Directive, which among other things includes an enhanced standard for new buildings, including more ambitious regulation for buildings to be zero-emission, including (amongst other measures) a gradual phase-out of stand-alone boilers powered by fossil fuels, starting with the end of subsidies to such boilers from 1 January 2025, and ensuring new buildings are solar-ready (fit to host solar installations) where technically and economically feasible.

A gender-responsive approach to urban planning and design is essential to the future of our cities, creating places where everyone can live, work and thrive. Designing urban areas that are responsive to the needs of all men and women, girls and boys - and striving for gender balance in urban governance, planning, and design - is key to making cities more sustainable and resilient - safer, healthier, fairer - and for reaching our climate goals.

A large part of the emissions from urban systems and buildings originate from energy use, which is reflected in the three broad mitigation strategies effective in reducing emissions from cities identified by the IPCC: (i) reducing or changing urban energy and material use towards more sustainable production and consumption across all sectors, including through compact and efficient urban forms and supporting infrastructure; (ii) electrification

[1] Sixth Assessment Report, Climate Change 2022: Mitigation of Climate Change, the Working Group III contribution

and switching to low-carbon energy sources; and (iii) enhancing carbon uptake and storage in the urban environment.

The MWP topic of this year thus relates strongly to the discussions under the MWP global dialogues on just energy transition last year. Generation of electricity and heat accounts for 57% of emissions from buildings[2], while transport is among the biggest contributor to emissions from cities. This underlines the centrality of electrification in the energy transition, aiming for net zero electric power, with the energy sector remaining the sector with the highest greenhouse gas emissions and the sector with the greatest emission reduction potential in this critical decade.

Therefore, we deem it important to ensure strong continuity from the first year of the MWP and the breath of solutions identified during last year's dialogues, IFEs and reports, e.g. on the expansion of renewable energy to cover the energy needs of cities, promoting energy efficiency in buildings, and developing zero-emission urban transport systems. This has informed the EU's suggestion for subtopics to be explored during the first MWP global dialogue this year (energy efficiency in buildings and building codes, renewable energy integration in cities, phasing out fossil fuels in city energy systems and urban planning and design: improving circularity and transport), which we will elaborate on below.

While we support the mandate of the MWP to cover all the IPCC sectors as per decision 4/CMA.4, **it is vital that interlinkages between the sectors are explored, allowing for the discussions under the work programme to build on one another**. We would thus encourage that the upcoming global dialogues provide a platform for Parties to reflect on how they have used the results from last year's dialogues to advance national mitigation efforts, including a focused exchange about lessons learned and challenges faced in doing so.

Likewise, **we aim for the Dialogues to be a platform to enhance the energy transition, thus the MWP should respond to the invitation from the Global Stocktake decision (1/CMA.5, §186) to integrate the relevant outcomes of the GST into the future work of the programme**. Many Parties and NPS also requested the MWP to address the follow-up to the GST in their submissions about the MWP's topics for this year. The agendas for the global dialogues should thus allow for dedicated discussions on how Parties and non-Party stakeholders are responding to efforts set out in the mitigation section of the GST decision, particularly paragraph 28, including avenues for collaboration in achieving the global efforts that we jointly decided on just a few months ago. This could also allow for early discussion on what barriers and challenges Parties are facing in contributing to each of the global efforts set out in paragraph 28, and the types of cooperation needed to overcome these.

[2] Sixth Assessment Report, Climate Change 2022: Mitigation of Climate Change, the Working Group III contribution

Suggested sub-topics for the 1st global dialogue of 2024

The EU is of the view that the provision of sub-topics for the first global dialogue of 2024 is essential to enable focused and guided discussions on the opportunities, best practices, actionable solutions, challenges and barriers linked to the selected focus topic of 2024. Reflecting on the global dialogues of 2023, both the submissions and the dialogues themselves benefitted from a structured approach. Therefore, **this submission is structured along four sub-topics, covering the main mitigation levers for cities, buildings, and urban systems**:

1. Energy efficiency in buildings and building codes,
2. Renewable energy integration in cities,
3. Phasing out fossil fuel energy production and consumption in city energy systems: cooling, heating, cooking and electricity generation,
4. Urban planning and design: improving circularity and transport.

These subtopics can generate the highest mitigation impact in this critical decade according to the best available science as provided by the IPCC and work of specialised institutions, such as IRENA, the IEA, and others. At the same time, **these sub-topics respond to the calls in the mitigation section of the GST Outcome**. Just transition and social aspects, especially how countries design domestic policies and initiatives in a way that ensures that benefits of the transition are equally spread throughout the population and that the costs are not borne by traditionally excluded or marginalised groups or individuals, should be considered under each sub-topic. Further, the critical importance of proper multilevel governance to make the best of cities' contribution, also in the context of NDCs and LT-LEDS, can be reflected. The EU trusts that the Co-Chairs will take these four sub-topics under thorough consideration in preparation of the final agenda of the first global dialogue of 2024.

1) Energy efficiency in buildings and building codes

According to the IEA, **buildings represent about 30% of global final energy consumption**. Substantially decreasing this consumption through **energy efficiency measures therefore has a strong mitigation impact and is directly linked to the so-called "energy package" of the first Global Stocktake**, which calls on Parties to double the average rate of annual energy efficiency improvements globally by 2030. Enhancing energy efficiency within the buildings sector, e.g. by retrofitting existing buildings and enforcing net-zero aligned building codes, are substantial elements of enhanced mitigation action in this critical decade, as they alone contribute 40% to the total mitigation potential for residential buildings[3]. To achieve this, annually at least 2% of the global building stock need to undergo substantial renovation [4]. In advanced economies, retrofitting rates need to increase to 2.5% in 2030, and the heating energy intensity should fall substantially to less than 50kWh/m2/year[5] On a global scale,

[3] IEA net zero report 2023, pg. 119

[4] Renovation of near 20% of existing building stock to zero-carbon-ready by 2030 is ambitious but necessary – Analysis – IEA (https://www.iea.org/reports/renovation-of-near-20-of-existing-building-stock-to-zero-carbon-ready-by-2030-is-ambitious-but-necessary)

[5] IEA net zero report 2023, pg. 119

around 80% of the current building stock will still exist in 2050[6], underlining the significance of substantial retrofitting work, ideally frontloaded to this critical decade.

The first global dialogue therefore should promote energy-efficient building designs, materials, and technologies to reduce energy consumption in both new construction and existing buildings. Strengthening regulation and policies to this end delivers several opportunities for enhanced mitigation action. The EU suggests discussing:

a) The implementation of mandatory energy efficiency standards and targets in building codes for new construction and renovations.

b) Incentives to increase the speed and depth of retrofitting of existing buildings, such as tax incentives, preferential loans, simplified administrative processes, etc.

c) Measures enhancing the dissemination of relevant information to create transparency for all stakeholders, especially tenants and owners, for instance by introducing energy performance labels and disclosure requirements for buildings.

d) The use of technology to measure and manage the real time energy performance of a building and its integration into a broader grid of smart buildings to improve demand-supply patterns,

e) Up- and reskilling campaigns that support the creation of quality jobs in energy efficient building design and retrofitting, enabling local and regional ecosystems and ensuring that demand for experts is met.

f) Awareness campaigns that enhance the ability of stakeholders to plan, implement and operate energy efficient buildings.

g) Measures enhancing energy demand flexibility, and promoting energy saving behaviour, including sufficiency, where appropriate.

h) Policies and measures for passive cooling, and low-GWP and high efficiency cooling technologies as well as energy efficiency measures for the HCFC phase-out and HFC phase-down, in line with Montreal Protocol and the Kigali Amendment.

i) Benefits of increasing energy efficiency in buildings, such as lower operating costs, increased quality of living, reduced pressure on electricity generation and distribution, as well as job and market creation.

j) Barriers to achieve higher energy efficiency in buildings, such as price distortion through fossil fuel subsidies, split agency between owners and renters, initial capital costs for and lack of incentives provided through domestic public and private finance.

2) Renewable energy integration in cities

The outcome of the GST calls on Parties to triple renewable energy capacity globally by 2030. While big greenfield developments will contribute a significant share of these capacity additions, the potential of integrating and scaling up renewable energy in cities is vast. According to the International Renewable Energy Agency (IRENA), every city has

[6] For net zero cities, we need to revisit our older buildings | World Economic Forum (https://www.weforum.org/agenda/2022/11/net-zero-cities-retrofit-older-buildings-cop27/)

massive potential to cost-efficiently boost renewable energy use at the local level.[7] This is especially true for solar generation and geothermal energy, which both offer significant untapped potential according to IRENA[8]. Additionally, increased availability and affordability of electricity storage improves the competitiveness of renewable energy integration in cities further. The IEA states that on-site and district level solar PV installations are not only an easy option to increase the renewable share in the energy mix, but also allow for local balancing of demand and supply, which decreases costs induced by congestion, distribution or fees of grid operators.[9] However, cities are currently not realising this potential. In general, a coherent approach towards renewable energy integration, starting with the introduction of renewable energy targets, is often missing, or not fully developed and implemented. According to IRENA, out of more than 6000 cities analysed globally, 95% of the cities with the highest solar potential don't set targets for renewable energy development. For cities, it makes sense to opt for decentralised solar PV systems that can be integrated in new and existing buildings, especially in densely populated urban areas where space for utility-scale plants is scarce. This is valid both for regions with large solar resources that remain largely unexploited, and for areas that have lower solar irradiance.[10] Additionally, other renewable energy sources, such as wind, hydropower, bioenergy and waste to energy, or ocean/tidal energy in case of coastal cities, should be considered in the urban context, even if the scale of their impact is lower compared to solar and geothermal energy.

Considering that the integration of renewable energy generation in cities combines high impact with shorter planning and implementation timelines underlines its role as key element to increase mitigation action in cities in this critical decade. The EU suggests discussing:

a) Approaches to define and set renewable energy targets for city-based energy generation and consumption, e.g. solar rooftop targets.

b) Incentivising the deployment of decentralised solar PV systems in cities, integrated in the existing and planned building stock.

c) Incentivising the deployment of centralised renewable electricity generation supplying urban systems with electricity.

d) Incentivising the use of renewable energy other than solar PV in cities and nearby areas.

e) Incentivising the active role of prosumers in local electricity generation and use, for instance by removing or updating regulations and upgrading auxiliary technology, such as local grids and switching to smart meters.

f) Implications of city power generation, especially decentralised generation, on the local grid and economic impact on local power suppliers and utilities.

[7] Cities and buildings (https://www.irena.org/Energy-Transition/Technology/Cities-and-buildings)
[8] Rise of renewables in cities – Energy solutions for the urban future (https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Oct/IRENA_Renewables_in_cities_2020.pdf)
[9] Solar PV and wind supply about 40% of building electricity use by 2030 – Analysis - IEA (https://www.iea.org/reports/solar-pv-and-wind-supply-about-40-of-building-electricity-use-by-2030)
[10] Rise of renewables in cities – Energy solutions for the urban future (https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Oct/IRENA_Renewables_in_cities_2020.pdf)

g) Research and development of smart, resilient infrastructure and renewable energy solutions tailored to the specific requirements and constraints of cities and urban systems.

h) Benefits such as lower cost for consumers, reduction and elimination of air pollution in cities, improved health and living quality, reduced pressure on upgrading the transmissions network, and improved energy security and energy independence, job and market creation due to deployment of renewable energy solutions.

i) Barriers such as regulatory constraints and outdated building codes, urban planning cycles and aesthetic considerations, lack of awareness about city-tailored solutions, lack of financial incentives and distortion of business cases due to fossil fuel subsidies.

3) Phasing out fossil fuel energy production and consumption in city energy systems: cooling, heating, cooking and electricity generation

The GST Outcome calls on Parties to transition away from fossil fuels and proceed towards net zero energy systems, accelerating efforts in this decade, so as to achieve net zero by 2050. Fossil fuel extraction, production and consumption are not only the single biggest driver of greenhouse gas emissions globally, but also the biggest driver of emissions in buildings, cities and urban systems. According to the IEA, the operations of buildings account for 30% of global final energy consumption and 26% of global energy-related emissions. Out of these energy-related emissions from buildings, 30%, or 3 GtCO2-eq, are direct emissions in buildings and 70%, or 6.8 GtCO2-eq, indirect emissions from the production of electricity and heat used in buildings. As the impacts of climate change lead to continuously increasing temperatures in cities, energy consumption from cooling has tripled since 1990 globally[11]

To stay in line with a 1.5C pathway as displayed in the IEA's net zero scenario, emissions from the operation of buildings need to decrease by 9% annually until 2030. However, while emissions in the building sector fell in the European Union in 2022, most other regions continue to show an increase.[12] Further, buildings and cities are strong drivers of activity in the construction sector, which is directly or indirectly responsible for almost 40% of global CO_2 emissions from fuel combustion and 25% of total global GHG emissions.[13] The construction of buildings alone created 2.5 GtCO2 in 2022.[14] These figures include the production of materials such as cement and steel.

In its AR6 WG3 report, the IPCC clearly states that urgent action is needed for urban mitigation, based on robust mitigation strategies that lead the way towards deep decarbonisation and systematic transformation in cities and urban systems. The report addresses both local urban challenges and supply chain challenges:

[11] Cooling – IEA (https://www.iea.org/energy-system/buildings/space-cooling)
[12] Buildings - Energy System – IEA (https://www.iea.org/energy-system/buildings)
[13] Net-zero building: Retrofits and new technologies | Sustainability | McKinsey & Company (https://www.mckinsey.com/capabilities/sustainability/our-insights/spotting-green-business-opportunities-in-a-surging-net-zero-world/transition-to-net-zero/buildings#:~:text=The%20net-zero%20transition%20in,and%20green%20technologies%20and%20operations.)
[14] Buildings - Energy System – IEA (https://www.iea.org/energy-system/buildings)

- With regards to local urban challenges, it explains that a core element of the required mitigation action is the practical phase out of unabated fossil fuels by replacing them with net-zero-emission resources, together with the reduction and changing of urban energy and material use, and a push towards broad electrification.
- Concerning supply chain challenges, it points out that due to its global reach, the required transformation does not stop at city borders, but also need to address emissions created outside the urban system.[15] Therefore, emissions across the fossil fuel supply chain, including from extraction, flaring, production, transport, and use, need to be addressed, especially with respect to methane emissions from the energy sector, which stayed at record levels in 2023.[16]. This includes enhanced carbon uptake and storage.

A variety of actions can enable the deep emissions cuts necessary until 2030:

- With respect to local urban challenges: In the buildings sector, a key opportunity is a faster switch from natural gas to electricity which primarily reflects advances in heat pump technology.[17] In 2022, only 10% of space heating globally was provided by heat pumps. Increasing this number, supported by incentivising policies and measures, can lead to a reduction of annual CO2 emission by 0.5 GtCO2 in 2030.[18] To cool spaces, a blend of regulations needs to foster innovation, implement strong energy-use reduction targets, and urge to transition to climate and environmentally friendly alternatives for the use of GHG with high global warming potential, i.e. HFCs. For appliances, switching to electrified appliances is a main enabler. For instance, reaching universal access to clean cooking can reduce annual emissions by 1.5 GtCO2-eq in 2030.[19]
- With respect to supply chain challenges: Phase out plans can be introduced or accelerated. In electricity generation, almost half of current methane emissions from the energy sector can be cut at no net cost, and less than 5% of the income generated by the oil and gas industry in only one year, 2023, is required to cut these emissions by 75% until 2030.[20]

To phase out fossil fuels in energy production and consumption in city energy systems, the EU suggests discussing:

a) The electrification of buildings and appliances and the necessary upgrades of infrastructure such as grids and transmission lines,

b) Incentivising an increased pace in switching fossil fuel-based heating to heat pumps, for instance through mandatory replacement dates and phase out dates for fossil fuel-based heating devices, tax incentives, and replacement bonuses,

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[15] IPCC_AR6_WGIII_Chapter08

[16] Key findings – Global Methane Tracker 2024 – Analysis - IEA (https://www.iea.org/reports/global-methane-tracker-2024/key-findings)

[17] Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach – Analysis - IEA (https://www.iea.org/reports/net-zero-roadmap-a-global-pathway-to-keep-the-15-0c-goal-in-reach)

[18] The Future of Heat Pumps – Analysis – IEA (https://www.iea.org/reports/the-future-of-heat-pumps)

[19] Executive summary – A Vision for Clean Cooking Access for All – Analysis – IEA (https://www.iea.org/reports/a-vision-for-clean-cooking-access-for-all/executive-summary)

[20] Key findings – Global Methane Tracker 2024 – Analysis - IEA (https://www.iea.org/reports/global-methane-tracker-2024/key-findings)

c) Increasing the end-user and consumer awareness of the opportunities to phase-out the use of fossil fuels, and countering misinformation about net-zero technologies, such as heat pumps,

d) Policies and measures to create an innovation ecosystem supporting the transition in cooking, heating and cooling,

e) The risk of lock-in effect from new carbon-intensive cooking, heating and cooling systems, and the opportunities for the development of zero or low-emission energy sources for building services (i.e. heating, cooling, ventilation, lighting, cooking, etc.), such as passive cooling,

f) Actions along the whole fossil fuel value chain to practically phase-out fossil fuels in buildings, cities and urban systems, including:

   a. Urge the oil and gas industry to assume the role of being a driving force of the just energy transition, and to respond to the IEA's call to invest at least 50% of total capital expenditure in clean energy in 2030, compared to around 2.5% in 2022 as analysed by the IEA.

   b. Cutting methane emissions from fossil fuel operations by at least 75% globally in 2030 compared to 2020 levels to stay on track of a 1.5˚C pathway, as indicated by the IEA,

   c. Methodologies for and implementation of targets for the phase out of fossil fuel energy production and consumption in cities and urban systems,

g) Benefits such as lower cost for consumers, reduction of air pollution in cities, improved health and living quality, improved energy security and energy independence, job and market creation resulting from the phase out of fossil fuels.

h) Barriers to the phase out of fossil fuels in city energy systems, such as market distortion due to fossil fuel subsidies, lack of incentives to replace fossil fuel technology, lack of availability of technology and trained experts due to demand – supply mismatch.

4) Urban planning and design: improving circularity and transport

The GST Outcome calls on Parties to accelerate the reduction of emissions from road transport, including through the deployment of zero- and low-emission vehicles, and recognises the important role and need for active engagement of cities to make collective progress to achieving the temperature goal of the Paris Agreement.

Cities and urban areas are thriving ecosystems and are expected to grow further in size and number of inhabitants over the next decades. A systematic view on expanding and building cities through urban planning and design is crucial to ensure that cities are aligned with limiting global warming to 1.5 °C. Urban green spaces also play a big role in ensuring long-term sustainable and healthy urban systems. Parks, forests and street vegetation all contribute to reducing urban heat- effects and creating environments that encourage people to travel by bike or foot, which all have a positive effect on reducing emissions.

Careful planning is especially important with respect to transport in urban areas and the management of waste and circularity, which both represent complex systems and, once implemented, require significant effort to modify. As discussed in last year's second global dialogue, 15% (8.7 GtCO2-eq) of global GHG emissions in 2019 originated in the transport

sector, with the biggest share of transport related emissions is generated by road transport vehicles (70%). Transport in urban areas is responsible for around 8% of global GHG emissions.[21] The IEA states that transport emissions need to decrease by around 25% in 2030 compared to 2020 levels to stay aligned with 1.5°C pathways – and cities can deliver a significant part of this reduction through shifts in the modal split within urban areas. Shifting away from fossil-based transport is not only imperative to deliver on our global collective ambition under the Paris Agreement, but also brings significant socioeconomic benefits.

Emissions from improper management of waste are mainly created at landfills (resulting in 5% of global GHG emissions), within industrial processes such as wastewater treatment and incineration (3.7% of global emissions), and biomass burning in agriculture, forestry and land use (0.5% of global emissions).[22] According to C40, waste disposal is responsible for 3-5% of the overall direct GHG emissions in cities, with 97% of those being methane emissions. When approached holistically, waste and sustainable materials management can help cities reduce 15-20% of their emissions through reduction, avoidance, recycling, treatment and offsetting.[23]

Considering the role of urban planning, transport, waste management and circularity, the EU suggests discussing:

a) Implementing the Avoid-Shift-Improve (ASI) framework in cities to drastically reduce GHG emissions emitted through transport in urban areas.

b) The role of urban planning and design in creating and integrating a wide public transport system, safe walking and biking infrastructure and urban green areas, that also contribute to carbon uptake, adaptation and reduce cooling energy needs (including actions to reduce urban heat islands through de-paving, increasing urban green spaces and forestation).

c) A commitment to improve public transport availability and infrastructure, the walk- and bike-ability of routes and accelerate the electrification of road transport, including the provision of sufficient charging infrastructure for electric vehicles, in line with 1.5˚C pathway.

d) The role of urban planning, and concepts such as 15-minutes cities, to promote dense, socially and functionally mixed-used spaces, inclusive and qualitative well-integrated neighbourhoods, notably to improve sustainable mobility. This urban planning also needs to take into account the spatial constraints in for example coastal cities.

e) The electrification of all transport modes in urban areas, including related infrastructures..

f) Promotion and co-finance of urban mobility choices by local or national governments as an alternative to the use of private cars, encouraging forms of mobility with low environmental impact and vehicle sharing, as well as promoting a change in citizens' habits and behaviours.

[21] Environmental and welfare gains via urban transport policy portfolios across 120 cities | Nature Sustainability (https://www.nature.com/articles/s41893-023-01138-0)

[22] Lamb et al., 2021; Liu et al., 2021

[23] Waste Management - C40 Cities (https://www.c40.org/what-we-do/scaling-up-climate-action/waste-management/)

g) Incentives to improve waste management and circularity, for instance by providing a recycling ecosystem, creating public awareness, and improving waste infrastructure, including by:

   i. Creating circular economy hubs within the city that serve as centres for the repair, refurbishment, and resale of used goods;

   ii. Implementing city-wide composting programs that encourage residents and businesses to separate organic waste and thereby reduce methane emissions;

   iii. Promoting zero-waste policies that encourage the reduction, reuse, and recycling of materials throughout the city;

   iv. Developing energy-from-waste facilities that convert non-recyclable waste into energy – aiming to divert waste from landfills and replace fossil fuels for energy generation.

h) Measures on demand side that can be undertaken by local actors to reduce emissions from urban transport: working hours flexibility, remote working, collective routes for schools or companies.

i) Benefits such as drastically reduced air pollution in cities, healthier lifestyles and improved public health, increased quality of living in cities, time savings, reduced costs for customers, improved safety for city inhabitants, improved resource management and reduced pressure on resource extraction, reduce and incorporate adaptation needs, job and market creation generated by sustainable urban planning and design.

j) Barriers such as lack of necessary infrastructure, lack of public awareness, lack of incentives.

Suggested topics for the 1st Investment Focused Event 2024

The necessary mitigation action in buildings, cities, and urban systems in this critical decade, in line with limiting global warming to 1.5 degrees, is significant. It therefore needs the full support of the investment community, given that for instance global investments in energy efficiency in the building sector in 2022 totalled at slightly below USD 250 billion, while investments of almost USD 600 billion annually will be required in 2026 to 2030 to be aligned with the IEA Net zero Scenario.[24]

Given the magnitude of this investment challenge, it is critical for city governments to develop forward-looking climate finance strategies and acquire the required capabilities to implement them. The majority of cities remain underprepared, lack essential knowledge and are struggling to mobilise funds to deal with climate action. Many cities have not yet estimated the total investment needed to become climate neutral and have little experience with financing specific climate projects, are insufficiently prepared to access capital markets, have limited engagement in co-financing with the private sector, and are not proactively developing an investor-ready pipeline of projects contributing to climate neutrality.

[24] Buildings - Energy System – IEA (https://www.iea.org/energy-system/buildings)

Despite these limitations, many cities are demonstrating creativity and ambition through financial innovation in their search for solutions to the challenge of limited public funding and low involvement of private resources. They are exploring innovative financing mechanisms such as green bonds, energy performance contracting and crowdfunding schemes to complement conventional instruments such as public investment.

At the Investment Focused Event, topics discussed should have structural and significant impact on mitigation action, inspire and incentivise the creation and use of innovative financial instruments, and be based on the existing experience of international financial institutions, private sector partners and other relevant stakeholder. The IFE should bring together a broad group of stakeholders and aim at increasing the participation of multilateral development banks and other international, regional and bilateral financial institutions, credit rating agencies, philanthropist climate organisations, public and private sector finance institutions (such as central banks and commercial banks), and other non-Party stakeholders such as civil society representatives. The EU suggests discussing:

a) The role of private financial institutions to incentivise mitigation action in buildings, cities, and urban systems, for instance by creating new financial products and instruments, as well as by introducing portfolio strategies aligned with limiting global warming to 1.5 degrees.

b) Experiences and best practices of financial tools such as guarantees and insurance products to mitigate the risks associated with investing in renewable energy projects in buildings.

c) The negative impact of fossil fuel subsidies on mitigation action in the building sector, for instance through market distortion, and strategies to re-channel funding for fossil fuel subsidies to investments that frontload mitigation action to this critical decade.

d) The role of green public procurement and the retrofitting and energy efficient construction of buildings in public ownership.

e) The enabling impact on industry and investment of local and regional long-term mitigation strategies and targets for cities and urban systems.

f) The positive effect of public policies and regulation for mitigation action in buildings, cities and urban systems, such as tax policies, financial incentives, and public-private partnerships.

g) Country-level laws, regulations, and institutions enabling or constraining the powers, authority, and resources available to cities to undertake climate-smart investment and service delivery, including fiscal transfers from national governments

Logistical arrangements of the first global dialogue and IFE 2024

The EU would like to reiterate that it sees the MWP as a valuable platform to provide policy guidance and inspiration to Parties and non-Party stakeholders regarding design and implementation of national, regional and international policies, measures and actions, yet considers operational improvements need to be made for the MWP to be able to achieve tangible results, which the MWP has not delivered so far.

With respect to achieving substantial improvements and tangible results, the EU strongly encourages the Co-Chairs to consider the following already for the first global dialogue and IFE in 2024:

a) Prepare, with the support of the Secretariat, a scoping/technical note prior to the dialogue to focus the discussions in the meetings;

b) Organize scene-setting presentations of relevant international organisations such as IPCC, IPBES, IEA, IRENA and relevant international finance institutions, also as a way to include more participation by non-Party stakeholder and experts. The EU is providing suggestions for institutions and experts below and stands ready to facilitate the outreach;

c) Increase the participation of non-Party stakeholders and encourage the high-level champions to support the effective participation of such stakeholders, and create synergies between the MWP and the GCAA;

d) Make use of ongoing mitigation initiatives as input to the MWP, for example regarding lessons learned, and to increase international cooperation and follow-up of such initiatives;

e) Make sure the dialogue considers social aspects and dimensions, including promoting gender equality and human rights as they are key enablers of climate action;

f) Organise the discussions in a way that truly aims at signalling to stakeholders inside and outside of the MWP that this is the critical decade for mitigation action, that any further delay will result in lost opportunities and hardly manageable consequences, and that ambitious action brings various societal and economic benefits outweighing the costs and challenges of the transition. In this regard, the EU suggests to follow a logical sequence during the dialogue, in which participants first consider a vision of what we aim to achieve laid out by expert presentations and inputs, world cafe type discussions and other interactions, and then, in a breakout setting, to consider the opportunities and actionable solutions that exist at large and affordable scale together with remaining barriers and challenges which impede the vision, allowing for a clear action-barrier-solution link in the discussions. This would reduce the number of breakout sessions, and allow for longer individual breakouts per sub-topic;

g) Ensure space to discuss regional challenges and solutions at the IFE;

h) Further improve the ability to deliver of the investment-focused events, for instance by increasing the participation of bilateral and multilateral development finance institutions, credit rating agencies, philanthropist climate organisations, and public and private sector finance institutions (such as central banks and (regional) commercial banks);

i) Include recommendations from the discussions at the Investment Focused Events in the reports from each MWP session as well as the annual report, and ensure that the reports reflect factual conclusions and concrete recommendations in line with 1.5 pathways according to the best available science to inform political decision-making and actors/investors in the relevant sectors, including key messages presented in the scene-setting presentations.

As laid out in bullet b), the EU suggest considering following institutions additional to the ones outlined above for expert input to the first global dialogue and investment focussed event 2024:

- Global Covenant of Mayors for Climate & Energy: Since 2015, over 13,000 cities have joined the Global Covenant of Mayors for Climate & Energy, together representing a mitigation potential equivalent to 5.6 GtCO2-eq (-76%) annually in 2050 compared to a business-as-usual trajectory (https://www.globalcovenantofmayors.org/);
- Solar Power Europe: To present their report "Solar Cities and Solar Regions 21 solar solutions for the city energy transition" (https://api.solarpowereurope.org/uploads/1423_SPE_Energy_Cities_report_03_6c81e208b0.pdf?updated_at=2023-06-14T10:36:50.951Z);
- World Green Building Council: To present their report: "From Thousands to Billions: Coordinated Action towards 100% Net Zero Carbon Buildings By 2050" (https://worldgbc.org/wp-content/uploads/2022/03/From-Thousands-To-Billions-WorldGBC-report_FINAL-issue-310517.compressed.pdf);
- C40 Cities Climate Leadership Group: To present their work on mitigation action in cities (https://www.c40.org/);
- Global Alliance for Buildings and Construction (Global ABC): to present their report "Global Status Report for Buildings and Construction" (https://www.unep.org/resources/report/global-status-report-buildings-and-construction)
- Cities Climate Finance Leadership Alliance: to present their work to close the investment gap for urban climate projects (https://citiesclimatefinance.org/).
- City Climate Finance Gap Fund : to present their approach to providing technical assistance and capacity building to support climate-smart planning and investment in cities in developing and emerging countries (https://www.citygapfund.org)

The EU trusts that the Co-Chairs will reflect on the logistics of the global dialogues in 2023 and use this experience to ensure that the global dialogues in 2024 can contribute to deliver significant mitigation action, significantly to closing both the ambition and implementation gap in this critical decade. Amongst the elements that can contribute to this effort, the EU encourages the Co-Chairs to take the necessary steps to facilitate the following:

- The report from the first global dialogue, as well as the annual report summarising the global dialogues of 2024, shall provide a science-based list of concrete actions that provide guidance to parties and non-party stakeholders.
- The reports should further be used as base for a substantive decision on the Mitigation Work Programme at COP29.
- The global dialogues shall provide space to follow up on discussions in previous dialogues and ensure that efforts made towards enhancing ambition and implementation of mitigation action since then are captured.
- The first global dialogue shall provide dedicated space to discuss the follow up of the relevant GST outcome, and set the stage to continue this discussion during the SB60.

ANNEX – EXAMPLES AT EU AND MEMBER STATES LEVEL

1) Energy efficiency in buildings and building codes

- The EU's Energy Performance of Buildings Directive aims to reduce GHG emissions from buildings with 60% by 2030 and make the EU's entire building stock climate neutral by 2050. Buildings are the single largest energy consumer in Europe. The building sector is therefore crucial to achieving the EU's energy and climate goals. Under the Directive, all new buildings will have to be zero-emission as of 2030, while new buildings occupied or owned by public authorities have to comply with this requirement as of 2028. With regards to the existing building stock, the directive will increase the rate of renovation, particularly for the worst-performing buildings in each country. EU Member States are expected to decide on the renovation measures best-suited to their specific national context and capture those in long-term Building Renovation Plans. The Directive provides for better energy system integration in buildings for heating, cooling, ventilation, charging of electric vehicles and renewable energy production. EU countries must also put in place schemes for the inspection of heating and air-conditioning systems, or take measures that have an equivalent impact on energy savings.

  More targeted financing to investments in the building sector is foreseen, complementing other EU instruments and fighting energy poverty by supporting vulnerable consumers. EU countries will also have to ensure that there are safeguards for tenants, such as through rent support or caps on rent increases. To further facilitate the renovation of the EU's building stock, one-stop-shops are foreseen for the energy renovations of buildings for home-owners, small and medium-sized enterprises and other stakeholders.

  For example, the Nordic region has long been a pioneer for life-cycle-oriented building assessments. A legal framework for disclosing life-cycle GHG emissions, with or without limit values, is planned to be introduced in all Nordic countries by the beginning of 2025. This means that all Nordic countries will probably have had at least two years of experience with mandatory national life-cycle regulation before the expected implementation of the revised Energy Performance of Building Directive (EPBD) with mandatory assessments for buildings greater than 1000 m2 in 2028, and all buildings in 2030. By 2027, EU member states must publish a roadmap for progressive carbon limit values for new buildings towards the EU climate neutrality goal in 2050. By 2030, binding carbon limits have to be introduced. With Denmark issuing the earliest limit values in 2023, and Sweden and Finland with plans to follow in 2025, all Nordic countries are preparing themselves to take the next step in order to exploit the climate protection potential of the building sector and initiate innovations.

  Also France has developed several policies to mitigate GHG emissions from buildings:

  - Building retrofits: MaPrimRénov is a subsidy for households, homeowners or landlords. It is modulated according to household income, with priority given to the lowest income households. In 2022, MaPrimRénov covered almost 700,000 homes, totalling more than 3.1 billion in subsidies, making it France's largest public expenditure on energy renovation;
  - New buildings: Since 2022, the RE2020 imposes a technical regulation on new buildings, increased energy efficiency, and mandatory thresholds for GHG

emissions linked to energy consumption and construction, using a dynamic lifecycle analysis approach. The gradual tightening of the thresholds – reduction of 30% of GHG emissions by 2031 – is set to encourage the use of fossil fuel-free heating systems and low-carbon materials, and help structuring the transformation of the sector;

- Commercial buildings: the Tertiary sector decree has required a reduction in the final energy consumption of all non-residential buildings over 1000m^2. The targets are a 40% reduction by 2030, a 50% reduction by 2040 and a 60% reduction by 2050.

France is also taking an active role in international collaboration for a globally decarbonized building sector, for instance through: the Buildings Breakthrough (launched at COP28) focusing on implementing collective actions to make near-zero emissions buildings the new norm by 2030, the first World Building and Climate Forum in March 2024 and its Chaillot Declaration.

- Energy Performance Certificates (EPCs) are an important instrument in the EU that help improve the energy performance of buildings, with a central role in the Energy Performance of Buildings Directive. EPCs provide information to consumers on buildings they plan to purchase or rent. They include an energy performance rating and recommendations for cost-effective improvements. According to EU rules, EPCs must be included in all advertisements in commercial media when a building is put up for sale or rent. They must also be shown to prospective tenants or buyers when a building is being constructed, sold, or rented. EPCs should also disclose cost-effective ways and, where appropriate, available financial instruments to improve the energy performance of the building. Moreover, in public buildings or buildings frequently visited by the public the EPC must be displayed. EPC are to be provided by qualified independent experts and are subject to an independent control system.

  For example, in Belgium the region of Flanders has decided that by 2050 all dwellings need to have an A(+) rating, corresponding to a maximum of 100 kWh/m^2 per year. In 2023, 7,8% of dwellings in the region had such a rating, leaving 92% of the dwelling stock to be renovated in the next 27 years. To achieve this objective, the region actively uses the EPC as a tool to inform and advice households about the cost of and how to enhance the energy performance of their dwellings, in addition subsidies and loans are foreseen for renovation measures which improve the energy performance of dwellings. At the same time, the region uses EPCs to impose renovations as households have the legal obligation to improve the EPC-label within five years after purchasing a dwelling. Similar rules apply to non-residential buildings.

  In the Netherlands, the Environmental Performance of a Building assessment tool (Milieu Prestatie Gebouwen, MPG): minimum performance requirements on construction safety, fire-safety, health, usability, energy and environment. A proscribed assessment method introduced in 2013. In January 2018 a limit value was added for all new homes and offices. The MPG calculates the sum of the shadow costs of all materials used in a building. The calculation rules are defined in the European standard EN 15978. If the sum exceeds a threshold, you will not get a building permit. Stricter requirements since July 2021, further tightening foreseen per January 2025. In this way we do not impose regulation on specific materials or specific applications of materials: the market participants can choose how to meet the requirement AND are stimulated to keep on innovating to be able to meet the increasingly stricter requirement.

Introduction of the 'Standard for home insulation' (2021): indicates when a home is well insulated and how much energy is still needed for heating and cooling. A future-proof level: no additional renovation needed before 2050 if the home is connected to sustainable sources with a lower temperature heat (delivery temp. 50C). Provides an action perspective for building owners in a situation where the availability and costs of the sustainable heating alternative are not yet known. No obligation for building owners to renovate to the level of the standard. Supported by an online tool where building owners can get tailor made, building specific advice on building renovation measures (Alles over je huis verduurzamen | Verbeterjehuis).

2) Renewable energy integration in cities

- The EU's Renewable Energy Directive stipulates a binding renewable energy target for the EU *of at least 42,5% by 2030, with an aspiration to reach 45% by 2030. Integrating renewable energy in cities is crucial to achieve this target. Integrating renewable energy solutions in buildings – such as solar water heaters, heat pumps or renewables-based district heating and cooling – plays a critical role in this regard, and is best done when planned in conjunction with building renovations. To that end, Member States are required to include measures in their building regulations and codes to increase the share of renewables. Such measures can relate to substantial increases in renewables self-consumption, renewable energy communities, local energy storage, smart recharging and bi-directional recharging, other flexibility services such as demand response.

  In addition, the directive contains specific provisions to accelerate the development of renewables in heating and cooling, in particular by increasing the policy prioritisation of this sector. These include indicative targets for each EU country to increase the share of renewables in heating and cooling every year, including a target for district heating and cooling. The Directive includes provisions on training and certification of heating and cooling system installers. Member States are required to ensure the provision of adequate information and advice on renewable, highly energy efficient alternatives as well as on financial instruments and incentives available to promote an increased replacement rate of old heating systems and an increased switch to solutions based on renewable energy.

- Cooperative Energy Generation Subsidy Scheme: a scheme in The Netherlands for energy cooperatives and owners' associations that wish to generate renewable electricity in a cooperative context in their own living environment (demarcated by a postal code rose) through solar energy, wind energy or hydropower.

3) Phasing out fossil fuel energy production and consumption in city energy systems: cooling, heating, cooking and electricity generation

- The EU Energy Performance of Buildings Directive requires fossil fuel boilers to be completely phased out by 2040 and subsidies cut from 2025. Solar rooftops will need to be deployed in all new residential buildings as of 2030 and fitted progressively in the existing building stock. Cities across the EU are progressively working to phase out fossil fuels in buildings. Several initiatives exist to facilitate collaboration among and support cities to achieve this objective. For example, the EU-funded project Decarb City Pipes 2050 involves cities which have started to develop and implement

actionable, district-by-district transition roadmaps to phase out fossil fuels used for heating and cooling.

- The EU's revised Emissions Trading System Directive (ETS2) will include the co2 emissions from fuel combustion in buildings and be fully operational as of 2027. The carbon price set by the ETS2 will provide a market incentive for investments in buildings renovations. ETS2 will cover upstream emissions in that it will be a be fuel suppliers, rather than end consumers such as households, that will be required to monitor and report their emissions. Suppliers will be required to surrender sufficient allowances to cover their emissions. Regulated entities will purchase these allowances at auctions. The ETS2 cap will be set to bring emissions down by 42% by 2030 compared to 2005 levels. All emission allowances in the ETS2 will be auctioned, and a share of the revenues will be used to support vulnerable households and micro-enterprises through a dedicated Social Climate Fund. Member States will be required to use the remaining ETS2 revenues for climate action and social measures.
- For example, Fossil Free Sweden works to make Sweden one of the first fossil free nations in the world with a focus to build a strong industrial sector and to create more jobs and export opportunities by going fossil free. As part of this work, the construction and civil engineering sector, which accounts for about 20% of Sweden's GHG emissions, has produced a roadmap to become fossil free. The roadmap spans the entire value chain from manufacturing material and products to operation and management of properties. The roadmap contains the following targets:
    - 2022: Actors in the construction and civil engineering sector have mapped their emissions and set climate targets.
    - 2025: GHG emissions clearly demonstrate a declining trend.
    - 2030: 50% reduction in GHG emissions (compared with 2015).
    - 2040: 75% reduction in GHG emissions (compared with 2015).
    - 2045: Net zero.

  To implement the roadmap, the industry is working on:
    - Changed composition of raw materials.
    - Electrification and efficiency improvements in production and transport processes.
    - Greater use of renewable fuels in production and transport processes.
    - More efficient transport.
    - Planning for circular flows and efficient use of resources.
    - Optimisation of energy and climate performance from a lifecycle perspective, in the construction and operation phase.

  Eight industry organisations in the urban development sector are jointly taking responsibility for the process of implementing the roadmap with around 170 companies, organisations and municipalities involved. The Swedish Construction Federation is the process owner.
- In June 2022, the City Council of Milan (Italy) approved the Air and Climate Plan (PAC), an action plan to become fully carbon neutral and a cycle-pedestrian city by 2050. Italy's second most populous city, Milan has set an ambitious goal and has

committed itself to reducing its greenhouse gas emissions by actively pursuing the actions set forth in the PAC. This approach will bring new governance models and citizen engagement processes, as well as innovative financing mechanisms to tackle energy efficiency and decarbonization issues. The strategy is divided into five areas: Health, Connection and Accessibility, Energy, Climate Change Adaptation and Awareness.

The city will also work on the energy refurbishment of public heritage buildings to promote the reduction of fossil fuels by up to 50% by 2030. More than 60 000 m2 of photovoltaic panels will be installed to cover the energy consumption of public buildings.

The PAC also includes educational activities aimed at city residents. The Municipality of Milan will raise awareness about the impacts of climate change and the need to adopt a sustainable lifestyle and consumption habits, as well as principles of circular economy through communication actions and local best practices.

4) Urban planning and design: improving circularity and transport

- Cities play a pivotal role in achieving climate neutrality by 2050, the goal of the European Green Deal. They take up only 4% of the EU's land area, but they are home to 75% of EU citizens. Under Horizon Europe, the world's biggest scientific research funding programme, Mission on Climate-Neutral and Smart Cities[25] (Cities Mission) brings together various stakeholder to work together to deliver 100 climate-neutral and smart cities by 2030 and to ensure that these cities act as experimentation and innovation hubs to enable all European cities to follow suit by 2050. As foreseen in its implementation plan, the Cities Mission takes a cross-sectoral and demand-led approach, creating synergies between existing initiatives and basing its activities on the actual needs of cities.

  For example, in Spain a wide range of mature solutions is promoted to reduce GHG emissions in cities: Energy refurbishment of buildings and public facilities, digitalization, renewing public lighting systems, improving the efficiency of water treatment and desalination, promoting clean transport, installing district heating, self-consumption of renewable energies and heat pumps. The 'Programme of subsidies to local entities for low-carbon economy investment projects' has been developed by the national Government in Spain to support projects for sustainable urban development where those solutions above are among the eligible activities, in cities below 20,000 inhabitants. This kind of national instruments supports local reduction of GHG emissions, with the benefits of tailoring the level of support (e.g. different percentage of funding depending on regional development index) and the category of activities to the local context and options, and help to leverage private investment and overcoming barriers. Continuous learning allows to renew for a new period of time the Programme, based on the experience acquired.

- The Road transport is a major contributor to climate change, and CO2 emissions from heavy-duty vehicles have grown by 25 % since 1990, accounting for over a quarter of road transport CO2 emissions.

  The existing Regulation EU 2019/1242 sets the first-ever EU CO2 emission standards for new heavy-duty vehicles. By 2030 new large trucks should emit 30 % less CO2 than today, with an intermediate target of 15 % by 2025. The Regulation required the

[25] https://mosaic-mission.eu/city-mission

European Commission to assess the effectiveness of the Regulation in 2022, with a view towards its possible extension to buses and other types of heavy-duty vehicles, and emission reduction targets for 2035 and 2040. In order to promote development and marketing of zero- and low-emission vehicles, manufacturers can benefit from incentives if they achieve certain sales targets (a 2 % share of manufacturers' sales as of 2025).

The proposed revision would expand the scope of the Regulation to include urban buses, coaches, trailers and other types of lorries. The average CO2 emissions of heavy-duty vehicles, compared to 2019 levels, would have to fall by 45 % from 2030, by 65 % from 2035, and by 90 % from 2040 onwards. The **proposal sets CO2 requirements for new trailers and targets 100 % of newly registered urban buses to be zero-emissions vehicles from 2030**. The incentive scheme for zero- and low-emission vehicles would end in 2029, but manufacturers would be allowed to take into account emission credits or emission debts also after 2029. Parliament and Council reached a provisional political agreement in the first trilogue on 18 January 2024. The **agreement maintains the CO2 reduction targets proposed by the Commission. It sets a 100% zero-emission target for urban buses by 2035 and an intermediate target of 90% by 2030**. The Commission will have to assess a possible methodology for assessment of the full lifecycle CO2 emissions of new HDVs, including a methodology for registering HDVs exclusively running on CO2-neutral fuels.

The provisional agreement was endorsed by the Coreper on 9 February 2024 and by the ENVI Committee on 14 February 2024. The next step is the formal adoption by Parliament (vote in April I 2024 plenary) and Council, followed by publication in the Official Journal. The regulation will enter into force 20 days after publication in the Official Journal and apply from 1 July 2025.

- Within the EU, **Sustainable Urban Mobility Planning (SUMP)** is the preferred urban transport planning concept. A Sustainable Urban Mobility Plan is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles." In contrast to traditional planning approaches, SUMP places particular emphasis on the involvement of citizens and stakeholders, the coordination of policies between sectors (especially transport, land use, environment, economic development, social policy, health, safety, and energy), and broad cooperation across different layers of government and with private actors.

  The EU is building a sustainable and smart trans-European transport network (TEN-T) that connects 430 major cities with ports, airports and railway terminals. All 430 major cities along the TEN-T network will have to develop SUMPs to promote zero-emission mobility, and to increase and improve public transport.

  SUMPs have proven to be an effective instrument within the EU: The Spanish capital Madrid saw a 15% reduction in nitrogen dioxide pollution in just three months after establishing low emission zones in its SUMP in November 2018. With Toulouse's latest SUMP, the city aims to reduce the number of people exposed to an increased concentration of NOx emissions from 8,000-18,000 (2013) to less than 300 in 2030. In Belgium, the Brussels region launched its Good Move plan 2020-2030 after extensive consultation with citizens. The plan will essentially ban non-local, non-essential motorized traffic, and takes an inter-modal and transversal approach. One

year after the implementation of the plan in the very city centre of Brussels, motorized traffic has dropped by a quarter and there are 36% more cyclists. Initial resistance in some neighbourhoods to vehicle restrictions underline the importance of citizen engagement.

- The EU Urban Mobility Framework initiative proposes measures to encourage EU Member States to develop urban transport systems that are safe, accessible, inclusive, affordable, smart, resilient, and emission-free.

  The EU Urban Mobility Framework strives to improve the quality of life of the EU urban population by addressing urban mobility challenges (such as air pollution, congestion, accessibility, urban road safety, growth of e-commerce, etc.) and by increasing the share of sustainable transport modes (in particular public transport and active mobility) as well as zero-emission urban logistics, last mile deliveries and urban fleets (taxis and ride-hailing services).

  It prioritises the construction and modernisation of multimodal hubs, as well as new digital solutions and services. It promotes a coherent and integrated approach to urban mobility planning while mapping out funding options for local and regional authorities to implement priority actions. The initiative also draws lessons from the effect of COVID-19 on public transport to help with the transition to a climate-neutral economy and emission-free transport at the local level.

  For example in Sweden, urban environment agreements are schemes for investments in public transport, cycling infrastructure or sustainable freight transport at the regional and local level in Sweden. The scheme commenced in 2015. In the national plan for the transport infrastructure 2022-2033, SEK 6 billion for the period 2022-2027 is allocated to the urban environmental agreements. Municipalities are eligible to apply for grants to cover part of the investment costs for public transport infrastructure. The investment should be coupled with other actions aiming at increasing the long-term sustainability of urban areas, including increased housing construction, and the transport system. The scheme is administered by the Swedish Transport Administration.

  Also in Sweden, Umeå strives to be a municipality that creates conditions/an environment for women and men, girls and boys, to have the same power to shape society and their own lives. Umeå Municipality recognizes that social sustainability is essential in achieving the vision of a growing and climate-neutral city. One of the projects undertaken in this context has been Sustainable and equal commuting to work, a project focusing on power, gender and identity in relation to mobility. The primary objective was to explore solutions utilizing service design methodology and norm-critical innovation in workplace areas predominantly travelled by private cars.

  In Denmark, work is done to achieve sustainable and healthy urban commuting. The Cycle Superhighway Collaboration between the Capital Region of Denmark and 29 municipalities provides a coherent network of cycle superhighways for safe, healthy, and sustainable commuting. The project tackles increasing transport emissions, road traffic and congestion, air and noise pollution, and physical inactivity across the capital region. By connecting work, study, and residential areas with 850 kilometres of cycle superhighways by 2045, the project provides the region's commuters with the infrastructure necessary to bike to work across municipal borders and longer distances. They are safe and easy to use, with fewer stops for a better flow – offering all the benefits of regional infrastructure combined with the physical and mental health benefits of cycling. Evaluations of the first ten superhighways have shown that

upgrading routes to cycle superhighways has led to a 59% long-term increase in bicycle traffic in 2022. Of all new cyclists, 13% used to commute by car, which will reduce CO2 emissions by an estimated 1,500 tonnes a year. A socio-economic analysis by the Technical University of Denmark found the project to be one of the most profitable infrastructure investments in Denmark, with a 23% return on investment.

Also in Copenhagen, road traffic is responsible for the vast majority of the city's public transport carbon emissions. Reducing CO2 from road traffic, as well as reducing air and noise pollution, are among the largest challenges Copenhagen is currently facing. To eliminate CO2 emissions and other harmful substances, the city has mandated that all bus lines be converted to zero-emissions buses by 2025. In collaboration with Movia, Denmark's largest public transit agency, new solutions within the transportation services which are efficient, green, and zero-emission have been created. In 2022, 43% of bus operations ran on electricity. In 2025, zero-emission bus travel in Copenhagen will save the climate approximately 17,000 tons of CO2 per year, all while ensuring cleaner air for Copenhagen's citizens, marking an important step towards a healthier, greener, and carbon-neutral city.

Since the 1970s the Netherlands has invested in cycling as a preferred mode of transport in cities. Now it is the #1 cycling country in the world, with more bicycles than people. DCE - Home (dutchcycling.nl)

In Italy, the Sustainable Urban Mobility Incentive Program (PrIMUS) promotes and co-finance urban mobility choices as an alternative to the use of private cars, encouraging forms of mobility with low environmental impact and vehicle sharing, as well as the promoting a change in citizens' habits and behaviors. The Programme, intended for municipalities with at least 50,000 inhabitants, has a budget of 15 million euros for the co-financing of projects that fall under one of the following actions: a) construction of new bike paths to cover urban home-school and home-work travel, as well as the provision of incentives for the purchase of pedal-assisted bicycles; b) development of sharing mobility in urban areas; c) development of mobility management activities at the offices of the State Administrations (central and peripheral offices), local administrations, schools and universities.

- The proposed Energy Performance of Buildings Directive foresees that public buildings should include sufficient parking spaces for bicycles and e-bikes.
- Intelligent Transport Systems (ITS) are vital to increase safety and tackle Europe's growing emission and congestion problems. They can make transport safer, more efficient and more sustainable by applying various information and communication technologies to all modes of passenger and freight transport. Moreover, the integration of existing technologies can create new services. ITS are key to support jobs and growth in the transport sector. But in order to be effective, the roll-out of ITS needs to be coherent and properly coordinated across the EU. The European Commission is working with Member States, industry and public authorities to find common solutions to the various bottlenecks for deployment.

  Through financial instruments the European Commission supports innovative projects in ITS and through legislative instruments it ensures that ITS are rolled out consistently. In the coming years, the digitalisation of transport in general and ITS in particular are expected to take a leap forwards. As part of the Digital Single Market Strategy, the European Commission aims to make more use of ITS solutions to achieve a more efficient management of the transport network for passengers and

business. ITS will be used to improve journeys and operations on specific and combined modes of transport. The European Commission also works to set the ground for the next generation of ITS solutions, through the deployment of Cooperative-ITS, paving the way for automation in the transport sector.

- Within the EU, the **electrification of vehicles** continues a strong trend. Almost half of new registered cars were either full electric or hybrid in 2023. With a share of slightly above 15% of all new cars, BEVs overtook diesel powered vehicles (13.4%) for the first time. At EU level, the Fit for 55 regulation of CO2 emissions from new cars and vans sets the following targets:
    - 55% CO2 emission reductions for new cars and 50% for new vans from 2030 to 2034 compared to 2021 levels
    - 100% CO2 emission reductions for both new cars and vans from 2035.

  A regulatory incentive mechanism for zero- and low-emission vehicles (ZLEV) will be in place from 2025 until the end of 2029. As part of this mechanism, if a manufacturer meets certain benchmarks for the sales of zero- and low-emission vehicles it can be rewarded with less strict CO2 targets. The benchmark is set at 25% for cars and 17% for vans. Under the Fit for 55 package, the EU has set specific targets to accelerate the transition to electrified road transport with regards to recharging points for cars and vans, hydrogen refuelling stations, and recharging points for heavy duty vehicles.
- The EU's **Landfill Directive** sets out strict operational requirements for landfill sites with the objective to protect both human health and the environment, including measures to reduce methane emissions. According to the EU's waste hierarchy in the **Waste Framework Directive**, landfilling is the least preferred option and should be limited to the absolute minimum. Among others, EU countries must implement national strategies to progressively reduce the amount of biodegradable waste sent to landfills and only waste that has been treated may be landfilled. The landfill Directive contains specific guidance on landfill gas control, including measures regarding the collection, treatment and use of methane emissions from landfills.
- The EU's **Urban Wastewater Treatment Directive** requires the wastewater sector to reduce its GHG emissions by over 60% compared to 1990 by 2040. By 2045 the sector should achieve energy neutrality, meaning that urban wastewater treatment plants must produce the energy they consume. The Directive aims to avoid the loss of resources and favour their re-use into a circular model. For instance, phosphorus from sludge will be recovered and re-used to make fertilisers for crop production.
- The EU's **Circular Economy Action Plan** will reduce pressure on natural resources and will create sustainable growth and jobs. It is a prerequisite to achieve the EU's 2050 climate neutrality target. The new action plan announces initiatives along the entire life cycle of products. It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the EU economy for as long as possible. The partnership of the **Urban Agenda for the EU on circular economy** aims to facilitate the implementation of the Action Plan in cities.